Chronology of KSC and KSC Related Events for 2006

Elaine E. Liston

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FOREWORD

This 2006 Chronology is published to describe and document KSC's role in NASA's progress.

Materials for this Chronology were selected from a number of published sources. The document records KSC events of interest to historians and other researchers. Arrangement is by date of occurrence, though the source cited may be dated one or more days after the event.

Materials were researched and compiled for publication by Archivist Elaine E. Liston.

Comment on the Chronology should be directed to the John F. Kennedy Space Center, Archives, LIBRARY-E, Kennedy Space Center, Florida, 32899. The Archivist may also be reached by e-mail at Elaine.Liston-1@ksc.nasa.gov, or (321) 867-1515.

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January 4: Accident delays GlobablFlyer's visit to KSC

A mishap that damaged a fuel-filled wing on the Virgin Atlantic GlobalFlyer prompted record-setting pilot Steve Fossett to postpone plans to bring the craft to Kennedy Space Center this week. Fossett planned to fly the aircraft from Salinas, Kansas to KSC on Friday. But those plans were dashed when one of the GlobalFlyer's wings was damaged after the plane was fueled for a test flight. Fossett and his team are trying to determine how long it will take to repair the wing and retest the aircraft for the longest nonstop airplane of balloon flight in history. With NASA's shuttle landing strip at KSC serving as his embarkation point, Fassett will attempt to pilot GlobablFlyer around the globe and across the Atlantic Ocean a second time before touching down at an airport outside London. The GlobalFlyer was built by Scaled Composites, Inc., a California company headed by legendary aircraft designer Burt Rutan. The aircraft is a single pilot, ultra-light aircraft designed for non-stop global circumnavigation. Web posted. (2006). [Accident delays GlobalFlyer's visit to KSC [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 4].] ["Wing mishap pushes back record try," **Florida Today**, January 5, 2006, p 1A.]

January 5: NASA Announces Next Space Station Crew

NASA formally announced the next crew bound for the International Space Station (ISS) Thursday, a two-astronaut team set to launch in mid-March aboard a Russian Soyuz spacecraft. Veteran cosmonaut Pavel Vinogradov, with Russia's Federal Space Agency, will command the ISS Expedition 13 mission with U.S. astronaut Jeffrey Williams serving as both flight engineer and NASA science officer. Also launching toward the ISS with the Expedition 13 crew will be Brazilian Air Force Lt. Col. Marcos Pontes, Brazil's first astronaut slated to fly in space. Pontes is expected to spend about one week performing experiments aboard the ISS before returning to Earth with the station's current crew. Both men will be onboard the ISS in May, when the current launch window opens for NASA's STS-121 shuttle flight aboard Discovery, NASA officials have said. Web posted. (2006). [NASA Announces Next Space Station Crew [Online]. Available WWW: http://www.space.com/ [2006, January 5].]

NASA Honors Michoud's Bravery During Hurricane

NASA Administrator Michael Griffin awarded the agency's Exceptional Bravery Medal on Thursday to workers who protected a key space shuttle facility from the onslaught of Hurricane Katrina. "Their courage reminds us that not all of NASA's heroes fly in space," Griffin said during a presentation to 38 employees at the Michoud Assembly Facility near New Orleans, where the giant shuttle external fuel tanks are built. ["NASA Honors Michoud Workers For Bravery During Hurricane," **NASA News Release #06-003**, January 5, 2006.]

January 6: Space Shuttle Processing Status Report

Mission: STS-121 - 18th ISS Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103); Location: Orbiter Processing Facility Bay 3; Launch Date:

NET May 2006; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. On Tuesday, the vehicle was powered up so technicians could open the payload bay doors and deploy the Ku-band antenna, putting the vehicle back into a processing configuration. Crew module leak checks were successfully performed. Fuel cell No. 2 was removed and replaced on Thursday. The fuel cells are located under the forward portion of the payload bay. They make power for the orbiter by mixing hydrogen and oxygen to produce electricity. The fuel cells also create potable water for the crew. Technicians continue to remove and replace gap fillers at a rate of about 100 per day. New installation procedures ensure the gap fillers stay in place and pose no hazard during re-entry to the atmosphere. Mission: STS-115 - 19th ISS Flight (12A) - P3/P4 Solar Arrays; Vehicle: Atlantis (OV-104); Location: Orbiter Processing Facility Bay 1 Launch Date: TBD; Launch Pad: 39B; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper; Inclination/ Orbit Altitude: 51.6 degrees/122 nautical miles. Atlantis' payload bay doors were opened and the Ku-band antenna was deployed this week. On Tuesday, the shipping lid for the remote manipulator system was removed and preparations continue for installation. Endeavour (OV-105) - Technicians began processing Endeavour in Orbiter Processing Facility Bay 2. The vehicle was powered up Wednesday to support the opening of the payload bay doors. Body flap installation is complete. Work continues on the thermal protection system blanket for the reinforced carbon-carbon nose cap. Endeavour is in a scheduled two-week, power down period to make modifications on the "station to shuttle power transfer system." The new system will allow the vehicle to stay docked to the International Space Station longer than on previous missions. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-001** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, January 6].]

Expendable Launch Vehicle Status Report

Mission: New Horizons; Launch Vehicle: Lockheed Martin Atlas V 551 (AV-010); Launch Pad: Complex 41, Cape Canaveral Air Force Station, Fla.; Launch Date: NET Jan. 17, 2006; Launch Window: Jan. 17 to Feb. 14, 2006. The borescope inspection of the Atlas V RP-1 propellant tank was successfully completed this week, and no defects were observed. The results of the inspection serve to increase confidence in launch success, but further testing and modeling of the vehicle continues in order to provide confidence in proceeding to launch. Launch vehicle ordnance installation was completed today. Third stage closeouts are scheduled for Monday. The safe and arm devices will be installed on the solid rocket boosters Tuesday. New Horizons spacecraft closeouts and final documentation are planned for Jan. 11 to 13. The final power-on integrated test is set for Jan. 12. The fairing doors will be installed for flight Jan. 14. Mission: Space Technology 5 (ST5); Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: Feb. 28, 2006; Launch Window: 8:57:21 a.m. - 10:19:21 a.m. EST (5:57:21 a.m. - 7:19:21 a.m. PST). The wings and aft skirt of the Pegasus launch vehicle are installed. Launch vehicle flight software is installed. Flight Simulation No. 1 is under way today. Flight Simulation No. 2 is scheduled for Jan. 25 to 26. Spacecraft software loading with associated testing took place Wednesday. A spacecraft functional test was successfully conducted Thursday. A 12-hour ST5 spacecraft operations test is under way today. Mission: Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation and

CloudSat (CALIPSO/CloudSat); Launch Vehicle: Boeing Delta 7420 with Dual Payload Attach Fitting; Launch Pad: Space Launch Complex 2, Vandenberg Air Force Base, Calif.; Launch Date: No Earlier Than February 2006 Launch Window: TBD. CALIPSO and CloudSat are installed in the Dual Payload Attach Fitting at the Astrotech payload processing facilities on north Vandenberg. They will remain there until a launch date is determined and then be prepared for transportation to NASA's Space Launch Complex 2. Further Delta II preparations at the launch pad are on hold until the CALIPSO/CloudSat payloads arrive for installation atop the second stage. KSC News Center (2006). **Expendable Launch Vehicles Status Report #E06-001** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, January 6].]

January 8: **Upcoming NASA launch draws anti-nuke protesters**

About 30 demonstrators gathered outside the south gate of Cape Canaveral Air Force Station on Saturday to protest the upcoming launch of a plutonium-powered NASA probe. The peaceful gathering lasted two hours and took place under the watchful eyes of a security patrol. The protesters gave speeches, sang songs and picketed the entrance with signs such as "No Nukes In Space" and "I Want To Grow, Not Glow." NASA is tentatively scheduled to launch its New Horizons spacecraft aboard an Atlas 5 rocket on Jan. 17. The mission would be the first to explore Pluto, still officially considered the most distant planet in the solar system, and its moon, Charon. Depending on the launch date, New Horizons would arrive no earlier than July 2015. The probe's systems are powered by a radioisotope thermoelectric generator, or RTG, that produces electricity from decaying plutonium. In the event of a launch failure, there is a chance some of the radioactive material could be released into the air. A NASA study estimates that chance at 1 in 350. The study contends that even if plutonium is released, the odds of it causing any deaths are remote. Saturday's event was very different from 1997, when 800 people showed up to protest the launch of NASA's Cassini spacecraft on a mission to Saturn with three times as much plutonium. Twenty-seven demonstrators were arrested, including some who scaled the base's security fence. Web posted. (2006). [Upcoming NASA launch draws anti-nuke protesters [Online]. Available WWW: http://www.orlandosentinel.com/ [2006, January 8].]

KSC on mission to boost tourism

You could say 2005 was business as usual at the Visitor Complex, which drew about 1.5 million visitors, about the same number as 2004, according to Dan LeBlanc, Delaware North's chief operating officer at the Visitor Complex. In recent years, attendance has been down at the Visitor Complex, and yet Delaware North keeps building more attractions and raising ticket prices each year -- in a sort of "keeping up with the Joneses" scenario with Central Florida's major theme parks. Today, the high-rise steel frame of what will be the Shuttle Launch Experience, a $60 million space shuttle simulation ride, rises above the Visitor Complex. The ride, scheduled to open in 2007, is a big part of the company's $160 million redevelopment plan announced in July -- an effort to compete more effectively with Orlando's theme park behemoths. With the 10-year redevelopment plan, Delaware North promises the facility will be a "state-of-the-art space interpretive center like no other NASA visitor center, science museum or attraction in the world." The plan also continues to put more emphasis on the Visitor Complex itself, rather than tours of the more locked down and less active launch complex. Not long after taking

over, Delaware North officials were talking about transforming the facility and began spending to do it. From 1995 to 2005, the company invested about $160 million on exhibits and infrastructure. Since the Visitor Complex has become a more elaborate and expensive tourist attraction, fewer people have come to see it. In 1990, five years before Delaware North arrived, an estimated 3.1 million people came to see the Visitor Complex and take the accompanying bus tours of the Space Center. Attendance had slumped to an estimated 2.05 million in 1994. The next year, NASA replaced TW Recreational Services, the Visitor Complex's longtime manager, with Delaware North, and attendance picked up each year, rising to an estimated 2.75 million in 1998, according to figures provided by Delaware North at the time. Tourism at the space center has yet to fully recover from the recession and terrorist attacks in 2001 and the Columbia disaster in February 2003, which has led to only one shuttle launch in three years. Web posted. (2006). [KSC on mission to boost tourism [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 8].]

Grissom's capsule to return to Brevard

The Liberty Bell 7 capsule from the early days of America's space program will come home to Brevard County for a Memorial Day-to-Labor Day exhibit at the Kennedy Space Center Visitor Complex. Late astronaut Virgil "Gus" Grissom piloted the capsule, which was used for NASA's second manned space flight, in 1961. After the capsule's splashdown, its hatch ejected prematurely, letting water into the vehicle. Grissom nearly drowned, but he was rescued by helicopter, and the capsule sank in deep water. Grissom, one of the first American astronauts, died six years later when he was killed with two other astronauts in a fire in the capsule of Apollo 1 on a launch pad at KSC. The Liberty Bell remained on the Atlantic Ocean floor for 38 years, until salvagers recovered it in 1999. The capsule is on loan from the Smithsonian Institution in Washington, D.C. It will be on display at the Visitor Complex from May 29 through Sept. 4, with no extra charge to see the capsule. Web posted. (2006). [Grissom's capsule to return to Brevard [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 8].]

January 9: Florida Tech, FSRI receive $1.3 million federal grant

NASA's FY-2006 budget includes a $1.3 million grant, at Florida Congressman Dave Weldon's request, for a life sciences research collaboration between the Florida Institute of Technology and the Florida Space Research Institute (FSRI). The two organizations will support ongoing programs within the state's Space Life Sciences (SLS) Lab at NASA's Kennedy Space Center, including research aimed at mitigating the negative health effects of long-duration space flight. The NASA grant will support joint faculty appointments between Florida Tech and FSRI within the SLS Lab, support existing biomedical and other life support technology projects within the facility, and enable research by other Florida universities and companies under FSRI's Florida/NASA Matching Grant Program. Florida Tech, FSRI, and the Economic Development Commission of Florida's Space Coast will continue to work closely together to leverage the research activity to continue their successes in the expansion of aerospace and biotech programs in the state. Florida Tech was founded in 1958 in Melbourne, Florida, to provide continuing education to professionals working in the space program at what is now Kennedy Space Center. The independent university is consistently listed as one of

America's best colleges in U.S. News & World Report. FSRI, which co-manages the Space Life Sciences Lab with NASA at the Cape Canaveral Spaceport, was established by Governor Jeb Bush and the Florida Legislature to promote collaboration among the state's academic institutions, industry, and federal space agencies to support space-related education, training, research and technology development. Web posted. (2006). [Florida Tech, FSRI receive $1.3 million federal grant for space research [Online]. Available WWW: http://www.eurekalert.org/pub_releases/ [2006, January 9].]

Boeing launch strike continues

A strike by 1,500 Boeing employees involved with the Delta launch vehicle program continues, with recent talks unable to bring both sides closer to an agreement. Officials from Boeing and International Association of Machinists and Aerospace Workers met Monday in an effort to try an end a strike that started two months ago, but made no progress. The union has turned down a proposal from the company for wage increases, saying the pay hike would not keep pace with inflation and would also cause health care costs to rise. The strike has delayed three launches of Delta 2 and Delta 4 vehicles from Cape Canaveral and Vandenberg Air Force Base, and has also halted most Delta manufacturing work at the company's plant in Decatur, Alabama. Company officials said they are now looking into "contingency plans" to move ahead with those launches. Web posted. (2006). [Boeing launch strike continues [Online]. Available WWW: http://www.spacetoday.net/ [2006, January 11].]

Nuclear rocket gets White House approval

The White House has given NASA the go-ahead on plans to launch a plutonium-powered spacecraft on the world's first mission to Pluto, an official said Monday. The green light came when John Marburger, who is director of the White House Office of Science and Technology Policy, signed final launch approval papers earlier this month. NASA aims to launch its New Horizons spacecraft Jan. 17 from Cape Canaveral Air Force Station on a nine-year journey to Pluto. White House launch approval was required for the mission because the power source the spacecraft will use to generate electricity. The spacecraft will carry a Radioisotope Thermoelectric Generator, or RTG. The device will convert heat from the natural decay of 24 pounds of radioactive plutonium-238 into electricity to power spacecraft systems on a four-billion-mile journey. Similar or identical nuclear generators have been used on 25 previous missions, including Apollo moon landings and robotic flights to Mars, Jupiter, Saturn, Uranus and Neptune. The New Horizons mission to Pluto will complete the nation's initial reconnoitering of all nine known planets in the solar system. . Web posted. (2006). [Nuclear rocket gets White House approval [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 10].]

January 10: GlobalFlyer will arrive Thursday

With wing damage to his aircraft repaired, famed aviator Steve Fossett will pilot the Virgin Atlantic GlobalFlyer to Kennedy Space Center on Thursday in advance of a flight that could make aviation history. Fossett and the GlobalFlyer are scheduled to arrive at KSC's three-mile shuttle runway about 4 p.m., clearing the way for final preparations for what is being billed as "The Ultimate Flight" -- an attempt at the longest flight in aviation history. The journey from Salina, Kan., had been scheduled to take placed last Friday but

was postponed after one of the airplane's wing tips struck a fuel tank truck before a test flight. Financially backed by Virgin Atlantic founder Sir Richard Branson, Fossett aims to take off from KSC and fly around the world before crossing the Atlantic Ocean a second time and landing at Kent International Airport outside London. The window for the flight extends from mid-January to the end of February. An exact take-off date will depend on global weather and jet stream conditions. Fossett said the rapid repair work would give him a good shot at getting the flight under way during that time frame. ["GlobalFlyer will arrive Thursday," **Florida Today**, January 10, 2006, p 1A & 3A.] [

Kennedy: Flight still possible by May, July

NASA still thinks the agency might be able to overcome concerns with external tank foam insulation and launch its second post-Columbia shuttle test flight in May, the director of Kennedy Space Center said Tuesday. "We have every hope that we can make the launch opportunity in May," KSC chief Jim Kennedy said at a luncheon presented by the National Space Club Florida Committee. "If not the May window, then the July window, but it's clear we are getting closer." Kennedy said NASA still plans to deliver an external tank for the test flight to the International Space Station in early February. Doing so would put the agency in position to attempt to launch Discovery during a window that extends from May 3 to May 23. NASA still has not set an official target date for the launch. A selection won't be made until the agency completes the testing and analyses needed to prove it is safe to fly without custom-crafted foam insulation that protects pressurization lines and electrical cables that run along the exterior of the tank. A heater designed to keep ice from building up on metal struts that connect the tank with the nose of the shuttle orbiter replaced the foam in that area. Daylight launch rules that are in place for NASA's first two post-Columbia test flights restrict the agency to sending shuttles aloft during certain windows of opportunity. After May, the next opportunities will come during windows that extend from July 1 through July 20 and Aug. 28 through Sept. 14. ["Kennedy: Flight still possible by May, July," **Florida Today**, January 11, 2006, p 1B.]

January 11: NASA Refines Design For Crew Exploration Vehicle

NASA's Constellation Program is making progress toward selecting a prime contractor to design, develop and build the Crew Exploration Vehicle (CEV), America's first new human spacecraft in 30 years. The agency has issued Phase II of a Request for Proposals. It is a "Call for Improvements" that incorporates the results of additional analysis and study. Phase II adds detailed design, development and production requirements. Phase II proposals will be evaluated and used to select a single CEV contractor later this year. The CEV is a key element of the Constellation Program, which will help NASA realize the Vision for Space Exploration. The CEV will transport up to six crew members to and from the International Space Station and up to four to and from the moon. It will also support future Mars missions. For the first time, the Phase II Request for Proposals specifies a configuration for the spacecraft: an improved, blunt-body crew capsule shape. Requirements are based on future exploration mission needs and the desire to fly the first CEV mission as close as possible to 2010, when the space shuttle will be retired. Phase I resulted in contract awards in July 2005 for CEV systems requirements definition to teams led by Lockheed Martin Corp. and Northrop Grumman Systems Corp. Phase II

proposals are due March 20, 2006. ["NASA Refines Design For Crew Exploration Vehicle," **NASA News Release #06-026**, January 11, 2006.]

January 12: Nelson recalls shuttle he rode 20 years ago

U.S. Sen. Bill Nelson said he couldn't believe it has been 20 years since he flew on the shuttle. "When I looked at some of those old pictures, then I believe it," Nelson said after meeting with top officials at Kennedy Space Center to discuss plans to prepare the spaceport for the transition from launching the final shuttle missions and new rockets and spaceships bound for the moon. Nelson got the opportunity to fly on shuttle Columbia while representing Brevard County in the U.S. House of Representatives and always has treasured the memories of the training, the anticipation, the launch and the flight itself. Nelson didn't spend the day reminiscing, though. He said his business at KSC was checking on the status of the center's effort to land as much of the assembly and refurbishment of NASA's next spacecraft as possible. The proposed Crew Exploration Vehicle, an Apollo-like capsule riding on a new rocket that will be based on a single shuttle solid rocket booster, could be built safer and for less money in existing facilities at KSC. ["Nelson recalls shuttle he rode 20 years ago," **Florida Today**, January 12, 2006, p 1B.]

Global Flyer on its way to KSC

Steve Fossett and the Virgin Atlantic GlobalFlyer are winging their way toward Kennedy Space Center today after taking off from Salina Municipal Airport in Kansas. The experimental aircraft took to the skies at 11 a.m. EST, heading first toward Kansas City. Fossett then will make a beeline toward Jacksonville before turning south and following the east coast of Florida to Ormond Beach. At that point, the flight plan calls for Fossett to angle inland to a point 20 miles west of KSC before making a final approach to Runway 15 at the Shuttle Landing Facility. Web posted. (2006). [Global Flyer on its way [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 10].]

NASA drops requirement for methane engine from CEV

Congressional pressure to avoid a gap in U.S. human space access is behind a NASA push to accelerate the first piloted flight of the planned Crew Exploration Vehicle (CEV). While President Bush originally wanted an operation CEV by 2014, the final RFP for the shuttle replacement called for a first flight with crew "as close to 2010 as possible, but no later than 2012, without compromising safety." The new document also drops requirements for a LOX/methane engine on the CEV service module as a placeholder for future extraction of the fuel from the atmosphere of Mars, and for delivery of un-pressurized cargo to the International Space Station, although nothing would prevent the winning team from proposing them, according to a program spokesman at Johnson Space Center. Officially a "call for improvements" to the original CEV bids, the long- awaited document specifies for the first time that the vehicle will be "an improved, blunt-body crew capsule shape" as called for in the exploration architecture released last fall (Aviation Week & Space Technology, Sept. 26, 2005). Final CEV dimensions remain in flux, the program spokesman says. Teams led by Northrop Grumman and Lockheed Martin are finalists for the job of building the CEV, which will run through 2019. The contract will fall into three parts - a cost-plus award fee element through "approximately 2013" that will cover design, development, test and evaluation (DDT&E) though first

flight of the initial two CEV blocks; an indefinite quantity indefinite delivery contract for full-scale CEV production, and a sustaining engineering element that will include "any additional DDT&E necessary to complete development of the Block 2 Lunar variant." E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "NASA drops requirement for methane engine from CEV," [Electronic]. Vol. 217, No. 7, [January 12, 2006.].]

Stardust On Final Approach For Landing

NASA's Stardust mission return capsule will land Sunday at approximately 5:12 a.m. EST (3:12 MST) on the Utah Test and Training Range. Stardust is completing a 2.88 billion mile round-trip odyssey to capture and return cometary and interstellar dust particles to Earth. The spacecraft performs its last maneuver to put it on the correct path to enter the atmosphere tomorrow at 11:53 p.m. EST (9:53 p.m. MST). The speed of the capsule, as it enters the atmosphere at 28,860 mph, will be the fastest ever of any human-made object, surpassing the record set in May 1969 by the returning Apollo 10 command module. ["NASA's Comet Hunter On Final Approach For Sunday Landing," **NASA News Release #06-028**, January 12, 2006.]

Expendable Launch Vehicle Status Report

Mission: New Horizons; Launch Vehicle: Lockheed Martin Atlas V 551 (AV-010); Launch Pad: Complex 41, Cape Canaveral Air Force Station, Fla.; Launch Date: Jan. 17, 2006; Launch Window: 1:24 p.m. - 3:23 p.m. EST. Flight Readiness Review completed today at NASA's Kennedy Space Center. Spacecraft closeouts conclude tomorrow; payload test team conducts spacecraft electrical tests Saturday, and the fairing access doors will be closed for flight. Rollout of the Atlas V from the Vertical Integration Facility is scheduled Monday at 10:30 a.m. EST. The storable propellant tank will be loaded onboard the Atlas first stage tank Monday afternoon. On Tuesday at 10:39 a.m., Pad 41 will be cleared for cryogenic fueling operations scheduled to begin at 11:24 a.m. EST. Mission: Space Technology 5 (ST5); Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: Feb. 28, 2006; Launch Window: 8:57 a.m. - 10:19 a.m. EST. Mating of the Pegasus second and third stage is tentatively scheduled for tomorrow; mating of the first and second stage is planned for Monday. Pegasus Flight Simulation No. 2 is scheduled for Jan. 25 - 26. Flight Simulation No. 1 was successfully completed last week. ST5 thermal blanket closeouts completed today. A limited spacecraft functional test is scheduled tomorrow, and the payload will be weighed. Mission: Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation and CloudSat (CALIPSO/CloudSat); Launch Vehicle: Boeing Delta 7420 with Dual Payload Attach Fitting; Launch Pad: Space Launch Complex 2, Vandenberg Air Force Base, Calif.; Launch Date: No Earlier Than February 2006; Launch Window: TBD. CALIPSO and CloudSat are installed in the Dual Payload Attach Fitting at the Astrotech payload processing facilities on north Vandenberg. They will remain there until a launch date is determined and they are prepared for transporting to the launch complex. Spacecraft battery charging is being performed as necessary. Further Delta II preparations at the launch pad are on hold until the CALIPSO/CloudSat payloads arrive for installation atop the second stage. KSC News Center (2006). **Expendable Launch Vehicles Status Report #E06-002** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, January 12].]

January 13: Fossett pumped for ultimate adventure

Steve Fossett landed the Virgin GlobalFlyer at Kennedy Space Center on Thursday. Fossett land March piloted the first nonstop solo flight around the world, taking off from Salina Municipal Airport and then landing there 67 hours and 1 minute later. Sometime in the next few weeks, Fossett and the GlobablFlyer will take off from KSC's shuttle runway and attempt to circle the globe fore crossing the Atlantis Ocean a second time and landing at Kent International Airport outside Longdon. The trip would cover 26,160 miles in about 80 hours. ["Fossett pumped for ultimate adventure," **Florida Today**, January 13, 2006, p 1A & 3A.]

January 14: Crawlers carry spacecraft for 40 years

They started work at Kennedy Space Center four decades ago, and NASA's cadre of German rocket scientists knew them colloquially as Hans and Franz. Now they are simply known as Crawler Transporters 1 and 2, but the machines continue hauling massive spaceships to the beachside launch pads at NASA's storied spaceport, and they likely will remain in service for years to come. "They are impressive pieces of equipment," said Michael Wetmore, a Merritt Island resident who serves as a launch integration manager for NASA. Manufactured by Marion Power Shovel Co. in Ohio, Hans and Franz started operating at KSC in early 1966. Dozens of current and former NASA and contractor managers, engineers and technicians gathered at KSC on Friday to celebrate 40 years of Crawler Transporter service. As tall as two story buildings and as wide as eight-lane highways, the vehicles have roofs that are the size of baseball diamond infields. Powered by two 2,750 horsepower diesel engines, the giant tracked vehicles each have tallied 1,800 miles hauling Saturn moon rockets and space shuttles to KSC's twin launch pads from its landmark Vehicle Assembly Building. Top speed with a full 12-million-pound load: About 0.9 mph. Web posted. (2006). [Crawlers carry spacecraft for 40 years ... and counting [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 14].]

January 15: New Horizons Pluto pre-launch

Though they've been staying in Cocoa Beach for months, the spacecraft engineers from Maryland are living on Pluto. "It's got to work at Pluto," they tell one another every time they iron out a wrinkle with the New Horizons spacecraft. They've worked 12-hour days, sometimes seven days a week, with rare trips home. For the plutonium-powered probe, safety is always first, but timing is certainly second. Launch is set for 1:24 p.m. Tuesday. If the Atlas 5 rocket flies by Jan. 28, the craft can get to Pluto in 2015, saving years of flight time. The first spacecraft to study the ninth planet is destined to travel more than 3 billion miles. Yet the $700 million mission has already taken a long journey, from its 2001 approval through struggles for funding, worries about getting enough plutonium fuel, and the headlong race to launch. Web posted. (2006). [New Horizons Pluto pre-launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 14].]

January 16: Pluto launch is go for Tuesday

A NASA spacecraft aiming for Pluto passed another round of approvals Sunday and will attempt a Tuesday launch from the Cape. The spacecraft, whose plutonium fuel was loaded during the weekend, is to launch on an Atlas 5 rocket. The one-hour, 59-minute

window opens at 1:24 p.m. Weather looks good for Tuesday, with an 80 percent chance of acceptable conditions. Winds are a concern as a cold front approaches. If the launch delays to Wednesday, prospects worsen, with just a 40 percent chance of acceptable weather. In a briefing Sunday, Launch Director Omar Baez acknowledged there had been some disagreement about whether to approve a fuel tank on the rocket for launch after another tank was "brutally tested and failed." This is the first Atlas 5 to fly with five solid rocket boosters. The Applied Physics Laboratory at Johns Hopkins University built the New Horizons spacecraft for NASA. The mission will cost about $700 million. [:Pluto launch is go for Tuesday," **Florida Today**, January 16, 2006, p 1A

January 17: NASA puts its journey to Pluto on hold again

High winds Tuesday forced NASA to postpone the launching of the New Horizons spacecraft on a decade-long mission to distant Pluto. Another attempt was scheduled for today from Cape Canaveral Air Force Station in Florida between 12:16 p.m. and 2:15 p.m. CST. Pluto is the only planet in the solar system that has gone without a close-up look by a U.S. spacecraft. Today's launch was called off as surface winds exceeded a 38-mph safety limit. Web posted. (2006). [NASA puts its journey to Pluto on hold again [Online]. Available WWW: http://www.houstonchronicle.com/ [2006, January 17].]

NASA ready for the worst

NASA will quickly gauge the magnitude of any radiological release and notify the public what to do next if an Atlas 5 rocket and a plutonium-powered spacecraft explode during launch today, officials said Monday. Equipped with an electrical generator fueled by 24 pounds of plutonium, NASA's New Horizons spacecraft is scheduled to blast off from Cape Canaveral Air Force Station between 1:24 p.m. and 3:23 p.m. on the world's first mission to explore Pluto. Government studies show there is a one in 350 chance of a launch accident that would trigger a release of radioactive plutonium. Under most circumstances, the material will not pose a threat beyond the Air Force station's property. Sixteen field teams armed with high-tech monitoring equipment will be spread out in Brevard County to determine the significance of any release. ["NASA ready for the worst," **Florida Today**, January 17, 2006, p 1A & 5A.]

Florida should have private spaceport

A commission will recommend that Florida create its own private spaceport, separate from the federally controlled property at Cape Canaveral, Florida Today reported Tuesday. The paper, citing an executive summary of a report to be released Wednesday, said the spaceport is one of 18 recommendations the Gov.'s Commission on the Future of Space and Aeronautics plans to make. The commission was established to help the state compete for space tourism business as NASA starts winding down its shuttle program. The space industry represents $4.5 billion of the state's economy, according to a recent Florida Senate report. Other recommendations include combining three space-related government agencies into one, improving space education programs, protecting current space jobs and creating new ones, and making sure the state retains a shuttle work force after NASA's orbiters retire in 2010, the newspaper said. "I can tell you that anyone who has attended our public meetings or hearings is going to find no surprises in the final report," commission member Jim Banke told the newspaper. "We're going to talk about

education. We're going to talk about how to market the state's space resources. We're going to talk about economic development." The commission said a spaceport, run like an airport, could lure business beyond today's traditional rocket-launch firms. The report will also recommend the state provide financial incentives and seed money for space companies and startups, according to the newspaper. Web posted. (2006). [Report: Commission says Florida should have private spaceport [Online]. Available WWW: http://www.theledger.com/ [2006, January 17].]

January 18: Federal mediators may intervene in rocket strike

The union representing striking Delta rocket workers is asking federal mediators to make certain a Boeing Co. offer to return to the negotiating table is being made in good faith, officials said Tuesday. Boeing contacted the Federal Mediation and Conciliation Service on Tuesday and asked for a meeting with union negotiating committees at Cape Canaveral Air Force Station as well as sites in California and Alabama. No new negotiation date has been set. About 1,500 machinists, including 288 here, represented by the International Association of Machinists and Aerospace Workers walked off the job Nov. 2 after the union and the company failed to come to terms on a new three-year contract. On hold as a result are launches of a classified payload for the National Reconnaissance Office, an atmospheric science mission for NASA and an advanced weather satellite for the National Oceanic and Atmospheric Administration. Federal mediator Charlie Griffin and Boeing spokesman Joseph LaMarca Jr. confirmed the company asked the FMCS to facilitate a meeting with union negotiators. Web posted. (2006). [Federal mediators may intervene in rocket strike [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 18].]

Griffin confident of shuttle launch

NASA Administrator Mike Griffin said Tuesday he is confident the shuttle fleet will return to flight in May or July, and then fly regularly enough to finish building the International Space Station before the orbiters retire in 2010. Griffin said the agency is close to picking a target date for the launch of shuttle Discovery on the second post-Columbia flight. The mission is likely to be scheduled sometime in May, Griffin said, though a delay to July remains possible if NASA needs more time to fix the lingering foam debris problem blamed for the 2003 shuttle disaster. Griffin's basis for optimism: the agency's 25 years of experience flying the aging shuttle orbiters. During that time period, even including the two lengthy groundings of the fleet following the fatal Challenger and Columbia accidents, NASA averaged between four and five shuttle missions a year. That's about the pace necessary to fly the 18 or so missions necessary to finish building the $100 laboratory as its currently envisioned. "All we have to do is execute our average performance in order to finish the station," said Griffin, who visited Kennedy Space Center to see the launch of a probe to Pluto. Web posted. (2006). [Griffin confident of shuttle launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 18].]

January 19: Florida plans spending to support space industry

Florida governor Jeb Bush released plans Wednesday to provide $55 million in the state's next budget to support the state's space industry. The plan, released in conjunction with

the final report of a state commission studying Florida's future in space, includes $35 million in facility improvements at Cape Canaveral, designed to lure the company that wins the contract to develop the Crew Exploration Vehicle (CEV) to establish maintenance and refurbishment operations there. The state will also waive sales taxes on space companies, improve educational programs, and consolidate three existing state agencies that deal with space into a single entity, Space Florida. That new agency will be charged with carrying out other recommendations by the commission, including the possibility of creating a new commercial spaceport in the state. Web posted. (2006). [Florida plans spending to support space industry [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, January 19].]

Atlas 5 to give it another try

Tuesday, it was heavy winds at Cape Canaveral. Wednesday, it was severe storms in Maryland that stopped the launch of the world's first mission to Pluto. NASA plans to try again today to launch the Atlas 5 rocket carrying its New Horizons probe after postponing Wednesday's attempt because of a power outage at a spacecraft control center in Laurel, Md. Today's launch window would extend from 1:08 p.m. to 3:07 p.m. if the power problems at the control center are resolved. NASA is anxious to get the plutonium-powered spacecraft off the ground as soon as possible because the longer they wait, the more years it will take to reach Pluto. If New Horizons launches by Jan. 28, it will arrive at Pluto in 2015. It still gets the benefit of a Jupiter gravity assist through Feb. 2 and then would have to fly directly to Pluto, with later and later arrival times until the launch window closes Feb. 14. There's a backup window next year. ["Atlas 5 to give it another try," **Florida Today**, January 19, 2006, p 1B.]

NASA Launches Spacecraft on the First Mission to Pluto

NASA launched the first space mission to Pluto as a powerful rocket hurled the New Horizons spacecraft on a nine-year, three-billion-mile journey to the edge of the solar system. As it soared toward a 2007 rendezvous with Jupiter, whose powerful gravitational field will slingshot it on its way to Pluto, mission managers said radio communications confirmed that the 1,054-pound craft was in good health. The $700 million mission began when a Lockheed Martin Atlas 5 rocket rose from a launching pad at the Cape Canaveral Air Force Station in Florida at 2 p.m., almost an hour later than planned because of low clouds that obscured a clear view of the flight path by tracking cameras. "We have ignition and liftoff of NASA's New Horizons spacecraft on a decade long voyage to visit the planet Pluto and then beyond," declared Bruce Buckingham, NASA's launching commentator. Speaking at a news conference at the Kennedy Space Center in Florida, Dr. Alan Stern said the timing assured that the New Horizons would arrive for its closest approach to Pluto on July 14, 2015 - the 50th anniversary of the first flyby of Mars by the Mariner 4, the mission that began the exploration of the planets. The New Horizons is to reach Jupiter's gravitational field in 13 months. Web posted. (2006). [NASA Launches Spacecraft on the First Mission to Pluto [Online]. Available WWW: http://www.nytimes.com/ [2006, January 20].]

January 20: Space Shuttle Processing Status Report

Mission: STS-121 - 18th ISS Flight (ULF1.1) - Multi-Purpose Logistics Module; Vehicle: Discovery (OV-103); Location: Orbiter Processing Facility Bay 3; Launch Date: No earlier than May 2006; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The shuttle arm (remote manipulator system) was installed Monday. Arm verification testing starts next week. All three main engines were installed last week and leak checks continue. Preparations are underway for installation of the dome-mounted heat shields that surround the three engines. That heat shield is made of two semicircular sections of thermal protection system tiles. Solid rocket booster stacking for Discovery's launch starts Monday in the Vehicle Assembly Building. Monday, the right aft booster, comprised of the aft shirt and the aft motor segment, will be transported from the Rotation Processing and Surge Facility to the assembly building for lifting onto the mobile launcher platform. Technicians will perform the same procedure for the left aft booster on Tuesday. Mission: STS-115 - 19th ISS Flight (12A) - P3/P4 Solar Arrays; Vehicle: Atlantis (OV-104); Location: Orbiter Processing Facility Bay 1; Launch Date: TBD; Launch Pad: 39B; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Atlantis was powered down, so a cold plate could be removed and replaced. The cold plate change-out is complete and leak checks are underway. Cold plates keep electronics boxes cool. Work is scheduled to begin on the shuttle's gap fillers in early February. Technicians will remove and replace approximately 3,000 gap fillers in the main priority area at a rate of about 100 per day. This work is being performed due to two gap fillers that were protruding from the underside of Discovery during the last mission, STS-114. New installation procedures were developed to ensure the gap fillers stay in place and do not pose any hazard during the shuttle's re-entry to the atmosphere. Endeavour (OV-105); In Orbiter Processing Facility bay 2, processing continues on Endeavour following an extensive modification period. The Ku-band antenna was installed on Wednesday. All mid-body structural inspections are complete. Work continues on the manipulator positioning mechanism for the shuttle's robotic arm before installation in the vehicle. The mechanisms are pedestals that keep the arm secured in the payload bay when it's not in use. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-002** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, January 20].]

NASA postpones troubled mission to visit asteroids

A NASA spacecraft built to explore two of the solar system's largest asteroids won't launch this year because the space agency is dealing with cost overruns and technical issues in the project. The planned summer launch of the Dawn spacecraft has been indefinitely postponed, said Andrew Dantzler, director of NASA's solar-system division. Mission managers had been ordered to halt work on Dawn last fall while the project was assessed by an independent review team, which is expected to present its findings to NASA on Friday. Dawn is part of a NASA program called Discovery that seeks to explore the solar system on what, for NASA, is considered a shoestring budget. The program includes the Stardust mission, which last week returned to Earth with samples of comet dust. ["NASA postpones troubled mission to visit asteroids," **Orlando Sentinel**, January 22, 2006, p A3.]

January 23: NASA Shuffles Center Leadership

NASA announced Monday that the head of the Stennis Space Center had been reassigned to a post at the Kennedy Space Center, to be replaced by an official from the Langley Research Center. Bill Parsons, who had taken over Stennis just last September, will become deputy director of the Kennedy Space Center. Parsons had held several other senior positions within NASA, including space shuttle program manager. Parsons will be replaced at Stennis by Richard Gilbrech, the deputy director of Langley. NASA also confirmed the departure of Scott Hubbard as director of the Ames Research Center. Hubbard, who announced his plans to leave the agency to center employees last week, will take a position at the nearby SETI Institute, an astrobiology research center. Web posted. (2006). [NASA shuffles center leadership [Online]. Available WWW: http://www.spacetoday.net/ [2006, January 24].]

NASA recycles Triana component for lunar orbiter

NASA will pay Honeywell to refurbish a Miniature Inertial Measurement Unit (MIMU) originally built for the Triana Earth-observation mission pushed by former Vice President Al Gore, and plans to install the unit on its proposed Lunar Reconnaissance Orbiter (LRO). Intended for launch in October 2008, the LRO requires three of the MIMUs for redundancy, and NASA wants a sole-source deal with Triana-supplier Honeywell for the whole set - two new and one refurbished. The units would provide attitude rate measurements for orbiter fine guidance over the lunar surface. Triana was intended to provide continuous coverage of the sunlit side of the Earth from a post at the L1 Lagrangian point. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "NASA recycles Triana component for lunar orbiter," [Electronic]. Vol. 217, No. 13, [January 23, 2006.].]

GAO: NASA needs better project planning

NASA may employ rocket scientists and many other very smart people, but the space agency still needs to improve how it executes big projects that cost taxpayers billions of dollars. A report Monday by the Government Accountability Office, which has long been critical of NASA's management skills, suggested the space agency's estimated $100 billion program to send astronauts back to the moon is headed for trouble unless it adopts more stringent procedures. Among the report's findings: - NASA policies allow projects to proceed without proving technologies are fully developed. This increases the risk of costly design changes later. - NASA centers have different levels of assessing a project. That, combined with the loss of experienced project managers, makes it difficult to objectively evaluate the status of a particular project. The report concluded: "NASA's failure to define requirements adequately and quantify the resources needed to meet those requirements resulted in some projects costing more, taking longer and achieving less than originally planned." The findings are not new. Over the past decade, the National Aeronautics and Space Administration has experienced delays, overruns and outright cancellations of projects. The GAO attributed those troubles, in part, to the now abandoned "faster, better, cheaper" philosophy articulated by former NASA Administrator Dan Goldin. In a written response to a draft of the GAO report, a NASA official defended the agency's policies. Shana Dale, an assistant administrator, indicated the space agency would take steps to strengthen its project management to reflect some of

the GAO's recommendations. The GAO is Congress' investigative arm and serves in an advisory role. Web posted. (2006). [GAO: NASA needs better project planning [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 23].]

January 24: Stacking begins for Discovery's solid rocket boosters

NASA on Jan. 23 began stacking the solid rocket boosters for space shuttle Discovery's second return-to-flight mission, STS-121, set to launch to the International Space Station no earlier than May. Stacking takes place in the Vehicle Assembly Building (VAB) at Kennedy Space Center in Florida. The right aft booster was transported from the Rotation Processing and Surge Facility to the VAB on Jan. 23, with the left aft booster slated to make the same trip the following day. Also starting this week is verification for Discovery's robotic arm, which was installed Jan. 16. Leak checks also continue on Discovery's three main engines. Meanwhile, shuttle Atlantis is being prepped for the next mission in the sequence, STS-115, which will resume assembly of the space station. Starting next month, technicians will begin replacing roughly 3,000 thermal tile gap fillers on Atlantis at a rate of 100 per day. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Stacking begins for Discovery's solid rocket boosters," [Electronic]. Vol. 217, No. 14, [January 24, 2006.].]

Weather, winds ground Fossett

Higher-than-desirable temperatures at sunrise and headwinds around the globe will keep adventurer Steve Fossett and the Virgin Atlantic GlobalFlyer on the ground the rest of the month, officials said Monday. The earliest Fossett will take off from Kennedy Space Center on "The Ultimate Flight" now is Feb. 1, Virgin Atlantic spokeswoman Suzanne Weldon said. Fossett, 61, aims to set a new record for the longest nonstop flight in aviation history. The plan is to take off from the shuttle runway and circle the globe before crossing the Atlantic Ocean a second time and landing at an airport outside London. The 26,160-mile trip would be the longest flight by an aircraft or balloon. An exact takeoff date for the 80-hour flight will depend largely on global weather and jet stream conditions. Weldon said forecasters are predicting relatively high temperatures at dawn at the Shuttle Landing Facility between now and the end of January. Web posted. (2006). [Weather, winds ground Fossett [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 24].]

January 25: GAO Recommends NASA Standardized Acquisition Process

The Government Accountability Office (GAO) is recommending that NASA adopt a standardized "knowledge-based" acquisition approach at all of its centers as it tackles the challenges of returning astronauts to the moon and beyond. According to GAO's definition, knowledge-based acquisition allows developers to be reasonably certain, at critical junctures, that their products will perform up to expectations. "A standardized, knowledge-based approach would prepare NASA to face competing budgetary priorities and better position the agency to make difficult decisions regarding the investment in and termination of projects," GAO's report says. Web posted. (2006). [GAO Recommends NASA Adopt Standardized Acquisition Process [Online]. Available WWW: http://www.aviationnow.com/ [2006, January 25.]

January 26: Administrator's Statement On NASA's Day of Remembrance

The following is a statement by NASA Administrator Michael Griffin on NASA's Day of Remembrance. The Day or Remembrance honors those who gave their lives for the cause of exploration and discovery. This includes NASA employees, the astronauts who died in Apollo 1 and on the Space Shuttles Challenger and Columbia. "Today we pause to remember the loss of all of our employees, including our Apollo 1, Challenger and Columbia astronauts, and to honor their legacy. Nearly 50 years into the space age, spaceflight remains the pinnacle of human challenge, an endeavor just barely possible with today's technology. We at NASA are privileged to be in the business of learning how to do it, to extend the frontier of the possible, and, ultimately, to make space travel routine. It is an enormously difficult enterprise. The losses we commemorate today are a strong and poignant reminder of the sternness of the challenge." ["Administrator's Statement On NASA's Day of Remembrance," **NASA News Release #06-032**, January 26, 2006.]

NASA remembers fallen astronauts

NASA employees throughout the country paused Thursday to rededicate themselves to space exploration and remember their 17 astronaut colleagues who died pursuing it. "They and their families sacrificed much in the pursuit of their dreams and our dreams. We have not, will not, ever forget what their sacrifice has meant to each of us," Johnson Space Center Director Mike Coats told hundreds of NASA workers. NASA Administrator Michael Griffin said he would lay a wreath at Arlington National Cemetery in memory of the astronauts lost in the Apollo 1, Challenger and Columbia tragedies. Saturday marks 20 years since Challenger blew apart as it lifted into space. Three astronauts died inside the Apollo 1 spacecraft in a fire during a countdown test at the launch pad on January 27, 1967; seven died aboard Challenger when it exploded on January 28, 1986, and seven more died as Columbia broke to pieces upon re-entering the Earth's atmosphere February 1, 2003. "Spaceflight remains the pinnacle of human challenge, an endeavor just barely possible with today's technology," Griffin said in a statement Thursday. Web posted. (2006). [NASA remembers fallen astronauts [Online]. Available WWW: http://www.cnn.com/ [2006, January 26.]

European rocket to lift NASA telescope

U.S. and European officials are close to a deal to launch a $4.5 billion U.S. space telescope on a European rocket from a facility in French Guiana. The unusual arrangement involves no cash but will save NASA tens of millions of dollars in launch costs at a time when the agency's budget is shifting to support an estimated $100 billion program to send astronauts back to the moon. In exchange for the launch, NASA will give the European Space Agency an undisclosed amount of research time on the orbiting observatory, the powerful successor to the Hubble Space Telescope. The deal's near-done status was confirmed Wednesday by Aaron Lewis, a U.S. spokesman for Arianespace, a European launch company. ["European rocket to lift NASA telescope," **Florida Today**, January 26, 2006, p 1A & 5A.]

January 27: Cape Canaveral lighthouse undergoes renovation

The historic Cape Canaveral Lighthouse is getting an extreme makeover -- to the tune of $750,000. Thursday, about 50 people hushed as a huge crane slowly hoisted the 18,000-pound roof and lamp room off the lighthouse tower for refurbishing. The renovations -- needed after hurricanes Frances and Jeanne accelerated the deterioration from age, salt air and leaks -- are to be completed by mid-July as part of the preparations to allow more public access to the lighthouse. "I've gotten calls from people from as far as San Francisco wanting to come and see this lighthouse," said Don George, natural/cultural resources manager for Patrick Air Force Base. It has served as a beacon to mariners for nearly 140 years. Because it is on Cape Canaveral Air Force Station, which is restricted property, public access to the lighthouse is limited to once or twice a year. It is the only lighthouse owned by the Air Force. Web posted. (2006). [Canaveral lighthouse undergoes renovation [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 27.]

County hopes to lure space tourism

The Brevard County Tourist Development Council voted to give $50,000 in marketing funds to Space Adventures, should the space tourism company decide to relocate anywhere in Brevard County. "We allocated these funds because space tourism could be a very important part of Florida's tourism industry," said Bonnie King, assistant director for the Space Coast Office of Tourism. "I think everyone used to think space tourism was something of the future. Well, the future is here." The $50,000 represents an important first step in expanding the role of the space industry -- and the role of Kennedy Space Center -- to encompass tourism and "real people" who want to experience spaceflight, officials said. "This was a very gracious offer aimed at boosting space tourism," said Chuck Sammons, vice president of suborbital flight and spaceport development for Space Adventures, based in Arlington, Va. Space Adventures also owns a percentage of Zero-G, located in Fort Lauderdale. "The next step will be a request for proposal that will go out next week," said Lynda Weatherman, president and chief executive officer of the Economic Development Commission of Florida's Space Coast. Web posted. (2006). [County hopes to lure space tourism [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 27.]

January 28: 20 Years Later, a Tribute to the Fallen Challenger Astronauts

Relatives and friends of the seven crew members who died in the explosion of the space shuttle Challenger gathered with NASA officials and hundreds of others Saturday to observe the 20th anniversary of the tragedy. They also paid tribute to the other astronauts who have died in the line of duty since the space program began. At the ceremony, held at the Space Mirror Memorial at the Kennedy Space Center, NASA also took the opportunity to recognize the other 17 astronauts who have been killed since human spaceflight began in 1961. Among those in attendance were family members of Challenger astronauts and relatives of the seven astronauts who died on Feb. 1, 2003, when the space shuttle Columbia broke apart as it re-entered Earth's atmosphere. Also present was the brother of Virgil I. Grissom, the Apollo 1 commander, who died in a fire along with two colleagues in a launch pad training session aboard the spacecraft in 1967. NASA said the other seven astronauts honored on Saturday all died in aircraft crashes during training missions. At the Space Mirror — a shiny, towering wall bearing the

names of the 24 fallen astronauts — people hung wreaths and flowers. William H. Gerstenmaier, an associate administrator of space operations at NASA, said, "As engineers, the machines we build can do great things but can also cause great harm. Sometimes it's hard for us who work with the space program to articulate the higher calling of our jobs. We are not here for fame or money, but we are here because we believe in what we do," he added. "The Challenger crew lived that higher calling." Web posted. (2006). [20 Years Later, a Tribute to the Fallen Challenger Astronauts [Online]. Available WWW: http://www.nytimes.com/ [2006, January 29.]

Ride: Program won't survive more failure

A significant foam loss on NASA's next shuttle flight would be "a serious setback" from which the agency might not recover, according to the only person to investigate both the Challenger and Columbia accidents. A catastrophic failure before the 2010 retirement of the remaining three orbiters might prompt immediate shutdown of the program, former astronaut Sally Ride said. "I think the loss of another shuttle before fleet retirement would probably retire the fleet right then and there," she said. "The shuttle was grounded for almost three years after the Challenger accident. . . . It was grounded for almost the same period of time after Columbia. "I think that tells you that when there is a shuttle accident, you are misleading yourself if you think that the shuttle is going to get back to flight in less than two-and-a-half to three years. And here we are in 2006. 2010 is not that far away." Ride, 54, became the first American woman to fly in space in 1983. She flew again in 1984. Ride served on the official government investigations of the 1986 Challenger accident and 2003 Columbia accident. Web posted. (2006). [Ride: Program won't survive more failure [Online]. Available WWW: http://www.floridatoday.com/ [2006, January 28.]

January 30: Boeing agrees to contract with rocket workers

Boeing said on Monday it agreed to a tentative contract with about 1,500 striking machinists at its rocket unit plants, who are represented by the International Association of Machinists and Aerospace Workers. The workers affected by the contract, in Alabama, Florida and California, are set to vote on the contract on Wednesday, Boeing said. The workers went on strike on Nov. 2 in a dispute over retiree health insurance. The IAM said on Saturday that Boeing had made "some movement" in its direction in negotiations that resumed in Birmingham, Alabama on Friday. Those were the first "substantive" talks since the strike began, the union said. The union called the changes offered in the contract "substantive, not substantial." Boeing said the contract offered lump sum bonuses and wage increases for all employees and pension increases for those retiring after March 1 but also will eliminate retiree medical coverage for new hires after September 1. Web posted. (2006). [Boeing agrees to contract with rocket workers [Online]. Available WWW: http://www.reuters.com/ [2006, January 30.]

January 31: Parsing shuttle launch dates

One of the great riddles of recent months is: When will the space shuttle launch again? As usual, the short answer is: Nobody knows. The longer answer hinges largely on when two external fuel tanks, designated ET-119 and ET-118, are delivered to the Cape. ET-119 will be used to launch the next mission aboard Discovery, which is tentatively

scheduled for May 3-22. If all goes well with Discovery, Atlantis will use ET-118 for the flight after that, now targeted for July 1-19. Atlantis also has to be ready to fly a timely rescue mission if Discovery runs into trouble. If ET-119 sticks to schedule, it will depart by barge on March 3 from its manufacturing plant, the Michoud Assembly Facility in New Orleans. It would arrive at Kennedy Space Center about five days later on March 8. Barring any problems, that would allow plenty of time at KSC to finish processing the tank and do checkouts before a May launch. ET-118's delivery date is more uncertain. The old schedule had it arriving the last week of June. That would practically rule out launching Atlantis in the July window and the mission would likely slip to August. KSC spokeswoman Jessica Rye acknowledged today: "We're still discussing what open work will be done at the Cape to fully certify the tank." There are other uncertainties, too. ET-119 is scheduled to arrive at KSC in March before engineers sign off on the safety of the tank's recent modifications. A critical design review is set for early-April after wind tunnel testing of the changes. Problems with any of the redesigns could mean months of delays. Web posted. (2006). [Parsing shuttle launch dates [Online]. Available WWW: http://www.orlandosentinel.com/ [2006, January 31].]

FEBRUARY 2006

February 1: Budget space shuttle flights

NASA and its supporters in Congress have won a behind-the-scenes battle with White House budget writers who suggested retiring one or more of the shuttles early and canceling some remaining flights to save money. The 2007 federal budget to be released Monday is not expected to slash shuttle missions or change the goals that President Bush set two years ago, according to Congressional leaders, analysts and NASA officials. NASA remains under orders to fly the shuttles through 2010, finish building the International Space Station and then replace the shuttles by 2014 with new spaceships. "Our best guess at this point is that the shuttle will . . . execute something like 17, 18 flights between now and retirement," Griffin said while at KSC last month for the launch of a probe to Pluto. Just last week, the agency adjusted its contract with Lockheed Martin to purchase 18 shuttle fuel tanks. The deal will bring NASA's total inventory to 22 tanks, which officials said covers the agency's needs until 2010. That's good short-term news for thousands of people who work on shuttles and station programs at Kennedy Space Center, where anxiety built as the White House Office of Management and Budget ordered studies this fall and winter into ways to dramatically cut the shuttle budget. Web posted. (2006). [Budget space shuttle flights [Online]. Available WWW: http://www.floridatoday.com/ [2006, February 1].]

February 3: Space Shuttle Processing Status Report

Mission: STS-121 - 18th ISS Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103); Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than May 2006 ; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The forward reaction control system is scheduled to be delivered to the bay next week for installation into the vehicle. The control system provides the thrust for attitude (rotational) maneuvers (pitch, yaw and roll) and for small velocity changes along the orbiter axis. Following shuttle main engine installation, leak checks were performed on the interfaces per standard procedure. Engines No. 2 and 3 did not pass the leak check. Those two engines were removed from the vehicle and were returned to the main engine processing facility for evaluations. Technicians in the engine facility will lap, or polish, the engine interfaces to remove any possible microscopic imperfections. Once completed, the engines will be reinstalled into the vehicle and leak checks repeated. The additional work will not impact the overall processing schedule. In the Vehicle Assembly Building, solid rocket booster stacking was placed on hold until Monday due to an issue with the 325-ton crane controller. Booster stacking is scheduled to be complete on the right booster in mid-February and the left booster by the end of the month. At this time, the additional work will not impact the overall processing schedule. Mission: STS-115 - 19th ISS Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: TBD ; Launch Pad: 39B Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles Preparations continue for the installation of the orbiter boom sensor system inside the payload bay. About 200 gap fillers have been removed and replaced on the underside of Atlantis. Once gap filler work is completed on

Discovery, the entire gap filler team will move to Atlantis to continue the work at a rate of about 350 gap fillers per week. New installation procedures were developed to ensure the gap fillers stay in place and do not pose any hazard on re-entry to the atmosphere. Endeavour (OV-105) ; In Orbiter Processing Facility bay 2, processing continues on Endeavour following an extensive modification period. On Jan. 27, the vehicle was powered up to support system testing. Body flap hardware reinstallation continues. Thermal protection system blanket installation continues in the nose cap. Nose cap installation for flight is planned for late February. Work continues on the new modification called the "station to shuttle power transfer system," which will allow the shuttle to remain docked to the station longer. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-004** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, February 3].]

Expendable Launch Vehicle Status Report

Mission: Space Technology 5 (ST5); Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: Feb. 28, 2006; Launch Window: 8:57 - 10:19 A.M. EST; Targeted Drop Time: 9:04 a.m. EST. The ST5 spacecraft will be mated to the Pegasus XL rocket today in the Orbital Sciences hangar, Vandenberg Air Force Base, Calif. Pegasus Flight Simulation No. 4, an integrated test with the ST5 spacecraft, is scheduled for Wednesday. ST5 final functional testing and spacecraft closeouts are scheduled for Feb. 11 and 12. The three-day operation to install the Pegasus vehicle fairing around the ST5 spacecraft is scheduled to begin Feb. 14. Mission: Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation and CloudSat ; Launch Vehicle: Boeing Delta 7420 with Dual Payload Attach Fitting Launch Pad: Space Launch Complex 2, Vandenberg Air Force Base, Calif. Launch Date: Under Review Launch Window: TBD. The strike against Boeing by the International Association of Machinists was settled this week. A launch timeframe is under review pending resolution of any technical issues. CALIPSO and CloudSat are installed in the Dual Payload Attach Fitting at the Astrotech payload processing facilities on Vandenberg. They will remain there until a new launch date is determined and then be prepared for transportation to NASA's Space Launch Complex 2. Delta II preparations at the launch pad are on hold until the payloads arrive for installation atop the second stage. KSC News Center (2006). **Expendable Launch Vehicles Status Report #E06-004** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, February 3].]

February 6: NASA must shift $3B to shuttles

A tight federal budget means NASA must divert more than $3 billion from science and its moon-landing quest to keep the shuttles flying long enough to finish building the International Space Station. "NASA simply cannot afford to do everything that our many constituencies would like us to do," NASA Administrator Mike Griffin said Monday, hours after President Bush delivered his 2007 budget plan to Congress. The president's proposal, which still faces months of tinkering and debate in Congress before approval, increases NASA spending from about $16.6 billion this year to about $16.8 billion next year. The space agency plan shifts about $2 billion to the ailing shuttle program by adjusting, delaying or canceling science projects or probes, prompting complaints from scientists and deep-space exploration advocates. Overall, spending on science increased

1.5 percent. However, that is far less than had been anticipated in previous versions of the agency's long-range budget, said Mary Cleave, associate administrator for science. Griffin said NASA still plans to fly people on its new Crew Exploration Vehicle, the proposed replacement for the shuttles, between 2010 and 2014. The combined changes provide enough money to solve what had looked like a $3 billion to $5 billion shortfall in the space shuttle budget between now and the orbiters' planned retirement in 2010. The schedule calls for about 16 shuttle missions to finish building the $100 billion space station -- as the United States promised to partner nations around the world -- and one more shuttle flight to repair and upgrade the Hubble Space Telescope. Web posted. (2006). [NASA must shift $3B to shuttles [Online]. Available WWW: http://www.floridatoday.com/ [2006, February 7].]

February 6: Statement on Scientific Openness from NASA Administrator
I want to make sure that NASA employees hear directly from me on how I view the issue of scientific openness and the role of public affairs within the agency. First, NASA has always been, is, and will continue to be committed to open scientific and technical inquiry and dialogue with the public. The basis for this principle is codified in the Space Act of 1958, which requires NASA to "provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof." Second, the job of the Office of Public Affairs, at every level in NASA, is to convey the work done at NASA to our stakeholders in an intelligible way. It is not the job of public affairs officers to alter, filter or adjust engineering or scientific material produced by NASA's technical staff. To ensure timely release of information, there must be cooperation and coordination between our scientific and engineering community and our public affairs officers. Third, we have identified a number of areas in which clarification and improvements to the standard operating procedures of the Office of Public Affairs can and will be made. The revised policy, when complete, will be disseminated throughout the agency. I want to encourage employees to discuss this issue and bring their concerns to management so we can work together to ensure that NASA's policies and procedures appropriately support our commitment to openness. Mike Griffin, NASA Administrator. E-mail distribution. (2006). [Griffin, Mike Re: "Statement on Scientific Openness" [Electronic]. KSC-NASA-INC-Message-Center [kscnasaincmc@kscems.ksc.nasa.gov] [February 6, 2006.].]

February 7: NASA budget request allows at least 16 more shuttle flights
NASA's fiscal year 2007 spending request uses science funds to pay down a $3- 5 billion shortfall in space shuttle accounts and begin work in earnest on a shuttle replacement, allowing the agency to plan for at least 16 more space shuttle flights to assemble the International Space Station. That should be enough to orbit and attach all of the station hardware provided by NASA's international partners on the project -- a European laboratory module and a pressurized lab, exposed experiment facility and logistics module supplied by Japan. The $16.792 billion request amounts to a 3.2 percent increase over what the agency got in fiscal 2006 (not counting $350 million to repair damage to its facilities from Hurricane Katrina), but will be flat over the remaining four years in the five-year budget runout. The high growth rates promised for the out-years in the agency's fiscal 2006 budget request have been trimmed by about $2 billion over the new runout,

leaving science with an increase of 1.5 percent in fiscal 2007 and about 1 percent a year thereafter. NASA Administrator Mike Griffin said ultimately NASA hopes to find "synergies" between retiring the shuttle and building its replacement -- the Crew Exploration Vehicle and its Crew Launch Vehicle -- using shuttle components to cover the funding shortfall. In its budget runout, NASA sees shuttle spending going from $2.2 billion in fiscal 2010 to $147 million in fiscal 2011 -- chiefly closeout costs after the shuttle is retired. That same year exploration systems accounts will jump from $5 billion to $8.8 billion as the shuttle accounts are shifted to the hardware needed to return to Mars. E-mail distribution. (2006. [Aviation Week's Aerospace Daily & Defense Report Re: "NASA budget request allows at least 16 more shuttle flights," [Electronic]. Vol. 217, No. 24, [February 6, 2006].]

February 8: NASA budget affects KSC jobs

With science dwindling and exploration shifting, Kennedy Space Center workers will feel the impact of the NASA budget unveiled this week. Some jobs will be eliminated by the time the shuttles are retired in 2010, officials said. "What we do know is it's coming down, and we need to be prepared for that, and we need to be honest with the work force," KSC Director Jim Kennedy said. NASA's budget is increasing, but areas within the agency are shrinking. Administrator Mike Griffin acknowledged that cuts in science will help pay for manned space flight. For KSC, that means dozens of people are halting research in areas such as growing plants for food and oxygen on long space trips. "The life science research that we do is something that will be needed one day for long-duration stays on the moon or Mars, but clearly not for a one-week stay," Kennedy said. NASA chose to divert money toward flying the rest of the shuttles and completing the International Space Station. "It was hard to see some of those people leave," Kennedy said, "but it's consistent with the priorities of this agency." Despite cuts, the state-funded Space Life Sciences Lab, which housed many biological experiments, will remain open after a fraction of its slashed funding was reinstated. It could be used for other technology work, Kennedy said. Though some people will lose jobs as the shuttles stop flying in 2010, the KSC government and contractor work force should hold steady at 15,000 until then, Kennedy said. NASA expects to fly 16 shuttle flights -- a reduction from 18 -- to finish building the station, plus perhaps a Hubble Space Telescope repair mission. There's a chance of two additional flights, but don't count on them, Kennedy said. As the shuttle winds down, construction jobs are expected to boom as the space center turns itself into a port for the Crew Exploration Vehicle. "We have to transform the VAB (Vehicle Assembly Building)," Kennedy said. "We have potentially major transformations of pads, the mobile launch platform, the crawler." Shuttle pad 39B is the likely target for overhaul or demolition. Pad 39A is being refurbished and will become the only shuttle pad. The center is hoping to get some as-yet-unallocated NASA money for the construction. Though the crew exploration vehicle will launch from KSC, with a test flight planned in late 2009, it may not be built here. The state is offering a $35 million incentive to lure the winning contractor team, Kennedy said. Such a coup could help offset the loss of jobs at KSC. Web posted. (2006). [NASA budget affects KSC jobs [Online]. Available WWW: http://www.floridatoday.com/ [2006, February 8].]

A Young Bush Appointee Resigns His Post at NASA

George C. Deutsch, the young presidential appointee at NASA who told public affairs workers to limit reporters' access to a top climate scientist and told a Web designer to add the word "theory" at every mention of the Big Bang, resigned yesterday, agency officials said. Mr. Deutsch's resignation came on the same day that officials at Texas A&M University confirmed that he did not graduate from there, as his résumé on file at the agency asserted. Officials at NASA headquarters declined to discuss the reason for the resignation. "Under NASA policy, it is inappropriate to discuss personnel matters," said Dean Acosta, the deputy assistant administrator for public affairs and Mr. Deutsch's boss. Web posted. (2006). [A Young Bush Appointee Resigns His Post at NASA [Online]. Available WWW: http://www.nytimes.com/ [2006, February 8].]

Ex-Space Wing commander dies

Retired Maj. Gen. Jimmey Morrell, a former commander who helped transform the 45th Space Wing at Patrick Air Force Base, died Wednesday. He was 59. Morrell, who between 1991 and 1993 was the commander of the 45th Space Wing, died at Wuesthoff Hospital in Rockledge. "Maj. Gen. Morrell was an Air Force legend," said Col. Gregg Billman, vice commander of the 45th Space Wing. "He was also my personal mentor and friend. Gen. Morrell was the first commander of the 45th Space Wing and transformed this wing from a research and development center into a fully operational space lift wing." That happened in 1991. Today, the 45th Space Wing processes and launches satellites from Cape Canaveral Air Force Station and manages the Eastern Range, which provides launch tracking and range safety. Before that, Morrell had been commander of the 9th Space Division, part of the Space Command that was headquartered at Patrick Air Force Base. The division was dissolved. Web posted. (2006). [Ex-Space Wing commander dies [Online]. Available WWW: http://www.floridatoday.com/ [2006, February 8].]

Global Flyer Departs From NASA's Kennedy Shuttle Runway

The Virgin Atlantic Airways GlobalFlyer aircraft took off today from NASA's Kennedy Space Center Shuttle Landing Facility, Fla., at 7:22 a.m. EST. The effort is an attempt to set a new world record for the longest flight made by any aircraft. NASA agreed to let Virgin use the shuttle facility as part of a pilot program to expand access to the runway for non-agency activities. The use of the runway is part of NASA's efforts to support the President's Management Agenda and the U.S. Space Transportation Policy. Piloted by Steve Fossett, the aircraft used more than 13,000 of the 15,000 foot runway before taking to the sky. Fossett will attempt to fly 26,084 miles in approximately 80 hours. He will attempt to land at Kent International Airport, near London. ["Global Flyer Departs From NASA's Kennedy Shuttle Runway," **NASA News Release #06-059,** February 8, 2006.]

February 9: NASA Preparing Oxygen Generation System for Space Station

NASA is preparing to launch an oxygen generation system to the International Space Station. The system uses water to generate breathable oxygen for crew members. Life support systems like this are necessary to support future long-duration missions to the moon, Mars and beyond. The system was shipped from NASA's Marshall Space Flight Center, Huntsville, Ala., on Jan. 24, and arrived the next day at the agency's Kennedy Space Center, Fla. The system will be installed in a pressurized cargo compartment later

this month for a possible May launch aboard the Space Shuttle Discovery. The oxygen generation system is one of two primary components in the station's regenerative environmental control and life support system. The other component, the water recovery system, is planned for shipment to Kennedy early next year, once testing and design modifications are completed. The water system is designed to provide clean water by recycling wastewater and crew member urine. The recycled water must meet purity standards before it is used to support crew, payload and spacewalk activities. The recovery systems will be packaged into three refrigerator-sized racks for installation in the station's U.S. Destiny lab module. . ["NASA Preparing Oxygen Generation System for Space Station," **NASA News Release #06-061,** February 9, 2006.]

Fossett to fly across Africa after harrowing takeoff

Adventurer Steve Fossett is to pilot the Scaled Composites/Virgin Atlantic GlobalFlyer across Africa Feb. 9, following a harrowing takeoff and initial cockpit problems Feb. 8 at the start of the planned longest flight in history. Fossett's takeoff from Kennedy Space Center, Fla., required 11,500 feet of runway. This was at least 1,500 feet more than predicted, even with a 10-knot headwind and temperatures at 47 degrees Fahrenheit. The Kennedy space shuttle runway is 15,000 feet long with another 1,000 feet of paved overrun, and using nearly 12,000 feet of it left precious little margin for safety. Fossett's "V1" go/no-go decision point was at 7,000 feet, and the longer roll frightened both he and onlookers. With a 22,000 pound takeoff weight, Fossett was committed at the 7,000 feet point in the roll to either fly, or in effect run off the end of the runway, crashing into the large ditch that surrounds the strip. That would have meant almost certain death given the aircraft's 18,200-pound fuel load. "Takeoff was a bit scary to say the least," Fossett radioed from GlobalFlyer. Immediately after the late rotation, GlobalFlyer also hit two birds, one striking the left wing in the port boom fuel tank area and the other possibly on the right wing. The birds, found dead on the Kennedy runway, were Black-Breasted Plovers, each weighing about 30 ounces with 12-inch wingspans. Scaled Composites engineers and pilots on Beech Starship chase aircraft performed a detailed inspection of the GlobalFlyer as it headed out over the Atlantic and found no sign of the bird strikes. Then Fossett had trouble with cockpit temperatures that temporarily soared to 130 degrees Fahrenheit, threatening his life and temporarily causing cockpit instrumentation to fail. Had the temperatures remained high, Fossett would have been forced to at least return to Kennedy for an emergency landing or bail out or ditch at sea. Fossett was able to correct the temperature problem and continue across the Atlantic. By dawn Eastern time Feb. 9 as he crosses the African coast nearly 24 hours after his 7:22 a.m. Eastern time takeoff, Fossett is to finally complete the climb to his cruising altitude of 45,000 feet. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Fossett to fly across Africa after harrowing takeoff, cockpit problems," [Electronic]. Vol. 217, No. 26, [February 9, 2006.].]

February 10: Analex 2005 'Small Business Contractor of the Year'

Analex Corporation, a leading provider of mission-critical professional services to federal government clients, today announced its selection by NASA as the Kennedy Space Center (KSC) Small Business Contractor of the Year for 2005. Analex won this honor for its excellent support to NASA through the Expendable Launch Vehicle Integrated

Services (ELVIS) Contract. In its nomination KSC commended Analex on its "outstanding collection of technical talent." Among other reasons for the award, KSC included Analex's large contributions in support of NASA to enhance risk mitigation processes and its superior capabilities in proactive approaches to solving engineering challenges. Web posted. (2006). [Analex 2005 'Small Business Contractor of the Year' [Online]. Available WWW: http://www.astroexpo.com/news/ [2006, February 10].]

NASA Honors Legendary Astronaut John Glenn

NASA will honor John Glenn, one of the original seven NASA astronauts, with the presentation of the Ambassador of Exploration Award. The award is being presented at 4:00 p.m. EST, Monday, Feb. 20 at the John Glenn Institute of Public Service and Public Policy, 300 Page Hall, Ohio State University, 1810 College Road, Columbus, Ohio. NASA is presenting the Ambassador of Exploration Award to the 38 astronauts who participated in the Mercury, Gemini, and Apollo space programs for realizing America's vision of space exploration from 1961 to 1972. The award is a small sample of lunar material encased in Lucite mounted for public display. The material is part of the 842 pounds of samples brought back to Earth during the six Apollo lunar expeditions from 1969 to 1972. Glenn's award will be displayed at the institute. ["NASA Honors Legendary Astronaut John Glenn," **NASA Media Advisory M06-020,** February 10, 2006.]

Expendable Launch Vehicles Status Report

Mission: Space Technology 5 (ST5); Launch Site: Vandenberg Air Force Base, Calif.; Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: Feb. 28, 2006; Launch Window: 8:57 to 10:19 a.m. EST; Targeted Drop Time: 9:02 a.m. EST. Flight Simulation No. 4, an integrated test with the ST5 spacecraft and the Pegasus rocket, completed Wednesday. The flight termination system, avionics batteries and ST5 logo installed. Final functional testing and spacecraft closeouts scheduled this weekend. The three-day operation to install the Pegasus vehicle fairing around the ST5 starts Tuesday. Pegasus will be mated to its transporter on Feb. 20 and moved to Vandenberg's runway for mating to the Orbital Sciences L-1011 carrier jet aircraft on Feb. 24. Mission: Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation and CloudSat; Launch Vehicle: Boeing Delta 7420 with Dual Payload Attach Fitting; Launch Pad: Space Launch Complex 2, Vandenberg Air Force Base, Calif.; Launch Date: No earlier than April; Launch Window: When determined. Delta II preparations will resume and payloads transported to the pad for installation. KSC News Center (2006). **Expendable Launch Vehicles Status Report #E06-005** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, February 10].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th ISS Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103); Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than May 2006 ; Launch Pad: 39B. Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Thermal protection system blanket installation continues on the orbiter boom sensor system. The sensor package was installed Tuesday on the boom. Engineers are

analyzing information and hardware following failed leak checks of shuttle main engines number 2 and 3. The two are in the main engine processing facility for evaluations. The engines will be reinstalled in the vehicle when analysis is completed; tentatively set for early next week. In the Vehicle Assembly Building, solid rocket booster stacking continues today; the left aft center segment is being lifted onto the stack on the mobile launcher platform. Right booster stacking is scheduled for mid-February completion; left booster by the end of the month. Endeavour (OV-105) In Orbiter Processing Facility bay 2, standard mission processing continues and return-to-flight modifications. Heads-up display alignment is scheduled for the commander's seat this weekend and pilot's seat next week. The display is an optical mini-processor that cues the commander and/or pilot during the final phase of atmosphere re-entry and during the final approach to the runway. Mission: STS-115 - 19th ISS Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) Location: Orbiter Processing Facility Bay 1 ; Launch Date: To be determined Launch Pad: 39B Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Atlantis is in a power-down period. More than 400 gap fillers have been removed and replaced on the shuttle underside. When gap filler work is completed on Discovery, the entire team will move to Atlantis to continue the work at approximately 350 fillers weekly. New installation procedures were developed to ensure the gap fillers stay in place and do not pose any hazard on atmosphere re-entry. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-005** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, February 10].]

February 12: Fossett makes history

Adventurer Steve Fossett ended the longest nonstop flight in aviation history the same way he began it, with a bit of hair-raising drama. Fossett, 61, piloting the Virgin Atlantic GlobalFlyer on its most demanding mission, nearly dove out of the sky to make a tire-shredding emergency landing in Bournemouth on the southern coast of England after the airplane's electrical generator suddenly stopped working. "That was an exciting finish," Fossett said. Fossett and GlobalFlyer flew 26,389 miles in about 76 hours to surpass three of aviation's toughest endurance records: longest nonstop solo flight, longest nonstop flight in an airplane and longest nonstop flight in a balloon. Fossett set the solo record last year with a nonstop flight around the world in the same airplane. This time, he made a second perilous crossing of the Atlantic Ocean to get the mileage necessary to surpass all of the distance records in a single mission. Upon landing, asked what was next for a man who holds more than 100 records, Fossett said "a good night's sleep." The three-day flight began at Kennedy Space Center on Wednesday morning with a harrowing takeoff during which Fossett admits he nearly ran out of runway. GlobalFlyer killed a couple of birds on the way up and then leaked about 750 pounds of precious fuel during the flight's first four hours. Web posted. (2006). [Fossett makes history [Online]. Available WWW: http://www.floridatoday.com/ [2006, February 12].]

February 13: NASA Honors Legendary Astronaut Deke Slayton

NASA will honor Deke Slayton, one of the original seven NASA astronauts, with the presentation of the Ambassador of Exploration Award. Slayton is being honored and remembered for his pioneering involvement in America's space programs. The award is

being presented at 5:30 p.m. CST, (6:30 p.m. EST), Wednesday, Feb. 22 at the Deke Slayton Memorial Space and Bicycle Museum, 200 West Main Street, Sparta, Wis. ["NASA Honors Legendary Astronaut Deke Slayton," **NASA Media Advisory M06-021,** February 13, 2006.]

February 14: No panic over STS manifest

NASA administrator Mike Griffin believes launching the Shuttle up to 19 times before their 2010 retirement won't be a problem, citing the launch frequency needed to fulfill the remaining manifest is in line with the average over the past 25 years of Shuttle operations. With 17-19 flights remaining in the manifest, the first step will be a "clean" STS-121, currently No Earlier Than (NET) May 10 - and it appears all efforts are being focused on that flight, with no news on the shipping dates past External Tanks ET-118 and ET-119. ET-119 will fly with Discovery on STS-121 and will arrive at KSC on March 4 - after new information today pointed to shipping date of Feb 28 - up from Match 3. ET-118 will fly with Atlantis, on her STS-115 assembly flight to the International Space Station - and supporting STS-300 role. ET-123 - currently in Building 103, Cell 2 at the Michoud Assembly Facility (MAF) - is expected to be the third tank to head to KSC, although no shipping or processing timelines have been noted by MAF at time of publishing. That could point to only two flights being on track for 2006, leaving NASA with a tight schedule of launches until the end of Shuttle operations. "As of April 12, 2006, NASA will have been flying the shuttle for 25 years exactly. We will have flown, to that point, 114 missions in 25 years. That works out to an average of 4.56 missions per year on average, even taking into account two accidents and all the downtime that we have had." Griffin also made a point of how recent stagnation in the launch manifest has its upside, with Discovery, Atlantis and Endeavour all in prime condition to carry out their remaining roles as spaceships. "When we return to flight, it will be with three fresh orbiters out of depot maintenance. It will be to return to flight with greatly increased knowledge that we have never had before. Yet, all we have to do is execute our average performance over those 25 years in order to be able to complete the station." Finishing the ISS is the primary role of the Shuttle fleet, bar STS-121's test flight and the un-named STS flight for a final Hubble Space Telescope servicing mission. Confidence is high that the remaining manifest of flights won't be hijacked by another problem of foam liberation from the ET. Web posted. (2006). [No panic over STS manifest [Online]. Available WWW: http://www.NasaSpaceFlight.com/ [2006, February 14].]

February 16: NASA Honors Legendary Journalist Walter Cronkite

NASA is honoring Walter Cronkite for his coverage of America's space program with the presentation of the Ambassador of Exploration Award. The ceremony will be hosted by the University of Texas at Austin Center for American History is on Tuesday, February 28 at 3 p.m. EST. NASA is presenting the Ambassador of Exploration Award to the 38 astronauts and other key individuals who participated in the Mercury, Gemini, and Apollo space programs for realizing America's vision of space exploration from 1961 to 1972. Cronkite is the first non-astronaut and only non-NASA individual to receive the award. The award is a small sample of lunar material encased in Lucite and mounted for public display. The material is part of the 842 pounds of samples brought back to Earth

during the six Apollo lunar expeditions from 1969 to 1972. Cronkite will present the lunar sample to University of Texas president William Powers. He will accept the award on behalf of the Center for American History, the archival home of the Walter Cronkite Papers. The sample will be displayed in the Center's exhibit gallery. Cronkite is the best remembered journalist for his commentary and enthusiastic coverage of the historic progression of missions from the early Mercury launches, through the ground-breaking Gemini missions, to the Apollo 11 and subsequent moon landings. His marathon, live coverage of the first moon landing brought the excitement and impact of the historic event into the homes of millions of Americans and observers around the world. ["NASA Honors Legendary Journalist Walter Cronkite," **NASA Media Advisory M06-022,** February 16, 2006.]

February 17: NASA plans to park space shuttle Atlantis in 2008

With just 17 or so flights left on the shuttle manifest before the program is terminated in 2010, NASA's three remaining orbiters can only expect to fly about five missions each. As it turns out, NASA now plans to retire Atlantis in 2008, after five flights, rather than put it through a required overhaul and to "fly out" the remaining half-dozen missions on the manifest with Discovery and Endeavour. But shuttle program manager Wayne Hale told Kennedy Space Center employees today that Atlantis will not be given to a museum, at least not right away. Instead, the space shuttle will be used for spare parts to help keep Discovery and Endeavour healthy through the end of the program. "Atlantis will be coming due for an OMDP (orbiter maintenance down period) in the '08 time frame," Hale said. "And we looked the manifest and laid it out and we believe we can fly the '08, '09 and '10 time frame with Discovery and Endeavour. "Discovery just came out of OMDP and Endeavour is just about to come out of OMDP. So it looks like the right thing to do is not to put Atlantis through another OMDP, which would get it ready to go fly maybe just at the very end, in 2010, but rather use it was a parts donor, if that's the word, for the other vehicles. All shuttles are required to undergo periodic inspections and modifications to maintain their overall health. Such OMDP overhauls can take a year or more to complete. Web posted. (2006). [NASA plans to park space shuttle Atlantis in 2008 [Online]. Available WWW: http://www.Spaceflightnow.com/ [2006, February 17].]

Expendable Launch Vehicle Status Report

Mission: Space Technology 5 (ST5); Launch Site: Vandenberg Air Force Base, Calif.; Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: Feb. 28, 2006; Launch Window: 8:57 to 10:19 a.m. EST; Targeted Drop Time: 9:02 a.m. EST. Spacecraft closeouts are complete. The fairing was cleaned and inspected with a black light for any contamination. Quality control contamination samples were taken from the craft. The right half of the fairing was installed Wednesday. Installation of the left half of the fairing was completed Thursday. The Pegasus/ST5 combination will be mated to the transporter on Monday. Transportation to the runway for mating to the L-1011 carrier aircraft is scheduled for Friday, Feb. 24. An integrated launch vehicle/spacecraft combined systems test and an ST5 state-of-health check is scheduled for Feb. 25. KSC News Center (2006). **Expendable Launch Vehicle Status Report #E06-006** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, February 17].]

NASA studies shuttle engine seals, contamination issues

NASA now plans to ship the next external fuel tank to the Kennedy Space Center ahead of schedule and the shuttle Discovery's commander said today the astronauts remain optimistic about launching in May on the second post-Columbia mission. But a variety of technical issues remain on the table, including wind tunnel tests to show fuel tank changes will work as expected, an ice and debris analysis and, most recently, main engine seal leaks and metallic contamination in the main propulsion system. The latter issue appears to be a generic problem in that metallic debris, estimated to weigh just 0.08 milligrams, has been found in the liquid oxygen prevalve filter screen used by Discovery's main engine No. 1 and also in an oxygen prevalve screen in the shuttle Endeavour. In the latter case, the debris is estimated to weigh 1.1 milligrams. The concern is that such debris, depending on its composition, could trigger a catastrophic fire during engine operation. It is not yet known whether the shavings detected by boroscope inspections represent a real ignition threat, whether the shuttle can safely fly as is or whether time-consuming work to disassemble the system and remove the debris will be necessary. If so, NASA could be hard-pressed to launch Discovery before the next launch window closes May 22. In a separate issue, Discovery's main propulsion system failed a helium leak test after engine installation and then failed it again after engineers detached the engines, installed different seals (two per engine) and reattached the powerplants. Engineers now plan to install the best seals in the shuttle inventory and carry out a third helium signature test to verify the integrity of the system. If the system passes, NASA will press ahead with Discovery's processing for a launch as early as May 10. But the issue will remain open until engineers figure out what caused the original sealing problem or, if the problem involves hardware that does not meet specifications, whether the shuttle can fly safely with any such out-of-spec components. At Lockheed Martin's Michoud Assembly Facility near New Orleans, meanwhile, engineers are readying external tank No. 119 for shipment to the Kennedy Space Center as early as next Friday, Feb. 24, a week ahead of schedule. Web posted. (2006). [NASA studies shuttle engine seals, contamination issues [Online]. Available WWW: http://www.Spaceflightnow.com/ [2006, February 17].]

February 21: Atlantis slated to be first shuttle retired

Atlantis will be the first of NASA's three space shuttles to be retired, most likely in 2008, as the shuttle program winds down in four years, a senior agency official said Tuesday. Atlantis' parts will be used by the remaining shuttles, Discovery and Endeavour, until the aging spacecraft are mothballed in 2010, shuttle program manager Wayne Hale told workers at the Kennedy Space Center last week. Atlantis, which began flying in 1985, was chosen for retirement first since it was scheduled for maintenance, a process that could take two years. The $3 billion shuttle likely will have four or five more flights to the international space station before retirement. "The reasoning is instead of taking it off-line for two years and spending a lot of money to return it to flight when it probably would fly only one time at the most, why spend that extra money, when you don't need to?" NASA spokesman Bruce Buckingham said Tuesday at the Kennedy Space Center. NASA has planned 17 more shuttle flights before the program ends in 2010. The next-generation vehicles are expected to be ready no later than 2014. Most of the nearly

15,000 NASA and contractor employees at the space center work on the shuttle program, but they likely will be unaffected by the retirement of Atlantis, Buckingham said. Web posted. (2006). [Atlantis slated to be first shuttle retired [Online]. Available WWW: http://www.cnn.com/ [2006, February 21].]

February 22: Lockheed's CEV plans

As part of Lockheed Martin's plans for the Crew Exploration Vehicle, the company has announced that final assembly and testing of the capsules will be performed at the Kennedy Space Center's Operations and Checkout Building. Lockheed Martin officials, Florida's lieutenant governor, the local congressman and a county economic development leader held this press conference Feb. 22 to unveil the plans. Web posted. (2006). [Lockheed's CEV plans [Online]. Available WWW: http://www.Spaceflightnow.com/ [2006, February 22].]

NASA's Return to Flight Shuttle Crew Visits White House

NASA's Return to Flight crew met with President George W. Bush in the Oval Office at the White House this afternoon. The seven astronauts flew aboard Space Shuttle Discovery last summer. Their mission, designated STS-114, was the first since the Space Shuttle Columbia accident in 2003. President Bush greeted NASA Administrator Mike Griffin and Discovery's commander Eileen Collins, pilot Jim Kelly, and mission specialists Steve Robinson, Andy Thomas, Wendy Lawrence, Charlie Camarda and Soichi Noguchi, an astronaut with the Japan Aerospace Exploration Agency. ["NASA's Return To Flight Shuttle Crew Visits White House," **NASA News Release #06-065,** February 22, 2006.]

Expendable Launch Vehicle Status Report

Mission: Space Technology 5 (ST5); Launch Site: Vandenberg Air Force Base, Calif.; Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: No earlier than March 6, 2006; Launch Window: 8:57:31 a.m. to 10:19:50 a.m. EST; Targeted Drop Time: 9:02 a.m. EST. The ST5 launch has been rescheduled to no earlier than March 6. The delay allows time for review of data from the spacecraft's separation system to ensure it will function when intended during the flight. The Pegasus/ST5 combination was mated to the transporter on Monday as planned. Transportation to the runway for mating to the L-1011 carrier aircraft is scheduled for March 2. An integrated launch vehicle/spacecraft combined systems test and an ST5 state-of-health check is scheduled for March 3. KSC News Center (2006). **Expendable Launch Vehicle Status Report #E06-007** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, February 22].]

February 24: Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) -Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103); Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than May 2006 ; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The forward reaction control system was installed Monday. The control system provides the thrust for attitude (rotational) maneuvers (pitch, yaw and roll) and for small velocity changes along the orbiter axis. Space shuttle main engines No.

2 and 3 were reinstalled in the vehicle last weekend and leak checks were successfully completed. Because the engines failed the previous leak checks, engineers evaluated the interface seals and decided to replace them with better fitting seals. Program management will continue its analysis to determine if these seals will fly, or if additional work will be needed prior to flight. Analysis is underway to determine what effect, if any, a small metallic shard found in Discovery's 12-inch liquid oxygen feed line filter screen will have. Options include cleaning or replacing the screen or flying as is if analysis determines the shard is inconsequential. In the Vehicle Assembly Building, stacking of both solid rocket boosters is complete, and booster closeouts are underway. The external fuel tank, designated ET-119, that will fly on the STS-121 mission is scheduled to leave the Michoud Assembly Facility in New Orleans this weekend and be transported via barge to the Kennedy Space Center. It usually takes about five days to transport the tank. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: To be determined ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Preparations continue for Friday's servicing of Freon coolant loops. Only 57 thermal protection system tile cavities remain to be filled. More than 680 gap fillers have been removed and replaced in the top-priority area of the vehicle. This work is being performed due to two gap fillers that were protruding from the underside of Discovery on the first return-to-flight mission, STS-114. New installation procedures were developed to ensure the gap fillers stay in place and do not pose any hazard on re-entry to the atmosphere. Endeavour (OV-105) ; In Orbiter Processing Facility bay 2, work continues on Endeavour following an extensive modification period. Powered-up system testing continues, as well as implementation of the new return-to-flight modifications to the vehicle. Ku-band antenna testing continues this week. Optics work is being performed on the shoulder and elbow pedestals that will hold the remote manipulator system, or shuttle arm. This work ensures proper alignment of the arm once installed. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-006** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, February 24].]

PR revamp at NASA met with pessimism

A committee headed by former astronaut Mary Cleve, now associate administrator for science, is revamping NASA's public relations rules following the flap over attempts by headquarters public affairs officers to meddle in the release of NASA-funded science results. But some public affairs professionals at the agency - and some of the scientists they serve - are pessimistic about the chances for real change. To replace the young political appointee who lost his job after it emerged that he misstated his academic record on his resume, NASA has picked another political appointee. The new hire, Joe Pally, has experience as a spokesman for the federal Office of Surface Mining and with the Coalition Provisional Authority in Iraq. But his selection continues the practice of placing officials who owe their jobs to Bush administration political connections directly in the flow of information from the agency, instead of in policy-making roles only. E-mail distribution. (2005). [Aviation Week's Aerospace Daily & Defense Report Re: "PR revamp at NASA met with pessimism," [Electronic]. Vol. 217, No. 37, [February 24, 2006.].]

Discovery's external fuel tank on way to KSC

A newly designed external fuel tank for Space Shuttle Discovery is expected to arrive at Kennedy Space Center, Fla., this week, NASA says. The huge orange tank, called ET-119, was scheduled to depart NASA Michoud Assembly Facility near New Orleans on Feb. 25 after being loaded on a covered barge. The barge will travel from the Mississippi River-Gulf of Mexico Outlet to Florida's Banana River, which flows into the Atlantic Ocean. The journey is expected to take five to six days. The tank will receive a final checkout once it arrives at Kennedy's Vehicle Assembly Building. It will later be attached to the twin solid rocket boosters and Discovery. NASA is shooting for May to send Discovery to the International Space Station. The tank will fly for the first time without Protuberance Air Load ramps. Tests showed the ramps are unnecessary and their elimination would make shuttle flights safer. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Discovery's external fuel tank on way to KSC," [Electronic]. Vol. 217, No. 37, [February 24, 2006.].]

February 27: Slowly Crumbling, NASA Landmarks May Face the Bulldozer

In February 1962, it was the hub of the space program, the center where controllers counted down and then watched tensely from their consoles as John Glenn became the first American to orbit Earth. Today the Mercury Control Center stands empty and all but abandoned, half hidden by thick Florida vegetation. Its 10-foot-wide NASA emblem, warped by high winds, flaps even in a light breeze. A trash can on the floor of the hollow control room seems to be the only barrier against rain seeping through the crumbling ceiling. And now the 45-year-old center may be slated for demolition, one of 12 sites and landmarks that the space agency says it may tear down to save money. Situated on Air Force property, the control center, where NASA directed the flights of unmanned and manned space capsules from 1960 to 1965, is off limits to the public except for some tours. It is listed on the National Register of Historic Places. But Mario Busacca, federal preservation officer for NASA at the Kennedy Space Center here, said that as the agency prepared to replace the space shuttle with a safer vehicle and to return astronauts to the Moon, it needed to rid itself of deteriorated or useless sites, the sooner the better. He emphasized, however, that no decision had been made about the Mercury Control. Many historic space sites are being preserved by NASA, the Air Force and private organizations, including the two bunkers used to launch the first American satellite in 1958, as well as the astronauts Alan B. Shepard and Virgil I. Grissom in 1961; a whole Saturn V rocket and part of its launching tower; and a lunar module and an Apollo spacecraft from the "Men Walk on Moon" era. A main concern for the space agency is pollution. Decontamination work costs millions. That is why in 2004 the space agency removed the launching tower used for two of its most historic missions, Apollo 8 and Apollo 11, and dispatched it to the blast furnace. An engineering support building and 200 acres of land around it are soaked with a toxic solvent used to clean rocket parts. The site, Launch Complex 34, was used to launch the first Saturn rockets and was the site of America's first space tragedy, the Apollo 1 fire that killed three astronauts in a training session in 1967. Like Mercury Control, it is on the historic register. Web posted. (2006). [Slowly Crumbling, NASA Landmarks May Face the Bulldozer [Online]. Available WWW: http://www.nytimes.com/ [2006, February 27].]

February 28: NASA estimates costs for shuttle return to flight at $1.267B
NASA's latest estimate for the total cost of returning the space shuttle to flight following the Columbia accident is $1.267 billion total spent from fiscal 2003 through FY '06. The cost estimates are included in the latest update to NASA's return-to- flight (RTF) implementation plan. The update, released Feb. 24, is the 11th edition of the plan and the first since the shuttle resumed operations with mission STS-114 in July 2005. NASA's estimates of RTF costs for fiscal 2003-2005 have remained stable since the July 2005 estimate of $1.141 billion, according to the agency. At the end of FY '05, the reported costs for RTF are $1.105 billion, which is $36 million below the estimate. NASA entered FY '06 expecting to spend $163 million on RTF activities during the fiscal year, a reduction of $125 million from the previous estimate of $288 million. NASA plans a number of RTF activities for FY '06, including completing orbiter tile/reinforced carbon-carbon (RCC)-related modeling, continuing the development of various methods of on-orbit thermal protection system (TPS) repair, and completing wing leading edge sensor deliveries for all orbiters. "NASA intends to complete the content associated with RTF projects in FY 2006," the report says. "Any remaining content will be minimal and will be managed in operations starting in FY 2007." The most challenging recommendation made by the Columbia Accident Investigation Board (CAIB) is the group's mandate that NASA develop methods by which astronauts can repair damage to the shuttle's TPS while the vehicle is in orbit. The astronauts experimented with several methods of TPS repair during STS-114. Columbia was lost as a result of damage done to the RCC on the leading edge of its left wing. NASA is implementing two complementary RCC repair concepts - plug repair and crack repair. Together they should allow astronauts to fix "limited RCC damage," NASA said. Similarly, NASA was able to develop a "limited" tile repair capability for STS-114, including an emittance wash application to repair shallow damage, a cure in place ablator (CIPA) repair material for larger damage, and a tile repair mechanical overlay designed for large damage areas or lost tiles. "Despite comprehensive efforts to develop TPS repair materials and techniques, the state of the art technology in this area has yielded modest technology to support the capability," the report says. "As a result, continued effort does not hold promise of significant capabilities beyond those in hand." E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Fossett NASA estimates total costs for shuttle return to flight at $1.267B," [Electronic]. Vol. 217, No. 38, [February 28, 2006.].]

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March 1: NASA considering removing particle from shuttle engine

NASA is considering whether to remove a tiny particle of debris caught in a pre-valve screen in one of shuttle Discovery's engines that some engineers worry could cause problems if it is dislodged and pulled into the engine. NASA's worry about the piece, which Shuttle Program Manager Wayne Hale described as being about the size of the point on a mechanical pencil, is that it could either clog up engine components or ignite in the oxygen-rich environment of the engine. If the particle is deemed a threat, NASA will take out the screen and clean it. "Cleaning the screens sounds simple, but it's never simple," Hale said during a press conference at Kennedy Space Center Feb. 28. "And the fact of the matter is that you run the risk of introducing more contamination when you take the covers off and clean the screens." Engineers also are analyzing certain engine seals that are slightly thinner than they should be due to a manufacturing defect. NASA has ordered a new batch of seals and is prepared to install them if the engineering suggests that the seals in the orbiter may pose a threat, although they have passed leak checks, Hale said. NASA hopes to launch Discovery during a window in May, and is reviewing the feasibility of a May 10 launch date. Although it would be an "extensive" procedure, getting the particle out of the screen should not threaten a May launch, according to NASA Launch Director Mike Leinbach. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "NASA considering removing particle from shuttle engine screen." [Electronic]. Vol. 217. No. 39. [March 1, 2006.].]

Expendable Launch Vehicle Status Report

Mission: Space Technology 5 (ST5); Launch Site: Vandenberg Air Force Base, Calif.; Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: No earlier than March 14, 2006; Launch Window: 8:57:31 to 10:19:50 a.m. EST; Targeted Drop Time: 9:02 a.m. EST. The ST5 launch has been rescheduled due to the availability of the Western Range. Technicians have completed reviewing data from the spacecraft's separation system and determined it will function as designed. The Pegasus/ST5 combination is mated to its transporter in preparation to be moved from the hangar to the runway. The L-1011 carrier aircraft is scheduled to arrive at Vandenberg March 6. A flight termination system test between the Pegasus and the Western Range is scheduled for March 8. The Pegasus/ST5 will be transported to the runway and mated to the L-1011 carrier aircraft on March 10. An integrated launch vehicle/spacecraft combined systems test and an ST5 state-of-health check is scheduled for March 11. KSC News Center (2006). **Expendable Launch Vehicle Status Report #E06-008** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, March 1].]

NASA Hopeful for May Shuttle Launching

NASA is still aiming for a space shuttle launching in May, but there is so little extra time left in the schedule that the plan could be derailed if a major technical problem arose that needed fixing, NASA managers said Tuesday. Wayne Hale, the space shuttle program manager, said NASA engineers and technicians were facing a "somewhat aggressive schedule" in trying to finish preparations to launch the shuttle Discovery during the May 10 to May 23 target window. At a news conference from the Kennedy Space Center in

Florida, Mr. Hale and other managers emphasized that they would not rush the flight just to stay on schedule. But they noted that crucial testing and flight preparations remained to be done with little "contingency time" left to absorb unexpected delays. If the Discovery does fly successfully in May, or during the next available launching period, July 1 to July 19, Mr. Hale said, it remains possible to get three flights off this year. The National Aeronautics and Space Administration has plans to fly the shuttle 17 times before the end of the program in 2010, which requires returning to the steady launching rate disrupted by the loss of the Columbia in 2003. Web posted. (2006). [NASA Hopeful for May Shuttle Launching [Online]. Available WWW: http://www.nytimes.com/ [2006, March 1].]

March 2: Joint Statement by International Space Station Heads of Agency

The heads of space agencies from Canada, Europe, Japan, Russia and the United States met at Kennedy Space Center, Fla. on March 2, 2006, to review International Space Station cooperation and endorse a revision to the station configuration and assembly sequence. At today's meeting, the Heads of Agency were also briefed on the status of ongoing International Space Station operations and flight hardware development activities across the partnership. The partners reaffirmed their agencies' commitment to meet their mutual obligations, to implement six person crew operations in 2009 and an adequate number of shuttle flights to complete the assembly of the space station by the end of the decade. The partners also affirmed their plans to use a combination of transportation systems provided by Europe, Japan, Russia, and the United States to complete space station assembly in a timeframe that meets the needs of the partners and to ensure full use of the unique capabilities of the space station throughout its lifetime. The International Space Station Heads of Agency expressed their appreciation for the outstanding work being conducted by the space station on-orbit crews and ground support personnel. They commended them for their creativity in making full use of available resources to operate the space station, prepare for assembly missions and carrying out scientific research aboard the station. The uninterrupted flow of Russian vehicles, the outstanding performance of Canadarm2, the successful shuttle logistics flight, and the resourcefulness of all of the partners' ground-based engineers, researchers and operations personnel have served to highlight the strength of the International Space Station partnership and the importance of international cooperation in space operations. The partners look forward to the upcoming space shuttle flight of the STS-121 mission, a return to International Space Station assembly activity and a permanent crew of three. They also noted the upcoming launch of key space station elements such as: three additional power trusses to support overall International Space Station needs and the needs of the partners; the European Space Agency Automated Transfer Vehicle; the U.S. Node 2; the European Space Agency Columbus Module; the Canadian two-armed Special Purpose Dexterous Manipulator Dextre; the Japanese Experiment Module Kibo; the Russian Multipurpose Laboratory Module and the Japanese H-2 Transfer Vehicle. These elements of the space station program will bring to fruition the partnership's goal of operation and use of a permanently inhabited civil International Space Station. ["Joint Statement By International Space Station Heads of Agency," **NASA News Release #06-084,** March 2, 2006.]

March 3: Space station chiefs agree on final configuration

NASA and its International Space Station partners have agreed to accelerate the launch of the European Columbus and Japanese Kibo modules on the space shuttle, ahead of any attempt to service the Hubble Space Telescope. The changes involve a major repackaging of ISS elements in the assembly sequence to ensure the full station configuration can be completed as early as 2009, before termination of shuttle flights in late 2010. Logistics and utilization flights have been deferred to ensure the shuttle is available to launch heavy station elements. And two shuttle flights with spares would not be launched until just before termination of the shuttle program. "I regard the scheduling of the Hubble servicing mission to be largely a technical matter" that will factor in the needs of the telescope and ISS assembly operations, says Michael Griffin, the NASA administrator. He said station assembly now has significant margin. The heads of the European, Japanese, Canadian and Russian space agencies met with Griffin last week at Kennedy to cement the plan. Notably, the Node 3 module and cupola are retained while the Russian power platform has been deleted in favor of U.S. solar arrays providing power to Russian elements through at least 2015, says Anatolii Perminov, who heads the Russian space agency. The large Russian solar array group has been a schedule risk for some time and a high-fidelity model of the ISS with the Russian arrays was ordered out of a Kennedy briefing room just as the agency heads came in to brief the news media. The major shift is important for the U.S. to resolidify its relationship with key international partners in the wake of shuttle delays caused by the Columbia accident in early 2003. Columbus is now scheduled for launch on the seventh upcoming mission in 2007, about nine months earlier than previously planned. "I must say we appreciate the priority that all the partners and especially NASA have put on the launch of Columbus," says Jean-Jacques Dordain. The logistics module for Japan's Kibo pressurized laboratory is planned for launch on the eighth upcoming flight in 2007, the Kibo module itself on the ninth flight in 2008 and its external exposure facility on the 12th mission later that year. "We had the fortunate situation of having one of our Kibo flights advanced earlier," says Keiji Tachikawa, president of the Japan Aerospace Exploration Agency. NASA had envisioned launch of a Hubble servicing mission as early as late 2007. The plan will now be for a Hubble servicing flight no earlier than about a dozen missions into the sequence in 2008, pending validation that the shuttle remains for an autonomous flight without the ISS for a safe haven. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Space station chiefs agree on final configuration." [Electronic]. Vol. 217. No. 41. [March 3, 2006.].]

NASA's new 'straight talk' express

Back in the day, some members of Congress were so suspicious of NASA's then-administrator Daniel Goldin they required Goldin and his deputies to stand before each committee hearing, raise a right hand and swear to "tell the truth, the whole truth and nothing but the truth." That all ended when the Bush White House brought in Sean O'Keefe. The long-time bureaucrat was a by-the-book NASA administrator. And, the book was Webster's Unabridged. So fond of the spoken word was O'Keefe that a well-respected aerospace writer once described him as "logorrheic," a label that stuck until he left NASA for a top position at Louisiana State University. Now comes the new administrator, Michael Griffin, and his team. After nearly a year in the role, Griffin has

shown himself to be candid and brief. He clearly has more valuable things to do than sit around giving two-dollar answers to fifty-cent questions. On the hot seat Thursday here in Washington, though, was Mary Cleave, a former astronaut and now associate administrator for NASA's Science Mission Directorate, the division straining under the Bush administration's proposal to trim its spending by $3.1 billion through 2010. Web posted. (2006). [NASA's new 'straight talk' express [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, March 3].]

Leaky shuttle power unit replaced

NASA contractor technicians are hooking up a spare hydraulic power device aboard shuttle Discovery today after replacing a leaky unit. The so-called Auxiliary Power Unit is one of three devices that play critical roles during shuttle launches and landings. The units provide the hydraulic power needed to steer the shuttle's three liquid-fueled main engines during an 8 1/2-minute climb into orbit. They also are key to operating the orbiter's wing flaps, rudder speedbrake and landing gear during a gliding freefall back to Earth. The removal and replacement work will not have an impact on NASA plans to move the orbiter from its hangar to the Kennedy Space Center Vehicle Assembly Building in mid-April. NASA hopes to launch Discovery on the agency's second post-Columbia test flight around May 10. Web posted. (2006). [Leaky shuttle power unit replaced [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, March 3].]

The "Survivor Astronaut" survives

Former shuttle astronaut Dan Barry continues to plod through "Survivor Panama" (television reality show) and there appears to be little threat of him being voted off the show anytime soon. He's older than a lot of the contestants, but continues to hold his own in what appear to be extremely physically demanding tasks, all while practically starving to death. In Thursday's installment, his tribe lost a battle for some badly needed fish and spice (and a bottle of wine to boot). They did get a tub of beans, but those only provided more pain and agony. Everyone who ate them was up all night sick, in the worst ways. In any event, the tribe won the important challenge and did not have to vote anyone out this week. The number of castaways is down to 11, and my guess is Dan is going to be on the show for at least another month or so. Web posted. (2006). [The "Survivor Astronaut" survives [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, March 3].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than May 10, 2006 ; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. On Thursday, Space Shuttle Program management set a launch date of no earlier than May 10 for Discovery's launch to the International Space Station. Technicians continue preparing Discovery for its roll over from Orbiter Processing Facility bay 3 to the Vehicle Assembly Building. Work is under way to close out various areas of the vehicle for flight. Following the installation of the space shuttle

main engines, technicians added a dome-mounted heat shield around each engine. The heat shields are composed of two, semi-circle shaped sections of thermal protection system tiles that surround the engines. The external fuel tank for the STS-121 mission arrived by barge at Kennedy Wednesday, five days after leaving the Michoud Assembly Facility in New Orleans. The tank, designated ET-119, was towed into the Vehicle Assembly Building. On Thursday it was lifted into a checkout area for final processing before being attached to the solid rocket boosters. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006; Launch Pad: 39B; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue processing Atlantis for its mission to the International Space Station, scheduled for no earlier than Aug. 28. The vehicle is in a scheduled powered-down period, with the next power-up as early as next week. Leak checks of water coolant loop No. 1 were successfully completed. Servicing of that loop is scheduled for the middle of next week. Work on the shuttle's thermal protection system (heat shield) continues with gap filler removal and replacements. Endeavour (OV-105) ; In Orbiter Processing Facility bay 2, work continues on Endeavour following an extensive modification period. The vehicle remains powered-down, and technicians continue to implement the new Return to Flight modifications. Rigging of both the elbow and shoulder for the remote manipulator system (shuttle arm) continues. Final work continues on the reinforced carbon-carbon nose cap. It is scheduled to be installed into the vehicle next week. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-007** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, March 3].]

March 6: Two secretive spaceships come out of "black"?

Space News, via space.com, has an interesting piece about SpaceX developing its own manned spacecraft. In it, the trade newspaper reports that the firm behind the soon-to-be-launched Falcon rocket also plans an Apollo-like spacecraft called Dragon. The company has been secretly working on the fleet for several years. Now, the company's likely to seek some funding from NASA to get the spaceships to completion. The move would fit NASA's strategy of finding private firms to get crew and cargo to the space station after the space shuttles retire. Another trade publication, Aviation Week, is reporting on another secret spacecraft project this week. In a fascinating article posted on its web site, Aviation Week details an apparently shelved project called Blackstar. The two-stage to orbit spacecraft, which some speculate has made secret orbital flights, is a mystery that AvWeek says it has chased for about 18 years. With the project facing cancellation, the magazine decided to put forward what documents and evidence is available about the project (including some contradictory information) before Blackstar's existence fades into oblivion. Web posted. (2006). [Two secretive spaceships come out of "black"? [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, March 6].]

NASA Sets Media Events for Space Technology 5 Launch

NASA's Space Technology 5 (ST5) spacecraft is scheduled to launch from an Orbital Sciences Pegasus XL vehicle at 6:02 a.m. PST (9:02 EST) on March 14 within a launch window that extends from 5:57 to 7:19 a.m. PST. The drop point of the Pegasus from the

L-1011 carrier aircraft is a location over the Pacific Ocean approximately 100 miles offshore west-northwest of Vandenberg Air Force Base, Calif. ST5 will be launched at an azimuth of 105.6 degrees into an elliptical polar orbit of 186 miles by 2,796 miles. The New Millennium Program's ST5 spacecraft consists of three miniature satellites called "micro-sats." ST5 will flight-validate innovative technology concepts to reduce risks to future science missions. Although only 55 pounds each, the satellites have capabilities comparable to those of much larger spacecraft. ST5 will demonstrate the ability of small satellites to perform research-quality science by taking measurements of the Earth's magnetic field using highly sensitive magnetometers. ["NASA Sets Media Events for Space Technology 5 Launch," **NASA Media Advisory #17-06,** March 6, 2006.]

March 7: Shuttle Woes Put May Launch in Jeopardy

Space shuttle Discovery has two problems -- a fuel tank sensor that misreads and a robotic arm that was dinged -- that could potentially delay its planned launch in May. No decision has been made on whether those predicaments will push back the launch of the second shuttle mission since the doomed Columbia flight in 2003, NASA spokesman Kyle Herring said Tuesday. But last week, NASA officials said that sticking to a May launch schedule provided little time to fix any major technical problems. Space shuttle program manager Wayne Hale plans to hear a formal presentation from tank project managers before deciding what to do. "The program hasn't heard the full story," Herring said. "It's very premature to indicate that we're going to do anything with this right now." The fuel tank problem was discovered during testing before it was shipped to the Kennedy Space Center in Florida last week. One of the four sensors at the bottom of the liquid hydrogen fuel tank gave an electrical current reading that was slightly off. The fuel sensors are used for making sure the spacecraft's main engines shut down during the ascent when the tank runs out of fuel. A launch could end in tragedy if the engines cut out too early or too late. Last year, the launch of Discovery was delayed because of a malfunctioning hydrogen fuel sensor. NASA never was able to pinpoint the cause and was prepared to fly with just three of the four fuel sensors working but the problem never resurfaced on launch day. Options for the current problem include flying with just three sensors working properly or swapping out parts, although engineers hope they don't have to open up the tank. "It's like your car," Herring said. "If you open up your engine to try to find a small problem, you might create some others." Discovery's robotic arm was bumped last Saturday by a cherry-picker-type vehicle that was being used to clean up broken glass from a light bulb whose pieces had fallen in the shuttle's open payload bay. Engineers haven't decided whether the arm will need to be changed out. Web posted. (2006). [Shuttle Woes Put May Launch in Jeopardy [Online]. Available WWW: http://www.nytimes.com/ [2006, March 7].]

March 8: Ultrasound on Discovery arm; Endeavour tiles hit

The shuttle Discovery's robot arm is undergoing ultrasound inspections after a weekend mishap in which a moveable access bucket bumped into the arm during work to clean up broken glass. Two small indentations were found underneath the arm's insulation blankets and NASA wants to make sure the underlying structure wasn't damaged. At the same time, engineers are assessing tile damage to the shuttle Endeavour's body flap caused by equipment that slipped off a tray used by workers inspecting the ship's

rudder/speed brake. The Endeavour incident happened Tuesday morning in Orbiter Processing Facility Bay 2 while technicians were carrying out an X-ray inspection of the rudder and speed brake system in the shuttle's vertical stabilizer. "While they were doing that, they dropped some equipment off the tray," said Jessica Rye, a NASA spokeswoman. "What they dropped was a film processor; it struck the left hand side of the body flap. There was some tile damage on the body flap, which they're addressing. They're looking, of course, at structural inspections to evaluate if there is any structural damage to the body flap." In Discovery's hangar (OPF Bay 3), meanwhile, engineers are continuing inspections of the shuttle's 50-foot-long robot. Friday night, engineers servicing the shuttle's heat shield tiles broke a light fixture. During work to vacuum up the fragments, a telescoping bucket used to move technicians from point to point in the cargo bay bumped into the robot arm. Insulation blankets were removed and engineers spotted apparent damage to an aluminum grounding strap that runs the length of the arm. In addition, there are two small indentations in the arm's so-called outer bumper, an epoxy honeycomb material that protects the arm's underlying carbon composite structure. One indentation is .115 inches deep and 1 inch long and the other is .035 inches deep and a half-inch long. During Discovery's upcoming mission, the shuttle arm will be used to pick up a long boom equipped with cameras and laser sensors to inspect the shuttle's heat-shield system after launch. In addition, two astronauts will ride about on the end of the boom during the first of three planned spacewalks as part of an engineering study to evaluate the extended arm-boom system's stability. The idea is to find out if the system could be used for heat-shield repair work if such work is ever needed. To help evaluate the loads on the arm-boom system, Discovery's robot arm has been instrumented and engineers want to make sure the arm itself and the instrumentation were not damaged by the work bucket incident. As of this writing, the arm damage does not appear to be a threat to the shuttle schedule, but engineers won't know for sure until the ultrasound tests are complete. Web posted. (2006). [Ultrasound on Discovery arm; Endeavour tiles hit [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, March 7].]

USA positioning itself for post-shuttle work

United Space Alliance is not resigning itself to fade into oblivion post-shuttle. The contractor responsible for the care and feeding of the space shuttle orbiters on a daily basis is positioning itself to become the "operator" of NASA's next fleet. To that end, USA named Anne Martt a vice president and Constellation Program Manager. She'll be responsible for handling USA's transition of workers, facilities and other assets from the space shuttle and station programs to the new exploration program. USA, a 50-50 partnership between aerospace giants Boeing and Lockheed, has been saying for some time it envisions itself as the "operator" for the Crew Exploration Vehicle just as it has been for the space shuttle since the mid-1990s. USA President and CEO Mike McCulley is reiterating that in the appointment of Martt, whose past jobs including running the space shuttle upgrades program and a business development post chasing work for the space alliance on new NASA programs. But McCulley notes that the company also intends to play a role in systems development and engineering as well. Martt starts the new job immediately. Web posted. (2006). [USA positioning itself for post-shuttle work [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, March 8].]

March 9: Mishaps damage shuttle hardware

NASA is investigating three shuttle-processing accidents in the past five days, a spate that represents a high number of workplace incidents in such a short time. Jessica Rye, a spokeswoman for NASA's Kennedy Space Center, said shuttle managers aim to pinpoint the factors that led up to the incidents and determine whether they might be related. "The management is concerned, and they are going to be looking into the incidents to see if there is a common thread," she said. NASA managers are trying to have Discovery ready for a targeted May 10 launch attempt, but the agency faces a tight schedule for work that still must be completed before flight. Two of the recent accidents damaged multibillion-dollar orbiters. Technicians inadvertently dropped an X-ray film processor onto the body flap of Endeavour on Tuesday, damaging thermal tiles that protect the ship and its astronaut crews from intense heat during atmospheric re-entry. The technicians had been preparing to perform X-ray inspections on the shuttle's rudder speed brake. NASA now plans additional structural inspections of the body flap to determine the extent of the damage. The body flap provides thermal protection for the shuttle's three main engines during ascent and also helps guide an orbiter during reentry and landing. Extra inspections also will be carried out on the robot arm of the orbiter Discovery, which is being readied for launch about May 10 on NASA's second post-Columbia test flight. A bridge bucket carrying technicians from a clean-up site in shuttle Discovery's payload bay late Saturday inadvertently struck the orbiter's 50-foot-long robot arm. Marks were noted in two places on multi-layered insulation blankets that provide thermal protection to the arm, which is mounted on brackets along the inside of the shuttle's cargo bay. The blankets were removed and two small indentations were found on the arm's so-called outer bumper, a layer of graphite epoxy that protects the composite carbon structure beneath. The technicians in the bridge bucket had just finished cleaning up glass shards inside the cargo bay. A technician performing thermal tile repair work Friday bumped a heat lamp into a handrail. The lamp broke and glass fell into the bay. No serious damage was apparent during any of the incidents. But they represent the most accidents in a short span in recent years. Web posted. (2006). [Mishaps damage shuttle hardware [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 9].]

March 10: U.S. Spacecraft Enters Orbit Around Mars

The most sophisticated spacecraft ever sent to Mars slipped into orbit on Friday after successfully firing braking rockets and maneuvering itself into position while tense controllers monitored from Earth. After a journey of seven months and 310 million miles, NASA's Mars Reconnaissance Orbiter, a large robotic spacecraft crammed with six scientific instruments, performed an intricate ballet of turns and engine firings to complete the crucial step of entering Mars's orbit without careering into space. At that point, mission controllers at the space agency's Jet Propulsion Laboratory in Pasadena, Calif., announced that everything had gone as planned and that the craft was orbiting Mars. Web posted. (2006). [U.S. Spacecraft Enters Orbit Around Mars [Online]. Available WWW: http://www.nytimes.com/ [2006, March 10].]

Expendable Launch Vehicle Status Report

Mission: Space Technology 5 (ST5); Launch Site: Vandenberg Air Force Base, Calif.; Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: No earlier than March 14, 2006; Launch Window: 8:57:31 to 10:19:50 a.m. EST; Targeted Drop Time: 9:02 a.m. EST. The Pegasus rocket with ST5 was transported today from the hangar to the L-1011 ramp area next to the runway on north Vandenberg. The rocket is being mated to the Orbital Sciences L-1011 carrier aircraft. A combined systems test is scheduled for Saturday. The integrated test between the Pegasus vehicle and the L-1011 will ensure all connections have been established and all systems are functioning properly. A state-of-health check of the ST5 is also scheduled. The Launch Readiness Review is scheduled for March 12. The four-hour, 40-minute countdown for launch is scheduled to begin at 4:20 a.m. EST, March 14; leading to launch at 9:02 a.m. EST. KSC News Center (2006). **Expendable Launch Vehicle Status Report #E06-009** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, March 10].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than May 10, 2006 ; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Final closeouts continue on Discovery in preparation for its roll over from Orbiter Processing Facility bay 3 to the Vehicle Assembly Building (VAB). Leak checks of the liquid oxygen system on space shuttle main engines No. 2 and 3 were successfully completed. On March 4, space shuttle technicians inside a work platform device, called a bridge bucket, accidentally bumped into Discovery's remote manipulator system, or shuttle arm. The bridge bucket was being used in the payload bay to clean up pieces of glass from a broken heat lamp. That accident caused pieces of glass to fall into the payload bay. Initial inspections showed two indentations in the arm's outer bumper, a honeycombed structure made of epoxy designed to protect it. One of the indentations is 0.115 inches deep and 1 inch long. The second indentation is 0.035 inches deep and 0.5 inches long. Inspections of the forward indentation were completed Thursday night, and no issues were found. The second indentation will be inspected today. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006; Launch Pad: 39B;Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue processing Atlantis for its mission to the International Space Station. The vehicle remains in a scheduled powered-down period, with the next power-up as early as today. Power up will follow servicing of the water coolant loop. On Thursday, liquid oxygen leak checks began on the space shuttle main engines. Endeavour (OV-105) In Orbiter Processing Facility bay 2, work continues on Endeavour following an extensive modification period. The vehicle was powered up on Wednesday following a planned powered-down period. Power-up system testing is resuming. On Tuesday, a technician preparing to perform X-rays on the rudder speed brake dropped a film processor on the left-hand side of the body flap, causing minimal tile damage. One tile was removed and will be replaced. Ultrasound inspections were performed, and there is no structural damage to the body flap. External Tank Final

closeouts continue in the checkout cell of the VAB on the external tank that will fly with Discovery. The tank is designated ET-119. An "all systems" electrical checkout was conducted on the tank approximately one week prior to shipment from NASA's Michoud Assembly Facility in New Orleans to Kennedy. Technicians noted a minimal difference from the expected reading on liquid hydrogen engine cutoff sensor No. 3. The sensors indicate whether the tank still has fuel during liftoff. While the reading was within acceptable limits, additional data evaluation is needed before the Space Shuttle Program makes any decisions regarding flight rationale. A series of external tank wind tunnel tests began this week and will continue for several weeks. Analysis of the testing will be ongoing. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-008** [Online]. Available E-mail: owner-press-release@spinoza.public.hqnasa.gov [2006, March 10].]

March 13: ST5 Launch Postponed 24 Hours Due To Weather Forecast
The launch of NASA's ST5 spacecraft aboard an Orbital Sciences Pegasus XL rocket has been postponed 24 hours to Wednesday, March 15, due to predicted launch weather conditions. Due to an approaching weather system, there is an 80 percent probability of not meeting the launch weather criteria within the area of the drop box, the location over the Pacific Ocean where the Pegasus rocket will be dropped from the Orbital Sciences L-1011 aircraft. The forecast conditions improve on Wednesday with only a 20 percent chance of not having acceptable weather. On Wednesday, March 15, launch is targeted for 6:02 a.m. PST. Launch coverage on NASA Television will begin at 4:30 a.m. PST. ["ST5 Launch Postponed 24 Hours Due To Weather Forecast," **NASA News Release #18-06,** March 13, 2006.]

March 14: NASA Announces New Window for Next Shuttle Mission
NASA announced today July 1 to 19, 2006, is the new launch planning window for Space Shuttle Discovery's mission (STS-121). The window gives the agency time to do additional engineering work and analysis to ensure a safe flight for Discovery and its crew. Space Shuttle Program Manager Wayne Hale made the announcement during a news conference from NASA's Johnson Space Center in Houston. The decision to target July followed a two-day meeting on the external fuel tank's engine cutoff (ECO) sensors. The sensors indicate whether the tank still has fuel during liftoff. During testing, one of the four ECO sensors had a slightly different reading than is expected. Shuttle officials have decided they will remove and replace all four liquid hydrogen sensors. "We've been saying for months that our engineering work would determine when we fly our next mission. Targeting July is the right choice in order to make smart decisions," said Bill Gerstenmaier, NASA associate administrator for Space Operations. Other issues factored into the decision to adjust the STS-121 planning window: Testing and analysis are required on the shuttle's modified external tank. The testing will help verify the tank is safe to fly without the protuberance air load (PAL) foam ramp. The PAL ramp was removed after a large piece of foam fell from that area during Discovery's July 2005 launch. More analysis is needed to decide whether changes are needed on the tank's ice frost foam ramps. Repair work on the shuttle's robotic arm must be completed. Technicians on a work platform accidentally bumped the arm last week, causing a tiny crack. The arm will be removed for repair. The STS-121 mission will take Shuttle

Commander Steve Lindsey and six crew members to the International Space Station. This is the second mission in the Return to Flight sequence to evaluate new heat shield inspection and repair techniques and to deliver supplies and equipment to the station. ["NASA Announces New Window For Next Shuttle Mission," **NASA News Release #06-092,** March 14, 2006.]

March 15: Shuttle launch target slips from May to July

NASA has given up on making the space shuttle's May launch window and is focused now on launching Discovery in July, Program Manager Wayne Hale announced March 14. The decision to shoot for the July 1-19 window for mission STS-121 followed a two-day meeting on the external fuel tank's engine cutoff (ECO) sensors, one of which is showing warning signs that it may be developing a problem (DAILY, March 9). Shuttle officials have decided they will remove and replace all four liquid hydrogen ECO sensors, which will take three weeks and rules out a May launch. "This decision was not an easy decision," Hale said during a press conference at Johnson Space Center in Houston. The difficulty of the decision was not based on losing schedule, however, but on the fact that going inside the tank to remove the sensors carries with it the risk of doing additional damage. "This was not a decision about schedule," Hale said. "This was a decision about safety." NASA still hopes to fly three missions total this year, he said. The erratic performance of the same sensors, which are designed to cut off the shuttle's engines if fuel runs too low, also hampered efforts to launch Discovery on its first return-to-flight mission last year (DAILY, July 20, 2005). A subsequent investigation found that there may be a manufacturing problem having to do with the wiring in the sensors, Hale said. Other factors also played into the decision to slip the May schedule, which NASA officials had already admitted contained little or no time to deal with unforeseen contingencies (DAILY, March 1). Further testing is required to assure NASA that the shuttle can fly without the external tank's Protuberance Air Load (PAL) ramp, which has been removed to reduce the risk of foam debris coming loose during ascent. More analysis also is needed to decide whether changes are needed on the tank's ice frost foam ramps, according to NASA. Meanwhile, repair work also continues on the shuttle's robotic arm, which was accidentally cracked last week when it got bumped. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Shuttle launch target slips from May to July." [Electronic]. Vol. 217. No. 49. [March 3, 2006.].]

ST5 Launch to Be Rescheduled

The launch of NASA's ST5 spacecraft aboard an Orbital Sciences Pegasus XL rocket was called off today when a locking pin in the rocket's flight control service mechanism did not retract just prior to launch. Orbital Sciences Corporation and NASA engineers will diagnose and correct the problem. A new launch date will be established at the earliest opportunity pending resolution of the issue, the availability of the Western Range, and acceptable weather conditions at the Vandenberg Air Force Base, Calif., launch site. The delay will be at least 48 hours. ["ST5 Launch To Be Rescheduled," **NASA News Release #19-06,** March 15, 2006.]

Statement from Center Director Jim Kennedy

To the KSC Workforce: "I have called for a 2-hour Centerwide Safety Standdown to be held Thursday, March 16, 2006, from 2-4 p.m. Please take this time to reflect on how you and your fellow employees ensure the safety of each other and the billions of dollars worth of assets the American people have entrusted us with. We have an awesome mission here at KSC--launching astronauts and payloads into space. To accomplish this hazardous mission, Safety must be our number one value. Spending this time to reflect on safety will help us stop, in its tracks, the chain of events that led me to call for this Safety Standdown. Additional information will be provided by your KSC leadership team and will also be available, along with a video message from me to you, on March 16 at the following link: http://nasa.ksc.nasa.gov/safetyhealth06/index.html. Thank you for all you have done to make KSC's safety record world-class, but remember, past performance does not guarantee future success. Only our commitment to safety can do this." Jim Kennedy. E-mail distribution. (2006). [Kennedy, James W. Re: "Centerwide Safety Standdown" [Electronic]. [March 15, 2006.].]

March 16: Firm plans 1,000 space jobs

ASRC Aerospace Corp. plans to add as many as 1,000 jobs during the next several years at Kennedy Space Center, as the high-tech company works on projects aimed at helping the transition to a new space vehicle. Experts say those jobs will boost the economy, as NASA shifts from launching space shuttles into orbit to developing the new Crew Exploration Vehicle that will send astronauts to the moon and Mars. The jobs ASRC will add mainly are engineering positions paying in a range of $40,000 for entry level and up to $100,000 for more senior positions, consistent with other engineering jobs in the state, company officials said. ASRC now employs about 230 people in Cape Canaveral and 700 companywide. The jobs ASRC is looking for would be a mix of savvy veterans and new graduates to "help build a new generation of designers," said Dick Lyon, vice president for Florida operations of ASRC. "This is not a one-time thing. The CEV program . . . will be going on for the next 35 or 40 years, so it's critical to retain the skills that keep Brevard the place for space." The jobs the company is planning to add to the area, combined with the innovation of its technologies and research, helped ASRC win the Florida Space Authority's 2006 Florida Space Business Award, beating out 24 other firms. ASRC also was cited for developing innovations that help the space program, investing in space technologies and forging partnerships with area universities. ASRC, is based in Anchorage, Alaska, and was started by Inupiat Eskimos. Web posted. (2006). [Firm plans 1,000 space jobs [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 16].]

Brevard delegation fights for space interests

When NASA Administrator Mike Griffin comes to call today, Florida officials will show unified public support for the state's space endeavors. Griffin's visit to the Capitol is part of Space Day, an annual event to draw legislative attention to the state's aerospace industry. Behind the scenes today, the Legislature and governor's office are squabbling over how to reorganize the state's space agencies to best capture the space flight business, who will control it and where it will be based. "I wish someone would tell the Brevard delegation that administration fits function," said Lt. Gov. Toni Jennings, who is pushing Gov. Jeb Bush's space plan. The governor's bill creates a single agency, Space Florida,

under the wing of the state's privatized economic development agency, Enterprise Florida. The House and Senate sponsors include Rep. Ralph Poppell, R-Vero Beach, and Sen. Mike Haridopolos, R-Indialantic. The bill gives the governor's office and Enterprise Florida broad authority over business development and space education programs, now housed among several small state agencies based in Brevard County. But it is a problem for some local lawmakers, who say Bush is ignoring local needs while overreaching, creating a new bureaucracy instead of honing the existing one. A competing bill offered by the House Spaceport and Technology Committee, led by Rep. Bob Allen, R-Merritt Island, preserves the state's business and education space agencies under the umbrella of a revived Space Florida Management Council. That, in turn, would answer to the new Space Florida. Allen's committee bill also requires that Space Florida be located close to Kennedy Space Center. "I would remind Toni Jennings that the Brevard boys are the ones who have to watch two, three, four-thousand people laid off at a whack," Allen said. "It's our community." Web posted. (2006). [Brevard delegation fights for space interests [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 16].]

Videotaped message from KSC Director to employees

The following is a transcript of a videotaped message from Kennedy Space Center Director James Kennedy. After a rash of recent shuttle processing accidents, Kennedy called for a two-hour safety stand-down on Thursday, March 16. The message was broadcast via closed circuit television to various KSC work sites: "I appreciate a few moments of your time as I address the No. 1 value at KSC – Safety. First and foremost, the Kennedy Space Center has an excellent safety record. Our personnel injury rates are world-class, exemplified by USA, SGS, NASA and Boeing being awarded the coveted VPP Star Certification. Even better, we have not experienced a major mishap involving flight hardware during ground processing in more than 15 years. However, our past does not guarantee future success. In the last few weeks alone, KSC has experienced a rash of close calls and mishaps leading me to call for a two-hour Center-wide Safety Stand-down. Let me give you some specific examples that led to this decision. First, during an orbiter jack transfer, an unexpected movement of Endeavour's nose landing gear occurred. This incident could have resulted in major damage to the Orbiter. Next, we inadvertently overpressurized Atlantis' Water Coolant Loop, resulting in damage to the water accumulators. Then, in less than a seven-day period, we had three more incidents. We damaged Discovery's robotic arm while moving the bridge bucket, which will require removal and replacement of the arm. Next, an X-ray film container was dropped onto a body flap tile on Endeavour, which will require repair. Finally, workers started a small fire during roof repairs to the VAB, the consequences of which could have been catastrophic. These incidents were experienced by several different organizations on Center and there is no apparent common cause. However, I considered all a threat to successfully accomplishing our mission – the launching of astronauts and payloads into space. I called for this Safety Stand-down so the workforce can focus on SAFETY. In the next two hours, I would like each of you to focus on two awesome responsibilities we all have. First, we are responsible for human lives! The Apollo 1 fire and the loss of Challenger and Columbia vividly remind us of this. Also, we all play a part in ensuring the safety of our fellow employees. An employee who cleans up a spill may be keeping somebody from slipping and falling. The fall-protection you tell your fellow employee to

wear may save his or her life. It's the small things each of us do on a daily basis that ensure we, and our fellow employees, make it home to our families at the end of the day. Second, the American people have entrusted us with significant assets. Remember, this is America's space program, not just NASA's. Our assets include not only flight hardware but the facilities, systems and utilities required to successfully accomplish our mission. KSC is, and will continue to be, the only United States facility capable of human space launches. Many of our facilities and systems, such as the VAB, are not only critical to our mission, but national treasures. Every employee at KSC is entrusted with the care of these facilities and flight hardware. We are expected to be good stewards of what the taxpayers of this country have provided. We understand that incidents may occur but a major mishap could result in losing the confidence of the American people to execute our mission as NASA's Launch Operations Center. This could derail NASA's plans to complete the International Space Station and begin exploration of the moon, Mars and beyond. We MUST stop, in their tracks, the chain of events that led me to call for this Safety Stand-down. Discovery is approaching rollout of the second Return-To-Flight mission. With this launch, and subsequent launches, NASA will complete the assembly of the International Space Station. Also, KSC is beginning the tremendous task of preparing our infrastructure for the Constellation program. This will require significant construction in the LC-39 and industrial areas. Taken separately, any one of these tasks is a major safety challenge. Together, they present KSC with a safety challenge unmatched by anything since Apollo – performing major construction in the middle of flight hardware processing. I know we are up to this safety challenge and our commitment to achieving it begins today. In all you do, remember that safety is our highest priority and we will not process, launch or build anything unless it is safe to do so. I have total faith that together we will rise to the challenge, stop the mishaps and SAFELY complete the work the American public entrusted to us! Thank you for your time." Web posted. (2006). [Videotaped message from KSC Director to employees [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 17].]

Boeing to let 41 space station workers go

The Boeing Co. on Friday officially will send out 60-day layoff notices to 41 employees because of a reduction in processing requirements for the International Space Station, business reporter Wayne Price will report tomorrow. Boeing, which employs 1,700 people in Brevard County, said changes in the space shuttle manifest made it necessary to eliminate some positions related to the work done at the Space Station Processing Facility. The presidential directive to retire the orbiters in 2010, along with budget and overarching safety concerns with the aging fleet, has prompted the space agency to adjust its manifest from 28 to about 16-18 to finish space station construction. That means less payloads and integration work at the SSPF. Susan Wells, a Boeing spokeswoman, says that the company will try to "absorb" the workers into other jobs. Web posted. (2006). [Boeing to let 41 space station workers go [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 16].]

Griffin: KSC ready for future

NASA Administrator Mike Griffin told legislators at the Capitol on Thursday the Kennedy Space Center could adapt itself to any new needs the space industry has for

decades to come. He assured House members that NASA's vertical launch systems at KSC and commercial structures at Cape Canaveral are adequate, despite increased attention to the development of horizontal launch sites. But should horizontal launches become the standard platform, NASA can adapt, he said. "I'll note that on the north side on Merritt Island is quite a lot of undisturbed land that could accommodate whatever runways need to be built," Griffin said. Gov. Jeb Bush is pushing legislation to collapse several state space-related agencies into one, Space Florida, under the wing of the governor's office and Florida's privatized business development agency, Enterprise Florida. The governor faces opposition from Brevard County's delegation, which wants to streamline existing agencies, and keep them headquartered near KSC. Griffin spoke to legislators Thursday as part of Space Day. But some lawmakers quipped that environmentalists might shudder at giving up Merritt Island National Wildlife Refuge next to Kennedy Space Center. "I have only limited interest in that, I'm sorry," Griffin said. Web posted. (2006). [Griffin: KSC ready for future [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 17].]

NASA Honors Apollo Moon Walker Buzz Aldrin

NASA will honor former astronaut Buzz Aldrin for his involvement in the U.S. space program with the presentation of the Ambassador of Exploration Award on Saturday, March 25 at the California Science Center in Los Angeles. NASA is presenting the Ambassador of Exploration Award to the 38 astronauts and other key individuals who participated in the Mercury, Gemini, and Apollo space programs for realizing America's vision of space exploration from 1961 to 1972. The award is a small sample of lunar material encased in Lucite and mounted for public display. The material is part of the 842 pounds of samples brought back to Earth during the six Apollo lunar expeditions from 1969 to 1972. Aldrin's award will be displayed in the Sketch Foundation Gallery: Air & Space Exhibits, California Science Center, 700 State Street, Los Angeles. ["NASA Honors Apollo Moon Walker Buzz Aldrin, **NASA Media Advisory #M06-045,** March 16, 2006.]

March 17: NASA changing out windows on Discovery

NASA contractor technicians are replacing two cockpit windows on shuttle Discovery with windows that have passed more stringent pressure tests. The work is being done in hangar No. 3 of the Orbiter Processing Facility at Kennedy Space Center. Each shuttle orbiter has six forward and two overhead cockpit windows. NASA is replacing the No. 3 and No. 5 forward windows on Discovery because they were not subjected to pressure tests at levels that would prove they meet engineering specifications. The loss of a window in flight would cause a loss of cabin pressure that could force a crew to attempt a risky and unprecedented emergency landing. NASA earlier this week delayed Discovery's targeted May launch to no earlier than July 1. Mission managers decided to take advantage of the extra time and replace the windows. Web posted. (2006). [NASA changing out windows on Discovery [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, March 17].]

Death to elevate KSC safety concerns

The death of a roof repairman at Kennedy Space Center on March 17, one day after the center held a safety "stand down" to review safety procedures, will elevate concerns about safety consciousness as the site transitions from the shuttle to Crew Exploration Vehicle operations. The roofer fell from a Kennedy building and was not involved in any aerospace activities. But the accident serves as a reminder about the risks inherent in launch site operations. The accident came just a day after James Kennedy, center director, had the entire work force pause for two hours to hear safety re-emphasized by managers and quality control personnel. The stand down came in the wake of accidental damage to the orbiter Discovery's manipulator arm and another incident in which Endeavour's body flap was damaged. Other recent incidents occurred when jacking Endeavour and pressurizing the Atlantis water coolant system, an event that damaged water accumulators in the spacecraft. "We understand that incidents may occur, but a major mishap could result in losing the confidence of the American people to execute our mission as NASA's Launch Operations Center. This could derail NASA's plans to complete the International Space Station and begin exploration of the moon, Mars and beyond," Kennedy said about the shuttle incidents that caused the safety stand down. "We must stop, in their tracks, the chain of events that led...for this safety stand down," Kennedy told the center's work force. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Death to elevate KSC safety concerns." [Electronic]. Vol. 217. No. 52. [March 21, 2006.].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: Launch Planning Window July 1-19, 2006 ; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. On Tuesday, Space Shuttle Program management announced Discovery's new launch planning window of July 1 to 19. This window provides the agency time to change the shuttle's external fuel tank engine cutoff sensors and to perform additional engineering analysis to ensure a safe flight for Discovery and its crew. Discovery's damaged remote manipulator system (shuttle arm) was removed from the payload bay on Tuesday. The lower section of the arm is en route to Canada today, so repairs can begin on the damaged section. Leak checks were successfully completed on all three space shuttle main engines, and thermal protection system foaming operations around the engines are under way. Removal and replacement of windows Number 3 and 5 have begun. Although the windows in the vehicle meet specification, the new ones have been tested to a higher pressure. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006; Launch Pad: 39B; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The vehicle was powered up March 10. Work continues with powered up system testing. Main propulsion system leak and functional checks were completed on Tuesday, with final space shuttle main engine operations continuing once engine No. 3 is installed. Endeavour (OV-105) ; In Orbiter Processing Facility bay 2, work continues on Endeavour following an extensive modification period. Installation is under way on a

new modification called the station-to-shuttle power transfer system. It will enable the shuttle to stay docked longer than normal to the space station. On Wednesday, technicians completed the leak-check requirements to support the multi-purpose logistics module. External Tank ; Following a two-day engineering discussion to determine whether one of the four external tank engine cutoff (ECO) sensors needed to be changed, program management decided to remove and replace all four liquid hydrogen sensors in the external tank. These sensors indicate whether the tank still has fuel during its climb to orbit. During normal testing, one of the four ECO sensors had a slightly different reading than was expected, and its performance in flight was questioned. The work will be completed at Kennedy in the Vehicle Assembly Building's external tank checkout cell. The change out will be performed by technicians from NASA's Michoud Assembly Facility who are most familiar with this particular work. The replacement of the sensors will take approximately 22 days to complete and is scheduled to begin on Monday. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-009** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, March 17].]

NASA Appoints Board To Investigate Shuttle Arm Incident

NASA has formed a board at the agency's Kennedy Space Center, Fla., to investigate the March 4 incident that damaged Space Shuttle Discovery's remote manipulator system (shuttle arm). Hugo Delgado is chairman of the five-member investigation board. He is deputy director for the Office of the Chief Engineer at Kennedy. The board is supported by one ex-officio member, four advisors and administrative personnel. Board functions include investigating the facts surrounding the incident, determining its probable cause, assessing the possibility of a recurrence and recommending corrective actions. A final report is expected this summer. On March 4 at about 10:10 p.m. EST, shuttle technicians inside a bridge bucket work platform device accidentally bumped into Discovery's robotic arm. The arm is a 50-foot-long, jointed extension used to grapple payloads, remove them from the payload bay and move spacewalking astronauts to various work platforms. Inspections showed two indentations in the arm's outer bumper layer, a Kevlar-covered plastic, honeycombed structure designed to protect the arm from minor impacts. One of the indentations in the honeycombed layer is oval shaped, 0.115 inch deep and 1 inch in diameter. The second indentation, also oval shaped, is 0.035 inch deep and 0.5 inch in diameter. Ultrasound inspections were performed once the Kevlar and honeycombed layer were removed. Under the largest indentation was a small crack in the carbon-fiber composite, measuring 1.25 inches long and 0.015 inches deep. The arm was removed from the vehicle on Tuesday and will be sent back to the vendor for repair. The shuttle is in Kennedy's Orbiter Processing Facility bay 3. It is undergoing preparations for the STS-121 mission to the International Space Station. The launch is targeted for no earlier than July 1. ["NASA Appoints Baord To Investigate Shuttle Arm Incident," **NASA News Release #06-100,** March 17, 2006.]

NASA Expendable Launch Vehicle Status Report

Mission: Space Technology 5 (ST5); Launch Site: Vandenberg Air Force Base, Calif.; Launch Vehicle: Orbital Sciences Pegasus XL; Launch Date: No earlier than March 22, 2006; Launch Window: 8:57:31 to 10:19:50 a.m. EST; Targeted Drop Time: 9:02 a.m.

EST. The weather outlook is generally favorable for a launch attempt on March 22. Testing and troubleshooting on the Pegasus rocket by the NASA and Orbital Sciences engineering team is under way. It is undetermined why the starboard flight control surface fin pin did not retract during the March 15 launch attempt. The Pegasus fin batteries have been removed and replaced in accordance with standard procedure following a launch attempt. They had been activated for the pre-deployment fin sweep tests during the terminal countdown sequence. A Launch Readiness Review is scheduled for Monday, March 20. KSC News Center (2006). **Expendable Launch Vehicle Status Report #E06-010** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, March 17].]

March 18: Redstone remembered

Tonight's reunion of the last remnants of the trailblazers who blasted America into the high frontier frames a bittersweet snapshot about the passage of time and local indifference to history. "They're coming from as far away as California and Arizona," says Redstone Missile Pioneers reunion organizer Pat Grimbly, who estimates a closed attendance of 120 people at the Radisson at the Port in Port Canaveral. "But we won't be able to do it again. We're all in our 70s, 80s and 90s now." The tribute will celebrate the Redstone rocket program, which ignited the United States' aerospace odyssey from Cape Canaveral in 1953. Its special guest will be Konrad Dannenberg, one of the last surviving V-2 missile scientists who followed visionary Dr. Wernher von Braun to America after World War II. Web posted. (2006). [Redstone remembered [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 18].]

March 20: Helms to take over at Patrick

Patrick Air Force Base's 45th Space Wing will get its first woman commander. Col. Susan Helms, a former astronaut and veteran of five space flights who served as vice commander of the 45th Space Wing until February 2005, is expected to return as commander by mid-summer. No date has been announced. She replaces Brig. Gen. Mark Owen, who has been commander of the 45th Space Wing since August 2004. He has been reassigned to the Pentagon, the Department of Defense announced Friday. Helms, who has been selected to become a brigadier general, returned to the Air Force after 12 years at NASA. She flew several shuttle missions and spent a combined 163 days aboard the International Space Station from March to August 2001. The commanders' post is a key role in national security. The commander oversees the launch of most of the Pentagon's spy, communications and navigational satellites from Cape Canaveral Air Force Station. She also will work closely with NASA and commercial launch companies. Web posted. (2006). [Helms to take over at Patrick [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 20].]

Ribbon Cutting Ceremony for Second OSB Building

Kennedy Space Center Deputy Director Bill Parsons, members of center management and local industry officials will participate in a ribbon-cutting ceremony for the Operations Support Building (OSB) II on Friday, March 24, at 9:30 a.m. The OSB II is an agency safety and health initiative project to replace modular housing and trailers in the Launch Complex 39 area. The OSB II project eliminated 198,466 square feet of

substandard modular housing and trailers, equivalent to 276 singlewide trailers. The facility represents a firm commitment by the center to provide a safe, efficient and attractive workspace for the employees. The new five-story, 189,000-square-foot building consists of approximately 960 office spaces, a 300-person mission conference center with observation deck, training rooms, computer rooms, multimedia conference rooms, and technical libraries. ["Ribbon Cutting Ceremony for Second Operations Support Building," **NASA News Release #21-06**, March 20, 2006.]

March 21: NASA Announces ST5 Spacecraft Launch Set for Wednesday
The second launch attempt of NASA's Space Technology 5 spacecraft is scheduled for Wednesday, March 22 at 9:02 a.m. EST. NASA TV begins live coverage at 7:30 a.m. EST. Departure of the L-1011 aircraft carrying the Orbital Sciences Pegasus XL rocket and ST5 is scheduled for 8:04 a.m. EST, from Vandenberg Air Force Base, Calif. The Pegasus/ST5 launch is targeted over the Pacific Ocean, 145 miles northwest of Vandenberg. The launch window closes at 10:20 a.m. EST. The weather forecast on Wednesday is generally favorable with an 80 percent chance of meeting launch criteria. During the first launch attempt on March 15, the Pegasus starboard flight control surface fin pin did not retract resulting in an aborted attempt. NASA and Orbital Sciences completed an engineering analysis, but the exact cause of the malfunction could not be determined. The most likely reason was the pin retractor system failed to operate due to the formation of ice. The mechanism was removed and replaced in case there were other contributing causes. Steps have also been taken to mitigate potential water intrusion that could form ice during captive carry. ["NASA Announces ST5 Spacecraft Launch Set for Wednesday," **NASA News Release #22-06**, March 21, 2006.]

March 22: Pegasus launches ST5
A Pegasus rocket successfully launched the three microsatellites that comprise NASA's Space Technology 5 (ST5) mission Wednesday morning. The Pegasus XL was dropped from its L-1011 aircraft and ignited its engine at 9:04 am, off the coast from central California. The three ST5 spacecraft were successfully placed into an elliptical orbit ranging in altitude between 300 and 4,500 kilometers about 20 minutes later. The launch was previously scheduled for a week ago but scrubbed at the last minute when a pin that holds a control fin in place on the booster failed to retract on command. The three ST5 microsatellites are designed to test a number of spacecraft technologies while performing measurements of the Earth's magnetosphere. Web posted. (2006). [Pegasus launches ST5 [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 20].]

March 23: 2nd Probe Ordered in Space Center Accident
For the second time in a week, NASA has taken the infrequent step of appointing a board to investigate an accident at the Kennedy Space Center. The five-member board appointed Thursday will examine how a construction worker fell off a warehouse last week while performing roof repairs. The worker died later at a hospital. A final report with recommendations on safety procedures is expected in a month, said NASA spokesman Bruce Buckingham. The panel's appointment comes almost a week after another investigative committee was formed to examine how the robotic arm of space shuttle Discovery was dented by a platform being used to clean up broken glass earlier

this month. The Discovery mishap was one in a series this year at the space center. In January, workers did not lock down space shuttle Endeavour's nose wheel landing gear while transferring it between floor jacks, causing the orbiter to pitch forward. Earlier this month, an X-ray film container was dropped on Endeavour, requiring tile repairs. Two weeks ago, workers repairing the roof of the vehicle assembly building inadvertently started a small fire. There was no major damage. Web posted. (2006). [2nd Probe Ordered in Space Center Accident [Online]. Available WWW: http://www.orlandosentinel.com/ [2006, March 23].]

March 24: Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: Launch Planning Window July 1-19, 2006 ; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue to process Discovery and close out completed areas for its launch to the International Space Station. The seven-member STS-121 crew was at Kennedy on Monday for the station crew equipment interface test. This standard test provides the crew with hands-on experiences with equipment that will be used on orbit. Final closeouts of the space shuttle main engines continue with thermal protection system foaming operations around the engines. Technicians removed and replaced windows No. 3 and 5. Work continues in the payload bay in preparation for reinstallation of the remote manipulator system, or shuttle arm. The repaired arm is scheduled to return to Kennedy from the vendor in Canada in early April. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006; Launch Pad: 39B; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue to perform powered-up system testing on Atlantis for its mission to the International Space Station. The final space shuttle main engine is scheduled to be installed in early April, and then final main propulsion leak checks will be performed. Global positioning system functional checks are scheduled to resume today. Removal and replacement of the water coolant loop No. 2 pump package was completed Wednesday. Following the installation of the pump package, the system was retested, and leak checks were completed. Endeavour (OV-105); Work continues on Endeavour in Orbiter Processing Facility Bay 2, ; following an extensive modification period. Technicians continued implementing the new return-to-flight modifications that have been added to the other two vehicles. Upgrades include the orbiter boom sensor system, sensors in the wing leading edges, and the new digital camera to view the external tank. Fuel cell No. 2 installation is scheduled to begin as early as March 29. Endeavour's external airlock arrived at Kennedy Space Center on Tuesday and is set to be installed into the payload bay in early April. External Tank; The external tank that will fly with Discovery on the STS-121 mission is in the Vehicle Assembly Building checkout cell where work is scheduled to begin on Monday. Technicians will remove and replace the external tank's four liquid hydrogen engine cutoff sensors, which indicate whether the tank still has fuel during its climb to orbit. The replacement will be performed by the technicians from NASA's Michoud Assembly Facility who are most

familiar with this particular work. This work will take approximately 22 days to complete. On Monday, the technicians will begin removing the foam on the bottom of the tank and then remove a cover, called the "manhole." This will provide access to the area to begin the removal and replacement of the sensors. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-010** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, March 24].]

March 25: Investigators: Launch put public at risk

Everything appeared normal June 5, 2002, as shuttle Endeavour thundered to orbit from Kennedy Space Center through hazy afternoon skies. Unknown to the public, however, the Air Force's top two safety officials at Cape Canaveral had tried to stop the countdown. Air Force technicians could not verify that a critical backup system used to destroy errant rockets was working properly. In an apparently unprecedented move, the safety officers were overruled after a phone conversation between Brig. Gen. Donald Pettit, commander of the Air Force's 45th Space Wing, and KSC Director Roy Bridges. Endeavour launched minutes later in violation of flight rules designed to protect the public. Those and other findings are detailed in a 2005 internal briefing on the incident written by investigators with NASA's Office of the Inspector General. Despite those findings, NASA Inspector General Robert "Moose" Cobb derailed the inquiry and declared the issue an Air Force matter last year, according to investigators familiar with the case. Sources in Cobb's office said they were forbidden from interviewing Bridges and Pettit or requesting crucial information from the Air Force. Cobb, a White House political appointee, is under investigation by an administration integrity committee after being accused of repeatedly quashing cases and retaliating against those who resisted. All manned and unmanned rocket launches from KSC and Cape Canaveral are supported by the Air Force's Eastern Range. The range is a network of tracking and communications stations that extend more than 5,000 miles from Cape Canaveral to Ascension Island in the South Atlantic. The network is managed in the Range Operations Control Center, or ROCC, at Cape Canaveral Air Force Station. One of the main reasons the range exists is to ensure public safety. All rockets launched from Cape Canaveral are equipped with explosive devices to destroy them if they veer off course. Both of the shuttle's pencil-shaped booster rockets have such devices, which range-safety officers can detonate by remote control. During the 1986 Challenger disaster, a safety officer used the system to destroy the shuttle's still-intact boosters as they arced uncontrollably away from the massive explosion. As with other critical functions, the so-called command-destruct system has a backup communication link in case the primary link fails. Launch rules mandate that both links must be working properly before a mission lifts off. On June 5, 2002, Endeavour was poised to begin a 14-day flight to the international space station. Bad weather and a faulty valve in one of Endeavour's rocket pods had delayed the launch for almost a week. Weather conditions were expected to worsen the next day. As countdown clocks ticked toward a 5:23 p.m. liftoff, the backup command-destruct link went down about 2:30?|p.m. Components were changed out, but still the link wouldn't work. After more troubleshooting, the system faded in and out before being reported back online about 3 p.m. However, the link went down again less than an hour later. According to the document drafted by investigators, Pettit and Bridges discussed the problem at some point late in the countdown in a "totally non-standard procedure" that

occurred off of the regular communications network used by range personnel. The investigators concluded it would be "unacceptable" for the KSC director, who has no role in the final countdown, and the range commander to privately develop a rationale for waiving a safety requirement. There was a "distinct probability" that occurred, investigators determined, although there was no definitive proof. "Because we weren't allowed to interview the two key people, Bridges and Pettit, we don't know exactly what was said," a former NASA investigator familiar with the case pointed out. "But everyone in the room knew Pettit was off the net[work] and on the phone with Bridges." Bridges, who retired from NASA last year, said Friday he did not remember the incident but that he typically spoke to range officials only to get updates on problems. By an hour before launch, Pettit had decided to waive the requirement for two command-destruct links, investigators found. The ROCC, from which Pettit worked, is several miles from KSC's Launch Control Center. Although there are communications between the two, NASA's shuttle-launch team relies solely on the Air Force for the decision on whether the range is "red" or "green." Two range officials -- the mission flight-control officer and the chief of safety -- are responsible for determining whether the command-destruct system is working and the public is protected. During the final poll before liftoff, both responded "no go" because of the system's problems. Pettit overruled them, however, and declared the range green "with little if any discussion," according to the briefing document drafted by investigators. Shuttle managers launched Endeavour without ever knowing of the safety officers' actions. "The commander has the authority to do that," a NASA investigator said. "But the review couldn't find another case where this had happened." Just before Endeavour's liftoff, internal system testing appeared to indicate the backup link was working. However, investigators found that the "functionality of the 2nd string was never verified" and an "external test [was] never conducted to verify communications with [the launch] vehicle." The incident might have escaped scrutiny if not for the efforts of Wally Toolan, a former range-safety officer at Cape Canaveral. Toolan wrote a letter to the Air Force Inspector General's Office on June 30, 2002, that accused Pettit of violating launch rules. Three months later, the Air Force Inspector General's Office responded to Toolan after completing its investigation. The inquiry found that "available evidence did not indicate any wrongdoing or misconduct on the part of the wing commander" and that there was insufficient information to investigate further. Toolan persisted with more letters. The Air Force refused to reopen the case, but in August 2003 it referred his complaint to the NASA Inspector General's Office. NASA reviewers found no evidence of criminal behavior, so they forwarded the information to the division that audits safety issues. NASA investigators finally were assigned to the case in November 2004 -- almost 2 1/2 years after the launch. Their preliminary findings were very different from the Air Force's. Several crucial issues were raised. The biggest was whether the shuttle program should rely solely on the Air Force to determine whether the range is safe for launch. Investigators recommended that NASA independently verify the range's status. KSC's safety office was unaware of the range problem during the countdown. NASA shuttle managers said they would not have proceeded without further discussion had they known the range's safety officers were "no go." Before Endeavour's 2002 launch, the shuttle program stationed a representative in the ROCC who had limited access to flight controllers' conversations over internal Air Force channels. For Discovery's launch last July, KSC's safety office sent someone to the ROCC to monitor

communications. However, that person has no direct link to KSC's Launch Control Center during the countdown, a former investigator said. Web posted. (2006). [Investigators: Launch put public at risk [Online]. Available WWW: http://www.orlandosentinel.com/ [2006, March 25].]

March 26: Unions pledge to finance space jobs

Labor union leaders say using up to $250 million of their members' pension funds is a risk they're willing to take to save local jobs in the space industry. Unions with thousands of workers at Kennedy Space Center are pledging the pension money in the hope of getting the state to provide matching funds for the proposed $500 million Aerospace Workforce Challenge Fund. Officials said the money would be used to invest in aerospace industry expansion and development opportunities, and construction and upgrades of space-related facilities. They hope to create jobs as NASA phases out the shuttle program and begins work on a future spacecraft and launch program. "There's always a risk," said Jeff Rainey, a local business representative for the International Association of Machinists and Aerospace Workers, which has more than 2,500 workers on the Space Center. Union officials said the uncertainties seem better than the alternative: possibly losing an estimated 3,000 to 7,000 space-related jobs on the Space Coast as NASA phases out the shuttle. The shuttle replacement vehicle is expected to require fewer workers. Web posted. (2006). [Unions pledge to finance space jobs [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 26].]

March 27: Panel to deliver report on KSC death in one month.

In one month a NASA investigation board is expected to deliver its report on the death of construction worker Steven Owens, who fell 16 feet while performing roof repairs at Kennedy Space Center on March 17. Owens was airlifted to a hospital in Orlando and died later that day. The five-member investigation board is chaired by veteran astronaut John Casper, manager of the Space Shuttle Management Integration and Planning Office at Johnson Space Center in Houston. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Panel to deliver report on KSC death in one month." [Electronic]. Vol. 217. No. 57. [March 27, 2006.].]

NASA attempts fuel tank repair

Kennedy Space Center technicians will take on a lengthy and unusual job today, one aimed at getting inside a shuttle external tank to swap out suspect fuel sensors. "It's not a trivial process," said John Chapman, manager of NASA's external tank project at Marshall Space Flight Center in Alabama. "There are certain risks involved," NASA shuttle program manager Wayne Hale added. "You could damage the tank." Delivered to KSC earlier this month, the 154-foot-tall tank is hanging vertically inside the 52-story Vehicle Assembly Building. A March 14 decision to replace four fuel-depletion sensors in the bottom of the tank prompted NASA to delay the planned launch of its second post-Columbia shuttle mission from May to July. The sensors serve the same purpose as automobile fuel gauges and also provide a backup means of making sure the shuttle's three liquid-fueled main engines shut down properly in flight. A malfunction could prompt a premature shutdown, which could lead to a risky and unprecedented emergency-landing attempt. A failure also could allow the engines to run dry, causing

powerful turbopumps to seize up, break apart and possibly prompt a catastrophe. Technicians have built scaffolding that will provide a work platform beneath the dome-shaped bottom of the tank. A makeshift clean room also was put in place to make certain no dirt or other contaminants get inside the tank. The replacement work will begin today as technicians start to remove foam insulation from a 3-foot-wide manhole cover bolted on the bottom of the tank. Later this week, the cover will be taken off and a technician will climb inside. The four sensors are on a bracket attached to an internal shock mount that crisscrosses the bottom of the tank. The technician will remove the bracket, replace it and then exit the tank. After the manhole cover is bolted back in place, the tank will be hoisted out of the checkout cell and onto a horizontal transporter in the center aisle of the assembly building. The move will enable technicians to reapply foam insulation on the bottom of the tank, a lengthy process that involves spraying several layers of liquid foam and allowing each to harden. All in all, the sensor swap is expected to take about 22 days. "It takes time," Chapman said. "But it's a straight-forward process." The change-out work will be followed by the mating of the tank to a pair of 149-foot-tall solid rocket boosters that already are stacked on a mobile launcher platform in the assembly building. The orbiter Discovery will be connected to the tank late next month. NASA hopes to launch the shuttle about July 1. Web posted. (2006). [NASA attempts fuel tank repair [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 27].]

March 27: NASA Reinstates the Dawn Mission

NASA senior management announced a decision Monday to reinstate the Dawn mission, a robotic exploration of two major asteroids. Dawn had been canceled because of technical problems and cost overruns. The mission, named because it was designed to study objects dating from the dawn of the solar system, would travel to Vesta and Ceres, two of the largest asteroids orbiting the sun between Mars and Jupiter. Dawn will use an electric ion propulsion system and orbit multiple objects. The mission originally was approved in December 2001 and was set for launch in June 2006. Technical problems and other difficulties delayed the projected launch date to July 2007 and pushed the cost from its original estimate of $373 million to $446 million. The decision to cancel Dawn was made March 2, 2006, after about $257 million already had been spent. An additional expenditure of about $14 million would have been required to terminate the project.The reinstatement resulted from a review process that is part of new management procedures established by NASA Administrator Michael Griffin. The process is intended to help ensure open debate and thorough evaluation of major decisions regarding space exploration and agency operations. "We revisited a number of technical and financial challenges and the work being done to address them," said NASA Associate Administrator ex Geveden, who chaired the review panel. "Our review determined the project team has made substantive progress on many of this mission's technical issues, and, in the end, we have confidence the mission will succeed." ["NASA Reinstates the Dawn Mission," **NASA News Release #06-108**, March 27, 2006.]

NASA Extends Cew Exploration Vehicle Contracts

NASA has authorized contract extensions for development of the agency's new Crew Exploration Vehicle. The companies, Lockheed Martin Corp., and a team of Northrop Grumman systems Corp., and The Boeing Co., were selected as CEV Phase 1 contractors

in June 2005. They have been working with NASA to define requirements and develop conceptual designs for the agency's next-generation vehicle for human space flight. The estimated maximum total value for each Phase 1 contract, including the extension to Aug. 31 and the optional extension periods, is approximately $60 million for each contractor. The approximate value of the basic extension period from March 31 to Aug. 31 is $17.5 million for each contractor; the approximate value of each two-month option is $7 million. One of the Phase 1 contractors will be selected as the Phase 2 prime contractor to design, develop, test, evaluate and produce the CEV. Although the new contract authorizations include options that could extend the Phase 1 work until December, NASA expects to select the Phase 2 prime contractor by August. The new contract extends Phase 1 work from March 31 until Aug. 31 and adds options for a pair of two-month extensions for each contractor. The first two-month option would extend Phase 1 work to Oct. 31, 2006. The second two-month option would extend Phase 1 work to Dec. 31. 2006. The new spacecraft is expected to carry up to six astronauts into Earth orbit soon after the space shuttle is retired in 2010 and then on to the moon by 2018. The Crew Exploration Vehicle is a key element of the Vision for Space Exploration, which returns human explorers to the moon, Mars, and beyond. [NASA Extends Cew Exploration Vehicle Contracts," **NASA News Release $C06-107**, March 27, 2006.]

Facilities modernised ahead of Crew Exploration Vehicle

The first of five architecture and engineering contracts to modernise NASA Kennedy Space Center (KSC) facilities for the Crew Exploration Vehicle (CEV) has been awarded to US infrastructure company Reynolds, Smith and Hills (RS&H). An unmanned test flight of the CEV's Crew Launch Vehicle (CLV) could take place in 2009, but KSC's infrastructure is incompatible. The first contract is for work on non-conventional buildings such as launch pads, test stands, mobile platforms and support facilities needed at KSC to support NASA's space exploration plans. Changes will have be made to the vehicle assembly building and crawler, which have serviced both Saturn rockets and the Space Shuttle. Rumours suggest that launch pad 40 will be upgraded for the CLV, and the first step for the centre's redevelopment is to remove the Shuttle and Spacelab materials from the operations and checkout building. "The magnitude of work expected to be involved with each of the five contracts is between $1 million and $10 million a year," says KSC, which awarded the first contract on 15 March. Under its contract, RS&H will test and analyse existing and planned structural and support systems and report on recommended actions and designs. The four other areas in which NASA will place contracts are specialised fluid systems, conventional structures, civil and mechanical work, and electrical and plumbing systems. Web posted. (2006). [NASA Kennedy Space Center facilities modernised ahead of Crew Exploration Vehicle flights [Online]. Available WWW: http://www.flightglobal.com/ [2006, March 28].]

March 29: Crews do slight damage to shuttle fuel tank foam

Workers on Tuesday dinged foam on an external fuel tank scheduled to fly with the shuttle in July. They were preparing to replace a gaseous oxygen vent valve near the nose and were repositioning a halogen lamp when it hit the tank, causing "extremely minor" damage to the insulating foam, NASA spokeswoman Jessica Rye said. Work continues on the bottom of the tank, in Kennedy Space Center's Vehicle Assembly

Building, as technicians replace problematic engine cutoff sensors. The workers are from the Lockheed Martin-run Michoud Assembly Facility in New Orleans, which makes the external tanks. Web posted. (2006). [Crews do slight damage to shuttle fuel tank foam [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 29].]

Space Shuttle Commanders inducted to Hall of Fame

Space history will be made on May 6, 2006, as three of America's finest Space Shuttle commanders are honored and inducted into the U.S. Astronaut Hall of Fame. The commander of the first joint U.S. and Russian Space Shuttle mission, the commander of Space Shuttle Discovery's maiden voyage and the commander of the mission that paved the way for construction of the International Space Station will increase the number of space explorers enshrined in the Astronaut Hall of Fame to 63. Charles Bolden, Henry Hartsfield and Brewster Shaw will join such American space heroes as Neil Armstrong, John Glenn, Alan Shepard, Jim Lovell, Sally Ride and John Young when they are enshrined during a May 6, 2006 public ceremony at Kennedy Space Center Visitor Complex. The inductees were selected by a committee of current Hall of Fame astronauts, former NASA officials and flight directors, historians, journalists and other space authorities in a process administered by the Astronaut Scholarship Foundation. This is the fifth group of Space Shuttle astronauts named. Earlier inductees came from the Mercury, Gemini, Apollo, Skylab and Apollo-Soyuz programs. Web posted. (2006). [Online]. Available WWW: http://hospitality-1st.com/PressNews/DNC-KSC-032906.html [2006, March 29].]

NASA probes damage to fuel tank

NASA is investigating another mishap at the Kennedy Space Center, this time an accident involving the remodeled fuel tank to be used for the next shuttle mission, the agency said on Wednesday. Technicians were replacing a vent valve near the top of the 154-foot (47-meter) tall tank on Tuesday when a Halogen work lamp fell and hit the tank's foam insulation. Preliminary inspections show the impact left five small indentations, with the largest about the size of a stick of gum, and one 6-inch (15-centimeter) to 7-inch (17-centimeter) long scratch, said Marion LaNasa, spokesman for tank manufacturer Lockheed Martin Corp. A detailed inspection of the area was under way, LaNasa said, but the incident was not expected to affect the shuttle's targeted July 1 liftoff. The affected area is not among the sections of tank foam insulation that were redesigned after the 2003 Columbia disaster and again after the July 2005 flight of Discovery, the only launch since the accident. A piece of foam insulation that fell off the tank and hit Columbia's wing during liftoff was responsible for heat shield damage that led to the ship's destruction and the loss of seven crewmembers during atmospheric re-entry on February 1, 2003. A similar problem occurred during Discovery's liftoff 2 1/2 years later, though the shuttle escaped damage. NASA is preparing Discovery for launch again, but it first must prove that the new tank design is safe to fly. A series of wind tunnel tests and analyses are under way. Safety has been a top priority for NASA, particularly at the shuttle processing center in Florida, where a series of mishaps have resulted in a death, equipment damage and several near-disasters over the past month. Web posted. (2006). [NASA probes damage to fuel tank [Online]. Available WWW: http://www.cnn.com/ [2006, March 30].]

March 29: NASA & HDNet Announce HDTV Broadcast Partnership

NASA and HDNet have joined together to provide high definition TV coverage of space shuttle launches through 2010. The agreement ensures the remaining shuttle liftoffs and landings at NASA's Kennedy Space Center in Florida will be broadcast in the highest quality television format available. NASA Administrator Michael Griffin and HDNet Chairman and President Mark Cuban are scheduled to discuss formal details of the agreement during a news conference Thursday, April 6, from 5:45 to 6:15 p.m. EDT at the Broadmoor Hotel in Colorado Springs, Colo. "We appreciate the financial investment and technical expertise HDNet has brought to the table to help us reach audiences interested in this next generation of television," Griffin said. HDNet will broadcast the flights in high definition TV, known as HDTV, which has at least twice the resolution of standard television formats. HDNet also will provide the agency a standard broadcast signal of launches for use by media networks and NASA TV. When possible, it will air HDTV coverage of NASA's expendable rocket launches on its network. "This is an exciting deal for HDNet," Cuban said. "Every shuttle launch is a unique and historic American experience. For the next four years, the place to watch this full live broadcast experience in high-definition will be on HDNet. We are proud that NASA has partnered with HDNet for this important role." This news conference is hosted by the Space Foundation during its 22nd National Space Symposium, which runs April 3 through April 6. ["NASA & HDNet Announce High Definition TV Broadcast Partnership, **NASA News Release #06-129,** March 29, 2006.]

March 30: United Launch Alliance nears approval

The federal government is expected to give its final approval to a joint venture that mergers the noncommercial launch operations of Boeing and Lockheed Martin, the Wall Street Journal reported Thursday. According to the report, the Defense Department and the Federal Trade Commission are completing work on an agreement that would permit the formation of the United Launch Alliance (ULA), and sources told the paper that the agreement should be completed in the next few weeks. The approval of the ULA will include provisions to allay any antitrust concerns from satellite manufacturers, notably Northrop Grumman; the agreement will also include provisions regarding future costs and how to treat new entrants into the market. Boeing and Lockheed announced the ULA nearly a year ago, and had expected to receive government approval by the end of 2005, but extended reviews by the Pentagon in particular delayed the joint venture. The agreement between the two companies allows either one to pull out of the deal if the ULA isn't in place by the end of March, but both companies have expressed their commitment to the joint venture in recent weeks. Web posted. (2006). [United Launch Alliance nears approval [Online]. Available WWW: http://www.spacetoday.net/ [2006, March 30].]

NASA revamps policy on talking to the press

NASA released a new policy Thursday to clarify the role of its public-affairs people in the wake of scientists' complaints of being intimidated for talking with the press. Administrator Mike Griffin said the policy was more clear, though it still encourages agency representatives to sit in on interviews. Even though public affairs officers aren't

required to be present at interviews, Griffin said he recommended that one be there to act as an intermediary and record the interview. "I myself do not like to do interviews without a professional present, because this is not my profession," Griffin said. While NASA employees may speak to the press, the policy encourages them to coordinate such conversations with bosses and public affairs. NASA received unwanted attention when one of its climate scientists said a public-affairs officer had stopped him from giving interviews on global warming. That spokesman, a political appointee, resigned. Spokesman Dean Acosta said Thursday there are five political appointees among 300 public affairs employees agency wide. Web posted. (2006). [NASA revamps policy on talking to the press [Online]. Available WWW: http://www.floridatoday.com/ [2006, March 31].]

March 31: Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: Launch Planning Window July 1-19, 2006 ; Launch Pad:39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Final powered-up systems testing and area closeouts continue in preparation for Discovery's move to the Vehicle Assembly Building no earlier than May 12. Final closeouts on the shuttle's main engines continue with thermal protection system foaming operations around them. Engine configuration for rollover was performed Thursday, which was followed by platform removal and final inspections. Work continues on the thermal protection system and thermal barriers for the nose landing gear. The landing gear functional test is set for next week. The lower section of the remote manipulator system, or shuttle arm, returned to Kennedy today following repairs by the vendor in Canada. Shuttle technicians inadvertently damaged the arm slightly March 4. The arm will be retested prior to reinstallation. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ;Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006; Launch Pad: 39B; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ;Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue performing powered-up system testing on Atlantis for its mission to the International Space Station. Water coolant loop servicing continues following the removal and replacement of the water coolant loop No. 2 pump package. Preparations began today for the orbiter boom sensor system's installation into Atlantis' payload bay on Monday. The 50-foot-long boom attaches to the shuttle arm and is one of the new safety measures added prior to Return to Flight last year. It equips the orbiter with cameras and laser systems to inspect the shuttle's heat shield while in space. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Work continues in preparation for the external airlock's installation into the payload bay, which is set for next week. On April 3, technicians will begin operations to install the reinforced carbon-carbon nose cap. Rigging operations continue on the manipulator positioning mechanisms, which support the remote manipulator system and orbiter boom sensor system. The mechanisms serve as pedestals that hold the shuttle arm and boom in the payload bay. ; External Tank; Work is under way in the Vehicle Assembly Building checkout cell on the external tank

that will fly on mission STS-121. Technicians are removing and replacing the tank's four liquid hydrogen engine cutoff sensors, which indicate whether the tank still has fuel during its climb to orbit. On Monday, technicians began removing thermal protection system foam around the bottom of the tank in an area known as the "manhole." The manhole was removed Tuesday to allow technicians to gain access into the tank, and on Thursday the sensors and mounting bracket were removed. The sensors were shipped back to the Michoud Assembly Facility in New Orleans for inspection. Work is also under way to install a new gaseous oxygen vent valve under the nose cap of the tank. While technicians were beginning to work around the nose cap area this week, a light stand that was being repositioned fell, contacting the tank. The lamp struck the composite nosecone and adjacent foam insulation, causing minor damage. Any repairs will be performed in the Vehicle Assembly Building checkout cell. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-011** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, March 31, 2006].]

APRIL 2006

April 3: Panel investigates new KSC accident

NASA launched an investigation Monday into yet another shuttle workplace accident: serious damage to a nearly half-million-dollar power controller that routes electricity to critical orbiter systems. The incident, which occurred last week at a shuttle spare parts depot in Cape Canaveral, followed a recent rash of accidents that have resulted in damage to shuttle orbiters and the death of a construction worker. Two other investigation boards have met to determine the cause of two of those incidents in hopes of preventing similar mishaps in the future. The estimated cost of replacing the power controller damaged last week would be $452,710, according to a Kennedy Space Center mishap report. Investigators are not yet certain whether replacement will be required. The initial mishap report said the damage occurred March 27 during an engineering evaluation of the power controller. A power-input connector had been installed backwards. That caused the flow of electricity to be reversed, damaging the controller during testing. The controller is one of three used to route electricity from a shuttle's power-generating fuel cells to orbiter systems. The devices are considered critical during launch, flight, atmospheric re-entry and landing. Web posted. (2006). Panel investigates new KSC accident [Online]. Available WWW: http://www.floridatoday.com/ [2006, April 4].]

April 4: 280 tourists could fly annually from shuttle runway

Zero Gravity Corp's weightless flights from Kennedy Space Center will become a regular thing, with up to 280 tourist flights a year from the shuttle landing strip. The company and NASA have already tested the concept at the runway, and they announced the new agreement Tuesday. The first flight for the public is slated for June 24. Using roller-coaster moves, the flights let tourists experience spurts of low and zero gravity similar to what astronauts feel in orbit. The advertised price is $3,750. NASA has actively encouraged proposals for alternative uses for the landing facility. Earlier this year, adventurer Steve Fossett staged a record-smashing airplane flight from the runway. Fossett piloted the GlobalFlyer aircraft around the world once and then across the Atlantic a second time on what is now the longest flight without refueling. Under the private-use deals, companies reimburse NASA for the use of the space center runway and any support services. Web posted. (2006). 280 tourists could fly annually from shuttle runway [Online]. Available WWW: http://www.floridatoday.com/ [2006, April 5].]

April 5: NASA Expendable Launch Vehicle Status Report

Mission: Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation and CloudSat (CALIPSO/CloudSat) ; Launch Site: NASA's Space Launch Complex 2, Vandenberg Air Force Base, Calif.; Launch Vehicle: Boeing Delta II; Launch Date: April 21, 2006; Launch Time: 6:02:08 a.m. EDT. NASA successfully completed a flight simulation of the Delta II rocket on April 4 at Space Launch Complex 2 at Vandenberg Air Force Base, Calif. Technicians are preparing both CALIPSO and CloudSat for the April 7 installation into the environmentally controlled payload transportation canister. Transportation from the payload processing facility to the launch complex is scheduled for the pre-dawn hours of April 8. Upon arrival, the payload will be hoisted and mated to the Delta II. The Flight Program Verification, an integrated electrical and mechanical

flight test involving the Delta II and the CALIPSO/CloudSat payload, is planned for April 11. Installation of the launch vehicle ordnance will follow on April 13. CALIPSO/CloudSat payload closeouts are scheduled for April 13 and will be followed by installation of the fairing around the spacecraft on April 14-15. Previous status reports are available on the Web at: KSC News Center (2006). **Expendable Launch Vehicles Status Report #E06-011** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, April 5].]

April 6: NASA vexed by worker accidents

Over the past three months, workers at the Kennedy Space Center have tripped, dropped things, banged into sensitive equipment and started fires in a deadly string of accidents that has NASA perplexed. The space agency has launched investigations into three accidents -- the death of a worker who fell off a roof, the bumping of space shuttle Discovery's robotic arm by a platform, and damage last week to an instrument that supplies power to the orbiters. But since the beginning of the year, there has been 20 other incidents in which a worker was injured or equipment was damaged in excess of $25,000. There were only 14 incidents during the same time period last year. Senior managers and contractors have been urged to get out in the field to talk to workers about any problems and emphasize safety and discipline. Web posted. (2006). NASA vexed by worker accidents [Online]. Available WWW: http://www.cnn.com/ [2006, April 6].]

First shuttle crew to appear at KSC

The two men who flew the first shuttle told workers tales of their flight at Kennedy Space Center on Thursday, and today they'll appear at the KSC Visitor Complex. The activities mark the 25th anniversary of STS-1, Columbia's maiden flight, on April 12, 1981. "That was the kickoff of what has been a fantastic history for the shuttle," STS-1 pilot Bob Crippen said Thursday. The men were by turns brash, somber and funny as they talked about the mission and its repercussions. Then-Commander John Young made jokes about breathing toxic gases and other narrow escapes. "I think maybe the surprise was it worked so well as it did," Young said. Another surprise came five years ago when he learned hot gases had come in where there was a loose gap filler between heat-shield tiles and buckled the ship's right main landing gear door. KSC Director Jim Kennedy announced that a firing room in the launch control center had been named for the men. Web posted. (2006). First shuttle crew to appear at KSC [Online]. Available WWW: http://www.floridatoday.com/ [2006, April 7].]

NASA KSC Names Firing Room For First Shuttle Crew

In tribute to the 25th anniversary of the first space shuttle flight, NASA's Kennedy Space Center today is honoring the crew of mission STS-1, Commander John Young and Pilot Robert Crippen, by dedicating the firing room that launched the historic flight as the "Young-Crippen Firing Room." The first shuttle mission launched the two astronaut test pilots on April 12, 1981, aboard Space Shuttle Columbia from firing room 1 at Kennedy. The crew landed two days later at Edwards Air Force Base in California, ending the boldest test flight in history. Center Director Jim Kennedy said, "It is our pleasure on behalf of all your friends at the Kennedy Space Center to honor you with a plaque commemorating your historic flight and your successes with NASA. "Young and

Crippen are visiting Kennedy today and Friday to celebrate the anniversary, as well as address employees and answer questions. Deputy Center Director Bill Parsons surprised the men with the honor following the crew's presentation to employees. A plaque featuring the STS-1 mission patch was placed outside the firing room. Signed by NASA Administrator Michael Griffin and Kennedy, the plaque bears the inscription: "On the 25th anniversary of STS-1, April 12, 1981, the first orbital test flight of NASA's Space Shuttle Program, we proudly name firing room 1 the Young-Crippen Firing Room in tribute to John W. Young, commander, and Robert L. Crippen, pilot." ["NASA Kennedy Space Center Names Firing Room For First Shuttle Crew," **NASA News Release #26-06**, April 6, 2006.]

Exploration Park To Host Space Technology and Commerce

NASA's Kennedy Space Center announced Thursday its plan to seek private-sector partners to develop a space technology and commerce park to be named "Exploration Park at John F. Kennedy Space Center." The park is expected to attract tenants engaged in space technology, space commerce, space education and otherwise involved in promoting and implementing the Vision for Space Exploration. Exploration Park will be located along Space Commerce Way, behind the KSC Visitor Complex. "Exploration Park will be a site where the private sector brings both traditional and non-traditional work to Kennedy Space Center in support of both our NASA programs and commercial space initiatives that find value in locating their operations here," said KSC Director Jim Kennedy. KSC expects to formally solicit development proposals soon. "This concept offers a front door at Kennedy Space Center for organizations that expect to be involved in NASA's exploration activities, or for commercial ventures that seek to support the vision and develop low earth orbit," said Spaceport Development Manager Jim Ball. "It's also an ideal site for support services and other uses that require close proximity to KSC facilities and personnel." ["Exploration Park To Host Space Technology and Commerce," **NASA News Release #06-180**, April 6, 2006.]

April 7: **Space Shuttle Processing Status Report**

Mission: STS-121 - 18th ISS Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: Launch Planning Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Final area closeouts continue in preparation for Discovery's move to the Vehicle Assembly Building and then to the launch pad for its mission to the International Space Station. Technicians plan to power up Discovery on Saturday to support the aft area structural leak test and orbiter compartment positive pressure test. Final cleaning operations of the environmental control and life support system bay continue in preparation for closeout prior to flight. Work continues on the nose and main landing gear prior to the final functional test. Mission: STS-115 - 19th ISS Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006; Launch Pad: 39B; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue performing powered-up system testing on Atlantis for its mission to the International Space Station. Water coolant loop

servicing is complete following the replacement of the water coolant loop No. 2 pump package. Technicians also successfully performed compression testing on the water coolant pump. The orbiter boom sensor system was installed in the payload bay of Atlantis on Monday. The 50-foot-long boom attaches to the remote manipulator system, or shuttle arm, and is one of the new safety measures added prior to the Return to Flight. It equips the orbiter with cameras and laser systems to inspect the space shuttle's heat shield while in space. Endeavour (OV-105) ; Powered-up system testing continues on Endeavour in Orbiter Processing Facility Bay 2 following an extensive modification period. On Wednesday, technicians installed Endeavour's reinforced carbon-carbon nose cap. Endeavour's external airlock was installed in the payload bay on Thursday. The airlock is located in the shuttle's middeck and permits flight crew members to transfer from the middeck crew compartment into the payload bay for extravehicular activities in their space suits without depressurizing the orbiter crew cabin. External Tank; Work is under way in the Vehicle Assembly Building checkout cell on the external tank that will fly with Discovery on mission STS-121. Last weekend, technicians removed and replaced the tank's four liquid hydrogen engine cutoff sensors, which indicate whether the tank still has fuel during its climb to orbit. They also installed a new gaseous oxygen vent valve under the nose cap of the tank. With the change out of the sensors complete, the access cover on the bottom of the tank called the "manhole" was reinstalled. On April 11, the tank will be lifted from the checkout cell and placed horizontally on the transporter in the transfer aisle. Once in the transfer aisle, technicians will reapply the thermal protection system foam that had to be removed in order to perform the sensor change out. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-012** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, April 7].]

April 8: Shuttle era began 25 years ago

No one really expected the first space shuttle to fly on April 12, 25 years ago. It was only the second countdown for Columbia. A computer glitch scrubbed the first attempt two days earlier. After struggling through the ship's creation, workers and astronauts alike were sure several more counts were in the works. Then it got down to the last minute. Pilot Bob Crippen and Commander John Young were the only two people aboard, taking the highly unusual risk of riding a vehicle that had never taken an unmanned test flight. Crippen turned to Young. "I think we might do it!" When the engines and solid rocket boosters lit, Gene Beckett could see the shock wave rolling across the grass toward where he stood outside the Vehicle Assembly Building at Kennedy Space Center. "It physically moves your skin, your clothes and everything else, when you get that initial thunder when those SRBs light," said Beckett, now director of United Space Alliance's Florida Program Office. In the launch control center, chief shuttle project engineer Bob Sieck and his colleagues hugged one another, shook hands and waved flags. "The marathon that it took to get us to that point . . . it was just lost in the euphoria that overcame us," said Sieck, who lives in Viera. "We actually pulled it off, and it worked." Crippen became an astronaut in 1969. He saw the end of the Apollo moon program in 1972 and thought he would fly a lot sooner than 1981. Ignition of the solid rocket boosters had prompted a pressure wave -- later mitigated by changes to the water sound suppression system -- that caused Columbia to lose heat-shield tiles. Nonetheless, the orbiter, which had launched

on the 20th anniversary of Yuri Gagarin's historic flight, landed with aplomb at Edwards Air Force Base in California on April 14. The people at KSC were exhilarated, but there was no way they would launch 24 times a year, as the hype would have it. NASA hopes the three-ship fleet will finish building the International Space Station by the time they retire in 2010. Web posted. (2006). Shuttle era began 25 years ago [Online]. Available WWW: http://www.floridatoday.com/ [2006, April 8].]

April 9: NASA Marks 25 Years, Preps for Sea Change

As NASA celebrates the 25th anniversary of its first shuttle flight this week, the agency also steels itself for the biggest upheaval since the moon shot days of Apollo in the early 1970s. In just four years the three aging, behemoth space shuttles will be shelved _ likely headed to museums. And by 2014, a brand new spacecraft will be flying _ one designed to get astronauts to the moon by 2018 and eventually Mars. This wrenching transition will be only the fourth such makeover for the manned space program in the agency's nearly 50-year history. Critics already are grumbling about the lack of money to accomplish the shift to the new crew exploration vehicle. More than a fifth of NASA's proposed $16.8 billion budget for next year will be spent on developing the new vehicle system. NASA Administrator Michael Griffin has acknowledged the agency will have to transform itself in order to carry out goals first articulated by President Bush two years ago. The transition will change everything from how astronauts are trained, which NASA operations stay open, which private companies get multibillion-dollar contracts and the size of NASA's work force. The crew exploration vehicle will be shaped like an Apollo-era capsule and hold six astronauts for trips to the space station and four for journeys to the moon. Under the proposed design, astronauts in the new space vehicle will be launched on one rocket, and the lunar lander and moon-propelling rocket parts will be launched on another, much bigger rocket. Once in orbit, the capsule carrying the crew will dock with the lander and rocket and head for the moon. The crew capsule will return to Earth by parachutes and can be used up to 10 times. Two competing contractors, Lockheed Martin and a team of Northrop Grumman and Boeing, each have received $60 million contracts to develop conceptual designs for the crew exploration vehicle. NASA will choose a winning bidder to build the spacecraft by August. A board of high-ranking NASA officials has begun deciding which of the millions of shuttle parts will be scrapped and which will be kept or retooled. Some parts, like the shuttles' solid rocket boosters, will be used in the new vehicles. The board also will decide which facilities, like the launch pads at the Kennedy Space Center, should be shuttered or refurbished _ and when. There are still 16 to 17 shuttle flights needed to complete the space station, and there is still a possible mission to repair the Hubble Space Telescope. Fearing a loss of skilled workers, Griffin has said he doesn't want a big gap like the one that occurred between Apollo and the shuttle in the 1970s. But space agency officials have a tough balancing act between keeping shuttle workers in place until the vehicles are retired and recognizing many workers will either have to be retrained or let go in four years. The new vehicles will require less servicing than the shuttles. Almost 2,000 NASA civil servants and more than 15,000 contractor employees work on the shuttles, mainly for United Space Alliance. Web posted. (2006). NASA Marks 25 Years, Preps for Sea Change [Online]. Available WWW: http://www.washingtonpost.com/ [2006, April 9].]

April 10: **NASA lab has a new mission**

Open a little more than two years, the gleaming new Space Life Sciences Lab at Kennedy Space Center is getting out of the plant seedling and cell culture business. The five-story, glass-front structure paid for by Florida taxpayers and NASA was intended to be a state-of-the-art home for scientists working on plant, animal and other experiments bound for the International Space Station. But NASA's directive to return astronauts to the moon means dozens of contract and university researchers have been reassigned. Now, space agency managers will use the building's offices and labs for chemists, physicists, engineers and others working on the exploration initiative called for by President Bush and endorsed by Congress. Just last year, the lab building bustled as about 150 scientists and others went about their research, some preparing payloads for transfer to the space station. Today, there are "significantly less" than 100 professionals in the building as NASA disengages from the space-based research that was the $100 billion space station's original purpose. NASA has sharply cut life sciences research funding across the agency. The Bush administration's budget for NASA, pending before Congress, would lower science spending approximately $3.1 billion during the next five years. The agency has eliminated or dramatically reduced funding for research projects staffed by 1,182 contractors and 671 civil servants, according to data provided by NASA's Exploration Systems Mission Directorate. Almost 240 university researchers received project "termination" letters from NASA within the past year, a NASA spokesman confirmed. NASA Administrator Mike Griffin repeatedly has defended the budget, saying it was the best the agency could do given the funding available. But for the foreseeable future, the Space Life Sciences Lab appears destined to become a hub for research into the new systems needed to keep astronauts alive and machines functioning for a return trip to the moon, scheduled for 2018. Florida officials, who originally agreed to invest almost $30 million to build and equip the lab for life sciences research, are working closely with NASA as the lab's focus changes. Web posted. (2006). NASA lab has a new mission [Online]. Available WWW: http://www.floridatoday.com/ [2006, April 10].]

NASA Honors First Man on the Moon Neil Armstrong

NASA will honor former astronaut Neil Armstrong for his involvement in the U.S. space program with the presentation of the Ambassador of Exploration Award at 11:15 a.m. EDT Tuesday, April 18, in the Reakirt Auditorium, Cincinnati Museum Center at Union Terminal, 1301 Western Ave., Cincinnati. NASA is presenting the Ambassador of Exploration Award to the 38 astronauts and other key individuals who participated in the Mercury, Gemini, and Apollo space programs for realizing America's vision of space exploration from 1961 to 1972. The award is a small sample of lunar material encased in Lucite and mounted for public display. The material is part of the 842 pounds of samples brought back to Earth during the six Apollo lunar expeditions from 1969 to 1972. Armstrong's award will be displayed at the Cincinnati Museum Center at Union Terminal. Armstrong, an Ohio native, was the first man to set foot on the moon on July 20, 1969. He is a Korean War combat veteran and has flown more than 200 different models of aircraft. ["NASA Honors First Man on the Moon Neil Armstrong, **NASA Media Advisory #M06-060**, April 10, 2006.]

April 11: **NASA Solicits Ideas for Exploration of the Moon**

NASA issued a Request for Information Tuesday soliciting ideas on lunar exploration activities that could be pursued as part of the agency's long term exploration goals for the moon, Mars and beyond. Sponsored by NASA's Exploration Systems Mission Directorate, this request seeks input from individuals and organizations covering a broad range of disciplines, from lunar science activities, to operational activities and technology research efforts that could be done on the moon to assist in preparing for future human missions to Mars and beyond. The goal is to collect a wide variety of perspectives on future human and robotic activities on the moon. Eventually, a multidisciplinary lunar exploration strategy will be developed using information from a variety of sources, including inputs received through this solicitation. ["NASA Solicits Ideas For Exploration of the Moon," **NASA News Release #06-134**, April 11, 2006.]

April 12: CALIPSO/CloudSat Satellites Ready for April 21 Launch

NASA's Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO) and CloudSat satellites are set to launch aboard a Boeing Delta II rocket at 3:02 a.m. PDT on Friday, April 21, from NASA's Space Launch Complex 2 (SLC-2) at Vandenberg Air Force Base, Calif. The launch window is instantaneous. The CALIPSO satellite will separate from the Delta II at 62 minutes after liftoff, followed by CloudSat at 96 minutes after launch. Together, CALIPSO and CloudSat will provide new perspectives on Earth's clouds and aerosols, answering questions about how they form, evolve and affect water supply, climate, weather and air quality. They will be launched into an orbit where they will fly just 15 seconds apart as members of NASA's "A-Train," a constellation of several Earth-observing satellites. ["CALIPSO/CloudSat Satellites Ready for April 21 Launch, **NASA News Release #26-06**, April 12, 2006.]

Expendable Launch Vehicle Status Report

Mission: CloudSat and Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO) ;Launch Site: Space Launch Complex 2, Vandenberg Air Force Base, Calif.; Launch Vehicle: Boeing Delta II; Launch Date: April 21, 2006; Launch Time: 6:02:08 a.m. EDT. NASA transported CALIPSO and CloudSat from the Astrotech payload processing facility at Vandenberg Air Force Base, Calif., to the launch complex on April 8. The payload was hoisted and attached to the top of the Delta II rocket. The Flight Program Verification, an integrated electrical and mechanical flight test involving the Delta II and the CALIPSO/CloudSat payload, was successfully completed today. Following the test, technicians began installation of the launch vehicle ordnance. Payload closeouts are planned for Thursday. Installation of the fairing around the two spacecraft is scheduled for Friday. KSC News Center (2006). **Expendable Launch Vehicles Status Report #E06-012** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, April 12].]

April 13: Tank foam lost during shuttle wind tunnel test

During wind tunnel tests earlier this week, NASA subjected a full-scale mockup of a shuttle external tank section to aerodynamic forces greater than a real tank would experience during launch. In one series of tests, unmodified foam insulation used to prevent ice buildups around external fittings suffered only minor damage while a redesigned "ice/frost ramp" suffered major foam loss. The redesign is being considered in

a bid to remove as much insulation as possible from the tank to minimize the threat of debris shedding during launch. The old ice/frost ramps, which insulate the fittings used to hold two pressurization lines and an electrical cable tray in place, featured long, sloping ramps to smooth the flow of air. But those very ramps, it was believed, were susceptible to cracks and failure, providing a potential source of debris that could strike a shuttle during launch. The redesigned ramps are much more blunt. But in initial wind tunnel tests at the Arnold Engineering Development Center in Tullahoma, Tenn., the old design fared better than the redesign. During two sets of test runs this week, the new design suffered major foam loss. "That's exactly what testing is all about," said one official. "This is where you want to find a problem, not on launch day." More tests are planned and other design changes are under consideration, along with the option of flying the ramps "as is." But a decision on how to proceed is needed by the end of the month to give engineers time to make any required changes before NASA's planned July launch of the shuttle Discovery on the second post-Columbia mission. In other developments, shuttle program manager Wayne Hale has told project engineers to begin planning for a shuttle fueling test around June 1 to verify performance of new low-level fuel sensors in the tank scheduled for use by shuttle Discovery in July. The test has not yet been formally approved and is opposed by some - including, sources say, William Gerstenmaier, NASA's chief of space operations - because of concern about putting unnecessary thermal stress on the tank's foam insulation. But Hale strongly favors the test in the wake of recent, unprecedented work to replace four engine cutoff - ECO - sensors, which are part of a critical backup system used to make sure the shuttle's main engines shut down on time. Problems with ECO sensors before Discovery's launch last July on the first post-Columbia mission were never fully resolved and a tanking test would give engineers confidence the new sensors will work properly on launch day. A tanking test also would provide an opportunity to monitor the performance of a relief valve used to maintain proper tank pressurization during flight. A valve in a tank last year cycled more often than usual. Discovery remains targeted for launch at 3:48 p.m. EDT on July 1. Web posted. (2006). Tank foam lost during shuttle wind tunnel test [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, April 13].]

NASA To Webcast Minotaur Launch of Cosmic Spacecraft

The Constellation Observing System for Meteorology, Ionosphere and Climate, or COSMIC, is set to launch from Vandenberg Air Force Base, Calif., at 5:10 p.m. PDT (8:10 p.m. EDT) Friday, April 14, aboard a U.S. Air Force Minotaur rocket. The launch window is three hours in duration. The launch countdown will be available on the Internet beginning at 3 p.m. PDT (6 p.m. EDT) and may be accessed at: http://www.ksc.nasa.gov/video/vafb.ram A globe-spanning constellation of six weather and climate research satellites based upon a novel application of a NASA-developed technology, the network is expected to improve weather forecasts, monitor climate change and enhance space weather research.NASA's Jet Propulsion Laboratory, Pasadena, Calif., designed COSMIC's primary instrument, a science global positioning system (GPS) space receiver. JPL will also provide instrument flight software and

technical support. The five-year mission is funded by Taiwan's National Space Organization and various U.S. agencies, including the National Science Foundation, Arlington, Va., which leads science activities. The University Corporation for Atmospheric Research, Boulder, Colo., manages the mission and designed the satellite array system. The low-orbiting satellites will be the first to provide atmospheric data daily in real time over thousands of points on Earth by measuring the bending of radio signals from the U.S. GPS as the signals pass through Earth's atmosphere, a technology known as radio occultation. The data will be used for research and operational weather forecasting. ["NASA To Webcast Minotaur Launch of Cosmic Spacecraft," **NASA News Release #27-06**, April 13, 2006.]

April 14: Space Shuttle Processing Status Report

Mission: STS-121 - 18th ISS Flight (ULF1.1) - Multi-Purpose Logistics Module; Vehicle: Discovery (OV-103); Location: Orbiter Processing Facility Bay 3; Launch Date: Launch Planning Window July 1-19, 2006 ;Launch Pad: 39B ;Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue closing out areas of Discovery prior to its move to the Vehicle Assembly Building, scheduled for May 12. The right and left payload bay doors were opened earlier in the week in preparation for reinstallation of the remote manipulator system, or "shuttle arm." The arm was transported from the lab in the Vehicle Assembly Building to the processing facility on Wednesday and installed in the vehicle today. Friday program managers determined the space shuttle main engine in position No. 2 will need to be replaced due to the possibility of a crack in a solder joint in the controller. During the certification of similar controllers, engineers observed cracking after thermal testing of the units. The engine replacement has no impact on the overall processing schedule. Mission: STS-115 - 19th ISS Flight (12A) - P3/P4 Solar Arrays; Vehicle: Atlantis (OV-104); Location: Orbiter Processing Facility Bay 1; Launch Date: No earlier than Aug. 28, 2006; Launch Pad: 39B; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue performing powered-up system testing on Atlantis for its mission to the International Space Station. The external tank door functional test is scheduled for early next week. Crane operations removed and reinstalled the orbiter boom sensor system in the payload bay of Atlantis on Wednesday for additional work on the manipulator positioning mechanisms. The positioning mechanisms are the pedestals that hold the boom in place in the payload bay while the boom is not in use. The 50-foot-long boom attaches to the shuttle arm and is one of the new safety measures added prior to the Return to Flight mission that launched in July 2005. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility Bay 2 following an extensive modification period. On Thursday, leak checks and functional tests were completed on the liquid oxygen portion of the main propulsion system. Technicians continue working on the positioning mechanisms for Endeavour's remote manipulator system in preparation for the arm's installation in the payload bay. External Tank ; Final closeouts continue in the Vehicle Assembly Building on the external tank that will fly with Discovery on mission STS-121. On Tuesday, crane operators lifted the tank from the checkout cell and placed it in a horizontal position on the transporter in the transfer aisle. Lockheed Martin employees are completing final work required to close

out the aft area of the tank in preparation for thermal protection system foam application, scheduled for late next week. Once the foam application is complete, the tank will be lifted from the transporter and attached to the two solid rocket boosters already stacked in high bay 3 of the Vehicle Assembly Building. That move is scheduled for April 24. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-013.** Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, April 14].]

April 17: NASA, Brevard County Partner to Preserve Historic Schoolhouse

NASA Kennedy Space Center and Brevard County of Florida are set to take a major step in preserving the Clifton School, a 116-year-old schoolhouse used by the children of early black homesteaders in North Brevard. On Saturday, April 22 at 8:30 a.m., KSC Director Jim Kennedy and Chairwoman of the Brevard County Board of Commissioners Helen Voltz are scheduled to meet at the school's site to signify its transfer of ownership from NASA to Brevard County. The school, built in 1890, was discovered in 2003 in a remote wooded area north of Kennedy Space Center. Under a Space Act Agreement, NASA and Brevard County formed a partnership to have the remnants of the school removed from its current location for reconstruction. Upon completion, the restored school will become part of the Heritage Park Complex at the Chain of Lakes Project in Titusville, Fla. ["NASA, Brevard County Partner to Preserve Historic Schoolhouse," **NASA News Release #28-06**, April 17, 2006.]

NASA Names Additional Ambassadors of Exploration

Two distinguished names have been added to the list of NASA's first generation of explorers honored as Ambassadors of Exploration. They include a man considered the architect of Mission Control, designing systems from the ground up and known to many in the early days of space exploration simply as "Flight." The other will be forever linked to the phrase "Failure is not an option," and is remembered for his flat-top hairstyle and relentless dedication to mission success. Christopher C. Kraft and Eugene F. Kranz join an eminent list of honorees that include astronauts Alan Shepard, U.S. Sen. John Glenn and Neil Armstrong. NASA's Ambassadors of Exploration are presented a unique award that includes a moon rock to recognize the sacrifices and dedication of the astronauts and others who were part of the Mercury, Gemini and Apollo programs. "The early years of our nation's space program had 400,000 heroes, not just the astronauts who took the first tentative steps into space," said Administrator Michael Griffin. "The managers, engineers, flight directors, the mathematicians and computer programmers, the technicians and construction workers, all of these carried what was in some ways the heaviest responsibility of all." "Through their work, they held the lives of other men in their hands. And no one in those early years carried this responsibility more visibly, or with more grace and fortitude, than did 'Red Flight' Chris Kraft and 'White Flight' Gene Kranz. And no two people are more deserving of the title 'Ambassador of Exploration' than these men. I have been privileged to know them, and to confer this recognition upon them," Griffin said. The award celebrates the realization of a vision for exploration first articulated 45 years ago next month by President John F. Kennedy, who was looking to bolster a nation and a fledgling space program. It was a mandate to extend humanity's reach further into the cosmos. Kraft began his career as an aeronautical engineer with the National Advisory Committee for Aeronautics, predecessor of NASA, and later became

an original member of the Space Task Group for NASA in 1958. He was the agency's first flight director, responsible for developing the technologies and procedures for ground operations for Project Mercury. Kraft served as flight director throughout Mercury, including Shepard's historic first spaceflight and Glenn's orbital mission. He later moved up to director of flight operations throughout the entire Apollo program. He is considered the father of Mission Control and later became the director of NASA's Johnson Space Center in Houston from 1972 to 1982. Kranz joined the Air Force in 1954 and flew jet fighter aircraft. He was selected to join the Space Task Group in 1960 and was assigned as assistant flight director. His first duty as flight director came in 1965 for Gemini 4, which featured the first spacewalk by an American astronaut. Kranz was flight director for Apollo 11 and led the team that helped to safely return the crew of Apollo 13 back to Earth. He later became director of NASA mission operations and retired in 1994 shortly after the space shuttle flight that repaired the ailing Hubble Space Telescope. To date, NASA has presented 13 of the nearly 40 lunar samples awarded as part of the Ambassadors of Exploration initiative. The award was first announced in July 2004 on the 35th anniversary of the Apollo 11 moon landing. Tuesday afternoon in Cincinnati, Griffin is scheduled to present the award to Armstrong, a former naval aviator and NASA test pilot. As Apollo 11 commander, Armstrong was the first human to ever land a spacecraft on the moon and the first to step on the lunar surface. ["NASA Names Additional Ambassadors of Exploration," **NASA News Release #06-186**, April 17, 2006.]

April 18: **NASA Announces Crew Launch Vehicle Contract Modification**

NASA has authorized a contract action having a maximum value of $28.6 million with ATK Thiokol of Brigham City, Utah, to continue design and development of the first stage for the crew launch vehicle. The contract action maintains the design, development, tests and evaluation schedule; initiates procurement of long-lead items; adds the necessary design and engineering analysis leading to a Systems Requirements Review in September 2006; and provides the necessary support for first stage and vehicle-level design reviews identified in the work statement. The cost-plus-award-fee contract provides additional support through Sept. 30, 2006. The crew launch vehicle is an in-line, two-stage rocket being developed primarily to carry the crew exploration vehicle - the capsule that will take astronauts to the moon. Development of the crew launch vehicle is led by NASA's Marshall Space Flight Center, Huntsville, Ala., in partnership with the agency's Johnson Space Center, Houston; Kennedy Space Center, Fla; and Stennis Space Center near Bay St. Louis, Miss. ["NASA Announces Crew Launch Vehicle Contract Modification," **NASA Release #C06-027,** April 18, 2006.]

Expendable Launch Vehicle Status Report

Mission: Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO) and CloudSat; Launch Site: Space Launch Complex 2, Vandenberg Air Force Base, Calif.;Launch Vehicle: Boeing Delta II; Launch Date: April 21, 2006;Launch Time: 6:02:08 a.m. EDT. Workers at Space Launch Complex 2 fueled the Delta II second stage Tuesday for flight with storable hypergolic propellants. Officials also conducted a launch countdown dress rehearsal. No significant issues or concerns were

found during the Flight Readiness Review on Monday. Technicians installed the payload fairing around the two spacecraft on April 14 and are conducting a routine state-of-health check today. Plans call for the RP-1 fuel, highly refined kerosene, to be loaded on the rocket's first stage on Thursday afternoon. Early that evening, the mobile service tower will be retracted from around the rocket. Liquid oxygen will be loaded into the first stage during the terminal countdown sequence that starts at 4 a.m. EDT Friday. There is currently an 80 percent chance of acceptable weather conditions for launch. KSC News Center (2006). **Expendable Launch Vehicles Status Report #E06-013** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, April 19].]

April 21: NASA's CloudSat and CALIPSO Launch Rescheduled

The launch of NASA's CloudSat and CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) was rescheduled for Tuesday, April 25. Launch is set for 6:02 a.m. EDT from Vandenberg Air Force Base, Calif. Launch commentary on NASA TV starts at 4 a.m. EDT. The weather forecast calls for a 90 percent probability of acceptable launch conditions. ["NASA's CloudSat and CALIPSO Launch Rescheduled," **NASA Media Advisory #06-068**, April 21, 2006.]

April 23: NASA's CloudSat and CALIPSO Launch Rescheduled

The launch of NASA's CloudSat and CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) was rescheduled for Tuesday, April 25. Launch is set for 6:02 a.m. EDT from Vandenberg Air Force Base, Calif. Launch commentary on NASA TV starts at 4 a.m. EDT. The weather forecast calls for a 90 percent probability of acceptable launch conditions. ["NASA's CloudSat and CALIPSO Launch Rescheduled," **NASA Media Advisory #06-072,** April 23, 2006.]

April 24: Problems Persist, but NASA Says the Discovery Can Launch as Scheduled

A string of distracting accidents, safety incidents and tough technical questions have complicated NASA's efforts to get the space shuttle program back on track. The shuttle Discovery is to fly again in July, in only the second mission since the Columbia disaster in February 2003. But there are continuing questions about fuel-tank foam, which doomed the Columbia and bedeviled the Discovery's return-to-flight mission last year, and about other parts on the aging shuttle fleet. And this winter, there were so many accidents — a robot arm damaged by a moving work platform, a dropped film canister that damaged heat tiles on the shuttle Endeavour, a small fire in the assembly building — that last month the director of the Kennedy Space Center stopped all work for two hours and lectured employees on safety. When work resumed the next day, a worker was killed in a fall from a warehouse roof. Nevertheless, NASA officials insist the Discovery can lift off on time. NASA had planned to fly the Discovery in May, but decided to go for the next available launching period, July 1 to July 19, to complete modifications on the large external fuel tank to reduce the chances that it would shed insulating foam and to replace some sensors inside the tank. The delay also allowed engineers more time to deal with other lingering technical issues, like debris in fuel lines and aging electronics. NASA needs to get at least two shuttle flights off this year to get back on schedule building the International Space Station before the shuttle fleet is retired in 2010.

Officials hope to send three missions aloft this year and then fly four per year to finish the station with 16 flights, plus one mission to repair the Hubble Space Telescope, before the deadline. Web posted. (2006). Problems Persist, but NASA Says the Discovery Can Launch as Scheduled [Online]. Available WWW: http://www.nytimes.com/ [2006, April 26].]

NASA Honors Record Setting Moon Walker Charles Duke

NASA will honor former astronaut Charles Duke for his involvement in the U.S. space program with the presentation of the Ambassador of Exploration Award at 10 a.m. EDT Monday, May 8 at the Admiral Farragut Academy, St. Petersburg, Fla. The event is open to the media and public. NASA is presenting the Ambassador of Exploration Award to the 38 astronauts and other key individuals who participated in the Mercury, Gemini, and Apollo space programs for realizing America's vision of space exploration from 1961 to 1972. The award is a small sample of lunar material encased in Lucite and mounted for public display. The material is part of the 842 pounds of samples brought back to Earth during the six Apollo lunar expeditions from 1969 to 1972. Duke's award will be displayed at the Admiral Farragut Academy, 501 Park Street North, St. Petersburg. For event, academy and media access information, contact Lt. Cmdr. JoAnne Linkner at: (727) 343-3678. Duke was selected as an astronaut in 1966, while serving as a U.S. Air Force jet pilot. He was a member of the Apollo 16 lunar expedition crew. Along with John Young, the fifth lunar landing team spent a record 71 hours and 14 minutes on the moon's surface. While command module pilot Thomas Mattingly orbited the moon, Duke and Young collected approximately 213 pounds of rock and soil samples, set up a remote observatory and the first lunar surface cosmic ray detector. Duke logged approximately 265 hours in space; more than 21 hours during extra vehicular activity. He retired from NASA and the Air Force as a brigadier general. ["NASA Honors Record Setting Moon Walker Charles Duke," **NASA Media Advisory #M06-070**, April 24, 2006.]

April 25: NASA chief defends approach to moon

Even with a tight budget, NASA has little choice but to move forward with the expensive shuttle and space station programs, the agency's chief told senators Tuesday. In at least his third appearance before a congressional panel this year, NASA administrator Mike Griffin defended the Bush administration's go-slow funding approach in developing a new generation of lunar launchers and landers. The administration has requested nearly $16.8 billion for NASA in the fiscal year that begins Oct. 1. Nearly 40 percent of those funds are necessary for the shuttles and the International Space Station. A chief worry, especially for the Space Coast, is what happens if the shuttles retire in 2010. Sen. Bill Nelson, D-Orlando, reminded Griffin that the NASA Authorization Act of 2005 made it national policy that U.S. astronauts wouldn't stop flying between when the shuttles are retired and when NASA delivers the new Crew Exploration Vehicle for moon exploration. "I don't believe we can have a CEV by 2010, no matter what we do," Griffin said. Even after Nelson offered a hypothetical $1 billion increase to NASA's budget, Griffin said technical challenges would prevent NASA from significantly speeding the delivery of the new space vehicles. The target is no later than 2014. The agency also is no closer to solving what Griffin described as its biggest challenge -- shifting its operational workforce from shuttle and space station duties to the new moon vehicles.

Many of the skills now possessed by shuttle technicians and engineers can easily be adapted for work on the new crew vehicles and launchers, Griffin said. Just how many of those workers will be retained remains an open question, Griffin said. "NASA will not need as many engineers and technicians on the shop floor as we do today with the space shuttle," he said. Web posted. (2006). [NASA chief defends approach to moon [Online]. Available WWW: http://www.floridatoday.com/ [2006, April 26].]

NASA'S CloudSat and CALIPSO Launch Scrubbed

NASA's CloudSat and CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) launch from Vandenberg Air Force Base, Calif., was scrubbed Tuesday shortly before 6 a.m. EDT due to higher than allowable upper level wind conditions. The next launch attempt is tentatively set for Wednesday, April 26, at 6:02 a.m. EDT, pending availability of all required Western Test Range assets. Launch commentary on NASA TV starts at 4 a.m. EDT. Weather is a concern for Wednesday's launch attempt. The forecast calls for a 40 percent probability of acceptable weather conditions. The primary concerns are for thick clouds, higher than allowable winds, rain showers and isolated thunderstorms. ["NASA's CloudSat and CALIPSO Launch Scrubbed," **NASA Media Advisory #06-074**, April 25, 2006.]

April 26: NASA chief accepts China invite

NASA Administrator Michael Griffin has accepted an invitation to visit China to start talks on possibly cooperating with the Chinese in some areas of space. "I think the United States always benefits from discussions and I do not see how it can hurt us," Griffin told members of the U.S. Senate Subcommittee on Science and Space in Washington on Tuesday. NASA spokesman Dean Acosta said no date or agenda has been set for a China visit by Griffin. Chinese President Hu Jintao met with President Bush in Washington last week. China launched its first manned space mission in 2003, making it the third country to send a human into orbit on its own, after Russia and the United States. A second, longer mission carrying two astronauts was completed last year. Web posted. (2006). NASA chief accepts China invite [Online]. Available WWW: http://www.cnn.com/ [2006, April 26.]

Weather Again Scrubs CloudSat and CALIPSO Launch

The launch of NASA's CloudSat and CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) satellites from Vandenberg Air Force Base, Calif., was scrubbed this morning at 4:24 a.m. EDT due to thick clouds. Launch has been rescheduled for Thursday, April 27, at 6:02:37 a.m. EDT. Launch commentary on NASA TV starts at 4 a.m. EDT. The weather is expected to improve for a Thursday morning launch attempt. The current forecast calls for an 80 percent probability of acceptable weather conditions. ["Weather Again Scrubs NASA's CloudSat and CALIPSO Launch, **NASA Media Advisory #06-076**, April 26, 2006.]

April 27: Former NASA Astronaut Robert L. Crippen Honored

At a ceremony in Washington to commemorate the 25th anniversary of NASA'S maiden flight of the space shuttle, the pilot of that historic mission was honored with the nation's highest award for spaceflight achievement, the Congressional Space Medal of Honor. STS-1 astronaut Robert L. Crippen was presented the award last night by NASA

Administrator Michael Griffin in the name of President George W. Bush and on behalf of the U.S. Congress. "This medal, awarded by the Congress of the United States, commemorates publicly what all of us who know Bob Crippen already understood: he is an authentic American hero," Griffin said. "He holds an unsurpassed record of dedicated service to this country as a military aviator, test pilot, engineer, and astronaut, including his assignment as pilot for the historic STS-1 mission, recognized with this award. And no one has more effectively applied such an extensive operational background more to the demands of senior management in both government and industry. And above all, Crip is a loyal friend to all who know him. We at NASA are honored by his association with our agency." In receiving the distinction, Crippen said the recognition was unexpected. "It was such a surprise. I am totally overwhelmed," Crippen said. "Just look at the names of the people who are on the list. They are heroes in the truest sense of the word and I can't believe someone would think to include me in such distinguished company. I'm so honored." The Congressional Space Medal of Honor was authorized by Congress in 1969 to recognize "any astronaut who in the performance of his duties has distinguished himself or herself by exceptionally meritorious efforts and contributions to the welfare of the nation and mankind." Crippen became a NASA astronaut in September 1969. He was a member of the astronaut support crew throughout the entire Skylab program and the Apollo-Soyuz Test Project, which was completed successfully in July 1975. For his first mission into space, he was selected for the initial flight of the space shuttle in what is considered the boldest test flight in history. Along with his crewmate, veteran commander and Apollo moonwalker John Young, he successfully piloted the orbiter Columbia on her maiden flight April 12, 1981. The two astronauts tested the space shuttle's systems for two days and 36 orbits before safely gliding the unique spacecraft to a safe landing on a California desert runway. Crippen went on to command three future space shuttle missions and served in a variety of supervisory positions at NASA before becoming the director for the Kennedy Space Center in Florida, where he safely managed 22 space shuttle flights. Young was awarded the Congressional Space Medal of Honor in May 1981. Apollo 11 astronaut Neil Armstrong was the first recipient of the award in 1978 as part of a celebration to mark NASA's 20th anniversary. Since then, a total of 28 astronauts have now received this prestigious recognition of their service, bravery, and dedication. Past honorees include: Neil Armstrong ; Frank Borman ; Charles "Pete" Conrad ;U.S. Sen. John Glenn ;Virgil "Gus" Grissom; Alan Shepard ; John Young ; Thomas Stafford ; James Lovell ; Shannon Lucid ; Roger Chaffee ; Edward White ; William Shepherd ; Dick Scobee ; Michael Smith ; Judith Resnik ; Ellison Onizuka ; Ronald McNair ; Greg Jarvis ; Christa McAuliffe ; Rick Husband ; Willie McCool ; Michael P. Anderson ; Kalpana Chawla ; David M. Brown ; Laurel Clark ; Ilan Ramon. ["Former NASA Astronaut Robert L. Crippen Honored With Congressional Space Medal of Honor," **NASA News Release #06-205,** April 27, 2006.]

NASA Honors Pioneer Astronaut Frank Borman

NASA will honor former astronaut Frank Borman for his involvement in the U.S. space program with the presentation of the Ambassador of Exploration Award at 5 p.m. EDT on Monday, May 8 at the Pima Air & Space Museum, Tucson, Ariz. The event is open to the media and public. NASA is presenting the Ambassador of Exploration Award to the 38 astronauts who participated in the Mercury, Gemini, and Apollo space programs for

realizing America's vision of space exploration from 1961 to 1972. NASA is also recognizing several other key individuals who either participated in or supported the early space programs. The award is a small sample of lunar material encased in Lucite and mounted for public display. The material is part of the 842 pounds of samples brought back to Earth during the six Apollo lunar expeditions from 1969 to 1972. Borman's award will be displayed in the museum at 6000 East Valencia Road, Tucson. Borman led the first team of American astronauts to leave Earth orbit and circle the moon as commander of the Apollo 8 mission in 1968. Borman, with crewmates James Lovell and William Anders, were the first humans to view the far side of the moon. He was also a member of the Gemini 7 crew, which performed the first ever orbital rendezvous linking with Gemini 6 in 1965. Borman was a career U.S. Air Force officer, retiring as a colonel. ["NASA Honors Pioneer Astronaut Frank Borman," **NASA Media Advisory #06-171**, April 27, 2006.]

NASA's CloudSat and CALIPSO Launch Rescheduled

NASA's CloudSat and CALIPSO launch from Vandenberg Air Force Base, Calif., is scheduled for 6:02 a.m. EDT Friday, April 28. Launch commentary on NASA TV begins at 4 a.m. EDT. On Wednesday, engineers and mission managers assessed a suspect temperature sensor on the Boeing Delta II rocket's second stage. They concluded the unusual temperature readings observed during the previous two launch attempts were primarily the result of higher temperature pressurization rates and are not indicative of any defect in the sensor. The sensor does not require replacement and can fly as is. Weather is not expected to be a concern for Friday's launch. ["NASA's CloudSat and CALIPSO Launch Rescheduled," **NASA Media Advisory #06-077**, April 27, 2006.]

April 28: NASA Launches Satellites For Weather, Climate, Air-Quality Studies

Two NASA satellites were launched Friday from Vandenberg Air Force Base, Calif., on missions to reveal the secrets of clouds and aerosols, tiny particles suspended in the air. CloudSat and CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) thundered skyward at approximately 6:02 a.m. EDT atop a Boeing Delta II rocket. The two satellites will eventually circle approximately 438 miles above Earth in a sun-synchronous polar orbit, which means they will always cross the equator at the same local time. Their technologies will enable scientists to study how clouds and aerosols form, evolve and interact. "Clouds are a critical but poorly understood element of our climate," said Graeme Stephens, CloudSat principal investigator and a professor at Colorado State University, Fort Collins, Colo. "They shape the energy distribution of our climate system and our planet's massive water cycle, which delivers the freshwater we drink that sustains all life." "With the successful launch of CloudSat and CALIPSO we take a giant step forward in our ability to study the global atmosphere," said CALIPSO Principal Investigator David Winker of NASA's Langley Research Center, Hampton, Va. "In the years to come, we expect these missions to spark many new insights into the workings of Earth's climate and improve our abilities to forecast weather and predict climate change." Each spacecraft will transmit pulses of energy and measure the portion of the pulses scattered back to the satellite. CloudSat's Cloud-Profiling Radar is more than 1,000 times more sensitive than typical weather radar. It can detect clouds and

distinguish between cloud particles and precipitation. CALIPSO's polarization lidar can detect aerosol particles and distinguish between aerosol and cloud particles. Lidar, similar in principle to radar, uses reflected light to determine the characteristics of the target area. Sixty-two minutes after liftoff, CALIPSO separated from the rocket's second stage. CloudSat followed 35 minutes later. Ground controllers successfully acquired signals from both spacecraft, and initial telemetry reports show both in excellent health. Over the next six weeks, system and instrument checks will be performed, and the satellites will maneuver into their final orbits. The satellites will fly in formation as members of NASA's "A-Train" constellation, which also includes NASA's Aqua and Aura satellites and a French satellite known as PARASOL, for Polarization and Anisotropy of Reflectances for Atmospheric Sciences coupled with Observations from a Lidar. The satellite data will be more useful when combined, providing insights into the global distribution and evolution of clouds to improve weather forecasting and climate prediction. ["NASA Launches Satellites For Weather, Climate, Air-Quality Studies," **NASA News Release #06-190**, April 28, 2006.]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Final powered-up systems testing and area closeouts continue in preparation for Discovery's move to the Vehicle Assembly Building no earlier than May 12. Final closeouts on the shuttle's main engines continue with thermal protection system foaming operations around them. Engine configuration for rollover was performed Thursday, which was followed by platform removal and final inspections. Work continues on the thermal protection system and thermal barriers for the nose landing gear. The landing gear functional test is set for next week. The lower section of the remote manipulator system, or shuttle arm, returned to Kennedy today following repairs by the vendor in Canada. Shuttle technicians inadvertently damaged the arm slightly March 4. The arm will be retested prior to reinstallation. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue performing powered-up system testing on Atlantis for its mission to the International Space Station. Water coolant loop servicing continues following the removal and replacement of the water coolant loop No. 2 pump package. Preparations began today for the orbiter boom sensor system's installation into Atlantis' payload bay on Monday. The 50-foot-long boom attaches to the shuttle arm and is one of the new safety measures added prior to Return to Flight last year. It equips the orbiter with cameras and laser systems to inspect the shuttle's heat shield while in space. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Work continues in preparation for the external airlock's installation into the payload bay, which is set for next week. On April 3, technicians will begin operations to install the reinforced carbon-carbon nose

cap. Rigging operations continue on the manipulator positioning mechanisms, which support the remote manipulator system and orbiter boom sensor system. The mechanisms serve as pedestals that hold the shuttle arm and boom in the payload bay. External Tank; Work is under way in the Vehicle Assembly Building checkout cell on the external tank that will fly on mission STS-121. Technicians are removing and replacing the tank's four liquid hydrogen engine cutoff sensors, which indicate whether the tank still has fuel during its climb to orbit. On Monday, technicians began removing thermal protection system foam around the bottom of the tank in an area known as the "manhole." The manhole was removed Tuesday to allow technicians to gain access into the tank, and on Thursday the sensors and mounting bracket were removed. The sensors were shipped back to the Michoud Assembly Facility in New Orleans for inspection. Work is also under way to install a new gaseous oxygen vent valve under the nose cap of the tank. While technicians were beginning to work around the nose cap area this week, a light stand that was being repositioned fell, contacting the tank. The lamp struck the composite nosecone and adjacent foam insulation, causing minor damage. Any repairs will be performed in the Vehicle Assembly Building checkout cell. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-014** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, April 31].]

MAY 2006

May 1: NASA KSC Director Announces Retirement

James W. Kennedy, the eighth director in the history of NASA's Kennedy Space Center, today announced his intention to retire in January 2007 after 35 years of government service. Kennedy spent 31 of those years with NASA and four with the U.S. Air Force. Kennedy's successor will be announced at a later date. "Serving as the director of the historic Kennedy Space Center where the U.S. space program was born is an opportunity of a lifetime," Kennedy said. "While I have treasured every minute of every day, now is the time to announce I'm stepping aside to allow someone else the opportunity to lead this great center and its incredible work force." In his position, Kennedy oversees nearly 15,000 government and contractor employees at KSC. The center's primary mission is the processing of space shuttle, International Space Station and expendable launch vehicle space flight hardware for launch. NASA Administrator Mike Griffin, after accepting Kennedy's retirement letter, stated: "I've had the pleasure of knowing and working with Jim Kennedy for 10 years. He has offered a sure and steady hand at the Kennedy Space Center in the difficult period following the loss of the Space Shuttle Columbia, and will be sorely missed. And while he can retire from NASA, he cannot retire from the NASA family. He will always be one of our own." Prior to serving as director, Kennedy served as the center's deputy director beginning in October 2002. Prior to coming to KSC, he served for 25 years at the George C. Marshall Space Flight Center in Huntsville, Ala., rising to the position of deputy center director. Kennedy began his career with NASA in 1968 in the Aerospace Engineering Cooperative Education Program, first at KSC and then at Marshall. After earning his Bachelor of Science degree in mechanical engineering from Auburn University in 1972, he was called to active duty with the U.S. Air Force. In 1977, he received his master's in business administration from Georgia Southern University and returned to NASA in 1980. Kennedy's work experience includes serving as project manager for major projects, such as the X-34, DC-XA and Solid Rocket Booster Projects. He served as Marshall's director of engineering. He has received numerous awards, including the National Space Club's Astronautics Engineer of the Year Award, the Silver Snoopy Award, NASA's Distinguished Service Medal, and the Presidential Rank of Meritorious and Distinguished Service Awards. Most recently, he received the NASA Outstanding Leadership Medal and was named the Florida Chapter of the National Space Club's Dr. Kurt H. Debus Award winner for 2006. Kennedy was born in Riverdale, Md., and currently resides in Cocoa Beach, Fla., with his wife, Bernadette. He's has two grown children, Jeff and Jamie, and is the proud grandfather of Hayes. ["NASA KSC Director Announces Retirement," **NASA News Release #29-06**, May 1, 2006.]

NASA Astronaut Eileen Collins Completes Career of Space Firsts

Astronaut Eileen Collins is leaving NASA. Collins was the first woman to command a space shuttle and the leader of Discovery's Return to Flight mission last year. She plans to pursue private interests and spend more time with family. "Eileen Collins is a living, breathing example of the best that our nation has to offer," said NASA Administrator Michael Griffin. "She is, of course, a brave, superb pilot and a magnificent crew

commander. Beyond those qualities, she is both very bright and modestly self-effacing about that fact. And above all, she is possessed of a quiet determination to attain the very highest levels of accomplishment. I am proud to know her and will greatly miss her at NASA." A veteran of four space flights, Collins' career at NASA has been punctuated by firsts. She was the first woman selected as a pilot astronaut, the first woman to serve as a shuttle pilot and the first woman to command a U.S. spacecraft. Collins was selected as an astronaut in 1990. She served as the pilot on mission STS-63 in February 1995, the first shuttle mission to rendezvous with the Russian Mir Space Station. In May 1997, she flew as pilot on mission STS-84, the sixth shuttle flight to dock to Mir. Collins commanded the Space Shuttle Columbia on mission STS-93 in July 1999, the flight that launched the Chandra X-Ray Observatory. Her most recent space flight was as commander of July's STS-114 mission, the first shuttle flight since the Columbia accident in 2003. During the 14-day mission, Collins and her six-member crew tested new shuttle safety enhancements and resupplied the International Space Station. ["NASA Astronaut Eileen Collins Completes Career of Space Firsts," **NASA News Release #06-208**, May 1, 2006.]

May 3: STEREO spacecraft begin Florida launch preparations

NASA's nearly identical twin STEREO (Solar TErrestrial RElations Observatory) spacecraft, designed and built by the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Md., arrived today in Florida for final pre-launch testing and preparations. Once in orbit, the observatories will capture the first-ever 3-D "stereo" views of the sun and solar wind. The observatories arrived today by truck at the Astrotech Spacecraft Processing Facility just outside NASA's Kennedy Space Center in Florida, where they will be placed inside a clean room for final pre-launch checks. They're scheduled for launch no earlier than July 22, 2006, aboard a single Delta II rocket from Cape Canaveral Air Force Station's Launch Complex 17, Pad B. Web posted. (2006). [STEREO spacecraft begin Florida launch preparations [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, May 3].]

STEREO Arrives In Florida to Begin Launch Preparations

NASA's Solar Terrestrial Relations Observatory (STEREO) spacecraft arrived today at Astrotech, a payload processing facility near Kennedy Space Center in Florida, to begin preparations and final testing for launch. Liftoff will occur aboard a Boeing Delta II rocket from Launch Complex 17 on Cape Canaveral Air Force Station in the summer. STEREO consists of two spacecraft that together comprise the first mission to take measurements of the sun and solar wind in 3-D. This new view will improve our understanding of space weather and its impact on the Earth. During its two-year mission, the two nearly identical spacecraft will explore the origin, evolution and interplanetary consequences of coronal mass ejections, the most violent explosions in our solar system. When directed at Earth, these billion-ton eruptions can disrupt satellites, radio communications and power systems. In addition, energetic particles associated with these solar eruptions are hazardous to scientific spacecraft and astronauts. Truly an international effort, the STEREO mission utilizes scientific collaboration and instrument components provided by the United Kingdom, France, Germany, Hungary, Switzerland, and the European Space Agency. The instruments were integrated with the observatories

by the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Md. Spacecraft testing was performed at APL and NASA's Goddard Space Flight Center in Greenbelt, Md. Now that both observatories are in Florida, technicians will begin the final activities to prepare them for launch. This includes integration and test activities such as: deployment of the solar arrays and high-gain antennas, installation of the flight batteries, a mission simulation for each of the two observatories (also involving the Deep Space Network), and a spacecraft Comprehensive Performance Test, an overall test of the spacecraft systems and its instruments. The observatory propulsion system will then be ready to undergo leak tests and fueling operations. Finally, the two observatories will be vertically stacked in their launch configuration for spin-balance testing before mating with the upper-stage booster. These operations are scheduled to take approximately three months. The build-up of the Boeing Delta II rocket at Launch Complex 17 will begin later this month. The first stage is currently planned to be erected on Pad 17-B during the last week of May, followed by the attachment of the nine solid rocket boosters. The second stage is currently planned to be hoisted atop the first stage late in the first week of June. STEREO is targeted for transportation to the launch pad and mating with the Delta II on July 10. The initial launch period for STEREO extends from July 22 to Aug. 6. ["STEREO Arrives In Florida To Begin Launch Preparations," **NASA News Release #30-06,** May 3, 2006.]

May 4: **Space Florida gets final approval**

Gov. Jeb Bush got his new space agency from the Florida Legislature today, despite efforts by two local lawmakers to slow down the shutdown of what's there now. The House today passed legislation that creates Space Florida, under the wing of the state's privatized economic development agency, Enterprise Florida. In doing so, it scuttles existing economic development and research agencies and boards. The legislation comes with $43 million in funding, including $35 million to modify launch facilities to accommodate a new spacecraft. The impetus is NASA's coming plans to shut down shuttle operations and shift to the Crew Exploration Vehicle, with yet unnamed contractors. Web posted. (2006). [Space Florida gets final approval [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 4].]

Shuttle managers decide against special fueling test

NASA managers today ruled out a June 1 fueling test with the shuttle Discovery, deciding there was no clear-cut technical justification for a complex exercise that would put unwanted stress on the tank's foam insulation and use up valuable contingency time. Shuttle program manager Wayne Hale ordered engineers to make tentative plans for a tanking test earlier this spring as a way to make sure recently replaced engine cutoff - ECO - sensors would work properly on launch day. The test would not have included any so-called "drag on" instrumentation in the shuttle's aft compartment and its sole purpose would have been to verify the ECO sensors changed state from dry to wet and back again as expected. In the absence of additional instrumentation, no detailed operational insights would be possible. During a weekly program meeting today, the management team unanimously decided not to run the test, officials said, because any major problems with the ECO sensors almost certainly would preclude a launch in the July window anyway and because loading the tank with supercold propellant would

subject its foam insulation to unwanted thermal stress. Shuttle tanks are certified for 13 fueling cycles. When a countdown proceeds past the point where the tank is pressurized for launch - part of the plan for the June test - it counts as two cycles. Discovery's launch on the second post-Columbia mission is targeted for July 1. The ECO sensors will be checked, as usual, when the tank is loaded with liquid hydrogen and oxygen on launch day. A final analysis of the tank's ability to withstand aerodynamic buffeting without the ramps in place, based on wind tunnel testing and complex computer modeling, is expected next month. Web posted. (2006). [Shuttle managers decide against special fueling test [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, May 4].]

May 5: Roadkill posse accomplishes mission

The Roadkill Posse at Kennedy Space Center is cleaning up. Literally. More than 800 pounds of carrion have been collected around KSC since NASA in mid-April asked workers to call in roadkill sightings. Coming in the wake of a bird strike during the STS-114 launch last July, the roadkill reporting program is aimed at ridding the spaceport of black vultures and turkey vultures. The vultures roost around NASA's twin shuttle launch pads, and a bird strike in flight can cause serious damage to an orbiter. NASA hopes that eliminating a major food source will prompt the scavengers to go live elsewhere. Web posted. (2006). [Roadkill posse accomplishes mission [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 5].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th ISS Flight (ULF1.1) - Multi-Purpose Logistics Module; Vehicle: Discovery (OV-103); Location: Orbiter Processing Facility Bay 3; Launch Date: Launch Planning Window July 1-19, 2006; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue final preparations on Discovery prior to its move to the Vehicle Assembly Building. The move is scheduled for May 12. Shuttle program managers will discuss readiness for the move and any final technical details during the Orbiter Rollover Review on May 8. As a precautionary measure to provide protection from the tin whiskering phenomenon, a reaction jet driver was replaced in an avionics bay and successfully retested early this week. Whiskering is a phenomenon identified decades ago whereby certain metals, primarily tin, zinc and cadmium, develop pure metallic crystalline extrusions. During retesting of the reaction jet driver replacement, an unrelated problem was discovered in the load control assembly in a line replacement unit box in the forward avionics bay. The remotely controlled assembly provides power to the reaction jet driver. Technicians have replaced the assembly and will retest the equipment over the weekend. Mission: STS-115 - 19th ISS Flight (12A) - P3/P4 Solar Arrays; Vehicle: Atlantis (OV-104); Location: Orbiter Processing Facility Bay 1; Launch Date: No earlier than Aug. 28, 2006; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians are carrying out powered-up system testing on Atlantis for its mission to the station. Workers continue to perform water coolant loop samples. The remote manipulator system, or shuttle robotic arm, is scheduled to be installed early next week. The shuttle arm maneuvers a payload from the payload bay of the orbiter to its

deployment position and then releases it. The arm can also grapple a free-flying payload, maneuver it to the payload bay of the orbiter and berth it in the orbiter. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility Bay 2 following an extensive modification period. Technicians continue completing system leak and functional checks on the liquid oxygen side of the main propulsion system. Heater checks for the multi-purpose logistics module are complete. The logistics module will be added to the payload bay at the launch pad and will carry supplies and equipment to the station. External Tank; Following detailed discussions Thursday, Space Shuttle Program management decided that a tanking test of the external fuel tank will not be needed prior to Discovery's STS-121 mission. Managers decided the proposed objectives of the test could be achieved during the actual launch attempt. Technicians continue to perform final closeouts on the external tank and solid rocket boosters in the Vehicle Assembly Building in preparation for Discovery to be attached to the tank and boosters, or as it's also known, the stack. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-015** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, May 5].]

International Space Station Module to Arrive In Florida

Columbus is embarking on a new journey to the United States. The European Space Agency's Columbus module, a laboratory facility destined for the International Space Station, is set to arrive at NASA's Kennedy Space Center, Fla., from Bremen, Germany on May 30. NASA will welcome Columbus during a ceremony Friday, June 2, at 10 a.m. EDT at Kennedy's Space Station Processing Facility. The Columbus module is the European Space Agency's primary contribution to the International Space Station. The module will be used to support a variety of life, physical and materials science experiments. At Kennedy, it will be processed for launch on a future space shuttle mission. ["International Space Station Module To Arrive In Florida This Month," **NASA Media Advisory #M06-082**, May 5, 2006.]

May 7: Three join space Hall

All inducted Saturday, the three newest members of the U.S. Astronaut Hall of Fame urged more than 1,000 spectators to make the world a better place. Charles Bolden Jr., Henry Hartsfield Jr. and Brewster Shaw Jr. became astronauts to help reach that goal and joined those "select few who have distinguished themselves through extended commitment and remarkable leadership," said Jim Kennedy, Kennedy Space Center director. More than 20 astronauts -- including John Young, Robert Crippen and Charles Duke -- attended the induction ceremony at Kennedy Space Center's Apollo/Saturn V Center. Their space-flying peers praised the inductees, who increased the number of space explorers in the Astronaut Hall of Fame to 63. Thomas Mattingly introduced Hartsfield, John Young introduced Shaw, and Robert Gibson introduced Bolden. Web posted. (2006). [Three join space Hall [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 7].]

May 8: Report: NASA in need of new blood

NASA's work force is graying and the agency lacks a long-term plan for luring qualified workers to help send astronauts to the moon and Mars, a National Research Council

report says. "NASA doesn't have a lot of people leaving, so what's been happening is they're aging in place," said MIT aeronautics professor Daniel Hastings, who co-chaired the panel of aerospace industry experts who wrote the report. The space agency has been too focused on short-term labor problems, such as what to do with some 900 employees whose work is ending along with the soon-to-be-retired space shuttle, the experts wrote. And there has not been enough attention on the type of skills needed in the future and the aging of the work force, they said. NASA requested the report last year from the research council, a nonprofit organization that is part of the National Academies of Science, which offer policy advice under congressional charter. A final version of the report will come out in early 2007. NASA spokesman Doc Mirelson said the space agency would reserve commenting on the interim report until making a formal response Monday at a meeting with the panel. NASA's 18,400 workers, along with the tens of thousands of contract employees, face the end of the space shuttle program in 2010 and the development of next-generation vehicles that will allow astronauts to go back to the moon and eventually explore Mars. The two projects require different skill sets, forcing NASA to keep space shuttle workers in place, while at the same time designing, building and testing new vehicles. The lack of major turnover at the space agency has added to the aging of the work force and the lack of younger employees. NASA only hired 411 new engineers in 2005, or about 4 percent of the 10,700 engineers at the agency. Only a quarter of NASA's engineers and scientists are under age 40, and by 2011 the agency predicts that close to half of its scientists and more than a quarter of its engineers will be eligible for retirement, the report noted. The panel found no evidence of a shortage of aerospace scientists and engineers as had been forecast for the industry but agreed that NASA was having trouble finding some workers, such as system engineers and project managers. Web posted. (2006). [Report: NASA in need of new blood Monday [Online]. Available WWW: http://www.cnn.com/ [2006, May 8].]

Tracy Anania Named Director of KSC Human Resources

Kennedy Space Center Director Jim Kennedy announced today Tracy Anania has been appointed the center's director of Human Resources. In this position, Anania will oversee the center's civil service staffing requirements, manage employee classifications and compensation, and build training and leadership development programs. Anania currently serves as the director of Human Resources for the Communications-Electronics Research, Development and Engineering Center for the Department of the Army Research, Development and Engineering Command at Fort Monmouth, N.J. This directorate has 21 staff workers and is responsible for Human Resources services in the areas of recruitment, retention, career development and training, performance management and employee recognition, and employee and labor-management relations. Anania is expected to arrive at Kennedy within the next month to assume her position. ["Tracy Anania Named Director of KSC Human Resources," **NASA News Release #31-06**, May 8, 2006.]

Stephen J. Altemus to Lead New KSC Engineering Organization

NASA Kennedy Space Center Director Jim Kennedy announced today the center is standing up a new organization called the Engineering Directorate with Stephen J.

Altemus as its director. The new 800-person Engineering Directorate is being created to centralize the center's engineering activities, processes and personnel into one organization that will have an independent reporting line of authority and to ensure the highest quality of engineering rigor at the center. The new directorate will be fully staffed by Oct. 1 and will be responsible for supporting projects and programs at Kennedy by furnishing design, development and operations engineers to these offices. Since January 2005, Altemus has been serving as acting and then deputy director for engineering at NASA's Johnson Space Center in Houston. He was responsible for providing engineering design, development and testing, as well as technical expertise in support of hardware, software and systems for human space flight programs such as space shuttle, International Space Station, and advanced spacecraft for human exploration initiatives. Prior to joining the Johnson team, he served at KSC as the chief of the Shuttle Launch and Landing Division, where he supervised and managed a team of engineers and technical experts in the specialized fields of shuttle ground processing and launch and landing operations. In this role, he also served as the Columbia reconstruction director for the Space Shuttle Program and KSC. During this six-month period, he managed a diverse team of up to 400 engineers, scientists and technicians from multiple NASA field centers, government agencies and contractor organizations. The team was responsible for cataloging, identifying and assembling more than 85,000 pieces of Columbia debris. ["Stephen J. Altemus To Lead New KSC Engineering Organization," **NASA News Release #32-06,** May 8, 2006.]

May 9: NASA steps up shuttle rollout

Discovery will move into Kennedy Space Center's massive assembly building this week, marking a key milestone in preparations for a planned July 1 launch on NASA's second post-Columbia shuttle mission. Secured atop a 76-wheel transporter, Discovery will be backed out of a nearby hangar about 8 a.m. Thursday and escorted to the 52-story Vehicle Assembly Building by technicians and engineers who have readied the orbiter for flight. "It's always nice when the vehicle leaves the hangar," said KSC spokeswoman Jessica Rye. The date and time for the move was selected after a meeting Monday. It had been planned for Friday; if all goes well, the move will take place 24 hours ahead of schedule. The short trip will cap a 263-day stay in the hangar, one that began Aug. 22 after Discovery was ferried back to KSC from Edwards Air Force Base in California. The spaceship landed at the Mojave Desert military base at the end of NASA's first post-Columbia test flight and then was flown back to Florida atop a modified 747 jumbo jet. Once in the assembly building, crane operators will hoist Discovery atop a mobile launcher platform and connect it to an external tank with two attached solid rocket boosters. The assembled shuttle remains scheduled to roll out to launch pad 39B on May 19. A move to the pad then would allow NASA to preserve two weeks of leeway in the schedule for a July 1 launch. The launch window will close July 19. Web posted. (2006). [NASA steps up shuttle rollout [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 7].]

Community Leaders Briefing to Discuss Space Exploration

The 2006 annual Community Leaders Briefing, which will focus on many of the space industry's most important aspects, is set to begin at 8:30 a.m. May 12 at the NASA

Kennedy Space Center Visitor Complex. KSC Director Jim Kennedy will meet with various leaders from throughout Florida to discuss a variety of KSC and NASA activities. Topics will include updates on the Space Shuttle, International Space Station, Launch Services and Constellation Programs. Participants also will discuss KSC's role in continuing the Vision for Space Exploration. Attendees will meet at the Dr. Kurt H. Debus Conference Facility for registration and a buffet breakfast. The briefing will begin at 9 a.m. Following the briefing, guests will have the opportunity to see exhibits at the KSC Visitor Complex and view the latest IMAX movie, "Magnificent Desolation." A variety of community leaders, business executives, state and local government officials and community organizations have been invited. ["Community Leaders Briefing To Discuss Space Exploration on May 12," **NASA Media Advisory #33-06**, May 9, 2006.]

May 11: Discovery cargo transferred to transporter

The prime payload for NASA's second post-Columbia shuttle mission now is resting in a transporter that will haul it out to Kennedy Space Center's launch pad 39B next week. Crane operators in the Space Station Processing Facility hoisted the Leonardo cargo module out of a work stand and then into the payload transporter during the day today. The transporter will head out to the launch pad next Tuesday. Shuttle Discovery is scheduled to join it at the pad on May 19. Web posted. (2006). [Discovery cargo transferred to transporter [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 11].]

May 12: NASA Automated Rocket Safety System Passes Key Test

NASA has successfully demonstrated a new automated system which may enhance launch safety and reduce costs for access to space. The autonomous flight safety system detects when a rocket is flying off course and directs itself to end the flight. The new "self-destruct" system, tested on April 5 during a suborbital flight from White Sands Missile Range, N.M., has the potential to dramatically reduce downrange radar, telemetry and command uplink requirements while enhancing reaction time. The safety system was able to detect the rocket's position and compare it to the projected flight path," said Barton Bull, technology development manager at NASA's Wallops Flight Facility, Wallops Island, Va. It was a very successful test of the prototype." In an operational system, if the onboard computers had detected that the rocket was flying off course and there was the potential of it flying outside the launch range, the vehicle would self-destruct he said. NASA's Kennedy Space Center, Fla., joins Wallops in supporting the project, designed to let errant vehicles use onboard software to end a flight based on self-contained position and attitude sensors. The system will be able to replicate all mission rules available to range safety officers without relying on any commands from the ground. The test incorporated redundant Global Positioning System sensors and used two on-board computer processors. One was loaded with a nominal trajectory and the other was programmed so that a nominal flight would violate safety rules and prompt a self-destruct. The system was not connected to a termination system during the test flight. The safety system functioned and reacted correctly during the entire flight from launch to parachute deployment. The two stage sounding rocket flew to an altitude of 47.5 miles, and the experiment package was safely recovered. The next goal of the project is to complete the design and demonstrate a system compliant with the strict

reliability and redundancy rules required by range safety organizations at NASA and Department of Defense launch ranges. The next test flight of the system is tentatively scheduled for fall. ["NASA Automated Rocket Safety System Passes Key Test," **NASA News Release #33-06,** May 9, 2006.]

Expendable Launch Vehicle Status Report

Mission: Solar Terrestrial Relations Observatory (STEREO); Launch Pad: 17-B, Cape Canaveral Air Force Station, Fla.; Launch Vehicle: Boeing Delta II ; Launch Date: July 22, 2006 ; Launch Times: 3:11 - 3:13 p.m. and 4:19 - 4:34 p.m. EDT. Technicians completed state-of-health testing of the two STEREO spacecraft this week, following their May 3 arrival in Florida. Individual system checkout is under way. The STEREO flight batteries are scheduled to be installed next week. The build-up of the Delta II rocket at Pad 17-B is scheduled to begin during the last week of May. STEREO will use "3D" vision to build a global picture of the sun and its influences. KSC News Center (2006). **Expendable Launch Vehicle Status Report #E06-014** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, May 12].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th ISS Flight (ULF1.1) - Multi-Purpose Logistics Module; Vehicle: Discovery (OV-103); Location: Vehicle Assembly Building; Launch Date: Launch Planning Window July 1-19, 2006; Launch Pad: 39B; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Discovery was moved today from Orbiter Processing Facility Bay 3 to the Vehicle Assembly Building, a major step toward a launch to the International Space Station. Technicians and crane operators began preparations to lift Discovery into the assembly building's High Bay 3 and attach the shuttle to its external fuel tank and twin solid rocket boosters. After final integration, a crawler transporter is scheduled to carry Discovery to the launch pad May 19. Discovery was scheduled to move Thursday, but a sheared left-hand jack screw on the lifting sling in the assembly building postponed the rollover until today. Both the right and left-hand screws were removed and replaced. The replacements were inspected, analyzed, proof loaded and installed on the sling. The payloads that will launch aboard Discovery were loaded into the payload transportation canister this week and are scheduled to roll out to the launch pad on May 16. Discovery's payloads include the Italian-built logistics module, known as Leonardo, which will carry food, clothing, spare parts and research equipment to the station. Other payloads include two cargo carriers which contain heat shield tile samples, a spare pump module and a replacement mobile transporter reel assembly. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S06-016** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006 May 12].]

May 13: Discovery makes its debut

Discovery took a first step toward the launch pad Friday, rolling out of its hangar and into Kennedy Space Center's shuttle assembly building. Mounted atop a 76-wheeled transporter, the winged spaceship emerged from a cocoon of scaffolding, slowly inching out of the hangar as about 200 technicians, engineers, managers and other workers watched from the roadside. "This is huge for us -- especially for the folks working on the

orbiter," said Stephanie Stilson, the NASA manager in charge of ground processing work on Discovery. Added Betty Muldowney, an Orlando resident who manages the hangar for United Space Alliance: "We're cheering the orbiter on. We've done our part, and now it's on to the next phase to get ready for launch." Discovery and seven astronauts are scheduled to launch July 1 on NASA's second post-Columbia test flight, a supply run to the International Space Station. The spaceship will be connected today to an external tank already equipped with twin solid rocket boosters. Five days of testing will follow before the fully assembled shuttle is hauled out to launch pad 39B. The 4.2-mile trip is scheduled to begin at 12:01 a.m. Friday. Muldowney and a team of 350 people in Bay 3 of NASA's Orbiter Processing Facility have been working on Discovery since it rolled into the hangar on Aug. 22, a day after the ship returned to KSC from a California landing site. Their biggest challenge: Replacing 5,104 heat-resistant fabric strips between thermal tiles on the underside of the orbiter. Seeing the finished product after all the extra work was a welcome sight, Stilson said. Web posted. (2006). [Discovery makes its debut [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 13].]

May 15: Delta 4 launch sliding a few days

The return to flight of the Delta 4 rocket looks to be sliding four to five days on the calendar to no earlier than May 24. A technical issue with the rocket's first stage is the culprit, and a final decision about the delay and the new launch date won't be made until sometime later today. The Delta 4 last flew in December 2004, when the first-ever heavy model of the Boeing rocket suffered first-stage performance degradation and left its payload about 10,000 miles short of its intended orbit. A string of technical problems and a lengthy strike by Boeing machinists have contributed to the lingering grounding. NASA's George Diller says the mission, to launch a GOES-N weather satellite, should be reset for either May 24 or May 25. We'll have more details later today once a new date and time are approved. We'll also get more details on the technical concern. Web posted. (2006). [Delta 4 launch sliding a few days [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 15].]

May 16: NASA releases DART report summary

A collision between a small NASA satellite and another spacecraft last year has been blamed on a glitch with the spacecraft's navigation system, compounded by management and training issues, according to a report summary released by NASA late Monday. The Demonstration of Autonomous Rendezvous Technology (DART) spacecraft was launched in April 2005 on a short mission to rendezvous with a defunct small military satellite, MUBLCOM, without human guidance. The mission ended early, though, when DART bumped into MUBLCOM. According to the summary of the mishap investigation board report, glitches in DART's navigation system caused it to inaccurately measure its position and navigation, using up an excessive amount of thruster propellant in the process. Contributing to the failure, the report summary noted, was the "high risk, low budget" nature of the project and inadequate training of the spacecraft team. The full report was not issued by NASA, citing export control issues. Web posted. (2006). [NASA releases DART report summary [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 15].]

May 17: **Super Loki launches from Cape**

A small weather rocket took off from Cape Canaveral Air Force Station today, marking the first of two test flights aimed at proving the 10-year-old rockets are safe to fly as part of a university launch program. The 15-foot Super Loki rocket blasted off about 10 a.m. at Launch Complex 47, which is operated by the Florida Space Authority under a license agreement with the Air Force's 45th Space Wing. A follow-up flight is expected to take place in June. Brevard Community College and the Florida Space Institute plan to use almost 200 Super Loki rockets in a program geared toward training a new generation of aerospace technicians and engineers. Web posted. (2006). [Super Loki launches from Cape [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 17].]

Shuttle cargo heads to pad

The cargo that will be hauled to the International Space Station aboard shuttle Discovery this summer is being transported to launch pad 39B at Kennedy Space Center today. Comprised primarily of an Italian-built moving van filled with supplies and equipment, the payload is nestled inside a specially designed canister that is mounted vertically atop a 48-wheel, self-propelled truck. The diesel-powered transporter departed the KSC Space Station Processing Facility around 9 a.m. The trip to the pad is expected to take a few hours. Still scheduled for launch on July 1, shuttle Discovery will join the payload at the pad on Friday. Web posted. (2006). [Shuttle cargo heads to pad [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 17].]

Liberty Bell 7 lands at Kennedy

Gus Grissom's lost spacecraft, the Liberty Bell 7, is making a return visit to the Kennedy Space Center. The famed spacecraft, which sank to the bottom of the ocean upon completion of the United States' second human space flight in 1961, is part of a traveling museum display. Entitled "The Liberty Bell 7 Recovered," the exhibit will be at the Kennedy Space Center Visitor Complex from May 26 through Sept. 10. The exhibit lets visitors go on a virtual ride into space with Grissom. Later, they get to travel three miles beneath the surface of the Atlantic Ocean for the recovery expedition funded by the Discovery Channel. The Kennedy Space Center Visitor Complex has hosted the traveling exhibit before. When it is at KSC, visitors have the advantage of adding to their trip an up-close look at the historic launch complex from which Grissom (and Shepard before him) launched on a Redstone rocket in the early days of Project Mercury. Web posted. (2006). [Liberty Bell 7 lands at Kennedy [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 17].]

NASA Finalizes Crew For Upcoming Shuttle Missions

NASA has finalized crew assignments for two space shuttle missions targeted for launch in 2007 to continue assembly of the International Space Station. Astronaut John D. Olivas will join the crew of shuttle mission STS-117. Astronaut Tracy Caldwell will join the crew of shuttle mission STS-118. Olivas and Caldwell will be making their first space flights. Astronaut Richard A. Mastracchio, previously assigned to STS-117, has been reassigned to STS-118. Veteran shuttle flier and spacewalker Scott Parazynski, previously assigned to STS-118, has left that crew to prepare for assignment to another mission. With the changes, the STS-117 crew is commanded by Marine Lt. Col.

Frederick W. Sturckow. The mission's pilot is Air Force Col. Lee J. Archambault and the mission specialists are James F. Reilly II, retired Army Col. Patrick G. Forrester, Steven R. Swanson and Olivas. STS-117 will deliver the second starboard truss segment to the space station with the third set of U.S. solar arrays, batteries and associated equipment. STS-118 will be commanded by Navy Cmdr. Scott J. Kelly. The pilot will be Marine Lt. Col. Charles O. Hobaugh. The mission specialists are Canadian Space Agency astronaut Dr. Dafydd R. Williams, educator astronaut Barbara R. Morgan, Mastracchio and Caldwell. STS-118 will deliver to the station the third starboard truss segment; an external stowage platform; and logistics and supplies in a SPACEHAB single cargo module. Olivas was born in North Hollywood, Calif., and raised in El Paso, Texas. He received a bachelor's from the University of Texas-El Paso, a master's from the University of Houston and a doctorate in mechanical engineering from Rice University, Houston. Upon completing his doctorate, Olivas worked as a senior research engineer at NASA's Jet Propulsion Laboratory, Pasadena, Calif. He was selected as an astronaut in 1998. Caldwell was born in Arcadia, Calif. She received a bachelor's from California State University in Fullerton and a doctorate in physical chemistry from the University of California at Davis. She was selected as an astronaut in 1998. Her assignments have included spacecraft communicator in mission control, shuttle flight software verification and support of shuttle launch and landing operations. ["NASA Finalizes Crew For Upcoming Shuttle Missions," **NASA News Release #06-221**, May 17, 2006.]

NASA's Space Shuttle Discovery Cargo Ready for Flight

The payloads that will launch aboard the next space shuttle mission, STS-121, arrived Wednesday at Launch Pad 39-B at NASA's Kennedy Space Center, Fla. Space Shuttle Discovery's cargo includes the Italian-built logistics module Leonardo, which will carry 11 large racks filled with food, clothing, spare parts and research equipment to the International Space Station. Also included in the cargo is the Oxygen Generation System, which can provide enough oxygen each day to support a six-member crew. The system will be operational before the first six-person crew arrives aboard the station in 2009. An integrated cargo carrier will deliver a spare pump module and replacement mobile transporter reel assembly to the station. Another carrier containing pieces of the shuttle's heat-shielding material is also installed in Discovery's payload bay. The material will be used to test heat shield repair methods in orbit during a potential third spacewalk. Discovery's launch to the International Space Station is targeted for July 1 in a launch window that extends to July 19. During the 12-day mission, crew members will test new hardware and techniques to improve shuttle safety. ["NASA's space Shuttle Discovery Cargo Ready for Flight," **NASA News Release #06-223**, May 17, 2006.]

May 18: NASA Set to Launch Lunar Reconnaissance Orbiter in 2008

After successful completion of its mission confirmation review on Wednesday, May 17, NASA's Lunar Reconnaissance Orbiter project has been given the authority to proceed to the implementation phase. The confirmation review represents NASA's formal decision for authorizing additional work and sets the project's cost estimate. The mission was deemed to be within budget and on schedule to launch in October 2008. After a 30-year hiatus, the orbiter represents NASA's first step towards returning humans to the moon. The spacecraft will spend an unprecedented year mapping the moon from an average

altitude of approximately 30 miles. It will carry six instruments and one technology demonstration to conduct investigations specifically targeted at preparing for future human exploration. The orbiter is being built at NASA's Goddard Space Flight Center in Greenbelt, Md. The instruments are being provided by various organizations throughout the U.S. and one in Russia. The instruments will generate a global map of the moon; to determine which potential landing sites are free from hazards; to measure light and temperature patterns at the moon's poles; to search for potential resources, such as water; and to assess the deep-space radiation environment and its potential effects on humans. The next spacecraft milestone is the critical design review, scheduled for later this year. This review represents the completion of detailed system designs and marks the transition into the manufacturing, assembly, and integration phase of the mission development cycle. ["NASA Set to Launch Lunar Reconnaissance Orbiter in 2008," **NASA News Release #06-224**, May 18, 2006.]

NASA Announces New Weather Satellite Launch Date

NASA announced the launch date for a weather satellite that will provide timely environmental information to meteorologists and the public. The Geostationary Operational Environmental Satellite-N, known as GOES-N, will launch Wednesday, May 24, from Launch Complex 37 at Cape Canaveral Air Force Station, Fla. The launch window is from 6:11 to 7:11 p.m. EDT. NASA TV will carry the launch live. GOES-N joins a system of weather satellites that graphically display the intensity, path and size of storms. Early warning about severe weather enhances the public's ability to take shelter and protect property. GOES-N will be launched on a Boeing Delta IV rocket under a commercial license with the Federal Aviation Administration. The satellite will be turned over to NASA after Boeing completes a successful checkout. The National Oceanic and Atmospheric Administration manages the GOES program, establishes requirements, provides all funding and distributes environmental satellite data for the United States. NASA's Goddard Space Flight Center, Greenbelt, Md., procures and manages the development and launch of the satellites for NOAA on a cost reimbursable basis, and Boeing built it. For more information about GOES-N, visit: ["NASA Announces New Weather Satellite Launch Date," **NASA Media Advisory #M06-088**, May 18, 2006.]

NASA Announces 2006 Fellowship Awards

NASA has named its 2006 awardees for the NASA Administrator's Fellowship Program, an effort to ensure the strength of our nation's scientific and technical workforce. The program was started nine years ago to help minority institutions respond to NASA's overall education, research and development mission. It's designed to enhance the professional development of NASA employees and faculty of minority-serving institutions. The fellowship offers access to NASA's internal and informal information networks. It also expands knowledge of NASA's technical and scientific needs, and provides opportunities for institutions to share information about their specific capabilities and technologies. The 2006 fellowship recipient for KSC is Dawn M. Elliott, Ph.D., NASA Kennedy Space Center, Fla. Seventy-one fellows have been selected since the program's inception. Participants have been instrumental in securing individual and institutional research awards and mentoring students to pursue NASA related research and work at agency centers. The program is managed and administered by the United

Negro College Fund Special Programs Corporation in Fairfax, Va., for the NASA's Office of Education. ["NASA Announces 2006 Fellowship Awards," **NASA News Release #06-225**, May 18, 2006.]

NASA's Exploration Systems Progress Report

NASA has chosen the RS-68 engine to power the core stage of the agency's heavy lift cargo launch vehicle intended to carry large payloads to the moon. The announcement supersedes NASA's initial decision to use a derivative of the space shuttle main engine as the core stage engine for the heavy lift launch vehicle. The cargo launch vehicle will serve as NASA's primary vessel for safe, reliable delivery of resources to space. It will carry large-scale hardware and materials for establishing a permanent moon base, as well as food, fresh water and other staples needed to extend a human presence beyond Earth orbit. Recent studies examining life-cycle cost showed the RS-68 is best suited for NASA's heavy-lift cargo requirements. The decision to change the core stage engine required an increase in the size of the core propulsion stage tank, from a 27.5-foot diameter tank to 33-foot diameter tank, to provide additional propellant required by the five RS-68 engines. The RS-68 is the most powerful liquid oxygen/liquid hydrogen booster in existence, capable of producing 650,000 pounds of thrust at sea level. In contrast, the space shuttle main engine is capable of producing 420,000 pounds of thrust at sea level. The RS-68, upgraded to meet NASA's requirements, will cost roughly $20 million per engine, a dramatic cost savings over the shuttle main engine. The RS-68 is used in the Delta IV launcher, the largest of the Delta rocket family. ["NASA's Exploration Systems Progress Report," **NASA News Release #06-226**, May 18, 2006.]

May 19: **USA expects to get smaller after shuttles**

The company that operates NASA's space shuttles faces job cuts, as the fleet approaches its 2010 retirement, but United Space Alliance's chief executive says he does not know how many people will be impacted or when reductions might begin. "We're going to be a smaller company," United Space Alliance President and Chief Executive Officer Mike McCulley said during a wide-ranging discussion with the Florida Today editorial board Thursday. McCulley promised to be straightforward with workers, providing them whatever information he has about potential reductions in force early enough to help people plan. Some, but not all, of the expected reductions would be mitigated by attrition as people retire or otherwise leave the company. Many of the company's approximately 10,000 workers already are asking questions about potential layoffs and what the future holds for the company. The problem: McCulley doesn't know yet. He could not even offer a range of the company's size post-2010. The reason things remain uncertain is that key decisions still are being made about how NASA will transition from the shuttle to a replacement Apollo-like spacecraft known as the Crew Exploration Vehicle. For instance, if one of the orbiters retires in 2008, one of the hangar-like Orbiter Processing Facilities could be shut down. It's unclear how many United Space Alliance staffers no longer would be needed or how soon after that. To be sure, by 2010, workers on certain tasks no longer will be needed. An example: The new vehicle won't use the same kind of heat-shielding tiles and blankets used on the shuttles. Another uncertainty: While NASA's goal is to minimize the gap between shuttle retirement and the buildup to the first Crew Exploration Vehicle flights, it's unclear how long that lapse in human

spaceflights might be or how many workers from the shuttle program can transition to the early work on the replacement vehicles and related hardware at KSC. The company is allied with both of the contractor teams vying for the Crew Exploration Vehicle contract. United Space Alliance, a 50-50 partnership of The Boeing Co. and Lockheed Martin Corp., is attempting to position itself as being more than the operator of a new vehicle. Web posted. (2006). [USA expects to get smaller after shuttles [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 19].]

Expendable Launch Vehicle Status Report

Mission: Solar Terrestrial Relations Observatory (STEREO) ;Launch Pad: 17-B, Cape Canaveral Air Force Station, Fla.; Launch Vehicle: Delta II; Launch Date: July 22, 2006; Launch Times: 3:11 - 3:13 p.m. and 4:19 - 4:34 p.m. EDT. Technicians are testing individual STEREO systems on both the "A" and "B" spacecraft. The flight battery for spacecraft A was installed this week. Technicians are expected to install the battery for spacecraft B next week. In addition to testing, work planned over the next few weeks includes solar array installation and integration of the high-gain communications antenna. The build-up of the Delta II rocket at Pad 17-B is scheduled to begin on June 1 with the first stage. Pad workers will start to erect the nine solid rocket boosters on June 2. The second stage will be hoisted into position and mated to the first stage on June 20. The crew will raise the 10-foot fairing into the pad clean room on June 21. STEREO will build a three-dimensional, global picture of the sun and study the sun's influence on Earth. KSC News Center (2006). **Expendable Launch Vehicle Status Report #E06-015** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, May 19].]

NASA's Space Shuttle Discovery Moves To Launch Pad

The Space Shuttle Discovery stands at its launch pad at NASA's Kennedy Space Center, Fla. The shuttle arrived at 8:30 p.m. EDT Friday on top of a giant vehicle known as the crawler transporter. "Rollout of Space Shuttle Discovery signifies the last major processing milestone in preparation for our next mission, STS-121," said Space Shuttle Program Manager Wayne Hale. "The entire team has worked tremendously hard to ensure we were prepared to move to the pad, and we are excited to continue moving toward a July launch." The crawler transporter began carrying Discovery out of Kennedy's Vehicle Assembly Building at 12:45 p.m. Friday. The crawler's maximum speed during the 4.2-mile journey was less than 1 mph. While at the pad, the shuttle will undergo final testing and hardware integration prior to launch, as well as a "hot fire" test of the auxiliary power units to ensure they are properly functioning. The rotating service structure then will be moved back around the vehicle to protect it from potential damage and the elements. Discovery's launch to the International Space Station is targeted for July 1, with a launch window that extends until July 19. During the 12-day mission, Discovery's crew will test new hardware and techniques to improve shuttle safety, as well as deliver supplies and make repairs to the station. Another upcoming milestone is the terminal countdown demonstration test, set for June 12 through 15. This countdown dress rehearsal provides each shuttle crew with the opportunity to participate in various simulated countdown activities, including equipment familiarization and emergency evacuation training. ["NASA's Space Shuttle Discovery Moves To Launch Pad," **NASA News Release #S06-016**, May 19, 2006.]

May 22: **Shuttle engine test preps under way**

Preparations for a key prelaunch engine test are under way at Kennedy Space Center today as NASA marches toward the planned July 1 launch of Discovery on the agency's second post-Columbia test flight. The Flight Readiness Test involves gimbaling the engines and cycling valves within them. The idea is to make certain the engines can be steered in flight and that valves open and shut when commanded to do so. Set for Tuesday, the test will follow checkout this past weekend of the shuttle's three Auxiliary Power Units. The units provide the hydraulic power needed to steer the shuttle's main engines in flight and operate its wing flaps, rudder speedbrake, landing gear and nosewheel steering system during atmospheric reentry and landing. All three units passed the routine prelaunch checkout. Web posted. (2006). [Shuttle engine test preps under way [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 22].]

Wednesday's launch weather forecast

The chance of acceptable launch weather is 60 percent on Wednesday for a planned Delta 4 launch of a GOES-N weather satellite. The weather forecast issued today by the 45th Weather Squadron. There are concerns about isolated storms, clouds within 10 miles of Pad 37B and potentially strong winds that could damage the launch vehicle or spacecraft. If the launch must wait one extra day, the conditions worsen. There is only a 40 percent chance of acceptable launch weather Thursday. For now, launch remains set sometime between 6:11 p.m. and 7:11 p.m. on Wednesday. Web posted. (2006). [Wednesday's launch weather forecast [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 22].]

May 22: **Space Shuttle Processing Status Report**

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. On May 19, the crawler transporter carrying Space Shuttle Discovery left the Vehicle Assembly Building at 12:45 p.m. on its 4.2-mile journey to Launch Pad 39B and arrived nearly eight hours later. Technicians performed a "hot fire" test of the auxiliary power units on Saturday to ensure they are properly functioning. Later that evening, the rotating service structure was moved back around the vehicle to protect it from potential damage and the elements while at the pad. Today, the launch team at the pad began preparing for the flight readiness test of the space shuttle main engines. Liquid hydrogen and liquid oxygen system leak checks are scheduled for this afternoon. The test will ensure the engine hydraulics are working properly. The payload arrived at the pad last week. Technicians will open the payload bay doors on the orbiter this afternoon and the payload will be transferred into the payload bay on Tuesday. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-052206** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, May 22].]

May 23: Communication key at KSC

Kennedy Space Center has been preparing for this hurricane season since 2004. NASA always prepares, but the triple whammy of Charley, Frances and Jeanne ripped off wall panels and roofs and pointed out many of the center's weaknesses. Since then, KSC has made a concerted effort to get rid of vulnerable "temporary" structures that have been around for decades. More than 3,000 people were in trailers and boxcars at one time. "We've almost eliminated the problem," NASA spokesman George Diller said. About a hundred trailers were removed. Now, there are fewer than 100 people in trailers, thanks to the new Operations Support Building 2 and other structures. "We've been trying to harden facilities," said Emergency Preparedness Officer Wayne Kee. The center got $126 million in federal funding for hurricane repairs. The money contributed to improvements to roofs and other structures at the center, where some 15,000 people work. Among the structures that have had repairs is the Vehicle Assembly Building, which had holes in its walls after Frances and Jeanne. Although it's in better shape, Kee said he couldn't rule out the loss of more panels in a hurricane. When a storm approaches, forecasters and officials meet frequently to determine the status of KSC and Cape Canaveral Air Force Station. The base goes through levels of hurricane alert that enable people to get ready in a methodical fashion. Even before the season, workers do a debris inspection and gather up discarded and loose items. The base's Emergency Operations Center is located in the Launch Control Center. Officials from the Air Force's 45th Space Wing also ride out the storm there. People in the center are able to communicate with county emergency managers, and they have a ham radio as a backup in case other links fail. "Communication's a big thing, staying in touch," Kee said. "If we're going to survive to operate after the storm we have to be prepared before it." Web posted. (2006). [Communication key at KSC [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 23].]

May 24: Tower back, clock ticking toward Delta 4 launch

The countdown clock has started and the rusty-orange and white Delta 4 rocket can clearly be seen now that its cocoon of work platforms has backed away from the pad. This will be the first Delta 4 launch since December 2004, when a heavy version of the rocket lifted off successfully but failed to get its payloads to target orbits. The primary concern today: a mediocre weather forecast saying there's a 40 percent of unacceptable launch conditions today. One slight improvement is that, if there is a 24-hour delay, conditions have gotten a little better. There's a 40 percent chance of unacceptable conditions Thursday (it had been 60 percent up until this morning). The mission will place into orbit the first of a series of three new GOES weather satellites. The Delta 4 rocket is due to lift the Geostationary Operational Environmental Satellite during a window that extends from 6:11 to 7:11 p.m. Wednesday. During a months-long delay, Boeing removed the satellite from the rocket and checked it out in the Astrotech facility in Titusville. It was deemed in good health and ready for its launch from Cape Canaveral. Web posted. (2006). [Tower back, clock ticking toward Delta 4 launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 24].]

Next-generation weather satellite takes flight

Boeing launched an unmanned Delta rocket carrying a new U.S. weather satellite toward orbit Wednesday, the first with the ability to keep an eye on developing storms even when the solar-powered craft is in Earth's shadow. The Boeing rocket carrying the satellite blasted off at 6:11 p.m. EDT from the Cape Canaveral Air Force Station, following a 15-month stay at the launch pad. The mission was delayed due to technical problems with the rocket and the Geostationary Operational Environmental Satellite, and because of a machinists' strike. The spacecraft is the first of three upgraded GOES weather satellites to be launched over the next few years. The National Oceanic and Atmospheric Administration will use them to provide imagery and data for weather forecasting in North America and the rest of the Western Hemisphere. The new satellite, designated GOES-13, will be the first to have enough battery power to continue data collection and transmission around the clock, even when the solar-powered craft is in Earth's shadow. Unlike its predecessors, the spacecraft also will be able to use sound wave technology to analyze the moisture content of storms. With the 2006 Atlantic hurricane season starting on June 1, forecasters are eager to get the new spacecraft into orbit and ready to work as a backup in case one of the currently operating, though aging, GOES satellites fails. After reaching its operational altitude of 22,300 miles above Earth's equator, the satellite will be tested for about six months to make sure its instruments are working properly. Then it will be put into orbital storage until it is needed to replace one of the three now in use. Though GOES-13 is primarily intended to watch for storms, hurricanes and other threatening weather on Earth, it also has sensors to monitor the Sun for flares and other disruptions. Solar activity can knock out communication and navigation satellites as well as pose a threat to astronauts in space. Web posted. (2006). [Next-generation weather satellite takes flight [Online]. Available WWW: http://www.cnn.com/ [2006, May 24].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Space Shuttle Discovery remains at Launch Pad 39B, and technicians continue performing system testing while the vehicle is powered. The external tank camera test was successfully completed, and the lens cap has been reinstalled until launch. Tuesday, the launch team conducted the flight readiness test of the space shuttle main engines, as well as the liquid hydrogen and liquid oxygen system leak checks. The test ensures the engine hydraulics are properly working. Technicians also are preparing for the gaseous and liquid hydrogen and oxygen leak checks of the power reactant storage distribution system. The distribution system will be loaded with hydrogen and oxygen next week. The system provides the fuel for the forward reaction control system and the orbiter maneuvering system pods. The orbiter payload bay doors were opened Tuesday in preparation for the payloads to be installed today. The team continues with other activities including the orbiter weather protection system's activation and the completion of validations of the sound suppression and Firex systems. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-052406** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, May 24].]

NASA Set to Welcome European Space Station Component

The European Space Agency's research laboratory, designated Columbus, will arrive at NASA's Kennedy Space Center in Florida on May 30. There it will be prepared for delivery to the International Space Station on a future space shuttle mission. NASA will hold a series of media events from May 31 to June 2 in conjunction with the lab's arrival. Columbus is being flown to Kennedy from its manufacturer in Germany. Columbus will expand the research facilities of the station and provide researchers with the ability to conduct numerous experiments in the area of life, physical and materials sciences. ["NASA Set to Welcome European Space Station Component," **NASA Media Advisory #M06-092**, May 24, 2006.]

May 25: Couple finds Uranium in an old NASA tool box

A Putnam County couple got a startling surprise when they found a piece of depleted uranium at the bottom of a box of tools. Susan and Lance Greninger called NASA because they had bought the box at an auction near the Kennedy Space Center. A Hazmat team from the fire department examined the metal and said it was a solid piece of depleted uranium about the size of a child's fist. They closed the road in the front of the home for about five hours just to be safe. The state Bureau of Radiation Control retrieved the cylinder. They said the piece is toxic, but does not pose a health hazard to the community. They did say that if the couple had walked around the house with the uranium in their pocket, they would get radiation sickness. Authorities said the piece may have been part of a tool. Depleted uranium can be used as a radiation shield and is sometimes used as a ballast in commercial airliners and ships. Web posted. (2006). [Couple finds Uranium in an old NASA tool box [Online]. Available WWW: http://www.tampabays10.com/ [2006, May 25].]

May 26: Atlantis assembly to begin next week

NASA next week will begin assembly of shuttle Atlantis for a planned Aug. 28 launch on a mission aimed at resuming construction of the half-built International Space Station. Set to begin June 2, the assembly work also is timed to enable NASA to launch Atlantis on a mid-August rescue mission should serious problems crop up during a test flight aboard Discovery in July. The assembly work will begin in high bay three of the Kennedy Space Center Vehicle Assembly Building, where workers will start stacking two solid rocket boosters on a mobile launcher platform. Now in a nearby hangar, Atlantis is to be rolled into the 52-story assembly building on July 25. Crane operators then will hoist the spaceship atop the mobile launcher platform and connect it to an external tank outfitted with the two boosters. The tank for the mission is due to arrive at KSC on June 5. The prime payload for the mission -- a port-side station truss segment and associated solar arrays -- is to be moved to the launch pad on July 27. Mounted atop a giant tracked transporter, the fully assembled shuttle will roll out to the pad on Aug. 1. The astronauts who will fly the mission will be at KSC for a practice countdown on Aug. 8. The crew includes commander Brent Jett, pilot Chris Ferguson and four mission specialists: Joe Tanner, Dan Burbank, Heidemarie Stefanyshyn-Piper and Canadian astronaut Steve MacLean. Web posted. (2006). [Atlantis assembly to begin next week [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 26].]

KSC Close-Up: Cargo loaded into Discovery

An Italian "moving van" was loaded into the payload bay of shuttle Discovery this week for a planned July 1 launch on a test flight that also will serve as a supply run to the International Space Station. Dubbed Leonardo, the cylindrical cargo carrier holds about two tons of food, water, supplies and other equipment, including a U.S. oxygen generation system for the station. Technicians used a specially designed ground-handling mechanism to transfer the module and other cargo elements into the 60-foot-long bay from a large payload canister. The work was done in the payload changeout room at Kennedy Space Center's Launch Complex 39B. Web posted. (2006). [KSC Close-Up: Cargo loaded into Discovery [Online]. Available WWW: http://www.floridatoday.com/ [2006, May 26].]

May 26: Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Technicians continue performing system testing on Space Shuttle Discovery while the vehicle is powered at Launch Pad 39B. Auxiliary power units No. 1 and 3 connections and leak checks were completed, with No. 2 in progress. The orbiter payloads were installed in Discovery's payload bay on Wednesday. Discovery's payloads include the Italian-built logistics module Leonardo, which will carry food, clothing, spare parts and research equipment to the International Space Station. Other payloads include two cargo carriers which contain heat shield tile samples, a spare pump module and a replacement mobile transporter reel assembly. There is no significant holiday weekend work planned. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, technicians are carrying out powered-up system testing on Atlantis for its mission to the International Space Station. Gaseous nitrogen leak checks are finished in the orbiter's mid-body. The remote manipulator system, or "shuttle arm," was installed and functional testing has been completed. Workers also finished testing the manipulator positioning mechanisms, which are the pedestals that hold the arm in place in the payload bay during launch and landing. On Wednesday, the crawler transporter moved mobile launcher platform No. 2 into high bay 3 of the Vehicle Assembly Building in preparation for stacking operations to begin for the STS-115 mission. The first solid rocket booster segment is scheduled to be lifted into the high bay next week. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Following external airlock installation, the team completed connector mates on Thursday and pick up with the docking system functional next week. Main propulsion system leak and functional testing continues. Ku-band communications and radar system testing has begun and will be finished following the docking system functional being completed. Owner-press-release. (2006). **Space**

Shuttle Processing Status Report #S-052606 [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, May 26].]

Expendable Launch Vehicle Status Report

Mission: Solar Terrestrial Relations Observatory (STEREO); Launch Pad: 17-B; Cape Canaveral Air Force Station, Fla.; Launch Vehicle: Boeing Delta II; Launch Date: July 22, 2006; Launch Times: 3:11 - 3:13 p.m. and 4:19 - 4:34 p.m. EDT. Technicians are testing individual STEREO systems on both the "A" and "B" spacecraft. Workers cleaned the black light on spacecraft "A," completed vertical alignments, and installed the solar array ordnance. They also attached the high gain antenna to the spacecraft's rotation fixture, and closed out blankets. Technicians installed the batteries on the "A" and "B" spacecraft last week. In addition to testing, upcoming work for spacecraft "B" includes solar array installation and integration of the high-gain communications antenna in mid-June. The build-up of the Delta II rocket at Pad 17-B is scheduled to begin on June 1 with the first stage. Pad workers will start to erect the nine solid rocket boosters on June 2. The second stage will be hoisted into position and mated to the first stage on June 20. The crew will raise the 10-foot fairing into the pad clean room on June 21. STEREO will build a three-dimensional, global picture of the sun and study the star's influence on Earth. For more information, visit: KSC News Center (2006). **Expendable Launch Vehicle Status Report #E06-016** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, May 26].]

May 31: Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles . Over the holiday weekend, technicians performed no significant processing work at the launch pad. Connections and leak checks of auxiliary power units No. 1, 2 and 3 are complete. Thursday morning, workers will begin prelaunch propellant loading of the monomethyl hydrazine and nitrogen tetroxide for the forward reaction control system and the orbital maneuvering system pods. Reaction control system quick disconnect mates and interface leak checks were completed May 26. Following payload installation into the payload bay last week, the payload bay and payload changeout room doors were closed on Friday. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-053106** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, May 31].]

JUNE 2006

June 1: Columbus lab lifted into place at SSPF

A gigantic crane hoisted the Europeans' space lab out of a shipping container early this morning at the Space Station Processing Facility at the Kennedy Space Center. The dangling module, about the size of a double-decker bus, then "flew" across the open bay of the processing facility and into a work stand where it will spend about 15 months being tested and readied for its late 2007 flight aboard the space shuttle. The early-morning operation brought out top managers and their support teams from NASA and the European Space Agency, a collaboration of 14 countries that funded and developed what will be one of the orbiting outpost's three laboratory modules. NASA plans a ceremony Friday to celebrate the module's arrival at the launch site. Web posted. (2006). [Columbus lab lifted into place at SSPF [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 1].]

Shuttle passes debris review, on track for July launch

The space shuttle program held a debris verification review May 31 that uncovered "no showstoppers," Program Manager Wayne Hale said, clearing the next hurdle for Discovery's planned July 1 liftoff on mission STS-121. The debris review was added in the wake of the Columbia accident to gauge the shuttle team's progress in eliminating potentially dangerous sources of foam debris that could strike the orbiter during ascent. The biggest change made to Discovery's tank for STS-121 is the removal of the Protuberance Air Load (PAL) ramp - a large buildup of foam designed to protect a cable tray on the tank from aerodynamic buffeting. The shuttle program's next major review is a design verification scheduled for June 7 that will make sure the shuttle can safely fly without the PAL ramp. NASA still expects to see foam come off during Discovery's launch, but nowhere near the size of the 1.67-pound piece that doomed Columbia or the one- pound piece that was shed from the PAL ramp during STS-114 last year. Hale said he expects to see numerous foam losses of less than one-tenth of a pound. The next major sources of concern for foam debris on the tank are its ice/frost ramps. These are ice-preventing buildups of foam that cover metal brackets connecting pressurization lines to the tank. There are a total of 34 ice/frost ramps. The biggest piece of foam NASA has observed coming loose from one of these ramps weighed an estimated 0.09 pounds, Hale said during a press conference at Kennedy Space Center May 31. For analytical purposes, NASA is testing up to 0.2-pound pieces of foam to determine the range of potential damage. Although it is unlikely a piece of foam could come off one of the ramps and strike the orbiter's wing leading edges - the type of damage that brought down Columbia - NASA is concerned that it could hit an aft tile and in a worst-case scenario produce damage that might prevent the shuttle from safely re-entering the atmosphere. Nonetheless, a month ago NASA decided to fly Discovery's ice/frost ramps as is to avoid making too many changes to the tank at once. The PAL ramp removal is the biggest aerodynamic change made to the shuttle stack in its 25 years of operations, Hale said, and such changes are best made one at a time. NASA has experimented with a prototype redesigned ice/frost ramp that did not perform well in wind tunnels, Hale said. He expects the program will move to an "interim" redesign that places insulators between the upper and lower parts of the bracket before settling on a final redesign that could replace the

brackets with a less thermally conductive material such as titanium that requires no insulation at all. This final ice/frost ramp redesign probably won't be available until six to eight missions further on in the sequence, Hale said. NASA hopes to fly the shuttle three times before the end of the year and 16 more times total to complete the International Space Station. Meanwhile, shuttle Atlantis is scheduled to roll out to the launch pad on July 25 in anticipation of the next scheduled flight, STS-115, set to launch Aug. 28. If Discovery experiences an emergency in orbit, NASA also is prepared to launch Atlantis on a rescue mission as early as Aug. 18, Launch Director Mike Leinbach said. The shuttle has a comfortable margin of two weeks worth of contingency processing time, Leinbach said. The team is troubleshooting a problem with an electrical bus in the left-hand solid rocket booster, but this is "no big deal" and not expected to affect the overall launch schedule, he said. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Shuttle passes debris review, remains on track for July launch," [Electronic]. Vol. 218, No. 43, [June 1, 2006.].]

June 2: **LockMart snags Mars laboratory launch**

A science lab that will carry a large rover to the surface of Mars will be launched from Cape Canaveral aboard a Lockheed Martin Atlas 5 rocket in the fall of 2009, NASA officials said today. In a deal valued at nearly $200 million, Lockheed Martin Commercial Launch Services Inc. will send up the Mars lab from Launch Complex 41 at Cape Canaveral Air Force Station. The firm, fixed-price contract for $194.7 million was awarded by Kennedy Space Center, which operates a NASA directorate that oversees expendable launch vehicle services for agency space science and planetary spacecraft. The Mars Science Laboratory will be the most advanced spacecraft the United States ever has launched to the red planet. The six-wheeled rover hitching a ride with it will explore the surface of Mars for two years. Its mission: to examine sites where water and other building blocks of life might exist. Web posted. (2006). [LockMart snags Mars laboratory launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 2].]

Shuttle drill keeps ground crew fresh

Simulation makes sure engineers know how to handle any situation. Although the space shuttle lost two engines three minutes after launch Friday morning and its top two emergency landing sites were shrouded in clouds, the seven-member orbiter crew landed safely on a runway in the Portuguese Azores. The orbiter was recovered and the crew was unharmed; it's hard to improve those results on an aborted mission, even if the mission is make-believe. Every 18 months, NASA conducts contingency shuttle simulations in which engineers and project managers from Kennedy, Johnson and Marshall Space Flight centers work a pretend emergency to hone their crisis communication skills. During Friday's simulation, the space shuttle team practiced how it would react if the vehicle lost a couple of engines and landing sites in Spain weren't usable because of weather. "The simulation team tries to think up a realistic but difficult scenario to throw at the space shuttle team," said John Chapman, external tank project manager. "We had some glitches in our communication, with cross-talk between channels. Mechanical things, things we can fix. After the four-hour simulation/debriefing was finished, Chapman said the goal of the simulation isn't to understand why the crisis happened or even to have solutions quickly at hand. The goal is to make sure that on

launch day, they have the right people in place who can. For instance, when the orbiter landed on the Lajes Field runway 900 miles west of Portugal during the simulation, it had 6,000 feet of runway behind it. One of the key questions was if that was enough room to land support planes that needed to come in to take care of the crew and the vehicle. "We didn't need to know the answer to that question," Chapman said, "but we needed to know that the person who could answer it was standing by." Although insulating foam has been the source of a shuttle disaster and near-disaster in recent years, foam played no part in the simulation. The team on the ground had no idea what problem was going to be thrown at them, or when it would be thrown. With the shuttle, there are countless things that could go wrong. "When you go from being bolted to the ground in Florida to going 17,500 miles per hour eight and a half minutes later, you know it must be a complicated system," Chapman said. "Then, on the return, you have to decelerate from 17,500 mph to zero on a runway. It's a complicated vehicle and a complicated system that runs it." The space shuttle Discovery is scheduled for liftoff on July 1, when it will take seven crew members to the International Space Station. One will be left behind to work at the space station. Two more shuttle launches are planned this year. Web posted. (2006). [Shuttle drill keeps ground crew fresh [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 3].]

NASA Welcomes European Space Station Module

NASA is celebrating the arrival of an important component to the International Space Station, the Columbus research laboratory. Columbus is the European Space Agency's primary contribution to the station. It arrived at NASA's Kennedy Space Center, Fla., Tuesday from Germany. Over the past week, it was unloaded from its transport aircraft and taken to its temporary home in Kennedy's Space Station Processing Facility, where it will be prepared for launch. It was welcomed Friday in a ceremony attended by guests from both sides of the Atlantic. Columbus will expand the research facilities of the station, providing researchers the ability to conduct a variety of experiments in the area of life, physical and materials sciences. It was manufactured by the European Aeronautic Defence and Space (EADS) company in Bremen, Germany, and Alcatel Alenia Space in Turin, Italy. It will launch aboard the space shuttle, on the seventh of the shuttle's upcoming missions to the station. "The arrival of Columbus is a major milestone in moving forward to complete the station,"said Michael Suffredini, NASA's space station program manager. "The delivery of Columbus to Kennedy to begin processing for flight signifies the strong international partnership and planning required for the operation of the station." The module has the capability to hold up to 10 payload facility racks of experiments. Each rack provides independent controls for power and cooling and communication links to researchers on Earth. In addition, four exterior mounting platforms will enable the station crew to conduct experiments outside the module. The operations center for the Columbus laboratory is located in Oberpfaffenhofen, Germany, and will serve as the primary control center for the science to be performed in the laboratory. ["NASA Welcomes European Space Station Module," **NASA News Release #06-232**, June 2, 2006.]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Discovery was powered up to support the prelaunch loading this week of hypergolic propellants into the forward and aft reaction control system and the orbital maneuvering system pods. Fuel loading for the orbiter's auxiliary power units is scheduled for the weekend. Testing of the reaction jet driver - electrical control system for the reaction control system jets - was successfully completed. The loading of hypergolic fuel into the solid rocket booster hydraulic power units is scheduled for next week. On Monday, the payload bay doors will be opened for payload testing and sensor installation in the Orbiter Boom Sensor System. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, Atlantis was powered up this week to support payload testing. Early in the week, the auxiliary power controller unit verification testing was successfully completed. Preparations for installing engine No. 3 are finished, with installation scheduled for Monday. Engines No. 1 and No. 2 already are in place on the orbiter. On Thursday, stacking for STS-115 began with the transfer of the right aft booster segment from the Rotation Processing and Surge Facility to the Vehicle Assembly Building, where it was lifted into high bay 3 and placed on mobile launcher platform No. 2. The left aft booster was transported to the Vehicle Assembly Building and lifted into high bay 3 on Friday. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Main propulsion system leak and functional testing continues, and the potable water leak checks also are ongoing. Technicians are performing tests and checkouts of the manipulator positioning mechanisms prior to installing the Orbiter Boom Sensor System. The manipulator positioning mechanisms are the pedestals that support the boom inside the payload bay. On Thursday, workers finished installing hardware in the rudder speed brake, allowing installation of thermal blankets to begin on the brake. The orbiter's drag chute was installed and the drag chute doors will be installed today. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-060206** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 2].]

June 4: **Moon missions require facelift**

NASA soon will decide how to start converting Kennedy Space Center back into a moonport, narrowing options for launch pads needed to stage human expeditions to the lunar surface. The transformation required to launch two new rockets could be subtle. Or it could be sweeping. A clearer picture will emerge in coming weeks, but this much is certain: The choices will change the face of NASA's prime launch operations center for decades. "This is a big step," said John "Tip" Talone, director of the Constellation Project Office at KSC. "We're going to go set in stone how we're going to design the facilities and how we're going to install the systems to support these vehicles. It's not an inconsequential thing." In fact, he said, the decisions would put NASA "on a 30- to 40-

year irreversible course." Coming up first: The selection of a pad for a Crew Launch Vehicle. The rocket will launch new capsule-like spacecraft and astronauts on missions to the International Space Station, the moon and ultimately Mars. Among options under consideration: modifying one of NASA's twin shuttle launch complexes -- either pad 39A or 39B. A new pad also could be built. Launch Complex 40, an abandoned Titan rocket pad at nearby Cape Canaveral Air Force Station, could be converted. But pad 39B appears to be the leading candidate. A May 12 forecast from the KSC Procurement Office indicates NASA is considering awarding contracts in 2007 to demolish the launch tower and a 100-foot-tall rotating service structure at the pad. Separate contracts might be awarded to modify heating, ventilation, air conditioning, mechanical, electrical and plumbing systems at the pad. Also on tap: modifications to a system that floods the pad with water during launch to prevent acoustical damage to rockets and payloads. NASA Shuttle Program Manager Wayne Hale said pad 39B could be handed over for modifications next spring. Ongoing refurbishment work at pad 39A will be completed by then, making it available for shuttle launches again. The timing of any such handover could ride on a pending NASA decision whether to launch a Hubble Space Telescope servicing mission before the shuttle is retired in 2010. Another factor: whether NASA chooses to have a second shuttle ready to fly a rescue mission should something go awry on a Hubble flight. That's because astronauts servicing the Hubble would not be able to reach the International Space Station and take shelter there should something go wrong with the shuttle. The station flies in a completely different orbit than Hubble, so a crippled shuttle would lack the fuel needed to get there. What's more, the shuttle cannot remain in orbit longer than two to three weeks. Consequently, NASA would have days, not months, to launch a rescue mission. Shuttles "don't have a lot of linger time in orbit," Hale said. "So you almost literally have to have a rescue mission on the launch pad when you launch to Hubble." Web posted. (2006). [Moon missions require facelift [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 4].]

NASA trying to head off Shuttle launch delay

STS-115's launch date could slip, should NASA fail to find a solution to the continuing problems with ET-118, which is having processing issues at the Michoud Assembly Facility (MAF) in New Orleans. A series of high level teleconferences took place over the weekend, as concerns grow over the evaporation of contingency days for the second launch of 2006, set to see Shuttle Atlantis re-start International Space Station (ISS) assembly missions. Web posted. (2006). [NASA trying to head off Shuttle launch delay [Online]. Available WWW: http://www.nasaspaceflight.com/ [2006, June 4].]

June 5: NASA Announces Distribution of Constellation Work

NASA announced Monday agency center responsibilities associated with the Constellation Program for robotic and human moon and Mars exploration. This distribution of work across NASA's centers reflects the agency's intention to productively use personnel, facilities and resources from across the agency to accomplish the Vision for Space Exploration. "Our past experiences have provided the foundation to begin shaping the space exploration capabilities needed to create a sustained presence on the moon and on to Mars," said Scott Horowitz, associate administrator for NASA's Exploration Systems Mission Directorate. "Our programs and projects are evolving as we

develop the requirements to execute the Vision for Space Exploration. At the same time we are aligning the work that needs to be accomplished with the capabilities of our NASA centers." In addition to primary work assignments each center will support moon and Mars surface systems conceptual designs. Centers also support additional Constellation program and project activities. Center assignments: Ames Research Center, Moffett Field Calif., leads the crew exploration vehicle (CEV) Thermal Protection System Advanced Development Project. Ames is developing information systems to support the Constellation Program Safety, Reliability and Quality Assurance Office. Dryden Flight Research Center, Edwards, Calif., leads CEV Abort Flight Test integration and operations including Abort Test Booster procurement and integration with the Flight Test Article. Glenn Research Center, Cleveland, leads the CEV Service Module and Spacecraft Adapter integration, providing oversight and independent analysis of the prime contractor's development of these segments. Glenn has lead responsibility for the design and development of several crew launch vehicle (CLV) upper stage systems. Goddard Space Flight Center, Greenbelt, Md., provides co-leadership of the Constellation Program's System Engineering and Integration navigation team and software and avionics team. Jet Propulsion Laboratory, Pasadena, Calif., leads a multi-center activity in support of the Mission Operations Project to plan systems engineering processes related to operations development and preparation. JPL provides co-leadership for the Constellation Program Office Systems Engineering and Integration Software and Avionics team. Johnson Space Center, Houston, host the Constellation Program, the CEV Project and the Mission Operations Project. The Constellation Program manages and integrates the program and all projects. The CEV Project Office manages and integrates all CEV elements including prime contractor work. The Mission Operations Project manages and integrates all activities related to mission operations. Kennedy Space Center, Fla., hosts the Ground Operations Project. The project manages all activities related to ground operations for the launch and landing sites, including ground processing, launch, and recovery systems. Langley Research Center, Hampton, Va., leads Launch Abort System integration supporting the CEV Project, providing oversight and independent analysis of the CEV prime contractor's development of the system. Langley leads the Command Module Landing System Advanced Development Project for CEV. Langley provides vehicle integration and CEV test article module development for the CLV Advanced Development Flight Test-0. Marshall Space Flight Center, Huntsville, Ala., hosts the Constellation Launch Vehicle projects. The projects are responsible for project management of all CLV and cargo launch vehicle related activities. Marshall provides the CLV first stage design, and is responsible for launch vehicle demonstration testing including the Advanced Development Flight Test-0. Stennis Space Center, Miss., manages and integrates rocket propulsion testing for the CLV Project. Stennis leads sea-level development, certification, and acceptance testing for the upper stage engine, sea-level development testing for the upper stage main propulsion test article, and sea-level acceptance testing for the flight upper stage assembly. While these decisions will result in budget and personnel allocations at the centers, detailed estimates will not be available until after prime contractors are formally selected for the program's major projects, such as the crew exploration vehicle, crew launch vehicle and cargo launch vehicle. ["NASA Announces Distribution of Constellation Work," **NASA News Release #06-233**, June 5, 2006.]

Shuttle booster problem pinpointed

A faulty electronics box will be replaced on shuttle Discovery's lefthand solid rocket booster, but the work will not delay NASA plans to launch its second post-Columbia test flight on July 1. Technicians will do the job at Kennedy Space Center's Launch Complex 39B, and NASA still has more than a week of extra time in the processing schedule leading up to the opening of a window that extends through July 19. "We're taking weekends off. That's how well the flow is going at the pad," said Kyle Herring, a spokesman for NASA's Johnson Space Center in Houston. During routine testing last week, engineers testing the booster's power distribution system noted an unexpected power shift from a prime to a back-up circuit. It wasn't clear what prompted the shift. NASA engineers now think the culprit is a faulty Integrated Electronics Unit, a critical device that serves as the primary communications link between the booster and shuttle orbiter computers. Each booster is equipped with two of the electronics boxes. They provide control electronics for the booster during launch, ascent and separation as well as booster splashdown and recovery operations. The faulty unit will be replaced in the coming weeks while other routine prelaunch work continues at NASA's coastal Florida spaceport. Technicians have swapped the electronics boxes at the pad during at least two previous launch campaigns. An STS-43 launch attempt in 1991 was delayed a day to replace on of the units. The boxes on both boosters were replaced at the pad prior to the STS-96 launch in May 1999. Web posted. (2006). [Shuttle booster problem pinpointed [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 5].]

NASA divides up exploration work

Kennedy Space Center, as expected, will be NASA's launch and landing operations center for the United States' bid to return humans to the moon and ultimately fly them to the planet Mars. NASA Administrator Mike Griffin announced the general assignments of each of the space agency's field centers in the Vision for Space Exploration and KSC's was no surprise. The Brevard County spaceport will be the launching site for the proposed Crew Exploration Vehicle as well as two new rockets, the Crew Launch Vehicle and Cargo Launch Vehicle. The center also will lead landing operations, although the Crew Exploration Vehicle is not expected to land at KSC. Discussions continue among program managers about whether to return the capsule-like spacecraft to water or to an oceanic splashdown. "Clearly not everyone working on the shuttle will transition over to the Crew Launch Vehicle and Cargo Launch Vehicle," Griffin said. If NASA did that, the new vehicles would cost too much and the program would not succeed, the administrator said. Web posted. (2006). [NASA divides up exploration work [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 5].]

Kennedy Space Center's (KSC's) Role in the Constellation Program

"I want to share with you my excitement about our Center's bright future and discuss some of our upcoming roles in the Agency's Constellation Program. Like the other NASA Centers, KSC's role is critical in carrying out the Agency's mission of space exploration and scientific discovery. As I have stated before, KSC has a key role in NASA's future. Specifically, we are gearing up to provide project management for the

transition of the ground facilities/systems from the current human space flight mission to the next generation of space vehicles. Our talented workforce will be responsible for designing, developing, testing, and evaluating those facilities/systems required for ground processing, launch, and recovery systems for the space vehicles. I'm proud to say that KSC also will provide prelaunch test and integration, launch operations, and recovery support for the Crew Exploration Vehicle, Crew Launch Vehicle, and Cargo Launch Vehicle. We will lead launch operations planning and execution for the advanced development test flight of the Crew Launch Vehicle, as well as other flight demonstration activities. We will actively manage the transition from the Space Shuttle to the Constellation Program. I am committed to making the transition as smooth and seamless as possible. This transition may indeed be our most significant management challenge over the next several years. In the coming months, the Agency will develop a detailed Space Shuttle transition plan describing how we will carry out our human space flight programs. KSC also will continue to support the refining of the architecture for the Constellation Program (such as design concepts for future elements). As you know, the Shuttle will continue to fly through 2010, and this will be done as safely as possible. That is our current focus. Throughout this time, however, KSC will develop strategies that will ensure we seamlessly transition our relevant Shuttle-derived assets, such as our facilities and workforce, to prepare for the next generation of space vehicles. The coming years at KSC will bring many new challenges and lots of excitement. I know the Center's most valuable resource—our employees—will enable us to continue making great strides in space exploration and scientific discovery that make a difference throughout the world. I offer my heartfelt thanks for all you have done and will continue to do as we seek to unlock the mysteries of the bold universe beyond. Remember, KSC is where visions become reality." James W. Kennedy. E-mail distribution. (2006). [Kennedy, James W. Re: "Kennedy Space Center's (KSC's) Role in the Constellation Program" [Electronic]. **CD Comm #2006-04**, [June 5, 2006.].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - ; Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The launch pad crew performed preparations on Space Shuttle Discovery over the weekend to support the launch to the International Space Station in July. The team has completed prelaunch loading of hypergolic propellants (monomethyl hydrazine and nitrogen tetroxide) into the forward and aft reaction control systems and the orbital maneuvering system pods, as well as fuel loading for the orbiter's auxiliary power units. Late this week, workers will begin loading the hypergolic fuel into the solid rocket booster hydraulic power units. Technicians at the pad are in the process of opening Discovery's payload bay doors. The doors will remain open for about three and a half days for payload testing and sensor installation in the orbiter boom sensor system. Tomorrow, integrated testing of the multi-purpose logistics module Leonardo is scheduled to begin. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-060506** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 5].]

Space museum snags lower-rent locale

Volunteers at the Space Walk of Fame Museum were hoping for a miracle to keep its doors open. Miracles happen. An affordable rental space has been found on Main Street in downtown Titusville, blocks away from Space View Park. The miracle on Main Street will prevent the museum from closing, which has been a threat ever since rent at the current Searstown Mall location was raised from $1,500 to $5,000 a month. The increase is slated to take effect later this year. The free space-themed museum opened in 2002 and was housed in Miracle City Mall before moving to its current location. Pins, spacesuits, flags, launch consoles and other quirky and varied items donated by people connected with the space industry are on display at the museum, which also includes a gift shop. The new location has 2,000 square feet, compared with the 10,000-square-foot area the museum currently occupies. Rent will be about $900 a month. Charlie Mars, president of the Space Walk of Fame Museum Foundation, said exhibits will be changed frequently as they are moved in and out of storage. Web posted. (2006). [Space museum snags lower-rent locale [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 5].]

Atlantis: Next booster segment stacked

A segment of shuttle Atlantis' righthand solid rocket booster was hoisted in the Kennedy Space Center Vehicle Assembly Building late Monday as NASA continued preparations for a planned Aug. 28 launch. Crane operators lifted the right aft center segment of the 149-foot tall booster up and over a transom on the 16th floor of VAB. Then it was lowered down toward a mobile launcher platform in high bay 3. The segment will be mated with the right aft booster assembly of the solid-fueled rocket, which was placed onto the launcher platform last week. The build-up of the shuttle's twin rocket boosters will continue over the coming week. An external tank will be fitted between the boosters before the orbiter Atlantis is added to the stack on July 25. The fully assembled shuttle is scheduled to roll out to Launch Complex 39B on Aug. 1. Web posted. (2006). [Atlantis: Next booster segment stacked [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 6].]

June 6: Faulty box won't delay shuttle launch

A faulty electronics box will be replaced on one of shuttle Discovery's solid rocket boosters, but the work won't delay NASA plans to launch its second post-Columbia flight July 1. Technicians will do the job at Kennedy Space Center's Launch Complex 39B. NASA has more than a week of extra time in the processing schedule leading up to the opening of a window that extends through July 19. "We're taking weekends off. That's how well the flow is going at the pad," said Kyle Herring, a spokesman for NASA's Johnson Space Center in Houston. During routine testing last week, engineers testing the booster's power distribution system noted an unexpected power shift from a prime to a backup circuit. It wasn't clear what prompted the shift. NASA engineers now think the culprit is a faulty integrated electronics unit, a device that serves as the primary communications link between the booster and shuttle orbiter computers. Each booster is equipped with two of the electronics boxes. They provide control electronics for the booster during launch, ascent and separation as well as booster splashdown and recovery.

The faulty unit will be replaced in the coming weeks while other prelaunch work continues. Technicians have swapped the electronics boxes during at least two previous launch campaigns. An STS-43 launch attempt in 1991 was delayed a day to replace one of the units. The boxes on both boosters were replaced at the pad prior to the STS-96 launch in 1999. Web posted. (2006). [Faulty box won't delay shuttle launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 5].]

Atlas rocket to launch Mars Science Laboratory

Lockheed Martin's Atlas V rocket has been selected by NASA to launch the Mars Science Laboratory (MSL) mission in 2009 from Cape Canaveral, Fla. The mission will fly on a powerful Atlas V 541 configuration to propel MSL on its journey to the red planet. "We are extremely proud of the trust NASA has placed in our team to deliver the biggest ever rover to Mars," said Jim Sponnick, Atlas program vice president for Lockheed Martin Space Systems Company. "This comes on the heels of two recent, very successful Atlas launches for NASA, the Mars Reconnaissance Orbiter and Pluto New Horizons. We are excited to be a part of our nation's space exploration efforts." Boosting the 7,900-lb. MSL spacecraft into a Mars transfer trajectory will require the Atlas V 541, similar to the Atlas V 551 that launched the New Horizons mission to Pluto in January. The 541 configuration includes four strap-on solid rocket boosters, each of which adds an additional 300,000 lbs. of thrust to the almost 1,000,000 lbs. provided by the core vehicle's RD-180 engine. The Atlas V 541 vehicle will also utilize a 5-meter fairing to protect the MSL payload on the ascent. Once the boost phase of flight is complete, the Centaur upper stage will perform two engine burns to place MSL into a Mars transfer trajectory. Scheduled for launch in the fall of 2009, MSL will land on the surface of Mars in summer 2010 and begin its two-year mission. Atlas V launched NASA's most recent Mars mission, the Mars Reconnaissance Orbiter (MRO), in August 2005. It arrived at Mars in March 2006 and is executing a series of orbit-lowering maneuvers prior to beginning its primary science mission. MRO will help determine the landing site for MSL, and later it will serve as a communication relay for MSL once the lab is on the Martian surface. Web posted. (2006). [Atlas rocket to launch Mars Science Laboratory [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, June 6].]

NASA awards rocket engine contract

A California company has been awarded a $50 million NASA contract to start the development of an engine the agency intends to use on two new rockets that will loft astronauts and payloads on missions to the moon and Mars. Pratt & Whitney Rocketdyne Inc. of Canoga Park, Calif., will build the J-2X, an upgraded version of the engine that powered the second and third stages of the Saturn 5 rockets that launched Apollo astronauts to the moon. NASA intends to use the J2X to power the second stage of a new Crew Launch Vehicle that will be built to launch Apollo-style capsules that will carry astronauts on missions to the International Space Station, the moon, Mars and other celestial destinations. The J-2X also will be used as the propulsion system for the second stage of a Cargo Launch Vehicle that will loft lunar landers, habitats and other hefty payloads needed to stage human expeditions to locations throughout the solar system. Web posted. (2006). NASA awards rocket engine contract [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 6].]

June 7: Discovery's fuel tank receives certification

NASA managers today cleared the shuttle Discovery's external fuel tank for flight based on wind tunnel data and computer modeling that show the huge tank can stand up to the aerodynamic rigors of launch despite the recent removal of long foam wind deflectors. Launch currently is targeted for July 1, at 3:48 p.m., but the long-awaited flight could slip another day or so to ensure better lighting for critical photography of the tank after Discovery reaches orbit. NASA managers are expected to discuss the lighting issue during a weekly review Thursday. Discovery's launch window is defined, in part, by a requirement to launch in daylight and to have the external tank separate from the orbiter in daylight, half a world away. The goal is to obtain good photos of the tank's redesigned foam insulation as well as the shuttle's heat-shield tiles and wing leading edge panels to spot any potential impact damage. As it turns out, a new analysis of orbital lighting conditions shows a camera mounted in the belly of the shuttle will not have enough light for good photography if Discovery takes off July 1. Conditions improve on July 2 and subsequent days. The results of the certification meeting, which focused on the removal of the PAL ramps and modifications to prevent foam shedding near the bipod that attaches the shuttle's nose to the tank, will be presented at a formal flight readiness review June 16-17 at the Kennedy Space Center. Discovery's crew, meanwhile, flies to the Florida spaceport June 12 for launch site emergency drills and a dress-rehearsal countdown June 15. Web posted. (2006). Discovery's fuel tank receives certification [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, June 7].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. On Tuesday at the launch pad, Space Shuttle Discovery was powered up for technicians to perform the integrated testing of the multi-purpose logistics module Leonardo, scheduled to fly in the vehicle's payload bay to the International Space Station. During testing, a problem was detected in left-hand solid rocket booster bus B, which is a power distribution circuit that delivers electrical power from the orbiter to the booster. This caused the system to switch to the backup circuit, bus C. Engineers have determined the integrated electronics assembly failed and needed to be replaced. Late this week, workers will begin loading the hypergolic fuel into the solid rocket booster hydraulic power units. External Tank; The external tank scheduled to fly with Atlantis on mission STS-115 departed the Michoud Assembly Facility in New Orleans on Monday. Liberty Star, the solid rocket booster retrieval ship towing the tank, is scheduled to arrive at Port Canaveral on Friday. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-060706** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 7].]

June 8: Crew confident of shuttle safety

The astronauts of the second return-to-flight mission stressed their willingness to fly the shuttle in July even as they acknowledged the risks Thursday. Some risks can be

understood, said Piers Sellers, one of the mission's spacewalkers. "We've driven those risks down as far as we can, which leaves the things you don't know about," he said. Since Columbia was lost to a breach caused by insulating foam that fell off the fuel tank, NASA has worked to reduce the risk of a similar accident. Another foam loss during last summer's flight prompted a year of modifications. Managers announced Wednesday that removal of a large piece of insulating foam wouldn't put too much stress on cables and pipes running up the external fuel tank. They also said, however, that they intend to remove smaller ramps of potentially dangerous foam on future missions, while Discovery will fly in July with them intact. Web posted. (2006). Crew confident of shuttle safety [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 9].]

June 9: **Expendable Launch Vehicle Status Report**

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: July 22, 2006 ; Launch Times: 3:11 - 3:13 p.m. and 4:19 - 4:34 p.m. EDT. Testing and prelaunch processing of STEREO continue on schedule. Deep Space Network spacecraft compatibility testing is under way. Launch and mission simulation exercises are also being performed. Upcoming next week is further thermal blanket installation and preparations for attaching the solar arrays. STEREO is scheduled to be transported to Launch Complex 17 on July 11 to be mated to the Boeing Delta II rocket. The first stage of the Delta II rocket at Pad 17-B was erected on June 2. The first of three sets of three solid rocket boosters were attached on June 5. At this time, the Delta II second stage is scheduled to be hoisted into position and mated to the first stage on June 20. The crew will raise the 10-foot fairing into the pad clean room on June 21. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-060906** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, June 9].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) -Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Work continued at the pad this week to support electrical testing and payload vertical operations on Discovery. On Thursday, the payload bay doors were closed in preparation for fuel loading of the solid rocket boosters. The doors will be reopened on Monday. In the payload bay, the installation of sensors and cameras in the shuttle robotic arm and boom was completed. Following replacement of a faulty integrated electrical assembly box in the left solid rocket booster, hypergolic fuel loading began today into the solid rocket booster hydraulic power units. Next week the crew will be at KSC for the Terminal Countdown Demonstration Test. This is a launch dress rehearsal that occurs prior to each shuttle mission. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, engine #3 was installed in Atlantis and leak checks of the system are under

way. Testing and checkout of the orbiter boom sensor system is complete. Window #2 was replaced, with plans to replace window #5 next week. In the Vehicle Assembly Building, stacking of the STS-115 solid rocket boosters continues. The right forward center section was lifted into high bay 3 and onto mobile launcher platform no. 2 on Wednesday. The external fuel tank for STS-115, ET-118, is scheduled to arrive via barge at the KSC turn basin late this afternoon and will be transported to the Vehicle Assembly Building this evening. It will be lifted into a checkout cell in the VAB this weekend, so that technicians can begin processing the tank for launch. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. This work includes main propulsion system leak and functional testing and potable water leak checks. The flash evaporator functional testing was completed. The flash evaporator provides supplemental cooling to the orbiter in flight. Technicians began test and checkout of the docking mechanism this week. Work continues on the orbiter's thermal protection system, with tee seal installation between the reinforced carbon carbon panels on the wing leading edges and replacement of gap fillers on the underside of Endeavour. To date, approximately 500 new gap fillers have been installed. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-060906** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 9].]

June 12: **NASA keeps an eye on Alberto**

NASA officials are keeping a close eye on Tropical Storm Alberto, but the first named storm of the 2006 Atlantic hurricane season is expected to pass well north of the Kennedy Space Center. Meteorologists expect winds at the spaceport to peak Tuesday at 30 knots, well below the threshhold for moving shuttle Discovery off its launch pad and back into the KSC Vehicle Assembly Building. One to three inches of rain are in the forecast at KSC. The strongest winds from the storm are expected to remain north of the Interstate 4 corridor. NASA's hurricane plan calls for a shuttle to be rolled back from the pad if there is a possibility that wind could exceed a sustained velocity of 60 knots. A rollback would have to be complete before the wind reaches 40 knots. Web posted. (2006). NASA keeps an eye on Alberto [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 12].]

Tropical storm delays astronauts' trip to Cape

Tropical Storm Alberto prevented commander Steve Lindsey and crew from flying to Florida's Kennedy Space Center from their home base in Houston on Monday. The seven astronauts will try again Tuesday afternoon, weather permitting. The crew is coming to the Cape for the traditional launch day dress rehearsal conducted before every shuttle mission. Web posted. (2006). Tropical storm delays astronauts' trip to Cape [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, June 12].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - ; Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. On Friday, hypergolic fuel was loaded into the hydraulic

power units of the solid rocket boosters. The payload bay doors of the orbiter are currently closed in anticipation of high wind and rain from Tropical Storm Alberto. Weather permitting, the doors will be opened Tuesday for camera checkouts in the shuttle's remote manipulator system (robotic arm) and the orbiter boom sensor system. Aft closeout work is also scheduled to begin Tuesday. The crew is scheduled to fly to KSC today in advance of the Terminal Countdown Demonstration Test, which is scheduled for Wednesday and Thursday. This is a launch dress rehearsal that occurs prior to each shuttle mission. External Tank; External Tank 118, which will fly as part of the STS-115 mission, arrived via barge at the KSC turn basin Friday evening. It was transported to the Vehicle Assembly Building the same day. On Saturday, the tank was lifted into a checkout cell in high bay No.2, where it is being processed for flight. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-061206** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 12].]

June 14: NASA automates rocket safety

NASA is developing a flight safety system capable of automatically detecting when a rocket flies off course and then destroying the vehicle before it endangers people on the ground. That job now is done by range safety officers who rely on data from widespread networks of ground stations that can cost $700,000 or more to operate during the launch of a typical, medium-sized rocket such as the Boeing Delta 2. The new autonomous system has the potential to cut costs by reducing the need for sophisticated radar and optical systems traditionally used to track rockets in flight. "It would minimize the costs," said Rich Nelson, chief of the advanced systems division of the applied technology directorate at NASA's Kennedy Space Center. The Autonomous Flight Safety System is the product of small teams of engineers and range safety experts at KSC and NASA's Wallops Flight Facility in Virginia. KSC project manager Michelle Amos said the new system is being designed for use on small- and medium-sized expendable launch vehicles rather than larger rockets such as the Boeing Delta 4 and the Lockheed Martin Atlas 5. "The concerns we have heard from various people that deal with those larger vehicles is that you're talking about a very costly vehicle and a very costly payload, typically," Nelson said. "Right now, they would prefer to have a man in the loop to make a decision rather than have an onboard decision made." The system, however, could be particularly useful for small rockets launching from remote sites. In those cases, it is extremely expensive to provide traditional ground tracking services. Web posted. (2006). NASA automates rocket safety [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 14].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - ; Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The payload bay doors of Discovery remained closed Monday and Tuesday because of the anticipated high wind and rain from Tropical Storm Alberto. Today, doors were opened for camera checkouts in the shuttle's remote

manipulator system (robotic arm) and the orbiter boom sensor system. Aft closeout work continues, with technicians performing final inspections and installation of panels and thermal blankets on the avionics bays. The STS-121 crew is conducting its Terminal Countdown Demonstration Test activities today and Thursday at KSC. This test is a launch dress rehearsal that occurs prior to each shuttle mission. Today's activities include pad egress training and systems briefings. On Thursday, the crew will climb aboard Discovery on the launch pad for the simulated final hours of the launch countdown. On Friday, NASA managers will gather at KSC for the Flight Readiness Review that is expected to culminate on Saturday with the setting of a launch date. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-061406** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 14].]

June 16: **Expendable Launch Vehicle Status Report**

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: July 22, 2006 ; Launch Times: 3:11 - 3:13 p.m. or 4:19 - 4:34 p.m. EDT. At the Astrotech Space Operations Facility, testing and prelaunch processing of STEREO continues. Communications testing with the Deep Space Network continues. On observatory "A" on Wednesday, the Heliospheric Imager vertical instrument door was successfully deployed during testing. On observatory "B," the scientific instruments were aligned and tested. Comprehensive performance testing of both observatories continues to go well. STEREO is planned to be transported to Launch Complex 17 on July 11 to be mated to the Boeing Delta II rocket. The first stage of the Delta II rocket at Pad 17-B was erected on June 2. The first of three sets of three solid rocket boosters was attached on June 5. A fourth solid rocket booster is set to be attached on Saturday. Following this, no further work on the launch vehicle is scheduled until after a U.S. Air Force launch next week on adjacent Pad 17-A. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-061606** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, June 16].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: Launch Processing Window July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Aft closeout work continues, with technicians performing final cleaning, inspections and installation of panels and thermal blankets on the avionics bays. Mid-body closeouts in the payload bay are scheduled to be completed today and the payload bay doors will be closed for flight this evening. The space shuttle main engine sensor checkouts were completed on Thursday. Flight crew systems workers de-stowed equipment from the crew cabin following completion of the Terminal Countdown Demonstration Test on Thursday, and are scheduled to install the extravehicular maneuvering units (the suits worn by shuttle crew members for spacewalks) on Saturday. NASA managers are meeting at KSC today for the Flight Readiness Review that is expected to culminate in the setting of a launch date on Saturday. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than

Aug. 28, 2006 ;Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, closeout work on Atlantis continues. Window No. 5 was replaced. Preparations for servicing of freon coolant loop No. 2 are under way. The coolant loop is part of the system that cools the avionics bays in the midbody and the aft of the orbiter. Main propulsion system leak checks are complete and the point sensor box was replaced. In the Vehicle Assembly Building, stacking of the STS-115 solid rocket boosters continues. Mating of the left aft center segment was completed Thursday, and the left forward center segment is scheduled to be lifted into high bay No. 3. Processing of the external fuel tank, ET-118, continues in the Vehicle Assembly Building. Workers from the Michoud Assembly Facility in Louisiana are at KSC and will remove and replace the tank's liquid hydrogen engine cutoff sensors, or fuel gauges, next week. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Mass spectrometer leak checks were performed this week on the system that provides nitrogen to the crew cabin. Work continues on the orbiter boom sensor system manipulator positioning mechanisms, which are the pedestals that support the boom. Hydrogen tank No. 4 was installed. There are a total of five oxygen tanks and five hydrogen tanks that supply the fuel cells in the orbiter. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-061606** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 16].]

NASA Conference Celebrates 30 Years of Mars Research

NASA will host a symposium titled "Mars: Past, Present and Future" on Thursday, June 22 from 9 a.m. to 5 p.m. at the agency's Langley Research Center, Hampton, Va. The event is part of NASA's Viking 30th Anniversary celebration. NASA's Viking 1 and 2 missions to Mars, each consisting of an orbiter and a lander, obtained high-resolution images of the Martian surface, characterized the structure and composition of the atmosphere and surface and searched for evidence of life. Viking 1 was launched on Aug. 20, 1975, and arrived at Mars on June 19, 1976. On July 20, 1976, the Viking 1 Lander separated from the Orbiter and touched down at Chryse Planitia. Viking 2 was launched Sept. 9, 1975, and entered Mars orbit on Aug. 7, 1976. The Viking 2 Lander touched down at Utopia Planitia on Sept. 3, 1976. ["NASA Conference Celebrates 30 Years of Mars Research," **NASA Media Advisory #M06-100**, June 16, 2006.]

June 17: **Launch adds to holiday tourism boom**

Shuttle launches can draw 150,000 viewers. And the scheduled July 1 launch of shuttle Discovery could attract even more since this will be the first shuttle flight in nearly a year, and it falls on a Saturday. But visitors from out-of-town are likely to have a tough time finding a hotel room along the Space Coast at the last minute. The scheduled launch date is the beginning of the Fourth of July weekend and the same day as the Pepsi 400 NASCAR race in Daytona Beach. "Our property is already sold out for the first week of July and looking strong for the rest of the month," said Rick Hutcherson, director of sales and marketing for Holiday Inn Cocoa Beach Oceanfront Resort. "We're on our way to having a record July. Any time we have a launch, we do well. But this launch will fall on our biggest holiday of the year." Danielle Courtenay, vice president of public relations for

the Orlando/Orange County Convention and Visitors Bureau, said launch day is a great opportunity for tourism in Central Florida. "The shuttle launch brings international recognition to our area," Courtenay said. Orlando-area residents also are expected to spend a significant amount in Brevard County on launch day. Among international visitors, tourists from the United Kingdom are expected to be among the largest contingents. The scheduled launch time is 3:48 p.m. -- allowing restaurants to draw customers for meals both before and after the event. The Kennedy Space Center Visitor Complex also is likely to get a boost from the launch. Dan LeBlanc, chief operating officer of the complex, said things have been going well in June, which is typically not a strong month for attendance at the complex. Web posted. (2006). Launch adds to holiday tourism boom [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 17].]

NASA Gives 'Go' for Space Shuttle Discovery's Launch

NASA senior managers on Saturday cleared the Space Shuttle Discovery for a July 1 flight to the International Space Station. The decision was announced after a lengthy Flight Readiness Review, a traditional meeting in which top NASA managers and engineers set launch dates, determine whether the shuttle's complex array of equipment, support systems and procedures are ready for flight and assess any risks associated with the mission. "We had two full days of an intensive Flight Readiness Review," said Administrator Michael Griffin. "It was spirited and one of the most open, yet non-adversarial meetings I've seen since returning to NASA." Commander Steve Lindsey and his six-crewmates are scheduled to lift off at 3:48 p.m. EDT to begin a 12-day mission, designated STS-121. Discovery's crew will test new hardware and techniques to improve shuttle safety, as well as deliver supplies, make repairs and bring a third crew member to the station. The ice/frost ramps are structures made of insulation foam that cover 34 brackets on the outside of the shuttle's external fuel tank. The ramps have been cited as a potential source of foam loss, which could cause damage to the shuttle. The Flight Readiness Review board decided the current design does not pose sufficient risk to delay the upcoming mission while design improvements for later flights are under way. Joining Lindsey aboard Discovery will be pilot Mark Kelly, mission specialists Mike Fossum, Piers Sellers, Lisa Nowak and Stephanie Wilson. European Space Agency astronaut Thomas Reiter will launch on Discovery and stay on the station for several months. Aboard the station, Expedition 13 Commander Pavel Vinogradov, a Russian Federal Space Agency cosmonaut, and Flight Engineer and NASA Station Science Officer Jeff Williams will greet Discovery and its crew. Vinogradov and Williams began their six-month mission on the station March 31. ["NASA Gives 'Go' for Space Shuttle Discovery's Launch," **NASA News Release #06-241,** June 17, 2006.]

June 19: Hubble camera down

NASA scientists have no explanation for Hubble's Advanced Camera for Surveys' (ACS) unexpected shutdown June 19. At 1:15 P.M. EDT, peak power-supply voltages in the camera's charge-coupled device (CCD) Electronics Box (CEB) exceeded limits. As a result, the camera suspended activity and automatically went into safe mode. Preliminary analysis of technical information from the camera's components reveals no anomalies. Tests focusing on the camera's low-voltage power supply and analog-to-digital converters

are now under way. One possibility being considered for the camera's shutdown includes a cosmic-ray strike that damaged its electronics. E-mail distribution. (2006). [Astronomy Magazine [AstronomyMagazine@maillist.astronomymail.com] Astronomy Newsletter 6-30-06, Re: "Hubble camera down" [Electronic]. [June 30, 2006.].]

NASA Assigns Crew for Shuttle Mission

NASA has assigned crew members to the space shuttle flight that will launch an Italian-built U.S. module for the International Space Station. Air Force Col. Pamela A. Melroy will command the STS-120 mission to take the Node 2 connecting module to the station. Melroy, a veteran shuttle pilot, is the second woman to command a shuttle. Marine Corps Col. George D. Zamka will serve as pilot. The flight's mission specialists will be Scott E. Parazynski, Army Col. Douglas H. Wheelock, Navy Capt. Michael J. Foreman and Paolo A. Nespoli, a European Space Agency astronaut from Italy. Zamka, Wheelock, Foreman and Nespoli will be making their first spaceflight. STS-120 will be Melroy's third shuttle flight. This crew announcement reflects reassignments of other astronauts to other missions and to technical and management positions within NASA. ["NASA Assigns Crew for Shuttle Mission," **NASA News Release #06-242**, June 19, 2006.]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Target Launch Date: July 1-19, 2006 ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. NASA's Flight Readiness Review was completed Saturday, with managers setting a July 1 launch date. At Launch Pad 39B, installation of ordnance in the orbiter and in the solid rocket boosters is complete. Flight crew systems workers installed extravehicular maneuvering units in the crew cabin on Saturday. The suits are worn by shuttle crew members for spacewalks. Mid-body closeouts in the payload bay are complete. Closure of the payload bay doors was delayed when a small amount of water seeped through the payload changeout room dock seals during violent weekend thunderstorms. Initial inspections revealed no damage to the orbiter. The payload bay doors will be closed for flight as soon as final inspections are complete. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-061906** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 19].]

June 20: Pluto's Twins Get Their Names

Pluto's baby twin moons, formerly known as S/2005 P 1 and S/2005 P 2, have been christened Nix and Hydra. The objects, discovered last year by the Hubble Space Telescope, received their names from the International Astronomical Union (IAU). A formal announcement will be issued this Friday, 23 June. The names were proposed this spring by the discovery team, who first identified the moons in May of last year. "We had a giant list of possible names to consider," says team member Andrew Steffl of the Southwest Research Institute in Boulder, Colorado. "It was a fun thing to do." In mythology, Pluto ruled the underworld. Nyx was the goddess of night and the mother of Charon, the boatsman who takes souls across the River Styx and into Pluto's grasp. Pluto's large satellite, discovered in 1978, is called Charon. Because an asteroid with the

name Nyx already exists, the IAU decided to use a slightly different spelling for the inner one of the two small Plutonian moons, to avoid confusion. Hydra was the mythological nine-headed serpent that guarded the underworld. A large but inconspicuous constellation in the spring sky also bears this name. Pluto-philes read even more significance into the two names. The first letters, N and H, also refer to NASA's New Horizons spacecraft, which was launched in January and is now on its way to an encounter with the Pluto system in the summer of 2015. And according to the team, nine-headed Hydra is a fitting companion for the ninth planet. This summer, the IAU will decide on the much-discussed planetary status of Pluto. The naming of Hydra "could possibly" help convince the IAU to preserve Pluto's planethood, says Steffl. Web posted. (2006). Rocket Pluto's Twins Get Their Names [Online]. Available WWW: http://sciencenow.sciencemag.org/ [2006, June 20].]

NASA Offers Media View of New Firing Room

Media are invited to view a newly renovated firing room in the Kennedy Space Center Launch Control Center at 1 p.m. Friday. The STS-121 launch of Space Shuttle Discovery on July 1 will mark the first use of Firing Room 4 (FR 4) for a space shuttle launch countdown. Now designated the primary firing room for all remaining shuttle launches, FR 4 will also be used daily to manage operations in the Orbiter Processing Facilities and for integrated processing for the shuttle. The firing room now includes sound-suppressing walls and floors, new humidity control, fire-suppression systems and consoles, support tables with computer stations, communication systems and laptop computer ports. FR 4 also has power and computer network connections and a newly improved Checkout, Control and Monitor Subsystem. The renovation is part of the Launch Processing System Extended Survivability Project that began in 2003. United Space Alliance's Launch Processing System directorate managed the FR 4 project for NASA. A fully manned firing room can hold more than 200 people, including the NASA launch director, space shuttle program management staff, test conductors, shuttle launch engineers, support engineers, public affairs staff and others. ["NASA Offers Media View of New Firing Room For STS-121 Launch," **NASA Media Advisory #37-06**, June 20, 2006.]

June 21: Rocket blasts off from Cape

A Boeing Delta 2 rocket lifts off from complex 17A at Cape Canaveral Air Force Station on Wednesday carrying the MiTEx spacecraft for the Air Force. Two mini-satellites meant to test technology for future military and intelligence satellites are in orbit today after blasting off from Cape Canaveral Air Force Station on Wednesday night. A Boeing Delta 2 rocket roared off its launch pad through an almost pristine blue sky at 6:15 p.m. after two minor delays, one for a troublesome heater on one of the microsatellites and another because a boater strayed into a hazard zone off the coast. The Micro-Satellite Technology Experiment (or MiTEx) was a collaborative effort by the Defense Advanced Research Projects Agency, the Air Force and the Navy. Web posted. (2006). Rocket blasts off from Cape [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 22].]

Foam would threaten shuttle rescue

NASA could not fix a serious foam-shedding problem in time to launch a rescue mission if Discovery suffers severe damage during its July 1 launch, the agency's top safety officer said Wednesday. Atlantis, the rescue vehicle, might be damaged by the same design flaw that Discovery now faces. Neither Bryan O'Connor nor NASA Chief Engineer Christopher Scolese plan to appeal a decision to proceed with the launch, because the shuttle's crew could seek safe haven on the International Space Station in that case. "That's a done deal. That decision has been made. We now go forward and we look to see if we can get this vehicle off the launch pad next week," O'Connor said. In a flight readiness review last Saturday, O'Connor and Scolese voted to delay the launch until NASA could redesign external tank foam covers that could shed insulation chunks large enough to severely damage shuttle heat shielding. Dubbed "ice-frost ramps," the foam covers are designed to keep ice from building up on metal brackets that secure pressurization lines on the outside of the tank. Ice also could cause critical damage to shuttle heat shields. NASA Administrator Mike Griffin decided to press ahead with the launch so the agency can resume construction of the half-built station on another mission in late August. NASA faces a 2010 deadline to finish the job. Sixteen more shuttle missions will be required. Web posted. (2006). Foam would threaten shuttle rescue [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 22].]

Helms to command 45th Space Wing

The next commander of the Air Force wing that supports rocket launches and manned space flights is a former astronaut with strong ties to NASA. But she's not afraid to criticize its safety program when she sees a problem. She's also a cat-loving musician who knows what it's like to lose her roof to a Florida hurricane. Today, Col. Susan Helms, 48, will be promoted to brigadier general, becoming the first woman to command the 45th Space Wing at Patrick Air Force Base. She replaces Brig. Gen. Mark Owen, who moves to Washington, D.C., for a job with the Pentagon. Helms, who was vice commander of the 45th from June 2004 to February 2005, takes charge just days before a critical shuttle launch. As commander, she will work closely with NASA on shuttle launches as well as commercial rocket launches from the Cape. Web posted. (2006). Helms to command 45th Space Wing [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 21].]

Launch will be safe despite no-go votes, 2 NASA chiefs say

NASA's top safety official and chief engineer voiced confidence Wednesday that space shuttle Discovery's crew would be safe to launch July 1 despite their "no-go" votes at a flight-readiness review last weekend. Safety chief Bryan O'Connor and Chief Engineer Chris Scolese based their dissent on concern that possible debris shedding from foam-insulation ramps on the ship's external fuel tank posed an unacceptable risk to Discovery. However, both said Wednesday that proceeding with the launch would be OK because of NASA's ability to provide astronauts safe haven on the international space station and to launch a rescue flight to bring them home. "I thought when I sized all of this up that if we were in the red area -- in other words, the unacceptable-risk area for loss of the vehicle -- I did not consider us to be there for the loss of the crew," said O'Connor, a former astronaut. "Even if I disagreed with some on loss of the vehicle, I think everybody in that room agreed that the loss-of-crew risk for this mission is acceptable." NASA's decision to

launch the shuttle after a finding of unacceptable risk by the safety office and chief engineer is unprecedented. It comes after months of internal debate about the threat posed by 37 so-called ice-frost ramps. The small foam ramps stretch from the tip of the tank to its base and prevent ice from forming on underlying aluminum brackets used to fasten fuel-pressurization lines and a tray of electrical cables to the tank's exterior. Web posted. (2006). Launch will be safe despite no-go votes, 2 NASA chiefs say [Online]. Available WWW: http://www.orlandosentinel.com/ [2006, June 22].]

NASA ships practice recovery of SRBs off local inlet

Two 170-foot-long NASA ships — spotted off the St. Lucie Inlet on Wednesday — are in the Treasure Coast for training purposes, officials said. The Liberty Star and the Freedom Star are identical ships used to retrieve solid rocket boosters after launches, and the crew is practicing the retrieval process through today, said Joe Chaput, manager of marine operations for the United Space Alliance. While the actual retrieval takes place 140 miles off the coast of Port Canaveral, the crew practices closer to shore to save time and gas money. The waters off Stuart, Chaput said, had the best underwater visibility closest to the Cape. "Sometimes we can do it right offshore (Cape Canaveral), but this week the water is turbid," he said. "We're just borrowing the clarity of your water." About two weeks before a scheduled launch, crew members and divers conduct an entire mission to retrieve the rocket boosters — work that takes five hours, Chaput said. After leaving the rocket, the 165,000-pound, 116-foot-long booster opens a parachute and falls at 50 mph into the ocean. First, it floats vertically. Then, divers attach an air pipe to it to pump air into the booster, allowing it to float horizontally. They then tow the booster behind the boat. Chaput said the crew had been practicing since Monday and hope to complete another training session this morning, if the visibility holds. The next shuttle launch is scheduled for 3:49 p.m. on July 1. Web posted. (2006). NASA ships practice recovery of SRBs off local inlet [Online]. Available WWW: http://www1.tcpalm.com/ [2006, June 22].]

June 22: Destination Space

Two top managers at NASA are again expressing their confidence in the next shuttle flight, despite no-go votes for the launch this past weekend. Wednesday, NASA's top safety official and chief engineer said they both have concerns that falling foam could cause problems for Discovery. They say they are confident in the astronauts' safety because of NASA's ability to provide the astronauts safe haven on the International Space Station if something were to go wrong. NASA's decision to launch the shuttle after a finding of unacceptable risk by the pair is unprecedented. A majority of NASA managers decided instead to develop a fix and implement it two or three missions in the future instead of holding up the July 1 launch. In other NASA news, workers at the Kennedy Space Center damaged the external fuel tank for Space shuttle Atlantis. NASA says the workers accidentally struck the tank with a mobile work platform, denting the foam. The dent is about 3/8 of an inch deep on the upper part of the tank very close to the centerline. That fuel tank is in the Vehicle Assembly building and is not the one scheduled to fly on next week's mission but it would be needed for Atlantis should it be called up for a rescue mission. NASA says they will be able to make repairs in time for Atlantis's scheduled August mission and in time for its use as a rescue shuttle for

Discovery. Web posted. (2006). [Destination Space [Online]. Available WWW: http://www.cfnews13.com/ [2006, June 22].]

June 23: Destination Space: Tank Problem

Workers at the Kennedy Space Center just found out that Hurricane Katrina caused a problem no one was aware of on space shuttle Atlantis' fuel tank. The workers were fixing a dent they made on the tank earlier this week, and noticed beads of water coming out of the tank's foam. They say it must have gotten in during Hurricane Katrina when the tank was being processed at its facility in New Orleans. KSC workers will inspect the problem throughout the weekend to see what needs to be done. NASA says it does not appear that it will affect Atlantis's scheduled launch on August 28 or the possible launch if it's needed as a rescue shuttle. Meanwhile, the crew for the Atlantis mission is at the Space Center to try out the gear they'll use on their flight. At the same time, space shuttle Discovery's crew is preparing to fly in for their launch. They're scheduled to land next Tuesday for their July 1st launch. Web posted. (2006). [Destination Space: Tank Problem [Online]. Available WWW: http://www.cfnews13.com/ [2006, June 23].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - ; Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Target Launch Date: July 1, 2006, 3:49 p.m. EDT ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Aft closeouts of Discovery are nearing completion. Workers are preparing to install the engine compartment access doors. Aft confidence testing will take place today. This involves power up and testing of all aft systems, such as the main propulsion system circuits. Workers are preparing the orbiter for pressurization of the orbital maneuvering system and main propulsion system, scheduled for this weekend. Also planned for this weekend are micro inspections of the orbiter windows. All checkouts of the external tank and solid rocket boosters are complete and those components are closed for flight. Mission: STS-115 - 19th International Space Station Flight (12A) - ; P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, the Crew Equipment Integrated Test with the crew of STS-115 is under way and will continue on Saturday. The test allows crew members to familiarize themselves with the vehicle, perform fit checks and verify hardware configurations that will be used on orbit. Closeout work in the aft and mid-body areas of Atlantis continues. Freon coolant loop No. 2 is serviced, and preparations for servicing water coolant loop No. 1 continue. The coolant loop is part of the system that cools the avionics bays in the mid-body and the aft of the orbiter. In high bay No. 3 of the Vehicle Assembly Building, stacking of the STS-115 solid rocket boosters fuel segments is complete. The forward assembly sections are mated, and joint closeouts are in progress.Processing of the external fuel tank for STS-115, designated ET-118, continues in the Vehicle Assembly Building. Workers from the Michoud Assembly Facility in Louisiana are at KSC and have completed replacing the tank's liquid hydrogen engine cutoff sensors, or fuel

gauges. This week, while workers repaired a minor nick on the side of the ET-118 tank facing away from the shuttle, they noticed a couple of beads of water come out of the foam. It appears the water got into the stringers of the intertank during Hurricane Katrina. An inspection is under way and is planned to be completed this weekend or early next week. The work is not expected to affect the launch-on-need support for STS-121 or STS-115. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Mass spectrometer leak checks are complete on the orbiter's oxygen lines. Work continues on the orbiter boom sensor system manipulator positioning mechanisms, which are the pedestals that support the boom. Installation of the reinforced carbon-carbon panels on the orbiter's wing leading edges is under way, as is functional testing of the docking mechanism. The engine No. 1 dome heat shield is being installed today. Elevon cove leak checks are complete. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-062306** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 23].]

Discovery's Launch Countdown Begins June 28

NASA will begin the countdown for the launch of Space Shuttle Discovery at 5 p.m. EDT June 28. The countdown includes nearly 28 hours of built-in hold time leading to a scheduled launch at about 3:49 p.m. on July 1. The launch window extends for nearly five minutes. The launch team at NASA's Kennedy Space Center, Fla., will conduct the countdown from the newly renovated Firing Room 4 of the Launch Control Center. This mission is designated STS-121. It is the 115th shuttle flight and the 18th U.S. flight to the International Space Station. Discovery's mission is scheduled to last about 12 days and end with 10:45 a.m. landing at Kennedy on July 13. The crew will test new equipment and procedures to improve shuttle safety, as well as deliver supplies and make repairs to the International Space Station. ["NASA Space Shuttle Discovery's Launch Countdown Begins June 28," **NASA Media Advisory #M06-106 (corrected)**, June 23, 2006.]

June 24: Discovery's flight will be the 115th space shuttle mission

The fleet leader • Discovery is flying for the 32nd time. Last flight (of all shuttles as well as Discovery), was July 26 to Aug. 9. • First mission of Discovery: Aug. 30 to Sept. 5, 1984. • Upcoming Discovery liftoff: Scheduled for 2:48 p.m. CDT July 1, Kennedy Space Center, Fla. • Destination: Space station, altitude 212 miles. • Docking: 10:25 a.m. CDT July 3. • Liftoff weight: 4,523,850 pounds (Discovery, all payloads, external fuel tank and both solid rocket boosters). • Delivering: Leonardo, a European cargo carrier with 5,100 pounds of food, clothing, research gear and other equipment. • First spacewalk: 9:24 a.m to 3:54 p.m. July 5. • Second spacewalk: 8:54 a.m. to 3:24 p.m. July 7. • Undock: 6:43 a.m. CDT July 11. • Landing: 9:46 a.m. CDT July 13, Kennedy Space Center. • Landing weight: 225,741 pounds (with cargo return from space station). Web posted. (2006). [Discovery's flight will be the 115th space shuttle mission By NASA [Online]. Available WWW: http://www.chron.com/ [2006, June 24].]

June 25: Flight Will Have an Effect on Brevard's Economy

The shuttle program and the jobs of thousands of space workers across the country, including about 15,000 here on the Space Coast, will be on the line when Discovery

blasts off Saturday from Kennedy Space Center. A catastrophe, or any failure that could have caused a catastrophe, will prompt the nation's leaders to retire the three remaining orbiters now and spend the $4 billion-a-year shuttle budget to rush development of a replacement fleet. "If we have another major incident in launching a space shuttle, I would not wish to continue the program," NASA Administrator Mike Griffin said last Saturday just after he gave the go-ahead to launch Discovery and seven astronauts. Granted, every launch brings do-or-die risks. Now, however, the consensus inside and outside NASA is that every mission will carry the highest stakes the shuttle team has ever faced. The imminent 2010 retirement of the shuttles -- long an emotional and economic linchpin of this community -- is worry enough. Closing the doors sooner would speed the loss of 5,000 to 10,000 jobs that pay, on average, almost twice what the typical Brevard Countian takes home. Even before the last three Apollo missions were called off, the cuts began to hit Kennedy Space Center and Brevard County. "Moonport," a NASA history of that era, says space center employment fell from about 26,000 in 1968 to 16,000 in 1970. Home prices fell. High-paid space workers moved away. Unemployment rocketed. A couple of years passed before community leaders forged a recovery, marketing affordable coastal homes to retirees and other Northerners. "There's legendary stories about people walking out the front door and leaving it open, abandoning their houses," said Mike McCulley, the former astronaut who heads United Space Alliance, the company that operates the shuttle fleet day to day and is the employer of the vast majority of Brevard's space workers. "It was an ugly environment." A new vehicle, the shuttle, was coming. But it was the latter half of the decade before the shuttle replaced those lost KSC jobs. Brevard is different now. Then, NASA and its contractors employed 40 percent of county workers. The numbers of people and diversity of businesses has exploded in the three decades since. Tourism, service and high-tech industries dominate Brevard's economy. The construction and real estate markets are running strong, too. KSC employs just 7 percent of Brevard's work force today. Most space workers live in North Brevard. A high percentage of KSC workers are nearing retirement, and they have savings and benefits at their disposal that would allow them to stay here. Another potential cushion: new opportunities developing beyond NASA-owned and -operated space vehicles. For instance, NASA wants companies to field private ships to take cargo and people to and from the station, which could generate new jobs here. Web posted. (2006). [A successful or unsuccessful flight will have an effect on Brevard's economy [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 25].]

Delta 4 rocket poised for first California launch

The final piece of Boeing's new generation Delta 4 rocket fleet makes its long-awaited debut this week when a booster blasts off from the U.S. West Coast for the first time, punctuating the company's work to develop a line of launchers and build pads in Florida and California. California Delta 4 pad once hosted the space shuttle. Boeing's Delta 4 rocket pad at Vandenberg Air Force Base was renovated in recent years, transforming Space Launch Complex-6 from the West Coast space shuttle launch site into a facility for the next-generation unmanned booster. Web posted. (2006). [Delta 4 rocket poised for first California launch [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, June 25].]

June 26: Reporters begin arriving at KSC

The news media horde is descending on Kennedy Space Center, albeit smaller than last year's return to flight. "The last two weeks are absolutely crazy," NASA spokeswoman Tracy Young said. "Sometimes you don't know whether you're coming or going, but it's fun, a lot of fun." Last July, when Discovery made the first flight since the 2003 Columbia accident, about 1,200 journalists showed up. KSC expects 700 to 900 for the launch Saturday. During the years, a typical launch has drawn from 300 to 700. With Soichi Noguchi on the last crew, Young said, "we had a lot of Japanese media. Of course, we're expecting a lot of European media as well for Thomas Reiter." Reiter is a German who will stay on the space station for several months. "We don't have nearly the entourage we did a year ago," said Peter King, a radio correspondent for CBS News who covers Kennedy Space Center. "Look at how many (news organization) trailers are not there. Remember when the parking lot was absolutely packed?" said King. "I think people in some cases don't realize what a big deal this particular return to flight is." This shuttle mission is key to finishing construction of the International Space Station by the time the fleet retires in 2010, but its nuances make it a hard story to tell, King said. Web downloads of space stories remain strong, he said, "so I think that there's a great deal of interest out there." Web posted. (2006). [Reporters begin arriving at KSC [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 26].]

UCF researcher to study space-traveling fruit flies

When the Space Shuttle Discovery blasts off from Kennedy Space Center on July 1, its cargo will feature a bunch of fruit flies that may give scientists, including a University of Central Florida researcher, clues into the effects of space travel on the human immune system. Laurence von Kalm, a UCF biology professor, will be part of a research team that will study the fruit flies upon their return to Earth at the end of the shuttle's 12-day mission. Von Kalm will work with Deborah Kimbrell, a University of California-Davis research geneticist, to evaluate the flies' responses to bacteria and fungi and compare them to the responses of flies that did not go into space. The primary question being asked is whether the immune system is compromised from prolonged space travel, says von Kalm. "Are they more susceptible to infection than the flies that don't travel into space?" NASA is funding the research with a grant, while Kennedy Space Center is providing a lab where von Kalm, Kimbrell and their colleagues will test the flies for two weeks after the shuttle returns. Scientists from NASA's Ames Research Center, Rice University and the University of Nevada at Las Vegas also will take part in the research. Von Kalm says NASA's goal is to find out how extended stays in space, such as a trip to Mars, could affect the health of astronauts. Web posted. (2006). [UCF researcher to study space-traveling fruit flies [Online]. Available WWW: http://orlando.bizjournals.com./ [2006, June 26].]

Airspace, Bridges and Waterway Restrictions

For the STS-121 launch of Space Shuttle Discovery, NASA managers are urging all aircraft pilots and boaters to fully comply with the airspace, bridges and waterway restrictions imposed around Kennedy Space Center prior to and during shuttle launches and landings. "As always, we are coordinating with officials from the U.S. Air Force Eastern Range, Federal Aviation Administration and the U.S. Coast Guard to help

provide a safe launch environment for the shuttle crew and for interested spectators," said KSC Launch Director Mike Leinbach. Violating these restrictions is not only unsafe for the astronauts and support crews, it's unsafe for the violator." Space Shuttle Discovery's first launch opportunity is Saturday, July 1, and is targeted for liftoff at 3:49 p.m. EDT. The launch window is 10 minutes. At NASA's request, Air Force and Coast Guard surveillance aircraft will patrol KSC's airspace boundaries on launch day. Violators will be intercepted by patrol forces, thoroughly investigated and subject to FAA enforcement action. A number of restrictions remain in effect around KSC during the hours immediately following the launch of a space shuttle. ["Airspace, Bridges and Waterway Restrictions in Effect for STS-121, **NASA News Release #41-06**, June 26, 2006.]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: July 1, 2006, 3:49 p.m. EDT ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Discovery's aft is closed for flight, and workers have successfully completed the aft confidence test. This involves powering up and testing all aft systems, such as the main propulsion system circuits. Workers began flight pressurization of the orbital maneuvering system and main propulsion system this weekend, and those operations continue today. Workers also continue preparing for the launch countdown, which will begin at the T-43 hour mark on Wednesday at 5 p.m. The STS-121 crew is scheduled to arrive at the Shuttle Landing Facility Tuesday afternoon from the Johnson Space Center in Houston. External Tank; The water that was discovered last week in one of the stringers of the intertank on ET-118 has been removed. Stringers are reinforcing channel structures located on the outside of the intertank skin. Preliminary water analysis indicates that corrosion and salinity levels are low and will not affect the launch-on-need support for STS-121 or the STS-115 mission. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S062606** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 26].]

Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: July 30, 2006 ; Launch Time: 2:55 - 2:57 p.m. or 4:03 - 4:18 p.m. EDT. The launch of STEREO aboard a Boeing Delta II rocket has been rescheduled to July 30, pending confirmation by the Eastern Range. This allows the launch to occur at a more optimum time in the launch period and provides additional schedule time to accomplish critical safety operations on the spacecraft, including fueling and spin balance testing. At the Astrotech Space Operations Facility, testing and prelaunch processing of STEREO continues. The final Comprehensive Performance Test was completed late last week on the "A" Observatory. The "B" Observatory completed the test earlier in the week. The "B" spacecraft's solar arrays have been installed. Technicians are performing the deployment tests on the "A" solar arrays and high-gain antenna today. STEREO launch and mission simulations with the Deep Space Network were also performed. Thermal blanket installation continues. The second and third sets of three solid rocket boosters will be erected on the Delta II

booster for STEREO at Pad 17-B this week. This is possible now that the U.S. Air Force MiTEx mission has launched from adjacent Pad 17-A. After the boosters are erected, the second stage will be hoisted atop the first stage, and the payload fairing will be raised into the clean room inside the pad's mobile service tower. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-062606** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006 June 26].]

June 27: Shuttle Is Set for Liftoff Saturday

With dogged determination, NASA will try resuming regular space shuttle missions this week, hoping that the venerable spacecraft will weather aging components and falling debris long enough to finish construction of the International Space Station. The shuttle Discovery is scheduled to be launched as early as Saturday from Cape Canaveral, Fla., on just the second flight since the loss of the Columbia and its crew of seven. Officials hope to test the modifications and new procedures instituted after the disaster. The National Aeronautics and Space Administration flew its first test flight after the disaster almost a year ago, and the second was to follow just weeks later. But a problem with shedding foam persisted, even after the space agency spent more than a year and hundreds of millions of dollars to correct it. The Columbia disintegrated while returning from a research mission on Feb. 1, 2003, after being critically damaged at liftoff when a piece of foam weighing 1.67 pounds broke from its external fuel tank and struck its left wing. That opened a crack that admitted superheated gases when the craft re-entered earth's atmosphere. When the highly modified Discovery flew last year, much less foam debris fell. But the tank still shed several unacceptably large pieces, weighing up to a pound, that could have done severe damage. NASA grounded the fleet and removed 35 more pounds of foam from critical areas. This month, mission managers pronounced the Discovery ready to fly again, even though some engineers argued that more needed to be done. Defending the decision, NASA's administrator, Michael D. Griffin, said that falling foam might pose a danger to the shuttle but not to the crew, because the astronauts could find a haven, if necessary, on the orbiting space station; another shuttle could then be sent to retrieve them. (Mr. Griffin did add, however, that another serious accident could end the shuttle program.) The shuttle fleet is scheduled to fly 16 more missions to complete work on the half-finished space station and possibly to service the Hubble Space Telescope. The three remaining shuttles — Discovery, Atlantis and Endeavour — are scheduled to be retired in 2010. "If we're going to fly, we need to accept some programmatic risks — not crew risks — and get on with it," Dr. Griffin said. The Discovery's crew members, experienced astronauts and rookies alike, say they are eager to get under way. "The crew is ready, we're ready," said the mission commander, Col. Steven W. Lindsey of the Air Force, who has flown three previous missions. The main goals of the 12-day flight are to test the post-Columbia modifications and procedures, perform maintenance on the space station and deliver critical supplies, and deliver a new crew member to the station. To inspect for possible in-flight damage to the Discovery, NASA has mounted additional cameras on the shuttle since the last mission; every aspect of liftoff will be examined for possible problems. Video cameras at the top of each rocket booster look down on the fuel tank, and new ones on the bottom look up. One on the tank looks at the shuttle's belly, and a digital camera will take photographs of the fuel tank after it drops away. Expanded observations of the flight will also take place on the

ground. More than 100 cameras and radar devices at 25 widely scattered sites will make high-definition images of the shuttle from numerous angles. As with the previous launching, this one will be done in daylight so the fuel tank can be easily photographed as it drops into the ocean thousands of miles from Cape Canaveral. The inspection will continue as the shuttle heads to the space station. Astronauts will extend a 50-foot, Canadian-built robot arm that has a 50-foot boom with a camera and a laser imager. The crew will spend seven hours moving the boom along critical parts of the shuttle's heat-protection system looking for potential problems areas, and will relay the data to the ground for closer examination. Upon approaching the space station, Colonel Lindsey will stop the Discovery about 600 feet away and execute a tricky maneuver that should take about eight minutes. He will rotate the 100-ton orbiter nose-up in a full circle, allowing the station crew to take detailed photographs of the shuttle. Once done, Colonel Lindsey and the Discovery's pilot, Mark E. Kelly, a Navy commander who flew on one earlier mission, will dock the shuttle to the station. The two spacecraft will be attached for about a week, during which time the Discovery will unload tons of supplies and new equipment carried in an Italian-made module called Leonardo. The cargo transfer will be supervised by Stephanie D. Wilson, a first-time astronaut, who will also use the station's robot arm to move Leonardo from the shuttle's cargo bay to the station and back again. Two spacewalks are planned during the mission, with a third possible if controllers determine that the Discovery has enough power and oxygen for an extra day at the station. Piers J. Sellers, a veteran of a previous flight and three spacewalks, and Michael E. Fossum, on his first mission, will venture outside to repair a mini-railcar system that transports equipment. The pair will also attach a work platform to the end of the shuttle's robot arm and extension boom to see if it can serve as a stable platform that would allow astronauts to reach previously inaccessible parts of the shuttle to repair damage. The Discovery's flight engineer, Cmdr. Lisa M. Nowak of the Navy, who is on her first mission, will operate the robot arm during the spacewalks. If a third walk is possible, the astronauts will tests methods that could be used to repair damage to the heat shields on the shuttle's wing and nose. If the mission is successful, N. Wayne Hale Jr., the chief of the shuttle program, said NASA could launch the Atlantis as early as Aug. 28 to resume construction of the space station. Web posted. (2006). [Shuttle Is Set for Liftoff Saturday, With All Eyes on the Fuel Tank [Online]. Available WWW: http://www.nytimes.com/ [2006, June 27].]

NASA replaces a key safety official

An astronaut from NASA's first post-Columbia mission told colleagues Monday he was fired from a high-ranking engineering job after refusing to step down from the team responsible for safety during Discovery's upcoming flight. The sudden departure of Charles Camarda from his job as director of engineering at Johnson Space Center changes the team responsible for flight safety -- five days before the planned launch of seven astronauts on the agency's second post-Columbia test flight. Camarda, who served as a mission specialist on Discovery's flight last summer, took the job as director of engineering at JSC in November. In that capacity, he would have served during the upcoming flight on NASA's Mission Management Team, which is responsible for overseeing safety while shuttle crews are in orbit. An expert in spacecraft thermal protection systems, Camarda accepted an immediate reassignment to a post with the

NASA Engineering and Safety Center, an oversight group created after the Columbia accident. The group is based at Langley Research Center in Hampton, Va. Camarda will work out of its office at JSC. But in an e-mail to colleagues, he indicated that he was forced to relinquish the Mission Management Team post held by the JSC director of engineering. NASA named Stephen Altemus as the new JSC director of engineering. He had been deputy engineering director at the NASA field center in Houston. A former chief of the launch and landing division at Kennedy Space Center, Altemus on May 8 was selected to lead a new 800-member engineering organization at KSC. Web posted. (2006). [NASA replaces a key safety official [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 27].]

Shuttle crew faces 1-in-100 chance of dying

The seven crew members of the space shuttle Discovery arrived at Kennedy Space Center on Tuesday to begin training for a spaceflight next month in which each will have a 1-in-100 chance of dying. Those are the official odds that NASA has long given. Exactly what the real odds are is a question that looms larger than normal this time. That is because two top officials at NASA took the unusual step of dissenting from the space agency's decision to go ahead with the launch without correcting the potentially catastrophic problem of foam falling from the external fuel tank. That was the problem that doomed the Columbia 3 1/2 years ago. The agency's safety director and chief engineer wanted to wait and repair the problem. NASA Administrator Michael Griffin decided, however, that a July 1 launch was worth the added risk for a variety of reasons. "It's a difficult decision, highly technical, highly subtle, very subtle, involves lots of assessment of statistical risks," Griffin said in an interview with The Associated Press. "We spent weeks on this decision." In engineering geek-speak, what they did is called "risk analysis." In everyday life, it's making up your mind about seemingly ordinary things that could be deadly. Will that car trip end in a fatal crash? Will that extra dessert or cigarette lead to life-shortening health problems? "What's really instructive is the way the various players in this controversial choice -- from the head of NASA to the safety director to the astronauts themselves -- are not only using the facts but their individual unique perspectives in trying to figure out what's right or what's safe," said David Ropeik, risk communications instructor at the Harvard School of Public Health. Humans have gone into space 717 times, and 18 astronauts and cosmonauts have died doing it: the seven Challenger astronauts, the seven aboard Columbia, and four cosmonauts in two Soviet accidents. (The total does not include the three astronauts who died in a fire during a launch-pad test aboard Apollo 1 in 1967.) Michael Stamatelatos, who as director of safety and assurance requirements at NASA is the agency's risk guru, said NASA's 1-in-100 odds for the loss a vehicle and its crew should be taken with a grain of salt, because NASA used to say the chances were 1 in 7,000 until Challenger proved that to be overly optimistic. The more NASA studies what goes on, the more the agency finds that the risks were really far higher than originally thought, because so much more could go wrong than engineers figured, said Paul Fischbeck, a Carnegie Mellon University engineering and decision sciences professor. At the same time, problems are being fixed, so the shuttle is getting safer to fly than before, he said. The uncertainty about the foam worried NASA safety chief Bryan O'Connor. He dissented from the launch decision but did not appeal, because NASA has drawn up plans to send the crew to the international

space station to await rescue if the shuttle skin should be damaged. Shuttle program chief Wayne Hale argued in favor of flying Discovery now, saying all sorts of changes that already have been made to the foam need to be tested in flight before more complicated modifications are made. The final decision rested with Griffin, who said that because everyone agreed the crew could survive on the space station, the risk was more to the space program than to the astronauts. Web posted. (2006). [Shuttle crew faces 1-in-100 chance of dying [Online]. Available WWW: http://www.cnn.com/ [2006, June 27].]

Europe has much riding aboard shuttle

While the upcoming flight of space shuttle Discovery marks a critical test for the U.S. space agency NASA, Europe will have a lot riding aboard the shuttle too. German-born Thomas Reiter, 48, will be one of Discovery's seven crewmembers when it makes its planned liftoff July 1. And his presence goes beyond mere symbolism since the flight, in many ways, is key to the future of Europe's manned space program. Reiter will be returning to space after a 10-year hiatus, having last served aboard Russia's now-defunct Mir space station. Reiter is set to become the first member of an international space station crew who is not from the United States or Russia, dominant partners in the 16-nation program. A latecomer to the Discovery crew, Reiter nonetheless said he feels perfectly at ease with his six shuttle crewmates. British-born Piers Sellers, who became a U.S. citizen in 1991 and joined NASA's astronaut corps five years later, will also be aboard. Rounding out the crew are commander Steve Lindsey, pilot Mark Kelly, flight engineer Lisa Nowak, spacewalker Michael Fossum and mission specialist Stephanie Wilson. Web posted. (2006). [Europe has much riding aboard shuttle [Online]. Available WWW: http://www.cnn.com/ [2006, June 27].]

VP Cheney to attend launch

Vice-President Dick Cheney and his wife will travel to Cape Canaveral to attend Saturday's planned launch of space shuttle Discovery, his office confirmed Tuesday. Details of his visit will be released Wednesday. After the launch, the Cheneys plan to attend the Pepsi 400 NASCAR race in Daytona Beach. "It's a terrific way to spend the Independence Day weekend," the VP's press office said Tuesday in a prepared statement. The photo of Cheney at left is courtesy of the White House. Click on the image to enlarge it. Web posted. (2006). [VP Cheney to attend launch [Online]. Available WWW: http://www.orlandosentinel.com/ [2006, June 27].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: July 1, 2006, 3:49 p.m. EDT ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The STS-121 crew arrived at 10 a.m. today at the Shuttle Landing Facility from Johnson Space Center in Houston. Final preparations for the launch of Discovery's mission to the International Space Station continue at Launch Pad 39B. Flight pressurization of the orbital maneuvering system and main propulsion system continues and initial helium tank pressurization is complete. Launch countdown preparations are nearing completion in Firing Room 4 of the Launch Control Center. The

STS-121 launch countdown begins at 5 p.m. Wednesday, at the T-43 hour mark. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-062706** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 27.].]

Delta 4 launches NRO satellite from California

A Delta 4 launched a classified National Reconnaissance Office (NRO) satellite late Tuesday evening, the first launch for that vehicle from California. The Delta 4 Medium-Plus (4,2) lifted off from SLC-6 at Vandenberg Air Force Base in California at 11:33 pm EDT Tuesday (0333 GMT Wednesday), placing into orbit an NRO payload identified only as NROL-22. No other details about the spacecraft and its mission were released. The launch is the first for the Delta 4 from California; previous launches took place from Cape Canaveral in Florida. The launch took place from a pad originally developed for the cancelled Air Force Manned Orbiting Laboratory project in the 1960s and later converted, but never used, for space shuttle launches. Web posted. (2006). [Delta 4 launches NRO satellite from California [Online]. Available WWW: http://www.spacetoday.net/ [2006, June 28].]

NASA Issues Hubble Space Telescope Status Report

NASA engineers continue to examine the issues surrounding a problem related to the Advanced Camera for Surveys aboard the agency's Hubble Space Telescope. Engineers received indications on Monday, June 19, that the power supply voltages were out of acceptable limits, causing the camera to stop functioning. The camera has been taken off line so engineers can study the problem and determine the appropriate remedy. Hubble observations are continuing using the other science instruments on board. "We believe we are very close to fully understanding the issue experienced with the camera and we are going to resolve it," said Ed Ruitberg, deputy associate director, Astrophysics Division at NASA's Goddard Space Flight Center, Greenbelt, Md. "However, before we proceed with any actions, we want to have a review board meeting to assess both the trouble-shooting and the proposed solution." The board will meet at Goddard Thursday, June 29, to decide the best course of action. Engineers anticipate instrument observations will resume no earlier than July 3, with no degradation to performance. ["NASA Issues Hubble Space Telescope Status Report, **NASA News Release #06-252**, June 27, 2006.]

June 28: Weather not looking good

There's a 60 percent chance of weather conditions prohibiting the launch on Saturday, and Sunday, and Monday. The forecast from the 45th Weather Squadron at Patrick Air Force Base says we're to expect the weather we've been having the past few days to continue through the holiday weekend. That makes it less likely the shuttle will get to fly as scheduled at 3:49 p.m. on Saturday. However, preparations continue today for the start of the countdown. As all Florida residents know, the weather can change fast here. The concerns all three days include thunderstorms and clouds within 10 miles of the flight path (dangerous in part because of the threat of lightning) and within 20 miles of the Shuttle Landing Facility, where the commander would have to try to emergency land the shuttle in the event of an aborted launch. Web posted. (2006). [Weather not looking good [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 28].]

Discovery countdown begins today

A three-day countdown to the planned launch Saturday of shuttle Discovery is set to begin at Kennedy Space Center today while seven astronauts take part in final training for NASA's second post-Columbia test flight. With the 18-story shuttle standing at launch pad 39B, mission commander Steve Lindsey and pilot Mark Kelly will practice landings five miles away at NASA's shuttle runway. The dive-bombing training runs will be done in a Gulfstream 2 aircraft modified to mimic the shuttle's steep descent during final approach -- seven times that of a commercial airliner. Mission specialists Mike Fossum, Stephanie Wilson and Piers Sellers will be at the pad, training to take pictures of the shuttle's redesigned external tank once it is jettisoned from the orbiter nine minutes into flight. All seven crewmates -- including mission specialists Lisa Nowak and Thomas Reiter -- will check the fit of the pumpkin-orange partial pressure suits that they'll wear during launch and atmospheric re-entry. The astronauts were more concerned about the weekend weather when they arrived Tuesday at KSC, disembarking from T-38 jet trainers just a few hours ahead of afternoon thunderstorms. Liftoff is scheduled for 3:49 p.m. Saturday -- prime time for seasonal summer storms. The first official launch forecast will be issued today. But extended forecasts from the U.S. Air Force's 45th Space Wing show a high probability of rain Saturday and Sunday. A 102-foot-tall service structure will be pulled away from Discovery about 7 p.m. Friday, and launch engineers will begin pumping a half-million gallons of super-cold propellant into the shuttle's tank about 5:50 a.m. Saturday. Web posted. (2006). [Discovery countdown begins today [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 28].]

Cockpit upgrade on back burner

One thing Discovery won't carry is a cockpit upgrade Commander Steve Lindsey helped develop, but its ideas will be employed in the shuttle's successor. The shuttle cockpits were designed in the 1970s, before designers thought much about how people would use them and how computers might help, Johnson Space Center's Bruce Hilty said. "A bunch of engineers designed the way the shuttle operates," said Hilty, who worked with Lindsey on the avionics upgrade project. The current cockpits don't employ safety lessons that have been learned over the years from aviation. "A tremendous percentage of aviation accidents are related to crew error," he said. A typical problem with the shuttle's current system is that it will sound alarms for an avalanche of glitches, even if they stem from one root cause. "Today's caution and warning system is not very smart, and it's going to enunciate to the crew every one of these problems," said human factors researcher Robert McCann of NASA's Ames Research Center. "Every single one is going to have its own alarm and its own fault message that shows up." A crucial message might be obscured by a stream of trivial ones. "Something will fail and a light will turn on here and a light will turn on there and some little number will turn here," Hilty said, "and you've just got to be trained to know that that sequence of events means this thing failed. And so you start adding up enough of those, it becomes very cumbersome." The new system that he, McCann, Lindsey and other experts developed does the recognition for the astronauts. The upgrade would have gone far beyond the so-called "glass cockpit," which improved the visibility of the old controls. It would have organized the displays better and employed multiple colors for easier interpretation. The new avionics software was

"flown" in simulators on the ground and tested. But installation of the upgrade was canceled because of time and money pressures after the Columbia accident. Web posted. (2006). [Cockpit upgrade on back burner [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 28].]

NASA Would Explode Shuttle If It Went Off Course

Risk is part of the astronaut business, but NASA thinks the people who live on the Space Coast should not have to bear part of that risk. That's why there's a little-known safety office at Cape Canaveral with a space shuttle destruct switch and two officers who have an awesome responsibility. The astronauts said they know that could be their fate. "There's nothing inherently safe about sitting on 4 1/2 million pounds of explosives," said astronaut Mike Fossum. Few places are as dramatic as the Range Safety display area. For the officers seated at the stations, the job is as dramatic as the setting. They ran through a practice run on Tuesday for the space shuttle's planned Saturday liftoff. The shuttle has to stay within certain lines on the officers' screens. If its debris footprint crosses one of the red lines, that would mean that it is wildly out of control and someplace such as Cocoa Beach or Titusville could be threatened. The space shuttle crashing into an area like that could cause devastation on the ground. John Bond, of St. Cloud, said he knows if that happens he has a couple of buttons he has to press. Those switches go to the shuttle's booster rockets, and the booster rockets would explode. Everything and everyone on board would go down. Bond has been through a lot of launches and missions, and he said he knows every one could be the one where he has to throw the switch. "I've probably got 1,000 training runs in that we've done and it will be done by instinct," Bond said. "You kind of make peace with that in your mind?" Billow asked. "Yes. We're pretty much, it's just part of the job, much like the astronauts know what their job is and part of the job is if they endanger the public, that's going to happen," Bond said. The space shuttle has emergency systems and procedures that might or might not work if the shuttle were out of control and off course. But the astronauts wouldn't get to try them because the safety of the public takes priority over the safety of the astronauts. Web posted. (2006). [NASA Would Explode Shuttle If It Went Off Course [Online]. Available WWW: http://www.wesh.com/ [2006, June 28].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: July 1, 2006, 3:49 p.m. EDT ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The countdown for the Space Shuttle Discovery launch begins at 5 p.m. today at the T-43 hour mark. Launch remains scheduled for Saturday at 3:49 p.m. Discovery's flight crew is relaxing today and reviewing its flight data file. The Launch Complex 39 avian detection and monitoring continues through launch. On Tuesday afternoon, a lightning strike was detected near the south perimeter of Pad B. Discovery was not powered up and was not struck. There was one report of hail that was not confirmed. Initial walkdowns indicate there was some damage to facility electrical equipment supporting liquid hydrogen operations, but no vehicle damage was reported. None of the damage is expected to impact Discovery's launch. Further assessments of the

shuttle and facilities will continue today. U.S. Air Force weather officers are forecasting a 60-percent chance of weather prohibiting a launch attempt on Saturday. The primary weather concerns are anvil clouds from inland thunderstorms, cumulus clouds within 10 nautical miles of the flight path, and showers within 20 nautical miles of the Shuttle Landing Facility. The forecast is similar in the event of a 24-hour delay. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-062806** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 28.].]

No technical hurdles to launch

The shuttle launch team is working no technical issues that would prohibit an on-time liftoff on Saturday afternoon from the Kennedy Space Center. Jeff Spaulding, the NASA test director on the launch team, says Discovery could get up to four launch opportunities over the five days beginning Friday. After that, the team would have to take a day or two off before preparing the vehicle for another round of launch attempts. So it's all about the weather at this point. Kathy Winters, the weather officer, says afternoon storms are the worry for Saturday, Sunday and Monday launch attempts. The chance of acceptable launch weather all three days is just 40 percent. Winters says conditions could actually worsen next week, though it is far too early to give specific forecasts. "While they sound a little gloomy, we have certainly launched with a higher-percentage no-go than we have for Saturday," Spaulding said. For those who might be trying to plan ahead, target launch times for the next few days are as follows: Saturday: 3:49 p.m.; Sunday: 3:26 p.m.; Monday: 3 p.m.; Tuesday: 2:37 p.m.; Wednesday: 2:12 p.m. Web posted. (2006). [No technical hurdles to launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 28].]

Clouds could thwart shuttle launch

Clouds in the forecast raised doubts Wednesday about whether Discovery would get off the launch pad this weekend for the first space shuttle flight in nearly a year. There was a 60 percent chance that clouds capable of producing lightning would prevent a launch during the 10-minute window Saturday afternoon, said Kathy Winters, shuttle weather officer. The forecast remained the same for Sunday and Monday and was expected to worsen later in the week. NASA test director Jeff Spaulding said the shuttle had no technical problems that would prevent a launch. The space agency said it will make up to four launch attempts over five days, if needed. The launch window extends until July 19. The countdown began late Wednesday afternoon. "Obviously these forecasts, while they sound a little bit gloomy, we've certainly launched with higher predictions of no-go," Spaulding said. Weather already was creating some problems. A violent thunderstorm Tuesday afternoon caused minor damage to equipment used for fueling the shuttle, but it was not expected to affect the launch. Among the dignitaries planning to attend the launch were Vice President Dick Cheney and two members of the board that investigated the Columbia disaster. The Kennedy Space Center also will test new techniques for keeping birds away from the launch pad during liftoff. A vulture struck Discovery's fuel tank during last summer's launch but did not cause major damage. Web posted. (2006). [Clouds could thwart shuttle launch [Online]. Available WWW: http://www.cnn.com/ [2006, June 29].]

June 29: NASA Has Plan to Land Shuttle if Crew Has to Leave Ship

NASA officials revealed a new plan on Thursday that might allow a last-ditch effort to save a damaged space shuttle by guiding it back to Earth without astronauts aboard. The system, which could be used if astronauts were forced to abandon the shuttle and take refuge in the International Space Station, makes use of a 28-foot-long braided cable, weighing about five pounds, that can be attached to various control boxes on the shuttle. It would allow flight controllers on the ground to activate systems that previously had to be switched on by members of the shuttle crew, including power units, landing gear and drag chutes. John Shannon, the deputy manager of the space shuttle program, described the automatic landing system at a news briefing in preparation for the launching of the shuttle Discovery as early as Saturday. The flight will be only the second since the loss of the shuttle Columbia and its crew of seven astronauts in 2003, because a piece of falling foam put a hole in the left wing during ascent. NASA spent two years redesigning the external fuel tank and developed potential repair methods. But in the flight of the shuttle Discovery last year, several pieces of foam fell from the tank. The newly announced cable system could offer an alternative to ditching a craft worth at least $2 billion. If the craft had a chance of successful re-entry but officials felt that the risk to crew might be unacceptably high, the cable could be tried. The landing might be tried at Vandenberg Air Force Base in California so the approach to Earth would occur over water. The plan was developed over the past year, said Kyle Herring, a NASA spokesman. In the past NASA officials have argued that it would be impossible to land the shuttle without astronauts. Before the cable was developed, Mr. Herring said, the ability to feed landing instructions to the computers was there, but "the ability to land safely was not." Web posted. (2006). [NASA Has Plan to Land Shuttle if Crew Has Had to Leave Ship [Online]. Available WWW: http://www.nytimes.com/ [2006, June 30].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Location: Launch Pad 39B ; Launch Date: July 1, 2006, 3:49 p.m. EDT ; Launch Pad: 39B ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The countdown for the Space Shuttle Discovery launch began at 5 p.m. Wednesday at the T-43 hour mark. The launch control team members are in Firing Room 4 of the Launch Control Center monitoring the system consoles. Launch remains scheduled for Saturday at 3:49 p.m. The entire STS-121 crew participated in flight training this morning in T-38 jets. The commander and pilot also practiced landing techniques in the Shuttle Training Aircraft. At Launch Pad 39B, preparations for the launch of STS-121 continue. Early stowage of items in the flight crew cabin is complete. Loading of fuel cell reactants is scheduled to pick up later today. The fuel cells provide electricity to the orbiter during flight. The Mission Management Team met this afternoon for the traditional launch readiness meeting and gave the approval for a launch attempt on Saturday. U.S. Air Force weather officers are forecasting a 60-percent chance of weather prohibiting a launch attempt on Saturday. The primary weather concerns are anvil clouds from inland thunderstorms, cumulus clouds within 10 nautical miles of the flight path, and showers within 20 nautical miles of the Shuttle Landing Facility. The forecast is similar in the event of a 24-hour delay. Owner-press-release. (2006). **Space Shuttle**

Processing Status Report #S-062906 [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, June 29].]

June 30: Shuttle fascinates tourists

About 10,000 tourists will file into the KSC Visitor Complex on Saturday for the scheduled launch of NASA's second post-Columbia test flight. Tickets to view the launch from the complex, one of the closest public viewing sites, have been sold out for weeks. Another 5,000 people will be bused a few miles east to the NASA Causeway and about 3,500 people are expected at the Astronaut Hall of Fame, a few miles west of the complex. Besides the anticipated crowds on launch day, a surge of tourists have flooded the two attractions in the days leading up to the launch, and higher attendance is expected through the shuttle's landing 12 days later. To prepare for the crowds, Delaware North Companies Parks & Resorts at Kennedy Space Center Inc., which manages both government-owned facilities, hired additional employees, increased food shipments and added food and souvenir locations. "There's no better way to tell the NASA story than seeing a space shuttle launch," said Dan LeBlanc, chief operating officer of Delaware North. "It's an emotional and inspirational event that lasts a lifetime." Web posted. (2006). [Shuttle fascinates tourists [Online]. Available WWW: http://www.floridatoday.com/ [2006, June 30].]

Most networks to go live for Discovery launch

If the space shuttle Discovery lifts off from its Florida launch pad at 3:49 p.m. EDT Saturday, all but one of the major networks will cover it live. Only CBS has opted not to cover the launch live, though most of the other networks aren't devoting the same kind of resources and airtime to this launch as they did in July when the shuttle program returned to flight after the February 2003 Columbia disaster. The longest coverage will be on the cable channels, with Fox, CNN and MSNBC -- and their Web sites -- devoting significant resources. But NBC and ABC have positioned anchors, correspondents and space experts in New York, Cape Canaveral and Houston and will interrupt regular programming. Fox won't because its network isn't on air at that time. NBC, which will carry the U.S. Women's Open Championship on Saturday, finalized a plan Thursday that will have NBC Sports throw a few minutes before the scheduled launch to NBC News weekend anchor John Siegenthaler. Joining him will be Tom Costello, longtime space correspondent Jay Barbree, astronaut Steve Robinson and analyst James Oberg. They also will work on MSNBC, where Chris Jansing will anchor coverage. "We always felt this was indeed newsworthy," NBC News specials executive producer Phil Alongi said. "There's been a lot of discussion surrounding this launch." The shuttle will ferry more than two tons of supplies to the work-in-progress International Space Station. Web posted. (2006). [Most networks to go live for Discovery launch [Online]. Available WWW: http://today.reuters.com/ [2006, June 30].]

Pre-Launch Mission: Get the Vulture Count Down

For decades, the vultures of Cape Canaveral have enjoyed a banquet served up daily by the thousands of commuters at the Kennedy Space Center. Workers used to move roadkill to the grassy roadsides so the vultures could eat in peace. All that ended after the space shuttle Discovery hit a vulture as it lifted off from Pad 39B last year. In videos, the bird

could be seen bouncing off the top of the external fuel tank several hundred feet above the ground. Two other vultures were immolated during the launch. Although the birds missed the orbiter containing the crew, the event alarmed NASA managers, who, in 2003, saw a 1.7-pound piece of foam insulation from the shuttle's external fuel tank strike Columbia, eventually causing its destruction and the deaths of all seven crew members. "We talk about a quarter-pound piece of foam being catastrophic to the vehicle — these are 4- to 6-pound birds," flight director John Shannon said Thursday while discussing preparations for Saturday's scheduled launch. "We laugh about it, but it is a serious risk." NASA will use radar to track the birds before liftoff. If too many vultures are deemed too close to the shuttle, the data "will allow us to make a real-time call about holding the launch to give them time to fly out," said shuttle launch director Mike Leinbach. Since the Columbia disaster, NASA has spent billions trying to ensure nothing hits the shuttle during launches. Birds have been frequent uninvited guests at shuttle launches throughout the program's 25-year history. Woodpeckers used to attack the external tank until NASA engineers began blasting them with loud noises. That doesn't work with vultures. There are two types at Kennedy: the black vulture and the red-headed turkey vulture. Each has a wingspan of up to 4 feet. They spend a significant amount of time patrolling the skies in search of meat, which makes them a launch hazard. Experts have no hard evidence about how well the bird abatement program is working. Anecdotally, they think they are seeing an effect. NASA has been hearing from neighboring cities claiming to be seeing more vultures. Deprived of the easy pickings at Kennedy, the birds are foraging farther afield, program workers said. The space agency is trying more exotic approaches — from loud noises to chemical fogs — to deal with vultures. Birds that didn't mind the stench of decaying alligator had no trouble ignoring the fog, said Tracy Gibson of ASRC Aerospace Corp. The space agency has decided to set a trap five miles from the launch site with enough bait to lure as many as 60 birds. "After launch, we'll release them," Leinbach said. "We live on a national wildlife refuge out here, so we're not free to mess with the birds in a terminal fashion." Web posted. (2006). [Pre-Launch Mission: Get the Vulture Count Down [Online]. Available WWW: http://www.latimes.com/ [2006, June 30].]

NASA Names New Rockets

NASA announced on Friday the names of the next generation of launch vehicles that will return humans to the moon and later take them to Mars and other destinations. The crew launch vehicle will be called Ares I, and the cargo launch vehicle will be known as Ares V. "It's appropriate that we named these vehicles Ares, which is a pseudonym for Mars," said Scott Horowitz, associate administrator for NASA's Exploration Systems Mission Directorate, Washington. "We honor the past with the number designations and salute the future with a name that resonates with NASA's exploration mission." The "I and V" designations pay homage to the Apollo program's Saturn I and Saturn V rockets, the first large U.S. space vehicles conceived and developed specifically for human spaceflight. The crew exploration vehicle, which will succeed the space shuttle as NASA's spacecraft for human space exploration, will be named later. This vehicle will be carried into space by Ares I, which uses a single five-segment solid rocket booster, a derivative of the space shuttle's solid rocket booster, for the first stage. A liquid oxygen/liquid hydrogen J-2X engine derived from the J-2 engine used on Apollo's second stage will power the crew

exploration vehicle's second stage. The Ares I can lift more than 55,000 pounds to low Earth orbit. Ares V, a heavy lift launch vehicle, will use five RS-68 liquid oxygen/liquid hydrogen engines mounted below a larger version of the space shuttle's external tank, and two five-segment solid propellant rocket boosters for the first stage. The upper stage will use the same J-2X engine as the Ares I. The Ares V can lift more than 286,000 pounds to low Earth orbit and stands approximately 360 feet tall. This versatile system will be used to carry cargo and the components into orbit needed to go to the moon and later to Mars. NASA's Johnson Space Center, Houston, manages the Constellation Program and the agency's Marshall Space Flight Center, Huntsville, Ala., manages the Exploration Launch Projects office for the Exploration Systems Mission Directorate, Washington. ["NASA Names New Rockets, Saluting the Future, Honoring the Past," **NASA News Release #06-270**, June 30, 2006.]

Space Shuttle Processing Status Report

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JULY 2006

July 1: Discovery's 'Pedestrian Mission' Means a Lot to NASA

The space shuttle Discovery and its seven astronauts are to roar into orbit this afternoon on what NASA managers called "a rather pedestrian mission" that nevertheless has a great deal riding on it. Liftoff is scheduled for 3:49, when Earth's rotation will put the launching pad at the Kennedy Space Center here in the orbital plane of the International Space Station, the shuttle's destination. Weather is still an open question with conditions shifting from favorable to unfavorable throughout the day. But a last-minute technical problem has cropped up: a heater in the shuttle's maneuvering system is not working properly. NASA officials have not stopped the countdown for this problem, but if it is not corrected it might cause the launching to be delayed at least one day. A different issue that had caused some concern -- whether fuel level sensors that caused a delay in the last flight would act up again -- was not a problem this morning. The sensors passed their test. Web posted. (2006). [Discovery's 'Pedestrian Mission' Means a Lot to NASA [Online]. Available WWW: http://www.nytimes.com/ [2006, July 1].]

Clouds Force Delay of Shuttle Launching

NASA scrubbed the launching of the shuttle Discovery minutes before its scheduled liftoff Saturday as threatening clouds encroached on the 20-mile boundary around the Kennedy Space Center. The postponement came on the first day of a 19-day launching window, just before the start of a 10-minute span in which the launching pad enters the same orbital plane as the International Space Station. Liftoff is now scheduled for a 10-minute window starting at 3:26 p.m. on Sunday, but current weather forecasts put the likelihood of adverse conditions at 70 percent. Conditions for Monday, according to forecasters working with the National Aeronautics and Space Administration, are likely to be even worse. Web posted. (2006). [Clouds Force Delay of Shuttle Launching for at Least a Day [Online]. Available WWW: http://www.nytimes.com/ [2006, July 2].]

July 2: NASA Scrubs Shuttle Liftoff for 2nd Day Over Storms

NASA scrubbed the launching of the shuttle Discovery on Sunday for the second day in a row as thunderstorms and clouds cloaked the Kennedy Space Center. "We decided to terminate the count today, stand down for 48 hours," Michael D. Leinbach, the launching director, told Col. Steven W. Lindsey of the Air Force, the shuttle's commander, at 1:15 p.m., a little more than two hours before the scheduled liftoff. All seven astronauts had entered the Discovery, but workers had not yet closed the hatch. The National Aeronautics and Space Administration will hold off launching until Tuesday at 2:38 p.m., with the extra day to keep the shuttle astronauts and crews fresh and to replenish the fuel cells, which provide electrical power to the orbiter. Mr. Leinbach said NASA could try again on Tuesday, Wednesday and Friday before having to shut down operations for three or four days to replenish fuels. Web posted. (2006). [NASA Scrubs Shuttle Liftoff for 2nd Day Over Storms [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 3].]

Russia, NASA Sign New Protocol on ISS Maintenance

Russian Federal Space Agency chief Anatoly Perminov and NASA Administrator Michael Griffin have signed a new protocol on cooperation in the maintenance of the International Space Station (ISS), agency press secretary Igor Panarin told Itar-Tass by phone. He said the protocol was signed at Cape Canaveral, Florida, on July 1 during Perminov's working visit to the United States. He was invited to attend the Discovery space shuttle launch, which was aborted on Saturday because of bad weather. This is a strategic document, which defines bilateral cooperation in all aspects of the ISS maintenance, including the delivery of cargos, Panarin said. The validity of the previous agreement expired this year. "It is of paramount importance that a new agreement has been signed, and Russia and the United States have found optimum forms of cooperation," he said. "Both Griffin and Perminov are pleased with the signing." Perminov has also met with the chief of the European Space Agency (ESA). Panarin said they discussed the program of the future manned space vehicle. That meeting did not result in signing of any accords, he said. Web posted. (2006). [Russia, NASA Sign New Protocol on ISS Maintenance [Online]. Available WWW: http://www.astroexpo.com/ [2006, July 5].]

July 3: Get these guys some barbecue

Brad Smith, Jeff Rowell and Charles Wassen earned their Fourth of July barbecue and a beer. Leaning off a platform 200 feet above the ground, tethered to the shuttle launch tower for safety reasons, Rowell was able to get a tiny camera within inches of an otherwise impossible-to-reach spot on shuttle Discovery's external tank on Monday. The pictures that he and his colleagues snapped gave NASA managers the last bit of confirmation that they needed to make the decision to go ahead and try to launch the shuttle on Independence Day. "It's not just us," Rowell said, noting several times that the 13-man micro-inspection team for United Space Alliance collaborated with countless engineers and members of the launch crew to pull off an unusual inspection of damaged foam insulation to make sure it posed no threat to the shuttle or the astronauts. "We do this all the time with the orbiter," said Rowell, a Cocoa resident on the team that uses a boroscope to get inside pipes, around corners and into all kinds of tiny crevices to inspect the places humans can't see. The call came in around noon Monday. Someone on the shuttle team was trying to figure out a way to get an up-close look at foam covering a bracket high on the external tank. Not only was the damaged foam too far from work platforms, it was blocked from view by a 17-inch wide liquid oxygen pipe. "He thought we would be the people to call," said Smith, who lives in Titusville. The team inserted a 6 millimeter wide, fiber optic cable with a camera on the end through a bendable piece of piping. Bent into a shape that would allow them to snake it around the big oxygen pipe, Rowell extended the camera-tipped tool within six inches of the damaged foam. He had to lean out as far as he could to get there, but the result was 20 pictures that were "about like looking at it with your eyeball." The pictures convinced the launch team that no more foam would fall from the area and gave engineers additional data they needed to predict whether the area would be covered in ice during the countdown or overheat during ascent. Web posted. (2006). [Get these guys some barbecue [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 4].]

July 4: Shuttle Makes a Safe Return to Space Flight

The space shuttle Discovery split a nearly cloudless sky with thunder and fire on Tuesday afternoon and roared safely into orbit. The liftoff, right on schedule at 2:38 p.m., was the start of a 13-day flight that is the first in a year for the diminished shuttle fleet as NASA continues its efforts to resume more frequent human spaceflight. The Discovery is to rendezvous on Thursday with the International Space Station, where it is carrying equipment, supplies and a fresh astronaut for the station's crew. But this is also considered the second and final test flight for the shuttle fleet since the loss of the Columbia and its seven astronauts in 2003, and the Discovery's ascent was scrutinized for the kind of liftoff debris that caused that disaster. At 2 minutes 53 seconds into the flight, an onboard camera showed numerous pieces of debris appearing to fall away from the external fuel tank. They fluttered away and did not appear to strike the shuttle, carrying a crew of seven. N. Wayne Hale Jr., NASA's shuttle program chief, said the pieces had fallen "after the time we are concerned about," after the air becomes so thin that debris usually floats harmlessly away. A piece of debris that broke off later in the ascent did appear to strike the midbody of the orbiter, NASA officials said. But they added that it probably did not do any damage. In all, officials said, insulating foam broke away from five spots on the external fuel tank and a solid rocket booster, some with several pieces of foam. But none occurred within the time that NASA considers hazardous, and only one piece might be larger than the allowable size. Batteries of cameras on the Discovery and the space station are photographing every square inch of the shuttle's surface during the mission. If serious damage is found, NASA plans call for the crew to abandon the shuttle and seek "safe haven" inside the station until a rescue mission can begin. NASA officials were jubilant about the liftoff. "They don't get much better than this," said NASA's administrator, Michael D. Griffin, who had been criticized for overruling engineering and safety officials last month after they recommended postponing the mission for more study of debris hazards. Web posted. (2006). [Shuttle Makes a Safe Return to Space Flight [Online]. Available WWW: http://www.nytimes.com/ [2006, July 4].]

July 5: NASA: No concern on fallen foam

At least five pieces of foam -- the material that broke off and doomed the space shuttle Columbia -- flaked off Discovery after its launch Tuesday, but the particles broke loose after a critical time period, said shuttle program manager Wayne Hale. "The shuttle (Discovery) performed very, very well. We saw nothing that gave us concern or pause that we wouldn't be safe to fly the next mission," Hale said. "The tank performed very well, especially early in the flight in the lower atmosphere." After a crack was discovered in Discovery's foam covering, there was a question as to whether Discovery would launch Tuesday -- the Fourth of July. NASA engineers decided the problem caused no risk to the seven astronauts on board. The foam insulates the exterior fuel tank to prevent ice from forming. The particles that fell from Discovery were observed in images of the flight, Hale said. He told reporters Tuesday night that NASA has only reviewed 30 or 40 percent of the pictures, and was still collecting data. Some of the images will be available Wednesday, he said. "Every piece of foam that came off was after the critical time, and we can confirm all but one of those was smaller than the mass that we worry about." Tuesday's foam fell off at 2 minutes, 53 seconds and 4 minutes, 45 seconds. "Two minutes, 15 seconds is our bingo time. Anytime after that, we're not worried," Hale said. In addition to the five pieces of foam that separated from the shuttle,

Hale said NASA has identified two other issues requiring further study: a shim that acts as a separator between tiles broke off, and a camera lens got water on it. A piece of ice broke off the shuttle about 15 minutes into the flight, but such occurrences are not unexpected, Hale said. There was a problem with the shuttle's cooling system, but it was being resolved. "It's incredible to me the space shuttle main engine can form frost on the outside when hot inside," Hale said. He said in an early conversion with the crew, there was "very little to talk about because the orbiter performed so well." Discovery was to have launched Saturday, but bad weather that day and Sunday delayed the effort. Web posted. (2006). [NASA: No concern on fallen foam [Online]. Available WWW: http://www.cnn.com/ [2006, July 5].]

Discovery astronauts to check heat shield today

Discovery's astronauts will inspect their ship's heat shield today after an impressive Independence Day launch on a mission marking NASA's second attempt to get a deadly foam-shedding problem under control. With sophisticated radar and more than 100 high-resolution cameras tracking Discovery's climb into orbit, engineers spotted a flurry of small foam fragments flying off the shuttle's redesigned external tank. But NASA officials said Discovery was traveling too high and too fast for the debris to do the type of serious damage that doomed Columbia's crew during an ill-fated atmospheric reentry back in February 2003. "We saw nothing that gives us any kind of concern about the health of the crew or the vehicle or any pause to think that we wouldn't be safe to fly the next tank," said NASA shuttle program manager Wayne Hale. The seven astronauts nonetheless will start a meticulous inspection of Discovery's vulnerable wing panels and nosecap early today. Along with the shuttle's thermal tiles, the heat shield components protect the ship and its crew from extreme temperatures -- up to 3,000 degrees Fahrenheit -- encountered during reentry. It was the first Fourth of July launch in the 45-year history of the U.S. human space flight program. About 200,000 people jammed Space Coast roadways, riverbanks and beaches to witness the holiday launch. NASA hosted another 20,000 VIPs, celebrities and dignitaries at Kennedy Space Center, and others traveled to the space center to work the launch. The 2:38 p.m. liftoff was precisely timed to put Discovery on course for a 10:52 a.m. Thursday docking at the International Space Station. The high-flying hookup will require some precision piloting. NASA hopes to extend the mission a day so a third spacewalk can be carried out to test heat shield repair techniques. As it stands, Discovery and its crew are scheduled to land at KSC at 8:52 a.m. July 16. Web posted. (2006). [Discovery astronauts to check heat shield today [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 5].]

Coast Guard patrols waters off Cape

Positioned nine miles south of the launch pad, the search-and-rescue boat's four-member crew snapped photos, recorded video and stared through binoculars as shuttle Discovery ascended over the Atlantic Ocean. "Look at her go," said Chief John Rice, executive petty officer of Coast Guard Station Port Canaveral and captain of the boat. "It's just beautiful." For the past week, including Tuesday, about 40 Coast Guard members -- both active and reserve -- patrolled the federally protected waters around the clock off Cape Canaveral. Their mission was twofold: to secure NASA property, especially Discovery, and to keep boaters in the area out of danger. Fourteen Coast Guard boats were stationed

throughout the security zone, which stretched 24 miles long and three miles wide. Boat traffic was light Tuesday, despite the expected launch and the Fourth of July holiday. A handful of boats ventured north of Port Canaveral before the launch Tuesday, and only a few were forced to change course. Web posted. (2006). [Coast Guard patrols waters off Cape [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 5].]

Space shuttle external tank fixes appear sound

After a full day of image analysis and inspections, NASA engineers are increasingly optimistic that major changes to the foam insulation on the shuttle Discovery's external fuel tank worked as required to minimize the release of potentially catastrophic debris during the ship's Fourth of July climb to space. If they're right, and if preliminary indications are confirmed during continued observations and around-the-clock analysis, NASA will move a major step closer to putting its painful post-Columbia return-to-flight effort behind it, shifting the focus instead to resuming assembly of the international space station. "We have in hand all the data we're going to get from the external tank and the performance was very good," said John Shannon, chairman of NASA's Mission Management Team. "And we got some good data, too, which was really important. We really want to be able to verify what kind of redesigns we were doing." Shannon said the most significant change made to the external tank since Discovery last flew a year ago - removal of a long foam wind deflector - worked well. Known as a protuberance air-load - PAL - ramp, the wind deflector was in place to smooth the flow of turbulent air over two pressurization lines and a cable tray during the shuttle's climb out of the dense lower atmosphere. Much of the 11 months preparing Discovery for its current mission was focused on proving the PAL ramps could be safely removed and that the pressurization lines and cable tray could, in fact, stand up to the aerodynamic rigors of launch on their own. Computer modeling and wind tunnel tests convinced agency managers the ramps were not needed and Discovery's launching Tuesday appeared to verify those conclusions. While a final answer will depend on analysis of data captured by sensors mounted in the cable tray - work that is not yet done - Shannon was clearly optimistic. "The only thing we have to do is go make sure all the aerodynamic modeling that we did is corroborated by the sensors that we flew on this flight," he said. "This was one data point and it was a really good data point, but we want to make sure we are not on the edge of anything. We don't think we are, but we need to go make sure." During Discovery's launch last year, foam debris also broke away from an area where two struts attach the nose of the shuttle to the tank. Engineers came up with a fix and it, too, appeared to work. Photographs of the tank after it was jettisoned in space showed no foam losses in the area. Even the ice-frost ramps on the tank appeared to work well. The ice-frost ramps, hand-sculpted foam insulation applied to 34 brackets holding the cable tray and pressurization lines in place, generated controversy before launch when two top NASA managers voted to delay the flight until they could be redesigned. The insulation in question was officially deemed an unacceptable risk, in large part because engineers lacked a solid understanding of foam failure mechanisms. Web posted. (2006). [Space shuttle external tank fixes appear sound [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, July 5].]

July 6: Space Shuttle Does Back Flip and Rendezvous With Station

The space shuttle Discovery glided Thursday morning to a smooth rendezvous with the International Space Station. The approach, at a gradual one-tenth of a foot per second as both craft raced through orbit at 17,500 miles an hour, could be seen on NASA Television from a camera mounted in the Discovery's docking mechanism. "Capture confirmed," the shuttle's commander, Col. Steven W. Lindsey of the Air Force, radioed to mission control at 10:52 a.m. Eastern time, when the two spacecraft joined about 220 miles above Earth, south of Pitcairn Island in the South Pacific. By 12:30 p.m., the crews had opened the hatch separating them and exchanged handshakes and hugs. An hour before docking, the Discovery, in its second full day in orbit, did a back flip of greeting as it approached the space station. During the maneuver, in which Colonel Lindsey pulled up the nose of the craft at three degrees per second, the 122-foot-long, 245,000-pound shuttle turned as gracefully as a gymnast, though an extremely large one. That gave crew members on the station, Pavel V. Vinogradov of Russia and Col. Jeffrey N. Williams of the United States Army, the flight engineer, a leisurely view of the bottom of the Discovery so they could take 350 highly detailed photographs of it. The flip was part of the program of inspection put in place after the 2003 Columbia disaster, when an undetected hole in the left wing caused that shuttle to break up during re-entry, killing all seven astronauts on board. It was only the second time that the maneuver had been performed. Colonel Lindsey executed the maneuver with the help of a small thruster, known as a Vernier, that developed a balky thermostat last week. The problem had threatened to delay the mission, but NASA elected to launch without fixing the thruster, saying the astronauts could maneuver without it. Once in orbit, Colonel Lindsey kept the left side of the shuttle facing the sun, which warmed the craft and brought the thruster up to operating temperature. The coast of Spain was clearly visible beneath the Discovery as the maneuver began, and the hills and clouds slid by underneath. Thomas Reiter, a German astronaut aboard the Discovery, officially joined the station's crew, bringing its complement to three for the first time since the Columbia disaster. John Shannon, deputy manager of the shuttle program, noted that a breakaway patch of thin foam that he described yesterday as being 8 inches by 10 inches was actually more than 12 by 14. That larger patch was still within the range that the agency expected to see, Mr. Shannon said, and did not constitute a threat. On Friday, the shuttle crew will transfer an Italian-made cargo carrier, known as Leonardo, from the shuttle to the station so that the 5,000 pounds of supplies inside can be loaded into the station. Web posted. (2006). [Space Shuttle Does Back Flip and Rendezvous With Station [Online]. Available WWW: http://www.nytimes.com/ [2006, July 6].]

July 7: Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory); Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: NET Aug. 1, 2006 ; Launch Time: 2:42 - 2:44 p.m. or 3:50 - 4:05 p.m. EDT. The launch of STEREO aboard a Boeing Delta II rocket has been rescheduled to Aug. 1, pending Eastern Range availability and confirmation. Due to a faulty crane at Pad 17-B, vehicle stacking of the solid rocket boosters was not able to resume until yesterday and will continue on Saturday and Sunday. Hoisting of the Delta second stage atop the first stage is scheduled for Tuesday, July 11. On Wednesday, the payload fairing will be lifted into the pad clean room. At the Astrotech Space Operations Facility, technicians completed

final thermal blanket installation on Observatory "A" yesterday. This was followed by final black-light cleaning of the observatory. Today, it is being transported to the adjacent hazardous processing facility in preparation for fueling. Instrument testing on Observatory "B" has been completed. Final thermal blanket installation and black-light cleaning will take place this weekend. On Monday, Observatory B will also be moved to the hazardous processing facility, joining Observatory A. Fueling of the two observatories, hoisting Observatory A and mating it with Observatory B, spin-testing of the integrated STEREO spacecraft, and mating to the upper stage booster will take place at the hazardous processing facility. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-070706** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, July 7].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Official Launch Date: July 4, 2006 at 2:38 p.m. ; Expected KSC Landing Date/Time: July 17 at about 9:14 a.m. ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Today is Flight Day 4 for STS-121, and Discovery is currently docked to the International Space Station. The Multi-Purpose Logistics Module containing supplies and equipment for the space station has been transferred from Discovery's payload bay to its station port. The crew will spend the next several days unloading the module and then filling it with items to be returned to Earth. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, workers are busy preparing Atlantis for rollover to the Vehicle Assembly Building, currently scheduled for the last week of July. Final gap filler and tile work is under way, and final inspections of the radiator are complete. The payload bay doors are scheduled to be closed for flight late today. Workers have configured the shuttle main engines for rollover and are finishing final closeouts in the forward and aft sections. In high bay 3 of the Vehicle Assembly Building, ET-118, the external fuel tank for STS-115, has been lifted from the checkout cell, and operations to mate it to the solid rocket boosters are under way. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. This week, functional testing of the atmosphere revitalization pressure control system got under way. This system maintains crew module pressure during flight. Window no. 3 installation is nearing completion, and tile-processing work continues around the external tank doors and nose landing gear doors. Gap filler removal and replacement continues in the high priority areas of the orbiter's heat shield. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-070706** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, July 7].]

July 9: **Board begins mission to land space business**

Monday marks the beginning of a new strategy for Florida's efforts to attract and retain the space and aeronautics industry with the first meeting of the board of Space Florida. It's a unified effort under the umbrella of the public-private Enterprise Florida and replaces the state's previous, three-agency effort. At stake are high-paying space and aeronautics jobs, nearly 30,000 private-sector jobs across the state with $2 billion in payroll in the most recent statistics available. The bulk of those are at Kennedy Space Center. With Discovery in orbit, Gov. Jeb Bush will lead the inaugural Space Florida board as the state continues efforts to snag business as the shuttle program concludes by 2010. Gone by September will be the Florida Space Authority, Florida Space Research Institute and Florida Aerospace Finance Corp. "A very smooth and easy transition is first and foremost. Let's take what we have, consolidate it down and move forward," said Jim Tolley of Palm Bay, a lieutenant with the Melbourne Fire Department and a board member of the old Space Authority moving over to new duty on the board of Space Florida. Created by legislation this year, board members said naming a search committee for Space Florida's first president will be an important part of early work. A strategic plan is due by March. Web posted. (2006). [Board begins mission to land space business [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 9].]

July 12: NASA visitor facilities among top contenders

As the space shuttle era draws to a close, NASA officials and aviation historians are preparing to transform the workhorse orbiters from reusable space wagons to revered museum pieces. Competition to host one of the three shuttles -- Atlantis, Discovery and Endeavour -- already has begun, even though the ships still face at least 15 more missions to the International Space Station and perhaps one repair call to the ailing Hubble Space Telescope during the next four years. "A whole bunch of museums and communities are vying for a retired shuttle," said Jim Hull, a NASA artifacts manager spearheading shuttle retirement planning. Visitor complexes at NASA's main space flight centers in Alabama, Florida and Texas are considered front-runners. But the National Museum of the United States Air Force in Ohio and the California community where the shuttles were built also have expressed a desire to house one of the orbiters. Hull said he is busy crafting proposals that would exhibit the shuttles in fascinating, innovative and fun ways. He declined to elaborate, saying the plan still is a work in progress and must be approved by NASA Administrator Mike Griffin. The $2 billion space planes are likely to be a big draw, wherever they come to rest. "People are absolutely fascinated with seeing anything that has been in space," said Valerie Neal, space history curator at the National Air and Space Museum in Washington. The shuttle Enterprise, a test vehicle that never flew in space, is a top attraction at the Smithsonian Institution's Udvar-Hazy Center in Chantilly, Va., where the annual visitor count exceeds 2 million. "People are astonished when they see it," Neal said. Currently, the National Air and Space Museum is designated as the primary repository for NASA artifacts of historic and educational value. Its two locations house the world's most complete collection of space artifacts. Space division branch chief Roger Launius said the museum has a standing request for one of the flown shuttles along with many of the estimated 900,000 shuttle components -- from space suits to onboard lavatories. "We've requested a flight vehicle as it was when it flew the last time because we would like to freeze it in time," said Launius, formerly NASA's chief historian. "We would like to ensure that one of these is preserved so 500 years from now

people can study and look at the technology." Smithsonian officials also could play a role in where the other shuttles go and how they are preserved. Curators say they are determined to avoid the mistakes made when the Apollo program came to an abrupt end in 1970s. Many valuable Apollo items were trashed or made their way into private collections. Three massive Saturn V moon rockets on loan from the Smithsonian to the Johnson, Kennedy and Marshall Space centers suffered serious degradation from weather and animal infestation. "These things (space shuttles) are so huge, and once they arrive somewhere, that's where they are going to stay indefinitely," Neal said. "We're trying to figure out what's the most responsible position for the preservation of these artifacts." Web posted. (2006). [NASA visitor facilities among top contenders [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 12].]

Wanted: Space dynamo

Retaining, recruiting and growing new jobs in Florida space's industry, which faces an avalanche of change with the retirement of the shuttle fleet in 2010 and deep workforce cuts at Kennedy Space Center. And efforts by other states that are out-thinking, out-maneuvering and out-hustling Florida to lure the new breed of space entrepreneurs who are creating industries as we speak. Florida has to get back in the game -- fast -- or risk watching its $4 billion a year space industry wither and Brevard County take an especially hard hit. To accomplish that, Gov. Jeb Bush and the Legislature took a smart step this spring by streamlining the state's outdated, ineffective space-development approach and consolidating the push into a new agency: Space Florida, a public-private entity that held its first meeting Monday and announced it was conducting a national search for a president. This is a critical hire, and the person selected should be an aggressive, innovative leader who can get things done and is not afraid to make turf-bound Tallahassee officials understand their old ways don't work. Decisions soon on what companies will build NASA's next-generation Crew Exploration Vehicle moonship, where the construction and assembly will be done, and what commercial firms will fly supplies to the International Space Station. KSC is poised to gain some of the work. But whatever it gets should be just the start of turning the spaceport into a hub for NASA's moon-Mars programs, which will require extensive state help to attract private companies via economic incentives. Beyond that, the state must create a spaceport -- perhaps centered at KSC's shuttle runway -- for the type of entrepreneurs who are launching the infant space tourism industry in other states. The facility should provide low-cost operations and easy licensing so companies can use it as an incubator, move rapidly to test their technologies and not be strangled by excessive regulation. Web posted. (2006). [Wanted: Space dynamo [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 12].]

Mystery surrounds beached boat at Cape

It's a real mystery but investigators hope to get some answers from a boater found walking out of the surf about two miles from where his 32-foot- vessel washed ashore at Cape Canaveral Air Force Station. The boat was found with a running motor and a dead dog onboard. The unidentified boater was spotted about noon after a short search of the restricted area by two military helicopters. The crew of a U.S. Coast Guard HH-60 Jay Hawk helicopter airlifted the man -- who was suffering from hypothermia and exposure

to the ocean waves -- to Holmes Regional Medical Center in Melbourne for treatment, officials said. The search started after a group of civil engineers walking along the beach came across a boat with a running motor and the remains of the dog still onboard, said Lt. Col. Maria Carl, spokeswoman for the 45th Space Wing. The discovery was made about 11:15 a.m. Brevard County homicide agents were called to the restricted area - also the site of several rocket launch complexes - to investigate. "We found the boater about two miles north of where his boat was found. He was walking out of the water onto the beach when he was spotted by the helicopters," said Donnie Brzuska, a spokesman with the U.S. Coast Guard. "Now we're working on trying to find out what happened and hope to debrief him at the hospital." There were no other people on the boat when it was found. Web posted. (2006). [Mystery surrounds beached boat at Cape [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 12].]

Discovery Astronauts Test Repair Methods

Two spacewalking astronauts squeezed a putty-like sealant from a caulk gun Wednesday to test new repair techniques that might some day be necessary to save a damaged space shuttle. "Easy motion on the trigger," astronaut Piers Sellers told his colleague, Mike Fossum, as they floated in Discovery's cargo bay and prepared for the tests on 12 deliberately damaged pieces of shuttle material. "Good goo?" Sellers asked. "Good goo!" Fossum responded. More than an hour into the 6 1/2-hour spacewalk, the astronauts ran into a brief delay when one of the safety tethers on Fossum became unlocked. There was no danger of the astronaut floating away since he is attached to the complex by more than one tether, and he was able to relock it. NASA spokesman Rob Navias said problems like that happen on occasion. During Monday's spacewalk, Seller's safety-jet backpack almost came loose while he worked on repairs. "They are double and in some cases, triple tethered at all times depending on where they are," Navias said. "Their chances of ever floating away are zero." Wednesday's was the third and final spacewalk planned while Discovery is docked at the space station. Using a caulk gun, the two squirted sealant onto 12 deliberately damaged reinforced carbon-carbon samples stored on a pallet in Discovery's open payload bay. Reinforced carbon-carbon is used to protect the shuttle's wing leading edges and nose cap from searing heat that can reach 2,300 degrees Fahrenheit during re-entry into Earth's atmosphere. A crack in Columbia's wing in 2003 allowed fiery gases to penetrate the shuttle, destroying Columbia high over Texas and killing its seven astronauts. The repair technique was devised by NASA to make sure such a disaster never happens again. Web posted. (2006). [Discovery Astronauts Test Repair Methods [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 12].]

NASA Seeks Master Developer for KSC's Exploration Park

NASA today issued a solicitation to attract offers for the development and long-term operation of Exploration Park at Kennedy Space Center. The agency posted a draft request for proposals and seeks comments from industry on the draft by Aug. 17. A briefing for potential developers and a site tour is planned at KSC for Aug. 10. NASA envisions Exploration Park as a unique technology and commerce park development, featuring trend-setting, sustainable design features while hosting cutting-edge technology and space exploration-related activities at the nation's primary spaceport. NASA's

primary objectives in establishing Exploration Park at KSC are to: Enable and grow private sector participation and contribution to the long-range exploration of space by the U.S. and its international partners; Promote the development and use of technologies that contribute to space exploration and preservation of Earth's environment; Attract tenants who advance the mission of NASA and KSC with an emphasis on commercial, academic and governmental synergy; Expand access to and use of the capabilities of KSC and neighboring space launch and landing sites. NASA also seeks through this project to accomplish a federal government goal of improved asset management by obtaining increased value from underutilized property. Through the solicitation, NASA aims to select a forward-looking, creative and highly capable developer who is adept at planning and delivering projects that foster entrepreneurial opportunity while honoring the environment. NASA intends to select a master developer of Exploration Park whose role and responsibility will be to: Define a master development plan for the entire park, including planned phasing; Define and implement detailed development plans to integrate all of the initial infrastructure and building projects and those of any subsequent phases; Provide full financial, management and project integration resources to design and deliver the site improvements for initial and any subsequent phase projects, including any build-to-suit projects and/or spec buildings to be constructed and owned by the master developer; Assure that all development in Exploration Park is consistent with design standards and implementation approaches proposed by the master developer and accepted by NASA; Establish and sustain an Exploration Park operations and management structure that ensures a well maintained, quality development. NASA plans to negotiate a long-term lease and development agreement, up to 75 years in term, and offer immediate and future development rights consistent with the site boundaries and conditions defined for the Exploration Park project. The master developer selection is a two-step process. NASA intends to use the responses to the first step to establish a list of approximately five most highly qualified candidates. Step two responses to this request for proposals will be accepted only from those developers on the short list. Prospective tenants and/or site developers with a specific project interest who wish to participate in Exploration Park -- but who do not wish to be considered as the master developer -- are encouraged to express their interest, and NASA will accept such information for the master developer ultimately selected. The master developer will have the right to sublease space in multi-tenant projects or improved sites for the development and use of improvements built by others. ["NASA Seeks Master Developer For KSC's Exploration Park," **NASA News Release #46-06**, July 12, 2006.]

July 13: **Fla. boater survives ocean adventure**

A New Smyrna Beach man was in good condition today after surviving about 24 hours stranded in the Atlantic Ocean without a life jacket, Coast Guard officials said. Brian Wallschlaeger, 34, was picked up when he swam onto Cape Canaveral Air Force Station in Brevard County shortly after noon Wednesday, said Petty Officer 1st Class Mark Carstens of U.S. Coast Guard Station at Port Canaveral. Wallschlaeger set out on his 32-foot Albamarle sport fisherman from Ponce de Leon Inlet about 8 a.m. Tuesday on his way to Fort Lauderdale. The boat was about 10 miles off shore when a large wave came by about 11 a.m. Wallschlaeger's Labrador retriever slid across the deck and knocked him into the ocean, Carstens said. Wallschlaeger held on to a platform on the back of the boat

for a time, but when he let go to try to wave down some passing boaters, his boat drifted away. A Coast Guard helicopter transported Wallschlaeger to Holmes Regional Medical Center in Melbourne. He was being treated for exhaustion, dehydration and hypothermia. The boat was found beached about two miles from where Wallschlaeger was located. The dog was found on the boat dead, Coast Guard officials said. Web posted. (2006). [Fla. boater survives ocean adventure [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 12].]

Mission managers update crew on shuttle APU issues

The Discovery astronauts took the day off today, relaxing and enjoying the view from space after a hectic week in orbit highlighted by three spacewalks and work to transfer supplies and equipment to the international space station. Texas Gov. Rick Perry plans to call spacewalker and fellow Texas A&M graduate Mike Fossum later today and flight engineer Lisa Nowak will join Fossum for two media interviews. Engineers, meanwhile, continue analysis of two seemingly minor issues with Discovery's hydraulic system. In the morning "execute package" of instructions and timeline changes uplinked to the astronauts, mission control passed along a few tongue-in-cheek ideas for spending an off-duty day in space: The morning execute package also included the latest thinking from NASA's Mission Management Team about the status of two of Discovery's auxiliary power units, or APUs, which provide the hydraulic power necessary to operate the shuttle's aerosurfaces, landing gear brakes and nose wheel steering during entry and landing. The shuttle is equipped with three APUs and can safely land with just one. But given the critical nature of the system, engineers pay close attention when anything out of the ordinary occurs. In a brief call to the crew late Wednesday, mission control told shuttle commander Steve Lindsey that engineers were monitoring two unrelated issues with APUs 1 and 3. The pressure in APU 1's fuel tank appears to be decaying faster than expected, indicating a possible hydrazine fuel leak or a leak in the nitrogen (N2) gas system used to provide pressurization. And APU 3 is experiencing heater problems. Both issues may be related to work done before Discovery's launch, but that remains to be seen. Web posted. (2006). [Mission managers update crew on shuttle APU issues [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, July 13].]

July 14: **Senate appropriators OK NASA bill with $1B Columbia recovery add-on**

The Senate Appropriations Committee approved a $16.757 billion fiscal 2007 spending bill for NASA July 13 that included an amendment to add another $1 billion in extra funding to help cover the agency's costs in recovering from the 2003 Columbia accident. The amendment, sponsored by Sens. Barbara Mikulski (D-Md.) and Kay Bailey Hutchison (R-Texas), is classified as an emergency appropriation that doesn't have to be offset within the larger $51 billion commerce/ justice/science spending bill that NASA is part of. "NASA had to forage for funds in other accounts, cutting funds in research" to return the shuttle to flight, Mikulski said during the committee's markup hearing. "NASA has paid a significant price in other programs in order to get the shuttle back up there." Mikulski is the ranking member on the Senate Appropriations subcommittee that directly oversees NASA. The amendment also includes $40 million for repairs to the Stennis Space Center in Mississippi and the Michoud Assembly Facility in New Orleans, both of

which were damaged by Hurricane Katrina. The funds also provide "critical support" for flight operations at Johnson Space Center in Houston, according to a statement from Mikulski's office. Although NASA actually needs $2 billion to help it recover from Columbia, Mikulski said, appropriating the full amount in the current fiscal environment wasn't realistic. Nonetheless, even the $1 billion boost will face an uphill battle to become law. Such a move is not without precedent, however. In 1986 Congress shifted $2.7 billion in emergency funding from the Defense Department budget to pay for a new space shuttle to replace Challenger. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Senate appropriators OK NASA bill with $1B Columbia recovery add-on," [Electronic]. Vol. 219, No. 8 [July 14, 2006.].]

NASA Accused of Serving Employees Spoiled Food

The WESH 2 I-Team has investigated a major federal lawsuit questioning whether those NASA employees are at risk. We're not talking about working conditions at the Kennedy Space Center. We are talking about bad or rotten food. More than 14,000 government employees and private contractors work just about non-stop, 24 hours a day, seven days a week for three months just to assemble the space shuttle and then get it off the ground. All those people have to eat. So, NASA has contracted with a private food company, Lackmann Culinary Services, out of Woodbury, N.Y., to feed those people at seven different cafeterias on base at Kennedy Space Center. The WESH 2 I-Team obtained undercover and home video of several different food lines at KSC run by Lackmann Culinary. Lackmann serves 6,000 meals each day. "These are people that trusted me to make sure they were getting something of quality," said former cafeteria worker Carolyn Vargas. "And they were getting food that wasn't fit for a dog. I wouldn't want to feed my Chihuahua the food that they made me serve." Vargas worked at the headquarters cafeteria for three years. She claimed that her superiors would force her and others to put food out on the cafeteria line that was old and past its due date -- food that sometimes would be spoiled. "We have three racks of raw chicken. Two days later it's still sitting there," Vargas said. "I said, 'That chicken is smelling. That chicken is no good.' It was rank," she said. WESH 2 I-Team reporter Stephen Stock asked Vargas what they did with the meat and if they served it. "They cooked it," Vargas said. "Yes. And served it." Vargas said that happened many different times with many different meats and other types of food that was past its expiration date, the date when it was supposed to be thrown away. "They would re-date the meat?" Stock asked. "Yes," Vargas answered. "Two or three times?" he asked. "Yes, if it was in a particular meal and they didn't use it all that day, they'd take old fish and chop it up and throw it in the chili. Everything went in the chili," she said. When she complained, Vargas said her position was eliminated. Now, she's suing in federal court. In the suit, Vargas claimed at least one entree -- one menu choice every day -- was unfit for human consumption. Vargas is asking a judge to fine Lackmann Culinary Services $500 million or $10,000 for each possible instance she estimates that tainted meals were served. "We inspect here at the Kennedy Space Center more frequently than they do on the outside," NASA Health and Environment Chief Burt Summerfield said. After an anonymous complaint in 2002, one Vargas said she filed, inspectors found minor problems, such as workers without hair nets or workers not wearing or not changing gloves appropriately. But federal inspectors said they never found evidence that cafeterias served bad or rotten food with any regularity. Web posted.

(2006). [NASA Accused of Serving Employees Spoiled Food [Online]. Available WWW: http://www.wesh.com/ [2006, July 14].]

Discovery's hydraulic system leaking

While astronauts set a record for using robotics in space, NASA engineers on Friday focused on a slow leak aboard space shuttle Discovery that if it worsens could cause a first-of-its-kind shutdown of one of three hydraulic systems during Monday's landing attempt. John Shannon, the shuttle program's deputy manager, said the problem was unlikely to affect the shuttle's return to Earth. But engineers were closely monitoring the leak in the pipeline of an auxiliary power unit that controls hydraulic steering and braking maneuvers. It is leaking at a rate of "about six drops per hour," and could be leaking harmless nitrogen or flammable hydrazine fuel, Shannon said. The leak is more likely nitrogen, but there is no way of knowing that, so NASA is treating the problem as if the leak were fuel, he said. If it is fuel, the current rate is still 100,000 times slower than what would cause a fire, Shannon said. So if nothing changes, the shuttle will land normally, Shannon said. Just in case, NASA will turn on the power unit with the leak early Sunday as part of its normal testing and then see if the leak rate changes. If it does, NASA may burn off the hydrazine and shut down the power unit before the shuttle returns to Earth to eliminate any fire hazard, Shannon said. If that happens, the shuttle would land with just its two other power units for the first time in the spacecraft's history. The shuttle is certified to land normally with two power units, with the only change requiring pyrotechnics to lower the landing gear, Shannon said. The shuttle could land with only one power unit, but that would be more difficult, he said. Discovery's touchdown is scheduled for 9:07 a.m. EDT on Monday at the Kennedy Space Center in Florida. Web posted. (2006). [Discovery's hydraulic system leaking [Online]. Available WWW: http://www.cnn.com/ [2006, July 14].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Official Launch Date/Time: July 4, 2006 at 2:38 p.m. ; Expected KSC Landing Date/Time: July 17 at about 9:07 a.m. ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Today is flight day 11 for STS-121. Discovery is docked to the International Space Station. The multi-purpose logistics module containing supplies and equipment for the space station has been unloaded and transferred from its station port back to Discovery's payload bay as the crew prepares for undocking. The crew will also conduct an imagery survey of the orbiter's left wing. Discovery is scheduled to undock from the station early Saturday morning. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, workers are busy preparing Atlantis for rollover to the Vehicle Assembly Building, currently scheduled for the last week of July. Final gap filler and tile work is under way. The payload bay doors are closed for flight. The orbiter main engine and maneuvering systems are configured for rollover. Close-out work in the

forward section of the orbiter continues. On Monday, Atlantis will be powered down for rollover. In high bay 3 of the Vehicle Assembly Building, close-out work is under way to mate the solid rocket boosters to ET-118, the external fuel tank for STS-115. Endeavour (OV-105) ; Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Functional testing of the atmosphere revitalization pressure control system is under way. This system maintains crew module pressure during flight. Tile processing work continues around the external tank doors and nose landing gear doors. Gap filler removal and replacement continues in the high priority areas of the orbiter's heat shield. Helium system leak and functional tests of the main propulsion system are under way. Workers are installing the star trackers in Endeavour's payload bay; these are deployed during flight for guidance and navigation. All reinforced carbon-carbon panels have been installed on both wing leading edges. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-071406** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, July 14].]

July 17: Astronauts ready for return, watch for rain

The space shuttle's six astronauts made final preparations to land Monday, with the chance of showers being the only possible obstacle to their return to Earth within hours. The doors to Discovery's payload bay were shut, the first step in a landing attempt. The astronauts planned to don their orange spacesuits as they aimed for a 9:14 a.m. EDT landing at the Kennedy Space Center. A second opportunity was possible at 10:50 a.m. EDT. When Mission Control woke up the astronauts just after 1 a.m. EDT, Discovery commander Steve Lindsey made it clear that his crew, weary after a 13-day mission that he said was the busiest of his four fights, wanted to come. "Hopefully, with good weather we will be on the ground" later Monday, Lindsey told Mission Control as he woke up. The weather forecast improved Monday morning at the Kennedy Space Center in Florida, the only landing site NASA has called up for the day. Rain clouds to the north had been forecast to dip south, but astronauts doing reconnaissance weather flights reported few problems. The landing rules say rain has to be 30 miles away because rain could damage the shuttle's tiles. NASA's spaceflight meteorology group had predicted scattered Monday morning showers and storms, with worse weather Tuesday. Landing officials have to make a "go-no-go" decision for the first landing try at 7:47 a.m. EDT. On that first landing attempt, Discovery would fly to Florida from the south, coming over the Yucatan Peninsula, pass by the western tip of Cuba and into Kennedy. This would be the first landing at Kennedy in nearly four years. Last year's flight of Discovery, after weather delays, came down at Edwards Air Force Base in California, the backup site. If Discovery can't land at Kennedy on Monday, NASA will call up Edwards and try to land at either location Tuesday, weather permitting, landing director Steve Stich said. The shuttle has to land no later than Wednesday because after that it will run out of oxygen for its fuel cells, he said. Landing at Edwards costs NASA about $1.7 million more because it has to get the shuttle back to Florida. Web posted. (2006). [Astronauts ready for return, watch for rain [Online]. Available WWW: http://www.cnn.com/ [2006, July 17].]

Discovery returns home

The space shuttle Discovery wrapped up its 13-day, 5.3-million-mile mission on Monday with a picture-perfect landing at Florida's Kennedy Space Center. The shuttle and its six-member crew glided through overcast skies before touching down at 9:14 a.m. ET. "It was a great mission," Shuttle Commander Steven Lindsey said after Discovery rolled to a stop. The crew then changed out of their orange flight and re-entry suits and went through medical tests before leaving to inspect Discovery. The four men and two women smiled and pointed as they walked around under the shuttle's belly, pausing occasionally to shake hand with NASA officials. "I've never seen a vehicle that was as clean as this one is," said Lindsey, a veteran of four shuttle flights. " Officials were concerned about rain showers and clouds north of the landing site and did not make the decision to land until about 10 minutes before Discovery was scheduled to fire its engines and begin its return to Earth. They also decided to use a different runway because of a last-minute change in the weather. It approached the runway from the south, flying over the Pacific Ocean, Mexico's Yucatan Peninsula and Florida, before reaching the runway. Monday's landing comes after a successful 13-day mission to the international space station where the Discovery astronauts delivered supplies and dropped off German astronaut Thomas Reiter at the station. Web posted. (2006). [Discovery returns home[Online]. Available WWW: http://www.floridatoday.com/ [2006, July 17].]

Commander Steve Lindsey thanks KSC workforce

Shuttle Discovery's crew has departed the landing strip in a silver van, headed to crew quarters at Kennedy Space Center. Before leaving, the shuttle's commander, Steve Lindsey, said a few words of thanks to KSC workers for preparing Discovery for flight. He said the shuttle was virtually trouble-free in orbit and looked good upon inspections after landing. He also said Discovery's successful mission bodes well for the shuttle program. He said: "I'd like to just thank the folks at Kennedy Space Center for a really, really clean vehicle. This is my fourth flight and I've done four walkarounds and I've never seen a vehicle that's looked as clean as this one did...We had two major objectives on this flight. The first one was to complete the return-to-flight test objectives that 114 started, and the second one was to get us ready back for space station assembly. I think we accomplished both of those objectives and we're ready to assemble station, and we're ready to start flying shuttles on a more regular basis." Web posted. (2006). [Discovery returns home [Online]. Available WWW: http://www.orlandosentinel.com/ [2006, July 17].]

Space Shuttle Processing Status Report

Mission: STS-121 - 18th International Space Station Flight (ULF1.1) - Multi-Purpose Logistics Module ; Vehicle: Discovery (OV-103) ; Official Launch Date: July 4, 2006 at 2:38 p.m. ; Official Landing Date: July 17, 2006 at 9:14 a.m. ; Crew: Lindsey, Kelly, Sellers, Fossum, Nowak, Wilson and Reiter ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. After 12 days, 18 hours and 37 minutes of flight, orbiter Discovery safely landed at Kennedy Space Center today with a main landing gear touchdown at 9:14:43 a.m. EDT. The nose landing gear touched down at 9:14:53 a.m. The orbiter came to a full stop at 9:15:49 a.m. Discovery made 202 trips around the Earth and traveled 5.3 million miles during the mission. Following a four-hour period of landing operations at the shuttle landing strip, the orbiter systems were safed and technicians connected Discovery

to ground support equipment for ground cooling and purging of the interior spaces. Preliminary inspections revealed 93 total hits to the orbiter's thermal protection system with 11 greater than one inch in diameter. The vehicle was towed to Orbiter Processing Facility bay 3, where the processing flow will begin for its next mission, STS-116, targeted for launch in December. Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, workers are making final preparations for the rollover of Atlantis to the Vehicle Assembly Building, currently scheduled for July 25. Forward closeouts continue and T-0 umbilical disconnects are scheduled to be completed today. The T-0 umbilical is the connection point for ground power to the orbiter. Final orbiter "power down" for rollover is scheduled for today. Final tire pressure for flight is under way. Procedures this week include orbiter jackdown, weight and center-of-gravity operations, which occur prior to the vehicle's transfer to the transporter. Atlantis will be placed on its transporter on Wednesday. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-071706** [Online]. Available E-mail: owner-press-elease@spinoza.public.hq.nasa.gov [2006, July 17].]

Safe return marks 'full circle'

Launch director Mike Leinbach has seen a lot of grief and hard work since Columbia was lost in 2003. So Discovery's homecoming Monday, marking the end of two test flights and a return to regular launches, was especially sweet. "It feels good," the Scottsmoor resident said. "It does kind of bring it full circle, because Columbia was such an awful day. Today was such a good day." The mood is upbeat at Kennedy Space Center, he said, "but we can't take anything for granted, either." The work flow will change as NASA tries to keep up with an ambitious schedule that includes Atlantis' flight in August and Discovery's return to the International Space Station in December. "We're in a turnaround process now that we haven't been in for 31/2 years, so that feels good," Leinbach said. After he got a look at the ship on the runway, he was encouraged by the condition of the orbiter's heat shield. Discovery's belly was nearly unscathed by foam debris from the external fuel tank. Foam concerns have driven modifications since a large piece caused the fatal breach in Columbia's wing. "We had to search for dings to the tile, and the couple that we saw were very, very minor," Leinbach said, "and so it's just a great-looking vehicle. Good to have her in Florida." As workers resume processing with a mix of cheer and caution, they're also aware that the shuttle flights between now and 2010 are the last. But Leinbach is optimistic. "We'll deal with that," he said. "There's another program on the line. So we're ready to go." Web posted. (2006). [Safe return marks 'full circle' [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 18].]

Flights will be frequent for shuttles

There's no rest for the space shuttle team at Kennedy Space Center. As Discovery touched down at the Shuttle Landing Facility on Monday morning, crews were finishing connections between Atlantis' external tank and twin solid rocket boosters inside the Vehicle Assembly Building. Work is on schedule for a shuttle launch that is now six

weeks away. United Space Alliance, the contractor in charge of day-to-day operations of the shuttle fleet, aims to transport Atlantis from its Orbiter Processing Facility hangar to the VAB around July 25. Inside the cavernous building, assembly crews will lift the orbiter into position and attach it to the tank and boosters atop a mobile launcher platform. That work takes about one week. If everything continues on schedule, Atlantis would roll out to the launch pad as early as Aug. 2. NASA currently plans to launch Atlantis sometime between Aug. 28 and Sept. 7, a window dictated by post-Columbia safety restrictions that require blastoff to occur during daylight hours. Shuttle teams are looking at lighting conditions to see if it might be possible to extend the launch window by one day, starting it a day earlier on Aug. 27. NASA said the launch crews have about five days of padding left in the schedule, raising the likelihood of an on time launch in late August. The mission will be the first since 2002 to carry up and install a new piece of the International Space Station. Another flight is set to launch no earlier than Dec. 14 to finish out the year. After that, NASA plans to launch five shuttle missions in 2007 including the long-awaited launches of the European Space Agency's Columbus science laboratory and Canada's robotic hand (a sophisticated grappling tool for the station's robotic arm). The schedule calls for four flights in 2008, including launch of Japan's Kibo science lab. Four flights are planned for 2009 and two more in 2010. That manifest doesn't include one of the highest-profile missions left for the space shuttles: the fifth and final servicing mission to the Hubble Space Telescope. The flight would repair and upgrade the telescope in hope of extending its mission well into the next decade. Web posted. (2006). [Flights will be frequent for shuttles [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 18].]

Information Picket

SPFPA Amalgamated Local 127 intends to stage an informational picket at KSC and CCAFS perimeter gates effective 0530 hours on Monday, July 17th. The Air Force and NASA maintains strict neutrality in contractor labor disputes and will not interfere or try to influence collective bargaining or labor disputes between contractors or labor unions representing contractor employees. Our goal is to minimize the impact of picketing and other demonstrations during this dispute so other operations aren't impacted, while ensuring the first amendment rights of all involved parties. E-mail distribution. (2006). Re: "Security Flash -- Informational Picket" [Electronic], [July 14, 2006.].]

July 18: Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: No earlier than Aug. 20, 2006 ; Launch Time: 3:52 - 4:07 p.m. EDT. At the Astrotech Space Operations Facility, STEREO was moved to the hazardous processing facility early last week for fueling, stacking and spin-testing of the two observatories. During fueling of Observatory A, one of the valves used to load the spacecraft with hydrazine propellant was observed to be leaking from a secondary seal. Technicians suspended the fueling and made adjustments to the fuel line connection. Fueling operations resumed with no further leakage. Both observatories are now completely fueled. However, as a precaution, the two observatories have not been pressurized while this problem is investigated. An anomaly team is working to fully determine the reason for the problem and assess the

integrity of the valve. For this reason, launch has been rescheduled for the opening of the next launch window, no earlier than Aug. 20. At Pad 17-B, the Delta II second stage was stacked atop the first stage on July 13. The following day, the payload fairing was hoisted into the pad cleanroom located at the upper levels of the mobile service tower. Technicians are now performing standard prelaunch electrical interface testing of the two stages and checking the guidance system. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-071706** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, July 18].]

July 19: Man injured during shuttle pad work

Kennedy Space Center officials suspended work on one of the space shuttle launch pads Wednesday, after a worker was seriously injured by a loose part that flew from a compressor and struck him on the head. The accident - one of a series of mishaps to take place at the space center this year - happened about 7 a.m., after a piece from a 10-foot-tall compressor unit used for sandblasting snapped loose and hit the worker as he stood on the ground level of launch complex 39A. "Right now we're setting up an investigation board either today or tomorrow to review what happened," said Bruce Buckingham, a spokesman for the Kennedy Space Center. "We're in a situation where we are securing the area and taking evidence so that we can understand what happened. Until that's completed we won't be doing any detailed work at the pad now." The unidentified worker, a subcontractor hired by the shuttle processing company United Space Alliance, was treated at the scene and then airlifted to Holmes Regional Medical Center's trauma center in Melbourne. His condition was not immediately known, officials said. "He's a good worker and a good person," said Dale Kauzlick, the site manager for the Titusville-based SDB Engineers and Contractors company that hired the injured worker. Kauzlick, whose company does corrosion control work at KSC, did not release the man's name. The launch complex, one of two 400-foot towers used by the space shuttle program, was not in use and was being refurbished for next year's launch schedule, Buckingham said. Launch pad 39B - the site of Discovery's liftoff on July 4 - is the primary launch site for the next three shuttle missions. Web posted. (2006). [Man injured during shuttle pad work [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 19].]

July 20: STS-115 Launch Windows

To reach the international space station, the shuttle must launch within about five minutes of the moment Earth's rotation carries the launch pad into the plane of the station's orbit. For STS-115, launch must occur in daylight and the external fuel tank must separate in orbit, on the other side of the planet, with enough sunlight to allow photo documentation of the tank. Those factors, plus temperature issues based on the angle between the plane of the space station's orbit and the sun result in the following launch windows for shuttle mission STS-115 in August and September (these times will be tweaked as launch approaches based on the station's actual orbit). The window's close is dictated by the scheduled Russian Soyuz launch with the Expedition 14 in mid-September. To maximize performance, NASA targets launch for right around the moment the shuttle can launch directly into that plane. In the chart below, the target launch time is listed in the "in plane" column. All times in EDT and subject to change. Web posted. (2006). [STS-115

Launch Windows [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, July 20].]

NASA Assigns Crew for Columbus Shuttle Mission

NASA has assigned crew members to the space shuttle mission that will deliver the European Space Agency's Columbus Laboratory to the International Space Station. A veteran space flier, Navy Cmdr. Stephen N. Frick, will command the STS-122 shuttle mission to deliver the lab to the station. Navy Cmdr. Alan G. Poindexter will serve as pilot. Mission specialists include Air Force Col. Rex J. Walheim, Stanley G. Love, Leland D. Melvin and European Space Agency astronaut Hans Schlegel. Poindexter, Love and Melvin will be making their first spaceflight. STS-122 will be Frick's second spaceflight. ["NASA Assigns Crew for Columbus Shuttle Mission," **NASA News Release #06-283**, July 20, 2006.]

Space Shuttle Atlantis to move to VAB

On Monday, July 24, Atlantis is scheduled to be moved out of its hangar at NASA's Kennedy Space Center, Fla. The first motion is expected at 6 a.m. EDT. Media must arrive at Kennedy's News Center by 5 a.m. to attend the event. The move from the Orbiter Processing Facility to the Vehicle Assembly Building is referred to as a "rollover." Inside the assembly building, Atlantis will be attached to its external fuel tank and twin solid rocket boosters. Atlantis' launch window begins Aug. 28. During its 11-day mission to the International Space Station, the STS-115 crew of six astronauts will install the Port 3/4 truss segment with its two large solar arrays. ["Space Shuttle Atlantis Set to Move To Vehicle Assembly Building," **NASA Media Advisory #M06-118,** July 20, 2006.]

July 21: **Space station trusses set to go**

In a big room at Kennedy Space Center, cylindrical labs and plastic-draped trusses surround a 17-ton space girder whose time to fly has come. It's not particularly pretty, with its hexagonal frame, bouquets of wires and squat batteries, but this two-truss combo is the first big piece of the International Space Station to be brought there in nearly four years. This morning, a super-crane will lift the linked P3/P4 truss segments -- designated "P" for their port or left-side location -- and place them in their canister. "I always love to see that," said Boeing site manager Chuck Hardison of Merritt Island, who has waited a long time to see it go. "It's like a ship going down the channel. It's so big, and it moves so gracefully." In turn, the cargo will head to the pad for a launch aboard Atlantis targeted for Aug. 28. The orbiter is set to roll to the Vehicle Assembly Building at Kennedy Space Center on Monday and to the launch pad July 31. "The shuttle is flying again, and we're excited and anxiously awaiting our turn at the end of August," said Robbie Ashley, NASA's manager for the cargo. The last true station construction mission was in late 2002, before the 2003 Columbia accident grounded the shuttles and prompted a round of design changes. In the interim, astronauts have taken several spacewalks, making repairs and performing other tasks on the station, but no large equipment has been installed. The truss will add another set of solar panel wings. Tests gave managers confidence that, after issues with sticky panels in the past, these will unfold despite their long storage. The batteries have been replaced because NASA feared

they wouldn't be able to store and distribute power as expected. "They were never intended to be on the ground this long," Hardison said. Perhaps one of the most impressive parts of the linked segments is the 10-foot-wide Solar Alpha Rotary Joint in the middle, which keeps the solar panels aimed at the sun. "The entire space station outboard of that joint will be rotating 360 degrees every orbit," Hardison said. "It'll be quite something to see, that's for sure." He said his team was eager to get the hardware into orbit as they waited for the shuttle schedule to pick up again. Among the many parts awaiting flight are the Japanese Experiment Module, Europe's Columbus Laboratory and a starboard truss that will mirror the port pieces about to fly. "We worked on it for so long," Hardison said. Web posted. (2006). [Space station trusses set to go [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 21].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segments and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Target Launch Date: Aug. 28, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. In Orbiter Processing Facility bay 1, Atlantis has been placed on a transporter that will be used to transfer the orbiter to the Vehicle Assembly Building. Rollover of Atlantis is currently scheduled for Monday morning. Once in the VAB, the orbiter will be lifted into high bay 3 for mating to the external fuel tank and solid rocket boosters. Discovery (OV-103); Discovery is back in Orbiter Processing Facility bay 3 following a 13-day mission to the International Space Station. The orbiter is now being processed for its next mission, STS-116. The payload bay doors have been opened, and thermography inspections of the nose cap and reinforced carbon-carbon panels on the wing leading edges are under way. The orbiter's main engines and the orbiter boom sensor system will be removed next week. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Functional testing of the atmosphere revitalization pressure control system is under way. This system maintains crew module pressure during flight. Tile-processing work continues around the external tank doors and nose landing gear doors. Gap filler removal and replacement continues in the high priority areas of the orbiter's heat shield. Workers have installed wiring for the station-shuttle power transfer system in the midbody. Testing of the orbiter's air to ground communication system is complete. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-072106** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, July 21].]

July 23: NASA works to lift night launch ban

The safe conclusion of Discovery's mission brings NASA's shuttle program to its next challenge: Can an agency that has flown two shuttle missions in three-and-a-half years now shift into higher gear and execute 16 of them in four years? History, in the long-term, says NASA can do it. On average -- even including two years-long groundings of the fleet after catastrophic accidents in 1986 and 2003 -- Kennedy Space Center has launched four to five shuttle missions every year since the first one in 1981. Flying 15 missions to the International Space Station and one to the Hubble Space Telescope during

four-and-a-half years is definitely doable. The space agency's difficulty getting shuttles off the ground since the Columbia accident is not exclusively limited to problems with the external tank's foam insulation. Rather, a host of post-Columbia safety requirements -- most notably not being able to fly at night -- exacerbated the situation. In the simplest terms, to fly 16 times between now and 2010, NASA needs the flexibility to launch the space shuttle day or night. Mike McCulley, the former astronaut who now leads the company that operates the shuttle fleet day-to-day, agrees that the agency needs to relax some of the post-Columbia restrictions placed on flying the shuttles while not sacrificing safety. "We have to make some changes to the way we do requirements," he said. The first relaxation is almost certain to be lifting the ban on nighttime launches. Currently, NASA wants to launch shuttles during daylight, when it can get the clearest possible pictures of the rising vehicle and its external tank foam insulation. The idea is to be able to document whether design changes have reduced the amount of foam coming off the tank and presenting a debris threat to the orbiter's delicate heat-shielding -- the flaw that doomed Columbia and seven astronauts. How does that hinder NASA's ability to fly frequently? There are only certain times on any given day when a shuttle blasting off from Brevard County can be targeted to dock with the International Space Station, orbiting more than 200 miles overhead and whizzing around the Earth at more than 17,000 mph. Certain days of the year, the times when the shuttle can launch to the station do not occur at the same times when the vehicle and its external tank will be lit properly during launch and when the tank is jettisoned. The periods of time when all of those conditions do exist have defined NASA's launch windows. The next one stretches from about Aug. 28 to about Sept. 13, though some schedule conflicts with the Russians' flight schedule practically means shuttle Atlantis can't launch after Sept. 7. The only other launch windows before December are a couple lasting no more than a few days each in October and November. Eliminate the daylight launch rule, and NASA suddenly has a much higher chance of getting off its two planned missions before the end of this year. The agency's leaders have said they may lift the daylight restriction after one more flight if the tank's foam continues to perform as expected and tools used to inspect the orbiter in space prove reliable. Discovery's flight is evidence things are turning in that direction and everyone from the astronaut corps to top management celebrated that. "The shuttle is back," shuttle program manager Wayne Hale said Tuesday. Steve Wallace, a former member of the Columbia Accident Investigation Board, said he is confident that NASA can fly the shuttle safely. However, he is not as confident that it is possible to fly all of the missions on NASA's plate before shuttle retirement in 2010. Wallace, who also served a stint on the agency's independent Aerospace Safety Advisory Panel, says post-Columbia safety restrictions, the availability of only three orbiters and limited financial resources could slow the agency's pace of flights when compared to the historical average that Griffin often cites as evidence it can be done. "We have funding limits, and it doesn't look like it's going to add up," Wallace said. ". . . It gets harder and harder for me to see how we're going to complete that space station by 2010." NASA could push harder to meet the goal, but Wallace said the internal discussions he has been part of in his role as an investigator and a safety watchdog suggest to him that no one will be willing to cut any safety corners to accelerate the flight rate. "I still think this Columbia loss is fresh in people's memories, and there is really is an awareness and a fear of letting schedule pressure cause that kind of thing to happen again," Wallace said. Web posted. (2006).

[NASA works to lift night launch ban [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 23].]

July 24: USA gets contract to support Constellation program

NASA plans to use the expertise United Space Alliance has built up running the space shuttle program to help it begin switching to the follow-on Crew Exploration Vehicle and its Ares I launcher for the remainder of the decade. Under a no-bid contract extension announced last week, the agency will award the Boeing-Lockheed Martin 50-50 joint venture a wide range of support work as it develops requirements for the shuttle replacements. "USA is the only known source with the wide range of unique skills, analytical capabilities and expertise ... that is available immediately," NASA says by way of justifying the sole-source arrangement. USA will support the new Constellation program under its existing Space Flight Operations Contract and the Space Program Operations Contract planned to follow after Oct. 1, as the program sets requirements for flight operations trajectory planning, mission planning, and flight-test, including test-vehicle assembly. However, "it is anticipated that the majority of those requirements will be competitive," the extension announcement notes. As a way to keep its work force engaged as the shuttle program winds down after 2010, USA also has been discussing possible collaborative efforts with European companies. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "USA gets contract to support Constellation program" [Electronic]. Vol. 219, No. 14, [July 24, 2006.].]

Atlantis to roll out to Vehicle Assembly Building on July 24

On July 24 space shuttle Atlantis will be moved out of the Orbiter Processing Facility and transported to the Vehicle Assembly Building (VAB) at Kennedy Space Center, Fla., in anticipation of flight STS-115, scheduled to launch no earlier than Aug. 27. Inside the VAB the shuttle will be mated to its external tank and solid rocket boosters before being rolled out to the launch pad. An 11-day mission, STS-115 will resume construction of the International Space Station, installing the Port 3/4 truss segment and its two large solar arrays. It will be the first flight for Atlantis since STS-112 in October 2002. . E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "USA gets contract to support Constellation program" [Electronic]. Vol. 219, No. 14, [July 24, 2006.].]

Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: No earlier than Aug. 20, 2006 ; Launch Time: 3:52 - 4:07 p.m. EDT. At the Astrotech Space Operations Facility, work to prepare STEREO for launch resumed today with the pressurization of the hydrazine tanks on each of the two observatories. This will be followed by preparations to stack the spacecraft. Stacking is currently planned for Friday, July 28. Three days of spin-testing will follow beginning Sunday, July 30. The final major processing activity prior to launch occurs next week with the mating of STEREO to the upper stage booster. At Pad 17-B, standard liquid oxygen leak checks of the Delta II first stage are under way today. The second stage will undergo a helium leak check on

Wednesday. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-072406** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, July 17].]

July 25: **Heat vision: Infrared eyes aid shuttle health predictions**

The space shuttle Discovery's mission may be over, but NASA is still hard at work evaluating a set of infrared tools used during the flight to help predict whether an orbiter's heat shield is clear to return astronauts back home safely. Engineers are poring through infrared video recorded by a pair of high-flying aircraft as Discovery re-entered the Earth's atmosphere last week to make a near-perfect landing at Florida's Kennedy Space Center to end its STS-121 mission. The video has given NASA scientists their first complete look at how the scorching temperatures of re-entry are distributed across a shuttle's belly at supersonic speeds, something only hinted at in previous ground-based attempts. "It's a really quite a spectacular image," said Bob Blanchard, a lead senior scientist at George Washington University who participated in the STS-121 and earlier shuttle heat shield studies. "It was something we kind of dreamed about when we were doing this low-altitude stuff earlier." A team of engineers at NASA's Langley Research Center in Hampton, Virginia are now working to match the infrared video against data from computer models and wind tunnel tests to determine how close their predictions were to Discovery's actual re-entry. During Discovery's STS-114 flight in July and August of 2005, engineers found that two protruding gap fillers could have unacceptable heating results to the orbiter's heat shield, prompting a spacewalk repair to pluck out the offending ceramic cloth bits. Meanwhile, a separate team is going over data from an orbital test of a new digital infrared video camera used by STS-121 spacewalkers Piers Sellers and Michael Fossum. The astronauts scanned heat shield test samples, Discovery's wing leading edge, space station radiators and themselves during the demonstration. Web posted. (2006). [Heat vision: Infrared eyes aid shuttle health predictions [Online]. Available WWW: http://www.usatoday.com/ [2006, July 25].]

NASA Appoints Board to Investigate Injury at KSC's Pad 39A

NASA has formed an investigation board at Kennedy Space Center, Fla., to review the circumstances surrounding the injury of a construction worker at Launch Complex 39-A July 19. The functions of the five-member board include examining the facts surrounding the incident, gathering evidence, determining causes and recommending corrective actions. A final report is expected in about three months. Chairing the board is Mike Smiles, manager of the Office of Safety and Mission Assurance at NASA's Stennis Space Center in Mississippi. In addition to the five voting members, the board is supported by an ex-officio member and a number of NASA advisers and administrative support staff. The employee of SDB Engineers and Construction Inc. of Titusville, Fla., was preparing to perform sandblasting work on Launch Pad 39-A when he was struck in the head by a section of pipe that had loosened from a pressurized sandblasting unit. Emergency personnel were called to the site and he was airlifted to a hospital in Melbourne, Fla. SDB is a subcontractor to United Space Alliance, the NASA contractor for space shuttle operations. ["NASA Appoints Board to Investigate Injury at KSC's Pad 39A," **NASA News Release #48-06**, July 25, 2006.]

July 26: **NASA Awards Contracts for Constellation Program Study**

NASA has awarded a 90-day study contract to four space-related companies to separately examine long-term ground processing and infrastructure planning for the agency's Constellation Program. The contractor teams are expected to provide a wealth of knowledge and experience during the study phase to support ground systems and operations planning through 2030, including missions supporting the International Space Station, lunar exploration and Mars exploration. Contract awardees are: ATK Launch Systems Group, Corrine, Utah; Boeing Space Operations Co., Titusville, Fla.; Lockheed Martin Space Systems Company, Littleton, Colo.; and United Space Alliance, Houston. The awards are limited to $150,000 per contract. Study recommendations will be considered in NASA Kennedy Space Center's planning for the Ares I crew launch vehicle, Ares V cargo launch vehicle operations and crew exploration vehicle processing. The contracts, which should be completed in October, were awarded in response to the Constellation ground operations Broad Agency Announcement Request for Proposal issued in April. "NASA's intent is to include industry in our planning phase to get a broad perspective of ground operations, especially for the long-term," said Pepper Phillips, deputy director of the Constellation Project Office at Kennedy. "These four companies will provide several possible solutions to the same challenges, which we expect to benefit our planning. Selecting ground processing and launch concepts are long-term commitments and we want to consider all options." Web posted. (2006). [NASA Awards Contracts For Constellation Program Study [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 26.]

July 27: NASA Foam Under Control

Discovery's heat-shield tiles sustained significantly less damage during NASA's second post-Columbia test flight, a sign that the agency is starting to get a deadly foam-shedding problem under control, a NASA official said. During post-landing inspections, engineers noted a drop of about 33 percent in the number of damage spots on heat shield tiles on the belly of the orbiter. There also was almost a 50 percent decrease in the number of hits greater than one inch - defects more susceptible to sustaining further damage when exposed to extreme temperatures during atmospheric reentry. "The vehicle looked very good," Thomas Ford, a member of NASA's ice-debris inspection team at Kennedy Space Center, said Wednesday. "It's definitely gratifying." Columbia and seven astronauts were lost on re-entry in February 2003 when hot gases surged into the orbiter through a hole created when its heat shield was struck by a 1.67-pound piece of external tank foam insulation about 82 seconds into flight. Since then, NASA engineers have modified the tank to try to prevent chunks of foam large enough to cause severe damage from breaking free at critical times during launch. Ford said 96 hits were tallied on the underside of Discovery after its July 17 landing. In comparison, 152 strikes were found on the shuttle's belly after NASA's first post-Columbia flight last summer. Only 11 strikes larger than one inch were found on Discovery during inspections conducted on Kennedy Space Center's three-mile runway earlier this month. Inspectors found 21 after last summer's flight. The drop is a sign that safety modifications meant to prevent the shedding of large foam chunks are working, Ford said. NASA engineers still are working on other design changes that should reduce the problem even further. "Do we have a handle on it? Yes. Is it still a problem? Yes," the Merritt Island resident said. "But we're getting better at it."

Web posted. (2006). [NASA Foam Under Control [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 27].]

Space authority dissolving, Scott resigns

Winston Scott, the former astronaut and Florida native who's led the Florida Space Authority for three years, is expected to have his resignation approved by the authority's board Friday. Scott is traveling this week and declined an interview. His departure comes just before the authority itself is dissolved in about a month. This is likely the last meeting of the board. A new agency, Space Florida, is working to consolidate the state's many space-promoting groups into one effort to lure businesses to Florida. Though the 1:30 p.m. meeting Friday is by teleconference, the public may attend at the authority's campus at 100 Spaceport Way, by the gate to Cape Canaveral Air Force Station. Also on the agenda: The board will discuss the dissolution of the authority and termination packages for its 17 full-time employees. In addition, it will consider approving the transfer of Lockheed Martin's leases -- and liability associated with the authority's financing of the building of Launch Complex 41 for the Atlas 5 -- to the United Launch Alliance, a proposed partnership between Boeing and Lockheed Martin. Web posted. (2006). [Space authority dissolving, Scott resigns [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 27].]

July 28: **Shuttle can fly earlier, NASA says**

NASA has moved up the launch window for shuttle Atlantis by one day. Shuttle managers decided Thursday they will have enough light to get good pictures of Atlantis and its external tank if the launch happens Aug. 27 instead of Aug. 28, a possibility the agency had been studying for several weeks. The launch window for Atlantis now runs from Aug. 27 through Sept. 13, although NASA and the Russians have agreed the shuttle probably would not launch after Sept. 7 to avoid a potential conflict with another visiting spacecraft. A Russian Soyuz is set to deliver the next permanent crew to the International Space Station in mid-September. A shuttle launch too late during the existing Atlantis window could result in both spaceships being docked at the orbiting outpost at the same time, a violation of flight rules. In addition to the oversized crew that would result from both ships being there at once, the space station partners prefer several days cushion between visiting ships to give the permanent outpost crew time to rest and get ready. The Aug. 27 opening of the window remains a target only. An official launch date will be set at a Flight Readiness Review meeting next month. Meanwhile, Atlantis is set to roll to the launch pad early Monday morning. Web posted. (2006). [Shuttle can fly earlier, NASA says [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 28].]

Space panel resigned to losing chief

Winston Scott, a former astronaut who's led the Florida Space Authority for three years, is expected to have his resignation approved by the authority's board today. Scott, a Florida native, is traveling this week and declined an interview. His departure comes just before the authority itself is dissolved in about a month. The authority, along with the Florida Space Research Institute and Florida Aerospace Finance Corp., are being folded into the new group. This is likely the last meeting of the Florida Space Authority board. A new agency, Space Florida, is working to consolidate the state's many space-promoting

groups into one effort to lure businesses to Florida. Though the 1:30 p.m. meeting today is by teleconference, the public may attend at the authority's campus at 100 Spaceport Way, by the gate to Cape Canaveral Air Force Station. Also on the agenda: The board will discuss the dissolution of the authority and termination packages for its 17 full-time employees. It also will consider approving the transfer of Lockheed Martin's leases -- and liability associated with the authority's financing of the building of Launch Complex 41 for the Atlas 5 rocket -- to United Launch Alliance, a proposed partnership between Boeing and Lockheed Martin. Web posted. (2006). [Space panel resigned to losing chief [Online]. Available WWW: http://www.floridatoday.com/ [2006, July 28].]

Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: No earlier than Aug. 31, 2006 ; Launch Time: 3:12:24 or 4:20:28 p.m. EDT. The launch of STEREO aboard a Boeing Delta II rocket has been postponed to no earlier than Aug. 31. At the Boeing plant in Decatur, Ala., a leak has been observed in the second-stage oxidizer tank for the Delta II that had been scheduled to launch NASA's THEMIS spacecraft in November. Therefore, all identical tanks scheduled for launch in the near future must be checked. Boeing engineers and technicians found that the second stage for the Delta II that will launch STEREO cannot be effectively tested while atop the first stage at Pad 17-B. It will be de-stacked and taken to the High Pressure Test Facility located near Launch Complex 17 for further leak checks. De-stacking will begin on Tuesday, Aug. 2. The stage will be returned to the pad in about a week if no problems are found. Due to the change in the launch date, a decision has been made not to stack the two STEREO observatories earlier than Aug. 9. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-072806** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, July 28].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Vehicle Assembly Building; Launch Date: No earlier than Aug. 27, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. On Monday, Atlantis rolled from Orbiter Processing Facility bay 1 to the Vehicle Assembly Building, where it was lifted into high bay 3 for mating to the external fuel tank and solid rocket boosters. Mating operations and checkouts are under way. The shuttle is scheduled to roll to Launch Pad 39B on July 31, with first motion targeted for 12:01 a.m. EDT. The STS-115 payload was transferred to the launch pad on Wednesday and is scheduled to be installed in Atlantis' payload bay on Aug. 2. Mission managers made the decision to move the opening of Atlantis' launch planning window to Aug. 27. The decision was made after it was determined that lighting conditions for launch and external tank separation were sufficient to support imagery analysis. The payload for STS-115 is the Port 3/4 truss segment, the next major addition to the 11-segment integrated truss structure that will eventually span more that 300 feet. The P3/P4 truss, with its two large solar arrays, will provide one-fourth of the total power generation capability of the completed station. Mission: STS-116 - 20th International

Space Station Flight (12A.1) - P5 Truss Segment ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than Dec. 14, 2006 ; Launch Pad: 39B ; Crew: Polansky, Oefelein, Curbeam, Higginbotham, Patrick and Fuglesang ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Processing of Discovery for its next mission, STS-116, continues in Orbiter Processing Facility 3. The payload bay doors have been opened, and engineers are performing thermography inspections of the nose cap and reinforced carbon-carbon panels on the wing leading edges. The orbiter's main engines were removed on Wednesday and the orbiter boom sensor system is scheduled to be removed today. Workers are also performing a checkout of the forward reaction control system. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Functional testing of the atmosphere revitalization pressure control system continues this week. This system maintains crew module pressure during flight. Workers completed the elevon and body flap rigging verification and calibration. Rigging and alignment of the remote manipulator system manipulator positioning mechanisms are under way. The star tracker doors were installed this week. The star tracker is part of the on-orbit guidance system. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-072806** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, July 28].]

July 30: Atlas will launch Lunar Reconnaissance Orbiter

Lockheed Martin's Atlas V rocket has been selected by NASA to launch the Lunar Reconnaissance Orbiter mission in 2008 from Cape Canaveral, Fla. LRO represents NASA's first step toward returning humans to the surface of the moon. The mission will be launched using an Atlas V 401 configuration. "This is the fifth time that NASA has selected the Atlas V to launch an important space exploration mission, and our team is extremely excited to play such a key role in carrying out our nation's plans for returning to the moon," said Jim Sponnick, Atlas program vice president for Lockheed Martin Space Systems Company. The Atlas 401 configuration includes a single Common Core Booster powered by the RD-180 engine system, providing almost 1,000,000 lbs. of thrust at liftoff. The Atlas V 401 vehicle will also utilize a 4-meter fairing to protect the LRO spacecraft during the ascent through the earth's atmosphere. Once the boost phase of flight is complete, the Centaur upper stage will perform two engine burns to place LRO into a lunar transfer trajectory. Atlas will launch LRO in the fall of 2008, along with a secondary payload called the Lunar CRater Observation and Sensing Satellite (LCROSS). Following delivery of LRO to its required lunar transfer orbit, the Centaur upper stage will perform a unique series of maneuvers to place LCROSS into a separate trajectory that will result in a subsequent lunar impact. Web posted. (2006). [Atlas will launch Lunar Reconnaissance Orbiter [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, July 30].]

July 31: NASA's Next Space Shuttle Crew Ready for Countdown Test

The astronauts and ground crews for Space Shuttle Atlantis' upcoming mission, STS-115, will participate in a full launch dress rehearsal Aug. 7-10 at NASA's Kennedy Space Center, Fla. The demonstration test provides the crew of each shuttle mission with an opportunity to participate in various simulated countdown activities, including equipment

familiarization and emergency egress training. The STS-115 crew members are Commander Brent Jett, Pilot Chris Ferguson and mission specialists Joe Tanner, Dan Burbank, Heide Stefanyshyn-Piper and Steve MacLean of the Canadian Space Agency. The launch window for Atlantis' mission to the International Space Station opens on Aug. 27. ["NASA's Next Space Shuttle Crew Ready for Countdown Test," **NASA Media Advisory #M06-123**, July 31, 2006.]

AUGUST 2006

August 2: **Pam Melroy hopes more women choose space as a career**
Pam Melroy plans to board shuttle Atlantis a year from now and then do something only one other woman ever has done: Strap into the left seat. Melroy, 45, nonetheless says she is astounded by the response she has received since NASA announced that she would become only the second woman to command a U.S. space mission. "I was really surprised that people have made a big deal out of it. I really was," she said. "I think it does reflect a little bit of our society. There still are a limited number of people who made a set of choices like I did 20 years ago." Former NASA astronaut Eileen Collins became the first woman to pilot a shuttle flight in 1995 and the first to command a U.S. space mission in 1999. She also commanded NASA's first post-Columbia test flight a year ago and then retired from NASA in January. Susan Still-Kilrain piloted two shuttle missions in 1997 but never served as a mission commander. She retired from NASA in 2002. And while Melroy is the only woman pilot-astronaut now employed by NASA, she hopes other female mission specialists are chosen to command expeditions on the International Space Station. Melroy will lead a crew of six on a mission to deliver a key component to the station. Dubbed Node 2, the can-shaped U.S. module will serve as gateway to European and Japanese laboratories at the outpost. Web posted. (2006). [Launch from Kennedy Space Center tentatively is set for Aug. 9, 2007 [Online]. Available WWW: http://www.floridatoday.com/ [2006, August 2].]

August 4: **Expendable Launch Vehicle Status Report**
Mission: STEREO (Solar Terrestrial Relations Observatory); Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: Aug. 31, 2006 ; Launch Time: 3:12:24 or 4:20:28 p.m. EDT. At Launch Complex 17, the second stage of the Boeing Delta II was de-stacked on Tuesday and taken to the nearby High-Pressure Test Facility. The planned precautionary leak test has been completed. No leak was observed. The second stage will be returned to the launch pad on Saturday and mated again with the Delta first stage. In the Hazardous Processing Facility clean room, the two STEREO observatories are scheduled to be stacked on Aug. 9 in preparation for spin test activities. These are planned to begin on Aug. 11. The integrated STEREO payload will then be mated to the upper stage booster on Aug. 16 and transported to Pad 17-B on Aug. 19 for integration with the Delta II. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-080406** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, August 4].]

Space Shuttle Processing Status Report
Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: No earlier than Aug. 27, 2006 ; Launch Pad: 39B ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Early on Wednesday, Space Shuttle Atlantis rolled from high bay 3 in the Vehicle Assembly Building to Launch Pad 39B. Early Thursday, the orbiter's auxiliary power units were successfully test fired. Also on Thursday morning, the rotating service structure was moved to the mate position and is now surrounding the orbiter as it sits on

the mobile launch platform. Functional tests and checkout of the shuttle and pad systems are under way. The STS-115 payload is scheduled to be installed in Atlantis' payload bay on Saturday. The payload for STS-115 is the Port 3/4 truss segment, the next major addition to the 11-segment integrated truss structure that will eventually span more that 300 feet. The P3/P4 truss, with its two large solar arrays, will provide one-fourth of the total power generation capability of the completed station. Mission managers made the decision to move the opening of Atlantis' launch planning window to Aug. 27. The decision was made after it was determined that lighting conditions for launch and external tank separation were sufficient to support imagery analysis. Next week, the STS-115 crew will visit KSC for a launch dress rehearsal, called the terminal countdown demonstration test. Mission: STS-116 - 20th International Space Station Flight (12A.1) - P5 Truss Segment ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than Dec. 14, 2006 ; Launch Pad: 39B ; Crew: Polansky, Oefelein, Curbeam, Higginbotham, Patrick and Fuglesang ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Processing of Discovery for its next mission, STS-116, continues in Orbiter Processing Facility bay 3. Following discovery of a leak, fuel cell no. 2 was removed and replaced. Work is under way to remove and replace the L5L vernier thruster, located on the portside orbital maneuvering system pod, following a thruster heater malfunction during the STS-121 mission. Windows no. 1, 2 and 5 have been replaced, with replacement of windows no. 3 and 4 to follow this week. The orbiter boom sensor system was re-installed Thursday after completion of post-flight inspections. Post-flight inspection of the thermal protection system is 90 percent complete. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Workers performed brake leak checks, main propulsion actuator leak checks and environmental control life support system rotary equipment checks this week. Fuel tank installation for the power reactant storage and distribution (PRSD) system is under way. Oxygen tank no. 5 will be installed Monday. The PRSD supplies liquid hydrogen and liquid oxygen to the orbiter's fuel cells, which serve as the electrical power plant for the vehicle. The seats for the shuttle crew commander and pilot were installed in the flight deck this week. Testing of the atmosphere revitalization pressure control system was completed this week. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-080406** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 4].]

August 7: Prelaunch test set for Thursday

Destined to resume construction of the International Space Station, the Atlantis astronauts this week face a key pre-launch test -- a practice countdown at Kennedy Space Center. With about 150 to 200 engineers operating computer consoles in the NASA Launch Control Center, shuttle skipper Brent Jett and five crewmates will board Atlantis at pad 39B on Thursday for a launch-day dress rehearsal. The exercise is one of the most important drills that any astronaut crew goes through during shuttle flight training. It's the only time astronauts don their partial pressure launch-and-entry suits and climb into their spaceship before the real deal on launch day. "The training events for this week mark the last milestones for us in flight preparations," Jett said after the astronauts arrived Monday. The Atlantis launch remains scheduled for Aug. 27 around 4:30 p.m. A three-

day launch countdown is scheduled to begin on Aug. 24. Shuttle preparations are proceeding on schedule. NASA contractors finished a flight readiness test of the shuttle's three liquid-fueled main engines during the weekend. Web posted. (2006). [Prelaunch test set for Thursday [Online]. Available WWW: http://www.floridatoday.com/ [2006, August 8, 2006].]

NASA Air Force Agree to Aeronautics Cooperation

NASA and the United States Air Force have formed an aeronautics research partnership. NASA Administrator Michael Griffin and Secretary of the Air Force Michael Wynne signed a Memorandum of Understanding Monday at a Pentagon ceremony. The agreement builds upon and expands on the longstanding relationship between the two organizations. "Although NASA and the Air Force have differing missions, there are common aeronautics research goals that dictate we maintain a close partnership, Griffin said. Besides the obvious benefits, it's in the nation's best interest for us to work together. "This is a great day for aerospace," Wynne added. "It's a renewal of an already strong partnership and codifies what we've been doing all along." The agreement is designed to ensure the free exchange of research information, reduce duplication of research, and enhance long-term research planning for both organizations. It covers areas such as advanced aircraft design, propulsion development, materials development and aviation safety. ["NASA Air Force Agree to Aeronautics Cooperation," **NASA News Release #06-289**, August 7, 2006.]

August 8: Rescue Shuttle to be on standby

NASA has decided it will have an orbiter on standby for a rescue mission for every Space Shuttle flight to the end of the programme in 2010. After the 2003 Columbia accident, NASA planned for contingency Space Shuttle support missions to rescue a damaged orbiter's crew from the International Space Station (ISS), which would act as a safe haven. Since the July 2005 Discovery/STS 114 return to flight mission, NASA has had a Shuttle undergoing pre-launch processing to prepare it to rescue a crew within 45 days of an in-orbit Shuttle emergency being declared. The agency's stated goal was to end the contingency support policy once post-Columbia Shuttle changes had been flight proven, but now NASA says: "We are planning to have a rescue mission for every flight until the end of the programme." The policy change comes despite the success of the Discovery STS 121 mission last month and has been made because NASA has an orbiter available on standby for all future missions since Endeavour's 22-month maintenance period was completed in October last year. No decision has been made on a rescue Shuttle for the proposed Hubble Space Telescope servicing mission STS 125 scheduled for 11 April 2008. Web posted. (2006). [Rescue Shuttle to be on standby [Online]. Available WWW: http://www.flightglobal.com/ [2006, August 8, 2006].]

August 9: Crew up for practice countdown, launch

With their planned Aug. 27 launch less than three weeks away, the Atlantis astronauts are anxious to climb aboard their spaceship Thursday and take part in a launch-day dress rehearsal. "We're looking forward to a good practice countdown," mission commander Brent Jett told reporters during an informal Q&A early today at Kennedy Space Center's launch pad 39B. Jett and his five crewmates are at KSC for a Terminal Countdown

Demonstration Test, or TCDT, a major training exercise that involves the astronauts and the KSC launch team. Some 150 to 200 engineers in the NASA Launch Control Center picked up a simulated countdown today, and early Thursday, the astronauts will don partial pressure spacesuits and then board Atlantis at the pad for the last three hours of the two-day drill. The crew also includes pilot Chris Ferguson and mission specialists Joseph Tanner, Daniel Burbank, Steven MacLean and Heidemarie Stefanyshyn-Piper. The prime goal during their flight: Mount a second portside segment to the International Space Station's central truss, which is the metallic backbone of the orbiting outpost. The assembly job -- as well as 14 additional station construction missions scheduled for launch before the shuttle fleet is retired in 2010 -- are considered some of the most complicated and difficult missions ever attempted in space. Said Jett: "Every crew likes to say that, 'Boy, this is one of the most complex missions that we've ever flown.' And they are all that way. And they will be that way until we stop flying in 2010." Web posted. (2006). [Rescue Shuttle to be on standby [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 9, 2006].]

Turns out Emeril's creations really are rocket science

Space food has evolved far beyond Tang, the fave drink of Gilda Radner's Lisa Loopner character on Saturday Night Live. Tang is still on board -- and in our little Tranquility Base-walking hearts -- but celebrated chefs are getting into the menu-planning these days. On Thursday, chef Emeril Lagasse gets in on the act. His menu of Mardi Gras Jambalaya, Kicked Up Mashed Potatoes with Bacon, Green Beans with Garlic, Rice Pudding and Mixed Fruit will be served aboard the International Space Station. Apparently, a special food locker was part of the Shuttle Discovery's recent cargo. More than 18 months ago, discussions began with NASA to launch Emeril's food into space. (Please refrain from gratuitous references to "kicking it up a notch.") Working with the NASA Space Food Lab, Lagasse's staff and the crew at the Food Network's Emeril Live came up with the promotion-of-all-promotions: Emeril in space. An Emeril Live crew recently went to Johnson Space Center in Houston to explore the food lab. The October show will chronicle how Lagasse's space menu was developed, finessed, tested, freeze-dried, packed and launched into space. NASA and the Food Network are billing this as the "ultimate takeout food." Until I see my fave takeout utensil, the spork, on the video, I'm reserving judgment on that. Web posted. (2006). [Turns out Emeril's creations really are rocket science [Online]. Available WWW: http://www.floridatoday.com/ [2006, August 9].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: No earlier than Aug. 27, 2006 at about 4:30 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, functional tests and checkout of the shuttle and pad systems are under way. Installation of the elbow camera of the orbiter's remote manipulator system (robotic arm) is complete. This weekend, hypergolic propellant loading will begin for the orbiter's reaction control system, orbital maneuvering system pods and the auxiliary power units, and for the hydraulic power units of the solid rocket boosters. The STS-115 payload was installed in Atlantis'

payload bay last Saturday. The payload for STS-115 is the Port 3/4 truss segment, the next major addition to the 11-segment integrated truss structure that will eventually span more that 300 feet. The P3/P4 truss, with its two large solar arrays, will provide one-fourth of the total power generation capability of the completed station. The STS-115 crew visited KSC this week for a launch dress rehearsal, called the terminal countdown demonstration test. The demonstration test provided the crew an opportunity to participate in various simulated countdown activities, and included equipment familiarization and emergency egress training. Mission managers will meet next week for a 2-day Flight Readiness Review, during which they will thoroughly assess the status of Space Shuttle Atlantis for launch. This meeting will yield a number of key decisions about STS-115, including selection of an official launch date. Mission: STS-116 - 20th International Space Station Flight (12A.1) - P5 Truss Segment ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than Dec. 14, 2006 ; Launch Pad: 39B ; Crew: Polansky, Oefelein, Curbeam, Higginbotham, Patrick, Fuglesang and Williams ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Processing of Discovery for its next mission, STS-116, continues in Orbiter Processing Facility bay 3. The thermal barrier on the orbiter's rudder speed brake was replaced this week. Testing of the power reactant storage and distribution system is under way, as are checkouts of the Ku-band antenna heater, the main propulsion system and the orbital maneuvering system pods. Functional checkout of the radiator is complete. The wheels and tires for the nose landing gear have been installed. Windows no. 3 and 4 were removed and replaced. Endeavour (OV-105); Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Freon coolant loop no. 2 deservicing was completed this week. Rigging and alignment of the remote manipulator system (orbiter arm) pedestals continue. Workers completed verification of the orbiter's airlock/hatch. Fuel tank installation for the power reactant storage and distribution (PRSD) system is under way. Oxygen tank no. 5 was installed last week, and leak checks were successfully completed this week. The PRSD supplies liquid hydrogen and liquid oxygen to the orbiter's fuel cells, which serve as the electrical power plant for the vehicle. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-081106** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 11].]

August 12: **Crew confident of foam fix**

The astronauts who will jump-start construction of the half-built International Space Station say they don't expect their spacecraft to experience the type of fatal foam shedding that doomed Columbia's crew. Set for launch aboard Atlantis on Aug. 27, the six-member crew aims to carry out the first station construction mission since late 2002. Assembly was halted after the February 2003 Columbia accident, which killed seven astronauts. An errant chunk of foam from the shuttle's external tank caused heat shield damage that went undetected during Columbia's 16-day science mission, leading to disaster during atmospheric re-entry. Safety changes since will prevent the loss of foam pieces large enough to cause catastrophic damage, the Atlantis astronauts say. "Foam will not bite us again," mission specialist Steve MacLean, a Canadian Space Agency astronaut, told reporters Friday during briefings at Johnson Space Center in Houston. Led by veteran mission commander Brent Jett, the Atlantis astronauts plan to add a 17.5-

ton segment to the left side of the station's central truss. It will be the most complicated job done so far in the assembly of the international outpost. Robot arms on both the shuttle and the station will be used to attach the section to the truss. It supports two massive solar arrays that will stretch 240 feet from tip to tip once unfurled in space. The hefty payload is the heaviest ever launched to the station. It weighs 34,977 pounds. It is 44 feet long, 16 feet wide and 15.5 feet tall. It cost $371.8 million. The 12-day mission is the first of 16 required to finish the station before a Sept. 30, 2010, deadline set by President Bush. Jett said the astronauts, who have trained for the flight for four-and-a-half years, are more than ready to take on the job. A three-day launch countdown is scheduled to begin on Aug. 24. Liftoff remains scheduled for 4:30 p.m. Aug. 27. An on-time liftoff would lead to a landing back at Kennedy Space Center at 12:46 p.m. Sept. 7. Web posted. (2006). [Crew confident of foam fix [Online]. Available WWW: http://www.floridatoday.com/ [2005, August 12].]

August 13: Shuttle communications antenna bolts a concern

Engineers are trying to determine whether critical bolts holding the shuttle Atlantis' KU-band antenna box in place are securely threaded, a potentially serious issue that could require tricky repairs before the ship's Aug. 27 launch, sources said Sunday. A two-day flight readiness review to assess Atlantis' ground processing, to resolve open issues and to set an official launch date begins Tuesday at the Kennedy Space Center. The launch window for the 116th shuttle mission opens Aug. 27 at 4:30 p.m. and closes Sept. 7. The KU-band antenna bolt issue will be discussed Monday, but it's not yet clear whether the issue can be resolved before the flight readiness review begins or whether additional work will be needed to determine what, if anything, needs to be done. The issue involves four bolts that hold the antenna support box to the forward right side of Atlantis' cargo bay. The KU-band antenna is used to relay voice, video and data between the shuttle and NASA's fleet of communications satellites. During an earlier launch campaign, engineers discovered problems with a certain type of bolt that in some cases were too short and not sufficiently threaded, or screwed in. Engineers began an assessment of similar bolts used elsewhere in the shuttle. As it turns out, the same type bolts are used to secure the shuttle's KU-band antenna box to the payload bay wall. Engineers replaced the bolts in the shuttles Discovery and Endeavour but not in Atlantis. The bolts have been in place since the antenna was installed aboard Atlantis and there has never been a problem. But it is known that some of the bolts could be engaged just a few threads worth because of a "tolerance stackup" in the way the bolts and washers are installed, according to engineers familiar with the matter. Should the box break free during ascent, it would fall the length of the shuttle's 60-foot-long cargo bay and could cause catastrophic damage. The bolts in question cannot be easily inspected at the launch pad. Kennedy Space Center engineers are studying paperwork and earlier analyses to determine whether the bolts are, in fact, sufficiently threaded. At the same time, sources said, they also are studying ways to replace the bolts at the pad, if necessary, a procedure that has never been done before. Atlantis' launch window is defined by the international space station's orbit and by a post-Columbia requirement to launch two missions in daylight for photo documentation of the shuttle's heat shield and external tank foam insulation. Because of unexpected foam shedding during the first post-Columbia mission last year, NASA extended the daylight requirement to the third flight in the sequence. But if Atlantis isn't off the ground by the end of the September window, NASA would be faced with the prospect of just two

launch days in October, none in November and just one in December. As such, agency engineers want to resolve the bolt issue as soon as possible. Web posted. (2006). [Shuttle communications antenna bolts a concern [Online]. Available WWW: http://www.floridatoday.com/ [2005, August 13].]

Tale of the TV tapes: Apollo 11 mission archive mystery unspools

Back in July 1969, the first moonwalks by Apollo 11's Neil Armstrong and Buzz Aldrin are frozen forever moments in the history books. But it turns out that millions of riveted spectators back on Earth were on the receiving end of substantially degraded television showing the epic event. The highest-quality television signal from Apollo 11's touchdown zone in the moon's Sea of Tranquility — from an antenna mounted atop the Eagle lunar lander — was recorded on telemetry tapes at three tracking stations on Earth: Goldstone in California and Honeysuckle Creek and Parkes in Australia. Scads of the tapes were produced — and now a search is on to locate them. And if recovered and given a 21st century digital makeover, they could yield a far sharper view of that momentous day, compared to what was broadcast around the globe. But Apollo 11 is a memory rewind — now over 37 years old. Nobody is quite sure just how much longer the original slow-scan tapes will last... that is, if they haven't already been erased. John Sarkissian, operations scientist at the Commonwealth Scientific and Industrial Research Organization's (CSIRO) Parkes Radio Observatory in Parkes, Australia said the tapes were appropriately handled and archived in the mid 1970's after the hectic activity of the Apollo lunar landing era was over. "We are confident that they are stored at [NASA's] Goddard Space Flight Center [in Greenbelt, Maryland] ... we just don't know where precisely," he told SPACE.com. It is important to note, Sarkissian added, that there is no inference of wrong-doing, incompetence or negligence on the part of NASA or its employees. Making it tough to track down the whereabouts of the data, many of those involved in the archiving of the tapes have since moved on, retired or passed away, "taking their corporate memory of where the tapes are with them," Sarkissian said. It is important not to exaggerate the quality of the images being sought, Sarkissian added. "The SSTV was not like modern high definition TV and nor was it even equal in quality to the normal broadcast TV we are accustomed to viewing," he said. Still, the SSTV was better than the scan-converted images that were broadcast at the time —which is the only version currently available, Sarkissian concluded. Web posted. (2006). [Tale of the TV tapes: Apollo 11 mission archive mystery unspools [Online]. Available WWW: http://www.usatoday.com/ [2006, August 13].]

August 14: NASA prepare for interesting FRR

Three "significant open items" will be at the center of tomorrow's STS-115 Flight Readiness Review (FRR), as NASA look to give final approval for the August 27 launch of Shuttle Atlantis. TPS (Thermal Protection System) putty repair risk, issues with the Ku band attach bolts and Ice Frost Ramp risk acceptance - the latter already noting dissenting opinion - are up for discussion, in what Shuttle lead Paul Hill noted would be the highlights of the FRR. 'The most significant open items for 115 are the Ice Frost Ramp risk acceptance, TPS putty repair risk and the OV-104 Ku band attach bolts,' said Hill in a pre-FRR memo acquired by this site. 'The IFR discussion is pretty much the same debate as 121's. 'The TPS putty repair issue is similar to the IFR and is still coming

together. Putty repairs have been lost in flight, including on 121. Debris transport can cause some of these to impact critical RCC panels and tiles under some conditions. 'Orbiter is bringing the latest status on the OV-104 Ku band attach bolts to Monday's noon board. The goal is to get into the payload bay on the pad to inspect and confirm sufficient threads are engaged.' (Attach bolts status will be updated). The Ice Frost ramps proved to be a key issue ahead of July's launch of Shuttle Discovery on STS-121, with NASA Safety and NASA Engineering both noting their concerns, later to be diluted by their understanding that the risk was not associated with the crew, given the 'safe haven' ability for the mission. It appears NASA is wanting to reduce the rating on the risk matrix to 'Infrequent/Catastrophic' - however, in documents dated August 11, NASA Engineering stated their self titled dissenting opinion, noting they feel the risk should remain as 'Probable/Catastrophic.' STS-121's clean flight is likely to help the evaluations of the FRR when it comes to the risks associated. However, an extra equation to add to the mix is STS-115's High Q ascent profile, which is required for Atlantis' ability to lift the heavy truss segment payload uphill. Discovery flew a Low Q ascent profile to reduce stresses on the modified External Tank. Regardless, following on from presentations from the MOD FRR associated with STS-115, the meeting in Florida should pass without any major standouts, with managers then being allowed to fully focus on trying to keep STS-116 (with Discovery) on track for a December launch - currently under threat. Web posted. (2006). [NASA prepare for interesting FRR [Online]. Available WWW: http://www.nasaspaceflight.com/ [2006, August 14].]

One small step for man,' 700-box tape loss for NASA

The U.S. government has misplaced the original recording of the first moon landing, including astronaut Neil Armstrong's famous "one small step for man, one giant leap for mankind," a NASA spokesman said on Monday. Armstrong's famous space walk, seen by millions of viewers on July 20, 1969, is among transmissions that NASA has failed to turn up in a year of searching, spokesman Grey Hautaloma said. "We haven't seen them for quite a while. We've been looking for over a year and they haven't turned up," Hautaloma said. The tapes also contain data about the health of the astronauts and the condition of the spacecraft. In all, some 700 boxes of transmissions from the Apollo lunar missions are missing, he said. "I wouldn't say we're worried -- we've got all the data. Everything on the tapes we have in one form or another," Hautaloma said. NASA has retained copies of the television broadcasts and offers several clips on its Web site. But those images are of lower quality than the originals stored on the missing magnetic tapes. Because NASA's equipment was not compatible with TV technology of the day, the original transmissions had to be displayed on a monitor and re-shot by a TV camera for broadcast. Hautaloma said it is possible the tapes will be unplayable even if they are found, because they have degraded significantly over the years -- a problem common to magnetic tape and other types of recordable media. The material was held by the National Archives but returned to NASA sometime in the late 1970s, he said. "We're looking for paperwork to see where they last were," he said. Web posted. (2006). ['One small step for man,' 700-box tape loss for NASA [Online]. Available WWW: http://www.cnn.com/ [2006, August 14].]

NASA tests pilot recovery parachute for Ares I launcher's first stage

NASA conducted two drop tests of the Ares I first stage's recovery pilot parachute over the US Army's Yuma proving ground from 14-17 August. The two tests were the first of nine planned for the next two years to test the recovery system's pilot, drogue and man parachutes. The Ares I first stage is a five-segment solid rocket booster (SRB), similar to the four-segment SRB used by the Space Shuttle. During the tests a 6,818kg (15,000lb) test vehicle, 304mm (12in) diameter and 9.15m (30ft) in length, representing the Ares I first stage was dropped from 10,000ft by a US Army Bell UH-1 Huey helicopter. Just before the test vehicle reached the ground another parachute opened to ensure the onboard instrumentation package had a soft landing. "The testing will included an examination of the differences between the performance of the recovery systems of the Shuttle's SRBs and the Ares I fist stage," says NASA. Because the Ares I first stage is larger, with an extra segment, and separates from the second stage at a higher altitude than the Shuttle SRBs detaches from the vehicle, the parachute system has to cope with a longer descent and potentially harder water landing. An Ares I single main parachute test will occur early next year, followed by a test of a cluster of main parachutes. In the second or third quarter of 2007 the Ares I drogue chute will be tested. Web posted (2006), [NASA tests pilot recovery parachute for Ares I launcher's first stage [Online]. www.floridatoday.com [2006, August 14-17].]

Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: Aug. 31, 2006 ; Launch Time: 3:12:24 - 3:14:24 or 4:20:28 - 4:35:28 p.m. EDT. At Launch Complex 17, the launch team is performing the Delta II Flight Simulation today. This is an electrical and mechanical test of the rocket that activates the first and second stage onboard systems, taking them through the programmed flight events as they will occur during launch. In the Hazardous Processing Facility clean room, STEREO spin-test activities were successfully completed on Saturday. Thermal blanket closeouts and final spacecraft cleaning are under way. The STEREO payload is scheduled for mating to the upper stage booster on Wednesday. It will be transported to Pad 17-B on Friday for integration with the Delta II. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-081406** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, August 14].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ;Location: Launch Pad 39B ;Launch Date: No earlier than Aug. 27, 2006 at about 4:30 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ;Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, functional tests and checkout of the shuttle and pad systems are under way. Hypergolic propellant loading continues this week. Ordinance installation is scheduled for Thursday and Friday. The Orbiter Boom Sensor System sensor package has been installed and checkouts are complete. T-0 instrumentation installation is under way. The T-0 umbilicals are connection points on the aft of the orbiter through which electrical power, fuel and systems data flow. The instrumentation will provide data during launch. On Tuesday and Wednesday, mission managers will

meet for the Flight Readiness Review, during which they will thoroughly assess the status of Space Shuttle Atlantis for launch. This meeting will yield a number of key decisions about STS-115, including selection of an official launch date. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-081406** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 14].]

August 15: Bolts cause trepidation

NASA managers will decide this week whether suspect bolts must be replaced before the planned Aug. 27 launch of shuttle Atlantis and six astronauts on an International Space Station construction mission. During a two-day flight readiness review that will start today at Kennedy Space Center, engineers will brief managers on a potential problem with four bolts holding a key communications antenna in place in the shuttle's cargo bay. The bolts are shorter than called for in engineering specifications, and engineers fear they might not have enough threads to hold the antenna in place during the spaceship's launch and nine-minute climb into orbit. The dish-shaped antenna is located at the right side of the payload bay near the shuttle's crew cabin. It beams voice, video and data to NASA's Mission Control Center in Houston via a fleet of orbiting communications satellites. With Atlantis poised in a nose-up position on launch pad 39B, the antenna could plunge the length of the 60-foot cargo bay and cause catastrophic damage if it shook loose during launch. "We haven't decided what we're going to do yet, but if we do decide to replace the bolts, it looks like we can do the work at the pad and probably not impact our launch date," KSC spokesman Bruce Buckingham said Monday. The job would be both unprecedented and difficult. Platforms would have to be built up almost six stories above the aft end of the payload bay. A technician lying flat on his or her back would work in tight quarters, with at least a foot-long reach to remove and replace the bolts. Accidental damage is possible. Buckingham said preliminary plans indicate the work would take at least a couple of days, and that the job could be done late this week. A decision is expected by Thursday. Web posted. (2006). [Bolts cause trepidation [Online]. Available WWW: http://www.floridatoday.com/ [2006, August 15].]

August 16: Air Force's space chief sounds an alert

The Air Force's new top commander for space is predicting future attacks on U.S. satellites and calling for greatly expanded tracking and identification of payloads launched by other countries. Currently, U.S. efforts are focused on determining if an overseas launch is a ballistic missile or designed to put an object in orbit, then cataloging it over a period that can take weeks, said Air Force Gen. Kevin Chilton, who heads the Air Force Space Command at Peterson Air Force Base, Colorado. "I say those days are over," he said Tuesday at an annual conference here on the fledgling, multibillion-dollar U.S. anti-missile shield. "If it's a space launch, we can't afford to relax." "We need to know what the intent of that launch is," he said, including whether an object could jam or otherwise harm satellites or spread micro-satellites that could do so. Chilton said his goal was to learn all this in the object's first orbit around Earth so the United States could take unspecified actions "before an adversary can cripple us." The increased "situational awareness" he had in mind could be achieved largely through improved computer work that would present information in easy-to-understand displays, he said. Foes would be foolish not to be thinking of how to deny the United States the advantages of space, on which it relies heavily for military and commercial purposes, said Chilton, who took over

the space command a month and a half ago. "And in the future, I'm convinced they'll strike at these capabilities, if nothing else to attempt to level the playing field," he said. Web posted. (2006). [Air Force's space chief sounds an alert [Online]. Available WWW: http://www.msnbc.msn.com/ [2006, August 16].]

Bolts May Pose Problem in Shuttle Launch

NASA managers on Wednesday unanimously picked Aug. 27 for the first attempt to launch the space shuttle Atlantis on a mission to resume construction of the international space station -- but two precariously attached bolts securing a crucial antenna could delay those plans. Engineers suspect that two of the bolts are too short on the KU-band antenna, which transmits images and other essential data between the space shuttle and Mission Control. They want to make sure the bolts are secure enough so that the antenna doesn't fly off while in the payload bay during a launch, which could cause catastrophic damage. "We're not going to fly if we think there's a possibility the antenna will come off," said NASA Administrator Michael Griffin. Atlantis has flown with those bolts without trouble since they were first installed two decades ago. The problem was discovered last week, after Atlantis was rolled to the launch pad, when a review of paperwork on bolts on NASA's three space shuttles was ordered because a related problem was found in Discovery. NASA officials likely won't decide until this weekend whether to leave the bolts in place or change them in a tricky swap-out at the launch pad. Technicians would have to build scaffolding on top of a platform six stories off the ground in order to change out the bolts with the shuttle vertical on the launch pad. A swap-out probably would take NASA the two spare days it has in the schedule. Web posted. (2006). [Bolts May Pose Problem in Shuttle Launch [Online]. Available WWW: http://www.nytimes.com/ [2006, August 16].]

NASA wrapping up launch review

Top NASA officials today are wrapping up a review aimed at determining whether the agency is ready to launch shuttle Atlantis and resume construction of the International Space Station after a near-four-year hiatus. Meeting at Kennedy Space Center, the officials will be briefed on a potential problem with bolts securing a key communications antenna inside the shuttle's payload bay as well as the status of orbiter systems. The bolts are shorter than required under engineering specifications and it is likely a decision will be made Thursday to swap them out at launch pad 39B. A news conference will be held no earlier than 2 p.m. to brief reporters on the two-day Flight Readiness Review and announce a firm launch date for Atlantis and its six-member astronaut crew. At the pad today, engineers and technicians are stowing a pair of spacesuits aboard Atlantis. Mission specialists Joe Tanner and Heide Stefanyshyn-Piper will use the suits during two of three spacewalks aimed primarily at preparing a new segment of the station's central truss and its two massive solar arrays for orbital operations. Suits to be worn by crewsmates Dan Burbank and Steve MacLean on the other spacewalk already are at the station. Web posted. (2006). [NASA wrapping up launch review [Online]. Available WWW: http://www.floridatodaycom/ *The Flame Trench* [2006, August 16].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: No earlier than Aug. 27, 2006 at about 4:30 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, functional tests and checkout of the shuttle and pad systems continue. Hypergolic propellant loading continues and should be complete by Thursday. Ordnance installation is scheduled for Thursday and Friday. Replenishing of both the liquid hydrogen and liquid oxygen storage tanks at Pad 39B is under way. The fuel from these storage tanks will be transferred to the shuttle's external fuel tank on launch day. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-081606** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 16].]

August 17: Dissing Pluto and the Other Plutons

A panel appointed by the International Astronomical Union thinks it has come up with a dandy compromise to the years-long struggle over whether we should continue to count Pluto as a planet. The trouble is, the new definition of a planet will include an awful mélange of icy rocks found on the outer fringes of the solar system. It would be far better to expel Pluto from the planetary ranks altogether, leaving us to bask in the comfortable presence of the eight classical planets that were discovered before 1900 and have excited wonder ever since. Pluto, discovered in 1930, never deserved to be called a planet. It is far smaller than first thought, smaller in fact than our own moon. Its orbit is more elliptical and tilted in a different plane than those of the other planets, and its icy, rocky body is more like a comet's core. If Pluto were discovered today, it seems highly unlikely that anyone would consider it a planet. But Pluto has emotional partisans who resent anyone picking on the puniest planet, so efforts to demote it invariably meet resistance. Now a panel of astronomers and historians has come up with a new definition of the word "planet" that will keep Pluto in the club. Under the new definition, a planet would be any celestial body that orbits around a star and is large enough for its own gravity to pull it into a spherical shape. That definition would produce an ugly porridge of 12 old and new planets, with dozens more on the way. Ceres, heretofore considered the largest of the asteroids, would qualify. The panel suggests that people might want to call it a "dwarf planet," raising the question of why bother to call it a planet at all. Pluto would still count as a planet but would be shunted into a new category called "Plutons," which would include any object that meets the definition and has an orbit beyond Neptune's. Web posted. (2006). [Dissing Pluto and the Other Plutons [Online]. Available WWW: http://www.nytimes.com/ [2006, August 17].]

August 18: NASA orders up bolt swap

Suspect bolts securing a key communications antenna in shuttle Atlantis' cargo bay will be swapped out at Kennedy Space Center's launch pad 39B over the weekend. But the work is not expected to delay the planned Aug. 27 launch of six astronauts on a mission to restart construction of the International Space Station. Senior shuttle program managers made the decision to change out the bolts in a meeting early today. NASA cannot be certain the threads on two of four bolts holding the antenna in place are engaged, so managers decided the prudent course of action would be to replace the

fasteners. The 304-pound antenna system is located on the starboard side of the forward end of the 60-foot long payload bay. With the shuttle in a nose-up position on the pad, the concern is that the antenna could break free during launch and fall the entire length of the bay, potentially causing catastrophic damage. NASA contractor technicians will start setting up for the job late tonight after engineers finish loading toxic propellants into tanks that feed steering thrusters on the nose of the orbiter. Lightning warnings over the past 24 hours have stalled that work, which included replacing a leaky poppet valve that failed last weekend, halting the hazardous operation. Plans now call for technicians to open the shuttle's clamshell-like payload bay doors late tonight and then begin setting up platforms and scaffolding. The set-up work is aimed at providing technicians with access to the antenna so that the bolts can be swapped out. The actual replacement work probably won't get under way until late Saturday or Sunday. Graphics showing how the work will be done are in a post below. A three-day countdown still is scheduled to begin next Thursday. Web posted. (2006). [NASA orders up bolt swap [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 18].]

NASA selects crew, cargo launch partners

NASA is making an unprecedented investment in commercial space transportation services with the hope of creating a competitive market for supply flights to the International Space Station (ISS). Two industry partners will receive a combined total of approximately $500 million to help fund the development of reliable, cost-effective access to low-Earth orbit. The agency is using its Space Act authority to facilitate the demonstration of these new capabilities. NASA signed Space Agreements Aug. 18 with Space Exploration Technologies (SpaceX) of El Segundo, Calif., and Rocketplane-Kistler (RpK) of Oklahoma City to develop and demonstrate the vehicles, systems, and operations needed to support a human facility such as ISS. Once the space shuttle is retired, NASA hopes to become just one of many customers for a new, out-of-this-world parcel service. Web posted. (2006). [NASA selects crew, cargo launch partners [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, August 18].]

Launch Countdown Begins Aug. 24 For Space Shuttle Atlantis

NASA will begin the countdown for the launch of Space Shuttle Atlantis on mission STS-115 at 6 p.m. EDT Thursday, Aug. 24, at the T-43 hour point. During this mission, Atlantis' crew will resume the construction of the International Space Station, which is the goal of the remaining space shuttle flights in the program. The Kennedy Space Center launch team will conduct the countdown from the newly renovated Firing Room 4 of the Launch Control Center. The countdown includes 27 hours, 24 minutes of built-in hold time leading to a preferred launch time at about 4:30 p.m. on Sunday, Aug. 27, with a launch window extending about five minutes. This mission is the 116th space shuttle flight, the 27th flight for orbiter Atlantis, and the 19th U.S. flight to the International Space Station. STS-115 is scheduled to last 11 days with a planned KSC landing at about 12:02 p.m. EDT on Sept. 7. Atlantis rolled into KSC's Orbiter Processing Facility on Oct. 18, 2002, after returning from its last mission, STS-112. Its next mission was planned to be STS-114; however, during the program delays following the loss of orbiter Columbia, Atlantis was reassigned to mission STS-115. The orbiter rolled out of the facility's bay 1 and into the Vehicle Assembly Building on July 24. While in the

building's high bay 3, Atlantis was mated to its modified external tank and solid rocket boosters. The entire space shuttle stack was transferred to Launch Pad 39B on Aug. 2. The STS-115 crew includes Commander Brent Jett, Pilot Chris Ferguson, and Mission Specialists Joe Tanner, Dan Burbank, Heidemarie Stefanyshyn-Piper and Steve MacLean of the Canadian Space Agency. During mission STS-115, Atlantis will dock with the station and the crew will perform three spacewalks. The astronauts will deliver and install the 17.5-ton, bus-sized P3/P4 integrated truss segment to the station's girder-like truss backbone. The new piece will include a second set of giant solar arrays, batteries and associated electronics. Together, the trusses and solar arrays will provide one-fourth of the total power-generation capability of the completed station. ["Launch Countdown Begins Aug. 24 For Space Shuttle Atlantis," **NASA News Release $51-06,** August 18, 2006.]

Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: Aug. 31, 2006 ; Launch Time: 3:12:24 - 3:14:24 and 4:20:28 - 4:35:28 p.m. EDT. After leak checks of the Delta II first stage, engineers decided to remove and replace the liquid oxygen fill and drain valve at Launch Complex 17. That work is being completed today without impact to the launch date. Also, preparations are under way at the pad for the arrival of the STEREO payload. In the Astrotech Hazardous Processing Facility clean room, the STEREO spacecraft was mated to the upper stage booster on Wednesday. Today the integrated payload is being installed into its transportation canister. On Saturday morning, STEREO will be moved to the launch pad for hoisting atop the Delta II. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-081806** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, August 18].]

August 19: NASA technicians are ready to tackle tall task

NASA is taking on an unprecedented and potentially dangerous repair job this weekend, trying to swap out suspect bolts securing a key communications antenna inside shuttle Atlantis' cargo bay. With Atlantis and six astronauts scheduled for launch Aug. 27, technicians plan to put in place a work platform and scaffolding almost six stories above the bottom of the bay. Toiling in tight quarters near a barrel-shaped airlock, a worker will shimmy onto a skinny gangplank and lie on his side, stretching to reach the bolts so they can be removed and replaced. "So imagine operating on a surfboard that's tied down at one end, sticking out over a six-story balcony," NASA shuttle program manager Wayne Hale said. "I mean, this has got all kinds of implications." Not the least of which is the potential for serious injury or accidental damage to the shuttle and its $372 million payload. Senior shuttle program managers ordered up the change-out in a meeting Friday. The reason: NASA cannot be certain that threads on two of four bolts holding the antenna in place are engaged. The 304-pound antenna system is located on the right side of the forward end of the payload bay, which is 60 feet long and 15 feet wide. With the shuttle in a nose-up position on Kennedy Space Center's launch pad 39B, the dish-shaped antenna could break free after liftoff and plunge the entire length of the bay, potentially causing catastrophic damage. Managers consequently decided the prudent course was to replace the fasteners. A three-day countdown still is scheduled to begin Thursday, and

the shuttle crew is due to arrive at KSC that day. Liftoff remains scheduled for 4:30 p.m. Aug. 27. The Atlantis astronauts will launch on NASA's first International Space Station construction flight since the February 2003 Columbia accident. They aim to deliver a new central truss segment equipped with two power-producing solar arrays. Landing at KSC's three-mile runway is set for 12:02 p.m. Sept. 7. Web posted. (2006). [NASA technicians are ready to tackle tall task [Online]. Available WWW: http://www.floridatoday.com/ [2006, August 19].]

August 20: Shuttle set for Thursday countdown

NASA is poised to pick up the countdown to launch of shuttle Atlantis this week after swapping out two suspect bolts securing a key communications antenna inside the ship's cargo bay. The work, which was finished Sunday at Kennedy Space Center's launch pad 39B, put NASA in position to start a three-day countdown Thursday. Liftoff of Atlantis and six astronauts remains scheduled for about 4:30 p.m. Sunday. "Everything is looking good," said KSC spokeswoman Tracy Young. Working atop a platform and scaffolding near the top of the shuttle's six-story payload bay, technicians replaced two of the four bolts holding the antenna in place with longer bolts. The engineers had feared that the two original bolts were not adequately engaged and that the 304-pound antenna -- located at the forward end of the payload bay -- might break free during launch. In that case, the antenna could have plunged the entire length of the 60-foot-long cargo bay, causing critical damage to the shuttle and its $372 million payload. NASA managers ordered the replacement work Friday. The shuttle's clamshell-like cargo bay doors were opened that night, and technicians spent the better part of Saturday setting up equipment for the job. A work platform was extended into the bay near the top of a towering room that provides access to shuttle cargoes on five levels. Scaffolding then was built up on the platform, and the gangplank was fixed atop it so that a technician wearing safety harnesses could reach the bolts. The actual replacement work began late Saturday and was completed Sunday. Web posted. (2006). [Shuttle set for Thursday countdown [Online]. Available WWW: http://www.floridatoday.com/ [2006, August 20].]

All Roads Lead to KSC for International ISS Hardware

With 200,000 lb. of International Space Station hardware being readied, the shuttle launch site is the nexus for final U.S., Japanese, European and Canadian station hardware preparation by multinational teams. The Japanese Kibo and European Columbus modules (see cover) are key elements in the Space Station Processing Facility (SSPF) here. The 17.5-ton, $372-million P3/P4 ISS payload (right) that will provide such station science modules with electricity was recently moved from the SSPF for loading into Atlantis for launch on STS-115 by late this month or early September. Launch timing will depend on resolution of a bolt issue with the orbiter's Ku band antenna. The 45 X-16-ft. truss payload is 5 tons heavier than the Hubble Space Telescope and, as with its shuttle-sized transport canister, the element will consume the entire Atlantis payload bay. The new element will be positioned on the ISS port beam to unfurl the station's second set of solar arrays spanning 240 ft. (see artist's concept, top right). The Kennedy Space Center (KSC) is already a busy intersection for 100 tons of diverse station hardware including Italian station logistics modules. But more hardware is also due in the coming months, especially from Japan. "There is a sense of upbeat battle rhythm across the

program," says Mark Jager, Boeing program manager for the NASA Checkout Assembly and Payload Processing Services (Capps) contract that oversees ISS payload support. Boeing not only leads a team of more than 175 aerospace contractors for the total U.S. segment, it also helps coordinate multinational preparations in Kennedy's SSPF under the $332-million Capps contract. The SSPF is the world's largest space processing clean room. Its high bay measures 363 X 80 X 61 ft. with an adjoining low bay nearly as gigantic. All of the already launched U.S., Canadian and early European hardware twice filled and emptied the SSPF, says David Bethay, Boeing Capps director of mission management and utilization. But the ISS, with a current mass of 404,000 lb., is not yet even half built. The hardware here now has filled the SSPF a third time and, by the end of the shuttle program, the facility will have been filled and emptied a fourth time as the ISS grows toward 925,000 lb. in space. The international presence in the SSPF is striking: about 110 personnel from multiple countries are on the floor at any given time. Because there can be U.S., European, Canadian, Russian and Japanese staff present simultaneously, International Traffic in Arms Regulations (ITAR) "are a very big deal for us here," Jager says. "We have detailed plans to deal with each individual country and its people." But it has not been a problem for hardware processing, because the personnel from each country respect the rules of the others, he says. There are 14 ISS cargo elements in preparation at KSC for 12 of the 16 ISS missions remaining, and all of them, except for the P3/P4 truss now in Atlantis, are in the SSPF, says Chuck Hardison, Boeing ISS site manager. The massive STS-115 truss payload only left the facility in late July. It and other elements have received significant upgrades here in the three years since the Columbia accident, Hardison says. Other key elements in the SSPF are: *Node 2: The 29,555-lb. module was built by Alenia in Turin, Italy, for the Italian Space Agency and provided by the European Space Agency under a barter agreement with NASA in exchange for the shuttle launch of Columbus. Set for launch next August, Node 2 will eventually be attached to the front of the U.S. Destiny Laboratory module where it will be the connecting hub for both the European Columbus and Japanese Kibo modules. *Columbus: The 27,000-lb. European Space Agency Columbus Orbital Facility (COF) was also built by Alenia with extensive outfitting by EADS in Bremen, Germany. Set for launch no earlier than September 2007, it arrived here in May and passed critical vacuum chamber tests. *Kibo: Developed by Japan's Aerospace Exploration Agency (JAXA), the Kibo Japanese Experiments Module (JEM) is twice the size of Columbus. Set for launch by late 2007, it was built by Mitsubishi in Nagoya, Japan. Major internal rack functional tests are planned for Kibo this week, while a major end-to-end systems test in October will link the module here via satellite to its Japanese Tsukuba control center near Tokyo and the Johnson Space Center in Houston. Other major Kibo facilities set for delivery to the SSPF over the next 12-18 months include its Toshiba manipulator arm and Nissan exposure facility porch. Web posted. (2006). [All Roads Lead to KSC for International ISS Hardware [Online]. Available WWW: http://www.floridatoday.com/ [2006, August 20].]

Voyager 1 passes milestone

Voyager 1, already the most distant human-made object in the cosmos, reached 100 astronomical units from the sun on Tuesday, August 15 at 5:13 p.m. Eastern time (2:13 p.m. Pacific time). That means the spacecraft, which launched nearly three decades ago,

is 100 times more distant from the sun than Earth is. Web posted. (2006). [Voyager 1 passes milestone [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, August 20].]

August 21: Space tourist fails medical test

A Japanese businessman seeking to become the world's fourth space tourist has failed a medical test and cannot fly to the international space station next month, a Russian space agency official said Monday. Daisuke "Dice-K" Enomoto, 34, was to be launched in a Russian Soyuz vehicle from the Baikonur cosmodrome in Kazakhstan with the next space station crew on September 14. However, Roscosmos spokesman Igor Panarin told The Associated Press that Enomoto "was deemed not ready to fly for exclusively medical reasons." Web posted. (2006). [Space tourist fails medical test [Online]. Available WWW: http://www.cnn.com/[2006, August 21].]

Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: No earlier than Sept. 18, 2006 ; Launch Time: TBD. STEREO's launch has been postponed to no earlier than Sept. 18, the opening of the mission's next launch window. The additional time is necessary for further evaluation of the Delta II second stage to verify it is structurally sound for flight. This concern arose after further engineering analysis revealed that a similar tank produced for another mission was marginally thin in an area of the oxidizer tank. Engineers are assessing several options for the STEREO launch vehicle at Pad 17-B to determine the thickness of the tank in this same area. STEREO was not transported from Astrotech to the launch pad over the weekend as planned. It will remain at the payload processing facility until the necessary course of action for the Delta II can be more clearly defined. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-082106** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, August 21].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: Aug. 27, 2006, 4:30 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, workers have completed hypergolic propellant loading of the orbiter and solid rocket boosters. Following a decision by Space Shuttle Program managers to remove and replace two Ku-band antenna actuator bolts in the forward section of the orbiter payload bay, workers spent the weekend preparing access platforms, performing the bolt replacement and then removing the temporary access equipment. The bolt replacement was completed early Sunday. Later on Sunday, the orbiter's payload bay doors were closed and ordnance installation was initiated, with completion early on Monday. Technicians are now closing out the orbiter's aft compartments and pressurization of the orbiter's maneuvering system, reaction control system and main propulsion system will begin tomorrow. Stowage of flight crew equipment in the crew module is ongoing. In Houston, the STS-115 crew began their health stabilization period

in preparation for the Aug. 27 launch. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-082106** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 21].]

Simpkins Named Director of New KSC Engineering Group

NASA Kennedy Space Center Director Jim Kennedy announced today that Patrick Simpkins has been appointed the director of the center's new Engineering Directorate. He replaces Steve Altemus, originally selected for the position, who recently accepted another position at Johnson Space Center in Houston. The new 600-person Engineering Directorate at KSC will centralize the center's engineering activities, processes and personnel into one organization that will have an independent reporting line of authority. It will ensure the highest quality of engineering rigor at the center. The directorate will officially begin operation in October. Simpkins will assume the responsibilities of the director's position immediately to ensure that all issues associated with the reorganization are addressed and to help with the successful transition from concept to operations. Bill Parsons, the KSC deputy director, will assume the responsibilities of acting director of the Advanced Planning Office, Simpkins' most recent position. Over the course of his career at KSC, Simpkins has worked as an engineer, performing systems engineering integration for human space flight programs and payloads for more than 15 years. He was also KSC's Human Resources director for 2 1/2 years, during which time he received a doctorate in business administration from Nova Southeastern University in Fort Lauderdale, Fla. He holds a bachelor's degree in environmental engineering from the University of Florida and a master's degree in human resource management from the Florida Institute of Technology, as well. Simpkins has played key roles in the strategic decision-making process at KSC, most recently as chairman of the Organizational Development Team for the Engineering Directorate. In this capacity, he guided the development of this reorganization, one of the most significant changes made to the center's structure since the transition from the Apollo to the Space Shuttle Program. Scott Kerr will serve as the deputy director of the Engineering Directorate. Kerr also had an instrumental role on the Organizational Development Team and has managed several large technical organizations at KSC. Other reassignments at KSC include the selection of Oscar Toledo as the director of the Design and Development Engineering Office in the new Engineering Directorate and Shannon Bartell as the director of Safety and Mission Assurance. Bartell replaces Denny Kross, who is retiring, and she will assume her new post on Oct. 1. ["Simpkins Named Director of New KSC Engineering Group," **NASA News Release #52-06**, August 21, 2006.]

August 22: NASA pressurizes propulsion systems

NASA is pressurizing propellant systems aboard Atlantis today as the agency continues preparations for the launch of six astronauts on the first International Space Station assembly mission since the 2003 Columbia accident. With Atlantis perched atop Kennedy Space Center's launch pad 39B, engineers are pressurizing the shuttle's main propulsion system as well as its twin maneuvering engines and 44 nose-and-tail steering jets. Close-out work in the shuttle's rear engine compartment is continuing along with preparations to pick up a three-day launch countdown. The Atlantis astronauts are scheduled to arrive at KSC's Shuttle Landing Facility about 11:15 a.m. Thursday. The

launch countdown is slated to start at 6 p.m. that day. Liftoff remains scheduled for about 4:30 p.m. Sunday. Web posted. (2006). [NASA pressurizes propulsion systems [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 22].]

Airspace, Bridges and Waterway Restrictions

For the STS-115 launch of Space Shuttle Atlantis, NASA managers are urging all aircraft pilots and boaters to fully comply with the airspace, bridges and waterway restrictions imposed around Kennedy Space Center prior to and during shuttle launches and landings. "As always, we are coordinating with officials from the U.S. Air Force Eastern Range, Federal Aviation Administration and the U.S. Coast Guard to help provide a safe launch environment for the shuttle crew and for interested spectators," said KSC Launch Director Mike Leinbach. "Violating these restrictions is not only unsafe for the astronauts and support crews, it's unsafe for the violator." The first launch opportunity is Sunday, Aug. 27, with liftoff targeted for 4:30 p.m. EDT. This launch time is approximately in the middle of a 10-minute launch window. At NASA's request, Air Force and Coast Guard surveillance aircraft will patrol KSC's airspace boundaries on launch day. Violators will be intercepted by patrol forces, thoroughly investigated and subject to FAA enforcement action. A number of restrictions remain in effect around KSC during the hours immediately following the launch of a space shuttle. ["Airspace, Bridges and Waterway Restrictions In Effect for STS-115," **NASA News Release #53-06,** August 22, 2006.]

August 23: Final countdown preps continue at KSC

NASA is stepping through final countdown preparations at Kennedy Space Center today, pressing ahead with plans to launch shuttle Atlantis and six astronauts on Sunday. Liftoff of the agency's first International Space Station assembly flight since the 2003 Columbia accident remains scheduled for about 4:30 p.m. that day. At launch pad 39B, NASA is continuing to pressurize the shuttle's main propulsion system as well as its twin orbital maneuvering engines and 44 nose-and-tail steering thrusters. Technicians also are wrapping up final closeouts in the orbiter's rear engine compartment. A three-day countdown is scheduled to pick up at 6 p.m. Thursday. The Atlantis astronauts are slated to arrive at KSC for final launch preparations at 11:15 a.m. that day. Web posted. (2006). [Final countdown preps continue at KSC [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 23].]

Texas woman tapped for tourist flight

The Texas businesswoman who helped bankroll the $10 million Ansari X-Prize will fly as a space tourist on an upcoming launch to the International Space Station, replacing a Japanese Internet magnate. Anousheh Ansari will launch Sept. 14 aboard a Russian Soyuz rocket with U.S. astronaut Michael Lopez-Alegria and Russian cosmonaut Mikhail Tyurin. She'll be the first woman to make a paid voyage to the station. Ansari follows Dennis Tito, Mark Shuttlesworth and Greg Olsen. The co-founder of Telecom Technologies in Richardson, Texas, will remain on the outpost for eight days and then return to Earth with current station commander Pavel Vingradov and flight engineer Jeffrey Williams. Web posted. (2006). [Final countdown preps continue at KSC

[Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 23].]

NASA names new ship Orion

A new spaceship that will carry astronauts to the International Space Station, the moon and Mars is being named for one of the brightest and most familiar constellations in the night sky. Orion is the moniker that NASA has chosen for its Crew Exploration Vehicle, which is slated to replace the space shuttle and make its first piloted flight no later than 2014. Its first piloted flight to the moon is slated for launch no later than 2020. The spaceships will be able to ferry up to six astronauts to and from the international station and crews of four to the lunar surface and back. "Many of (Orion's) stars have been used for navigation and guided explorers to new worlds for centuries," NASA project manager Skip Hatfield said in a statement. "Our team, and all of NASA -- and I believe, our country -- grows more excited with every step forward this program takes. The future of space exploration is coming quickly." NASA is expected to announce the winner of a multibillion-dollar contract to build the new ships next week. The two competitors are Lockheed Martin and a team made up of Northrup Grumman and Boeing. Orion spaceships will be launched aboard two new moon rockets that NASA has dubbed Ares 1 and Ares 5. The name Ares was selected because it is a synonym for Mars. Tell us what you think of the new name for NASA's future fleet by clicking on comment below. Web posted. (2006). [NASA names new ship Orion [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 23].]

Launch of Sun-watching mission delayed again

Continuing concerns about the structural integrity of the Boeing Delta 2 rocket's second stage that will launch NASA's twin STEREO solar observatories have again delayed liftoff from Cape Canaveral. Problems with a similar stage in the factory led engineers to re-check the motor for STEREO, pushing back the launch to Aug. 31. Now, launch is being delayed to no sooner than Sept. 18. Although STEREO's rocket has passed its testing, further analysis is underway to ensure the internal tank structures are the proper thickness. Web posted. (2006). [Launch of Sun-watching mission delayed again [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, August 23].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: Aug. 27, 2006, 4:30 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, closeout of the orbiter's aft compartments continues, with aft door installation expected later today. Once the doors are installed, workers will begin aft confidence testing. This involves powering up and testing all of the aft systems, such as the main propulsion system circuits. Pressurization of the orbiter's maneuvering system, the reaction control system and the main propulsion system has been completed. Stowage of flight crew equipment in the crew module is ongoing, and the crew cabin and White Room are being prepared for launch. Technicians will open the payload bay doors today to allow for the charging of the payload batteries. The payload bay doors will be closed

for flight on Thursday. Final closeouts on the solid rocket boosters and the external fuel tank will be completed today. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-082306** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 23].]

August 24: Atlantis astronauts arrive at KSC

The Atlantis astronauts are arriving at KSC ahead of Sunday's scheduled launch. The first of a string of T-38 training jets carrying the crew members touched down at just before 11:30 a.m. Commander Brent Jett and his five crewmates will now start the final preparation for a launch set for 4:30 p.m. Sunday. Also, NASA has decided to start the countdown six hours earlier than scheduled today. They had planned to start the clock at 6 p.m. Instead, the launch team is being called to their stations right now. NASA's George Diller says the countdown will start at noon. So far, everything is on track for a Sunday liftoff. There are no major technical concerns. The weather forecast for a Sunday launch looks good, with a 70 percent chance that conditions would allow an on-time liftoff. Web posted. (2006). [Atlantis astronauts arrive at KSC [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 24].]

Kohler to lead Space Florida

Gov. Jeb Bush has chosen Steve Kohler as president of Space Florida, a new state agency that is designed to lead Florida's efforts to maintain and attract the aerospace industry to the Sunshine State, officials said Wednesday. Kohler, president and chief executive officer of Pennsylvania-based Winner Global Defense LLC, a maker of security and anti-terrorism equipment, was one of three finalists for the job. Joseph Wiendl, a member of Space Florida's board of directors and part of the search committee that chose the finalists, said the governor's office informed him of Bush's selection of Kohler. pace Florida is scheduled to go into operation Sept. 1 and likely will be based in Brevard County near or at Kennedy Space Center, Wiendl said. Web posted. (2006). [Kohler to lead Space Florida [Online]. Available WWW: http://www.floridatoday.com/ [2006, August 24].]

Pluto gets the boot

Leading astronomers declared Thursday that Pluto is no longer a planet under historic new guidelines that downsize the solar system from nine planets to eight. After a tumultuous week of clashing over the essence of the cosmos, the International Astronomical Union stripped Pluto of the planetary status it has held since its discovery in 1930. The new definition of what is -- and isn't -- a planet fills a centuries-old black hole for scientists who have labored since Copernicus without one. The decision by the prestigious international group spells out the basic tests that celestial objects will have to meet before they can be considered for admission to the elite cosmic club. For now, membership will be restricted to the eight "classical" planets in the solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Web posted. (2006). [Pluto gets the boot [Online]. Available WWW: http://www.cnn.com/ [2006, August 24].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: Aug. 27, 2006, 4:30 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, closeout of the orbiter's aft compartments is complete and the aft doors have been installed. Technicians have finished performing the aft confidence test, which involves powering up and testing all of the aft systems, such as the main propulsion system circuits. The payload bay doors will be closed today for flight. The start of the launch countdown was moved from 6 p.m. to noon Eastern time today to allow for earlier loading of fuel for the power reactant storage and distribution system. The goal is to finish the system loads before the predicted afternoon thunderstorms on Friday. Additional hold time will be added at the T-19 hour mark, extending the hold from four hours to 10 hours. After T-19, the schedule will proceed as normal, culminating in a launch on Sunday at 4:30 p.m. Eastern time. The STS-115 crew arrived at 11:30 a.m. today at the Shuttle Landing Facility from Johnson Space Center in Houston. They will spend the next days prior to launch going over their flight plans. U.S. Air Force weather officers are forecasting a 30-percent chance of weather prohibiting a launch attempt on Sunday. The primary weather concerns are anvil clouds, showers and thunderstorms within 20 nautical miles of the Shuttle Landing Facility. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-082406** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 24].]

August 25: Countdown starts early for Aug. 27 shuttle launch

The Kennedy Space Center countdown for the planned launch of Atlantis began 6 hours early on Aug. 24 to provide an extra margin for the loading of electrical fuel cell cryogenics as thunderstorms were a threat at the launch site. The liftoff of STS-115 is planned for 4:30 p.m. Eastern time Aug. 27 to reinitiate assembly of the International Space Station with a $372 million, 7.5- ton solar array truss. The countdown had been planned to start at 6 p.m. Eastern time Aug. 24, but was moved up to noon to provide several extra hours in which liquid oxygen and liquid hydrogen could be loaded into the Atlantis electrical fuel cell system. The cryogenics cannot be loaded when lightning is present in the area. Although thunderstorms are a risk to prelaunch timing, forecasters expect a 70 percent chance of good weather for at least the first three days of the 12- day Atlantis launch window. But a tropical system brewing in the Caribbean could be a factor if weather or technical factors slip liftoff into early next week. The system, threatening to reach tropical storm or hurricane status, has the potential of curving northeast, which could bring it near Kennedy Space Center. Conversely, if it takes a more western track, it could threaten the Gulf Coast area including Mission Control at the Johnson Space Center. The overall launch window extends only through Sept. 7. The window was shortened from Sept. 13 a month ago to coordinate the Atlantis flight with the launch of the Expedition 14 crew to the station on a Soyuz in early September. Atlantis and its payload are in excellent shape, with no technical issues being worked, so managers believe there is a very good chance to launch early in the 12-day window. Earlier questions about the integrity of bolts holding the orbiter's Ku band antenna were resolved when two suspect bolts were replaced in a difficult repair operation with Atlantis vertical on Launch Complex 39B. Given launch team rest and fuel cell

cryogenic replenishment factors, there could be a maximum of seven countdowns during the 12-day period. This includes the potential for four attempts during the first five days. Under that scenario there could be launch attempts on Aug. 27 and 28, with an off day Aug. 29, then attempts again Aug. 30 and 31 if necessary. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Countdown starts early for Aug. 27 shuttle launch," [Electronic]. Vol. 219, No. 38, [August 25, 2006.].]

Air Force and FAA collaborate on launch safety requirements

Air Force and Federal Aviation Administration officials strengthened their long history of cooperation and partnership in the commercial space launch safety arena today with the publication of the FAA's Licensing and Safety Requirements for Launch document, Code of Federal Regulations Title 14 Part 417. The FAA has worked with Air Force Space Command since 1997 to develop and improve standardized launch safety requirements, with an emphasis on continuing the legacy of experience and knowledge developed over the decades by Air Force safety personnel. These federal guidelines will ensure common safety standards for federal and non-federal launch sites, and will reduce costs, improve efficiency and ensure public safety during space launches. These launch safety requirements are the first such set of guidelines for non-federal launch sites, and were intended to codify and maintain safety measures that have been used by the Department of Defense and NASA for years. Air Force Space Command, based at Peterson Air Force Base, Colo., manages space launch activities at Cape Canaveral Air Force Station, Fla., and Vandenberg AFB, Calif. In the 53 years that the Air Force has had oversight of public safety for space launch activities, there have been no injuries to the public resulting from launch operations. Web posted. (2006). [Air Force and FAA collaborate on launch safety requirements [Online]. Available WWW: http://www.af.mil/news/ [2006, August 25].]

NASA working around stormy weather at the Cape

A lightning bolt struck near the space shuttle Atlantis today as powerful thunderstorms rolled across the Kennedy Space Center, but the launch pad lightning protection system shielded the orbiter and officials said the countdown was on track for a Sunday launch try, weather permitting. Forecasters are continuing to predict a 40 percent chance of afternoon storms that could block the planned 4:30 p.m. launch, but the outlook improves to 80 percent "go" Monday and Tuesday. NASA's launch strategy supports four attempts in five days and LeRoy Cain, director of shuttle integration at the Florida spaceport, told reporters "we feel very good about where we are going into the weekend." NASA started Atlantis' countdown six hours early Thursday, knowing storms today could interrupt work to load liquid hydrogen and oxygen to power the ship's electricity producing fuel cells. Engineers were able to load the oxygen tanks today but work to load hydrogen was delayed when the powerful afternoon storms developed. Lightning struck a thick wire that runs to either side of the launch pad as part of its lightning protection system, but launch director Mike Leinbach said telemetry from the shuttle showed no signs of any unusual electrical activity. As for fuel cell loading, Leinbach said engineers had plenty of time in a long built-in hold to make up for lost time and by tomorrow morning, the countdown was expected to be back on track. NASA and Air Force meteorologists are monitoring the development of tropical storm Ernesto in the southern Caribbean, but it

does not pose any immediate threat to Florida's space coast. If Atlantis gets delayed, however, the storm could come into play next week depending on where it is, where it's going and how strong it might be. While the Kennedy Space Center likely will be unaffected, the storm at some point could have an impact on Houston and mission control at the Johnson Space Center. Web posted. (2006). [NASA working around stormy weather at the Cape [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, August 25].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: Aug. 27, 2006, 4:30 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, final launch preparations continue. The payload bay doors were closed for flight last night, and loading of the fuel for the power reactant storage and distribution system is now under way. Weather delays interrupted the PRSD loading earlier this afternoon, but the task is expected to be completed later this evening. No impact to the remaining schedule is expected. Also, the Tyvek ring covers have been installed on the forward reaction control system thrusters. These covers protect the thrusters from inclement weather. They are designed to release from the orbiter shortly after launch, as the shuttle clears the tower. Mission managers met at KSC this afternoon to further discuss progress made and give final approval to continue with launch activities. No problems were discussed that would prevent an on-time launch on Sunday. Weather forecasters indicate the launch day probability of weather prohibiting launch is 40 percent. A Bermuda high pressure ridge located over the Florida Straits is creating a southwesterly flow over Central Florida, bringing afternoon thunderstorms for the next two days. The primary concerns on Sunday are anvil clouds, showers and thunderstorms within 20 nautical miles of the Shuttle Landing Facility. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-082506** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 25].]

August 26: Lightning delays Atlantis launch a day

The lightning bolt that hit launch pad 39B Friday was one of the most powerful on record at the Kennedy Space Center, sending some 100,000 amps of current through the lightning protection system, officials said today. While the lightning protection system worked, shielding the shuttle Atlantis from a direct hit, engineers are concerned about induced currents that showed up in a brief spike in one of the shuttle's main circuits and another in a launch pad pyrotechnic system. The spike in the shuttle electrical system was very small and within allowable limits. But no such spikes were expected, an official said, prompting engineers to question whether it might have caused any problems. At the same time, telemetry indicated a spike in the circuitry associated with a pyrotechnic device that releases a hydrogen vent arm from the side of the shuttle's external tank at liftoff. Engineers inspecting the pad later reported a burning smell in the area of the gaseous hydrogen vent arm, but no obvious signs of damage were seen. LeRoy Cain, chairman of NASA's Mission Management Team and director of shuttle integration at the Kennedy Space Center, delayed Atlantis' launch for at least 24 hours, from Sunday to

Monday at 4:04:18 p.m., to give engineers time to inspect the vent arm system and to carry out additional tests and analyses. The forecast Monday and Tuesday is 80 percent "go." The MMT will meet again at 10 a.m. Sunday to hear an update from the engineering community and to make a decision about whether to proceed to launch Monday or order an additional delay. As of this writing, it's not at all clear how that discussion might go. Video of the lightning strike at pad 39B showed a large bolt hitting the mast atop the shuttle gantry that anchors the pad's lightning protection system. The shuttle wasn't hit and other than the slight 20-millisecond spike in the shuttle electrical bus, and the concern about the hydrogen pyrotechnic device, there are no other known problems. " The goal of the 116th shuttle mission is to deliver a $372 million solar array truss segment to the international space station, a complex assembly task requiring three spacewalks to complete. The shuttle's launch window, based on a requirement to launch in daylight and to avoid conflict with a Russian Soyuz launch, runs through Sept. 7. Atlantis' fuel cell system has enough on-board liquid oxygen and hydrogen for launch attempts Monday, Tuesday and Wednesday, although NASA does not usually make three attempts in a row. Web posted. (2006). [Lightning delays Atlantis launch a day [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, August 26].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ;Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: Aug. 28, 2006, 4:04 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. The Mission Management Team decided today to postpone the launch of Shuttle Atlantis on mission STS-115 for 24 hours. Launch is now scheduled for 4:04 p.m. Eastern time on Monday, Aug. 28. On Friday, at about 1:49 p.m., a lightning strike occurred on the pad's lightning protection system. Managers determined additional time was required to be assured all systems on the shuttle and the pad were not affected. Mission managers will meet again Sunday morning to further assess launch readiness. The countdown clock is currently in an extended hold at T-11 hours. At Launch Pad 39B, launch preparations continue. Loading of the fuel for the power reactant storage and distribution system was completed Friday night, following a six-hour weather delay. Closeouts of the pad systems and final stowage of flight crew items is under way. U.S. Air Force weather officers are forecasting a 20-percent chance of weather prohibiting a launch attempt on Monday. The primary weather concern is for the probability of showers within 20 nautical miles of the Shuttle Landing Facility. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-082606** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, August 26.]

August 27: Solid rocket booster tests could be ordered

NASA's Mission Management Team decided early Sunday to continue testing and analysis to assess the possible effects of a launch pad lightning strike Friday on the shuttle Atlantis' solid-fuel booster and self-destruct systems. Monday's launch attempt remains feasible for now, sources said, but only if the community agrees time-consuming tests to verify the health of booster and range safety pyrotechnic systems are not needed. If the tests are required, launch likely would slip to mid week or later. The Mission

Management Team plans to meet again at 6 p.m. Sunday to discuss the progress of the analysis and to make a decision on how to proceed. The lightning bolt hit Friday, pumping some 100,000 amps of current through the launch pad's lightning protection system. Lightning strikes typically generate 5,000 to 20,000 amps of current and the bolt Friday is one of the strongest on record at the Kennedy Space Center. Telemetry showed a very small "spike" in one of the shuttle's electrical buses and a larger surge in the circuitry associated with a launch pad pyrotechnic device used to disconnect a hydrogen vent arm from the shuttle's external tank. Concern that induced currents could have affected other sensitive electrical systems on the pad or in the shuttle, Mission Management Team Chairman LeRoy Cain on Saturday ordered Atlantis' launch delayed for at least 24 hours, from Sunday to Monday at 4:04 p.m., to give engineers a chance to assess their systems. Later Saturday, representatives of the shuttle booster program and the range safety system raised concerns that prompted a late night meeting of the Mission Management Team. Web posted. (2006). [Solid rocket booster tests could be ordered [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, August 26 updated August 27].]

August 28: Rollback to start early Tuesday

Launch director Mike Leinbach says in an ongoing press conference that he hopes to get Atlantis rolling back from the pad as early as 8 a.m. Tuesday, instead of Tuesday afternoon. He's concerned about deteriorating conditions as the day wears on, and the trip takes several hours. If for some reason the forecast changes drastically and NASA decides at the last minute to stay on the pad, the earliest a launch could take place would be late next weekend. If they do roll back, they can't get to a launch day before the current end of the window, Sept. 7, according to Launch Integration Manager LeRoy Cain. Shuttle weather officer Kathy Winters says hurricane-force winds are expected on the Space Coast by 5 p.m. Wednesday, based on the current National Hurricane Center forecast. Web posted. (2006). [Rollback to start early Tuesday [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 28].]

Shuttle crawler complications

NASA's tentative plan to move shuttle Atlantis back to the Vehicle Assembly Building just got a little more complicated. Shuttle fleet operator United Space Alliance was moving a mobile launcher platform and a partial booster stack out of east-facing High Bay 3 of the building, but the crawler-transporter hauling it broke down. Technicians were able to get it started again, but the problem prompted NASA to move the stack back into bay 3. So if NASA ultimately decides to move Atlantis, the shuttle will be rolled into High Bay 2, which is on the southwest side of the building. The bay was converted into a shuttle hurricane shelter back in the mid-1990s. An Atlantis rollback, consequently, would take about 12 hours -- or about four hours longer than a move from pad 39B to the east-facing bay. Web posted. (2006). [Shuttle crawler complications [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 28].]

Rollback preps ordered for Atlantis

In what amounts to a "perfect storm" of high winds, high stakes and international drama, tropical storm Ernesto is now predicted to hit southern Florida as a possible category two or three hurricane early Wednesday, passing within a few miles of the Kennedy Space Center later that day. NASA managers early today ordered engineers to begin preparations for rolling shuttle Atlantis off the launch pad and back to the protection of the Vehicle Assembly Building, eliminating any chance of launching the shuttle Tuesday. While its movement over land will decrease Ernesto's strength, the current track likely will bring tropical storm-force winds to Florida's space coast by Wednesday morning and possible category one hurricane-force winds by Wednesday night. NASA managers met this morning at 7 a.m. to discuss the storm and quickly decided to begin preparations to roll Atlantis off the launch pad, a move that would take 42 hours to complete. Rollback can be called off at any point between now and Tuesday afternoon if the storm changes strength or direction. NASA's safety rules forbid moving the unprotected orbiter off the pad in winds higher than 40 knots. On Sunday, when the storm's track was well west of the space center, NASA managers expected 40-knot winds early Wednesday morning, giving them time to complete a rollback, if necessary, by Tuesday evening. NASA managers considered ordering a rollback Sunday night but deferred a decision to today believing they had time before the onset of 40-knot winds. By deferring a decision, NASA kept open the possibility of launching Atlantis Tuesday on a space station assembly mission if Ernesto's track or strength dramatically changed. That option is now closed. Atlantis' launch window closes Sept. 7, based on a desire to launch in daylight for photo documentation of the shuttle's heat shield and external tank and because of conflict with launch of a Russian Soyuz rocket carrying the space station's next crew. While the shuttle can launch as late as Sept. 13 from a lighting standpoint, any launch past Sept. 7 would force the Russians to delay the Soyuz launch and, more important, delay the return to Earth of the station's outgoing crew. A shuttle launch on Sept. 7 would result in a pre-dawn landing for the returning Soyuz. Every day past Sept. 7 would move the landing earlier in the day and Russian managers want to avoid a dead-of-night touchdown because the recovery team will be conducting its first operation under new civilian management. A rollback likely would use up NASA's available launch window, barring a concession form the Russians to delay the Soyuz launch. Even if Ernesto passes without causing major damage, it would take NASA at least eight days to ready the ship for flight after rolling back out to pad 39B. Web posted. (2006). [Rollback preps ordered for Atlantis [Online]. Available WWW: http://www.spaceflightnow.com/ *The Flame Trench* [2006, August 28].]

August 29: Kennedy Space Center Closes For Tropical Storm Ernesto

As a result of Tropical Storm Ernesto approaching Central Florida, Kennedy Space Center will close at midnight tonight. All non-essential KSC employees are being asked not to report to work on Wednesday, Aug. 30. Based on current conditions, the center is expected to reopen Thursday, Aug. 31, or as soon as the "all clear" is given. A ride-out crew has been designated and will remain at KSC in critical facilities during the storm. If HURCON I (hurricane condition with 58 mph sustained winds within 12 hours) is declared, the ride-out crew will report to their appointed stations until the "all clear" is given. ["Kennedy Space Center Closes For Tropical Storm Ernesto," **NASA News Release #56-06**, August 29, 2006.]

NASA errs on side of caution

Shuttle Atlantis is headed back to its assembly building after a decision to avoid any chance that Tropical Storm Ernesto might spawn hurricane-force winds as it passes near Kennedy Space Center on Wednesday. The move began at 10:06 a.m. and is expected to take about 10 hours to complete. It was a tough call for NASA officials. The move could delay the resumption of International Space Station assembly until late October. But when it came down to it, NASA decided it made more sense to haul the shuttle out of harm's way than risk damage to the $2 billion spaceship at the launch pad. "There was a sense that there was a lot at stake either way," said KSC spokesman Bruce Buckingham. "But we are always cautious when it comes to the health of the shuttle, the safety of the vehicle. We do not take unnecessary risks." The launch pad is designed to withstand winds up to 125 mph. NASA safety rules call for a rollback if peak winds are expected to top 79 mph. And while winds from Ernesto are expected to be well below that threshhold, managers were concerned that flying debris could damage the shuttle at the pad. The pad is equipped with a robust weather protection system, but the shuttle's external tank nonetheless is exposed on the pad. Web posted. (2006). [NASA errs on side of caution [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 29].]

August 30: KSC Visitor Complex closed Wednesday

The Kennedy Space Center Visitor Complex is closed today and Wednesday because of Tropical Storm Ernesto. The visitor complex is closing today to prepare for severe winds that could damage. Tentatively, the visitor complex could reopen as early as Thursday. A decision will not be made until the storm is through the Space Coast. Workers are placing sandbags and moving outdoor equipment indoors, as well as securing and protecting space items that can't be moved inside. Unless they are part of the close-out team for the visitor complex, workers are asked not to come to the visitor complex today or tomorrow. Workers can call a hotline at 449-0969 for updates on work schedules and other issues related to the storm. Web posted. (2006). [KSC Visitor Complex closed Wednesday [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, August 30].]

August 31: NASA aims for Wednesday launch

After a week of weather delays, NASA officials on Thursday set a Wednesday launch time for space shuttle Atlantis on its mission to resume construction of the international space station. The launch decision was made after a check of Kennedy Space Center following Ernesto's pass as a tropical depression on Wednesday found no serious damage. "We're back," said NASA spokesman Bill Johnson. "There was no water intrusion in any operational areas, and so basically we came through this one unscathed." The launch time was set for 12:29 p.m. EDT on Wednesday. If the shuttle doesn't lift off then, NASA has launch opportunities in the following two days. Atlantis' six astronauts, who flew in their training jets back to Houston earlier this week, planned to return to Florida Saturday morning. The countdown was set to begin Sunday morning. Tropical Storm Ernesto's approach and a lightning strike on the launch pad last week had forced

NASA to delay the launch. Web posted. (2006). [NASA aims for Wednesday launch [Online]. Available WWW: http://www.cnn.com/ [2006, August 31].]

Kennedy Space Center Reopens After the Passage of Ernesto

The Kennedy Space Center returned to normal operations today with the passage of Tropical Storm Ernesto late Wednesday. There is no apparent damage to Space Shuttle Atlantis at Pad 39-B or to the Delta II rocket for the STEREO mission at Pad 17-B. Inspections are continuing today. No damage to facilities on Kennedy Space Center or Cape Canaveral Air Force Station has been found. The peak wind at Pad 39-B was 44 mph, and the total rainfall for the storm was 4.16 inches. At the top of the 500-foot weather tower located north of the Vehicle Assembly Building, a peak wind of 56 mph was measured. Launch of Space Shuttle Atlantis is targeted for no earlier than Wednesday, Sept. 6. ["Kennedy Space Center Reopens After The Passage of Ernesto," **NASA News Release #57-06**, August 31, 2006.]

Lockheed Wins Contract to Build NASA's New Spaceship

Lockheed Martin Corp. won a multibillion-dollar contract yesterday to build a vehicle to replace NASA's space shuttles, put a human on the moon for the first time since 1972 and be the precursor to a manned spaceship to Mars. The award marks NASA's most concrete step to fulfill President Bush's two-year-old, $230 billion promise that the space agency would return astronauts to the moon and restore excitement about space exploration. NASA has planned to replace the shuttles since the mid-1980s and has spent almost $5 billion to do so -- with little success so far. "It's just thrilling, for all of us," said Skip Hatfield, NASA's project manager. The vehicle, known as Orion, is the embodiment of the "very future of human space flight," he said. Orion will look somewhat like the three-man Apollo command module but will carry as many as six astronauts. Like the shuttle, Orion will be able to carry cargo to and from the International Space Station. Orion is expected to make its first manned flight by 2014, four years after NASA's three operating shuttles are retired. NASA said it hopes for a moon landing by 2020. Unlike the shuttle, which lands like an airplane on a runway, Orion will descend with the aid of a parachute to landings in the ocean or on land. NASA plans to build two of the vehicles, one for manned flight and the other for unmanned. After judging how often the spaceships can be reused, the agency will decide how many more to buy, Hatfield said. Web posted. (2006). [Lockheed Wins Contract to Build NASA's New Spaceship [Online]. Available WWW: http://www.washingtonpost.com/ [2006, August 31].]

SEPTEMBER 2006

September 1: Layoffs Hit Kennedy Space Center

Central Florida News13 reported that in a cost cutting move, one of NASA's contractors will be laying off workers at the Space Center. This move comes just days before another scheduled launch of the Space Shuttle Atlantis. 75 NASA contractors will lose their jobs. They work for SGS, a contractor that keeps the infrastructure of the space center running. The contractor fought to keep some jobs, but now have to tell those 75 employees, they'll no longer have a job at the space center. The laid off employees include engineering support and environmental services workers along with space center police and firefighters who would support rescues if a space shuttle had a launch accident. The company says it can still do its job. NASA and the Air Force originally told SGS to lay off 115. The company fought till that number dropped to 75. However, there are more layoffs to come. NASA points out that the space shuttle's replacement will not require as many workers. Web posted. (2006). [Layoffs Hit Kennedy Space Center [Online]. Available WWW: http://www.cfnews13.com/ [2006, September 1].]

Top employers in Brevard County

The top seven as identified by the Economic Development Commission of Florida's Space Coast.* United Space Alliance (Lockheed Martin/Boeing partnership) 6,500
* Harris Corp. 6,500
* Health First 6,100
* Space Gateway Support 3,000
* Wuesthoff Health System 2,500
* Northrop Grumman 2,000
* The Boeing Co. 1,800

Number 12: * Lockheed Martin Space Systems Co. 975
Web posted. (2006). [Top employers in Brevard County [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 1].]

Shuttle weathers storm

NASA reopened Kennedy Space Center Thursday and resumed preparations for Wednesday's planned launch of Atlantis after the spaceport and the shuttle came through Ernesto unscathed. "We're in great shape," said KSC spokeswoman Tracy Young. Added center spokesman Bruce Buckingham, "We didn't even have to send out our damage assessment team." Ernesto had weakened considerably by the time it swept through central Florida on Wednesday evening. There was no apparent damage to Atlantis or its $372 million payload, a new truss segment for the International Space Station. The peak wind at launch pad 39B, where the shuttle is being readied for flight, was 44 mph. The total amount of rainfall recorded was 4.16 inches. A 56-mph gust was measured by instrumentation at the top of a 500-foot weather tower north of the Vehicle Assembly Building. The winds turned out to be "far less than we had anticipated," Buckingham said. No damage was done to two Boeing Delta 2 rockets being readied for launch at nearby Cape Canaveral Air Force Station either. The storm passed through the area more quickly than NASA had anticipated, enabling the agency to reopen KSC and launch pad 39B by first shift Thursday. Technicians verified mechanical, electrical and

other connections between the pad and the shuttle. They also began installation of small explosive devices used to separate the shuttle from its mobile launcher platform, two solid rocket boosters and external tank in flight. Today, engineers will pressurize the shuttle orbiter's main propulsion system as well as tanks that feed its twin maneuvering engines and 44 nose-and-tail steering thrusters. Web posted. (2006). [Shuttle weathers storm [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 1].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: Sept. 6, 2006, 12:29 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, preparations for Wednesday's launch are under way, with the launch countdown scheduled to begin on Sunday at 8 a.m. The liquid oxygen and liquid hydrogen transfer lines used for filling the external fuel tank (ET) were reconnected to the mobile launch platform. The ET hydrogen vent line hook-up is complete. The ordnance was disconnected to allow for vehicle power-up and will be reconnected this weekend. The Orbiter Midbody Umbilical Unit (OMBUU) mate is complete. This is the connection point for lines that will be used to provide hydrogen and oxygen reactants for the fuel cells. Weekend work includes pressurization of the orbital maneuvering system, the reaction control system and the main propulsion system. The two doors to the aft compartment of Atlantis were removed for access to ordnance, and they will be closed during the weekend to allow for the aft confidence test on Sunday. This test involves powering up and testing all aft systems, such as the main propulsion system circuits. On Tuesday, the shuttle was moved off the pad in advance of Tropical Storm Ernesto, then returned to the pad after traveling about 2 miles toward the Vehicle Assembly Building when the storm predictions became more favorable. On Thursday, engineers inspected the ET thermal protection system, post-rollback, and found three areas of minor foam damage. One area, about 3/8 inches long, is located at the midsection of the liquid oxygen tank, about 2 feet outboard of the ice frost ramps. A second area, about 1 inch long by 1/16 inch wide, is located near the ET/right SRB aft fairing, which is the attach point between the two components. Both of these resemble a scratch, are accessible and are expected to be easily repaired. The third area, a missing foam nodule from the liquid hydrogen barrel between the ET and the left SRB, about five feet below the intertank flange closeouts, will not need repair. Mission: STS-116 - 20th International Space Station Flight (12A.1) - P5 Truss Segment ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than Dec. 14, 2006 ; Launch Pad: 39B ; Crew: Polansky, Oefelein, Curbeam, Higginbotham, Patrick, Fuglesang and Williams ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Processing of Discovery for its next mission, STS-116, continues in Orbiter Processing Facility bay 3. Work was interrupted this week by the arrival of Tropical Storm Ernesto, but the vehicle is now configured for normal operations, and system testing on the main propulsion system continues. Preparations for removal and replacement of auxiliary power unit No. 3 are in work. The brake anti-skid and nose wheel steering testing is in work. Final closeouts are under way to complete installation of the orbiter's drag chute. This weekend the orbiter's thermal protection system will be waterproofed. Endeavour (OV-105);

Powered-up system testing continues on Endeavour in Orbiter Processing Facility bay 2 following an extensive modification period. Work was interrupted this week by the arrival of Tropical Storm Ernesto, but the orbiter is now configured for normal work and technicians are performing electrical tests on the remote manipulator system (shuttle arm) pedestal wire harnesses. Rigging of the orbiter boom sensor system pedestals is under way. Workers continue to remove and replace gap fillers in the high priority areas of the orbiter's underside. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-090106** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, September 1].]

Expendable Launch Vehicle Status Report

Mission: STEREO (Solar Terrestrial Relations Observatory) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: No earlier than Oct. 18, 2006 ; Launch Time: TBD. A decision was made to remove the STEREO second stage from the launch vehicle and perform inspection from inside the propellant tank to verify it is structurally sound for flight. The launch of STEREO is now targeted for no earlier than Oct. 18. An electrical checkout of the vehicle is under way due to lightning strikes within a one-third mile radius of Complex 17 during the passing of Tropical Storm Ernesto. The STEREO observatories remain at the Astrotech Space Operations Facility. Today technicians removed the transportation canister from around the payload to begin the process of reconditioning the batteries and preparing for the storage period (currently about 30 days). The twin spacecraft will remain in storage until the necessary course of action for the Delta II can be more clearly defined. There was no effect on the STEREO spacecraft from Tropical Storm Ernesto. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-090106** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, September 1].]

Launch Countdown Begins Sept. 4 for Atlantis

NASA will begin the countdown once again for the launch of Space Shuttle Atlantis on mission STS-115 Sept. 3 at 8 a.m. EDT, at the T-43 hour point. During this mission, Atlantis' crew will resume the construction of the International Space Station, which is the goal of the space shuttle flights remaining in the program. The Kennedy Space Center launch team will conduct the countdown from the newly renovated Firing Room 4 of the Launch Control Center. The countdown includes 33 hours, 24 minutes of built-in hold time leading to a preferred launch time at about 12:29 p.m. on Sept. 6 with a launch window extending about five minutes. This mission is the 116th space shuttle flight, the 27th flight for orbiter Atlantis, and the 19th U.S. flight to the International Space Station. STS-115 is scheduled to last 11 days with a planned KSC landing at about 8:03 a.m. EDT on Sept. 17. Atlantis rolled into Kennedy's Orbiter Processing Facility on Oct. 18, 2002, after returning from its last mission, STS-112. Its next mission was planned to be STS-114; however, during the program delays following the loss of orbiter Columbia, Atlantis was reassigned to mission STS-115. The orbiter rolled out of the facility's bay 1 and into the Vehicle Assembly Building on July 24, 2006. While in the building's high bay 3, Atlantis was mated to its modified external tank and solid rocket boosters. The entire space shuttle stack was transferred to Launch Pad 39B on Aug. 2. A lightning strike at the pad Aug. 25 caused the launch to slip from Aug. 27. As assessments of the strike's

impact were conducted, Tropical Storm Ernesto threatened the Space Coast. Atlantis was rolled half way back to the Vehicle Assembly Building on Aug. 29 for protection from the storm, but returned to the pad again on the same day after shuttle managers received a more favorable weather forecast. The STS-115 crew includes Commander Brent Jett, Pilot Chris Ferguson, and Mission Specialists Joe Tanner, Dan Burbank, Heidemarie Stefanyshyn-Piper and Steve MacLean of the Canadian Space Agency. During mission STS-115, Atlantis will dock with the station and the crew will perform three spacewalks. The astronauts will deliver and install the 17.5 ton, bus-sized P3/P4 integrated truss segment to the station's girder-like truss backbone. The new piece will include a second set of giant solar arrays, batteries and associated electronics. Together, the trusses and solar arrays will provide one-fourth of the total power-generation capability of the completed station. ["Launch Countdown Begins Sept. 3 for Space Shuttle Atlantis," **NASA News Release #59-06**, September 1, 2006.]

NASA Requests Proposals for Exploration Park Developer

NASA today issued a formal Request for Proposal (RFP) for the selection of a master developer for a 320-acre technology and commerce park at Kennedy Space Center. The RFP seeks offers from qualified firms interested in leading the development and long-term operation of Exploration Park, which NASA as established to enable and grow private sector participation in space exploration, support commercial space transportation and promote commercial development of technologies for application in space and on earth. NASA plans to negotiate a 50-year lease and development agreement, which could extend for up to 99 years, with the selected master developer. NASA has also invited prospective tenants that desire occupancy in the initial phase of the park to formally express their interest to the agency. ["NASA Requests Proposals for Exploration Park Developer," **NASA News Release #58-06,** September 1, 2006.]

September 2: After Storm Evacuation, Shuttle Crew Returns to Florida

Four days after evacuating the Kennedy Space Center as Tropical Storm Ernesto approached, the six crew members of the space shuttle Atlantis flew back to Florida on Saturday to prepare for a launching on Wednesday. When the crew left in training jets last Tuesday for a trip to Houston, they watched from the air as the space shuttle crawled off the launching pad on a journey to an assembly building for shelter, said Capt. Brent W. Jett Jr., the shuttle commander. Midway through the shuttle's four-mile journey, managers with the National Aeronautics and Space Administration decided to return it to the launching pad once the storm's intensity had been downgraded. The decision gave NASA an opportunity to launch on Wednesday, rather than several weeks later. "I think all of us thought we were going to be spending a little while in Houston," Captain Jett said Saturday after returning to the Kennedy Space Center. "I think we're all really happy that just four days later we're back here and we have a shot at this launch window." By the time the storm reached the Kennedy Space Center on Wednesday night, it had been downgraded to a tropical depression, and peak gusts at the launching pad were at 44 miles an hour, well below the 79 m.p.h. threshold that requires the shuttle to be moved indoors. Engineers inspecting the Atlantis the next day found three areas of minor foam damage on its external fuel tank: a three-eighths-inch cut in the middle of the liquid oxygen tank, a one-inch scratch near where the tank connects to the solid rocket boosters,

and a missing lump of foam from the liquid hydrogen barrel. The first two scratches were expected to be repaired easily, and the missing foam will not need to be replaced, NASA officials said. Web posted. (2006). [After Storm Evacuation, Shuttle Crew Returns to Florida [Online]. Available WWW: http://www.nytimes.com/ [2006, September 2].]

September 4: NASA IG examines KSC problem tracking

NASA's Inspector General has issued a report saying that the agency could improve the way it tracks problems with the shuttle fleet at Kennedy Space Center. NASA employs a so-called Problem Reporting and Corrective Action (PRACA) system to track problems and their root causes, document corrective actions and provide a database the agency can use to prevent recurrence. The agency's Office of Inspector General audited the system and said that it included inaccurate and incomplete data, and that KSC should put in place a means to improve the system. The IG is not the first time find fault with the system. The Columbia Accident Investigation Board found that the system did not enable NASA to adequately track a long history of the type of external tank foam shedding that led to the 2003 loss of Columbia and its seven astronauts. A separate board that investigated wiring problems that led to a five-month grounding of the shuttle fleet in 1999 expressed similar concerns. NASA shuttle program manager Wayne Hale said the system is considered "extremely important" to the agency and that a team of technical experts is coming up with a plan to address the recommendations made by the IG. Web posted. (2006). [NASA IG examines KSC problem tracking [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 4.]

NASA: Three consecutive attempts possible

NASA is planning to make three consecutive launch attempts, if necessary, to get shuttle Atlantis off the ground so the agency can resume construction of the International Space Station after a near-four-year hiatus. The strategy is a bit unusual. NASA has only made three consecutive launch attempts once before: on STS-101 back in late April 2000. The agency generally will make two attempts and then stand down a day to rest its launch team. The move in 2000 was unprecedented, and unsuccessful. Stiff crosswinds at the KSC Shuttle Landing Facility forced NASA to scrub two initial attempts on April 24 and April 25. The third on April 26 was postponed due to bad weather at emergency landing sites overseas, which was a bit of a rarity itself. It was only the fifth time in 19 years of shuttle operations up to that point that overseas weather had forced a shuttle scrub. The STS-101 flight fell back behind a string of previously planned missions that included four unmanned rocket missions and a classified fleet ballistic missile test. Atlantis and a crew of seven finally launched on May 19, 2000. The weather for the upcoming Atlantis launch, however, still is looking good. Meteorologists say there is an 80 percent chance conditions will be acceptable for flight at liftoff time: 12:29 p.m. Wednesday. On Thursday and Friday, the forecast calls for a 70 percent chance that the weather will be good enough to go. Web posted. (2006). [NASA: Three consecutive attempts possible [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 4.]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: Sept. 6, 2006, 12:29 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, preparations for Wednesday's launch are under way. The launch countdown began on Sunday at 8 a.m. The pressurization of the orbital maneuvering system, the reaction control system and the main propulsion system is complete. The aft confidence test is complete. This test involves power-up and testing of all aft systems, such as the main propulsion system circuits. The power reactant storage and distribution system fuel loading is complete. Weather officials are predicting favorable conditions for Wednesday's launch attempt, with a 20 percent chance of weather prohibiting the launch. Dryer conditions are expected to arrive on Wednesday, and the early launch time should avoid the afternoon thunderstorms. The primary concerns for launch are cumulus clouds within 10 nautical miles of the launch pad, and isolated showers within 20 nautical miles of the Shuttle Landing Facility. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-090406** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, September 4].]

September 5: Shuttle weather forecast worsens

NASA is marching through the final full day of a shuttle launch countdown at Kennedy Space Center, aiming to send Atlantis and six astronauts aloft Wednesday on a mission to resume construction of the half-built International Space Station. But meteorologists now expect an increase in moisture in the atmosphere, and they say there is only a 70 percent chance that conditions will be acceptable for launch -- down from 80 percent. Liftoff remains scheduled for 12:29 p.m. Wednesday, and NASA still plans to begin loading the shuttle's 15-story external tank with a half-million gallons of liquid hydrogen and liquid oxygen around 2:30 a.m. that today. Engineers earlier today finished filling the 290-foot-tall sound suppression system water tank at launch pad 39B, where Atlantis is being readied for launch. The system dumps 300,000 gallons of water on the pad surface prior to liftoff to dampen the acoustical wave that accompanies ignition of the shuttle's solid rocket boosters and main engines, avoiding a potential damage to the orbiter and its payload. Final close-out work on the mobile launcher platform and a checkout of the shuttle's star tracker navigation devices began just before 6 a.m. Later today engineers and technicians will activate the orbiter's communications systems, install film in cameras around the launch pad and stow flight crew equipment in the shuttle's crew cabin. The Rotating Service Structure is to be moved away from the shuttle around 3 p.m., and the this evening, the orbiter's three power-producing fuel cells will be activated and the blast danger zone surrounding the pad will be cleared of all non-essential personnel. Web posted. (2006). [Shuttle weather forecast worsens [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 5].]

Air Force Jets Ready To Protect Shuttle From Terrorism

The Air Force is stepping up its counter-terrorism flights over Central Florida in advance of Wednesday's shuttle launch. Air Force F-15s and F-16s fighter planes will be in the air Tuesday night and on Wednesday to protect the astronauts. NASA's biggest fear is a small airplane flying in off the ocean and slamming into a space shuttle full of rocket

fuel. The only way to stop such an attack is to have fighter planes in the air, ready to shoot at anything that gets too close. Air Force officers said they've received no specific additional threats against the shuttle, but they are raising the profile and increasing the frequency of these patrols. Air Force jets can fly more than twice the speed of sound. That's fast enough to easily outrace a small plane that might be headed for a collision with the shuttle on the pad. The Air Force is also restricting all civilian flights in and out of local airports. Local pilots have been sternly warned to stay out of the shuttle's air space. The Air Force pilots get one of the most amazing views available of the shuttle launch. It's one that's tempting for small plane owners, too. The fighter jets will restrict the airspace up to 40 miles from the launch pad. That will affect noncommercial flights out of Orlando International Airport, along with local airports in Melbourne, Titusville and New Smyrna Beach. Web posted. (2006). [Air Force Jets Ready To Protect Shuttle From Terrorism [Online]. Available WWW: http://www.wesh.com/ [2006, September 5].]

Danger is the only constant

NASA intends to jump-start the most complex engineering project in human history Wednesday, launching six astronauts on the first International Space Station assembly mission since the 2003 Columbia accident. Set to blast off from Kennedy Space Center at 12:29 p.m., the flight aboard Atlantis will be the first of 15 required to finish the half-built station and retire the shuttle fleet before a 2010 deadline established by President Bush. Five massive truss segments, three sets of power-producing solar arrays, science laboratories from Europe and Japan and other components still must be erected amid an intricate assembly sequence that leaves little margin for error. "The assembly of (the station) has been described as one of the most difficult tasks ever attempted by humans, and I'm here to tell you that it seems like it's going to be that hard," said Mike Suffredini, who manages the construction project for NASA. "These are extremely intense, extremely tightly choreographed missions -- probably more so than any we have done in the past," added Phil Engelauf, NASA's chief of mission operations. Circling 213 miles above Earth, the 200-ton station and three tenants will be passing high over the Pacific Ocean south of Tasmania at launch time Wednesday. The Russian side of the outpost features a command-and-control center that doubles as crew quarters, a space tug that also serves as a storage unit, and a barrel-shaped airlock. Each is equipped with a docking port, and a telescoping construction boom is fixed to the outside of the airlock. The U.S. Unity module serves as a bridge to the American section of the station. It leads to the U.S. Destiny science laboratory, an attached shuttle docking port, and the U.S. Quest airlock. There's also a Canadian-built construction crane that can be moved from the hull of the lab to a rail cart that runs between work sites along the station's American-made central truss. Now the size of a small three-bedroom house, the station was raised during a series of 18 shuttle and Russian rocket missions and 69 spacewalking excursions outside the outpost. Over the next four years, the station is expected to double in size and mass, ultimately weighing about 925,000 pounds. By 2009, the outpost will be equipped to house crews of six people -- twice as many as today. And it will operate in orbit until at least 2017, the year before NASA hopes to send astronauts back to the moon. Getting the job done before the presidential deadline will not be easy. Web posted. (2006).

[Danger is the only constant [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 5].]

NASA: Falcons might chase off vultures

As part of an ongoing bid to prevent deadly bird strikes during shuttle launches, NASA is negotiating with falconers that could bring trained raptors to Kennedy Space Center to scare off troublesome vultures. The potential hazard was pointed up when a vulture slammed into the shuttle Discovery's external tank shortly after liftoff of NASA's first post-Columbia test flight in July 2005. No damage was done, but the bird strike prompted NASA to form an "avian abatement team" to develop means to reduce the threat to shuttles in flight. That effort resulted in NASA's "Road Kill Round-Up," a program aimed reducing the vulture population at KSC by quickly gathering carrion, and thus, eliminating a prime food source for the scavengers. Thousands of pounds of road kill has been collected in the past six months. In addition, NASA now uses radar to survey the launch pad area for flocks before clearing a shuttle for liftoff. Hiring a falconer to bring young, trained raptors onto the center is the latest idea being investigated by the agency, NASA Launch Director Mike Leinbach said today. Falcons typically claim an area as their territory and chase away other birds of prey like hawks and vultures. Web posted. (2006). [NASA: Falcons might chase off vultures [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 5].]

NASA look to move Hubble mission to 2007

NASA is evaluating the possibility of moving the final Hubble Space Telescope servicing mission from April 2008, to December 2007 - following a request to the Shuttle Program from the group in charge of the telescope. STS-125, currently manifested to launch with Shuttle Discovery, will receive final authorization next month, with plans for a unique LON (Launch On Need) rescue mission also in works. The flagship mission for the final run of launches prior to Shuttle retirement, HSM-04 will be the final life extending mission to the telescope. The last Hubble Space Telescope servicing mission took place on STS-109, with one of the most spectacular launches ever witnessed at the Kennedy Space Center, as Columbia's dawn launch pierced through low clouds, lighting up the State of Florida in the process. Such changes would see the Hubble mission sandwiching the two JAXA (Japanese Space Agency) missions, currently flight 7: December 6, 2007 - STS-123 - 1J/A - Endeavour - JEM ELM-PS, SLP-D1 with SPDM Dextre - and flight: 8: February 7, 2008 - STS-124 - 1J - Atlantis - JEM PM, JEM RMS. 'Hubble Space Telescope (HST): Hubble Servicing Mission is currently slotted for around April 2008, HST project would like to go in December 2007,' noted a NASA update on the current STS manifest. 'Japanese flights (1J/A & 1J) would stay were they are manifested, the HST mission would be between 1J/A and 1J. Space Shuttle Program (SSP) is looking at other options. Decision expected by end of October.' Other notable changes on the latest manifest include: STS-116 has a new flight

Below is the current STS launch manifest (updated).

1 - September 6, 2006 - STS-115 - 12A - Atlantis ? P3/P4

(November 11, 2006 - STS-301 - LON for STS-115 - Discovery)

2 - December 14, 2006 - STS-116 - 12A.1 - Discovery - P5, Spacehab-SM, ICC

(February 9, 2007 - STS-317 - LON for STS-116 - Atlantis)
3 - February 22, 2007 - STS-117 - 13A - Atlantis - S3/S4
(May 8, 2007 - STS-318 - LON for STS-117 - Endeavour)
4 - June 11, 2007 - STS-118 - 13A.1 - Endeavour - S5, Spacehab-SM, ESP3
(July 26, 2007 - STS-320 - LON for STS-118 - Atlantis)
5 - August 9, 2007 - STS-120 - 10A - Atlantis - Node 2, PDGF
(September 28, 2007 - STS-322 - LON for STS-120 - Discovery)
6 - October 17, 2007 - STS-122 - 1E - Discovery - Columbus, ICC-Lite
7 - December 6, 2007 - STS-123 - 1J/A - Endeavour - JEM ELM-PS, SLP-D1
with SPDM Dextre
8 - February 7, 2008 - STS-124 - 1J - Atlantis - JEM PM, JEM RMS
9 – April 17, 2008 - STS-125 - HST SM-04 - Discovery
10 - June 19, 2008 - STS-119 - 15A - Endeavour - S6
11 - August 21, 2008 – STS-126 - ULF2 - Atlantis - MPLM Leonardo
(last flight of OV-104)
12 - October 30, 2008 - STS-127 - 2J/A - Discovery - JEM EF, JEM ELM-ES, SLP-D2
13 - January 22, 2009 - STS-128 - 17A - Endeavour - MPLM Donatello, LMC
14 - April 30, 2009 - STS-129 - ULF3 - Discovery - ELC1, ELC2 (last flight of OV-103)
15 - July 16, 2009 - STS-130 - 19A - Endeavour - MPLM Donatello, LMC
(October 22, 2009 - STS-131 - ULF4/CLF - Discovery - ELC3, ELC4)
16 - January 21, 2010 - STS-132 - 20A - Endeavour - Node 3 with Cupola
(last flight of OV-105) (July 15, 2010 - STS-133 - ULF5/CLF –
Endeavour - ELC5, ELC1)
Web posted. (2006). [NASA look to move Hubble mission to 2007 [Online]. Available WWW: http://www.nasaspaceflight.com/ [2006, September 5].]

Space Shuttle Processing Status Report

Mission: STS-115 - 19th International Space Station Flight (12A) - P3/P4 Truss Segment and Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Launch Pad 39B ; Launch Date: Sept. 6, 2006, 12:29 p.m. EDT ; Crew: Jett, Ferguson, Tanner, Burbank, MacLean and Stefanyshyn-Piper ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. At Launch Pad 39B, preparations for Wednesday's launch are under way. The external tank camera functional test is complete. Rain covers have been installed on the reaction control system thrusters, and all engine covers have been removed for launch. Workers continue stowing flight crew items in the orbiter crew module. The orbiter communications systems have been powered up for flight. The launch pad rotating service structure, which protects the shuttle prior to launch, will be rolled away from the shuttle today. Weather officials are predicting favorable conditions for Wednesday's launch attempt, with a 30-percent chance of weather prohibiting the launch. A low-pressure area may develop over Central Florida on Wednesday, increasing the potential for moisture in the atmosphere. However, the early launch time is expected to avoid the afternoon thunderstorms. The primary concerns for launch are cumulus clouds within 10 nautical miles of the launch pad and isolated showers within 20 nautical miles of the Shuttle Landing Facility. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-090506** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, September 5].]

'Anxious anticipation' for shuttle

Launch integration manager LeRoy Cain says the shuttle team is filled with "anxious anticipation" of Wednesday's launch. "We work so hard to get to this point," he said in an ongoing briefing. "As it's been said, the first couple inches are the hardest part of the whole flight." The mission management team met this morning and found no issues standing in the way of launch. They put to rest discussion of an unusual haz-gas reading at the launch pad - a slight indication of gaseous oxygen in one reading in the aft of orbiter, launch director Mike Leinbach said. He's confident it was associated with a ground system that is no longer attached to the ship. "This is not a problem for us," he said. "This is not a constraint." The weather forecast is 70 percent "go" for launch, with a chance of showers and storms. Of more concern for the moment is this afternoon's weather, which could delay rollback of the rotating service structure that encloses Atlantis at the pad. "If we get it back before the weather sets in, that's great," Leinbach said. If not, later will be OK, too, he said. He's not concerned about storms rolling over the pad after the structure is rolled back, especially since the chance of hail today is extremely low. The shuttle can get wet with no issues. "The countdown's going extremely well," Leinbach said. Said Cain: "I think tomorrow's going to be a good day." Web posted. (2006). ['Anxious anticipation' for shuttle [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 5].]

Hale talks foam redesign, mission extension options

NASA managers are holding open the possibility of extending the shuttle Atlantis' mission by at least one and possibly two days to give the crew time to carry out additional heat shield inspections and to handle any unexpected problems that might crop up, officials said today. Atlantis is scheduled for blastoff Wednesday at 12:29 p.m. on a space station assembly mission considered one of the most complex shuttle flights in recent memory. There are no technical problems of any significance at pad 39B and forecasters are predicting a 70 percent chance of good weather Wednesday, Thursday and Friday. "We really are working no issues, the vehicle's in very good shape," said LeRoy Cain, launch site chairman of NASA's Mission Management Team. "I conducted the go/no-go poll to continue and everybody on the team is go and in good spirits. We're ready to press forward from here." Launch Director Mike Leinbach said engineers may move the launch pad service gantry away from Atlantis an hour or so early today to beat the onset of expected afternoon thunderstorms. "If we get it back before the weather sets in, that's great," he said. "If not, we'll recover that time after the weather passes. Typically, we hold four or five hours in abeyance for RSS (rotating service structure) retract. So if we do get hit by the afternoon weather that really shouldn't pose a problem for us." The Mission Management Team plans to meet at 1:45 a.m. Wednesday to assess the weather and give engineers clearance to proceed with loading Atlantis' external tank with liquid oxygen and hydrogen rocket fuel. Fueling is scheduled to begin at 2:33 a.m. and if all goes well, commander Brent Jett, pilot Chris Ferguson, flight engineer Dan Burbank, Joe Tanner, Canadian astronaut Steve MacLean and Heidemarie Stefanyshyn-Piper will begin strapping in around 9:09 a.m. Liftoff is targeted for 12:28:49 p.m. If Atlantis fails to get off the ground Wednesday, NASA can try again Thursday and Friday. After that, the flight will be delayed until after the Russians launch a fresh crew to the

international space station Sept. 18 and bring the lab's outgoing crew back to Earth Sept. 29. The next daylight launch opportunity or the shuttle after Friday is Oct. 26. Web posted. (2006). [Hale talks foam redesign, mission extension options [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 5].]

Airspace, Bridges and Waterway Restrictions in Effect

For the STS-115 launch of Space Shuttle Atlantis, NASA managers are urging all aircraft pilots and boaters to fully comply with the airspace, bridges and waterway restrictions imposed around Kennedy Space Center prior to and during shuttle launches and landings. "As always, we are coordinating with officials from the U.S. Air Force Eastern Range, Federal Aviation Administration and the U.S. Coast Guard to help provide a safe launch environment for the shuttle crew and for interested spectators," said KSC Launch Director Mike Leinbach. "Violating these restrictions is not only unsafe for the astronauts and support crews, it's unsafe for the violator." The first launch opportunity is Wednesday, Sept. 6, with liftoff targeted for 12:28 p.m. EDT. This launch time is approximately in the middle of a 10-minute launch window. At NASA's request, Air Force and Coast Guard surveillance aircraft will patrol KSC's airspace boundaries on launch day. Violators will be intercepted by patrol forces, thoroughly investigated and subject to FAA enforcement action. A number of restrictions remain in effect around KSC during the hours immediately following the launch of a space shuttle.["Airspace, Bridges and Waterway Restrictions In Effect For STS-115," **NASA News Release #60-06**, September 5, 2006.]

September 6: Fuel cell problem delays shuttle launch

NASA postponed the launch of space shuttle Atlantis by another day after discovering problems with a fuel cell early Wednesday. Fueling the shuttle never got under way before one of three cells providing electricity malfunctioned. The space agency planned to further examine the problem and try again Thursday. The shuttle, which is on a construction mission to the international space station, was already delayed by the Columbia shuttle accident, continued safety problems after Discovery's flight in 2005, a lightning strike in August and the threat of Tropical Storm Ernesto. If Atlantis doesn't get in the air this week, the next chance probably won't come until late October. The Russians plan to launch a Soyuz capsule on Sept. 18 ferrying two new station crew members and the space station's first female tourist, Dallas-area entrepreneur Anousheh Ansari. Officials with both space agencies wanted to avoid the shuttle and Soyuz meeting at the station, fearing a traffic jam. Atlantis' mission will be the first since late 2002 to expand the space station. The last two flights were tests evaluating a redesign of the external fuel tank, whose falling foam was blamed for the Columbia accident. Web posted. (2006). [Fuel cell problem delays shuttle launch [Online]. Available WWW: http://www.cnn.com/ [2006, September 6].]

New details on fuel cell issue

The suspect fuel cell that prompted NASA to scrub today's Atlantis launch is not believed to have failed. NASA believes the problem lies with an associated freon coolant loop, which prevents the electricity-generating device from overheating. The shuttle team is looking at a variety of options, from ways to accommodate for what could be a non-

functioning coolant loop to how it might repair or replace the suspect components. The team is studying options for repair or replacement with the shuttle still on the pad, a difficult but not impossible or unprecedented task. Engineering work continues at the Kennedy Space Center, Johnson Space Center and elsewhere to gather as much information as possible ahead of a 1 p.m. meeting of the Mission Management Team, where a decision is expected to be made about whether NASA could go ahead with a launch attempt on Thursday. Liftoff would be at 12:03 p.m. There is some history to on-pad repair and replacement of the fuel cells, with differing results. At least two times (STS-6 in 1983 and STS-69 in 1995), NASA has replaced fuel cells in orbiters on the pad. In 1995, the work on Endeavour took about seven days, quick work that would not allow launch this week but would protect late-September launch options by avoiding a time-consuming rollback (presuming of course that's the necessary fix and that it could be replicated). In 1997, NASA flagged a technical glitch with a fuel cell component at about the same time in the countdown, but believed it had worked the problem out. Shuttle Columbia launched. The suspect fuel cell failed. Columbia's crew had to come home after just four days in orbit, without finishing its mission. The mission was reflown three months later. Web posted. (2006). [New details on fuel cell issue [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 6].]

Smaller crowds expected for launch

A midweek space shuttle launch in September -- like the one scheduled today -- won't draw the same number of people as it would have if the event been on a weekend or later in the day. And local tourism officials are concerned that even the faithful, Orlando-area visitors may stay away if the weather isn't perfect. That could mean viewership for today's midday launch would be half the number that would come for a weekend launch -- cutting into revenue for local hotels, restaurant, bars and shops. "We won't have the people we would have on a Sunday, like when it was supposed to launch last time," said Rob Varley, executive director of the Space Coast Office of Tourism. A shuttle launch draws a crowd, but when it's in the middle of the week -- especially the week after threats of tropical depression Ernesto and just following a Labor Day weekend that yielded mediocre hotel occupancy -- don't expect the hotels to be teeming with sky-watchers, either, tourism officials said Tuesday. "We'll still see a crowd," Varley said. "But I would say we'll get around 75,000 day-trippers, rather than our usual 150,000. September is our slow time, anyway, and so it all depends on the weather. People just look outside, and if it's cloudy or looks like it will rain, people could stay at home and watch the launch on TV. Hopefully, it'll turn a dismal Wednesday into a decent Wednesday. Web posted. (2006). [Smaller crowds expected for launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 6].]

NASA Aims for Possible Shuttle Launch Attempt Friday

NASA is targeting a possible launch of Space Shuttle Atlantis on Friday, Sept. 8 because of a problem associated with one of the spacecraft's electricity-producing fuel cells. Shuttle program managers at NASA's Kennedy Space Center decided Wednesday afternoon additional time was needed to evaluate fuel cell flight history and potential causes of the malfunction. Mission managers will hold another meeting Thursday at 1

p.m. EDT to assess the issue. There will be a news conference on NASA Television at the conclusion of that meeting. If the team decides to "go" for launch Friday, lift-off would be at 11:41 a.m. EDT. Tuesday night as ground teams were preparing for Atlantis' scheduled launch Wednesday, a voltage spike in the motor of Atlantis' fuel cell #1 coolant pump was observed during the activation of the shuttle's three fuel cells. The coolant pump flows Freon through the fuel cell to prevent it from overheating during flights. During Atlantis' mission, STS-115, astronauts will deliver and install a girder-like structure, known as the P3/P4 truss, aboard the station. The 35,000-pound piece includes a set of giant solar arrays, batteries and associated electronics. The arrays eventually will double the station's power capability. Atlantis' crew, Commander Brent Jett, Pilot Chris Ferguson and mission specialists Dan Burbank, Heide Stefanyshyn-Piper, Joe Tanner and Steve MacLean, a Canadian Space Agency astronaut, will remain at Kennedy Space Center while the fuel cell evaluation continues. ["NASA Aims For Possible Shuttle Launch Attempt Friday," **NASA News Release #06-400**, September 6, 2006.]

September 7: NASA still undecided on date of shuttle launch

NASA remained undecided late Sept. 6 on whether to proceed with the launch of Atlantis on the STS-115 mission Sept. 7, 8 or 9 or delay the flight into perhaps October for repairs following an electrical spike detected in a Freon coolant pump motor associated with one of three orbiter fuel cells. The orbiter fuel cells use cryogenic hydrogen and oxygen to produce electricity and all three must be operational for a mission to launch or remain in orbit should one fail in space. A 1.5 amp current increase and associated spike in voltage occurred in the coolant pump motor for Fuel Cell 1 as the system was being activated with Atlantis on Pad 39B about 10 hours prior to the scheduled 12:29 p.m. Eastern time launch target on Sept. 6. When the problem occurred, the loading of liquid oxygen and hydrogen propellants into the shuttle's external tank was delayed with the hope that troubleshooting could clear the problem. But when it became obvious the problem needed significant assessment, the Sept. 6 launch attempt was scrubbed. This left only Sept. 7 and 8 as primary launch options until the shuttle launch window expires, although some options for Sept. 9 were also being considered. The orbiter team is facing at least two major questions in its assessment. First, how to troubleshoot the cause and effect of the coolant loop motor voltage problem, and second, to determine whether the electrical gremlin could also affect other critical orbiter systems not involved with the motor. Launch timing for flight to reinitiate station assembly is dictated by lighting for photography of external tank foam and an agreement with the Russians to have Atlantis off of the International Space Station by about Sept. 17 to allow proper spacing for the arrival of Soyuz TMA-9 that includes the station's Expedition 14 crew. Soyuz launch timing is one issue that could play a part in any decision. If a launch attempt is made Sept. 7, liftoff would be about 12:03 p.m. Eastern time. If Sept. 8 is used, the launch time would be about 11:40 a.m. Eastern time, with an 11:15 a.m. Eastern time liftoff if an attempt is made Sept. 9. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "NASA still undecided on date of shuttle launch," [Electronic]. Vol. 219, No. 46, [September 7, 2006.].]

Atlantis launch decision on tap today

NASA worked through the early morning hours today trying to determine whether it can launch shuttle Atlantis on Friday without repairing or replacing a suspect fuel cell system that prompted the postponement of Wednesday's launch. The agency's Mission Management Team will be briefed on an ongoing engineering analysis at 1 p.m. today, and a decision on whether to press ahead with a targeted 11:41 a.m. launch opportunity Friday could come at that time. Engineering teams across the country have been trying to determine what could have caused abnormal current readings and the consequences of the problem recurring whenever the shuttle does launch. An exhaustive overnight effort could not be completed in time to attempt a launch today, so leaders gave the engineers more time to try to resolve the problem. If the fuel cell or associated components must be replaced, there is no way NASA could launch this week. The abnormal data recorded during fuel cell activation late Tuesday did not violate launch restrictions, shuttle program manager Wayne Hale said. NASA could have gone ahead with launch Wednesday, but determined that "there is something funny going on with that fuel cell" that needed to be investigated, Hale said. The fuel cells create electricity to power shuttle systems. All must work for the shuttle to complete its full mission. The most likely consequence of a fuel-cell failure in orbit is that NASA would have to cut Atlantis' mission short, preventing the crew from finishing all its work. NASA could decide to accept that risk, but Hale would rather fly with increased confidence there won't be a failure. "This is one of those 50-50 kind of decisions," Hale said of the rigorous debate during a Mission Management Team meeting that lasted more than four hours on Wednesday afternoon. "If you want high drama this is about as good as it gets." If NASA can't launch Friday, Hale would not rule out the possibility of extending the launch window to make an attempt on Saturday. Nor would he rule out easing daylight launch restrictions that would open a late-September launch window. Hale said he would prefer to not have to deal with making either of those difficult decisions, and the team won't make those decisions until it has to confront them. Web posted. (2006). [Atlantis launch decision on tap today [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 7].]

Turning to Lady Luck to Bless Launchings

"Superstitions? What's that all about?" NASA's shuttle launch director, Michael D. Leinbach, asked in an interview this week. "I am not a superstitious person." If not, he is one of the few. The space program is rife with rituals, charms, lucky numbers and other defenses against bad karma — not just disaster, but the mechanical and weather problems that have postponed the Atlantis liftoff. In a custom that dates from the first shuttle mission in 1981, shuttle crews will not leave the suit-up room until the commander loses in a card game. They repeatedly draw poker hands until the commander ends up with the lowest. Some managers insist on wearing special clothes. During the Apollo era, the Lunar Orbiter program manager, Lee R. Scherer, always wore the same sport coat, said Hugh W. Harris, a retired public affairs chief at the Kennedy Space Center here. When the program ended, Mr. Scherer shredded the coat and distributed pieces among co-workers. Numerology is also important. Space shuttle missions were numbered as STS-1, STS-2 and so on, for Space Transportation System. Then NASA turned the consecutive identification system into an awkward combination of numbers and letters that included even the fiscal year. "Whether that was superstition, you really can't say,

but somehow they avoided STS-13," Mr. Harris said, laughing. (NASA has since gone back to straightforward numbering.) It should be noted that three astronauts aboard the International Space Station are the 13th team of permanent residents, and NASA officially refers to them as the Expedition 13 crew. As they launched a Soyuz capsule on March 30, television showed a dangling toy white bear, a lucky charm. And that is hardly the only superstition at work in Russia and the Baikonur Cosmodrome. In keeping with a custom almost half a century old, the wives of Russian astronauts do not attend launchings. Nor do the crews watch their Soyuz spacecraft roll to the pad two days before liftoff. The Russian astronauts have another ritual: urinating against a tire of the bus taking them to the launching pad. They are commemorating the first man in space, Yuri A. Gagarin, by replicating his urgent deed before his launching in 1961. An odder ceremony took place before Titan rocket missions back in the 60's. Members of the launching team would meet the night before liftoff, and the youngest would bury a knife in the sand, aimed in the same direction as the flight path. At the space center here, some controllers pick a different place to park the day after a liftoff is scrubbed. Not Mr. Leinbach, the launch director — he has a reserved spot. "So I park in the same spot all the time," he said with a laugh. "I don't have to worry about that." Web posted. (2006). [Turning to Lady Luck to Bless Launchings [Online]. Available WWW: http://www.nytimes.com/ [2006, September 7].]

September 8: CEV decision document ranks LM ahead in mission suitability, cost, past performance

A source selection document explaining NASA's rationale for choosing Lockheed Martin to build the Orion Crew Exploration Vehicle (CEV) says the aerospace giant bested rival Northrop Grumman/Boeing's bid in the areas of mission suitability, cost, and past performance. Doug Cooke, NASA's source selection authority, wrote in the Aug. 31 document that although both team's proposals were sound, Lockheed's possessed a "clear advantage." Both received ratings of "very good" in overall mission suitability, but Lockheed's was numerically ranked somewhat higher because of its superior technical approach. "I was particularly impressed with the numerous technical enhancements, the sound, effective, and realistic concepts for avionics and software development, and incorporation of proven operations considerations and innovative technologies into the design of the spacecraft and operational processes," Cooke wrote. While the Northrop/Boeing proposal was praised for its proposed Crew Module (CM) pressure vessel design, which NASA thinks would have significantly reduced production time and schedule risk, it was criticized for having "high and unsubstantiated" proposed software production rates, as well as "unrealistic" re-use claims for flight and test software. Both teams' cost proposals for building the CEV were deemed "very realistic," but Lockheed's final price tag turned out "appreciably" lower. "I determined that the difference in cost between the proposals is a compelling consideration in my selection decision," Cooke wrote. "I have determined that the lower-cost [Lockheed] proposal represents a substantial savings to the government." Finally, Cooke deemed Lockheed's past performance on Phase 1 of the CEV program "exceptional," saying there is "no better predictor" for how a company will perform in Phase 2. Lockheed's past performance was rated "very good," and Northrop/Boeing's was rated "good." The CEV is scheduled to have its first flight with crew no later than 2014. E-mail distribution. (2006). [Aviation

Week's Aerospace Daily & Defense Report Re: "CEV decision document ranks LM ahead in mission suitability, cost, past Performance," [Electronic]. Vol. 219, No. 47, [September 8, 2006.].]

NASA manager: 24-hour launch delay likely

The scheduled late-morning liftoff of space shuttle Atlantis on Friday is likely to be delayed by 24 hours. As NASA prepared for launch, crews on the launch pad were troubleshooting a glitch in a fuel sensor for the main-engine cutoff system. A similar sensor has plagued previous missions, and a malfunctioning fuel cell held up the launch of Atlantis earlier in the week. Weather conditions at Kennedy Space Center were forecast to be 70 percent favorable for the scheduled 11:41 a.m. ET launch. The launch of the Atlantis has been delayed multiple times. The launch of the Atlantis, commanded by Navy Capt. Jett, will be the first shuttle mission since the 2003 Columbia disaster to deliver a major new portion of the International Space Station. The Atlantis crew will conduct three spacewalks to install a massive set of solar arrays to the station's main truss. Under NASA regulations, three operational fuel cells are required to proceed with a launch. They generate electricity that powers the onboard systems during flight and generates water for the crew. Web posted. (2006). [NASA manager: 24-hour launch delay likely [Online]. Available WWW: http://www.cnn.com/ [2006, September 8].]

September 9: NASA's Space Shuttle Atlantis Begins Mission to the Space Station

The Space Shuttle Atlantis and its six-member crew are on their way to the International Space Station after lifting-off from NASA's Kennedy Space Center, Fla., at 11:14:55 a.m. EDT Saturday. "It's been almost four years, two Return to Flight missions, a tremendous amount of work by thousands of individuals to get the shuttle program back to where we are right now and that's on the verge of restarting the station assembly sequence," said Atlantis' Commander Brent Jett. "We're confident over the next few weeks, and few years for that matter, that NASA's going to prove to our nation, to our partners and our friends around the world that it was worth the wait and the sacrifice. We're ready to get to work." The fuel cut-off sensor system, which malfunctioned and delayed Atlantis' scheduled Friday launch, performed normally Saturday. The engine cut-off, or ECO, sensor is one of four inside the liquid hydrogen section of the shuttle's external fuel tank. Atlantis' flight, STS-115, will resume construction of the International Space Station. The shuttle and station crews will work with ground teams to install a girder-like structure, known as the P3/P4 truss aboard the station. The 35,000-pound piece includes a set of giant solar arrays, batteries and associated electronics. The arrays eventually will double the station's power capability. Atlantis' crew includes Pilot Chris Ferguson and mission specialists Dan Burbank, Heide Stefanyshyn-Piper, Joe Tanner and Steve MacLean, a Canadian Space Agency astronaut. The shuttle is scheduled to dock with the station on Monday. Once Atlantis arrives, a day could be added to the 11-day mission for a focused inspection of the shuttle's heat shield. ["NASA Space Shuttle Atlantis Begins Mission to the Space Station," **NASA News Release #06-402,**September 9, 2006.]

After topsy-turvy 13 days, smooth count

After a tumultuous launch campaign, it was a relatively easy day at the office for the shuttle launch team. There were almost no issues from fueling overnight to liftoff at 11:15 a.m. Saturday, in contrast to the last few days when problems with critical orbiter power generators and engine cutoff sensors forced the agency to scrub launch tries on Wednesday and Friday. On top of that, Atlantis' flight was delayed several times the previous week by a freakish lightning strike at the launch pad and an aborted rollback from the launch pad because of the unpredictable Tropical Storm Ernesto. "We've been in a launch countdown for over 13 days," relieved launch director Mike Leinbach said after watching Atlantis soar into orbit. "The countdown itself went extremely smoothly, which probably shouldn't be a surprise considering how many times we tried it," said Leinbach of Scottsmoor. "It was just really, really clean today. We were trying to find stuff to talk about and couldn't." On Saturday, the three electricity-generating fuel cells inside Atlantis worked as expected. That included the fuel cell that acted up during the countdown to Wednesday's launch attempt. One of the power streams to that fuel cell is not working, but two others were fine and the fuel cell functioned properly Saturday. "We didn't have any issues with it. It is performing nominally," launch integration manager Leroy Cain said of the fuel cell, which combines liquid hydrogen and liquid oxygen in way that generates electricity for the computers and other systems inside the orbiter. Also Saturday, all four engine cutoff sensors did the job of recording when there was and was not liquid hydrogen inside the external tank. Friday's launch was called off because one of those four sensors was providing incorrect readings. NASA debated launching with three working sensors, but decided to wait a day. The agency could have launched Saturday even if that fuel sensor failed countdown tests, but instead the sensor worked. "When we retanked today, it went wet," Cain said, so the launch team never had to revisit the issue. Web posted. (2006). [After topsy-turvy 13 days, smooth count [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 9].]

Minor foam loss seen on tape

It appears from the post-launch films that Atlantis' external tank shed at least four pieces of foam, all of which seemed to be small in size. The fragments came off from near the liquid oxygen feedline and flew near (or possibly struck) the wing of the orbiter. However, the foam loss came almost four minutes into flight, at a time when the shuttle was beyond the atmosphere. NASA has long said that small pieces of foam coming off that late in flight could not impart enough force on the orbiter's heat-shielding to do serious enough damage to threaten the spaceship or crew. Of course, the engineers and imagery experts are looking a lot closer at the still and video images of launch and they will do their own quick-look review. A post-launch news conference is set to begin at 12:30 p.m. A few hours later, after downlink of the crew photos and video taken of the tank after separation, NASA will hold another news briefing to discuss the early analysis of any foam loss or debris incidents during ascent. Web posted. (2006). [Minor foam loss seen on tape [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 9].]

Engineers' input important in decision

The top manager representing NASA's astronauts was one of just two people on the Mission Management Team to cast a "no go" vote against launching shuttle Atlantis on Friday. Ken Bowersox, a veteran shuttle and space station commander who is the outgoing head of the Flight Crew Operations Directorate, objected Friday to NASA launching the shuttle in the face of a fuel sensor glitch that violated the agency's launch rules. While his vote on behalf of the astronauts certainly would have been considered influential, the rules governing the operation of the Mission Management Team actually make the most important vote the one cast by the team's chairman. In this case, that was KSC launch integration manager Leroy Cain. On Friday, Cain just happened to be the other "no go" vote. Bowersox sits on the prelaunch Mission Management Team by virtue of his position, a post he intends to leave next month to take a new job as an aide to Johnson Space Center Director Mike Coats. Approximately 20 senior space agency managers serve on the Mission Management Team. The prelaunch team includes managers of the space station program, the astronaut office, mission control, payloads and spacewalk operations among other divisions. They serve as a sort of advisory board, but one with strong influence over final decision-making. The chair, in this case Cain, would lean heavily on their input. Friday was an interesting diversion from that. All but two voting members of the MMT were supportive of a proposal to deviate from written flight rules to launch Atlantis and six astronauts knowing that one of four critical fuel sensors was not working properly. According to an internal NASA document outlining the MMT's responsibilities, the chair of the prelaunch mission management team has the final say on whether or not to launch the shuttle on any given day. Cain said Friday that he made the call after considering not only what the voting members of the management team had to say, but also what other nonvoting engineers and technical experts had to say. Cain repeatedly stressed that he and Bowersox were not the only ones voicing objections to launching. They were just the only voting members of the MMT who did not agree with attempting to fly Friday. Web posted. (2006). [Engineers' input important in decision [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 9].]

September 11: Additional heat shield inspections ruled out

High-resolution photographs of the shuttle Atlantis' underbelly shot Monday during final approach to the international space station show the orbiter's heat shield tiles are in good shape with no obvious signs of damage. Agency engineers decided late today that additional heat shield inspections, a move that would have triggered a one-day mission extension, were not required. Web posted. (2006). [Additional heat shield inspections ruled out [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, September 11].]

Debris analysis update

NASA's Mission Management Team has refined the timing of a handful of launch debris events noted during the shuttle Atlantis' climb to space Saturday. As mission managers reported Sunday, no impacts occurred during the first 135 seconds of flight, the period when atmospheric density is high enough to give debris enough energy to cause heat shield damage. Here is the latest MMT summary uplinked to the astronauts by mission control as part of their daily "execute package" of notes and instructions: "The teams

continue to review the ascent imagery data (ET LOX feedline camera, ground cameras, WAVE aircraft video, and debris radar). The preliminary characterization is the debris environment was minimal, which is consistent with the preliminary debris report that you received yesterday during the post insertion timeframe. There was only one event occurring inside the debris sensitive timeframe. That event was a late release of an F4D (thruster jet) Tyvek Cover at (about) 16 secs MET (mission elapsed time) at a velocity of 230 mph." An attached photo showed the paper cover did not impact the orbiter. Other debris events are as follows (shown in minutes and seconds after launch): 2:50: Debris from ET ice-frost ramp at position Xt 1270. 4:05: Possible orbiter debris impacts to belly and wing leading edge glove areas, but no damage visible. 4:07: Debris outboard of liquid oxygen feedline; no orbiter impact. 5:27: Potential debris impact on right wing, but no signs of visible damage. Wing leading edge sensors did not detect any impacts. 5:30: Radar detected a possible debris event, but nothing shows up in the imagery. 7:32: Debris seen with possible impact. 8:44: Suspected ice hit Atlantis near a nose landing gear door. Web posted. (2006). [Debris analysis update [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, September 11].]

September 12: NASA Names Parsons New Kennedy Space Center Director

NASA Administrator Michael Griffin today named William (Bill) W. Parsons the new director of the agency's Kennedy Space Center, Fla., effective in January 2007. Parsons succeeds James W. Kennedy, who is retiring. Parsons currently serves as deputy director of NASA Kennedy Space Center, a position he has held since February. As space shuttle program manager, Parsons led the return-to-flight activities for the agency and played a major role in the success of the Discovery STS-114 mission. His first stint as NASA's Stennis Space Center director, Stennis, Miss., came in August 2002. He was first assigned to Stennis in 1997 as the chief of operations of the Propulsion Test Directorate. Parsons relocated to NASA's Johnson Space Center in Houston to become the director of the Center Operations Directorate. He later served as the deputy director of Johnson. He returned to Stennis in 2001 and served as director of the Center Operations and Support Directorate. In 1990, Parsons joined the NASA team at Kennedy Space Center as a launch site support manager in the Shuttle Operations Directorate. He also worked as an executive management intern and later as the shuttle flow director of the Shuttle Operations Directorate at Kennedy. In 1996, he became manager of the Space Station Hardware Integration Office at the center. Parsons has received numerous honors, including the Presidential Rank Award (Meritorious Executive); NASA's Exceptional Service Medal and Distinguished Service Medal; and the Silver Snoopy, awarded by astronauts for outstanding performance in flight safety and mission success. Parsons holds a bachelor's degree in engineering from the University of Mississippi and a master's degree in engineering management from the University of Central Florida. ["NASA Names Parsons New Kennedy Space Center Director," **NASA News Release #06-314,** September 12, 2006.]

September 13: Boehlert: NASA will try to shorten gap between manned space programs

The chairman of the House science committee says he expects NASA will be able to reduce the projected gap between the final space shuttle mission and the first flight of the

next-generation Orion space exploration vehicle. Sherwood Boehlert -- a Utica-area Republican -- says it might be difficult to cut the length of time between the two space programs. But Boehlert expects NASA administrator Michael Griffin to make a "determined effort" to narrow the gap. The shuttle program now is set to end in 2010 while the first test flight of the Orion spacecraft isn't scheduled until four years later. Boehlert said there likely will be a period when the U-S doesn't have manned space flight capability. NASA has selected Lockheed Martin to lead the development team for the Orion program. Web posted. (2006). [Boehlert: NASA will try to shorten gap between manned space programs [Online]. Available WWW: http://www.wstm.com/ [2006, September 13].]

September 14: ` Spacewalkers lose the darndest things

It's a junkyard out there in space and sometimes astronauts accidentally contribute to the litter. In 1965, the first American spacewalker, Ed White, lost a spare glove when he went outside for the first time. From that time on, astronauts have accidentally added some of the more unusual items to the 100,000 pieces of space trash that circle Earth. Last July, spacewalker Piers Sellers sheepishly reported that he lost a spatula. Nicknamed "spatsat" by space junk watchers, it returns to Earth in a fireball early next month. This week the Atlantis astronauts made their own contributions to the space debris in low orbit: a couple of bolts that escaped from the addition they were connecting to the international space station. To engineers, this isn't funny. Many of those pieces of space junk can kill astronauts, puncture satellites or at the very least scratch up expensive space shuttle windows. "It's one of these problems that is growing in seriousness," said William Ailor, director of the Center for Orbital and Reentry Debris Studies at the Aerospace Corp. in Los Angeles. "It's really the small things that will get you." NASA and the Air Force track objects bigger than about 4 inches. The official "box score" of that space debris as of Thursday was 9,925. But the 90,000 objects smaller than that can be as dangerous, zipping around Earth at more than 15,000 mph. They are just harder to track. Of all the items followed by the Air Force, the more unusual ones are those "that aren't necessarily meant to drop," said Air Force Space Protection Officer David Ward of the First Space Control Squadron in Cheyenne Mountain. "The astronauts didn't necessarily mean to let go of the bolts the last couple days, but that happens." So when spacewalkers venture outside, NASA makes sure everything is tethered -- tools, bolts, the astronauts themselves. Think of it as wrapping a Christmas present with everything tied up to something, the scissors, the paper, the scraps of paper not used, said NASA spokesman Phil West, a former spacewalk tool engineer. "You worry about (losing tools) all the time," said former astronaut and spacewalker Jay Apt, noting that he never lost anything. And well they should worry. Web posted. (2006). [Spacewalkers lose the darndest things [Online]. Available WWW: http://www.cnn.com/ [2006, September 14].]

NASA Exercises Payload Processing Services Contract Option

NASA's Kennedy Space Center, Fla., will extend its Checkout, Assembly, and Payload Processing Services contract for three years with Boeing Space Operations Company of Titusville, Fla., a wholly owned subsidiary of The Boeing Company, Chicago. The contract extension and modification, valued at $278.5 million, covers Oct. 1, 2006,

through Sept. 30, 2009. The total contract value including exercised and unexercised options is approximately $846 million. The contract is a performance-based, cost-plus award fee contract to provide checkout, assembly, and payload processing services at Kennedy Space Center, Fla., Cape Canaveral Air Force Station, Fla., and Vandenberg Air Force Base, Calif. Under the contract, Boeing provides management and technical support of payload processing for the space shuttle, International Space Station and expendable launch vehicle programs. Services and support include the planning for and receiving of payloads, maintenance of associated ground support systems, integration of payloads with the space shuttle, launch support and space shuttle post-landing payload activities. ["NASA Exercises Payload Processing Services Contract Option," **NASA Contract Release #C06-046**, September 14, 2006.]

September 15: Expendable Launch Vehicle Status Report

Mission: Solar Terrestrial Relations Observatory (STEREO) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: No earlier than Oct. 25, 2006 ; Launch Time: TBD. At Pad 17-B, the Delta II second stage was destacked on Sept. 6 for further testing to determine the thickness of the tank in identified areas. The initial test procedures are complete and the results are being assessed. These results will be used with continuing analytical evaluation to determine the flight worthiness of the second stage. This should be concluded in about a week. In the meantime, workers will reinstall the engine on the second stage. STEREO remains at the Astrotech Space Operations Facility. The transportation canister was removed on Sept. 1 so technicians could recondition the spacecraft flight batteries and monitor critical functions during the hiatus. The twin observatories remain stacked on top of the third stage. The transportation canister will be reinstalled immediately prior to the payload being moved to the launch pad for mating to the Delta II. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-091506** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, September 15].]

NASA Awards Thermal Protection Contract for Orion

NASA has selected The Boeing Company, Huntington Beach, Calif., to support the design and development of a lunar direct return-capable heat shield for the Orion crew exploration vehicle. The hybrid firm fixed-price and cost-plus-fixed-fee contract has a 16-month period of performance, with a maximum value of approximately $14 million, including all priced options. ["NASA Awards Thermal Protection Contract for Orion Spacecraft," **NASA Contract Release #C06-046**, September 15.]

September 18: STS-125 - NASA's Flight Of Opportunity

Flagship mission STS-125, better known as the final Hubble Space Telescope Servicing Mission, has officially entered NASA's flight manifests as the "Flight Of Opportunity." HST SM-04 is currently scheduled for No Earlier Than (NET) April 17, 2008, involving Shuttle Discovery. Confirmation of the mission is expected next month. The last Hubble Space Telescope servicing mission took place on STS-109, with one of the most spectacular launches ever witnessed at the Kennedy Space Center, as Columbia's dawn launch pierced through low clouds, lighting up the State of Florida in the process. December 2007 is ambitious to say the least, due to natural slippage in the launch

manifest. Both STS-116 and STS-117 are under threat of slipping a few months due to delays with Atlantis' External Tank (required both for Atlantis' primary mission and her support of Discovery's December mission). Realistically, the Hubble mission is expected to remain sandwiched between the two major launch and installation missions for the Japanese Space Agency (JAXA) in early 2008, currently dated - before slippage - as NET December 6, 2007, STS-123/1J/A, Endeavour - JEM ELM-PS, SLP-D1 with SPDM Dextre, and NET February 7, 2008, STS-124/1J, Atlantis - JEM PM, JEM RMS. Web posted. (2006). [STS-125 - NASA's Flight Of Opportunity [Online]. Available WWW: http://www.nasaspaceflight.com/ [2006, September 18].]

Final shuttle heat shield inspections performed

The Atlantis astronauts carried out a final inspection of the shuttle's heat shield today, using a laser on the end of a long boom to look for signs of damage on the ship's nose cap and wing leading edge panels. An identical inspection was carried out Sept. 10, the day after launch, to make sure the most critical parts of the heat shield came through the climb to space in good condition. Today's inspection was designed to make sure no space debris or micrometeoroids hit the shuttle unnoticed while docked with the international space station. "The first one is obviously geared towards any debris which came off during ascent and may have hit the orbiter," commander Brent Jett said in a NASA interview. "There's a second threat to your thermal protection system, and that is from micrometeorite damage. It's a threat we deal with on every mission." Heat shield inspections are carried out using a 50-foot-long boom attached to the end of the shuttle's 50-foot-long robot arm. A laser scanner and a high-resolution camera are mounted on the end of the orbiter boom sensor system to look for signs of damage to the reinforced carbon carbon material making up the shuttle's nose cap and wing leading edge panels. Those areas experience the most extreme heating during re-entry, some 3,000 degrees Fahrenheit. "There's an analysis done that gives you the probability of being struck by a micrometeorite," Jett said. "It all depends on what attitude you're flying and what orbit you're flying in. The thought is that if you inspect early in the mission for ascent debris, you might want to inspect late in the mission to see if you've sustained any damage from a micrometeorite hit on the RCC, a critical area of the orbiter." Along with carrying out the heat shield inspection, Jett and his crewmates - pilot Chris Ferguson, flight engineer Dan Burbank, Joe Tanner, Canadian Steve MacLean and Heidemarie Stefanyshyn-Piper - also plan to begin initial packing for re-entry and landing Wednesday. Cabin stow will begin in earnest Tuesday, when the astronauts also will test the shuttle's re-entry systems. Web posted. (2006). [Final shuttle heat shield inspections performed [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, September 18].]

September 19: Boeing rocket program to cut 39 jobs

The Boeing Co. plans to cut 39 local rocket program jobs Friday. The job reduction will result in 25 to 29 layoffs — mainly engineers, inspectors and technicians, Boeing spokesman Michael Rein said. Prior to the job cuts, Boeing had about 615 employees on the Space Coast for its Delta rocket program, Rein said. Boeing is trimming its local work force because of an anticipated decrease in commercial rocket launches, he said. Initially, Boeing planned to lay off 43 workers, but later decided to keep four. Boeing also has found 10 of the affected workers other jobs with the company, and is trying to

find jobs for four others, bringing the number of expected layoffs from the job reduction to between 25 and 29, Rein said. The local job reduction is part of 125 jobs that Boeing was considering cutting from its rocket program at Cape Canaveral and the program's other locations in Alabama and California, Rein said. Web posted. (2006). [Boeing rocket program to cut 39 jobs [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 19].]

Landing forecast: Weather iffy at best

The Atlantis astronauts are packing up their spaceship for a planned return to Earth on Wednesday, but the weather at Kennedy Space Center is going to be iffy at best. Meteorologists say that a frontal boundary moving through central Florida will bring with it stiff crosswinds at the three-mile shuttle runway, low-level clouds and a chance of thunderstorms within 30 nautical miles of the landing strip. In the event the weather is clear, the astronauts would fire the shuttle's twin maneuvering engines at 4:56 a.m. EDT, heading for a 5:59 a.m. EDT touchdown. Web posted. (2006). [Landing forecast: Weather iffy at best [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 19].]

September 20: Look ahead to a possible landing

NASA flight directors report that they saw no signs of heat shield damage during an overnight survey of shuttle Atlantis with cameras on the ship's robot arm. What's more, they said they'll be ready to support a landing attempt Thursday if mission managers clear the ship and its six astronauts for a return to Earth. The Atlantis crew would have two opportunities to land at Kennedy Space Center: at 6:21 a.m. EDT and 7:51 a.m. The weather outlook is good, with few clouds and light winds that will blow directly down the runway. There are no plans at this time to activate NASA's back-up landing site: Edwards Air Force Base in California. And as it turns out, rainy weather would have forced the shuttle crew to forego the two opportunities NASA passed up today to perform additional heat shield inspections. The Atlantis crew is wrapping up an extra heat shield survey with the shuttle's orbital inspection boom. NASA mission managers will meet at 10 a.m. EDT to decide whether to press ahead with the Thursday landing opportunities. A news briefing is scheduled to start no earlier than noon EDT. Web posted. (2006). [Look ahead to a possible landing [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 20].]

NASA aims for Dec. 7 launch

Saying NASA now is back in the International Space Station construction business, NASA shuttle program manager Wayne Hale says the agency is considering moving up its next outpost assembly flight. Now set for launch Dec. 14, shuttle Discovery and six astronauts plan to erect another new segment to the port side of the station's central truss. Hale said managers are trying to determine if the launch can be moved up a week so that the mission can be finished in time for workers to take a break at Christmas. "If that's not incentive, I don't know what is," Hale said. Web posted. (2006). [NASA aims for Dec. 7 launch [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 20].]

Atlantis crew spots more space debris

Shuttle astronauts spotted three pieces of debris floating in space outside Atlantis early Wednesday, a day after the discovery of two other mysterious objects prompted postponement of the landing. Atlantis commander Brent Jett described the objects as two rings and a piece of foil. He told Mission Control the first object, about 100 feet from the shuttle, was "a reflective cloth or a mechanic looking-cloth. ... It's not a solid metal structure." The astronauts noticed the objects during an extensive inspection of the space shuttle using a 50-foot boom early Wednesday to see if its heat shield was damaged by a mysterious object that apparently floated off the spacecraft. Jett suggested the three objects might have come from the Russian Soyuz vehicle, which docked with the international space station early Wednesday. But Mission Control told him the Soyuz likely was too far below the shuttle, and that the closest the two space vehicles came to each other was 20 miles. Before the postponement Tuesday, Atlantis had been scheduled to touch down just before daybreak Wednesday, when the weather forecast wasn't favorable for landing anyway. The landing time was reset for early Thursday, but could be put off until Friday. The extra inspection with the boom followed a 41/2-hour inspection using cameras on the space shuttle's robotic arm early Wednesday. The first object sighted appeared to drift away when landing systems were put through a normal but bumpy trial run early Tuesday morning. Worry about whether it came from a crucial part of Atlantis was enough to make NASA postpone the landing. NASA officials said their best guess was that the object was a plastic filler placed in between thermal tiles which protect the shuttle from blasting heat. But after being unable to determine what the object was Tuesday, NASA managers opted to spend early Wednesday making sure the shuttle was in good shape instead of concentrating on solving the mystery. Web posted. (2006). [Atlantis crew spots more space debris [Online]. Available WWW: http://www.cnn.com/ [2006, September 20].]

Inspections find no shuttle damage

An additional round of inspections of the exterior of the shuttle Atlantis Wednesday turned up no evidence of damage to the orbiter, apparently clearing the way for a Thursday morning landing. The STS-115 crew spent much of Wednesday surveying the exterior of Atlantis a day after cameras on the shuttle identified two small objects that apparently floated away from the orbiter, raising fears that an object struck and damaged critical tiles or panels. Cameras found three additional objects floating away from the orbiter on Wednesday, but officials did not believe these were critical items. If managers decide to press ahead with landing, Atlantis will return to Earth on Thursday at the Kennedy Space Center, landing at either 6:21 or 7:57 am EDT (1021 or 1157 GMT). Weather conditions are forecast to be favorable for a landing attempt either Thursday or Friday. Web posted. (2006). [Atlantis crew spots more space debris [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, September 20].]

NASA Forms Partnership With Red Planet Capital, Inc.

NASA has joined with Red Planet Capital, Inc., San Mateo, Calif., in a partnership to help the agency gain access to new and innovative technologies through the venture capital community. Red Planet Capital is a nonprofit organization that will establish a strategic venture capital fund for NASA. The purpose of the fund is to provide NASA

earlier and broader exposure to emerging technologies. It is designed to promote the future availability of technologies with both government and commercial applications that can meet NASA's future mission requirements. The effort signifies the administration's commitment to creative approaches for promoting innovation in pursuit of America's space agenda. Red Planet Capital will use venture capital and a NASA investment of approximately $75 million over five years to attract private sector innovators and investors who typically have not done business with the agency. ["NASA Forms Partnership With Red Planet Capital, Inc.," **NASA News Release #06-317**, September 20, 2006.]

September 21: NASA Announces Kennedy Construction Contract

NASA selected Rush Construction, Inc., Titusville, Fla., for construction of a new Replacement Life Support Facility at the agency's Kennedy Space Center, Fla. The 500 calendar day contract has a maximum value of $5,375,000. Rush Construction will furnish all management, supervision, labor, transportation, facilities, materials, tools, disposal, coordination of subcontractors, documentation and equipment (except any government provided property, including utilities) to construct the new Kennedy facility. Web posted. (2006). [NASA Announces Kennedy Construction Contract [Online]. Available WWW: http://www.prnewswire.com/ [2006, September 21].]

Atlantis touches down safely at KSC

Space Shuttle Atlantis and six astronauts safely returned to the Earth early this morning, completing the first construction at the International Space Station since the 2003 Columbia disaster. "It's nice to be back," Commander Brent Jett said minutes after the landing wheels stopped rolling on the runway at the Kennedy Space Center. Jett and his crew spent about 12 days in space, adding a new set of solar arrays that will double the amount of electric power available at the international space lab. The shuttle touched down at 6:21 a.m. in the pitch black of predawn coastal Florida. It was the third safe reentry since Columbia disintegrated during its attempted landing in February of 2003 because its heat-shielding was compromised by debris that struck that vehicle during launch. The first two missions after that were test flights to attempt to get under control a problem with foam insulation popping off the external tank and hitting the delicate heat-shielding in the first moments of flight. The last two flights have shown that situation is improved and this was the first operational mission since the disaster. NASA now plans to stage 15 more flights to finish construction of the International Space Station and NASA deems those some of the most complicated space missions ever tried. The shuttle also may be used one more time for a repair flight to the Hubble Space Telescope. The next space shuttle flight is set for December, and NASA is even attempting to move up Discovery's launch one week from Dec. 14 to Dec. 7. That would allow the mission to be completed, if all goes well, before Christmas so employees can spend the holiday at home with families. Web posted. (2006). [Atlantis touches down safely at KSC [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 21].]

As Atlantis returns, NASA plans to speed up assembly of station

The Atlantis astronauts aim to return to Earth today, and it appears NASA is poised to accelerate construction of the International Space Station. "I just have to remind everybody that we are back in the assembly business," NASA shuttle program manager Wayne Hale said Wednesday in advance of a scheduled 6:21 a.m. landing at Kennedy Space Center. "We're set up in a very good way for the next set of assembly flights. There are about six in a row here that we really need to pull off in fairly rapid order to keep the assembly going." Next up: A complicated mission to rewire the entire 235-ton station. Six astronauts are scheduled to launch aboard Discovery on Dec. 14, but NASA is going to attempt to get the flight going a week early so its shuttle team can be home for Christmas. "If that isn't incentive," Hale said, "I don't know what is." Winding up the first station assembly mission since the February 2003 Columbia accident, the Atlantis crew would have a second opportunity to land at 7:57 a.m. today. But meteorologists expected only light winds and a few clouds in the area. A planned landing Wednesday was canceled so the crew could make one final heat shield inspection -- a survey prompted in part by a small piece of debris seen flying below the shuttle Tuesday. Mission managers considered it highly unlikely the unidentified flying object might have compromised the shuttle's fragile heat shield. But sensor readings, later discounted, indicated the ship's right wing might have been pinged eight times. Faced with a dismal weather forecast, the crew was kept in orbit an extra day. An extensive survey already had been done on the second day of the flight. There were no signs of significant damage during another survey the next day. And the heat shield was clean too, when yet another scan was done Monday. Managers nonetheless decided it would be prudent to take one last look before committing the shuttle crew to an encounter with temperatures up to 3,000 degrees Fahrenheit. So the astronauts inspected the wing panels, nose cap and thermal tiles on the belly of the ship once again. Atlantis pilot Chris Ferguson and mission specialist Dan Burbank did most of the work with an assist from Canadian astronaut Steve MacLean. The intense operation had its own perils. It called for the astronauts to wield the shuttle's robot arm, and later, a sensor-tipped inspection boom, in close proximity to the vulnerable heat shield they were inspecting. The chance of accidental damage was significant, and the whole operation took about nine hours to complete. No signs of damage were detected. Flight controllers hailed the effort. "They made something very difficult look easy," fellow astronaut Terry Virts said from NASA's Mission Control Center in Houston. "Everybody is trying to do the right thing," shuttle skipper Brent Jett said. "So we're happy to do what it takes." Hale said the effort exemplified a new post-Columbia attitude, one in which NASA is determined to make certain astronaut crews fly safely. "We've seen a new standard in NASA in vigilance and the thoroughness of engineering rigor," Hale said. As it turned out, rain showers and low-level clouds would have forced NASA to keep the crew aloft another day anyway. "If it makes you feel any better, both of your de-orbit opportunities (Wednesday) would have been no-go," Virts told the astronauts. The same cold front that spawned the bad weather near KSC swept through Houston earlier this week, and then skies cleared. "So we're hoping the same will happen in Florida," Virts said. Added Jett: "We're hoping so too." Web posted. (2006). [As Atlantis returns, NASA plans to speed up assembly of station [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 21].]

NASA Honors America's First Flight Director Chris Kraft

NASA will honor Christopher C. Kraft, Jr., for his key involvement in America's space programs with the presentation of the Ambassador of Exploration Award. The ceremony is at 10:30 a.m. EDT Saturday, Sept. 30, in the Inn at Virginia Tech University, Blacksburg, Va. NASA is presenting the Ambassador of Exploration Award to the astronauts and other key individuals who participated in the Mercury, Gemini, and Apollo space programs for realizing America's vision of space exploration from 1961 to 1972. Kraft originally joined the National Advisory Committee for Aeronautics, NASA's predecessor agency, in 1945. In 1958, he joined the newly created NASA as one of the original members of the Space Task Group organized to design and manage Project Mercury. He was America's first manned space mission flight director, managing all of the Mercury and several Gemini missions. Kraft served as director of NASA's Johnson Space Center in Houston from January 1972 to August 1982. He was one of the designers and implementers of the Mission Control Center in Houston, the heart of all NASA crewed space missions. After his retirement from federal service in 1982, he served as an aerospace consultant for numerous companies. The Ambassador of Exploration Award is a small sample of the 842 pounds of the lunar material collected during the six Apollo moon landings from 1969 to 1972. The sample is encased in Lucite and mounted for public display. The material for Kraft's award came from the samples brought back by the crew of Apollo 11, the first to land on the moon in 1969. Kraft's award will be displayed at Virginia Tech's College of Engineering. ["NASA Honors America's First Flight Director Chris Kraft," **NASA Media Advisory #M06-148**, September 21, 2006.]

NASA Welcomes Space Shuttle Crew Back To Earth

The Space Shuttle Atlantis and its crew are home after a 12-day journey of more than 4.9 million miles in space. The mission, STS-115, succeeded in restarting assembly of the International Space Station. The crew delivered and installed the massive P3/P4 truss, an integral part of the station's backbone, and two sets of solar arrays that will eventually provide one quarter of the station's power. Atlantis' Commander Brent Jett, Pilot Chris Ferguson and mission specialists Joe Tanner, Heidemarie Stefanyshyn-Piper, Dan Burbank, and Steve MacLean, a Canadian astronaut, landed Thursday, Sept. 21, at NASA's Kennedy Space Center, Fla., at 6:21 a.m. EDT. After landing, Jett told Mission Control at NASA's Johnson Space Center, "Thanks, Houston. It's nice to be back. It was a great team effort, so I think assembly's off to a good start." The flight was the first in a series of missions that will be among the most complex in space history. Atlantis delivered the first major new component to the station since 2002 and laid the groundwork for upcoming station assembly missions. STS-115 is one of the most photographed shuttle missions ever, with more than 100 high-definition, digital, video and film cameras documenting the launch and climb to orbit. Data from these images, as well as station and shuttle crew inspection, helped to clear Atlantis' thermal protection system for return only two and a half days after launch. Tanner, Piper, Burbank and MacLean, with the help of crewmates, made three spacewalks that completed truss installation, enabled solar arrays to be deployed and prepared an important radiator for later activation. They also installed a signal processor and transponder that transmits voice and data to the ground and performed other tasks to upgrade and protect the station's systems. A new procedure called a "camp out" was implemented, in which

astronauts slept in the Quest airlock prior to their spacewalks. The process shortens the "prebreathe" time during which nitrogen is purged from the astronauts' systems and air pressure is lowered so the spacewalkers avoid the condition known as the bends. On each of the three spacewalks, the astronauts were able to perform more than the number of scheduled activities. The astronauts performed unprecedented robotics work. They used the shuttle's arm in a delicate maneuver to hand off the school bus-sized truss to the station's arm. The 45-foot truss weighs 35,000 pounds. The arrays at the end of the truss extended to their full 240-foot wingspan once they unfurled on flight day six. The astronauts also moved the station's robotic arm to a position where it will assist in the next phase of station construction. After Atlantis undocked from the station, it did the first full fly around of the facility since prior to the Space Shuttle Columbia accident. The maneuver helped ground crews get a better perspective on the station's environment and overall exterior health. Canadian Prime Minister Stephen Harper made a call during the mission to astronaut Steve MacLean to congratulate him on being the first Canadian to operate Canadarm2, the station's Canadian-built robotic arm. After undocking, the Atlantis crew participated in a first-ever three-way call with the Expedition 13 crew aboard the International Space Station and the three crew members of the Soyuz spacecraft on its way to the station. All 12 astronauts in space at that time were able to have a conversation. With Atlantis and its crew safely home, the stage is set for the next stage of International Space Station assembly. Preparations continue for Space Shuttle Discovery's launch, targeted for mid-December, on the STS-116 mission to deliver an additional truss segment and a cargo module to the station. Discovery will also do extensive work on the station's electrical and cooling systems. ["NASA Welcomes Space Shuttle Crew Back To Earth," **NASA News Release #06-321**, September 21, 2006.]

September 22: **Bigelow announces space station plans, Lockheed agreement**

Bigelow Aerospace announced Thursday that it has signed an agreement with Lockheed Martin to study the use of the Atlas 5 to launch human missions, while making plans to launch a human-rated orbital habitat as early as 2009. The Lockheed Martin agreement initially covers the study of modifications needed to the Atlas 5 so it can safely launch passenger spacecraft, something Lockheed has already been examining, as well as "potential business models and business plans". Under one scenario, that would involve the launch of up to 16 Atlas 5 vehicles a year. Bigelow Aerospace founder Robert Bigelow also announced Thursday that the company is planning a larger inflatable habitat, called Sundancer, would be ready for launch in late 2009 or early 2010. Sundancer would have life-support systems and 180 cubic meters of habitable volume, and thus could support human crews if a means of transporting them there is available. Bigelow launched a subscale inflatable module, Genesis 1, in July, and it continues to operate well. A second spacecraft, Genesis 2, is scheduled for launch in early 2007. Last month Bigelow announced that it was making significant but unspecified changes to its program intended to accelerate its overall development. Web posted. (2006). [Bigelow announces space station plans, Lockheed agreement [Online]. Available WWW: http://www.spacetoday.net/ [2006, September 22].]

Leaky valve delays rocket

A Delta 2 rocket launch has been delayed one day to Monday because of a repair to a leaky valve, the Air Force said. The rocket, which carries a Navstar Global Positioning System satellite, is scheduled for launch between 2:50 and 3:03 p.m. from Cape Canaveral Air Force Station. The Air Force said that during routine testing, a few drops of hydrazine were detected leaking from a valve on the third stage of the Delta 2. The launch team needed one day to make a repair and verify that it worked, the Air Force said. Web posted. (2006). [Leaky valve delays rocket [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 22].]

Shuttle Atlantis crew successfully completes work on space station

NASA's highly successful third post-Columbia mission likely will lead to a rapid return to night shuttle launches, a move that would boost the agency's ability to finish the International Space Station before a 2010 deadline. "We're soon going to make a decision," senior NASA manager LeRoy Cain said after shuttle Atlantis and six astronauts made a predawn landing Thursday at Kennedy Space Center. "I expect that we will in all likelihood be able to launch at night as early as (December)." Self-imposed restrictions put in place after the 2003 Columbia accident limit NASA to launching shuttles during daylight and at times when the ship's modified external tank will be jettisoned on the sunlit side of Earth. More than 100 cameras on the ground, on aircraft and the shuttle then can photograph the tank to see whether safety changes work. The restrictions, however, cut in half the number of launch opportunities available in any given year. Keeping them in place would severely hamper NASA's ability to launch at least 14 station assembly missions by a September 2010 deadline set by President Bush. So lifting them "is extremely important to us," Cain said. "And we will be able to get back to being able to launch without lighted conditions because we have to to complete the space station assembly." NASA's first station construction flight since the Columbia accident wrapped up at 6:21 a.m. as Atlantis emerged from inky black skies, touching down on the three-mile runway at KSC. "Welcome back, and congratulations on return to assembly," astronaut Toni Antonelli said from NASA's Mission Control Center in Houston. "Thanks, Houston. It's nice to be back," shuttle skipper Brent Jett said. The 225-mph landing followed an hour-long atmospheric re-entry that was observed by astronauts peering out station windows more than 200 miles above Earth. "The brightest thing through the window by far is the orbiter itself, with its contrail behind," station flight engineer Jeffrey Williams told colleagues in Mission Control. Fifteen minutes before Atlantis touched down, the 235-ton station soared over the shuttle runway, a spectacular man-made shooting star nearly as bright as Venus and Jupiter. Its brilliance in part comes from a new set of massive solar wings that the Atlantis crew erected at the outpost. Stretching 240 feet from tip to tip, the glistening gold arrays make the station one of the brightest objects in the night sky while doubling the amount of electricity available to run science labs and outpost systems. The astronauts struggled through three arduous spacewalks to wire up the new wings and deploy a radiator that will shed excess heat from them. The work was some of the most complicated and physically demanding to be performed at the outpost. "I know it might have looked easy; it was not," mission specialist Joe Tanner said. "I'm not really sure what to say after a flight like that," Jett said. "It was a pretty tough few days for us, a lot of hard work, and a great team effort to

get the station assembly restarted on a good note. We've got a lot more missions coming up, and they are going to be just as difficult." NASA Administrator Mike Griffin said the 12-day mission set a pace for what promises to be some of the most ambitious space missions ever attempted. "Whatever else the space station is, it's one of the most amazing construction projects that human beings have ever undertaken. It's maybe a little simpler than trying to build an aircraft while you fly it, but not a lot," he said. "It's obvious to me, and I hope it's obvious to you, that we are rebuilding the kind of momentum that we have had in the past and that we need if we are going to finish the space station," Griffin said. "We're halfway done, and of course we lost several years with a major accident. We've got a number of very challenging missions to go, but I know we are going to make it." Web posted. (2006). [Shuttle Atlantis crew successfully completes work on space station [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 22].]

NASA Announces New Advisory Council Members

NASA Administrator Michael Griffin named nine new members to the NASA Advisory Council on Friday, including Dr. Edward David, Jr., Chair of the Science Committee, and Dr. Paul Robinson, Chair of the new Space Operations Committee. The NASA Advisory Council (The "Council") consists of six committees, Aeronautics, Audit and Finance, Exploration, Human Capital, Science, and Space Operations. Council Chairman Harrison H. Schmitt welcomed the new members. Schmitt was NASA's first scientist astronaut to fly in space and explored the moon during the Apollo 17 mission. He also served as a U.S. Senator from New Mexico. The new members and their primary committee assignments are: Col. Eileen Collins (USAF, Ret.), a retired astronaut, was the first female pilot and commander of the space shuttle. Col. Collins, most recently the commander of STS-114, will serve on the Space Operations Committee. Lt. Gen. (Dr.) Pat Condon (USAF, Ret.) is the Chairman of the Board of the Air Force Association and will serve on the Space Operations Committee. Dr. Edward David was the Science Advisor to the President from 1970-1973 and currently is the President of EED, Inc. Dr. David will serve as the Chair of the Science Committee. Dr. Owen Garriott is a retired scientist astronaut who flew on board the second manned Skylab mission and Spacelab-1. He will serve on the Science Committee. Dr. Thomas Jones, a retired scientist astronaut and planetologist who flew four Space Shuttle missions, installed the centerpiece module of the International Space Station during his final mission. Dr. Jones will serve on the Space Operations Committee. Admiral Benjamin Montoya, former Chairman, President and CEO of the Public Service Company of New Mexico, is the Chief Executive Officer of SmartSystems Technologies and will serve on the Space Operations Committee. Dr. C. Paul Robinson, President Emeritus and former Director of Sandia National Laboratories, will serve as the Chair of the Space Operations Committee. Dr. Alan Stern is the Executive Director of the Space Science and Engineering Division of the Southwest Research Institute and will serve on the Science Committee. Dr. John Sullivan is the Director of the Center for Advanced Manufacturing at Purdue University and will serve on the Aeronautics Committee. The NASA Advisory Council will host its next public meeting on October 12, 2006, at the agency's Goddard Space Flight Center, Greenbelt, Md. ["NASA Announces New Advisory Council Members," **NASA News Release #06-320**, September 22, 2006.]

NASA Honors Veteran Astronaut James McDivitt

NASA will honor former astronaut James (Jim) McDivitt for his involvement in the Gemini and Apollo space programs with the presentation of the Ambassador of Exploration Award. The ceremony is at 3:30 p.m. EDT, Friday, Oct. 6, in the Boeing Auditorium, Francois-Xavier Bagnoud Building, University of Michigan, College of Engineering, Ann Arbor, Mich. NASA is presenting the Ambassador of Exploration Award to the astronauts and other key individuals who participated in the Mercury, Gemini, and Apollo space programs for realizing America's vision of space exploration from 1961 to 1972. The award is a small sample of lunar material encased in Lucite and mounted for public display. The material is part of the 842 pounds of samples brought back to Earth during the six Apollo lunar expeditions from 1969 to 1972. McDivitt was the command pilot for Gemini 4 in 1965. He was commander of Apollo 9, a 10-day Earth orbital mission, launched March 3, 1969. This was the first flight of the complete set of Apollo hardware and the Lunar Module. In August 1969 he became manager of the Apollo Spacecraft Program. He was program manager for Apollo 12 through 16. McDivitt's award will be displayed at the College of Engineering. ["NASA Honors Veteran Gemini-Apollo Astronaut James McDivitt," **NASA Media Advisory #M06-149**, September 22, 2006.]

September 23: Union plans to picket launch

Local 127 of the Security, Police and Fire Professionals of America plans to hold an "informational picket" starting at 11 a.m. Monday at the main entrance of the Cape Canaveral Air Force Station -- the day of a scheduled launch of a Delta 2 rocket. Union representatives said Space Gateway Support, which employs security police and various other workers at Cape Canaveral Air Force Station and Kennedy Space Center, "has refused and failed to engage in meaningful or realistic collective bargaining for an amended contract." The union is ramping up pressure on the company, since Space Gateway Support laid off about 68 people on Sept. 15. Seventeen of them were from Local 127. "Our main issues are twofold: Reduction in force, and failing to engage in a meaningful and realistic collective-bargaining agreement," Local 127 President Jerry Heyman said Friday. "We are in limbo at this time, while we are waiting for the selection of an arbitrator, at which time we will be in 'interest arbitration' for another three-year agreement." Union workers last got a new contract in 2003, and that contract expired on May 31. "The company has made more than 180 proposed changes to the contract, like, with seniority, holidays, grievance, vacation, and they want to take away many benefits that have been negotiated over the 50 years this contract has been in existence," Local 127 Vice President Joe Nocera said. "Recently, we had layoffs, and, with the proposed changes, that's forced us to get back to the table." "The parties haven't reached an agreement, and we respect what they have to do, but both parties have tried very hard to reach an agreement, and we, unfortunately, could not," said Sam Gutierrez, public affairs manager for Space Gateway Support. "Our concern is making sure we're serving our customer." Web posted. (2006). [Union plans to picket launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 23].]

September 27: Population boom inspires scientists to study birds

They bump shuttles at liftoff and live to squawk about it. In July of 2005, the tip of the external fuel tank of shuttle Discovery smashed into at least one turkey vulture. The strike caused no significant damage but triggered stepped-up patrols to pick up road kill at the Kennedy Space Center. That tip came from a consultation with Disney officials. "By taking the road kill out of the main roads, we have, we believe, reduced the number of vultures," said Steve Payne, NASA's test director. The space center shoots a shotgun-like device to scare buzzards from launch pads and landing strips, with mixed success. Past attempts to trap them or "stink" them away with chemical odors failed. "They find very little offensive. We've tried everything," Payne said, adding that buzzards sometimes nest atop the shuttle fuel tanks. "We have had scratches on our tanks, where hawks and vultures will roost on top of it and leave scratch marks," he said. In coming shuttle launches, they'll try a new, 18-foot tall canon NASA bought that can blast a focused sound wave to scare birds from up to a few thousand feet away. NASA also bought new radar to scan for birds near launch pads and is considering using trained falcons to scare off the vultures, Payne said. Buzzards have long been the bane of those who maintain telephone, water supply and Doppler radar towers. "They have a highly acidic digestive tract from what we know," Avery said. "They're very adaptable." Web posted. (2006). Population boom inspires scientists to study birds [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 27].]

Expendable Launch Vehicle Status Report

Mission: Solar Terrestrial Relations Observatory (STEREO) ; Launch Pad: 17-B, Cape Canaveral Air Force Station ; Launch Vehicle: Boeing Delta II ; Launch Date: No earlier than Oct. 25, 2006 ; Launch Time: TBD. After an assessment of all engineering data, engineers have determined that the Delta II second stage tank for STEREO is ready for processing to continue. A final determination of flightworthiness will be made prior to spacecraft mating to the Delta II rocket. The second stage will be re-erected atop the first stage on Friday, Sept. 29 at Pad 17-B. STEREO remains at the Astrotech Space Operations Facility. During the hiatus, the spacecraft flight batteries were reconditioned. The twin solar observatories remain stacked on top of the third stage. The transportation canister will now be reinstalled in preparation for moving to the launch pad on Oct. 12. KSC News Center (2006). **Expendable Launch Vehicles Status Report ELV-092706** [Online]. Available E-mail: ksc@newsletters.nasa.gov [2006, September 27].]

NASA opens door to new era

NASA quite literally opened the door Tuesday on a new era in space exploration at Kennedy Space Center. For the first time since the end of the Apollo program in the mid-1970s, NASA raised an 80-foot-tall door on the west side of the KSC Operations & Checkout Building. The high bay inside -- which once housed moon-bound Apollo spacecraft -- is being converted into a factory for the Crew Exploration Vehicles that will carry U.S. astronauts back to the lunar surface before the end of the next decade. The final assembly and integration of the new Orion spacecraft will be performed there by Lockheed Martin, which will build up to eight of the ships under a contract that could worth more than $8 billion through 2019. "This is truly a symbolic event," Russell Romanella, director of the International Space Station and Payload Processing Directorate at KSC, told a crowd of 100 who gathered for the ceremonial reactivation of

the building's West Vertical Door. "We have an exciting future, and today we are really opening the door to exploration." Lockheed Martin won the lucrative contract for a new fleet of Apollo-style space capsules earlier this month. Orion spacecraft are scheduled to begin flying sorties to and from the international station by 2014 and moon missions by 2020. A work force of 300 to 400 people will perform the assembly and checkout work at KSC. Local economic development officials said luring the new work was an important step toward attracting more than launch operations to Florida. "This is new business for KSC," said KSC Director Jim Kennedy. "It's a paradigm shift in the industrial climate of this state," added Lynda Weatherman, president and chief executive officer of the Economic Development Commission of Florida's Space Coast. "This is just the beginning." Originally known as the Manned Spacecraft Operations Building, the facility is being converted with $35 million in incentive money offered to Lockheed Martin by the state of Florida. The state also is providing $735,000 to clean out the building in preparation for the conversion. The clean-out work, which is being performed by The Boeing Co., so far has involved tearing down test stands and hauling away more than 50 tons of structural steel. Thirty pallets piled high with surplus equipment also has been removed from the building. Built between 1962 and 1964, the building has quite a storied history. Some of NASA's Gemini capsules and all of the agency's Apollo Command Modules and Service Modules were inspected, tested and integrated in the five story facility, which houses more than 600,000 feet of offices, laboratories, astronaut crew quarters and payload processing areas. The spacecraft flown during the Apollo-Soyuz Test Project and Skylab space station program also were assembled and tested at the facility. The cylindrical science laboratory modules and instrument pallets flown during 26 Spacelab missions also were processed in the facility. Those missions were launched aboard space shuttles between November 1983 and April 1998. "Pretty amazing history," Romanella said. Web posted. (2006). Population boom inspires scientists to study birds [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 27].]

Hearings about nuclear-powered probe planned

A sophisticated science laboratory bound for Mars will draw its electrical power either from a nuclear generator or solar arrays, and local residents this week can weigh in on NASA's choice. The space agency plans two public hearings today on the potential danger of launching the Mars Science Laboratory with a plutonium-powered generator, which is NASA's preferred method of powering the craft. Launch of the big Mars rover is set for sometime between September and November 2009 on an Atlas 5 rocket. Safety studies by NASA and the Department of Energy show there is a 1 in 420 chance of an accident early in the flight resulting in a release of radioactive material over communities near Cape Canaveral Air Force Station. Two public hearings, from 1 p.m. to 4 p.m. and 6 p.m. to 9 p.m. today, will give area residents a chance to hear NASA's explanation of the mission, the dangers and the safety measures being taken by the government. The three-hour sessions at the Florida Solar Energy Center in Cocoa also include time for people to speak in support of or opposition to the launch of the new Mars rover. The nuclear generator is similar to ones launched on past space missions, including the launch earlier this year of the New Horizons probe bound for Pluto and the 1997 launch of the Cassini probe now orbiting Saturn. Public hearings are a routine step in the government's effort to

inform the public and get feedback before launch. In the past, such missions have prompted protests of varying size and intensity. Anti-nuclear protesters have argued against the mission on the basis that the danger to the public is too great and that the science purposes touted by the space agency are a cover for plans to test technologies that could ultimately become nuclear space weaponry. "Time will likely prove us to be right as we say that fabricating and launching nuclear power is too much of a risk and danger to this planet," said Bruce K. Gagnon, who is the leader of an anti-nuclear peace organization that has repeatedly protested such launches. Gagnon said in an e-mail interview that his group would fight this launch, too. Past protests have not stopped NASA from launching probes carrying the plutonium power plants, which are called Radioisotope Thermoelectric Generator. The device generates electricity that powers the spacecraft's science instruments, communications tools and other systems on the surface of Mars. NASA has a backup plan to outfit the Mars Science Lab with solar arrays to do the same job if it is ultimately deemed that the nuclear generator should not be used. Doing so would require the addition of some smaller nuclear-powered heating devices, but those would carry a fraction of the plutonium and pose substantially less risk. The plutonium fuel is not the highly explosive kind used in weapons. It is a different grade that is only dangerous to people if reduced to fine dust, and the generator itself is designed to make sure that does not happen. The generators are subjected to intense testing to make sure they will hold up to violent rocket explosions. Pellets of plutonium, much like ceramic, are designed not to break up even if they somehow escape the generator in a mishap. The biggest danger for Brevard residents comes from an accident on the launch pad or within a minute after liftoff. Studies found once the rocket arcs out over the ocean, there is no chance of a plutonium release if it crashed into the water. If there is an accident, people living near the launch site would be told to take shelter inside buildings until government detection teams determine whether there was a radioactive release and whether residents are at risk. Web posted. (2006). Hearings about nuclear-powered probe planned [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 27].]

September 28: Critical door on Discovery damaged

One of the two external tank umbilical doors on the underside of Discovery was damaged this week, but NASA officials say the problem is not expected to delay the planned launch of the shuttle in December. Senior shuttle program managers, meanwhile, will meet today to decide whether to move a planned Dec. 14 launch up to Dec. 7. Six astronauts aim to fly an International Space Station construction mission aboard the orbiter. Kennedy Space Center workers were replacing a power distribution unit on one of the doors Wednesday when apparent damage was done to a bell crank and push rod that are part of the mechanism used to open and shut the door. The door is one of two that swing shut after the shuttle's external tank is jettisoned from the orbiter nine minutes into flight. It must close and seal properly to protect the ship and its crew from extreme temperatures encountered during atmospheric reentry. KSC spokesman Bruce Buckingham said engineers are troubleshooting the problem, trying to determine whether the bell crank and push rod will have to be replaced. Parts from the orbiter Endeavour likely would be used in that case. Engineers still are determining how long any replacement work might take. Buckingham said the problem at this point is not expected

to threaten either a Dec. 7 or Dec. 14 launch date. Web posted. (2006). Critical door on Discovery damaged [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, September 28].]

Jeb Bush to visit for space celebration

Gov. Jeb Bush will be in Brevard County this afternoon to help celebrate Florida's role in the next generation of space exploration, the $8 billion construction of a space shuttle replacement. Aerospace and defense giant Lockheed Martin won the lucrative contract earlier this month to build an Apollo-style crew vehicle called Orion. It will be used to service the International Space Station and for lunar missions. Bush will be joined by Lockheed's Orion program manager, Cleon Lacefield, as well as other state and local officials at the Radisson Resort and Port Convention Center at 1:30 p.m. Lockheed's contract calls for the construction of up to eight vehicles through 2019. The work will employ 300 to 400 workers who will do assembly and checkout at Kennedy Space Center. The work will be done in the Manned Spacecraft Operations Building, which is being converted with $35 million in economic development money provided by the state. Florida also is paying $735,000 to clean out the building to make it ready for the conversion. Web posted. (2006). Jeb Bush to visit for space celebration [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 28].]

Space Shuttle Processing Status Report

Mission: STS-116 - 20th International Space Station Flight (12A.1) - P5 Truss Segment ; Vehicle: Discovery (OV-103) ; Location: Orbiter Processing Facility Bay 3 ; Launch Date: No earlier than Dec. 7, 2006 ; Launch Pad: 39B ; Crew: Polansky, Oefelein, Curbeam, Higginbotham, Patrick, Fuglesang and Williams ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. During today's Program Requirements Control Board meeting, Space Shuttle Program management moved the target launch date for Discovery to no earlier than Dec. 7, a week earlier than originally planned. This change allows for workers at both Kennedy Space Center and Johnson Space Center to enjoy additional time with their families during the December holidays. At this time, there is currently a range conflict with an Atlas V launch, which is currently on the range on December 8 and 9. NASA will work with Lockheed-Martin and the Air Force to determine whether we will have a launch opportunity on December 7. Until this negotiation is complete, we understand that December 7th is a target and that we are not on the range schedule at this time. As always, the official launch date is not set until the Flight Readiness Review. Technicians continue processing Discovery in the Orbiter Processing Facility for its launch to the International Space Station. The keel yoke assembly was installed in the payload bay last weekend. The assembly holds the payload in the bay during the mission. Workers completed the payload premate test in preparation of the Spacehab module being installed in the payload bay. Engineers are reviewing potential damage to orbiter Discovery's right-hand external tank door mechanism, which resulted during the process of reassembling the linkage following the change out of the power drive unit. No impact to the processing schedule is expected. The external tank scheduled to fly with Discovery, designated ET-123, arrived by barge at Kennedy Space Center from Michoud Assembly Facility in New Orleans last week. The tank was lifted into the checkout cell in the Vehicle Assembly Building for final work prior to being mated to the solid rocket

boosters. Mission: STS-117 - 21st International Space Station Flight (13A) - S3/S4 Truss Segment Solar Arrays ; Vehicle: Atlantis (OV-104) ; Location: Orbiter Processing Facility Bay 1 ; Launch Date: No earlier than Feb. 22, 2007 ; Launch Pad: 39B ; Crew: Sturckow, Archambault, Reilly, Forrester, Swanson and Olivas ; Inclination/Orbit Altitude: 51.6 degrees/122 nautical miles. Following the landing of Atlantis on Sept. 21, technicians towed the vehicle into the Orbiter Processing Facility to begin preparing it for its next mission to the International Space Station. Thermal protection system post-flight inspection is 27 percent complete. Flight crew equipment removal was completed Monday. Technicians installed payload bay door strongbacks on Monday in preparation for the doors to open. On Wednesday, the doors were opened and the Ku-band antenna was deployed. Nose cap and chin panel thermography has begun and preparations are under way to begin thermography on the wing leading edges. Endeavour (OV-105); Endeavour remains powered down in Orbiter Processing Facility bay 2 and technicians continue to prepare the vehicle for its first launch following an extensive modification period. Technicians completed the environmental control and life support system functional test. Work continues on the orbiter boom sensor system manipulator positioning mechanism. The mechanisms serve as the pedestals that hold the boom in place in the payload bay when it is not in use. Owner-press-release. (2006). **Space Shuttle Processing Status Report #S-092806** [Online]. Available E-mail: owner-press-release@spinoza.public.hq.nasa.gov [2006, September 28].]

Next shuttle mission to do complex electrical work

NASA managers today agreed to move up the target launch date for the shuttle Discovery and mission STS-116 from Dec. 7 to Dec. 14 at roughly 9:38 p.m. EST. Agency managers have not yet formally relaxed a post-Columbia daylight launch constraint, but that issue will be discussed at the next program requirements change board meeting Oct. 5 at the Johnson Space Center in Houston. Still unresolved is conflict with a Lockheed Martin Atlas 5 rocket carrying a military payload that currently is scheduled for launch Dec. 7 from the Cape Canaveral Air Force Station. An overview of the STS-116 mission is posted below. Shuttle mission STS-116, a December visit to the international space station, represents the most complex construction flight yet attempted, a three-spacewalk mission to rewire the U.S. segment of the outpost and activate its sophisticated cooling system. Construction has now reached the point where an interim power system, designed to support the station during its initial assembly, needs to be upgraded to support the eventual attachment of new research modules. And with the delivery of new solar arrays by shuttle astronauts earlier this month, NASA is finally ready to activate the lab's permanent power and cooling systems. But in order to do that, the astronauts must first retract one wing of the older solar arrays providing interim electricity to the U.S. segment of the station. Flight controllers then will power down the lab's two major circuits, one at a time, while spacewalking astronauts plug electrical cables into different sockets. With the solar arrays attached by the shuttle Atlantis' crew in September, "we'll now be generating enough power we can bring the permanent cooling system on line and start using it," said Paul Hill, mission operations manager at the Johnson Space Center. Web posted. (2006). Next shuttle mission to do complex electrical work [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, September 28].]

September 30: **KSC Visitor Complex offers ticket deal**

The Kennedy Space Center Visitor Complex is offering Florida residents one year of access for the price of one daily admission. Florida residents will receive a 12-month pass to the Kennedy Space Center Visitor Complex with the purchase of a one-day Maximum Access pass. The tickets are only available online and over the phone, and the offer expires Dec.15 of this year. Owning a 12-month pass comes with a few perks, including first access to the Shuttle Launch Experience, opening May of next year, and a 10 percent discount in the gift shop. Pass holders also get admission to IMAX films and the Astronaut Hall of Fame. Web posted. (2006). KSC Visitor Complex offers ticket deal [Online]. Available WWW: http://www.floridatoday.com/ [2006, September 30].]

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October 2: NASA Awards Space Program Operations Contract

NASA has awarded a letter contract valued at $1.1 billion for the first six months to United Space Alliance (USA), LLC, of Houston. When definitized, it will result in a four-year contract through Sept. 30, 2010, to cover Space Shuttle Program operations. Efforts under the Space Program Operations Contract include work and support for mission design and planning; software development and integration; astronaut and flight controller training; system integration; flight operations; vehicle processing, launch and recovery; vehicle sustaining engineering; flight crew equipment processing; and Space Shuttle and International Space Station-related support to the Constellation Program. It is a cost reimbursement contract, with provisions for award and performance fees. Work in support of this contract is performed at USA's facilities in Houston; Huntsville, Ala.; Kennedy Space Center, Fla.; major subcontractor facilities in Huntington Beach, Calif.; Houston; and Cape Canaveral, Fla. ["NASA Awards Space Program Operations Contract," **NASA Contract Release #C06-054**, October 2, 2006.]

October 3: Spokane woman wins NASA's Greatest Fan video contest

A Spokane woman has won NASA's Greatest Fan video contest. Kayla LaFrance's 30-second video is called "Mars Mates Forever." It features still photos set to music. LaFrance's video was tops among 15-hundred entries from contestants aged 13 to 24. She and a friend will be treated to a five-day trip to the Kennedy Space Center in Florida to witness a shuttle launch. She is an engineering physics major in her senior year at Belmont University in Nashville, Tennessee. Suprisingly, another Spokane woman was also a finalist -- Becca Millsap, a junior at Clark High School. Web posted. (2006). [Spokane woman wins NASA's Greatest Fan video contest [Online]. Available WWW: http://www.kndo.com/ [2006, October 3].]

NASA research earns Nobel Prize

John Mather of NASA's Goddard Space Flight Center and George Smoot of the University of California at Berkeley won the Nobel Prize in physics today "for their discovery of the blackbody form and anisotropy of the cosmic microwave background radiation," according to the Royal Swedish Academy of Sciences. They did research into the earliest days of the universe, using data from NASA's Cosmic Background Explorer or COBE satellite, launched in 1989. To quote the press release, "The COBE results provided increased support for the Big Bang scenario for the origin of the Universe, as this is the only scenario that predicts the kind of cosmic microwave background radiation measured by COBE. These measurements also marked the inception of cosmology as a precise science." Web posted. (2006). [NASA research earns Nobel Prize [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, October 3].]

NASA awards space operations contract

NASA has awarded a space program operations contract valued at $1.1 billion for the first six months of its term to United Space Alliance LLC, of Houston. When formalized, the agreement will result in a contract running through Sept. 30, 2010. The National Aeronautics and Space Administration operations agreement covers work and support for

mission design and planning; software development and integration; astronaut and flight controller training; system integration; flight operations; vehicle processing, launch and recovery; vehicle sustaining engineering; flight crew equipment processing; and space shuttle- and International Space Station-related support to the Constellation Program. NASA said the contract includes provisions for award and performance fees. Work in support of this contract is performed at Space Alliance facilities in Houston; Huntsville, Ala.; and Cape Canaveral, Fla. Web posted. (2006). [NASA awards space operations contract [Online]. Available WWW: http://www.upi.com/ [2006, October 3].]

FTC approves ULA formation

The Federal Trade Commission (FTC) has agreed to allow the formation of the United Launch Alliance (ULA), the merger of the government launch operations of Boeing and Lockheed Martin, but with conditions. In a statement released late Tuesday, the FTC said that it would allow Boeing and Lockheed to proceed with the ULA, but only under the terms of a consent decree that requires the companies to cooperate equally with all manufacturers of government payloads and to protect sensitive information provided by those payload manufacturers. Proponents of the ULA argued that the joint venture would save the government money, while satellite manufacturers and other launch vehicle developers expressed concern that the ULA would give the two companies an unfair advantage for government launch and satellite work. Boeing and Lockheed announced the formation of the ULA in May 2005, hoping to win approval for the deal by the end of last year. In separate statements both companies said they would press ahead with completing work on ULA's formation but did not set a date for the deal to close. Web posted. (2006). [FTC approves ULA formation [Online]. Available WWW: http://www.spacetoday.net/ [2006, October 3].]

October 4: State grant to support NOTU

A state grant of $160,000 that will go for a study of Naval Ordnance Test Unit is among 14 projects around the state to help solidify ties to the military that could help keep projects in the state. Other projects from Key West to Jacksonville shared in the $4 million in grants, Gov. Jeb Bush announced Tuesday. Business and community leaders rallied successfully to get NOTU off a list for closure during the 2005 round of base closures. Web posted. (2006). [State grant to support NOTU [Online]. Available WWW: http://www.floridatoday.com/ [2006, October 4].]

Look ahead at the launch prep work

The launch team at Kennedy Space Center is pressing ahead toward the scheduled Dec. 7 launch of shuttle Discovery on a construction mission to the International Space Station. The major milestones between now and launch are beginning to stack up and we thought you might want a quick look guide to the current processing schedule: * Oct. 13: Connect external tank to the solid rocket boosters. * Nov. 1: Discovery rolls from its processing hangar to the Vehicle Assembly Building, where it is lifted into positioned and connected to tank and boosters. * Nov. 8: A crawler-transporter hauls the fully assembled shuttle stack to Pad 39B. * Nov. 16: STS-116 crew and launch team participate in countdown demonstration test. * Dec. 4: Countdown begins. * Dec. 7: Launch at 9:38 p.m. A date for the Flight Readiness Review is not yet finalized. Also,

NASA and Lockheed Martin Corp. still must work out a scheduling conflict with the U.S. Air Force's Eastern Range because Lockheed has an Atlas 5 already set to launch that day. Presumably, the Atlas 5 would move back a couple days to make way for NASA. Web posted. (2006). [Look ahead at the launch prep work [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, October 4].]

Ares I Crew Launch Vehicle First Stage Contract Modification

NASA is extending a previous contract action with ATK Thiokol of Brigham City, Utah, to continue design and development of the first stage for the Ares I crew launch vehicle. The extension has a maximum value of $35 million. Ares I is the crew launch vehicle that will transport the Orion crew exploration vehicle, its crew or other small cargo payloads to low-Earth orbit. The first stage will consist of a single solid rocket booster similar to those used on the space shuttle, but with a fifth motor segment added. The upper stage will consist of a J-2X liquid hydrogen, liquid oxygen engine and the associated propellant tanks and main propulsion system. The contract action maintains the design, development, test and evaluation schedule; expedites the procurement of new nozzle metal hardware and production tooling for propellant casting and nozzle fabrication; and maintains the necessary design and engineering analysis leading to a Systems Requirements Review in December 2006. ["Ares I Crew Launch Vehicle First Stage Contract Modification," **NASA Contract Release #C06-057**, October 4, 2006.]

October 5: Merritt Island refuge among most 'at risk'

The Defenders of Wildlife has listed the Merritt Island among 10 refuges most at risk from harmful impacts of global warming. Warmer coastal waters could trigger more algae blooms such as red tide that kill fish, manatees and other marine life. Shifting gender ratios of sea turtles could hatch more females but too few males, gutting their numbers. While refuge officials temper such dire predictions, they say Defenders' annual refuge report raises important issues and public awareness about the challenges refuges face from climate change. "They lean a little bit to the left, but I think their perspective is pretty well founded in science," said Dorn Whitmore, a refuge ranger at Merritt Island for about three decades. The Washington, D.C.-based nonprofit group released its annual Refuges at Risk report Thursday to coincide with the upcoming National Wildlife Refuges Week, Oct. 7 to Oct. 14. Web posted. (2006). [Merritt Island refuge among most 'at risk' [Online]. Available WWW: http://www.floridatoday.com/ [2006, October 5].]

October 6: NASA safety panel to recommend changes to review process

The Aerospace Safety Advisory Panel (ASAP) plans to recommend that NASA adopt a new method of categorizing and distributing information during flight safety reviews that will give more latitude to lower-level managers to solve simpler problems on their own, while leaving senior managers free to focus on larger, thornier issues. Retired Vice Adm. Joseph Dyer, chair of the ASAP and former head of Naval Air Systems Command (NAVAIR), told The DAILY that NASA's current philosophy for flight safety reviews is to provide all levels of management with as much information as possible. "At DOD we tried to tier information such that easier things got taken care of at lower levels, then at the top you had time to really focus on the hard ones," Dyer said. "NASA's way of

working similar briefings and decision processes is really to bring all the information to all the people... We think there is an opportunity to further enhance safety by highlighting those issues that require senior-level judgment, and setting them apart from the laborious details that the current culture still embraces." During safety reviews, a "tremendous depth and breadth of information" is made available all the way up the chain to top officials such as Chief Safety Officer Bryan O'Connor, NASA Chief Engineer Chris Scolese and even Administrator Michael Griffin, Dyer said. NASA personnel have told Dyer that the roots of this approach go back to the way rocket pioneer Wernher von Braun managed reviews. The ASAP's recommendations for "tiering" information will be in its next quarterly report, Dyer said. "There's an opportunity to improve quality of life of the senior folks, to give more empowerment to the junior folks, and to focus on the hard [problems]," he said. Originally formed in the wake of the Apollo 1 fire in 1967, the ASAP is charged with advising NASA on safety. Its next meeting will be at Johnson Space Center in Houston, where the panel will work on a report to Congress due by year's end. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "NASA safety panel to recommend changes to review process," [Electronic]. Vol. 220, No. 4, [October 6, 2006.].]

Debris Damage to Shuttle Is Found

The shuttle Atlantis came back from space last month with a tiny but significant hole in it, apparently from a collision with a piece of space debris, NASA officials said yesterday. The micrometeoroid did not damage the delicate thermal panels and tiles that protect the shuttle on its return to earth; instead, it struck a radiator panel that extends from the payload bay doors. The doors hang open during missions to get rid of heat produced by the shuttle's systems. By historical standards, it was a major hit, said James Hartsfield, a NASA spokesman, who called it "the second-most-damaging particle that we've encountered in the program." Mr. Hartsfield added, however, that the damage was slight. "It posed no danger to the crew and no change to the mission," he said. The hole is about a tenth of an inch in diameter at the entry point, with damage extending about an inch around and a half inch deep within the radiator itself, where the particle shattered. On the other side of the radiator, it left an exit hole three-hundredths of an inch in diameter and a crack two-tenths of an inch long. The radiators are tucked inside the bay when the doors are closed shortly before returning to earth, so the damaged area never faced the searing heat of re-entry. It was superheated plasma entering a hole in the wing of the shuttle Columbia on Feb. 1, 2003, that caused the loss of that craft and its crew of seven. The obvious high velocity of the impact meant that the debris that struck the Atlantis did not come from the shuttle itself, Mr. Hartsfield said, since objects floating away from the shuttle have a low velocity relative to the speed of the shuttle. Web posted. (2006). [Debris Damage to Shuttle Is Found [Online]. Available WWW: http://www.nytimes.com/ [2006, October 6].]

October 9: Road Kill Posse PSA

The Road Kill Posse at Kennedy Space Center is still trying all it can to get the word out about the dangers of big birds swarming over the nation's launch site. The latest offering to get the word out to the troops: a public service video on the KSC web site that can't be missed. The folks out at KSC obviously had some fun with that, but they're serious about

this issue. Road kill attracts vultures. Vultures are a real threat. The one that recently met its demise in a collision with Discovery's external tank posed a serious danger. The video warns workers that post-flight analysis shows a vulture strike could be catastrophic for the shuttle and its crew. Web posted. (2006). [Road Kill Posse PSA [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, October 9].]

October 10: NASA to name moonlander after Greek goddess Artemis
Artemis is the preferred name for NASA's proposed Lunar Surface Access Module (LSAM), which is expected to land four astronauts at the Moon's southern pole from 2020 for missions that initially will last up to a week. Artemis was a daughter of Greek god Zeus and is identified with the Greek Moon goddess Selene. NASA sources confirm the name choice. The US space agency released a request for information (RFI) of lunar lander concept studies in May. Participants in the study were asked to refine the LSAM design including descent stage propulsion system packaging, crew cabin layout, airlock design and options for unmanned operation of the LSAM to deploy lunar outpost modules and equipment. NASA has already named its crew exploration vehicle Orion, and its launcher Ares I. The proposed heavylift cargo booster is being called Ares V. These names have been registered with the US Patent and Trademark Office, but the government organisation's website shows no applications for Artemis to be trademarked by NASA. Web posted. (2006). [NASA to name moonlander after Greek goddess Artemis [Online]. Available WWW: http://www.flightglobal.com/ [2006, October 10].]

October 11: Visitor complex, astronaut hall welcome locals this weekend
Two of the best space museums in the United States are free to local residents this weekend. On a normal day, it would cost $38 for adults and $28 for children (ages 3 to 11) to get into the Kennedy Space Center Visitor Complex and the Astronaut Hall of Fame. All day on Friday, Saturday and Sunday, any resident of Brevard County gets in for nothing, as long as they bring proof they live here and food for the poor. The freebie is a yearly show of thanks by the private company that operates the visitor complex and hall of fame, both located east of U.S. 1 on State Road 405 in Titusville. Delaware North Park Services began the free weekend for locals in 1999, about the time the company began charging theme park-style fees to get into the NASA-owned visitor facility long accessible to the public free. Delaware North calls the event "Salute to Brevard Residents." The company says in a written release promoting the event that the free weekend is a way "to thank the people of Brevard for their continued support of Kennedy Space Center Visitor Complex's mission: to tell the NASA story and inspire all people to support the exploration of space." A driver's license or utility bill will be good enough to demonstrate you are a Brevard resident. Local residents also will get 10 percent off items bought from the gift shop. The event serves a dual purpose: feeding the local hungry. Delaware North is collecting food for area food banks. Although a donation is not required to get into KSC or the hall, the company asks each person coming through the gates for free to bring one canned good or nonperishable food item. The donations will go the North Brevard Charities, Central Brevard Sharing Center and South Brevard Sharing Center. Web posted. (2006). [Visitor complex, astronaut hall welcome locals this weekend [Online]. Available WWW: http://www.floridatoday.com/ [2006, October 11].]

October 13: Tank, boosters mated as crew checks things out at KSC
Launch processing crews this morning finished connecting the external tank to the twin solid rocket boosters for NASA's next space shuttle mission. The operation to lift the tank into place and then mount it between the booster rockets began yesterday and finished this morning. It's a key step toward NASA's targeted Dec. 7 launch of shuttle Discovery on another space station construction mission. Also at KSC this week, Discovery's crew is checking out its spaceship and the cargo as part of what's called the Crew Equipment Interface Test. The astronauts are here through Saturday morning looking over the space station truss segment they will deliver and install as well as their orbiter. Web posted. (2006). [Tank, boosters mated as crew checks things out at KSC [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, October 13].]

October 16: Shuttle manifest summit under way
A summit aimed at sorting out a launch schedule for NASA's remaining shuttle flights is under way today as NASA and contractor managers try to determine how best to finish building the International Space Station. NASA is planning to launch at least 14 more missions to complete the orbiting outpost and perhaps another to service the Hubble Space Telescope. The launch dates for those flights largely will depend on a complex combination of factors that include the agency's budget, external tank delivery dates, shuttle modifications and the timing of crew rotation missions to the international outpost, among other things. Launch of shuttle Discovery on the next station construction mission remains scheduled for Dec. 7, but dates for flights beyond that could change. Web posted. (2006). [Shuttle manifest summit under way [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, October 13].]

October 18: U.S. Says 'Keep Out of My Space'
The White House has quietly put out a new National Space Policy — a document that, among other things, makes it clear that the Bush administration will not sign any treaty that limits America's ability to put weapons in orbit. The document, much of which is classified, also promotes the growth of private enterprise in space, and calls on NASA to continue its exploration missions, but those come after a call "to ensure that space capabilities are available in time to further U.S. national security, homeland security and foreign policy objectives. " "Freedom of action in space is as important to the United States as air power and sea power," the policy states. "Consistent with this policy, the United States will preserve its rights, capabilities and freedom of action in space ... and deny, if necessary, adversaries the use of space capabilities hostile to U.S. national interests." In other words, analysts say, don't expect the United States to sign any new treaties that try to keep weapons from being launched. Web posted. (2006). [U.S. Says 'Keep Out of My Space' [Online]. Available WWW: http://www.abcnews.com/ [2006, October 18].]

NASA announces new International Space Station crew
NASA and the Russian Federal Space Agency have named two astronauts and two cosmonauts to the next International Space Station crew, known as Expedition 15. Astronauts Clayton C. Anderson and Daniel M. Tani will travel to the station next year and work as flight engineers. Cosmonauts Fyodor N. Yurchikhin and Dr. Oleg V. Kotov

will spend six months aboard the orbiting laboratory. Anderson will get a ride to the station aboard Space Shuttle Endeavour's STS-118 mission, targeted for launch in June 2007. He will return to Earth on shuttle Atlantis on mission STS-120. That flight will carry his replacement, Tani, to the station. Tani will return on shuttle mission STS-122, targeted for October 2007. Yurchikhin will command Expedition 15, and Kotov will serve as station flight engineer and Soyuz commander. Yurchikhin and Kotov will fly to the complex aboard a Soyuz spacecraft scheduled to launch in March 2007. Until Anderson arrives, astronaut Sunita L. Williams will serve as Expedition 15's third crew member and flight engineer. She will fly to the station on STS-116 in December. Web posted. (2006). [NASA announces new International Space Station crew [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, October 18].]

Twin solar observatories set for launch

A Delta rocket and twin solar observatories passed a critical test this week, setting the stage for a scheduled launch next Wednesday from Cape Canaveral Air Force Station. The 12-story rocket and its payload -- NASA's Solar Terrestrial Relations Observatory, or STEREO -- are slated to blast off from launch pad 17B between 8:38 p.m. and 8:53 p.m. that day. An all-systems test of the rocket and the two satellites was completed Monday, and a subsequent data review showed the Delta and its cargo are ready for launch. "That's the last major test we do before launch," said George Diller, a spokesman for NASA's Kennedy Space Center. The two STEREO spacecraft are designed to shed unprecedented light on solar explosions that can cause communications and power outages on Earth. The spacecraft will spend two years studying coronal mass ejections, which are violent explosions on the sun. The eruptions create bursts of solar wind that can disrupt satellite and radio communications on Earth and trigger problems with electrical power grids. They also create energetic particles that are hazardous to spacecraft electronics systems as well as astronauts working in low Earth orbit. The mission is a joint effort of the U.S., the United Kingdom, France, Germany, Hungary, Switzerland and the European Space Agency. Web posted. (2006). [Twin solar observatories set for launch [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, October 18].]

October 19: Firing Room 1 Gets a New Look

There are exciting changes ahead at Kennedy space Center, and the first step toward supporting future launches for NASA's Constellation Program is taking place in Firing Room 1 at the Launch Con troll Center. The Shuttle Processing Transition Team is working to decommission the firing room, also known as FR1, for transfer to the program by no later than January. The transition team held management briefings and determined that FR1 decommissioning would pose no risk to the Space Shuttle Program, which will use Firing Room 4 for all remaining launches. "Firing Room 1 is the first such facility to be transferred to the Constellation Program for reuse," said George Jacobs, ANSA shuttle program transition manager. FR1 recently was renamed the Young/Crippen Firing Room, in honor of Commander John Young and Pilot Robert Crippen as a tribute to their first space shuttle flight on mission STS-1 in April 1981. Mario Busacca of the Environmental Program Branch said the Launch Control Center is listed as an historic property on the National Register of Historic Places. Before work began, ANSA

analyzed the activity to determine if it would have an adverse effect on the property and shared plans for the decommissioning with the State Historic Preservation Office. According to Busacca, it was determined that removing the equipment from FR1 wouldn't cause the facility to lose its historic value. Curtis Williams, launch processing hardware and system software co-lead, said it's exciting to consider that the transition is one of the first steps toward providing an infrastructure that will eventually support mankind's return to the moon. He shared a little-known fact about FR1: the "Master Console" sign carries the signatures of many notable visitors, including Prince charles and Prince Andrew and astronauts Bob Crippen and Story Musgrave. "It is tremendously exciting to begin to see the physical transformation of the historic firing room that launched Apollo 11 and 13, as well as the first shuttle launch in 1981," said Mike Leinbach, NASA launch director. Web posted. (2006). [Firing Room 1 Gets a New Look[Online]. Available WWW: http://www.nasa.gov/mission_pages/constellation/main/fr1.html/ [2006, October 19

Bush, new space group want more jobs

Florida is not content with just winning the assembly and launch work for NASA's next human spaceship. Gov. Jeb Bush and the president of the state's new space agency say they aim to capture more pieces of NASA's next moon-landing program as well as investment and jobs created by space tourism and other private space businesses. "We need to attract high-wage jobs," Bush said. "We need to target our resources for high wage jobs in targeted areas and space is one of them." Space Florida, meeting Friday for the first time under new president Steve Kohler, mostly took care of basic transition housekeeping such as approving an initial $8.5 million annual budget and establishing target deadlines for hiring staff, reports and planning documents. Still, the governor and several of his highest-ranking economic development officials traveled to Kennedy Space Center to gather with the Space Florida board to get started on the new agency's work. Kohler, who took over the agency less than three weeks ago, gave the board of directors and the governor's contingent a broad overview of the agency's strategy going forward. Members of the board toured some key state-owned or state-financed facilities at KSC and Cape Canaveral Air Force Station as part of Friday's daylong activities. Approximately half of the agency's $8.5 million goes to operating expenses such as paying salaries and benefits and fixed costs for facilities such as the Space Life Sciences Laboratory constructed near KSC. The other half goes for economic development projects and other incentives aimed at luring new space jobs to Florida, whether from existing aerospace companies or the creation of new companies. In other business, the board voted to increase the loan the state has helped secure to finance a new shuttle simulator ride at the Visitor Complex from $35 million to $40 million. The complex operator, Delaware North Park Services, is constructing a ride aimed at giving tourists a chance to experience what it feels like to launch in a space shuttle. The Shuttle Launch Experience is set to open later this spring. The additional funds will pay for enhanced services around the ride, such as a pizza restaurant, better landscaping and a Kodak photo stand, officials said. The ride will be paid for over time with a portion of the tourist complex's ticket sales. Web posted. (2006). [Bush, new space group want more jobs[Online]. Available WWW: http://www.floridatoday.com/ [2006, October 20].]

October 21: Lunar Lander Challenge prizes go unclaimed

The only team approved to compete in NASA's Lunar Lander Challenge prize competition failed to win any of the $2 million in prize money when their vehicle failed in several attempts to claim part of the purse. The inaugural competition, sponsored by Northrop Grumman, took place at the X Prize Cup in Las Cruces, New Mexico on Friday and Saturday. Although four teams had signed up to participate, only one, Armadillo Aerospace, completed their vehicle and won FAA approval to fly it at the event. Armadillo's first flight attempt for the less-difficult "Level 1" part of the competition on Friday failed when a hard landing on the first leg of the flight damaged some wires. The team repaired the vehicle, nicknamed Pixel, overnight, and flew it again Saturday morning, only to have it land only partially on a hard concrete pad and tip over. The vehicle wasn't damaged and Armadillo flew it again Saturday afternoon, successfully completing the first leg of the flight. However, on the return leg the vehicle tilted on liftoff, triggering an automatic shutdown that caused the vehicle to crash seconds later. The Level 1 version of the competition, part of NASA's Centennial Challenges program, requires vehicles to fly to an altitude of 50 meters, translate 100 meters to another pad and land, remaining in the air for at least 90 seconds, and then make an identical return trip. The unclaimed prize money will be held over for next year's competition. Web posted. (2006). [Lunar Lander Challenge prizes go unclaimed [Online]. Available WWW: http://www.spacetoday.net/ [2006, October 21].]

October 23: NASA Reaction

The Congressional Budget Office's (CBO) recent analysis of alternative launch programs to support NASA's exploration plans "largely...validated" NASA's choice to develop the shuttle-derived Ares launch systems, according to Jeff Hanley, the agency's Constellation program manager. CBO estimates that the total cost of the launch campaign to support a 2018lunar return, assuming NASA relies solely on the U.S. Air Force's Atlas Evolved Expendable Launch Vehicle (EELV), would be $26 billion, versus the roughly$30 billion NASA plans to spend during that time on Ares (DAILY, Oct. 18).However, CBO acknowledges that relying on EELV would involve many more launches than the two-launch scheme enabled by the shuttle-derived Ares 1and Ares 5, Hanley says. To get to a two-launch solution with EELV would involve "substantial" additional costs beefing up the vehicles, Hanley says. Also, "we would have to go build a new launch pad, new infrastructure, and all of that," he says. Another advantage of sticking with the shuttle's partially reusable solid rocket boosters (SRBs) is the fact that they can be recovered and analyzed after each flight, he says. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "NASA Reaction," [Electronic]. Vol. 220, No. 15, [October 23, 2006.].]

Hubble could soon learn its fate

The fate of what some scientists dub "the people's telescope" is again up in the air as NASA decides soon whether to squeeze in a last astronaut repair mission to extend the life of the Hubble Space Telescope. On Friday, NASA engineers will debate the safety of sending a fifth and final manned space shuttle flight to the 16-year-old telescope, probably in 2008. Soon afterward, NASA Administrator Michael Griffin will make the final call. His decision could prolong Hubble's ability to capture some the most

spectacular images of the universe well into the next decade or allow the telescope to deteriorate into oblivion by 2009 or 2010. The final Hubble repair mission was canceled by former NASA Administrator Sean O'Keefe 2 1/2 years ago after the space shuttle Columbia disaster which killed seven astronauts in 2003. The decision was roundly criticized by scientists and politicians, but the ex-administrator cited the risk to astronauts and the need to use the remaining shuttle flights to finish building the international space station. The remaining 14 shuttle flights are dedicated to completing the space station by the time the fleet is grounded in 2010. If a Hubble servicing mission is approved, it would have to be squeezed into the space station construction schedule sometime in early 2008. NASA also would have another shuttle on the launch pad, ready to make an emergency rescue trip if there were a catastrophic problem. Web posted. (2006). [Hubble could soon learn its fate [Online]. Available WWW: http://www.cnn.com/ [2006, October 23].]

October 24: Discovery cargo bay doors closed for rollover

Shuttle Discovery's payload bay doors now are closed after an additional cycling to ensure a latch is working properly. The bonding of the thousands of thermal tiles that protect the orbiter during atmospheric reentry also is complete, and the ship's planned Nov. 1 move to the Kennedy Space Center Vehicle Assembly Building remains on schedule. The shuttle's two clam shell-like cargo bay doors initially were closed last week, but engineers questioned the performance of a motor that drives a door latch. Sixty feet in length, the doors were opened and shut again late Monday, and the motor drive worked as expected. Technicians today are preparing the shuttle's three liquid-fueled main engines for the move from Orbiter Processing Facility No. 3. Rear-engine compartment doors are to be installed Wednesday and the aft of the vehicle will be checked for leaks on Thursday. Discovery and an astronaut crew are scheduled to launch on Dec. 7 on a International Space Station assembly flight, but a conflict with a previously scheduled Atlas rocket launch that day still must be resolved. A Dec. 7 shuttle liftoff would come at 9:39 p.m., marking NASA's first post-Columbia night launch. Landing in that case would come at 5:09 p.m. Dec. 18. Web posted. (2006). [Discovery cargo bay doors closed for rollover [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, October 23].]

October 25: Observatories to launch tonight

Twin NASA observatories are set to rocket into space today, heading off on a half-billion-dollar mission to shed light on powerful solar eruptions that wreak havoc on Earth and in orbit. Mounted atop a 12-story Delta 2 rocket, the spacecraft are scheduled to blast off from Cape Canaveral Air Force Station between 8:38 p.m. and 8:53 p.m. One of them is destined to fly ahead of Earth in orbit; the other will trail behind. Together, their instruments will beam back unprecedented three-dimensional views of solar explosions that endanger astronauts and airline crews, disable satellites, disrupt radio communications and trigger widespread terrestrial power outages. "We are going to be providing what I call 'really cool science' out of this mission," said NASA project manager Nicholas Chrissotimos. "It will be the first time we have ever taken 3-D images of the sun." The expected outcome: a revolution in solar science. The $550 million mission is aimed primarily at studying coronal mass ejections -- violent explosions that propel billions of tons of solar particles out of the sun's atmosphere and into

interplanetary space. About the size of electric golf carts, the 1,364-pound spacecraft are outfitted with suites of science instruments that will enable researchers to monitor coronal mass ejections as they erupt on the sun and plow toward Earth. The long-awaited mission had been slated to launch earlier this year but was delayed six months by a string of spacecraft and rocket problems. Two technical issues cropped up earlier this week but were resolved in time to press ahead with plans to launch at the opening of the 15-minute window today. Web posted. (2006). [Observatories to launch tonight [Online]. Available WWW: http://www.floridatoday.com/ [2006, October 25].]

Launch lights up the skies

A pair of solar satellites launched into orbit Wednesday should better NASA's rudimentary ability to forecast space weather -- an expertise deemed key to carrying out human expeditions to the moon. Lofted by a Boeing Delta 2 rocket, the spacecraft are designed to analyze violent solar eruptions that propel billions of tons of high-energy particles out of the sun's atmosphere and into interplanetary space. The $550 million mission got off to a spectacular start at 8:52 p.m. Powered by a liquid-fueled main engine and six solid rocket boosters, the Delta 2 blasted off from Cape Canaveral Air Force Station amid a brilliant flash of light. The sleek vehicle sped into the night sky, riding atop a blazing trail of flame. The six boosters -- and three more that lit one minute into flight -- peeled away from the rocket as planned, looking like tumbling orange embers as the Delta arced out over the Atlantic Ocean, streaking toward orbit. Liftoff was delayed 14 minutes while range safety officers verified the wind would not blow toxic clouds over populated areas in the event of a launch explosion. The satellites were dropped off in orbit 25 minutes after launch. Web posted. (2006). [Launch lights up the skies [Online]. Available WWW: http://www.floridatoday.com/ [2006, October 26].]

October 26: NASA Announces 2005 Agency Invention of the Year Winner

A groundwater treatment technology developed at the Kennedy Space Center, Fla., was recognized Thursday as NASA's 2005 Government Invention of the Year and Commercial Invention of the Year Award winner. The Emulsified Zero-Valent Iron (EZVI) technology was developed by researchers from Kennedy and the University of Central Florida, Orlando. The technology is used to clean up environmental contaminants in ground water around industrial areas, like rocket launch pads. The invention also provides a means to clean up Superfund sites. A traditional method of cleaning up areas with pollutants has been to pump out the groundwater and treat it to remove harmful contaminants. The EZVI process can exceed "pump and treat" systems in both the time it takes to achieve clean up and cost. During NASA's early years, the grounds around the launch complex at Kennedy became polluted with chlorinated solvents used to clean Apollo rocket parts. Dense Non-Aqueous Phase Liquids, or DNAPLs, were left untreated in the ground and contaminated the fresh water sources in the area. A DNAPL is denser than water and doesn't dissolve or mix easily in water. These pollutants are a common cause of environmental contamination at thousands of government and private facilities around the country. ["NASA Announces 2005 Agency Invention of the Year Winner," **NASA News Release #06-341**, October 26, 2006.]

Space Shuttle Discovery Set for Move to VAB

Discovery is scheduled to move from the Orbiter Processing Facility at NASA's Kennedy Space Center, Fla., to the Vehicle Assembly Building, where it will be attached to its external fuel tank and twin solid rocket boosters. The first motion is expected at 6 a.m. EST. Media must arrive at Kennedy's News Center by 5 a.m. to attend the event. Discovery's launch window opens Dec. 7. During its 11-day mission to the International Space Station, the STS-116 crew of seven astronauts will deliver a third truss segment, a SPACEHAB module and other key components during the shuttle's 20th mission to the International Space Station. ["Space Shuttle Discovery Set For Move to Vehicle Assembly Building," **NASA Media Advisory #M06-169**, October 26, 2006.]

October 27: NASA seeks alternate schemes after Orion TPS effort hits snag
NASA is quickly mounting an alternate effort to develop thermal protection system (TPS) materials to protect the Orion Crew Exploration Vehicle (CEV) during a return from lunar orbit, after having disappointing results from the primary development program. Only a single Boeing-led team was chosen to move forward into Phase II of the primary TPS program, known as Block 2. "NASA is not satisfied with the Orion heat shield development risk posture that results from the development of a single Block 2 heat shield," the agency said in procurement documents. "Consequently, NASA plans to procure alternative Block 2 TPS materials and heat shield systems. "NASA is moving forward swiftly with the alternative effort. The agency expects to issue a draft RFP by Nov. 1, followed by the final RFP on Nov. 13. Proposals will be due one month later, with up to three contracts awarded in mid-February. The teams will be expected to perform to a "tailored subset" of the requirements the Boeing team must fulfill in its ongoing Block 2work. The alternate program wraps up at the end of August 2008.NASA has divided Orion TPS development into Blocks 1 and 2. Block 1 is developing TPS materials good enough to protect the Orion during atmospheric reentry after a trip to low-Earth orbit. These temperatures will be less than those routinely experienced by the space shuttle. Block 2 is developing the more advanced TPS that will be needed to shield the Orion from the higher temperatures and stresses of returning from the moon. Block 1 was instituted as a risk-mitigation effort, so that if the more advanced Block 2 TPS wasn't ready in time for the earliest flights of the Orion to LEO, those missions could still take place. NASA awarded five teams Phase 1 contracts for the Block 2 TPS in November 2005: Applied Research Associates, for phen-carb materials; Boeing, for PICA (phenolic impregnated carbon ablator) materials; Lockheed Martin Space Systems, for advanced carbon carbon with calcarb material; and two Textron teams working on Avcoat 5026-39 material and 3D-Q/P-HD/LDmaterial. Each team delivered samples to NASA for thermal and structural testing, and a request for proposals (RFP) for Phase II was released in June. But in September, only the Boeing team received a Phase II contract. "The intended objective of the TPS Block 2 Phase II contracts was to reduce the current development risks for an Orion Block 2 heat shield by awarding multiple TPS contracts to develop preliminary heat shield designs and to demonstrate system maturity through manufacturing demonstrations and performance testing," NASA said. "This intended objective, however, was not accomplished. "The alternate procurement will be focused on developing technology and reducing risk, and won't be "specifically tied to the critical path scheduled for Orion initial operating capability," according to NASA. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "NASA

seeking alternate schemes after Orion TPS effort hits snag," [Electronic]. Vol. 220, No. 19, [October 27, 2006.].]

October 30: Shuttle rollover moves up to Tuesday

The orbiter Discovery will be rolled from its processing hangar to the Kennedy Space Center Vehicle Assembly Building on Tuesday, a day ahead of schedule. Mounted atop a 76-wheeled transporter, the 122-foot-long spaceship is scheduled to begin backing out of its hangar about noon EST. Transporter drivers then will deliver the orbiter to the transfer aisle of the 52-story assembly building a short while later. Once there, crane operators will hoist the orbiter up and over a 16th floor transom before lowering the vehicle onto a mobile launch platform in High Bay Three of the building. The spaceship then will be hooked up to an external tank with attached solid rocket boosters before a weeklong series of tests is carried out to verify mechanical and electrical connections between shuttle components. The fully assembled shuttle is scheduled to be rolled out to launch pad 39B on Nov. 7. The STS-116 astronaut crew will be at KSC the following week for a practice countdown, and a traditional Flight Readiness Review will be held Nov. 28 and Nov. 29 at KSC. Launch of the International Space Station assembly mission is targeted to take off no earlier than Dec. 7. The shuttle flight, however, might be pushed back a couple of days because a Lockheed Martin Atlas rocket already had been scheduled to launch that day on a military mission. Web posted. (2006). [Launch lights up the skies [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, October 30].]

October 31: NASA Approves Mission and names Crew for Return to Hubble

Shuttle astronauts will make one final house call to NASA's Hubble Space Telescope as part of a mission to extend and improve the observatory's capabilities through 2013. NASA Administrator Michael Griffin announced plans for a fifth servicing mission to Hubble Tuesday during a meeting with agency employees at NASA's Goddard Space Flight Center, Greenbelt, Md. Goddard is the agency center responsible for managing Hubble. "We have conducted a detailed analysis of the performance and procedures necessary to carry out a successful Hubble repair mission over the course of the last three shuttle missions. What we have learned has convinced us that we are able to conduct a safe and effective servicing mission to Hubble," Griffin said. "While there is an inherent risk in all spaceflight activities, the desire to preserve a truly international asset like the Hubble Space Telescope makes doing this mission the right course of action." The flight is tentatively targeted for launch during the spring to fall of 2008. Mission planners are working to determine the best location and vehicle in the manifest to support the needs of Hubble while minimizing impact to International Space Station assembly. The planners are investigating the best way to support a launch on need mission for the Hubble flight. The present option will keep Launch Pad 39-B at the Kennedy Space Center, Fla., available for such a rescue flight should it be necessary. Griffin also announced the astronauts selected for the mission. Veteran astronaut Scott D. Altman will command the final space shuttle mission to Hubble. Navy Reserve Capt. Gregory C. Johnson will serve as pilot. Mission specialists include veteran spacewalkers John M. Grunsfeld and Michael J. Massimino and first-time space fliers Andrew J. Feustel, Michael T. Good and K.

Megan McArthur. ["NASA Approves Mission and Names Crew for Return To Hubble," **NASA News Release #06-343**, October 31, 2006.]

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November 1: NASA sets new date for rocket launch

NASA has set a new target date for the launch early next year of a Boeing Delta 2 rocket and a quintet of agency science satellites. The 12-story rocket is scheduled to blast off Feb. 15 from Launch Complex 17 at Cape Canaveral Air Force Station. Its cargo of five spacecraft will be embarking on a two-year mission to study the Northern Lights. NASA has dubbed the mission THEMIS after the Greek goddess of justice, wisdom and good counsel. The agency acronym stands for Time History of Events and Macroscale Interactions during Substorms. The five satellites will align above the North American continent and make the first comprehensive study of the onset of solar storms and how they trigger auroral eruptions known as the Northern Lights. Web posted. (2006). [NASA sets new date for rocket launch [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, November 2].]

NASA's Space Shuttle Discovery Rolls to VAB

NASA's Space Shuttle Discovery completed one milestone and is nearing another as workers prepare the orbiter for a December launch to the International Space Station. On Tuesday night, drivers moved Discovery from the shuttle processing facility to the Vehicle Assembly Building at NASA's Kennedy Space Center in Florida. Discovery, perched on top of the giant, 76-wheel orbiter transporter system, began moving out of the facility at 9:23 p.m. EST. In the assembly building, technicians attached Discovery to its propulsion elements, an external fuel tank and twin solid rocket boosters. Following those operations, final integration, preparations and closeouts began in preparation for flight. Discovery's next milestone is the 4.2-mile trip to Launch Pad 39B in preparation for its mission, designated STS-116. During the 11-day mission, the shuttle's seven astronauts will rewire the station to bring online new power supplies generated by solar arrays installed in September. ["NASA's Space Shuttle Discovery Rolls To Vehicle Assembly Building," **NASA Media Advisory #M06-171**, November 1, 2006.]

November 2: Discovery prepped for December launch

Space shuttle Discovery was hoisted by a crane and outfitted with its external fuel tank and twin booster rockets on Wednesday in preparation for another flight next month. NASA plans a week of tests to make sure the electrical and mechanical connections are intact before the ship is hauled out to the launch pad, said Kennedy Space Center spokeswoman Jessica Rye. The shuttle, which is due to return to space on December 7, will be taking another section of the half-built International Space Station's metal truss, or frame, into orbit. Web posted. (2006). [Discovery prepped for December launch [Online]. Available WWW: http://www.cnn.com/ [2006, November 2].]

November 6: Toxic fuel leak prompts evacuation at KSC

A leak of toxic rocket fuel prompted the evacuation of two shuttle processing hangars at Kennedy Space Center today but no workers were exposed to fumes or injured, NASA officials said today. The hydrazine leak was detected in Bay No. 1 of Orbiter Processing Facility, where the orbiter Atlantis is undergoing post-flight servicing and inspections. More than 100 people were evacuated from the hangar and nearby OPF Bay No. 2 as a

precaution. Safety inspectors think the leak came from the shuttle's Orbital Maneuvering System. Technicians over the weekend were draining residual fuel from the system and removed a quick-disconnect line. Inspectors think an end-cap for the line apparently came off after work was completed, causing the leak. Hydrazine is used in combination with nitrogen tetroxide to power the shuttle's twin maneuvering engines in flight. An elevated level of the toxic fuel -- 60 parts per million -- was detected in the air around the engines, prompting the evacuation. "That's not what we consider a dangerous level. But with any reading above zero, we would take precautionary measures and evacuate the facility," said KSC spokeswoman Jessica Rye. The hangars were evacuated around 9 a.m. and reopened by 2 p.m. Web posted. (2006). [Toxic fuel leak prompts evacuation at KSC [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, November 6].]

Dec. 6 slotted for Discovery

NASA faces a Dec. 17 deadline to launch Discovery and avoid computer failures that could appear if the shuttle and its astronauts are flying during the year-end computer clock rollover from 2006 to 2007, officials said Monday. The next chance to launch would be Jan. 14. Five computers control almost all aspects of a shuttle flight, from sending the commands to ignite the ship's solid rocket boosters to guiding the orbiter through atmospheric reentry and landing. The system is tied to Greenwich Mean Time, and unlike the computers that control the International Space Station, they were not designed to operate during the transition from one year to the next. Rather than switching from Day 365 of one year to Day 1 of the next, the computers would simply tick up to Day 366. NASA engineers have been testing procedures Discovery's astronauts could execute to make certain the year-to-year transition would go smoothly in orbit. However, they've only been certified for use in an emergency. They have not been proven for use otherwise. The upcoming mission is scheduled to last 12 days, and mission managers always protect for the possibility of weather delays. NASA wants to move the launch date up to Dec. 6. The Jan. 14 launch opportunity is based on the next time sun angles would be adequate to keep a docked shuttle and station at temperatures conducive to completing the flight. Web posted. (2006). [Dec. 6 slotted for Discovery [Online]. Available WWW: http://www.floridatoday.com/ [2006, November 7].]

November 8: NASA Honors Apollo Moon Walker's Memory In Seattle Ceremony

NASA will honor former astronaut Charles "Pete" Conrad for his involvement in the U.S. space program with the presentation of the Ambassador of Exploration Award at 2 p.m. EST, Saturday, Nov. 18, in the Allen Theater, The Museum of Flight, 9404 East Marginal Way South, Seattle. The award ceremony coincides with the 37th anniversary of the Apollo 12 mission of Nov. 14-19, 1969, and culminates a day of museum space-related activities and workshops. NASA is presenting the Ambassador of Exploration Award to the astronauts and other key individuals who participated in the Mercury, Gemini, and Apollo space programs for realizing America's vision of space exploration from 1961 to 1972. The award is a sample of lunar material mounted for public display. The material is part of the 842 pounds of samples brought back to Earth during the six Apollo lunar expeditions from 1969 to 1972. Conrad's award will be displayed at The Museum of

Flight, one of the largest air and space museums in the world. Conrad was the third man to walk on the moon as commander of Apollo 12, the second lunar landing mission. He and lunar module pilot Alan L. Bean spent 31.5 hours on the moon. Conrad also served as pilot of the Gemini V mission; commander of Gemini XI; and commander of the first mission launched to the Skylab space station in 1973. He retired from the U.S. Navy and NASA as a captain in 1974. Conrad died of injuries sustained in a motorcycle accident in July 1999, so his widow Nancy will accept the award on his behalf. She will present it for display to The Museum of Flight President Bonnie Dunbar. Dunbar is also a former NASA astronaut. ["NASA Honors Apollo Moon Walker's Memory In Seattle Ceremony," **NASA Media Advisory #M06-174,** November 8, 2006.]

November 16: Astronauts practice countdown

Discovery's astronauts wrapped up a practice countdown at Kennedy Space Center on Thursday, completing a key milestone in preparations for their Dec. 7 launch. Wearing bright orange launch-and-entry suits, the seven crewmates crawled through the side hatch of Discovery at launch pad 39B and then strapped into couches in the shuttle's two-level crew cabin. About 150 to 200 engineers at the KSC Launch Control Center also took part in the launch-day dress rehearsal, which was the last major-training exercise for the astronauts at KSC prior to their launch on an International Space Station construction mission. "We had a good exercise," said KSC spokesman Bruce Buckingham. "We got the astronauts in the vehicle and let them get hands on a real live space shuttle." Led by mission commander Mark Polansky, the crew includes pilot William Oefelein and mission specialists Robert Curbeam, Nicholas Patrick, Joan Higginbotham, Sunita Williams and Christer Fugelsang of the European Space Agency. During a 12-day mission, the astronauts will mount a new segment to the port side of the station's central truss and rewire the outpost's power-producing electrical system. Web posted. (2006). [Astronauts practice countdown [Online]. Available WWW: http://www.floridatoday.com/ [2006, November 17].]

November 17: House Spaceport panel being eliminated

The House Spaceport and Technology Committee is being eliminated in the chamber's new committee structure. Instead, space industry issues will be included within another committee as it had been previously. Spaceport and Technology no longer exists among the committees being created by House Speaker-designate Marco Rubio. Former chairman of the defunct committee, Rep. Bob Allen, said he discussed the change in a meeting with Rubio earlier this week. The Merritt Island Republican said he was promised that space issues would be folded into a committee that includes economic development. The departing speaker, Allan Bense, created the spaceport committee two years ago at Allen's urging, as Florida jockeyed with other states to land contracts for the next phase of the national space program. Its biggest task was in overseeing last year's repackaging of state space agencies into a new, single agency Space Florida, following a blueprint developed by Lt. Gov. Toni Jennings and an advisory board appointed by Gov. Jeb Bush. In the Senate, space legislation is a function of the Commerce and Consumer Services Committee. Rubio next week is expected to unveil part of his committee structure and key appointments — a perquisite of every new speaker. His staff says the entire structure and assignments won't be final until as late as mid-December, but the

merger of what used to be policy-setting and budget-writing committees means an accumulation of power for the recipients of those choice appointments. Web posted. (2006). [House Spaceport panel being eliminated [Online]. Available WWW: http://www.floridatoday.com/ [2006, November 17].]

Delta 2 launches new GPS satellite

After a beautiful Friday launch from Cape Canaveral Air Force Station, another navigation satellite is in orbit, enriching the Global Positioning System used by people from soldiers to anglers. A Boeing Delta 2 rocket lifted the satellite into a breezy blue sky at 2:12 p.m., right at the start of the launch window, after bad weather delayed Thursday's attempt. "Everyone's very excited, thrilled -- a sigh of relief, if you will, for people who have been along with this satellite all along, as it's been built, tested and made ready for launch today," said Lt. Col. Alan Edmiaston, representing the office at Los Angeles Air Force Base that builds GPS satellites. The spacecraft will be operational Dec. 8, Edmiaston said, and brings the group of working satellites back to 30. Usually the spacecraft number in the high 20s. This one has a life expectancy of 10 years. The spacecraft launched Friday is the third of a series of modernized GPS satellites. Web posted. (2006). [Delta 2 launches new GPS satellite [Online]. Available WWW: http://www.floridatoday.com/ [2006, November 18].]

November 21: NASA: Harness swapout won't stall launch

NASA set out Tuesday to replace a faulty wire harness crucial to jettisoning the shuttle's external tank in flight, but the work isn't expected to delay the planned Dec. 7 launch of Discovery on an International Space Station construction mission. The harness houses electrical cabling that routes commands from flight computers to small explosive devices designed to ignite about nine minutes into flight, separating the 15-story tank from Discovery. The tank subsequently makes a destructive plunge through the atmosphere. A three-foot section of the 21-foot harness failed to operate properly during routine prelaunch testing, said Kennedy Space Center spokeswoman Jessica Rye. Senior shuttle program managers ordered up replacement work as a result. Rye said the swap-out would not prompt a launch delay. Discovery and seven astronauts are tentatively scheduled to blast off at 9:36 p.m. Dec. 7 on a mission to rewire the station and add another girder to the port side of the outpost's central truss. Other standard launch preparations are continuing without problems. Engineers this week finished loading toxic rocket propellants into tanks that feed the shuttle's twin orbital maneuvering engines, 44 nose-and-tail steering jets and hydraulic power units. The latter provide the hydraulic power needed to steer the shuttle's three main engines in flight and control crucial systems such as its wing flaps, landing gear and brakes during atmospheric reentry and landing. NASA and contractor managers will gather at KSC next week for a two-day Flight Readiness Review. A firm launch date will be set Nov. 29. Web posted. (2006). [NASA: Harness swapout won't stall launch [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, November 21].]

November 23: ISS crew performs spacewalk, golf shot

Two members of the crew of the International Space Station performed a spacewalk outside the station Wednesday evening, highlighted by a much-publicized "golf shot" into

orbit. Astronaut Mike Lopez-Alegria and cosmonaut Mikhail Tyurin spent five hours and 38 minutes outside the station Wednesday starting at 7:17 pm EST (0017 GMT Thursday). The first major task of the EVA, and the one that garnered all the attention leading up to the EVA, was a golf shot by Tyurin, where he hit a lightweight golf ball using a gold-plated club provided by a Canadian company. Web posted. (2006). [ISS crew performs spacewalk, golf shot [Online]. Available WWW: http://www.spacetoday.net/ [2006, November 23].]

November 27: Meeting to review plans for next week's shuttle launch
NASA managers are gathering at the Kennedy Space Center for a two-day flight readiness review Tuesday and Wednesday to assess the shuttle Discovery's launch processing and to set an official launch date for mission STS-116. Liftoff currently is targeted for Dec. 7 and there do not appear to be any major issues that would force a delay. But the launch window is complex because it includes lighting, holiday and end-of-year issues that are not normally on the table. As it now stands, the window opens Dec. 7 and closes Dec. 26 because of a so-called "beta angle cutout," that is, thermal issues associated with the international space station due to the angle between the plane of its orbit and the sun. Based on the beta angle, the shuttle cannot launch between Dec. 27 and Jan. 13. To reach the international space station, Discovery must be launched when Earth's rotation carries the launch pad into the plane of the lab's orbit. For mission STS-116, on Dec. 7, that works out to 9:35:45 p.m., resulting in NASA's first night launch since 2002. Daylight launch opportunities do not become available until Dec. 18. Major post-Columbia objectives through the first three return-to-flight missions included photographing the shuttle's external fuel tank after separation in orbit to document how its foam insulation performed during ascent. For STS-116, NASA managers are relaxing that requirement based on the performance of the tank over the past three flights. For the record, sufficient lighting for a camera mounted in the shuttle's belly does not become available until Dec. 20. For crew hand-held photography, good lighting is not expected until Dec. 24. A launch past Dec. 19 would result in the shuttle being in orbit during the year-end rollover from Dec. 31 to Jan. 1. The "YERO" issue has received quite a bit of attention in recent months because of concern about possible computer glitches. The shuttle's flight software was not designed to handle the transition from one year to the next and YERO will be a topic of discussion during the flight readiness review this week. Launches between Dec. 7 and 12 result in a landing before Christmas for a standard 12-day mission. A launch on Dec. 17 would result in a landing on Dec. 29, preserving two days for bad landing weather or some other contingency. Launches past Dec. 17 could result in a YERO flight, depending on weather or other problems, while a launch past Dec. 19 would require the shuttle to be in orbit over the year-end rollover. Web posted. (2006). [Meeting to review plans for next week's shuttle launch [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, November 27].]

November 28: Space Week lifts off for Brevard students
Brevard County sixth-graders will storm the Kennedy Space Center Visitor Complex today to learn about space exploration from NASA scientists and former astronauts. Today marks the official launch of the fourth annual Space Week, an effort to provide nearly 6,000 students first-hand knowledge of KSC. About 800 students will visit the

center each day for the next nine days. They will participate in a scavenger hunt and experiments with NASA scientists and learn about NASA's plans to build and launch a new crew exploration vehicle back to the moon. Sixth-graders have been receiving special instruction in preparation for their visits. During the summer, a committee of Brevard teachers worked with NASA and the Kennedy Space Center education departments to develop activity guides and curriculum. The goal is to inspire students to continue studies in math and sciences. The students also will receive complimentary passes to return to the center with their families. Web posted. (2006). [Space Week lifts off for Brevard students [Online]. Available WWW: http://www.floridatoday.com/ [2006, November 28].]

November 29: Discovery launch set for Thursday, pending ISS issues
NASA managers today wrapped up a two-day flight readiness review and officially set December 7 as the target launch date for the shuttle Discovery on an unprecedented mission to rewire the international space station. If all goes well, Discovery's countdown will begin at 11 p.m. EST Monday, setting the stage for a launch attempt at 9:35:45 p.m. EST Thursday. This will be NASA's first night launch since 2002. But space station engineers are working two issues that must be resolved for Discovery to get off the ground next week: Russian engineers must resolve a problem that cut short a space station rocket firing today about three minutes into a planned 18-minute 22-second burn. NASA engineers must resolve a glitch that cropped up Tuesday during tests of new solar array drive control software on the international space station. The software did not work as expected and one of two critical circuit breakers that deliver power to motors that allow the newly installed solar arrays to rotate and track the sun popped open. Web posted. (2006). [Discovery launch set for next Thursday, pending ISS issues [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, November 29].]

November 30: NASA Will Wait to Redesign Shuttle Tank
NASA managers decided Thursday to wait until 2008 before redesigning the space shuttle's external fuel tank, the source of the foam problem that caused the Columbia disaster. NASA spokesman Kyle Herring said the tank's current design "has proven to be more robust" than initially thought. After the disaster, engineers refined the process of applying insulating foam to the tank to prevent the situation that doomed Columbia. Since then, three flights have launched without foam falling off the tank early enough in the journey to damage the shuttle. NASA plans to have the redesign ready in early 2008. The decision comes a week before Discovery is scheduled to make NASA's first nighttime shuttle launch in four years. The shuttle is supposed to liftoff late on Dec. 7 for a mission to the international space station. Also on Thursday, Mission Control resolved a problem with a unit that controls power to an enormous joint that rotates solar arrays at the space station. A circuit breaker opened this week during a software test on the device, which ensures that the panels follow the sun to generate electricity. Engineers were concerned that the circuit breaker had been tripped, but NASA spokeswoman Lynnette Madison said they determined it had mistakenly been commanded to open. The space station crew was later able to close the circuit breaker. NASA will continue tests to determine the source of the glitch. Web posted. (2006). [NASA Will Wait to Redesign

Shuttle Tank [Online]. Available WWW: http://www.washingtonpost.com/ [2006, November 30].]

Not One Hurricane Strikes United States

The mild 2006 Atlantic hurricane season draws to a close Thursday without a single hurricane striking the United States _ a stark contrast to the record-breaking 2005 season that killed more than 1,500 people and left thousands homeless along the Gulf Coast. In May, scientists predicted 13 to 16 named storms and eight to 10 hurricanes, with four to six of them major. The 2005 hurricane season was the busiest on record, with 28 named storms, including 15 hurricanes, four of which hit the United States, including Katrina and Rita. Only two storms, Tropical Storms Alberto and Ernesto, hit the U.S. mainland in 2006. Neither caused significant damage. The season effectively ended with Hurricane Isaac, the last named storm, which dissipated Oct. 2. Web posted. (2006). [Not One Hurricane Strikes United States [Online]. Available WWW: http://www.washingtonpost.com [2006, November 30].]

Launch Countdown Begins Dec. 4 for Space Shuttle Discovery

NASA will begin the countdown for Space Shuttle Discovery's STS-116 mission at 11 p.m. EST Monday, Dec. 4, at the T-43 hour point. During this mission, Discovery's crew will rewire the International Space Station, bringing electrical power on line from solar arrays launched earlier this year. The Kennedy Space Center, Florida, launch team will conduct the countdown from Firing Room 4 of the Launch Control Center. The countdown includes 27 hours, 36 minutes of built-in hold time leading to a preferred launch time at 9:35 p.m. on Thursday, Dec. 7. The launch window extends an additional five minutes. This mission is the 117th space shuttle flight, the 33rd flight for Discovery and the 20th U.S. flight to the International Space Station. STS-116 is scheduled to last 12 days with landing at about 4:35 p.m. EST on Dec. 19 at Kennedy. Discovery rolled into Kennedy's Orbiter Processing Facility on July 17 after returning from its last mission, STS-121. The shuttle rolled out of the facility's bay 3 and into the Vehicle Assembly Building on Oct. 31. While in the building's high bay 3, Discovery was mated to its modified external fuel tank and solid rocket boosters. The entire space shuttle stack was transferred to Launch Pad 39B on Nov. 9. The STS-116 crew consists of Commander Mark Polansky, Pilot Bill Oefelein and mission specialists Bob Curbeam, Joan Higginbotham, Nicholas Patrick, Christer Fuglesang of the European Space Agency and Sunita Williams. Williams will remain aboard the station to begin a six-month stay. European Space Agency astronaut Thomas Reiter, aboard the station since July, will return to Earth on Discovery. During STS-116, Discovery's astronauts will completely rewire and activate the station's electrical and thermal control systems. The crew will deliver and install the P5 truss segment between the station's existing P3/P4 and P6 truss segments during two of three planned spacewalks. Installation of the P5 truss will allow the solar arrays on the P3/P4 and P6 truss segments to operate and rotate without interfering with each other. The P5 truss will act as a conduit that will transmit power and data from the P6 segment to the other segments on the station. ["Launch Countdown Begins Dec. 4 for Space Shuttle Discovery," **NASA Media Advisory #M06-185**, November 30, 2006.]

DECEMBER

December 1: ULA becomes reality

Boeing and Lockheed Martin say this morning that they've finalized the merging of their rocket divisions into a new company called United Launch Alliance. The deal, proposed in May and approved by the government earlier this year, applies to launches of government payloads only. Boeing's Delta 4 and Lockheed's Atlas 5 would stop competing for those launches. Both rockets will keep flying. The companies are calling today "Day One" of the new venture, a 50-50 partnership modeled after a similar structure they used to create United Space Alliance to win the contract for day to day operations of NASA's space shuttle fleet. News conferences are set for later in the day to explain implications. Web posted. (2006). [ULA becomes reality [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, December 1].]

Boeing and Lockheed Martin Complete United Launch Alliance Transaction

The Boeing Company and Lockheed Martin Corporation today announced that they have completed the transaction combining their expendable launch vehicle businesses, forming the joint venture called United Launch Alliance, LLC (ULA). ULA will combine the production, engineering, test and launch operations associated with U.S. government launches of Boeing Delta and Lockheed Martin Atlas rockets. The proposed joint venture was first announced in May 2005. "With this merger we have combined the launch capabilities of Boeing and Lockheed Martin to create a very capable family of rockets that will support our country's space needs for the 21st century," said Boeing Chairman, President and CEO Jim McNerney. "I am grateful to all of the employees who have remained focused on mission success and continued to deliver to our customer despite the distractions of the merger process." "On behalf of all Lockheed Martin employees and shareholders, I would like to thank the many government agencies that were involved in reviewing this very complex and important transaction," said Bob Stevens, Lockheed Martin Chairman, President and CEO. "Formation of ULA is essential if our country is to meet its requirements for assured access to space in the 21st century. I have the fullest confidence that ULA and its employees will meet our country's launch needs in a cost effective and reliable manner. This is clearly an important day for our nation." Michael C. Gass has been named ULA president and chief executive officer and Daniel J. Collins has been named chief operating officer. ULA will be headquartered in Denver where most engineering and administrative activities will be consolidated. Major assembly and integration operations will be located primarily at Delta's manufacturing and assembly facility in Decatur, Ala. Web posted. (2006). [STS-107 Columbia landing jou Boeing and Lockheed Martin Complete United Launch Alliance Transaction [Online]. Available WWW: http://studio.financialcontent.com [2006, December 1].]

Air Force plans shuttle security patrols

The Air Force will step up its air patrols in the Cape Canaveral area to increase security for the upcoming shuttle launch, officials said today. "NORAD protects a variety of national assets across the nation on any given day," 1st Air Force commander Maj. Gen. Hank Morrow said a press release today. "In this case we're increasing our sorties in the

Cape Canaveral area during the Space Shuttle launch window. It's part of our continuing mission to protect America's airways with our fighter air patrols." Increased military aircraft activity will have minimal impact on the heavy volume of low-flying aircraft in the area, the Air Force said. Air Force jets will be making low approaches at Orlando Executive, Orlando Sanford International, Daytona Beach International, and Melbourne International Airport on Tuesday. The missions are carefully planned and closely controlled to ensure public safety, and are not in response to any specific threat, the Air Force news release said. The Air Force will use F-15 Eagles and F-16 Fighting Falcons in the security mission. The Discovery launch is set for Thursday at 9:36 p.m. from Kennedy Space Center. Web posted. (2006). [Air Force plans shuttle security patrols [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 1].]

December 3: Astronauts arrive at Space Center

Seven astronauts jetted to Kennedy Space Center Sunday, where they will make final preparations for the planned launch this week of shuttle Discovery on an ambitious International Space Station assembly mission. Piloting high-performance T-38 training jets, the astronauts soared over the launch pad where Discovery is being readied for flight and then landed at the north end of NASA's shuttle runway five miles to the west. "We seven certainly are very ready to go, and we're looking forward to executing a great mission," said Discovery pilot William Oefelein. Oefelein and his crewmates are slated to blast off from pad 39B about 9:35 p.m. Thursday — the first after-dark shuttle launch in four years. "We're going to go ahead and hopefully have one heck of a night show," Discovery mission commander Mark Polansky said. The crew includes mission specialists Robert Curbeam, Joan Higginbotham, Nicholas Patrick, Sunita Williams and Christer Fuglesang of the European Space Agency. Williams will replace European astronaut Thomas Reiter as a flight engineer on the outpost. Reiter will be ferried back to Earth on the shuttle. Fuglesang will become the first Swedish astronaut to fly in space, and Higginbotham - a former NASA payload and orbiter engineer — will become only the second astronaut from KSC to launch into orbit. "I actually began my career here at the Kennedy Space Center," said Higginbotham, who worked at the center from 1987 to 1996. "And to finally come back as an astronaut and get to fly on the vehicle that I used to work on is just absolutely beyond words." A three-day countdown is scheduled to begin at 11 p.m. today. Technicians replaced a broken duct in the shuttle's rear engine compartment Sunday, but launch preparations are proceeding without major problems. The astronauts plan to add another segment to the station's central truss and rewire the electrical system that powers the U.S. side of the outpost. Landing is scheduled for about 4:35 p.m. Dec. 19. Web posted. (2006). [Astronauts arrive at Space Center [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 3].]

December 4: NASA unveils exploration strategy, lunar architecture

NASA on Monday unveiled the initial elements of the Global Exploration Strategy and a proposed U.S. lunar architecture, two critical tools for achieving the nation's vision of returning humans to the moon. NASA Deputy Administrator Shana Dale, who is guiding the long-term strategy development effort among 14 of the world's space agencies, said, "This strategy will enable interested nations to leverage their capabilities and financial and technical contributions, making optimum use of globally available knowledge and

resources to help energize a coordinated effort that will propel us into this new age of discovery and exploration." The Global Exploration Strategy focuses on two overarching issues: Why we are returning to the moon and what we plan to do when we get there. The strategy includes a comprehensive set of the reasons for embarking upon human and robotic exploration of the moon. NASA's proposed lunar architecture focuses on a third issue: How humans might accomplish the mission of exploring the moon. In April 2006, NASA initiated development of the Global Exploration Strategy in order to meet a congressional mandate, as well as to accomplish goals outlined in the agency's strategic plan and the Vision for Space Exploration. The strategy is evolving from a lengthy dialogue among more than 1,000 individuals, including experts from NASA and 13 other space agencies, as well as non-governmental organizations and commercial interests. Experts from the Australian, Canadian, Chinese, European, French, German, British, Indian, Italian, Japanese, Russian, South Korean and Ukrainian space agencies participated. NASA planners used the international group's deliberations as well as input from academia, private sector and private citizens as the basis for sketching a U.S. blueprint for a return to the moon. NASA's Lunar Architecture Team, chartered in May 2006, concluded that the most advantageous approach is to develop a solar-powered lunar base and to locate it near one of the poles of the moon. With such an outpost, NASA can learn to use the moon's natural resources to live off the land, make preparations for a journey to Mars, conduct a wide range of scientific investigations and encourage international participation. As currently envisioned, an incremental buildup would begin with four-person crews making several seven-day visits to the moon until their power supplies, rovers and living quarters are operational. The first mission would begin by 2020. These would be followed by 180-day missions to prepare for journeys to Mars. The proposed lunar architecture calls for robotic precursor missions designed to support the human mission. These precursors include landing site reconnaissance, natural resource assays and technology risk reduction for the human lander. Moving into 2007, NASA will continue to refine its lunar architecture, maintaining the open dialogue initiated in 2006, to enhance further the Global Exploration Strategy. NASA's goal is to enable a sustainable space exploration effort in which participating organizations can achieve individual goals with mutually beneficial results. Web posted. (2006). [NASA unveils exploration strategy, lunar architecture [Online]. Available WWW: http://www.spaceflightnow.com/ [2006, December 4].] **news release**

NASA's Delayed Moon Plans Worry KSC Workers

NASA is slowing down its plans to return to the moon. For Central Florida's space industry, that puts thousands of jobs in doubt. NASA is now confirming a four-year gap between the last flight of the shuttle and the first launch of its replacement. There are 14,000 space workers at the Kennedy Space Center, and many are wondering what will happen to them when nothing is flying for that length of time. NASA is asking them to hang on because they're needed if the U.S. is going to return to the moon. "As we're getting ready for 2014, there will have to be test flights leading up to that," said NASA's Dr. Scott Horowitz. That's the best space workers can hope for -- less than a handful of test launches between the last shuttle flight in 2010 and the first launch of its replacement, the Orion capsule, in 2014. NASA said there's no chance of extending the shuttle's lifetime. It's too old and too high-risk to fly that long, and NASA must free up

money to pay for the moon program by retiring the shuttle. The space agency is looking for help from other countries to pay for going to the moon. "It is critical that we have international participation," said NASA's Shana Dale. Workers will be needed to assemble the shuttle's replacement ship at the Kennedy Space Center, but that will take only 300 or 400 of the 14,000 space workers here. So, while workers worry about getting pink slips, NASA worries the employees will start leaving on their own, draining too much talent from the space program. Managers hope to keep them interested and announced Monday that the first moon base might be at the south pole, where astronauts could find frozen water. "We're going to go after a lunar base," Horowitz said. "A lunar base will be the central theme in our going forward plan for going back to the moon in preparation to go to Mars and beyond." The first test-launch for the moon effort is delayed until mid-2009. That will be a launch of a single space shuttle booster rocket, which is the rocket that will carry the new replacement capsule into space. Web posted. (2006). [NASA's Delayed Moon Plans Worry KSC Workers [Online]. Available WWW: http://www.wesh.com/news/ [2006, December 4].]

Astronauts arrive at Space Center

A three-day countdown to the planned launch of Discovery is under way at Kennedy Space Center and the weather for a planned Thursday night liftoff looks good. The shuttle and its seven astronauts will be able to dock at the International Space Station on the third day of their flight as a result of an orbit-raising maneuver at the outpost. Look for NASA's first countdown status briefing at 10 a.m. Tuesday. Taking part in the news conference will be NASA Test Director Steve Payne, NASA Payload Manager Debbie Hahn and Shuttle Weather Officer Kathy Winters. NASA finished launch countdown preparations Monday. A final pressure check of Discovery's rear engine compartment was completed. Engineers staffed consoles in the KSC Launch Control Center and countdown clocks began ticking backward at 11 p.m. Monday. Russian engineers sucessfully carried out an engine firing about 4:30 p.m. Monday that put the outpost in the proper orbital position for the shuttle to link up with the station on the third day of a busy flight. The 23-minute firing propelled the station into an orbit with high and low points of 219.5 and 205.9 statute miles, opening up Flight Day Three rendezvous opportunities for Discovery's crew from Thursday through Dec. 23. Discovery's astronauts arrived at KSC on Sunday, and work at launch pad 39B is continuing without major problems. Engineers and technicians on Tuesday will test circuits that route computer commands to small explosive devices that are used to separate the shuttle from its mobile launch platform, solid rocket boosters and external tank in flight. Also on tap: the loading of liquid hydrogen and liquid oxygen into the shuttle's fuel cell system, which generates electricity to power the shuttle in flight. The astronauts aim to add a new segment to the station's central truss and rewire the U.S. side of the outpost. Liftoff remains scheduled for about 9:35 p.m. Thursday. Web posted. (2006). [Astronauts arrive at Space Center [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 4].]

Hatch Act Information and Training

As many of you may know, the U.S. Office of Special Counsel (OSC) conducted a Hatch Act investigation at the NASA Kennedy Space Center (KSC) regarding then-Presidential

candidate John Kerry's campaign stop at the Debus Facility Center on July 26, 2004. OSC's investigation heightened our awareness of the Hatch Act, and it is now recognized that using NASA Select to broadcast and Web stream this campaign stop to Federal employees and contractors while on duty or in a Federal building was not sensitive to the Hatch Act's prohibitions and protections concerning political activity. Thus, we are committed to ensuring that the NASA community understands the Hatch Act's restrictions. To that end, we have arranged for the NASA community to receive two broadcasts of OSC's Hatch Act training video. Therefore, all Federal employees are required to view the video. The video will be shown on December 12, 2006, and December 14, 2006, each day at 11:00 a.m. and 3:30 p.m. E-mail distribution. (2006). [Re: "Hatch Act Information and Training" [Electronic]. KSC-Center-Director [KSC-Center-Director@mail.nasa.gov], [December 4, 2006.].]

December 5: Danger will run high on 'complex mission'

Shuttle Discovery's seven astronauts are about to embark on a difficult and dangerous attempt to rewire the electrical system that powers the American side of the International Space Station. Set for launch from Kennedy Space Center 9:36 p.m. Thursday, the orbital construction crew first plans to add a new girder to the station's metallic backbone -- a high-precision job during which crane operators will have clearances as tight as two inches. A solar panel that's been in orbit for six years must be rolled up like a window shade to allow a new solar wing to rotate for the first time so it can track the sun and maximize electrical output. No one is sure the old array will retract. But the job must be done to proceed with the rewiring work, which calls for half of the electricity to the U.S. segment to be shut down. Lab lights and communications links with ground controllers will be cut off, and like electricians on Earth, the astronauts will face electric shock hazards. What's more, the crew must start critical cooling pumps that have not been turned on. No one at NASA expects the 12-day mission to come off without trouble, and there is more than ample opportunity for things to go seriously wrong. The wiring work itself will be a challenge. Curbeam and Fuglesang face two spacewalks to unplug and plug 140 connectors, first making certain power to each has been shut down to avoid electrical shock or even electrocution. The job must be completed to draw power from all four American solar wings after all are delivered to the station. It also is required to start up cooling pumps dormant at the outpost since their delivery in 2002. The initial pump activation will be like starting a car that's been garaged for four years. Coupled with the rewiring work, the activation of the new cooling system -- which will be completed during three spacewalks early next year -- will clear the way for the long-awaited addition of their science laboratories. Web posted. (2006). [Danger will run high on 'complex mission' [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 5].]

December 6: Glue problems could gum up shuttle launch

Before the space shuttle Discovery can embark on a mission to rewire the international space station's electrical system, NASA engineers have to resolve two late-breaking technical worries: a brief power surge and potential problems with a glue that helps seal rocket boosters. Engineers will spend much of Wednesday trying to decide whether the two problems are minor or major. It's too early to tell if these will postpone Discovery's

scheduled liftoff at 9:35 p.m. EST Thursday, said launch integration manager LeRoy Cain. The split-second power surge occurred early Tuesday when power was about to be switched from the shuttle's launch platform to Discovery itself. Early tests found that the shuttle's main engines, boosters and external fuel tank are OK after the power burst, but NASA was not saying the same about Discovery, Cain said. Concern about booster-seal glue involves the adhesive that helps connect segments of the solid rocket boosters together. Routine tests found that the adhesive used on some of the connection joints in the boosters might not be as strong as it should be, NASA spokeswoman June Malone said. But the adhesive is only of one many systems that keep hot gas from escaping and is not one of the main ones, she said. Aside from those potential problems and a concern about worsening weather, NASA was marching toward its first nighttime launch in four years. Web posted. (2006). [Glue problems could gum up shuttle launch [Online]. Available WWW: http://www.cnn.com/ [2006, December 6].]

Rocket to blast off from Wallops

Early Monday morning is "T-minus 300." The countdown to liftoff of the first orbital rocket launched from NASA's Wallops Flight Facility range in more than 10 years will start at 2 a.m. In a best-case scenario, the five-hour countdown will culminate at 7 a.m. with a blast into space. The launch window for the Air Force Research Lab's TacSat-2 satellite runs to 10:30 a.m., but if fog cover or other weather events preclude the launch, backup dates run through Dec. 20. If successful, the launch will propel the 35-ton Minotaur I rocket into space, placing into orbit the 814-pound satellite with 11 onboard experiments 254 miles above the Earth. Also hitching a ride will be a NASA nano-satellite, the 22-pound GeneSat1, which will perform life science experiments. It would be the first time a payload has been released into orbit from Wallops in more than two decades. This launch, from pad 0-B on Wallops Island, is the first time the 113-foot launcher -- built by the regional spaceport at a cost of $3.6 million in 1998 -- has been used. Web posted. (2006). [Rocket to blast off from Wallops [Online]. Available WWW: http://www.delmarvanow.com/ [2006, December 6].]

December 7: Shuttle pad cleared for fueling preps

NASA this hour is clearing Pad 39B of everyone except people necessary for the fueling operations that are to begin later this morning. The fuel cells that will generate electricity for the orbiter's systems once it reaches space are being activated. The launch crew is scheduled to start pumping more than 500,000 gallons of liquid hydrogen and liquid oxygen into the shuttle's 15-story external tank about 11:40 a.m. That's about the same time that Discovery's crew is scheduled to be awakened to start their launch day activities. Mission managers will meet at 10:30 a.m. to give engineers a go-ahead for fueling. They could decide to move up the start of fueling to 11:10 a.m. Web posted. (2006). [Shuttle pad cleared for fueling preps [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, December 7].]

Shuttle may launch tourism

More than 150,000 out-of-town visitors and local spectators are expected to pack the hotels, restaurants and bars along the Space Coast tonight to catch a glimpse of the first scheduled nighttime launch of the space shuttle in four years. The launch is a welcome

lift to the sagging tourism industry, which is slowly marching back from a dismal October and poor September. Kennedy Space Center Visitor Complex could draw 10,000 guests to view the launch, said Andrea Farmer, public-relations manager for the complex. Web posted. (2006). [Shuttle may launch tourism [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 7].]

Clouds could delay launch

NASA will try to send Discovery aloft tonight after resolving two minor technical issues, but worsening weather might force a delay in the first nighttime shuttle launch in four years. Seven astronauts remain scheduled to blast off from Kennedy Space Center just before 9:36 p.m., setting sail on a complex mission to rewire the electrical system that powers the U.S. side of the International Space Station. A cold front is expected to sweep into the Cape Canaveral area early today, spawning isolated rain showers and low-level cloud cover that is expected to linger up to launch time. Meteorologists said Wednesday that there is a 60 percent chance cloudy weather would prohibit launch -- a significant downgrade from favorable forecasts earlier this week. "The forecast has trended toward the worse," said Kathy Winters, shuttle weather officer with the U.S. Air Force's 45th Space Wing, which provides forecasting services for all launches from Florida's Space Coast. NASA launch rules call for cloud ceilings to be at least 4,000 feet so range safety officers can track the shuttle during the critical early portion of flight. Conditions will be no better Friday or Saturday. The concern then would be strong winds at the launch pad and the runway. Two late-breaking technical issues were resolved Wednesday. Engineers determined a split-second power surge at Discovery's launch pad Tuesday did no damage to shuttle systems. Managers also said there was no significant problem with an adhesive used to glue insulation together between solid rocket booster segments. Engineers will begin loading more than 500,000 gallons of super-cold liquid hydrogen and liquid oxygen into the shuttle's 15-story external tank around 11:40 a.m. today. The propellant will power the shuttle's three main engines during a nine-minute climb into orbit. Polansky and his crew -- which includes former KSC engineer Joan Higginbotham -- will don partial pressure launch-and-entry suits and then depart crew quarters at 5:45 p.m. The astronauts will arrive at the launch pad and begin climbing aboard Discovery about 6:15 p.m. The orbiter's side hatch will be closed for flight about 7:30 p.m. An on-time launch would lead to a landing at KSC around 4:30 p.m. Dec. 19. Web posted. (2006). [Clouds could delay launch [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 7].]

NASA Reschedules Space Shuttle Launch for Saturday

NASA managers postponed Thursday's space shuttle launch until Saturday because of low cloud cover. Friday's weather is not expected to be favorable for a launch attempt but mission managers believe conditions will improve by the weekend. Launch of Discovery is now scheduled for 8:47 p.m. EST Dec. 9. Tomorrow's weather is not expected to be favorable for a launch attempt but mission managers believe conditions will improve by the weekend. During STS-116, the astronauts will deliver and install a girder-like structure, known as the P5 truss, aboard the station. The 4,000-pound component will make possible future installation of solar arrays. The crew will also reconfigure the station's electrical and cooling systems from temporary to permanent mode. Discovery's

crew is Commander Mark Polansky, Pilot Bill Oefelein and mission specialists Bob Curbeam, Joan Higginbotham, Nicholas Patrick, Sunita Williams and Christer Fuglesang, a European Space Agency astronaut. ["NASA Reschedules Space Shuttle Launch For Saturday," **NASA News Release #06-368**, December 7, 2006.]

December 8: Stormy weather clouds shuttle launch

Bad weather at NASA Kennedy Space Center, Fla., will continue to be a factor Dec. 9-11 in attempts to launch space shuttle Discovery on the STS-116 mission to the International Space Station. Bad weather forced a last-second scrub of the original countdown for a launch at 9:36 p.m. Eastern time Dec. 7. NASA planned to make a second launch attempt Dec. 9 after bad weather forecast for Dec. 8 forced NASA to skip an attempt that day altogether. A liftoff Dec. 9 would be at 8:47 p.m. Eastern time. By skipping Dec. 8, the Kennedy launch team was able to replenish the hydrogen supply in the shuttle's electrical fuels cells, increasing the number of attempts that could be made before a more lengthy delay is required to replenish both the hydrogen and oxygen supply for the cells. Poor weather, including light rain and unacceptable winds, were forecast to persist in the Kennedy area through at least Dec. 11. Florida weather is highly changeable, however, and launch managers hoped to catch a period of acceptable weather beginning Dec. 9. Forecasts for Dec. 9, however, called for only a 30 percent chance of acceptable conditions and only a 40 percent chance on Dec. 10 and 11. But the weather is likely to improve on Dec. 12. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Stormy weather clouds shuttle launch," [Electronic]. Vol. 220, No. 48, [December 11, 2006.].]

December 9: KSC bids its own farewell for now

As she prepared to board the shuttle Discovery before a launch that ultimately was scrubbed Thursday evening, Joan Higginbotham held up a message saying "Hi" to her mom. On Saturday, her hand-written sign was a bit broader, sending love to "all of you," and on the other side, proclaiming allegiance to her hometown Chicago NFL team, "Da Bears." Her unofficial extended family at Kennedy Space Center was thrilled Sunday as they saw a former member of their team fly into space. Higginbotham, the second of KSC's own to orbit the Earth, was an engineer at the center when she was selected for astronaut training. She started at KSC in 1987 as a payload electrical engineer, just two weeks out of college in her native Illinois. In 1996, after working on 53 shuttle launches, she joined the astronaut class. During the 12-day Discovery flight, Higginbotham, a mission specialist, will orchestrate what she described as a ballet, operating a 57-foot crane to get a truss out of the cargo bay and onto the International Space Station. It was at KSC she fostered her interest in weight lifting, which remains, along with cycling and motivational speaking. She came under the tutelage of former center director Jay Honeycutt, and was designated a "bubba," Honeycutt's term for people chosen for mentoring and special attention as acknowledged future leaders. Bill Parsons was another mentor. He, too, was an engineer at KSC in the late '80s and early '90s. In January, Parsons becomes center director, succeeding Jim Kennedy. "Each one is special," Parsons said Saturday evening of the seven astronauts aboard Discovery. "But when you have one of your own, there's a tremendous feeling of pride." Parsons was jubilant over a successful launch half an hour after Discovery made its ascent into orbit,

but he said he also was particularly happy for an astronaut he's known for so long. Parsons said he didn't know if Higginbotham would have a special message from space for her former colleagues at KSC. The 14,500 employees here will watch her mission with special enthusiasm, Parsons said. Even more, they'll be happy to have her back. "We're looking forward to getting her back here before Christmas and welcoming her back to Kennedy Space Center," Parsons said. Web posted. (2006). [KSC bids its own farewell for now [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 10].]

NASA's Shuttle Discovery Begins Mission to the Space Station

The space shuttle Discovery and its seven-member crew lifted off Saturday from NASA's Kennedy Space Center at 8:47 p.m. EST on one of the most complex missions ever to the International Space Station. Shortly before launch, Discovery's Commander Mark Polansky said he and his crew were excited to continue assembly of the station, "We look forward to lighting up the night sky and rewiring ISS." After hearing of the successful liftoff, Expedition 14 Commander Michael Lopez-Alegria told Mission Control in Houston "We'll leave the light on," in anticipation of the space shuttle crew's arrival, now scheduled for Monday. Low clouds delayed Discovery's launch on Thursday night. After standing down on Friday, weather was much better for Saturday's launch. During the 12-day mission, designated STS-116, a new structural component will be added to the station. Shuttle and station crews will work with ground teams to install the P5 truss. This latest addition to the station's backbone weighs 4,000 pounds and will extend the left side of the truss to allow future solar panels to rotate. The mission also includes extensive work to reconfigure the station's electrical and cooling systems from temporary to permanent mode. During the mission, ground control will shut down and reroute the station's power in stages so that the astronauts can reconfigure the power system and make the P4 solar arrays delivered during the last mission fully operational. This complex operation has never been done before. Part of an existing solar panel will be retracted to allow the P4 arrays to track the sun for a full 360 degrees and provide power to the rest of the station. As part of these operations, the station's temporary cooling system will be deactivated and a permanent system will become operational. The station's newest resident will also be traveling aboard Discovery. Astronaut Sunita Williams joins the Expedition 14 crew. Thomas Reiter, a European Space Agency astronaut who has been aboard the station since July, will return to Earth with the Discovery crew. Williams is scheduled to spend six months on the station. Discovery's crew is Polansky, Pilot Bill Oefelein and mission specialists Bob Curbeam, Joan Higginbotham, Nicholas Patrick, Williams and Christer Fuglesang, a European Space Agency astronaut. ["NASA's Shuttle Discovery Begins Mission to the Space Station," **NASA News Release #06-367**, December 9, 2006.]

December 11: Heat shield OK; Discovery docks today

Discovery's astronauts are due to dock at the International Space Station today after a survey showed no obvious damage to the heat shield that will protect them during a fiery atmospheric re-entry later this month. With the shuttle and the station flying in formation 220 miles above Earth, mission commander Mark Polansky will ease Discovery up to the outpost while both ships circle Earth at a speed of five miles per second. Some 600 feet

below the station, Polansky will pilot the orbiter on a nose-over-tail backflip, exposing the tile-covered belly of the shuttle to camera-wielding astronauts on the station. Outpost commander Michael Lopez-Alegria and station flight engineer Mikhail Tyurin will photograph the heat shield tiles to detect any damage. An extensive inspection to the shuttle's wing panels and nose cap on Sunday yielded no evidence of the type of severe damage that downed Columbia and its crew in February 2003. Preliminary data from more than 100 cameras and radar that tracked Discovery raised no alarm, after NASA's first nighttime shuttle launch in more than four years. And data from sensors inside the shuttle's wings indicated that any possible debris hit was at least one-tenth the force that could cause even minor damage. "I was very encouraged by what we saw," NASA deputy shuttle program manager John Shannon said. Web posted. (2006). [Heat shield OK; Discovery docks today [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 10].]

Discovery docks with ISS

The space shuttle Discovery docked with the International Space Station on Monday afternoon, and shortly afterwards shuttle crewmembers performed an additional inspection after detecting a possible debris hit earlier in the day. Discovery docked with the Destiny module of the ISS at 5:12 pm EST (2212 GMT) Monday, after a normal approach.. Later Monday, though, NASA instructed the Discovery crew to inspect an area on the outer edge of the orbiter's left wing, after accelerometer data indicated a minor impact there earlier in the day. Images of the affected panels showed no obvious signs of damage. The next major milestone of the mission will be on Tuesday afternoon, when astronauts Robert Curbeam and Christer Fuglesang will install the P5 truss segment onto the ISS. Web posted. (2006). [Discovery docks with ISS [Online]. Available WWW: http://www.spacetoday.net/ [2006, December 12].]

Florida base provides mix of support for shuttle launch

The Air Force's 45th Space Wing out of Patrick Air Force Base, Fla. supported NASA's launch of Space Shuttle Discovery from Kennedy Space Center Dec. 9 on the shuttle's first night launch in four years. Several units across the 45th SW played vital roles such as helping validate the pad after the shuttle rolled out, final ordnance installation, providing weather forecasts, organizing and training Department of Defense contingency response forces and media relations. The wing also provided eastern range support with a vast network of radar, telemetry, meteorological, optical and communications instrumentation that helped facilitate a safe, picture-perfect launch. Web posted. (2006). [Florida base provides mix of support for shuttle launch [Online]. Available WWW: http://www.af.mil/news/story.asp?storyID=123034723 [2006, December 11].]

December 12: NASA asking for industry help with 2009 ISS cargo shortfall

NASA is seeking information from industry about the feasibility of launching an additional unmanned cargo resupply mission to the International Space Station (ISS) in 2009 to make up for an anticipated shortfall in dry cargo deliveries. An analysis of the station's cargo needs versus scheduled deliveries has determined that the outpost will be left 54.4 metric tons short on dry cargo logistics - which includes food and other supplies but not propellant from the period 2009-2015. Although NASA is already preparing to

fill the gap through its Commercial Orbital Transportation Services (COTS) program, routine deliveries to the ISS by COTS suppliers would not begin until the next decade. The anticipated shortfall in 2009 is two metric tons, and can't be made up by the space shuttle, according to NASA. The additional flight would have to deliver 2,000 kilograms (4,409 pounds) of dry cargo, and be able to take an equivalent volume of trash off the station when it undocks, as Russia's unmanned Progress spacecraft currently does. The vehicle would have to dock with the ISS for at least 30 days and be ready by April 2009. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "NASA asking for industry help with 2009 ISS cargo shortfall," [Electronic]. Vol. 220, No. 49, [December 12, 2006.].]

TacSat-2 launch scrubbed at NASA Wallops

The launch of the U.S. Air Force Research Laboratory's TacSat-2 satellite from NASA's Wallops Flight Facility in Wallops Island, Va., was scrubbed Dec. 11 due to a possible problem with the software that points the spacecraft's solar arrays. Mission controllers opted to postpone the morning liftoff when Air Force engineers running simulations determined that the software might not point the arrays directly at the sun when the spacecraft arrives in orbit, which could leave it with insufficient power, according to NASA spokesman Keith Koehler. The earliest the next launch attempt can take place is Dec. 14, Koehler said. The launch window is from 7-10 a.m. Eastern Time each morning and runs through Dec. 20. If TacSat-2 has to be de-mated from the rocket to solve the problem, it would push the flight back to January, Koehler said. The Orbital Sciences Minotaur 1 rocket carrying TacSat-2 includes two refurbished Minuteman II stages and two stages built by the company. The mission is being conducted from the newly opened Mid-Atlantic Regional Spaceport commercial launch pad at the southern end of Wallops. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "TacSat-2 launch scrubbed at NASA Wallops," [Electronic]. Vol. 220, No. 49, [December 12, 2006.].]

Inspection shows Discovery damage free

Inspection of the shuttle Discovery's reinforced carbon carbon wing leading edge and nose cap material by the Orbiter Boom Sensor System (OBSS) shows no sign of any external tank foam or ice impact. But examination of video of the external tank recorded by cameras on the solid rocket boosters will be delayed by about a day because of a non life- threatening accident to a worker on one of the booster recovery ships. He was helicoptered off the vessel, but the process delayed SRB recovery. The SRB video can only be retrieved once the boosters are towed back into Port Canaveral near the Kennedy Space Center launch site. The now routine OBSS inspection in space was conducted Dec. 10, following the shuttle's night liftoff Dec. 9. OBSS operations involve detailed robotic auto sequences, and great care is needed by the crew to ensure that those sequences do not accidentally result in orbiter contact by the 100-foot OBSS/manipulator arm combination. A detailed inspection of the thermal tiles on the belly and underside of the wings were set to be done later Dec. 11 using photography from the International Space Station as Discovery's autopilot is used to fly a 360-degree backflip maneuver with the orbiter 600 feet below the ISS just before docking. The docking was set to take place at 5:06 p.m. Eastern time. During launch, wing leading edge accelerometers detected six events of 1.2- 1.3 gs each on the orbiter wing leading edges. Four of these were on the

left and two were on the right at about 110-120 seconds into launch. The characteristic has been seen on other flights and is believed to be caused by a shock wave moving along the wings in combination with the settling of the T-seals that bridge the RCC with the upper wing surface. The data is only one-tenth of what would be required to even scuff an RCC panel and one-twentieth of what would be required to actually cause damage, says John Shannon, shuttle deputy program manager and head of the shuttle Mission Management Team. Nevertheless, the imagery analysis team headquartered at Johnson Space Center, along with members linked across the country, was assessing as a matter of routine whether the minor data spikes could be correlated with any debris seen falling from the external tank. No significant debris was spotted from the ET mounted camera nor by C and X band radars on the ground. A large new C-band debris tracking radar is based at Kennedy, while the two X-band radars are mounted on the booster recovery ships, one positioned north and the other south of the launch trajectory. The C band and the northern ship's X-band saw nothing of concern. But a failure of the tracking pedestal for the southern ship's X-band prevented it from tracking the ascent properly, Shannon said. The ET camera also returned spectacular imagery of the night ascent, including a circular rocket plume feature trailing behind the orbiter just before main engine cutoff. E-mail distribution. (2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Inspection shows Discovery damage free," [Electronic]. Vol. 220, No. 49, [December 12, 2006.].]

December 13: Budget deal to keep NASA funded at 2006 levels

A plan by the incoming Democratic leadership of Congress to resolve a number of outstanding appropriations bills for 2007, including one that funds NASA, would keep the space agency's budget at the same level as 2006. On Monday the incoming chairman of the appropriations committees in the House and Senate, Rep. David Obey and Sen. Robert Byrd, said that planned to replace the incomplete appropriations bills remaining in Congress for the 2007 fiscal year with a continuing resolution that would run through the end of the fiscal year. NASA and many other federal agencies have been operating since October 1 under a series of short-term continuing resolutions that keep them funded at 2006 levels; the year-long resolution would also keep spending at 2006 levels with only minor adjustments. That decision would be a setback to NASA and its supporters, who had sought a modest budget increase for NASA in 2007. The decision also ends a separate bipartisan plan by two senators to provide a billion-dollar boost to the NASA budget. The continuing resolution, however, would also be free of earmarks that traditionally have sapped money from the budget for specific pet projects. Web posted. (2006). [Budget deal to keep NASA funded at 2006 levels [Online]. Available WWW: http://www.spacetoday.net/ [2006, December 13].]

December 14: Vandenberg successfully launches Delta II

Vandenberg successfully launched a Delta II rocket carrying a National Reconnaissance Office payload from Space Launch Complex-2 at 1 p.m. Dec. 14. The Delta II, a 125.75-foot expendable launch, medium-lift vehicle, launches civil and commercial payloads into low-earth, polar, geosynchronous transfer and stationary orbits. Vandenberg credited teamwork in the delivery of 100-percent mission success. "Today's successful launch was accomplished from the outstanding teamwork from all

organizations to include the 30th Space Wing, Space and Missile Systems Center, NRO, and recently named United Launch Alliance," said Col. Jack Weinstein, 30th SW commander. "Vandenberg ensures national security with each executed launch, continuously proving that no one does it better," he said. Vandenberg Airmen strive to continually deliver successful launches to ensure national security through teamwork with other base organizations. "I'm proud of our entire 30th Space Wing team for their amazing teamwork that made NROL-21 a success," Lt. Col. David Goldstein, commander of the 4th Space Launch Squadron, said. "The perfect orbit insertion we achieved is a testament to the hard work and dedication of the professional Airmen of the 30th Space Wing." "The 4th SLS along with the 30th Launch Support Squadron and the Aerospace corporation conducted launch base mission assurance guaranteeing 100-percent mission success and we delivered; the satellite launched will provide invaluable intelligence data to support the Global War on Terror." The next United Launch Alliance mission from Vandenberg will be an Atlas V in the spring. Web posted. (2006). [Vandenberg successfully launches Delta II [Online]. Available WWW: http://www.afspc.af.mil/news/ [2006, December 14].]

State Department defends national space policy

In the first public comments by a Bush Administration official since the release of the new national space policy two months ago, a State Department undersecretary said that the policy is not evidence that the US wants to weaponize space, but that the nation will do whatever is required to defend its space assets. Robert Joseph, Under Secretary for Arms Control and International Security at the State Department, said in a speech Wednesday that the policy is intended to emphasize the importance of space to US commercial and government interests, and that the US must therefore take seriously unspecified threats to them by both nations and "non-state actors". Joseph said that the policy did not mean that the US planned to put weapons in space, adding that the there is no evidence of an "arms race in space", but that the policy did not rule that step out, and that there was no need for a treaty banning space weaponization. The policy had come under criticism since its low-key release in early October, with some people interpreting the document to mean that the US would act unilaterally to attack other countries' satellites or deny them access to space. Web posted. (2006). [State Department defends national space policy [Online]. Available WWW: http://www.spacetoday.net/ [2006, December 14].]

December 18: 1 killed, 1 hurt in KSC traffic accident

One person is dead and another critically injured following Monday night's fiery crash on Kennedy Space Center property. The Florida Highway Patrol is withholding names pending a criminal investigation, Sgt. Channing Taylor said. Alcohol may have been a factor, he said. The accident occurred around 9:40 p.m. Monday. According to Taylor, a 2007 Hyundai Tiburon was driving at 80 to 100 mph on eastbound State Road 406, also called the Max Brewer Memorial Parkway. The posted speed is 45. The car failed to stop at the intersection of State Road 3, drove more than 100 feet into the woods and burst into flames, he said. One person was confirmed dead at the scene, and another was flown to Holmes Regional Medical Center in Melbourne, Taylor said. Web posted. (2006). [1 killed, 1 hurt in KSC traffic accident [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 19].]

Astronauts complete retraction of solar panel

Astronauts completed the retraction of a troublesome solar array on Monday during an unscheduled EVA. Robert Curbeam and Christer Fuglesang spent just over six and a half hours outside the ISS Monday on the fourth EVA of the STS-116 shuttle mission. The EVA, added to the schedule only on Saturday, allowed the two astronauts to help with the retraction of a solar array on the P6 segment of the station, after previous efforts to have the panel retract automatically failed. The astronauts primarily tugged on guide wires that got stuck in grommets on array segments as they retracted. The panel, and an identical one of the same segment, have to be retracted before the segment is moved to its final location on the station's truss next year. The EVA was the fourth in the mission for Curbeam, setting the record for the most spacewalks by an astronaut on a single shuttle mission. Discovery is scheduled to undock with the ISS shortly after 5 pm EST (2200 GMT) Tuesday, with a landing in Florida on Friday afternoon. Web posted. (2006). [Astronauts complete retraction of solar panel [Online]. Available WWW: http://www.spacetoday.net/ [2006, December 19].]

NASA, Google begin partnership

NASA and Google announced Monday that they would work together to help make NASA's vast archives of images and other information available on the Web. Under the Space Act Agreement between NASA and Google, the search engine giant will work to make "the most useful of NASA's information" available online, from real-time weather visualizations to high-resolution three-dimensional maps of the Moon and Mars, although no date for when such visualizations would be available was announced. Future collaboration between the two could include "joint research, products, facilities, education and missions," according to a statement. NASA's Ames Research Center, located in Silicon Valley, and Google first planned to collaborate on such ventures about a year ago, although the deal was only finalized on Monday. Web posted. (2006). [NASA, Google begin partnership [Online]. Available WWW: http://www.spacetoday.net/ [2006, December 19].]

December 21: Crew rises as landing options get discussed

Mission Control just sent the morning wake up call to Discovery. On tap today: late inspection of the heat-shielding and preparations for a scheduled Friday landing. "We look forward to seeing you back here on planet Earth real soon," astronaut Shannon Lucid just called up from Mission Control in Houston. Discovery's landing options, as of right now, are being worked out as we write this morning. For now, the plan is that the shuttle will land Friday at Kennedy Space Center, Edwards Air Force Base in California or White Sands Space Harbor in New Mexico. All three sites are activated for a Friday landing. Limited consumables likely will force a Friday landing. There appears to be little chance of a "wave off" for a Saturday landing attempt if the weather is bad. Right now, Saturday is there as a backup day for a technical problem. If it's just weather, the plan is to come back on Friday regardless of location. Forecast for Kennedy and Edwards looks pretty grim for Friday. So White Sands could be the destination, unless NASA decides today to skip or dramatically reduce the late heat-shield inspection in order to move up landing to Thursday. That's a real long shot and noone is "officially"

talking about it yet. Indeed, the Mission Management Team's decision as of late last night was to stick with a Friday landing. Web posted. (2006). [Crew rises as landing options get discussed [Online]. Available WWW: http://www.floridatoday.com/ *The Flame Trench* [2006, December 21].]

Shuttle on way home, but maybe not to KSC

A final pre-landing inspection found no apparent heat-shield damage, so shuttle Discovery remains set to return to Earth on Friday. However, weather may prevent landing in Florida. At 3:56 p.m., the first scheduled landing opportunity at Kennedy Space Center, forecasters expect clouds, wind and rain that could make it unsafe to land. If so, Discovery would orbit the Earth once more and land at KSC, Edwards Air Force Base in California or White Sands Space Harbor in New Mexico. "Our intent will be to land somewhere, safely, on Friday," said Phil Engelauf, chief of NASA's flight directors. Wednesday's forecasts for all three sites made New Mexico look most likely. That is NASA's least favored site because it lacks the specialized equipment needed to hook the shuttle to the top of a modified 747 jet for its ride home to the Space Coast. Getting the necessary gear to New Mexico, among other factors, could delay Discovery's return to Florida by weeks. NASA could not estimate how many weeks, but it would be longer than the week it normally takes to return from California. Engelauf, however, stressed that "these are forecasts" more than 48 hours before landing. The weather could change by Friday. The day Discovery blasted off, there was a 70 percent chance the weather would not permit launch. NASA has just one backup day and will only use that in the unlikely event of a serious technical problem or severely unacceptable weather at all three landing sites Friday. Web posted. (2006). [Shuttle on way home, but maybe not to KSC [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 21].]

December 22: Shuttle lands safely at Kennedy Space Center

Space Shuttle Discovery returned safely to Earth Dec. 22, completing a 13- day mission in which astronauts conducted four spacewalks and continued work on the International Space Station. The shuttle's seven astronauts were cleared to perform a re-entry toward a Kennedy Space Center landing at about 5:30 p.m. Eastern time after initial Kennedy and Edwards Air Force Base, Calif., opportunities were cancelled because of dynamic weather conditions. The final "go" for a Kennedy landing was made only five minutes before the deorbit burn to KSC. Clouds and light rain in the central Florida area were the initial problem at Kennedy, while high crosswinds were the problem at Edwards, although the weather there was clear. Weather was also acceptable at Northrup Strip, at White Sands Space Harbor, N.M. But managers wanted to avoid Northrup if at all possible because of the lack of orbiter turnaround facilities there. The clouds and rain showers near Kennedy began to trend more toward acceptable conditions in the 30 minutes prior to the deorbit burn, about 60 minutes before the landing. The Mission Control decision to go for a Kennedy landing was based on key observations by Astronaut Office Chief Air Force Col. Steve Lindsey, flying a Gulfstream II Shuttle Training Aircraft (STA) on approaches to Runway 15 at KSC, combined with real time forecasts by the Space Flight Meteorological Group at Johnson Space Center in Houston. The most critical observation was that showers moving toward Kennedy were actually dissipating, although they remained threatening on radar displays. E-mail distribution.

(2006). [Aviation Week's Aerospace Daily & Defense Report Re: "Shuttle lands safely at Kennedy Space Center," [Electronic]. Vol. 220, No. 58, [December 26, 2006.].]

December 27: NASA's Top Exploration and Discovery Stories of the Year
NASA moved forward in 2006 to extend humanity's exploration of the solar system and learn more about the universe and our home planet. The space shuttle got back to work building the International Space Station, and the agency began developing the next generation of spacecraft and outlined plans for returning to the moon as a stepping stone toward Mars. Space science missions found new evidence of water on Mars, sent the first-ever probes toward Pluto, brought back dust from a comet and launched new instruments to study the sun and the weather on Earth. For more information, visit: http://www.nasa.gov/ ["NASA's Top Exploration and Discovery Stories of the Year," **NASA News Release #06-376**, December 27, 2006.]

December 28: Workers recall loyalty to space
Retired space industry workers and historians on Wednesday remembered former President Gerald Ford as a staunch supporter of America's space industry and a leader who held steady reins as the program advanced from moon exploration to manned shuttle launches. Ford died Tuesday night (December 26, 2006) at his home in Rancho Mirage, Calif., about 130 miles east of Los Angeles. He was 93. He served 25 years in the U.S. Congress representing Michigan before becoming president in 1974 after the resignation of Richard Nixon. Cocoa Beach resident George English, who served on the executive staff to the Kennedy Space Center director in 1975, met Ford around the time of the Apollo-Soyuz Test Project, the first manned space flight between the United States and Russia. "He was very low-key, a very friendly individual," English, 77, said. "He was a supporter of the space program, more so than some of the other presidents." In 1972, long before the Watergate scandal forced him out of office, Nixon approved funding for America's shuttle program. Ford ensured that didn't change, despite a public and political perception of a weakened presidency, said Roger Launius, head of space history for the National Air and Space Museum in Washington, D.C. What most people don't know, Launius said, is that Ford's strong belief in the space program was formed early in his political career. "His role in Congress is one thing most people wouldn't think about," Launius said. "He was proud to have been a part of that process -- a floor leader -- to make sure the NASA budget was maintained." Gerry Griffin, KSC deputy director KSC from 1977 to 1982, agreed and called Ford a "great friend" of the space program. Griffin, 72, ran legislative affairs for NASA in Washington when Ford was House Minority Leader. "We could always count on Ford to be the guy to carry the day for us in the House," Griffin said from his home in Hunt, Texas. "He went to bat on several occasions to get appropriations passed that worked for us. Once he got into the White House, the agency from time to time would go to him when they were having trouble." Web posted. (2006). [Workers recall loyalty to space [Online]. Available WWW: http://www.floridatoday.com/ [2006, December 21].]

Appendix A
Space Shuttle Missions
2006

Mission	Vehicle	Launch	Payload	Landing
STS-121	Discovery	July 4, 2006 LC-39B 9:15 a.m. EDT	ULF1.1	July 17, 2006 KSC 13 days
STS-115	Atlantis	September 9, 2006 LC-39B 6:21 a.m. EDT	P3/P4 Arrays	September 21, 2006 KSC 12 days
STS-116	Discovery	December 9, 2006 LC-39B 5:32 p.m. EDT	P5 Truss, SPACEHAB	December 22, 2006 KSC 12 days, 20 hours, 45 minutes

Web posted. (2006). [Mission Information [Online]. Available WWW:http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/list_main.html [2006, December 28].]

Appendix B
Expendable Launch Vehicle Missions
2006

Mission	Vehicle	Launch Site	Launch Date
New Horizons	Atlas V	CCAFS CPX 41	January 19, 2006 2 p.m. EST
Space Technology 5	Pegasus XL	VAFB	March 22, 2006
CALIPSO	Delta II	VAFB	April 28, 2006
CloudSat	Delta II	VAFB	April 28, 2006
STEREO	Delta II	CCAFS CPX 17B	October 25, 2006 8:52 p.m. EDT

Web posted. (2006). [2006 Expendable Launch Vehicle Missions [Online]. Available WWW: http://www.nasa.gov/centers/kennedy/launchingrockets/archives/2006.html [2007, January 5].]

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