



Chronology of KSC and KSC Related Events for 2012

Elaine E. Liston

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*Elaine E. Liston,
Abacus Technology Corporation, Kennedy Space Center, Florida*

FOREWORD

This 2012 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 Liston.

Comments 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@nasa.gov, or (321) 867-1515.

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JANUARY

January 1: NASA in February plans to open competition for a third round of funding to further development of private spacecraft that could taxi astronauts to the International Space Station later this decade. The request for proposals will reflect the revised contracting strategy announced in December. NASA changed its approach to account for the \$406 million its Commercial Crew Program received this year — less than half what NASA requested from Congress. The limited funding and uncertain outlook for future years raised the likelihood that only one company might emerge to provide a viable crew transportation service. That outcome would have undermined program goals to reduce costs and spur a market for flights of non-NASA crews. NASA agreed, scrapping its original plan to award 21-month contracts this summer that hoped to complete designs for at least two crew commercial systems. Instead, in July or August, the program will sign a new set of Space Act Agreements that agree to pay multiple companies incrementally as they meet technical milestones over a still undetermined period of time. Such agreements guided two previous rounds of funding totaling \$365 million, including \$316 million split among four companies last year. In reverting back to them, NASA sacrificed some technical control in an effort to keep more players in the game longer. The fixed-price contracts that were discarded would have allowed NASA to dictate some spacecraft design requirements to ensure they met safety standards. But Space Act Agreements legally require a more hands-off approach. NASA can only offer advice, increasing the risk that companies may pursue designs that need adjustment later, causing delays to flights now projected to begin in 2017. Web posted. (2012). [NASA opening competition for space taxi development [Online]. Available WWW: <http://www.floridatoday.com/> [2012, January 1].]

January 5: A SpaceX Falcon 9 rocket is scheduled to blast off Feb. 7 from Launch Complex 40 at Cape Canaveral Air Force Station, hauling up a Dragon spacecraft on a mission to demonstrate that it can safely and reliably dock at the station. If all goes well, the flight will lead to the launch later this year of a Dragon spacecraft carrying a full load of cargo to the outpost. SpaceX, based in Hawthorne, Calif., holds a \$1.6 billion contract to launch 12 cargo resupply missions to the station. SpaceX also is one of several companies vying for future NASA contracts to transport astronauts to and from the station. Web posted. (2012). [Space station crew excited by visit from Dragon capsule [Online]. Available WWW: <http://www.floridatoday.com/> [2012, January 5].]

January 6: Six months before the space shuttle Challenger exploded over Florida on Jan. 28, 1986, Roger Boisjoly wrote a portentous memo. He warned that if the weather was too cold, seals connecting sections of the shuttle's huge rocket boosters could fail. "The result could be a catastrophe of the highest order, loss of human life," he wrote. The night before the Challenger's liftoff, the temperature dipped below freezing. Unusual for Florida, the cold was unprecedented for a shuttle launching, and it prompted Mr. Boisjoly and other engineers to plead that the flight be postponed. Their bosses, under pressure from NASA, rejected the advice. The shuttle exploded 73 seconds after launching, killing its seven crew members, including Christa McAuliffe, a high school teacher from Concord, N.H. Mr. Boisjoly's memo was soon made public. He became widely known as a whistle-blower in a federal investigation of the disaster. And though he was hailed for his action by many, he was also made to suffer for it. Mr. Boisjoly died in Nephi, Utah, near Provo, on Jan. 6. He was 73. Web posted. (2012). [Roger Boisjoly, 73, Dies; Warned of Shuttle Danger [Online]. Available WWW: <http://www.nytimes.com/> [2012, February 3].]

◆ NASA has turned off the lights in space shuttle Atlantis for the final time. Since the shuttle's landing in July, workers have been preparing Atlantis for display. They have now powered it down -- an emotional moment for those who worked on the shuttle. The RMS, or robot arm, was one of the last things turned off and stowed away. Workers swung in the dish antenna and put cockpit switches in their final configuration. Preparing Atlantis for display requires electrical power, so in a way, the shuttle has been alive since its last landing. The Kennedy Space Center Visitor Complex has big plans to put

Atlantis on display. It will look like it's in orbit, possibly with the robot arm extended holding a spacewalking astronaut. Visitors will be able to get almost, but not quite, close enough to touch it. They will also be able to peer in the cockpit windows and look inside the cargo bay. Nearby simulators will let you see and feel what it's like to be in a space shuttle on a mission. Web posted. (2012). [NASA Powers Down Atlantis [Online]. Available WWW: <http://www.wesh.com/> [2012, January 6].]

◆ United Space Alliance (USA), the Boeing-Lockheed Martin joint venture created in 1995 to operate NASA's now-retired space shuttle, has been barred by its corporate parents from pursuing any new business, according to industry sources. The move raises new questions about the future of the Houston-based company, a major NASA contractor that has struggled to carve out a prominent new role for itself in the post-shuttle era. USA's current shuttle operations contract is set to expire in September. Another industry source said USA was notified of the Boeing-Lockheed Martin decision during a Dec. 6 meeting of the USA advisory board. USA was not represented at a twice-yearly chief executive roundtable with NASA Administrator Charles Bolden, held Dec. 6 at agency headquarters here, according to attendees. The meeting was attended by the heads of NASA's largest contractors, including Boeing Network and Space Systems President Roger Krone and Lockheed Martin Space Systems Executive Vice President Joanne Maguire, attendees said. USA spokeswoman Tracy Yates said Virginia Barnes, the company's president and chief executive, did not attend the meeting because it conflicted with the USA advisory board meeting. Yates described the USA advisory board meeting as a "major event" that "involves all of our top management." "NASA was informed in advance that our [chief executive] would not be there and why. There was no issue," Yates said. Speculation about USA's future has been rampant since the space shuttle retired last summer, forcing the company to lay off workers in droves. While USA does have other NASA support contracts, these are dwarfed in size by the shuttle-focused Space Program Operations Contract. USA's Space Program Operations Contract was last extended in October and modified in November to cover shuttle program closeout activities, including getting the retired orbiters ready for museum display. The contract extension and modification, worth some \$280 million combined, are set to expire at the end of September. USA announced no new contract wins in 2011 beyond the modification of its main Kennedy Space Center support contract. Web posted. (2012). [Sources: United Space Alliance Directed To Stop Pursuing New Business [Online]. Available WWW: <http://www.spacenews.com/> [2012, January 6].]

January 7: NASA will ramp up production at its Orion spacecraft factory at Kennedy Space Center this year, expanding the spaceport's role beyond launch operations to manufacturing vehicles that will carry astronauts into space. In a renovated high bay first erected for the Apollo moon-landing project, the tooling required to build Orion spacecraft is being put in place. A crew module, other structural elements, and all critical systems will be delivered in the next several months, and the first Orion spacecraft destined for orbit will electrically come to life. "There's a lot of work to be done over the next year to really put the vehicle together, to get it to that first power-up, and to make sure it's ready to go," Scott Wilson, NASA Orion Production Manager at KSC, said Friday. "It's going to be an exciting year." The effort marks a huge first for Florida's Space Coast. It will be the first time a NASA spacecraft production operation takes place at the launch site rather than a factory elsewhere. NASA spacecraft always have been built in other states; then the finished product would make its way to the Cape for launch. About 260 people already work on Orion at KSC. That number will increase to 350 to 400 by June as preparations for the first flight test in early 2014 pick up. Coming after shuttle fleet retirement and the loss of thousands of jobs, the start-up of the Orion factory is welcome news. NASA is developing the Apollo-style Orion capsules to fly astronauts on missions beyond Earth orbit — to asteroids, the moon, Mars and other interplanetary destinations. The first of those expeditions probably won't take place until late in this decade or in the early 2020s. But NASA is making significant strides. Like Apollo capsules returning from lunar sorties, Orion spacecraft will make high-energy atmospheric reentries and parachute to water landings — splashdowns. So NASA is conducting parachute tests at the U.S. Army's Yuma Proving Grounds in Arizona, and water drop tests, including one Friday, at Langley Research Center in

Hampton, Va. Orion's first orbital flight test will put the spacecraft through a launch campaign, mission operations and a reentry sequence that is much faster and hotter than a shuttle return-to-Earth. The capsule will be launched atop a United Launch Alliance Delta IV Heavy rocket at Cape Canaveral Air Force Station. A KSC team will handle recovery operations in the Pacific Ocean. Web posted. (2012). [Orion starts from the ground up in Brevard [Online]. Available WWW: <http://www.floridatoday.com/> [2012, January 7].]

January 9: When the next big group of shuttle contractors is laid off in April, it will be the last time some depart with a special bonus rewarding skills that were deemed essential to flying the final missions safely. NASA and lead contractor United Space Alliance implemented the \$100 million "critical skills" bonus in 2008, concerned about retaining the right personnel as the 30-year shuttle program wound down. Both say the added incentive to stay on the job, which offered eligible USA employees between 15 and 26 weeks of pay on top of their standard severance package, was a success. But with the bonus program set to expire in April, some employees now face a difficult decision: Should they volunteer to be let go to bank the bonus, or try to hang on with a company whose future is highly uncertain? "The program accomplished what it was supposed to do," said Kari Fluegel, a spokeswoman for Houston-based USA. "Our employees did an absolutely amazing job flying out the shuttle program safely and successfully. That's a debt that I believe the whole country owes to them." From the beginning, the bonus program was designed to end nine months after "wheels stop" on the final shuttle mission, which came when Atlantis touched down at Kennedy Space Center last July 21. About 6,500 people qualified when the program opened, then representing 60 percent of the company and 80 percent of its direct shuttle workforce. Just more than 3,500 have received the bonus to date. The exact number of employees to be let go in April was still being finalized, but once was projected at about 250 — significantly fewer than the 1,100 workers still eligible to receive a bonus. Work to close out the shuttle program is dwindling, and no follow-on program is ready to absorb all of USA's roughly 3,000 remaining employees, about half of whom are based in Florida. To qualify for the bonus, employees had to work directly on the shuttle, not be a union member or top executive, and be nominated by a supervisor. The final bonus amount depends on the number of employees who end up sharing \$100 million. Fifteen weeks of pay was the minimum, unless someone qualified for a pro-rated share later. But the value of a full share was expected to be greater, capped at 26 weeks. Web posted. (2012). [Last of shuttle layoffs loom for USA workers [Online]. Available WWW: <http://www.floridatoday.com/> [2012, January 9].]

January 10: NASA has selected a.i. solutions Inc. of Lanham, Md., to receive a contract award that will enable the agency's Launch Services Program (LSP) to provide integrated services for the preparation and launch of NASA's next generation of scientific and exploration spacecraft. The Expendable Launch Vehicle Integrated Support 2 (ELVIS 2) contract has a potential maximum value of \$138.1 million. This new contract resulted from a competitive, small business set-aside. The contract has a two-month phase-in period that begins February 2012, followed by a one-and-a-half-year base period extending from April 1, 2012, through Sept. 30, 2013. Two option periods are available that would bring the total period of performance to five years. The ELVIS 2 contract supports LSP and LSP-sponsored missions, activities and strategic initiatives for multiple NASA programs, the Defense Department, and other government agencies and commercial launch activities. The contract will provide LSP with program management support; vehicle engineering and analysis; launch site support engineering; communications and telemetry; technical integration services; LSP programmatic safety, reliability and quality support; support at Vandenberg Air Force Base in California; information technology support; and special studies. ["NASA Awards Launch Services Program Support Contract," **NASA Contract Release #C12-001**, January 10, 2012.]

◆ The combined Delta 4 rocket and its Wideband Global SATCOM 4 spacecraft payload have successfully completed a thorough electrical test that simulated the countdown and booster's trek into a

supersynchronous orbit in preparation for the real blastoff next week. The craft was delivered to Cape Canaveral's pad 37B and mounted atop the United Launch Alliance-made rocket last Tuesday. The Integrated Systems Test then followed to verify the booster and cargo were in proper sync for flight. Now, technicians are moving into the last round of preps needed to ready the Delta and launch pad facility infrastructure for liftoff next Thursday, Jan. 19. Web posted. (2012). [Final preps underway for next week's Delta 4 launch [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, January 10].]

January 11: Citing a busy 2012 launch schedule, the director of Florida's storied rocket range said Tuesday that's proof there is life after NASA's shuttle program. "We are alive and well, and we are in business here in Central Florida," said Brig. Gen. Anthony Cotton, commander of the Air Force 45th Space Wing and director of the Eastern Range, the nation's prime rocket-launching region. A dozen launches are scheduled from Cape Canaveral Air Force Station in the coming months, including missions that are critical to the International Space Station as well as U.S. troops operating in theaters around the world. First up this year: The Jan. 19 launch of a United Launch Alliance Delta IV rocket with a new-generation military communications satellite. The launch window that night will extend from 7:38 to 9:11 p.m. Targeted for a Feb. 7 launch: A SpaceX Falcon 9 rocket with a Dragon spacecraft. The mission: to demonstrate Dragon spacecraft can safely and reliably deliver cargo to the International Space Station. The following week, on Feb. 16, an Atlas V rocket is scheduled to launch with a communications satellite that will provide the Navy with a space-based 3G network. Another advanced military communications satellite is aiming for a launch in late April. Two top-secret National Reconnaissance Office payloads will be lofted this summer. A SpaceX Falcon 9 is targeting launch on an International Space Station supply run in July. A NASA science satellite is to be launched in August, followed by a Global Positioning System spacecraft in September. The third flight of the military's unmanned mini-shuttle — the X-37 — will start in October, and a NASA Tracking and Data Relay Satellite is slated for launch at the end of the year. The number of scheduled 2012 launches would top by one the number of missions launched in 2011. The year 2011 included 4 Atlas V launches, the final three NASA shuttle flights, two Delta IV missions and the final launch of a Delta II rocket from the Cape. Web posted. (2012). [2012 to be busy year for rocket launches on Space Coast [Online]. Available WWW: <http://www.floridatoday.com/> [2012, January 11].]

◆ NASA intends to increase Lockheed Martin's \$6.4 billion Orion spacecraft contract by \$375 million to compensate the company for conducting an early orbital flight test of the capsule in 2014. The extra money will enable the U.S. aerospace giant to procure a United Launch Alliance Delta IV Heavy rocket and launch services for the mission, which will blast off from Cape Canaveral Air Force Station. Orion is being developed to fly U.S. and partner-nation astronauts on missions beyond Earth orbit — to asteroids, the moon, or Mars or other destinations. The 2014 flight test will launch an unmanned Orion on two highly elliptical orbits of Earth. Then the spacecraft will reenter the atmosphere at a velocity that is 84 percent of the speed of a capsule returning from a moon mission. A NASA procurement announcement posted Jan. 6 says the flight will "test critical systems that contribute to 10 of the 16 highest risks to crew survivability and exploration mission failure." NASA wants to gather test data before the Orion spacecraft's final design is frozen in advance of manufacturing. Doing so will enable NASA to lessen the chance of a delay in the first piloted Orion exploration mission in December 2017. Boeing and SpaceX expressed interest in the flight test. NASA selected Lockheed Martin because analyses showed the company is the only contractor capable of completing flight test objectives by early 2014. Web posted. (2012). [NASA to boost Orion spacecraft contract [Online]. Available WWW: <http://www.floridatoday.com/> [2012, January 11].]

◆ Space Florida, the State's aerospace economic development organization, has announced details of a sub-orbital flight program intended to stimulate market interest in microgravity research via sub-orbital

and parabolic flights from Florida. The Space Florida Sub-Orbital Flight Incentive Program will provide a partial reimbursement for customers to fly research payloads from Florida, equal to one-third of the published list price of an approved flight provider, up to a maximum of \$10,000. Space Florida will provide this incentive in order to increase the volume of commercial and academic research payloads that fly from Florida. All flight research considered for the program should have either a terrestrial or space application. The program period commences on January 12, 2012 and is set to continue until December 31, 2013. It is anticipated that a wide variety of flight providers will participate in the program. At this time, Masten Space Systems, Starfighters/StarLab and Zero G Corporation have shown interest, and it is probable that the number of participating flight providers will increase as the program grows. Web posted. (2012). [Space Florida Announces Sub-Orbital Flight Incentive Program [Online]. Available WWW: <http://www.spaceref.com/> [2012, January 11].]

January 12: A Kennedy Space Center team this morning packed up a space shuttle main engine to be trucked to Stennis Space Center in Mississippi next week, as NASA transfers the engines from the shuttle program to the agency's new heavy-lift rocket. The engine will be the third shipped from KSC, the second that has flown in space. Twelve more will follow, with the last expected to leave Florida around April. NASA has 15 space shuttle main engines, of which 14 are certified for flight. Early versions of NASA's heavy-lift Space Launch System will use engines to power a first stage burning liquid hydrogen and liquid oxygen, assisted by shuttle-like solid rocket boosters. The system is supposed to evolve from a capability to lift 70 tons to 130 tons, growing from a height of 320 feet to 389 feet. It will fly the Orion crew capsule, which will be assembled at KSC. Web posted. (2012). [Shuttle main engines leaving KSC [Online]. Available WWW: <http://www.spaceref.com/> [2012, January 12].]

◆ The Kennedy Space Center Visitor Complex has scheduled the groundbreaking ceremony for its \$100 million exhibit that will showcase the space shuttle Atlantis. The event will be Wednesday, Jan. 18. Eventually, the 65,000-square-foot exhibit will be a centerpiece of the Brevard County attraction. It will spotlight the 30-year history of the space-shuttle program and give guests an up-close look at the orbiter, which was retired last year. Scheduled speakers at the groundbreaking include Lt. Gov. Jennifer Carroll; Chris Ferguson, former Atlantis commander; Bill Moore, chief operating officer of the visitor complex; Janet Petro, deputy director of the Kennedy Space Center; and Jeremy Jacobs, CEO of Delaware North Companies Parks & Resorts. The ceremony begins at 11 a.m. and is open to that day's guests of the Kennedy Space Center Visitor Complex. Web posted. (2012). [Kennedy Space Center Groundbreaking for Atlantis exhibit is Wednesday [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, January 12].]

January 13: Applications close at the end of the month for a new group of astronauts to fly the Orion capsule beyond the space station to the Moon, Mars and points in between. So far more than 1,300 would-be space travelers have applied for the job, hoping that Orion will become the ultimate enabling technology for deep-space human exploration. The figure is comparable to the response NASA received from its calls for space shuttle crews. Like everyone who has flown in space, the Orion applicants are risk-takers, willing to gamble their lives for a plunge into the unknown. And at this point, the unknown includes specific target destinations for the craft that NASA engineers call the "multi-purpose crew vehicle, or MPCV." While President Barack Obama has set a goal of sending humans to an asteroid by 2025, that is only one possible destination for Orion. The first Orion flight on an SLS—tentatively set for 2017—probably will go around the Moon, and the first flight with a crew—in 2021 under current plans—may follow suit. It is also possible that the capsule will dock with the ISS, as a backup crew-transport vehicle to the private spacecraft under development. Lockheed Martin, selected as the prime contractor on Orion in 2006, has been working on possible human missions with the capsule since 2007 and is looking for things to do with it on top of the original "back-to-the-Moon" plan. Web posted. (2012).

[Targets For Orion Visits Remain To Be Set [Online]. Available WWW: <http://www.aviationweek.com/> [2012, January 13].]

◆ The aerodynamic tail cone to cover space shuttle Discovery's main engines and provide a smooth airflow during the piggyback ride atop the modified Boeing 747 carrier jet to the Smithsonian in April was installed onto the orbiter this week. The tail cone structure was moved from the Vehicle Assembly Building to the nearby Orbiter Processing Facility bay 1 at NASA's Kennedy Space Center where Discovery has been decommissioned. Discovery is being prepared for display at the Smithsonian's National Air and Space Museum, Steven F. Udvar-Hazy Center in Chantilly, Virginia. Web posted. (2012). [Ferryflight tail cone put onto shuttle Discovery [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, January 13].]

January 16: As another sign of the changing landscape in the U.S. space program, NASA's long-time space shuttle launch director has joined United Launch Alliance to lead the commercial firm's human spaceflight operations. Mike Leinbach presided over the final space shuttle missions as the launch director from his perch on the top row of Firing Room 4 in the Complex 39 launch control center, giving astronaut crews his signature sendoff of "good luck, Godspeed and have a little fun up there." But once the winged spaceships finished flying last summer, the future of human space missions by the U.S. have been stalled while waiting for development of commercial replacements. United Launch Alliance, which was formed in December 2006 to blend Lockheed Martin's Atlas 5 and Boeing's Delta 4 rocket programs into a collaborative organization for the Air Force's Evolved Expendable Launch Vehicle program, is vying to be the rocket-maker of choice for carrying future piloted craft. A native of Reading, Pa., Leinbach graduated with a Bachelor of Science in Architecture in 1976 and a Master of Engineering in Civil Engineering with emphasis in structural dynamics in 1981 from the University of Virginia, Charlottesville. He began his NASA career in 1984 as a structural engineer in the design engineering directorate and served as a lead design engineer for a variety of launch pad systems including the orbiter weather protection and emergency egress slide wire systems. He advanced to the role of NASA test director in 1988 to direct daily operations at Launch Complex 39. In 1991, he was named shuttle test director, conducting the terminal countdown and launch of 17 missions. A stint in the late 1990s then saw him serve the deputy director of the space station hardware integration office to oversee processing at KSC and integrated testing of the station elements before assembly in orbit. Then came the role that Leinbach is most remembered for, becoming the space shuttle launch director in August 2000 as the person to give the final "go" for liftoff at T-minus 9 minutes. Web posted. (2012). [Former space shuttle launch director joins ULA [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, January 16].]

January 17: A satellite is set to launch from Cape Canaveral Air Force Station at 7:38 p.m. Thursday. Secured atop a 218-foot United Launch Alliance Delta IV rocket is the fourth in a new generation of Department of Defense communications satellites that can transmit vastly more information at higher speeds than their predecessors. There's only a 10 percent chance of strong ground winds during a launch window that extends to 9:11 p.m., and the odds are almost as good if the launch slips to Friday or Saturday. It's the first launch of 2012 from the Cape. Web posted. (2012). [1st liftoff of 2012 will aid military [Online]. Available WWW: <http://www.floridatoday.com/> [2012, January 17].]

January 18: Kennedy Space Center tourism officials, Florida's lieutenant governor and the final space shuttle commander Wednesday morning broke ground on the \$100 million complex that will showcase the retired orbiter Atlantis. Construction of the 65,000-square-foot, 6-story-tall exhibit will begin soon in preparation for receiving the spacecraft early next year and a planned summer 2013 grand opening to the public. "The largest project ever undertaken here at the Kennedy Space Center Visitor Complex ... is the new, \$100 million home for space shuttle Atlantis, a place where NASA's longest running spaceflight

program will be honored," said Bill Moore, chief operating officer of the Visitor Complex. KSC's museum area has been run by the commercial Delaware North firm since 1995. They also constructed the sprawling Saturn 5 facility that houses one of the leftover Apollo moon rockets. "It is an honor to create the home for space shuttle Atlantis and to work with NASA to tell its story to the world," said Jeremy Jacobs, chairman and chief executive officer of the Delaware North Companies, said at the groundbreaking. Plans for Atlantis call for the orbiter to be displayed on support struts at an angle, its 60-foot-long payload bay doors open just like the ship was flying high above Earth, and spectators being able to walk around to see all of the vehicle's exterior. The building also features plans to "tell the story" of the Hubble Space Telescope that the space shuttle program launched, fixed, upgraded and maintained on numerous servicing calls. And the International Space Station that the shuttles helped assemble in orbit will be prominently highlighted. Other details about specific items to be displayed alongside the orbiter are being worked out, as well as exact the arrival date for Atlantis, officials said. The tourism firm began work on the site last year when it removed the replica orbiter Explorer, an external fuel tank and the solid rocket boosters from the center's Shuttle Plaza area. A gantry still visible at Wednesday's groundbreaking will be torn down before construction of the Atlantis facility begins. Web posted. (2012). [Construction about to begin on shuttle Atlantis' new home [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, January 18].]

January 19: The Air Force has sent into space a satellite that is expected to improve communications with military drones in the Middle East and Southeast Asia. Officials say a Delta 4 rocket carried the WGS 4 satellite from Cape Canaveral Air Force Station at 7:38 p.m. Thursday. It's the fourth in a series of military satellites that have been put into place since 2007. The next one is expected to be ready to launch next year. WGS stands for Wideband Global SATCOM. The satellites are replacing aging Defense Satellite Communications System spacecraft and have 10 times the speed and capacity of the older satellites. Web posted. (2012). [Air Force launches military satellite to improve communications with drone aircraft [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, January 20].]

January 20: The first commercial cargo run to the International Space Station is off until spring. SpaceX planned to launch its unmanned supply ship from Cape Canaveral on Feb. 7. But the company said more testing was needed with the spacecraft, named Dragon. And on Friday, officials confirmed the launch would not occur until late March. Space station commander Daniel Burbank said as much as he'd like to take part in the historic event, it's important that SpaceX fly when it's ready. Burbank will return to Earth in mid-March. This first Dragon capsule to visit the space station will carry several hundred pounds of astronaut provisions — nothing crucial, in case of a failure. Astronauts aboard the space station will use a huge robot arm to grab and berth the Dragon. Web posted. (2012). [Delay for world's 1st commercial cargo run to space station, launch off until spring [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, January 20].]

◆ The space capsule that carried the first American into space is leaving the Naval Academy. The Freedom 7 capsule carried academy graduate Alan Shepard into space in 1961 in a 15-minute Project Mercury suborbital flight. The capsule is heading to the John F. Kennedy Memorial Library in Boston. The academy says the NASA space capsule arrived at the school in 1998 and has been on display since then at its visitor center, where it will be until the end of February. The Naval Academy says it has produced 52 astronauts, more than any other college or university in the nation. Web posted. (2012). [Shepard space capsule leaving Naval Academy [Online]. Available WWW: <http://www.wtop.com/> [2012, January 20].]

◆ The shuffling of NASA's three retired space shuttle orbiters between the two remaining hangars at the Kennedy Space Center continued Friday morning as Atlantis was moved into a two-month storage at the Vehicle Assembly Building. The towmachine brought Atlantis the quarter-mile down the road starting at

8:27 a.m. EST, then backed her into the center aisle of the 52-story building at 9:40 a.m. EST. Technicians hooked up purging equipment stationed in the VAB that a NASA spokeswoman says is needed to preserve orbiter hardware that could be recycled for use by future programs. Endeavour has been parked in the VAB bay 4 since August, now she'll take the open Orbiter Processing Facility bay 2 hangar that Atlantis vacated around Feb. 1 to resume the decommissioning and museum preparation work before going to Los Angeles later this year. But for the next several days, tourists can see both Atlantis and Endeavour inside the VAB by taking one of the Kennedy Space Center's Visitor Complex bus tours. Discovery is in OPF bay 1 and nearing completion of the Smithsonian display prep. She will swap places with Atlantis in mid-March and wait out the final weeks at the spaceport parked in the VAB before being ferried to the Dulles International Airport outside Washington in mid-April. Atlantis, which flew the final space shuttle mission, is scheduled for delivery to Kennedy Space Center's Visitor Complex next January. Web posted. (2012). [Shuttle Atlantis moves to VAB, but only for storage [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, January 22].]

January 23: With the space shuttle fleet having retired in July, leaving NASA with no independent means to launch astronauts to the international space station, human spaceflight will be the primary focus of the agency's 2012 procurement activity. NASA intends to select one or two companies this year to finalize designs for commercially operated vehicles to ferry crews to and from the station starting around 2017. The agency also intends to competitively award contracts for risk reduction studies for the Space Launch System (SLS), a congressionally mandated heavy-lift rocket that in combination with the Orion Multi-Purpose Crew Vehicle will support manned missions beyond low Earth orbit starting as soon as 2021. The next phase of the Commercial Crew Program, which was to feature fixed-price contract awards, will now be administered under a Space Act Agreement structure. A request for proposals is expected in late February, with plans to award Space Act Agreements to at least two aspiring providers by August. The object of the 21-month Space Act Agreements is to get competing crew taxis ready for production. The follow-on contracts, whose award date has not been announced, will be aimed at getting the vehicles up and flying to the international space station by 2017. Ed Mango, NASA's manager for the effort, said in December that most of the \$406 million Congress appropriated for the agency's commercial spaceflight activities in 2012 will not be used for the third round of the Commercial Crew Program but will instead support the second round, which is set to wrap up in July. NASA requested \$850 million for the activities this year, and the smaller amount approved by Congress was the rationale for pursuing Space Act Agreements for the upcoming round. Fixed-priced contracts, NASA reasoned, would be more costly to manage, and given the congressional appropriation the agency would have been able to support only a single provider. Five companies have received NASA funds in the first two phases of the Commercial Crew Program: Blue Origin, Kent, Wash.; Boeing Space Exploration Systems, Houston; Sierra Nevada Space Systems, Louisville, Colo.; Space Exploration Technologies Corp., Hawthorne, Calif.; and United Launch Alliance, Denver. While some NASA centers are gearing up to build or manage the next government-owned crew launching system, the agency's Kennedy Space Center in Florida is preparing to upgrade the infrastructure needed to get it off the ground. Kennedy this year will award the massive Test and Operations Support Contract, which covers many of the services formerly provided by United Space Alliance of Houston under the Space Program Operations Contract. Proposals for the new contract are due Feb. 21. The winning bidder will modernize Kennedy's ground and launch-support infrastructure in preparation for the SLS/Orion missions. Web posted. (2012). [NASA Set To Start Spending for Big Human Spaceflight Programs in 2012 [Online]. Available WWW: <http://www.spacenews.com/> [2012, January 24].]

January 24: The Smithsonian's National Air and Space Museum is preparing to welcome the space shuttle Discovery into its collection. Smithsonian Secretary Wayne Clough (cluff) says the shuttle will be flown to Washington Dulles International Airport on the back of a Boeing 747 in April. A flyover is planned above the nation's capital before Discovery makes its final home at the museum's massive hangar in northern Virginia. Clough said Monday the flyover is planned for April 17. A museum spokeswoman

later said the flyover has not been confirmed, and details are still being finalized. A formal welcome ceremony is planned for April 19 at the museum's Udvar-Hazy Center in Chantilly, Va. Shuttle Endeavour will travel to the California Science Center in Los Angeles in the second half of the year. Web posted. (2012). [Space Shuttle Discovery headed to Smithsonian [Online]. Available WWW: <http://news.yahoo.com/> [2012, January 24].]

◆ A spacewalker who tied the record for the most space missions, the military's highest ranking astronaut, and a former chief of the NASA astronaut corps will be inducted into the U.S. Astronaut Hall of Fame this May. Retired astronauts Franklin Chang-Diaz, Kevin Chilton and Charles Precourt were confirmed as the 2012 honorees by the Astronaut Scholarship Foundation, which oversees the Hall of Fame's annual selections. The three veteran space shuttle crew members will be added to the 79 astronauts enshrined in the Hall of Fame since 1990, including all of NASA's Mercury, Gemini and Apollo program pioneers. An induction ceremony is scheduled for Saturday, May 5, 2012 at NASA's Kennedy Space Center Visitor Complex in Florida, where the Astronaut Hall of Fame is located. Web posted. (2012). [Three space shuttle veterans selected for Astronaut Hall of Fame [Online]. Available WWW: <http://www.collectspace.com/> [2012, January 24].]

January 25: Visitors to the Oklahoma Science Museum got a chance Tuesday to get up close and personal with the future of deep space exploration. A test version of the Orion spacecraft, fresh off a series of trials at the White Sands Missile Range in New Mexico, arrived at the museum Monday en route to the Kennedy Space Center in Florida. Museum officials say the Orion spacecraft will remain on the premises through Wednesday, after which it will make stops in Dallas and the U.S. Space and Rocket Center in Huntsville, Ala., on its way to Florida. Josh Byerly, a NASA spokesman traveling with the module, said the design of Orion is a throwback to the nation's earliest spacecraft. "They do look a lot like the Apollo spacecraft," he said. "But that was a tried and true design that's held up well." Byerly said the module will be used in Florida in the same way it was in New Mexico. Web posted. (2012). [NASA test spacecraft makes brief stop in Oklahoma City on way to Florida [Online]. Available WWW: <http://www.newsok.com/> [2012, January 25].]

January 26: This week, NASA is paying tribute to fallen astronauts who lost their lives in the pursuit of space exploration by holding a remembrance ceremony today (Jan. 26) at the Kennedy Space Center in Florida. Today's Day of Remembrance will honor the 45th anniversary Friday (Jan. 27) of the three astronauts who died in a fire at the launch pad while training for the Apollo 1 mission. The tribute ceremony also marks 26 years since the fatal shuttle Challenger accident on Jan. 28, and nine years since the loss of shuttle Columbia and its crew on Feb. 1. "NASA's Day of Remembrance was actually started after the Columbia accident," agency spokesman Allard Beutel told SPACE.com. "By pure happenstance, the three high-profile accidents at NASA related to astronauts happened at relatively the same time of the year, separated by years, but all within a few days of each other. It was decided that NASA would put aside the last Thursday of January — whatever that date happens to be — to pay tribute." During the ceremony at the Florida spaceport, NASA officials, including Kennedy Space Center director and former astronaut Bob Cabana, will participate in a wreath-laying at 10:30 a.m. EST (1530 GMT) at the Space Mirror Memorial at the Kennedy Space Center Visitor Complex. Web posted. (2012). [NASA Honors Fallen Astronauts in Solemn Ceremony [Online]. Available WWW: <http://www.space.com/> [2012, January 25].]

◆ The ocean-going cargo vessel used to transport rocket stages from the manufacturing factory in Alabama to the two primary U.S. launch sites in Florida and California struck a bridge in southern Kentucky Thursday night, causing a section to collapse. The Egner's Ferry Bridge, which crosses Kentucky Lake and the Tennessee River, was opened to traffic in 1932. Known as the Delta Mariner, it is owned and operated by Foss Marine. The shipping firm transports United Launch Alliance Delta 4 and

Atlas 5 components to Cape Canaveral, Florida, and Vandenberg Air Force Base, California. The ship was carrying rocket parts to Cape Canaveral from the factory in Decatur, Alabama, when the crash occurred at U.S. Highway 68 and Kentucky Highway 80 over the Tennessee River Thursday at 8:15 p.m. Central Time. "There are no injuries on the Mariner or the bridge. Initial inspections have shown that the flight hardware being transported was not damaged," ULA said in a statement. Web posted. (2012). [Section of bridge collapses after struck by rocket vessel [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, January 27].]

◆ NASA safety watchdogs are warning that continued underfunding of the agency's commercial crew initiative could put astronauts at risk by increasing the temptation to cut corners in order to end U.S. dependence on Russia for accessing the international space station (ISS). Under the 2012 budget Congress enacted late last year, NASA will get less than half of the \$850 million it requested to put at least two U.S. firms under contract this year to develop privately operated crew taxis. In a report released Jan. 25, the Aerospace Safety Advisory Panel (ASAP) — an outside group of experts chartered to sniff out NASA safety problems and recommend changes — says the \$406 million Congress approved will not allow commercial crew transportation to the ISS by 2016. "In fact, if the new funding level continues into the future, it is the ASAP's belief that the program is in jeopardy, thus extending the current lack of a U.S. human spaceflight capability and resulting in no alternative to reliance on Russia to obtain access to the ISS," the ASAP wrote in its annual report. NASA, seeking to end that dependence, is preparing to solicit proposals for a two-year effort to prepare competing astronaut transportation concepts for production. But the ASAP points out that NASA managers are worried about commercial crew funding going forward and consider "inadequate budget" to be "the top program risk." In ASAP's view, an inadequately funded commercial crew program threatens more than just spacecraft development timelines; it could also compromise safety. The ASAP also took issue with NASA's abrupt about-face on the use of Space Act Agreements for the next phase of the commercial crew development program, known at the time as CCDev. NASA disappointed would-be commercial crew providers last summer when it announced it would award conventional fixed-price contracts, rather than more-flexible Space Act Agreements, for the next round of CCDev awards. But after Congress halved the Commercial Crew Program's budget request in November, NASA announced Dec. 21 it would stick with Space Act Agreements. Web posted. (2012). [Panel Report Warns that Underfunding May Affect Commercial Crew Program [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, January 27].]

◆ Friday marked the 45th anniversary of a launch pad fire that killed three NASA astronauts during testing of the then-new Apollo capsule. Reviews found many flaws in the craft's early design. Among other problems, engineers saved weight by filling the capsule with pure, low-pressure oxygen instead of air, which is 80 percent inert nitrogen. Faulty wiring probably sparked the blaze that killed Roger Chaffee, Virgil "Gus" Grissom and Ed White, according to NASA and congressional investigations. The fire spread quickly in the pure-oxygen environment. The tragedy is still etched on the space agency's collective psyche. The agency held its annual day of remembrance last week. NASA Administrator Charles Bolden laid a wreath at Arlington National Cemetery, and a ceremony at the Kennedy Space Center visitors center honored the three Apollo heroes and the 14 astronauts who later died in space shuttle disasters. Web posted. (2012). [45 years after America's first space tragedy, lessons linger [Online]. Available WWW: <http://www.washingtonpost.com/> [2012, January 27].]

January 28: The shuttle program was ending and the economic forecast was dire: Unemployment would hit 16 or even 17 percent as up to 8,000 space workers entered unemployment. Foreclosures would cascade through the housing market. Home sales would erode. And indeed, during the past three years as the Great Recession rolled across the country, dishing out its own punishment, the shuttle program hosted its final mission and those thousands of workers fell into joblessness. The housing market continued its post-bubble slump, with sale prices falling to decade-old lows. Unemployment peaked at 12.8 percent in January 2010, the highest it has been since the Apollo era (but well short of the predictions). Foreclosure

filings approached 10,000 in 2010, by far the highest total ever in Brevard County. The trends were all headed the wrong way. Now, with another full year of economic data added to the picture, a different trend is emerging: improvement. Brevard, it seems, has absorbed the economic blow from the end of the shuttle program, and residents can expect the economy to improve, gradually. That means a net gain of jobs, more spending and more positive impact from economic development. In several key facets of the Brevard economy, 2011 was better than 2010, which indicates that, in many aspects, 2010 was the low point for the county since the recession began in late 2007. Unemployment averaged 11.3 percent for 2011, down from 2010's 11.5 percent. The sale of existing homes was more than 6,800, 11 percent ahead of 2010's year-end tally of 6,110 and the highest since 2006. And foreclosure filings in 2011, at 3,925, were down by more than 41 percent from 2010 and the lowest since 2006. While no large space program is planned, jobs will be created by a number of smaller programs that Kennedy Space Center Director Bob Cabana and Space Florida Director Frank DiBello have worked to bring to Brevard. These programs include suborbital flights, renovation at KSC and commercial companies, Jim Muncy, an independent space consultant in Virginia, said. Web posted. (2012). [Space Coast economy moves on from shuttle's end [Online]. Available WWW: <http://www.floridatoday.com/> [2012, January 28].]

January 29: There's no firm date yet, but sometime in early 2014, NASA intends to take its first major step toward rebuilding its human spaceflight program. The milestone is the maiden test flight of its Orion spacecraft, a launch that has come into sharper relief in the three months since NASA and manufacturer Lockheed Martin announced it. As planned, an unmanned Orion capsule will begin its journey at Cape Canaveral and take two loops around Earth before splashing down in the Pacific Ocean. What's now clear is that the capsule will be sent into deep space, far beyond the lower Earth orbit of the International Space Station. At its peak, Orion's orbit is expected to extend nearly 3,700 miles from Earth — the farthest a NASA spacecraft built for humans has gone since the early 1970s. Key is whether Orion can survive the brutal re-entry into Earth's atmosphere — where temperatures are expected to reach 4,000 degrees — in preparation for a first human flight in 2021. Ultimately, NASA hopes Orion can carry astronauts back to the moon or to nearby asteroids. Besides the heat shield, the practice flight is designed to test 10 systems whose failure could be disastrous, including the capsule's flight software and parachutes. Like its Apollo-era predecessors, the four-person Orion capsule is designed to land in water. The test also gives NASA, and Orion manufacturer Lockheed Martin, a chance to showcase part of the agency's new exploration program, details of which were agreed to last fall after a year of tense negotiation among the White House, Congress and industry. Locally, the test flight, which will cost \$375 million, will provide Kennedy Space Center with some badly needed work. The retirement of the shuttle led to the loss of at least 6,000 jobs. Lockheed Martin plans to employ as many as 400 workers for Orion at KSC as it approaches the test flight. Web posted. (2012). [Orion test to reach deep space — with broad NASA implications [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, January 29].]

January 30: Hunter woman Kim Ellis has won a Federal Government Australian Endeavour Award and is heading to the Kennedy Space Centre in Florida. Hunter Valley woman is set to become an international space science academic. Medowie woman Kim Ellis has won a Federal Government Australian Endeavour Award and is due at the Kennedy Space Centre in Florida in the United States in May. The award is worth nearly \$20,000 and covers travel and other expenses. Ms Ellis trained as a chemist and later pursued astronomy and says she is looking forward to her time overseas. "I'll be the deputy academic co-ordinator there at the program which means I'll have 120 students to look after as well as about 15 teaching associates," she said. "Also I'll be preparing workshop and lecture material for space science and space law and policy." Web posted. (2012). [Hunter woman heads to NASA [Online]. Available WWW: <http://www.abc.net.au/> [2012, January 30].]

◆ While the Smithsonian gets ready to receive the retired space shuttle Discovery for display this spring, NASA, together with archivists spread across four states, is preparing to preserve the historic orbiter and its sister ships digitally and on paper. The agency's efforts, called "Space Shuttle Recordation" recently

became public through a new NASA website. "Recordation is a term generally used in the context of Historic American Building Surveys or Historic American Engineering Records," NASA's federal preservation officer Jennifer Groman told collectSPACE in an e-mail. "We at NASA have adopted the term for a broader purpose to cover the documentation efforts we are conducting as part of a memorandum of agreement with several state historic preservation officers and the Advisory Council on Historic Preservation for our Section 106 compliance under the National Historic Preservation Act." Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties. In this case, it is NASA's decision to transfer the shuttles to museums for public display. Under its memorandum of agreement, NASA is generating a historical narrative of the development and design of the Space Transportation System, more commonly known as the space shuttle. "The recordation package will include measured drawings developed by the National Park Service and contractors based on laser technology, large format photographs, oral histories, videos and a bibliography," Groman said. According to its website, the recordation effort is paying special emphasis to the changes to the orbiters that were ordered in the wake of the two shuttle accidents. Shuttle Challenger was lost 73 seconds into its launch on Jan. 28, 1986 and Columbia was lost 16 minutes from its landing on Feb. 1, 2003. Discovery, which returned the fleet to flight after both of the tragedies, has been identified by NASA as the "shuttle of record," which means it has been and will be the orbiter most extensively documented and researched. A copy of the materials will also be held by the Library of Congress. Web posted. (2012). [Documenting Discovery: NASA, archivists work to record space shuttles' history [Online]. Available WWW: <http://www.collectSPACE.com/> [2012, January 30].]

FEBRUARY

February 1: Though thick smoke from a prescribed burn disrupted some operations today at Kennedy Space Center, the orbiter Endeavour successfully completed a planned move from the Vehicle Assembly Building to a nearby processing hangar. Endeavour began rolling at 9:54 a.m., nearly two hours later than planned, and was safely parked in Orbiter Processing Facility-2 a half-hour later. Tomorrow, Atlantis is scheduled to assume Endeavour's vacated spot in the assembly building's High Bay 4. Atlantis left OPF-2 last month and now sits in the VAB's transfer aisle. The moves are part of NASA and contractor efforts to ready the retired shuttle fleet for museum display. Web posted. (2012). [Endeavour rolls from VAB to processing hangar at KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 1].]

◆ Smoke from a 2,700-acre controlled burn covered Kennedy Space Center's industrial area Wednesday morning, prompting some road closures and instructions for employees who work in that area to stay home or work elsewhere. Some who had made it to work early complained about difficulty breathing, but no injuries were reported. The Headquarters Building, Space Station Processing Facility and others in the area were emptied of personnel and monitored for smoke and carbon dioxide levels. The center planned to delay workers' arrival at those sites today until 10 a.m. to ensure the air was clear, with forecasts showing wind might blow smoke back into the area. Employees were advised to check a center hotline in the morning to get an update on their status. Despite the haze blanketing the industrial area, Launch Complex 39 remained fully open and active. Atlantis was scheduled to take Endeavor's place in an assembly building high bay this morning, moving a short distance from its temporary parking spot in the building's transfer aisle. But the move was postponed due to a minor glitch with ground support equipment. A new date was not set immediately. Web posted. (2012). [Smoke prompts KSC to tell some workers to stay home [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 1].]

◆ SpaceX's dream of fielding a spacelaunch system that is completely reusable is inching forward with the successful test-firing of its new SuperDraco engine at SpaceX's Rocket Development Facility in Texas. The powerful new SuperDraco will be installed in the side walls of the next-gen Dragon spacecraft and provide up to 120,000 pounds of axial thrust, enabling not only on orbit maneuvering, but emergency escape from the rocket tower should something go awry during launch. The Draco engines currently used on the Dragon spacecraft allow the robotic resupply capsule to maneuver on orbit and orient itself during reentry, but SpaceX has bigger plans for a system that will one day be able to return all elements--including rocket stages--to Earth intact for reuse in later missions. Web posted. (2012). [SpaceX test-fires its new super-powerful capsule engines [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 1].]

February 2: Buyouts and layoffs will shave more than 200 employees from Kennedy Space Center's ranks during the next few months as post-shuttle downsizing continues. Prime shuttle contractor United Space Alliance, which has been cutting staff quarterly since before last year's final shuttle mission, plans to let go about 160 local employees on April 13. Nearly 140 "self-nominated," or volunteered, for the layoff during an application period that ended last week. So pending approval of those candidates, only a small number may receive unwanted notice by next week that they, too, must go. The April layoff is the last when selected contractors can collect a "critical skills" bonus worth up to 26 weeks of pay on top of their normal severance package. NASA funded the \$100 million bonus program during the shuttle's final years as an incentive to retain essential personnel and ensure safe missions to the end. The bonus deadline and Houston-based USA's uncertain future didn't prompt a surge in employees looking to leave. Companywide, about 200 people volunteered for the 250 positions expected to be cut. USA currently employs just under 2,900, including about 1,500 in Florida, where work centers on closeout of the shuttle program and the delivery of three retired orbiters to museums. NASA, meanwhile, offered voluntary

buyouts last fall to more than 660 civil servants across the country, including up to 150 at Kennedy. It appears the number accepting the \$25,000 offer will be well below those targets. At KSC, only about 122 NASA employees planned to take the buyout, with Friday being the last day on the job for most, a KSC spokesman said. About 60 had already left by Dec. 31, out of 273 agencywide. KSC confirmed some senior center managers were among those leaving with the buyout, including Mike Leinbach, the shuttle launch director; Joe Dowdy, special operations manager in the center director's office; and Jim Ball, deputy manager of center planning and development. Center employment has dropped from more than 15,000 two years ago to about 8,900 people as of last October, with contractors making up almost the entire decline. KSC Director Bob Cabana has said he expects workforce levels to stabilize around 8,000, then gradually rebound to 10,000. Web posted. (2012). [KSC jobs to shrink by 200 this spring [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 2].]

◆ One of NASA's industry partners, Sierra Nevada Corp. (SNC), recently delivered the primary structure of its first Dream Chaser flight test vehicle to the company's facility in Louisville, Colo., where it will be assembled and integrated with secondary systems. This is one of 12 milestones to be completed under SNC's funded Space Act Agreement (SAA) with NASA's Commercial Crew Program (CCP). "It's rewarding to see our partner's ideas and concepts come to fruition," said CCP Program Manager Ed Mango. "The company's delivery of its flight structure will allow them to make more strides toward launching NASA astronauts on American vehicles to the International Space Station." The Dream Chaser flight test vehicle, a full-scale prototype of the company's planned winged spacecraft, will be used to carry out several remaining NASA Commercial Crew Development Round 2 (CCDev2) milestones, including a captive carry flight and the first free flight of the craft. ["NASA's Commercial Crew Partner Sierra Nevada Delivers Flight Test Vehicle Structure," **NASA News Release #09-12**, February 2, 2012.]

◆ United Launch Alliance (ULA) today announced the completion of two key milestones leading toward the certification of the Atlas V launch vehicle for human spaceflight. ULA has successfully completed the third and fourth milestones of its Commercial Crew Development (CCDev) Unfunded Space Act Agreement (SAA). In December, ULA conducted a series of detailed reviews that reflected the culmination of efforts involving technical experts and representatives from NASA's Commercial Crew Program (CCP). A Tailored System Requirements Review (TSRR) was successfully conducted which summarized months of work with ULA and NASA. The team reviewed the detailed evidence that demonstrates how the existing, flight-proven Atlas V meets the intent of NASA's Human Spaceflight Certification requirements. The team paid particular emphasis to requirements traceability, verification and certification planning. Because Atlas V is already certified to fly the nation's most complex exploration and national security missions, ULA was able to provide a wealth of detailed system and sub-system analysis, qualification, certification, and flight data resulting from 28 successful missions. A Probabilistic Safety Analysis (PSA) Review also was conducted to evaluate safety-critical launch vehicle systems. This included the details of existing Failure Modes and Effects Analysis (FMEA) data, Probabilistic Risk Assessment (PRA) results, explosion modeling analyses, system hazard analyses and fault coverage assessments. The PSA leveraged similar data developed in support of Atlas V launches of critical NASA missions including Pluto New Horizons, Juno and the Mars Science Laboratory. Web posted. (2012). [United Launch Alliance Completes Critical Milestones Toward Certifying Atlas V for Human Spaceflight [Online]. Available WWW: <http://www.spaceref.com/> [2012, February 2].]

February 3: Amid signs space shuttle operator United Space Alliance (USA) may not be around to do the job, NASA is seeking an industry steward for millions of dollars worth of high-tech support equipment housed in the Shuttle Logistics Depot, a sprawling facility just a short drive from Kennedy Space Center in Florida. The facility itself, owned by a private landlord, would not be part of the deal. The 15,000-square-meter building that houses the machine shops and specialty labs previously used to keep the shuttle flying is currently leased by USA. The equipment itself, which was used to crank out and refurbish space shuttle parts, is owned by the space shuttle program office at Johnson Space Center in

Houston, USA, the Houston-based Boeing-Lockheed Martin joint venture created in 1995 to maintain and operate the space shuttle, was set to continue its stewardship of the depot and the machinery housed there even after the company's shuttle support contract ends, according to Florida aerospace economic development officials. USA's plan called for putting the equipment to use for non-NASA customers, such as the Defense Department, until it was needed again to support a next-generation space transportation system. But new business was slow to materialize and that strategy finally imploded in December when USA's parent companies barred it from seeking any new business. NASA put out a request for information Jan. 18 to industry, advertising that it wanted to sign a five-year Space Act Agreement with a single company willing to take the equipment in the Shuttle Logistics Depot on loan. Prospective caretakers were told they had to keep the equipment within an 80-kilometer radius of Kennedy Space Center. NASA would provide no funding for the equipment's upkeep and would reserve the right to ask for it back at any time. Web posted. (2012). [USA's Exit Sends NASA in Search of New Steward for Shuttle Equipment [Online]. Available WWW: <http://www.spacenews.com/> [2012, February 3].]

February 5: NASA controllers and curious spectators won't be the only ones watching the upcoming launch of the first commercial vehicle to the International Space Station. Lawmakers, administration officials and other policy makers with a role in deciding NASA spending will be watching as well. The launch of SpaceX's Falcon 9 rocket and Dragon spacecraft from Cape Canaveral, now scheduled for April, is billed as a demonstration mission to show the world a private company can safely deliver cargo to the space station. But the launch also can be seen as a test of whether it was a good idea to retire the shuttle and have the private sector take over the job of carrying crew and cargo to the space station. SpaceX is one of four companies receiving government funding to develop the new spacecraft. SpaceX initially planned the launch — with no crew on board — for February 7, but pushed back the date to at least April while it conducts additional tests. Recent missteps by Russia's space agency, which now provides rides to U.S. astronauts, add to the pressure to speed development by American companies. NASA announced Thursday that Russia's March 30 launch to bring crew to the space station has been delayed until May 15 because a descent capsule was damaged during a test. Web posted. (2012). [SpaceX launch will be a key test for NASA [Online]. Available WWW: <http://www.usatoday.com/> [2012, February 5].]

February 6: Kennedy Space Center workers have been given the all-clear to report to work as usual this morning following overnight concerns lingering smoke or fog could present a problem for the area this morning. Environmental health teams rode throughout the complex but didn't find any of the heavy smoke from a massive Merritt Island Wildlife Refuge controlled burn that seeped into buildings last Wednesday and forced supervisors to tell workers to stay home. "Everything is fine today," said Lisa Malone, spokeswoman for the Kennedy Space Center. "Everyone can report to work." The 2,000-acre prescribed burn was conducted last Tuesday, just south of the space center. The email alert about possible weather concerns went out to employees Sunday. The assessment of the roadways and buildings was conducted earlier this morning, providing supervisors with an all-clear, Malone added. Web posted. (2012). [Smoke no concern as KSC workers head back to work [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 6].]

◆ The hulking cargo ship that tore through a western Kentucky bridge last month is carrying millions of dollars of rocket components that will be used to blast satellites into space for NASA and Department of Defense missions. The Coast Guard on Monday allowed the Delta Mariner to move away from the damaged bridge so that debris, including twisted steel and asphalt, could be cleared from the boat's bow. The five-story tall ship struck the bridge on the Tennessee River on Jan. 26, tearing away a span and halting traffic on the western entrance to the Land Between the Lakes National Recreation Area. The boat is carrying an Atlas V rocket and a Centaur upper stage component that belong to a rocket system that typically costs hundreds of millions of dollars to launch. The rocket parts had been sitting stranded on the ship for about 10 days until the Delta Mariner was moved on Monday. "The salvage operations are

proceeding as planned, and it is a significant milestone that the ship has now been relocated downriver and clear of the" bridge, Coast Guard Cmdr. Claudia Gelzer in Paducah said in a statement. The Delta Mariner was headed to Cape Canaveral Air Force Station, Fla., with the rocket parts when it hit the 90-year-old bridge, known locally as the Eggner's Ferry Bridge. Web posted. (2012). [Ship that hit Ky. Bridge has precious space [Online]. Available WWW: <http://www.utsandiego.com/> [2012, February 6].]

◆ NASA contractor InoMedic Health Applications at Kennedy Space Center won a Voluntary Protection Program STAR award from the Occupational Safety and Health Administration in January. The company provides occupational medicine services, environmental health, environmental services and health management to personnel at KSC. Based in Hampton, Va., the company is a service-disabled veteran-owned small business. The award is presented for passing a rigorous inspection for comprehensive safety and health management systems. Only 75 businesses in Florida have been recognized. Web posted. (2012). [Medical company wins OSHA award [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 6].]

◆ Legendary astronauts John Glenn and Scott Carpenter will be on the Space Coast this month to celebrate the 50th anniversaries of the nation's first two orbital human spaceflights. The two Project Mercury astronauts will appear at the Kennedy Space Center Visitor Complex on Feb. 18 along with U.S. Sen. Bill Nelson, D-Orlando, KSC Director Robert Cabana and NASA astronaut Stephen Robison. Robison flew with Glenn on the STS-95 shuttle mission in 1998. Glenn and Carpenter, the last two surviving members of the nation's first seven Project Mercury astronauts, will appear at a 6:30 p.m. Feb. 18 event dubbed "On The Shoulders of Giants." Web posted. (2012). [Astronaut legends John Glenn, Scott Carpenter to visit Space Coast [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 6].]

February 7: As part of NASA's ongoing efforts to foster development of a U.S. commercial crew space transportation capability to and from low Earth orbit and the International Space Station, NASA has issued a call for industry to submit proposals for the Commercial Crew Integrated Capability Initiative. It's expected that proposals will lead to Space Act Agreements that will help NASA and the U.S. achieve safe, reliable, and cost effective human access to space. NASA expects to make multiple awards this summer, with values ranging from \$300 - \$500 million. To provide industry a better understanding of this initiative so that they may provide more comprehensive proposals, NASA plans a pre-proposal conference on Feb. 14, at the Courtyard Marriott in Cocoa Beach, Fla. Proposals are due March 23. NASA's announcement asks industry to propose a base period of approximately 21 months, running from award through May 2014. The goals of the base period include completing the design of a fully integrated commercial crew transportation system, which consists of the spacecraft, launch vehicle, ground operations, and mission control. In addition, NASA is asking for the proposals to contain optional milestones beyond the base period leading to and culminating in a crewed orbital demonstration flight. ["NASA Calls for New Commercial Crew Proposals," **NASA News Release #12-045**, February 7, 2012.]

February 8: Space Exploration— also known as SpaceX — has inked an agreement with Asia Satellite Telecommunications Co. Ltd. To launch two AsiaSat communications satellites in 2014 using SpaceX's Falcon 9 rocket. AsiaSat 6 and AsiaSat 8 are scheduled to launch in the first half of 2014 from SpaceX's launch complex at Cape Canaveral Air Force Station. The high-powered transponders on the satellite will enable the use of small antennas on the ground. The two satellites will serve Asia, the Middle East and Australasia. Hawthorne, Calif.-based SpaceX manufactures and launches rockets and spacecraft. In 2010, SpaceX became the first commercial company to put a spacecraft into orbit and return it safely to Earth. Web posted. (2012). [SpaceX to launch AsiaSat satellites [Online]. Available WWW: <http://www.bizjournals.com/> [2012, February 8].]

◆ NASA today said it was looking for technology that could offer green rocket fuel alternatives to the highly toxic fuel hydrazine used to fire up most rockets today. According to NASA: "Hydrazine is an efficient and ubiquitous propellant that can be stored for long periods of time, but is also highly corrosive and toxic. It is used extensively on commercial and defense department satellites as well as for NASA science and exploration missions. NASA is looking for an alternative that decreases environmental hazards and pollutants, has fewer operational hazards and shortens rocket launch processing times." NASA said it expects such green fuels would decrease environmental pollutants but also reduce propulsion systems complexity, create fewer operational hazards, decrease launch processing times and increase performance. Of course creating and testing such fuels takes money and time. NASA noted it expects to make multiple contract awards for the technology with no single award exceeding \$50 million. This isn't the first trip down the green fuel lane NASA has made. In 2009 the agency and the Air Force said they had successfully launched a 9ft rocket 1,300 feet into the sky powered by aluminum powder and water ice. Aluminum powder and water ice, or ALICE, has the potential to replace some liquid or solid propellants and is being developed by Purdue University and Pennsylvania State University to possibly replace liquid or solid rocket propellants. Web posted. (2012). [NASA wants green rocket fuel [Online]. Available WWW: <http://www.networkworld.com/> [2012, February 8].]

February 10: Orion teams are in the final stages of preparing for the first Generation II Parachute Test Vehicle (PTV2) airdrop at the end of this month. Following the failure of the last Capsule Parachute Assembly System (CPAS) test, the new system will be hoping for a successful outcome, when the vehicle is deployed out of the back of a C-17 aircraft over the US Army Yuma Proving Ground in Arizona. The tests – which had included testing the giant parachutes for since-cancelled Ares I first stage recovery – were enjoying a good amount of success until an Orion PTV (first generation) suffered a failure back in 2008, resulting in the vehicle crashing into the ground. Web posted. (2012). [Orion hoping for success with second generation parachute system [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, February 10].]

◆ The launch of NASA's second Orbiting Carbon Observatory, under construction to replace a satellite lost in 2009, will be delayed at least one year after the space agency terminated an agreement for the carbon-tracking mission to lift off on a Taurus XL rocket, officials said Friday. Officials with NASA and Orbital Sciences Corp., the Taurus XL contractor, told Spaceflight Now the arrangement to launch OCO 2 in February 2013 was canceled earlier this month. Mike Curie, a spokesperson at NASA Headquarters in Washington, said the agency and Orbital Sciences agreed Feb. 2 to a bilateral contract modification leading to a "termination for convenience" of the Taurus XL launch contract for the OCO 2 satellite. The parties "came to an understanding to no longer pursue the launch of OCO 2 on a Taurus XL," Curie said. NASA released a multi-mission request for launch service proposals that included OCO 2 on Feb. 3, according to Curie. All rockets covered by the NASA Launch Services contract are eligible to compete to fly the OCO 2 spacecraft. Once officials select a new rocket for OCO 2, Curie said NASA expects it will take about 27 months to launch the satellite. The timetable means OCO 2 will likely be grounded until at least mid-2014, more than a year after its previous target launch date. The NLS contract includes United Launch Alliance's Delta 2 and Atlas 5 rockets, SpaceX's Falcon 1 and Falcon 9 launchers, Lockheed Martin's Athena 1 and Athena 2 boosters and Orbital's air-launched Pegasus XL, which is too small to loft the 972-pound observatory into the necessary 438-mile-high orbit. Web posted. (2012). [Carbon-sniffing satellite faces one-year delay [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, February 10].]

February 11: A device created by a small business in Santa Maria could change the way Atlas 5 and Delta 4 boosters are tracked upon liftoff. The Vehicle Based Independent Tracking System, or VBITS, was developed by Santa Maria-based Space Information Laboratories, and its debut is scheduled for launch on a rocket this month in Florida. VBITS will allow crews to track rockets using GPS satellite technology instead of old-fashioned radar. The first of three required test flights is scheduled for Feb. 16

aboard a United Launch Alliance Atlas 5 rocket set to blast off from Cape Canaveral, Fla. Web posted. (2012). [Small company is sky-high [Online]. Available WWW: <http://www.santamariatimes.com/> [2012, February 11].]

February 13: The Obama administration is requesting \$17.7 billion for NASA in its fiscal 2013 budget - down slightly from 2012 levels -- doubling the amount spent on development of new commercial manned spacecraft to ferry astronauts to and from the International Space Station and giving a substantial boost to the delayed and over-budget successor to the Hubble Space Telescope. Funding for the space station and ongoing development of new rockets and capsules for deep space exploration remains roughly constant, but the agency's hugely successful Mars exploration program will be sharply scaled back, in large part to offset gains in other areas. Putting an optimistic spin on the numbers, NASA Administrator Charles Bolden said "it's a \$17.7 billion blueprint for NASA and the nation to embark on an ambitious plan of space exploration that will take us farther into the solar system than we've ever gone." The budget request represents the opening round in the administration's annual negotiations with Congress over federal spending and while the total for NASA may remain relatively constant, the emphasis given to various programs -- and how much money they will receive -- likely will change in the months ahead. As it now stands, nearly \$3 billion would go to International Space Station operations, including \$1.3 billion for crew and cargo transportation. That figure includes the cost of launching U.S. and partner astronauts on Russian Soyuz spacecraft. Some \$830 million is budgeted for the administration's ongoing drive to develop private-sector spacecraft to ferry astronauts to and from the space station and to end the agency's post-shuttle reliance on the Russians. That is roughly what the administration requested in fiscal 2012, but Congress cut that figure in half, to \$406 million, during budget negotiations. How the commercial space initiative will fare this time around remains to be seen. NASA's fiscal 2013 budget includes \$1.88 billion for ongoing work to develop a new heavy-lift booster and ground systems, along with another \$1 billion for continued development of the Orion Multi-Purpose Crew Vehicle that will be used for eventual missions to deep space targets ranging from nearby asteroids in the mid-2020s to the environs of Mars in the mid-2030s. The costly James Webb Space Telescope, NASA's follow on to the Hubble Space Telescope, would receive \$628 million in 2013, a \$109 million increase over 2012 levels, while Earth and solar science missions would receive \$1.8 billion and \$647 million respectively, both reflecting slightly increased spending. But the president's 2013 budget proposal reduces the scope of NASA's Mars exploration program, calling proposed joint missions with the European Space Agency "unaffordable." Overall, the budget would reduce funding for planetary science from \$1.5 billion to \$1.2 billion with additional reductions expected through 2017. If approved, the near-term impact would be to force NASA to back out of a 2008 agreement with the European Space Agency to share the costs of two ambitious Mars missions known as ExoMars, which called for launch of an orbiter in 2016 and two rovers in 2018. Along with searching for signs of past or present life on the red planet, the missions also would have tested technologies needed for a long-sought sample return mission. Bolden said NASA would focus on "medium-class" robotic missions to Mars, avoiding for now more expensive showcase missions like ExoMars and the Mars Science Laboratory, current en route to the red planet. Web posted. (2012). [NASA's 2013 budget boosts manned space, reduces Mars [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, February 13].]

◆ The forecast is favorable for Thursday's [February 16th] planned launch of a United Launch Alliance Atlas V rocket carrying the first in a new series of communications satellites operated by the Navy. There's an 80 percent chance of good weather during a launch window that opens at 5:46 p.m. and extends to 6:30 p.m. at Cape Canaveral Air Force Station, with cumulus clouds the primary concern. Conditions at Launch Complex 41 are expected to worsen if the launch slips to Friday, with only a 60 percent chance of acceptable weather. The 206-foot Atlas V, supported by five strap-on solid rocket boosters, is launching the first of the Navy's Mobile User Objective System, or MUOS, spacecraft. Web posted. (2012). [Forecast favorable for Atlas V launch on Thursday [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 13].]

◆ Space agency NASA has switched off its last IBM Z9 mainframe. Chief information officer Linda Cureton said in a blog post that the environment had been kept alive this long "to support applications that we knew would soon be retired." "It was more cost-effective to keep the as-is architecture in place rather than migrate to a server environment," Cureton said. "When we were in the position to retire the applications, retiring the mainframe made sense." Cureton said there had been no new application development on NASA's mainframe infrastructure "for a while". "Our larger business applications run on SAP in a non-mainframe environment," she said. The mainframe retirement also realized cost savings in software licenses for the space agency. Web posted. (2012). [NASA powers down last mainframe [Online]. Available WWW: <http://www.itnews.com.au/> [2012, February 13].]

February 14: Kennedy Space Center would see more funding for its programs — but no significant change in employment — under the Obama administration's proposed 2013 budget. Center Director Bob Cabana said the overall spending plan and local impact were "good news" given the broader emphasis on reducing federal spending and deficits. "I'd say it's very good for the Kennedy Space Center," Cabana told reporters Monday. "Is it going to bring a lot of work? Not in this year coming up, but it's going to allow us to keep the workforce that we have working, and build on what we've already set in motion." In motion are efforts to close out the shuttle program and prepare launch pads and other facilities for use by the heavy-lift rocket and Orion crew capsule planned for deep space exploration, or by new commercial users. After at least a couple hundred more contractor layoffs expected soon because of the shuttles' retirement, Cabana expects center employment to remain around 7,500 through 2013, including about 2,050 civil servants. Shuttle work would wrap up in 2013 with delivery of the last retired orbiters to museums, including Atlantis moving to the KSC Visitor Complex. Funding to modernize launch infrastructure would remain flat at close to a half-billion dollars, Cabana said. A program intended to turn the center into a "21st Century space launch complex" would be cut 67 percent, to \$41 million, but another \$404 million would go toward ground systems upgrades needed to launch an unmanned test flight of the heavy-lift rocket and Orion in 2017, and a crewed flight in 2021. Cabana said total funding funneling through KSC would increase by \$323 million, to \$2.1 billion. That's largely due to the increased funding NASA requested for development of commercial crew transportation systems, a program managed at KSC. That \$830 million request is more than double the total Congress approved this year. NASA hopes commercial vehicles are ready to launch astronauts from Florida to the International Space Station by 2017, ending reliance on Russian spacecraft. Other center activity will include continued support for launches of NASA science satellites on expendable rockets, and work by a new nonprofit to manage experiments performed in the National Lab portion of the space station. Web posted. (2012). [Budget 'good news' for KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 14].]

◆ NASA needs sustained funding at the levels President Barack Obama recommended this week for commercial vehicles to launch astronauts from Florida by 2017, officials said Tuesday. "We think private industry could field a system in probably four or five years if they had adequate funding," said Phil McAlister, head of commercial spaceflight programs at NASA Headquarters. "If we get less money than that, obviously it will slip that date out a little bit further." McAlister joined space industry representatives at a conference to discuss the next phase in development of commercial transportation services needed to return NASA crews to the International Space Station on American vehicles instead of Russian spacecraft. McAlister believes the requested budget is attainable, noting that funding for commercial crew systems has grown steadily from \$50 million a few years ago to \$312 million last year and \$406 million this year. NASA has committed to operating the space station only through 2020. That horizon could be extended, but if it isn't, companies might decide it's not worth investing in vehicles that would only fly a handful of NASA crews. More clarity on how soon companies could be ready to fly, and how much money they're willing to invest, is expected when NASA awards its next round of development grants this summer. Proposals are due March 23. In July or August, NASA hopes to award agreements with multiple companies worth \$300 million to \$500 million over 21 months to complete designs for

“integrated” systems including rockets, spacecraft, ground systems and mission systems. Beyond that period, companies must offer plans for a potential three-day orbital test flight by a private crew before NASA certifies the vehicles’ safety for its own crews. “We don’t want a sales pitch,” said Ed Mango, manager of NASA’s Commercial Crew Program at Kennedy Space Center. “We want to know how are you technically going to go make this happen?” McAlister said companies’ forthcoming proposals would show that U.S. private industry has the technical ability to fly crews to low Earth orbit and that an end in the human spaceflight gap was within sight. Web posted. (2012). [NASA targets \$830M annually to reach local astronaut launch by 2017 [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 15].]

◆ Five legends in space exploration kicked off a yearlong celebration Tuesday of the 50th anniversary of Kennedy Space Center, recounting a half-century of adventures in and beyond Earth orbit. Ike Rigell set the stage with anecdotes from the earliest days of the great Space Race between the United States and the former Soviet Union, a time when Kennedy Space Center was not yet Kennedy Space Center and NASA still did not exist. JoAnn Morgan recalled being the first women to work amongst a cigarette-smoking bunch of white male engineers in black suits, skinny black ties and short-sleeved white shirts with pen-filled pocket protectors. Steve Francois was a young engineer when the U.S. launched Pioneer 10, the first spacecraft to escape the grasp of Earth’s gravity and the first to traverse the rocky asteroid belt between Mars and its destination, Jupiter. Long-time launch director Bob Sieck talked about the complexity involved with sending up the world’s first reusable spacecraft and then turning NASA’s shuttle orbiters around from flight to flight. And Lee Solid summed up what it takes to be part of the greatest adventure the human race ever has embarked upon. “The bottom line is, love what you do, and give it all you’ve got,” Solid said. That’s what it takes to be part of the exploration of space, Solid and others told crowd of 200 at the monthly luncheon meeting of the National Space Club Florida Committee. The sold-out event came during a week in which NASA, Project Mercury veterans and the Space Coast are celebrating the golden anniversary of the first two U.S. orbital human space flights. In 1962, legendary astronauts John Glenn, Scott Carpenter and Wally Schirra launched Feb. 20, May 24, and Oct. 3, respectively, putting the U.S. on even footing with the Soviet Union, which had launched Sputnik in 1957 and Yuri Gagarin in 1961. KSC also is celebrating its 50th anniversary this year. In the early days of space exploration, the facility was the Launch Operations Directorate of Marshall Space Flight Center in Huntsville, Ala. On July 1, 1962, the site became NASA’s Launch Operations Center, elevated to the same status level as Marshall and other NASA centers. On Nov. 29, 1963, a week after President John F. Kennedy was assassinated, the spaceport was given its current name. The Gemini program followed, and then NASA successfully carried out the Apollo moon-landing project, the Skylab space station program and the Apollo-Soyuz Test Flight before the advent of space shuttle operations and the assembly of the International Space Station. NASA now is investing in the development of private space taxis to fly people to and from the station and other Earth orbit destinations. The agency also is developing a new Orion crew vehicle for missions beyond Earth orbit and a heavy-lift rocket to support launch the new spacecraft. The moon, Mars, asteroids and other celestial destinations await U.S. astronauts. “We are celebrating 50 years of spaceflight here at Kennedy Space Center,” said former NASA astronaut and current KSC Director Robert Cabana. “I believe our next 50 years are going to be as good or better than our first 50 years.” Web posted. (2012). [Space legends launch a year of celebration [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 15].]

February 17: Fifty years ago Monday, America needed a hero. And John Glenn was ready. With the Cold War at its coldest, the Soviet Union was boasting that its first man in space, and first to orbit the Earth, was evidence that it was technologically superior to the United States — a claim that chilled more than just America’s space aspirations. Mercury astronaut Alan Shepard had flown a 15-minute suborbital flight the previous spring, just before President John F. Kennedy challenged the United States to push past Soviet technology and put a man on the moon by the end of the decade. But by the next winter, the United States still hadn’t even put a human into orbit. Then on the morning of Feb. 20, 1962, Glenn — a

40-year-old former Marine test pilot — climbed into the tiny Friendship 7 Mercury capsule atop an Atlas rocket, for his 11th launch attempt. Seconds before launch — on live national TV — fellow astronaut Scott Carpenter came on the radio: "Godspeed, John Glenn." The rocket fired — and rose slowly off the pad at what was then Cape Canaveral Space Center. And almost five hours later, after three orbits of the Earth, America had its hero. "There was a lot of buildup to this, and I think America was at a low point. If there was such a thing as a national psyche, it was at a low point," said Glenn, who returned to what's now Kennedy Space Center on Friday. "And we think this was sort of the turning point. And people appreciated what we were doing. So there was this national attention. It was almost unbelievable." Now 90 and a retired U.S. senator from Ohio, Glenn was joined by Carpenter, the only other surviving member of the original "Mercury 7" astronauts. Carpenter, now 86, was Glenn's backup and primary CapCom, his radio-link partner at launch control. He got the next launch, three months later, going for three orbits May 24, 1962. To commemorate the 50th anniversary, the pair will be at the KSC Visitor Complex today as part of a full day of activities recalling the Mercury mission. Glenn stepped from the capsule hailed as a hero; he would go on to serve four terms in the U.S. Senate and run for president in 1984. Carpenter, as the second American in orbit, was merely famous — and went on to a career in oceanography. Fame, he shrugged Friday, "was just an occupational hazard." Web posted. (2012). [Glenn, Carpenter headline orbital anniversary [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, February 17].]

◆ With the next generation of space business just beginning to take seed at Kennedy Space Center, NASA Administrator Charlie Bolden declared Friday that the agency is turning the corner from the expired space shuttle program to its next missions. Bolden and KSC Director Bob Cabana met with KSC workers to assure them that the president's proposed \$17.7 billion dollar budget contains what the facility needs to prepare for its next big missions: manned commercial flights to lower Earth orbit, and a longer-term heavy-lift rocket for deep space exploration. Bolden and Cabana toured a multi-payload processing facility where the transition is evident. The hangar-like building was used to process payloads and components for the space shuttle and International Space Station. Now it is leased to Lockheed Martin and is being prepped to process Orion, the capsule being developed to carry astronauts into deep space aboard a new heavy-lift rocket in the next decade. The 2012-13 budget proposed by President Barack Obama routes about \$2 billion toward development of the rocket and \$1 billion toward Orion. Another \$500 million is set aside for updating Kennedy's launch pads. "I'm excited for the agency, but I'm especially excited for the KSC family, because, you know, we've been through some difficult times here. But we've turned the corner," said Bolden, a former astronaut. "When you're two years away from a very important launch, as we are, that gives you goose bumps." Web posted. (2012). [NASA's Bolden says KSC is preparing for its next mission [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, February 17].]

February 18: NASA's prime contractor for its Orion deep space crew capsule is aiming to launch an early flight test in late 2013 and plans to at least double its work force at Kennedy Space Center between now and then. In what amounts to a paradigm shift, Lockheed Martin will manufacture Orion spacecraft at the launch site rather than a factory elsewhere — a first for KSC, which still is reeling from the loss of about 9,000 jobs as a result of the shutdown of the space shuttle program. NASA Administrator Charles Bolden, a former shuttle pilot and mission commander, said the Lockheed Martin decision to do production work at the KSC Operations & Checkout Building is a game-changer. "The No. 1 thing about bringing jobs back here to the Kennedy Space Center is that we bring jobs back to this community — high-tech, good-paying jobs that put American workers back to work in something that they know and love," Bolden said Friday during a visit to KSC. Lockheed Martin holds a \$6.4 billion contract to design, develop and build Apollo-style space capsules that will be able to transport astronauts on missions beyond Earth orbit — to asteroids, the moon, Mars, the Martian moons Phobos and Deimos, or other interplanetary destinations. NASA late last year decided to add \$375 million to the contract so that Lockheed Martin could carry out an early unmanned flight test. The goal: to launch an Orion capsule into a 5,000-mile-high orbit and then simulate the type of high-speed atmospheric re-entry astronauts would

fly on a return from the moon, Mars or other interplanetary destinations. NASA schedules show the flight test launching in early 2014, and Bolden is not pressing Lockheed Martin to launch earlier. But the contractor is aiming for late 2013 — as early as October, company officials say. Lockheed Martin will begin production work on the capsule for that flight test at KSC in March, and the company's local Orion work force — which now numbers about 150 — is expected to grow to about 188 this year. That number is expected to increase significantly in 2013, and by the end of that year, somewhere between 300 and 400 people will be working for Lockheed Martin on the Orion project at KSC. NASA and Lockheed Martin aim to launch a second flight test around 2016. The aim would be to test an abort system designed to pull the spacecraft and astronauts safely off an exploding rocket. An unmanned orbital test flight is scheduled on NASA's heavy-lift Space Launch System in 2017, and NASA hopes to launch astronauts on a deep space mission in 2021. Web posted. (2012). [Orion aims for early test flight [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 18].]

◆ The launch of NASA's NuSTAR space telescope, a \$165 million black hole-hunting X-ray observatory, will be delayed at least one week until March 21 to give engineers extra time to complete engineering reviews of the mission's air-launched Pegasus XL rocket, the space agency announced Friday. "The mission's launch is now scheduled for no earlier than March 21 to allow the launch vehicle team an additional week to complete necessary engineering reviews," said a statement released by NASA's Jet Propulsion Laboratory. "After the reviews, the team will begin final preparations for the rocket's delivery to the launch site at Kwajalein Atoll in the South Pacific." Technicians are preparing the Orbital Sciences Corp. Pegasus XL rocket and the NuSTAR spacecraft for launch at Vandenberg Air Force Base, Calif. The rocket and its carrier airplane, an L-1011 jumbo jet, will fly from California to Kwajalein about a week before launch. Web posted. (2012). [One-week launch delay ordered for X-ray telescope [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, February 18].]

February 19: John Glenn joined the proud, surviving veterans of NASA's Project Mercury on Saturday in celebrating the 50th anniversary of his historic orbital flight. The first American to orbit the Earth thanked the approximately 125 retired Mercury workers, now in their 70s and 80s, who gathered with their spouses at Kennedy Space Center to swap stories, pose for pictures and take a bow. "There are a lot more bald heads and gray heads in that group than others, but those are the people who did lay the foundation," the 90-year-old Glenn said at an evening ceremony attended by NASA officials, politicians, astronauts and hundreds of others. "We may be up on the point of that thing and get a lot of the attention, and we had ticker-tape parades and all that sort of thing. But the people who made it work ... you're the ones who deserve the accolade. So give yourselves a great big ovation," Glenn said, leading the crowd in applause. Glenn and fellow astronaut Scott Carpenter, 86, spent nearly an hour before the ceremony being photographed with the retirees, posing for individual pictures in front of a black curtain with a model of a Mercury-Atlas rocket. Glenn and Carpenter are the lone survivors of NASA's original Mercury 7 astronauts. Earlier in the day, the Mercury brigade traveled by bus to Launch Complex 14. That's the pad from which Glenn rocketed away on Feb. 20, 1962. Web posted. (2012). [John Glenn reunites with Mercury workers who helped launch him 50 years ago this Monday [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, February 19].]

February 20: Human spaceflight has become so common over the past five decades that it may be difficult to remember just how exciting it was when John Glenn became the first American to orbit the Earth 50 years ago today. For all the achievements of the U.S. human spaceflight program in the subsequent five decades, though, Glenn is dismayed at the state of the program today. NASA and the nation are celebrating Glenn's accomplishment on February 20, 1962 when he flew into space on Friendship 7 as part of the Mercury program. He had been beaten into orbit ten months earlier by Soviet cosmonaut Yuri Gagarin and the United States was trying mightily to catch up with its superpower rival. Alan Shepard reached the threshold of space on May 5, 1961, but his flight was suborbital. Nonetheless, it was enough to give President John F. Kennedy confidence to announce three weeks later that the United States would land a man on the Moon and return him safely to Earth by the

end of the decade. Glenn's flight and others in the Mercury, Gemini and Apollo programs proved that America was good to its word, with Neil Armstrong and Buzz Aldrin landing on the Moon on July 20, 1969. Support for human spaceflight diminished dramatically after the Moon race was won, however. The space shuttle program was approved by President Nixon in 1972 and made its first flight in 1981. Repeated attempts to develop new systems to replace the shuttle failed. The 2004 decision by President George W. Bush to focus on returning astronauts to the Moon without a commensurate boost to NASA's budget meant the shuttle program would have to be terminated to free up money for the new program. The shuttle flew its final mission last year, and the United States currently has no way to launch people into space. When a new U.S. system will emerge is unclear and is largely dependent on funding. NASA is anticipating 2017 for the first U.S. commercial human space transportation system and 2021 for its own new system. Web posted. (2012). [Fifty Years Ago Glenn Sailed Into Orbit; Today, He's Dismayed [Online]. Available WWW: <http://www.spacepolicyonline.com/> [2012, February 20].]

◆ The next attempt to launch an Atlas V rocket and a new Navy communications satellite at Cape Canaveral Air Force Station looks as if it might be Friday, but, as with previous attempts, weather could be iffy. Liftoff from Launch Complex 41 that day would be targeted for 5:15 p.m. with a 44-minute window extending to 5:59 p.m. Air Force meteorologists at the 45th Space Wing on Monday issued an Atlas launch forecast for an attempt Friday. There is a 40 percent chance weather would be acceptable for launch then. The weather for attempts Saturday or Sunday would improve significantly. Forecasters say there is an 80 percent chance conditions would be acceptable either day. United Launch Alliance spokeswoman Jessica Rye said the company would be ready to launch on Thursday if the Eastern Range becomes available that day. The range provides tracking, weather forecasting and range safety services for all launches from the Space Coast. Web posted. (2012). [Atlas launch try possible Friday night [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 20].]

◆ A figurative “for rent” sign hangs on the front gate of John F. Kennedy Space Center. Among the facilities available: A space shuttle launchpad, slightly used; a giant crawler for moving rockets, still serviceable; two enormous mobile launch platforms; two space shuttle maintenance hangars; a 15,000-foot concrete runway, one of the world’s longest; and the blocky, 52-story Vehicle Assembly Building, with four soaring rocket assembly bays — and no waiting. America’s spaceport turns 50 this year, and a wrenching middle-age transition is under way. “I have a lot of facilities that we, NASA, no longer need,” said Robert Cabana, Kennedy’s director and a four-time space shuttle flier. “I don’t have the money to maintain them, I don’t have the money to tear them down. They’re just going to sit and rot.” That is, unless NASA can find some tenants. “We’re putting out the word officially and unofficially that Kennedy Space Center is open for business,” said Scott Colloredo, chief architect for ground systems here. At the apex of the space shuttle program, some 18,000 people worked here. Now, just 7,500 do. On a recent Wednesday morning, parking lots across the vast complex sat two-thirds empty. Since 2009, Cabana has handed pink slips to 9,000 engineers, technicians and office workers. “Do you know what that feels like?” Cabana asked as he stood inside one of Kennedy’s hangars. He looked up at the space shuttle Discovery, where three workers were crawling inside the engine compartment. In April, Discovery will make a final flight to Dulles International Airport. Retirement awaits it at the National Air and Space Museum’s Udvar-Hazy Center. Cabana outlined a vision for the spaceport’s future. Instead of serving a single customer — the enormous shuttle program — he foresees Kennedy launching rockets from NASA and from private companies now racing to build a new generation of crewed space vehicles. But that vision depends on the rapid maturation of a commercial space industry. Critics say Congress has not delivered enough cash to support private development, and expected launch dates have already slipped. In 2010, President Obama spoke here and vowed to seed a commercial space industry, to replace the canceled Constellation program to return Americans to the moon. With NASA money, American companies would build rockets and spaceships to travel to low Earth orbit. They would deliver astronauts and cargo to the international space station and, someday, to privately owned space stations. For 2012, the Obama administration and NASA asked for \$850 million to spread among American space companies.

Congress provided less than half that, \$406 million. In 2010, Obama also pledged \$40 million to transform Kennedy into a diversified research park. Energy, biotechnology and other high-tech companies were supposed to race for the funds — and the services of skilled workers along the 50-mile Space Coast. But Congress never delivered the \$40 million; except for a few small projects, Kennedy has not diversified. Situated on Merritt Island, the space center and adjacent Cape Canaveral Air Force Station have launched all 165 of NASA's human spaceflights. During the Apollo program, the workforce swelled and surrounding Brevard County boomed from a sleepy area known for its Indian River oranges and grapefruit into a vibrant region with a surfeit of well-paid jobs. In the two decades to 1970, the population of the county swelled tenfold, to 250,000, as America aimed for the moon. Space became a seemingly permanent industry. Today, not all is gloom. The spaceport has recently managed to claw back a few hundred jobs. Lockheed Martin moved into a "clean room", where the Apollo capsules were prepped 40 years ago, putting 150 people to work. The company is building the Orion capsule for NASA, with a test launch scheduled for 2014. NASA is developing Orion to travel into deep space; the test vehicle is set to arrive here in May. Boeing plans to move into one of the three space shuttle hangars. The state of Florida rented the building last fall for 15 years and subleased it to the company, which hopes to eventually put 550 people to work building a capsule to fly to the international space station. NASA has asked Congress for \$400 million in the coming year to retrofit launchpads and other facilities. By 2017, NASA hopes, it will fly a giant new rocket, the Space Launch System, on an uncrewed test flight. To accommodate the rocket, workers have already torn down the big gray tower on one of the two space shuttle launch pads. Cabana said NASA recouped \$621,000 from selling miles of copper wire stripped out of the 25-story structure. NASA also plans to retrofit a mobile launch tower it never used. Built for the canceled Constellation rockets, the 39-story cross-hatched steel tower cost nearly \$500 million and sits parked on Kennedy property. The future of the second shuttle launchpad remains uncertain. Coloredo said NASA officials were talking with "two or three" potential customers. One is California-based Space Exploration Technologies, or SpaceX. The company already occupies an old Air Force hangar and a smaller launchpad on Cape Canaveral, where it is readying a rocket and a capsule for an uncrewed test flight to the international space station in April or May. The company's founder, PayPal billionaire Elon Musk, has sketched out grand plans for bigger rockets that would call for the huge concrete curtain of the shuttle launchpad. But there's still no word on who might be interested in renting the huge Vehicle Assembly Building. For now, the decommissioned space shuttle Atlantis rests on the building's floor, its engines removed, its windows blinkered. Behind Atlantis, a sea of gunmetal gray desks, tables, cabinets, office chairs and other discarded furniture awaits removal. Among the castoffs is a lone white refrigerator, its door ajar. It bears a handwritten note that says, "Free to good home." Web posted. (2012). [Kennedy Space Center at 50: A spaceport in transition [Online]. Available WWW: <http://www.washingtonpost.com/> [2012, February 20].]

February 21: A team of former space shuttle technicians at the Kennedy Space Center is about to start working on NASA's first Orion spaceship, outfitting the prototype capsule for a test flight in Earth orbit as early as late 2013. Now under construction in Louisiana, the Orion multi-purpose crew vehicle will be shipped to Florida in May, when engineers will start crafting the capsule into a flight-ready spacecraft. Inside the space center's Operations and Checkout Building, technicians will add the Orion craft's heat shield, flight computers and avionics boxes. Lockheed Martin Corp., Orion's prime contractor, selected the O&C Building for final assembly of the spacecraft. Engineers in Florida will start receiving flight hardware for the first space-bound Orion as soon as March, as components for the craft's service module arrive at the space center. A structural mock-up of the service module will fly on the first mission in 2013 or 2014. Jim Kemp, Lockheed Martin's director for Orion assembly, testing and launch operations, said about 150 employees now work on the program at KSC. The number is expected to grow to about 188 workers later this year, he said. Web posted. (2012). [Florida workforce stands ready for Orion assembly [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, February 21].]

◆ The first flight of the Antares booster, one of two U.S. rockets selected to launch cargo to the International Space Station, will be delayed until at least late June as work to certify the launch pad continues on the Virginia coast, Orbital Sciences Corp. officials said Tuesday. Construction of the pad should be complete in early March, leading to certification of the facility's systems by the end of April, when Orbital will take control of the coastal complex to begin final flight preparations. If all goes according to plan, another Cygnus spacecraft could blast off around the end of 2012 on an operational resupply flight to the space station. The Antares launch complex, named pad 0A, is located at Wallops Island, Va., and owned by the Virginia Commercial Space Flight Authority, a state agency created in 1995. The launch pad lies on NASA property. Web posted. (2012). [Launch pad rework pushes Antares launch to summer [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, February 21].]

February 22: The steel structures that provided the backbone for blasting off to space could soon enliven the underwater world of grouper and snapper. Within a year, divers and fishermen hope to get more hulls, culverts and boulders as well as segments of NASA and military rocket launch towers to lure big grouper and other fish to an artificial reef about 17 miles off Cape Canaveral's shore. First, local officials must gain federal approval to add more material to an existing 4-square-mile area called the Brevard County Artificial Reef Site 2. The site is in water about 75 to 85 feet deep. Adding to the reef could help offset closed fishing areas farther out at sea, officials said, as well as easing fishing and diving pressure on nearby natural reefs. According to a U.S. Army Corps of Engineers public notice of the permit application, the project would put natural rock boulders, culverts, stormwater junction boxes, power poles, railroad ties, concrete road barriers and other similar concrete materials on the bottom. There would be no asphalt, creosote, petroleum or toxic residue. County officials also hope to add portions of old defunct launch complexes from Cape Canaveral Air Force Station and Kennedy Space Center. That could help the military and NASA defray costs of disposing of old launch complex material. "Instead, they can invest in a local project," said Matt Culver, Brevard County's boating and waterways program coordinator. Web posted. (2012). [Launch tower trash could turn into sea life's treasure [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 22].]

◆ How active NASA should be in ensuring, or even regulating, the safety of commercial crew vehicles is an issue that has been debated for some time, but a couple of events in the last week demonstrate that the issue is still on the minds of people on Capitol Hill. At last Friday's hearing about the administration's FY13 budget proposal for R&D programs, the first question posed to Office of Science and Technology Policy director John Holdren was not about proposed spending for NASA or other agencies, but about whether NASA had sufficient authority to oversee crew safety given its use of Space Act Agreements (SAAs). "I have a problem with this," said committee chairman Rep. Ralph Hall (R-TX). "It's my understanding that NASA can't require the companies to meet any safety standards. I don't know how that could have been left out." Hall then asked Holden how NASA would ensure that these vehicles "ultimately are going to be safe enough to take NASA astronauts to the International Space Station?" Holdren said he was not familiar with the details of the limits of Space Act Agreements on enforcing compliance to safety standards. "I can't imagine that NASA does not retain that responsibility" for ensuring crew safety, he said. "And if there is a problem in the agreements that would jeopardize that, I am sure we will fix it." Under a Space Act Agreement, NASA can't force companies to meet specific safety requirements. NASA originally planned that the third phase in the Commercial Crew Program would be done under a contract in part to mandate compliance. However, NASA backtracked in December, saying the next phase, like the first two, would use SAAs in order to make better use of limited funding. At a Commercial Crew program forum at the Kennedy Space Center earlier this month, NASA officials said they were confident that safety would be ensured without mandating compliance, since it will be in the companies' best interests to meet NASA's published safety standards in order to qualify for future contracts for crew transportation that will require meeting those standards. "So, our safety requirements are on the street and we would expect that any partner that might want to go after that service capability, and any commercial partner that might want to use NASA and its ISS as a potential

customer, will need to look seriously at those requirements and understand what they are and understand the safety parameters we have within those requirements,” deputy program manager Brent Jett said at the February 7 briefing. A separate issue is the role of NASA versus the FAA in regulating commercial crew launches. Such a mission would likely be considered a commercial launch and thus require a license from the FAA’s Office of Commercial Space Transportation (AST). Web posted. (2012). [The role of NASA in commercial crew safety [Online]. Available WWW: <http://www.spacepolitics.com/> [2012, February 22].]

February 23: This year will mark several major milestones for the development of the Space Launch System (SLS), with teams already pushing through a systems review process. The roadmap – which may include a “battleship” pathfinder core test at the Kennedy Space Center (KSC) in 2015 – runs through the opening mission in 2017, which has been named as Exploration Mission -1 (EM-1). Although the early SLS effort suffered from numerous reviews and alleged delaying tactics at the political level, 2012 has seen a noticeable increase in work on the SLS, especially via the construction of the development roadmap towards the maiden flight of the Heavy Lift Launch Vehicle (HLV) in 2017. It has been a long road to get to this point, where NASA’s next flagship launch vehicle is now enjoying its the first full year of focused development, a path which started with the Review of Human Space Flight (HSF) Plans Committee (Augustine Panel) back in 2009. Thankfully, engineering and management teams had already begun a level of preparation on the SLS and hit the ground running by entering the System Requirements Review (SRR) checkpoint kickoff meetings the month after the official SLS announcement. With the Key Decision Point A (KDP-A) “memo” already approved, SLS finds itself into the Cross-Program SRR stage, along with a number of key hardware milestones and tests already under its belt. These include the five-segment Solid Rocket Booster Development Motor 3 firing success, J-2X upper stage engine full-duration testing, and RS-25 Ground Support Equipment, which is in the process of being positioned for future integration activities at the Stennis Space Center. The current meetings are working towards the joint System Requirements Review (SRR) and System Definition Review (SDR), which kicked off at the program level meeting stage this month, prior to its concluding meeting which is scheduled for March 29 - a milestone which will feed into the major effort of the Preliminary Design Review (PDR), scheduled for June 28, 2013. Web posted. (2012). [Acronyms to Ascent – SLS managers create development milestone roadmap [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, February 23].]

◆ NASA has presented its Quality and Safety Achievement Recognition, or QASAR, award for 2011 to three Kennedy Space Center, Fla., employees; Humberto "Bert" T. Garrido, Joseph B. Hamilton and Francis "Frank" Merceret. NASA's QASAR award recognizes individual government and contractor employees who have demonstrated exemplary performance in contributing to the quality or safety of products, services, processes, or management programs and activities. "The first of NASA's four core values is safety, and without it, none of the agency's missions of exploration and scientific discovery can successfully happen. Bert, Joe and Frank exemplify that core value," said Kennedy Center Director Bob Cabana. ["NASA Presents Safety Award to Three Kennedy Employees," **NASA News Release #15-12**, February 23, 2012.]

February 24: An Atlas V rocket carrying a new Navy satellite launched today from Cape Canaveral Air Force Station, Florida Today reported. The 44-minute launch window opened at 5:15 p.m. The launch was scrubbed twice last week due to the weather. Today's forecast had called for a 40 percent chance of favorable weather for a launch. The rocket is carrying the Navy's Mobile User Objective communications satellite. Web posted. (2012). [Atlas V rocket blasts off from Cape Canaveral [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, February 24].]

◆ The North Brevard Economic Development Zone Special District Board voted unanimously to add Exploration Park on NASA property at Kennedy Space Center to the zone. The expansion of the zone

also requires approval by the Brevard County Commission. The zone currently is contained within Brevard County Commission District 1, represented by Commissioner Robin Fisher. Exploration Park is just south of Fisher's district and is within District 2, represented by County Commission Chairman Chuck Nelson. Special District Board Vice Chair Brenda Fettrow said the move "seems to have the potential for great benefits" in helping attract businesses and jobs to Exploration Park, which is south of State Road 405/NASA Causeway. Funding for incentives used within the North Brevard Economic Development Zone will come from Brevard County and Titusville property tax revenue generated by new commercial and industrial development within the zone. Web posted. (2012). [Board lets zone extend to KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 24].]

February 28: For more than two decades, the shuttle program relied on a Cape Canaveral facility to test, repair and build thousands of spaceflight components no longer available from original manufacturers. Some considered the NASA Shuttle Logistics Depot's combination of agency-owned equipment and skilled contractors a "national treasure," and one well-positioned to transition to other industries after the shuttle program's end. Lead shuttle contractor United Space Alliance pursued new business opportunities, and last fall appeared to have secured a post-shuttle mission servicing military and commercial hardware at the Astronaut Boulevard facility. There was even talk of a new name for the eight-building complex. But plans changed abruptly when USA's parent companies, The Boeing Co. and Lockheed Martin Corp., began re-evaluating the joint venture's future and reportedly directed managers not to sign new contracts. Both USA and its parents have refused to comment on the company's future, which now may be limited to closing out the shuttle program. USA confirms only that it will wrap up its closeout work at the depot by April 2013, after finishing several smaller contracts this fall for the Department of Defense and commercial customers. Web posted. (2012). [United Space Alliance iffy for future at KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 24].]

◆ The Smithsonian Institution today released plans for four days of festivities to welcome the retired shuttle orbiter Discovery in April. NASA plans to ferry Discovery to the National Air and Space Museum's Udvar-Hazy Center in Chantilly, Va., on April 17, weather permitting. Spectators at the center and across the Washington, D.C., area are encouraged to "spot the shuttle" during its final approach to Dulles International Airport atop a 747 Shuttle Carrier Aircraft. A ceremony formally turning Discovery over to the museum is planned at 11:30 a.m. April 19. Led by astronauts and the U.S. Marine Drum and Bugle Corps, Discovery will parade to a nose-to-nose meeting with Enterprise, the orbiter prototype Discovery is replacing. Enterprise is expected to be ferried to New York City within a few days later, where it will be readied for delivery to the Intrepid Sea, Air & Space Museum. Web posted. (2012). [Discovery to be welcomed to Smithsonian in four-day event [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 28].]

◆ Stratolaunch is to complete the systems design review (SDR) of its new launch system "in the next couple of months". That is the timeframe set out by Jim Halsell, director of Stratolaunch systems at Dynetics, which has been contracted to design the technical integration and to mate and demate procedures and systems. "We are on the cusp of doing the systems design review, and we're moving toward a preliminary design review [PDR]," said Halsell. "Between those two, the SDR and the PDR, we will lock down the details of the technical approach, the outer mold lines of all the systems. It's the grunt early work of designing a complex system." Major system trades and exact specifications, including information crucial to operation such as maximum gross take-off weight and required runway length, will not be finalized until the PDR. Disclosed in December 2011, the ambitious Stratolaunch system involves a massive Scaled Composites-built aircraft with a SpaceX-built rocket suspended between twin fuselages. The system will launch payloads of up to 6,100kg (13,500lb) in weight and 5m (16.4ft) in diameter into low Earth orbit (LEO). Although Stratolaunch eventually hopes to launch people into orbit and will build to strict human spaceflight standards, design efforts are on hold while the focus is on building and testing the launch system. Although Stratolaunch officials have repeatedly mentioned plans to operate from the

NASA Kennedy Space Center (KSC) runway, one of the longest and widest runways in the world, there has as yet been no formal agreement between Stratolaunch and facility operator Space Florida. Operating from the KSC runway would enable Stratolaunch to fly south, closer to the equator, allowing greater payload and launch azimuth flexibility. Launching to the east over the Atlantic Ocean would take advantage of the Earth's rotation, allowing additional advantages. Web posted. (2012). [Stratolaunch nears conclusion of systems design review [Online]. Available WWW: <http://www.flightglobal.com/> [2012, February 28].]

February 29: Animal rights activists with the *People for the Ethical Treatment of Animals* today requested permission to use unused buildings at the Kennedy Space Center for a “Chimpanzee Empathy Museum” that would honor some of NASA’s earliest test pilots — and put a spotlight on modern-day experimentation. “PETA’s exhibit will show that while NASA has stopped blasting terrified chimpanzees into space and crippling them in crash tests, chimpanzees are still tormented in laboratories — and that cannot go on,” says PETA Vice President of Laboratory Investigations Kathy Guillermo, in a statement. “With Congress considering a bill to ban experiments on these intelligent and social animals, it’s the perfect time for an exhibit about what we have done to our closest primate relatives.” Web posted. (2012). [PETA wants chimp ‘empathy’ museum at KSC [Online]. Available WWW: <http://www.orlandosentinel.com/> *the write stuff blog* [2012, February 24].]

◆ A major contractor this week started converting the main motor for the abort system that will launch in early 2014 on NASA’s first flight test of an Orion crew exploration vehicle. The Orion spacecraft is scheduled to blast off from Cape Canaveral Air Force Station on a two-orbit flight that will test the capsule’s heat shield during a high-speed atmospheric reentry. The idea is to simulate a return from a mission to the moon, Mars, an asteroid or other destinations beyond Earth orbit. Former NASA Chief Astronaut Charlie Precourt, who will be inducted this year into the U.S. Astronaut Hall of Fame, said the flight test is critical to America’s next era of human space exploration. “This test flight is an extremely important milestone as we move forward with America’s new human exploration spacecraft and heavy-lift launch system, enabling our human space flight program to conduct missions beyond Earth orbit,” Precourt, General Manager and Vice President of Space Launch System for contractor ATK, said in a statement. President Obama in 2010 directed NASA to send astronauts on a mission to an asteroid by 2025 and Mars by the mid-2030s. To that end, NASA is developing the Apollo-style Orion crew capsule and new heavy-lift rockets as part of its Space Launch System project. ATK is developing the main motor for the abort system that would pull an Orion capsule and its astronaut crew away from a rocket in the event of an explosion or other emergency on the launch pad or during launch. The company also is developing smaller abort system thrusters that would steer the capsule into position for the deployment of parachutes that would float a crew to a safe landing back on Earth. Web posted. (2012). [Orion escape system motor prepped for 2014 flight test [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 29].]

◆ A Falcon 9 rocket and Dragon capsule stand on SpaceX’s Cape Canaveral launch pad, where the company plans to perform a countdown and fueling test Thursday. The simulation at Launch Complex 40 is part of preparations for a NASA demonstration flight that aims to deliver the Dragon to the International Space Station, possibly as soon as late April. A successful demonstration flight would prove Hawthorne, Calif.-based SpaceX is ready to begin delivering cargo to the station later this year under a \$1.6 billion NASA contract. A SpaceX spokeswoman said the rocket would be lowered at the pad today, then raised to a vertical position again this evening, with the “wet dress rehearsal” beginning early Thursday morning. The test will load rocket-grade kerosene and liquid oxygen into the rocket’s two stages, running through nearly an entire countdown. Web posted. (2012). [SpaceX Falcon 9 on launch pad for fuel tests [Online]. Available WWW: <http://www.floridatoday.com/> [2012, February 29].]

◆ The shuttle mockup destined for Space Center Houston has been taken down from its long-time perch at Kennedy Space Center and transported to the dock there to await its long journey to Clear Lake. As things now stand, that will be by barge from KSC to possibly a site near the Clear Lake Hilton and then up NASA Parkway to Space Center Houston. Sounds simply enough, but it isn't. We're not talking about putting a box on a boat; we're dealing with a big, heavy boy. Think large airplane. Waterways have to be deep enough and wide enough to handle it, not to mention a boat big enough to haul it. Most likely it will sit at the KSC dock for the next few weeks. There is no cost for the mock shuttle, but transporting it here will be pricey. It has to travel from Florida's east coast on the Atlantic Ocean, down around the southern tip of Florida, across the Gulf of Mexico into Galveston Bay and then Clear Lake. In December, Chevron donated \$100,000 to help with the transportation costs, with Chevron's Joni Baird noting that "Space Center Houston is an important part of our community and a place for children and adults to learn about the incredible impact our space program has had on our lives." The mock shuttle had to be removed to make room for Space Shuttle Atlantis, which was awarded to KSC. While the mock shuttle was called Explorer, Allen said it probably would be renamed when it arrives here. Web posted. (2012). [Shuttle mockup ready to set sail, but... [Online]. Available WWW: <http://www.yourhoustonnews.com/> [2012, February 29].]

◆ In a surprise announcement Monday morning, Rep. Alan Austerman declared in a press conference that if the Alaska Aerospace Corporation cannot sign a large commercial contract by the end of the year, it could close or sell the Kodiak Launch Complex. Austerman, the Republican House majority leader, represents Kodiak Island in the Alaska Legislature and is a non-voting member of the Alaska Aerospace Corporation board of directors. According to the corporation's latest strategic plan, from 1993 through 2011, Alaska Aerospace received approximately \$26.6 million in state investment, \$144.8 million in federal grants and \$134.3 million in revenue from rocket launches. Sixteen rockets have blasted off from the corporation's flagship facility at Narrow Cape, the most recent in late September, when a Navy communications satellite was lifted into orbit. The Kodiak spaceport can only launch small-lift rockets, and it has so far failed to attract enough customers to break even financially without an increasing amount of state support. To increase revenue, the corporation has proposed expanding the spaceport to launch medium-lift rockets, which are becoming commercially more important. Web posted. (2012). [Alaska Aerospace Corp. faces funding issues without contract [Online]. Available WWW: <http://www.homernews.com/> [2012, February 29].]

MARCH

March 1: SpaceX is draining propellant from a Falcon 9 rocket after successfully fueling it during a countdown dress rehearsal today at Cape Canaveral Air Force Station. After beginning at T minus 7 hours, the countdown clock stopped as planned at T minus 5 seconds to conclude the test at Launch Complex 40, which ran systems and launch teams through procedures they'll follow on launch day. "The test went well," SpaceX said in a statement. "Over the coming days, we will continue to review the data as we prepare for our upcoming mission." The practice countdown was recycled at least once at T minus 10 minutes, according to Twitter updates provided by Kennedy Space Center. The company hasn't yet commented on the rehearsal's results. SpaceX is preparing to fly a NASA demonstration mission that will send a Dragon capsule to the International Space Station, possibly by late April. Web posted. (2012). [SpaceX completes dress rehearsal of Falcon 9 launch at Cape Canaveral [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 1].]

◆ For more than 30 years, NASA's two Apollo-era crawler-transporters carried six space shuttles (Atlantis, Challenger, Columbia, Discovery, Endeavour and Enterprise) atop mobile launcher platforms from the Vehicle Assembly Building (VAB) to Launch Complex 39 at Kennedy Space Center. After traveling 2,190 miles (3,524 kilometers), crawler-transporter 2 (CT-2), which weighs about six million pounds, will receive two new diesel engines and generators so it can be used to carry NASA's Space Launch System heavy-lift rocket, currently under design, and new Orion spacecraft to the launch pad. Mary Hanna, the project manager for the crawler-transporters in NASA's Ground Systems Development and Operations Program, is overseeing the upgrade efforts. "The crawler has to be ready for the new future programs," Hanna said. "It's the only way to get launch vehicles out to the pads, and we're taking time now to do the upgrades so that we're ready." On Feb. 15, in High Bay 2 inside the VAB, NASA engineers and United Space Alliance engineers and technicians prepared the obsolete diesel engines, generators and associated parts for removal. The old engines, which were built in 1964 and installed as original equipment, ran the AC electrical system. Work began to remove the massive engines in late January when the crawler was moved from the crawler yard into the VAB. About 20 technicians and engineers coordinated efforts to remove the old engines and generators using the VAB's 325-ton overhead crane to lift them out. The new 1,500 kilowatt power diesel engines, built by Cummins Engines in Minnesota, arrived at Kennedy in mid-December and are being stored in the crawler maintenance yard. "The new engines are more powerful but they've a smaller footprint," Hanna said. After the engines are in place, Hanna said, there is a lot of work required to connect the electrical, plumbing and mechanical lines and installation will be completed by mid-June. The removed engines are being drained, cleaned and readied for transport by flatbed truck to Ransom Road where they will be resold or recycled. Hanna said crawler-transporter 2 is also undergoing other upgrades and modifications, including 16 higher capacity jacking cylinders; new roller bushings and roller shafts; upgraded electrical power system components; power, control and instrumentation cable replacement; and driver cab controls. Other upgrades include electrical control systems and programmable logic controller modernization, new instrumentation systems, a new belt pin lubrication system, new hydraulic valves and hydraulic tubing replacement. Structural shear web augmentation and corrosion control are ongoing tasks, as well. When all of the modifications have been completed, the crawler will be ready to carry NASA's heavy-lift rocket and other future space program vehicles to Launch Complex 39 for their turn to make space program history. Web posted. (2012). [Workers removed Apollo-era engines from crawler [Online]. Available WWW: <http://www.collectspace.com/> [2012, March 1].]

◆ NASA's space shuttle Enterprise, which never flew in space but did pave the way for the United States' historic 30-year shuttle program, will arrive in New York on April 23, the Intrepid Sea, Air and Space Museum announced on Thursday (March 1). The prototype orbiter's arrival in the Big Apple will start its journey to a new display at the Intrepid, a converted World War II aircraft carrier-turned-museum complex. Enterprise, which since 2003 has been on display at the Smithsonian National Air and Space Museum's Steven F. Udvar-Hazy Center in Virginia, will be flown atop NASA's shuttle carrier aircraft, a Boeing 747, from Dulles Airport to John F. Kennedy International Airport in New York. Weather permitting, the ferry flight will come less than a week after NASA's most-flown shuttle, Discovery, arrives at the Udvar-Hazy Center to take Enterprise's place within the Smithsonian's collection. "We are immensely excited about Enterprise's landing at JFK, and are readying the Intrepid for her arrival," Susan Marenoff-Zausner, museum president, stated. "Introducing Enterprise to New York is a landmark occasion." Enterprise's final flight to New York will be the first time it has been in the air since it was flown to the Smithsonian in 1985. For the past two years, NASA shuttle technicians have inspected and prepared the orbiter to make sure it was ready for the trip from Washington, D.C. to New York City. The flight will mark a reunion with NASA 905, the modified Boeing 747 carrier aircraft, which first flew Enterprise for a series of atmospheric approach and landing tests in the late 1970s. The tests proved the reusable winged shuttles could return to Earth as a glider. Enterprise will stay about two months at the airport before being loaded onto a barge and shipped to the Intrepid. On its way down the Hudson River, it will pass by New York landmarks, including the Statue of Liberty and the site of the World Trade Center. Once at the Intrepid, Enterprise will be lifted off the barge by crane and placed onto the aircraft carrier's flight deck where it'll be on exhibit to the public starting this summer. Web posted. (2012). [Space shuttle Enterprise lands in New York City on April 23 [Online]. Available WWW: <http://www.collectspace.com/> [2012, March 2].]

March 2: The Falcon 9 rocket and Dragon spacecraft rolled back into their hangar in Florida on Friday, a day after completing a launch exercise in which cryogenic propellants were pumped inside the privately-developed booster. Technicians hydraulically lowered the two-stage rocket from its launch mount Thursday night, and engineers planned to practice cargo loading techniques with the Dragon capsule Friday. SpaceX constructed a mobile access room, giving specialists a clean pathway into the Dragon spacecraft outside its pristine processing facility. The apparatus will permit SpaceX and NASA place items into the Dragon when the spacecraft is attached to its booster, just before the rocket is erected on the launch pad. Late cargo could include urgent spare parts, fresh food, or time-sensitive experiments. With the vehicle back inside the hangar at Cape Canaveral's Complex 40, SpaceX will unbolt the Dragon spacecraft, move it to a work stand and begin final processing before its scheduled launch to the International Space Station in late April. Web posted. (2012). [SpaceX rocket back in hangar after cargo demo [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, March 2].]

March 3: On Wednesday Office of Science and Technology Policy (OSTP) director John Holdren appeared at a hearing of the Commerce, Justice and Science subcommittee of the House Appropriations Committee. The hearing was held in a location without webcasting capabilities, so there was limited coverage of the event. Those reports, though, suggest that a battle may be brewing in Congress between preserving the administration's requested funding for NASA's commercial crew program and restoring funding for the agency's Mars exploration program. *ScienceInsider* reported that Holdren himself brought up that connection in his testimony regarding the decision to terminate NASA's participation in the joint ExoMars program with the European Space Agency. Holdren said the decision was one of many "tough choices" in the president's proposed budget for fiscal year 2013, which begins on 1 October. He said that NASA realized it needed \$450 million more than Congress gave it this year to maintain progress on building a commercial crew vehicle that would replace the space shuttle in ferrying U.S. astronauts to the international space station. That money, Holdren said, had to come from somewhere else within NASA's \$17.8 billion budget, which would remain flat under the president's request. Web posted. (2012). [Mars

exploration versus commercial crew? [Online]. Available WWW: <http://www.spacepolitics.com/> [2012, March 3].]

March 5: A significant amount of refurbishment work is taking place at the Kennedy Space Center (KSC), as the spaceport prepares to welcome the Orion spacecraft and Space Launch System (SLS) to the world-famous launch site. Work is taking place throughout the center, with the focus on the refurbishment being conducted on SLS' launch pad, Pad 39B. With the Space Shuttle orbiters now in their final phase of preparation for being moved to their retirement homes, the Kennedy Space Center is transitioning towards the new era, with SLS and Orion the centerpieces of the 21st Century spaceport effort. One of the largest projects involves the revitalization of the KSC Water and Wastewater Systems, which have been in place since the spaceport's initial construction, back during the drive towards the Apollo moon missions. The work – contracted to Speegle Construction II, Inc – is set to be completed in the spring of 2013, is currently 15 percent complete, with work stretching from the VAB and Turn Basin area, along the crawlerway, out to both Pad 39A and 39B. This multi-phased effort will – through various enhancements – improve water quality, reduce water consumption and required flushing, replace or repair aging pipes that are susceptible to breaks or leaks, and increase overall water and wastewater system reliability. These systems are vital to operations throughout the center for restrooms, food preparation, fire protection and sound suppression at the launch pads. Refurbishment of Pad 39B is noticeable even from a distance, as major work is conducted on the historic launch pad, which saw its shuttle assets demolished in order to allow for a “clean pad” for use by the Space Launch System (SLS) – a vehicle that will arrive at the pad complex via the Crawler Transporter and Mobile Launcher (ML). Work on the giant water tower is now in full swing, ahead of its scheduled completion date of July, 2012. The scope of work includes repairs to the interior of the 300,000-gallon, 285-foot elevated water tank (constructed in the late 1970s), repairs to the piping system, and sandblasting and recoating of the exterior of the tank, piping and associated supports. However, work is also taking place on the pad itself, which remains a construction zone with access restricted to official business coordinated through the Pad B Operations Office. Web posted. (2012). [Major KSC refurbishment work continuing ahead of SLS and Orion debuts [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, March 5].]

◆ The March 2011 theft of the unencrypted computer was one of 5,408 cyber security incidents — many foreign-based — the space agency reported during the past two years, according to NASA Inspector General Paul Martin. The incidents, which include the installation of malicious software and unauthorized access to NASA systems, have caused disruptions and cost taxpayers millions in missing equipment and repairs. Some cases are clearly more serious than others, such as the theft of space station algorithms, though there's nothing to indicate the ISS was affected in any meaningful way. Kennedy Space Center recorded 973 incidents during 2010 and another 463 in 2011, spokesman Allard Beutel wrote in an email. He described them “as minor as someone receiving/reporting a suspicious e-mail, or as significant as a machine/ phone being reported stolen or confirmed infected with a virus or malware.” Beutel said the “overwhelming majority” of these threats don't specifically target KSC or NASA. Most, he wrote, are the result of having a large number of computers in use daily and the wide range of Internet services delivered or accessed as part of the agency's multiple missions. Beutel said many of the cyber security issues involved employees who visited websites with infected links or ads, or received emails that linked to malicious code. “Many of these issues are identical to what virtually every user of the Internet faces daily,” he said. Beutel attributed the substantial drop in cyber security incidents in 2011 to increased employee training, more aggressive patching of IT systems, and improved blocking of access to dangerous websites. Martin said the agency's vulnerability stems from two issues: It's a high-profile target that generates plenty of sought-after data, and it offers potential hackers a wide array of entry points. NASA manages approximately 3,400 websites — nearly half of all the federal government's non-defense sites — and is home to some 176,000 individual email addresses. Its assets include 550 information systems that control spacecraft, collect and process scientific data, and enable NASA to interact with colleagues and researchers in other agencies and universities around the globe, according to

Martin. Web posted. (2012). [NASA cybersystems under attack [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 5].]

◆ By the end of this year, NASA's space shuttles will be in their new homes. Recently, the shuttles were on the move as part of the transition and retirement (T&R) activities at NASA's Kennedy Space Center in Florida. On Feb. 1, NASA Vehicle Manager for T&R Bart Pannullo watched as shuttle Endeavour was backed out of the Vehicle Assembly Building (VAB) and towed to Orbiter Processing Facility-2 (OPF-2). The next day, shuttle Atlantis made an appearance outside the VAB as it was towed from the VAB transfer aisle into high bay 4 for temporary storage. Atlantis is being prepared for public display at the Kennedy Space Center Visitor Complex in 2013. "It's been two beautiful days here for these operations and seeing people I haven't seen in a while," Pannullo said. "I'm not taking these events for granted." Endeavour was moved to OPF-2 so that technicians can continue to prepare it for display. The shuttle will remain in the OPF until it is ready to be ferried to the California Science Center in Los Angeles in the fall. Once inside the facility, Endeavour was leveled and safed. Then, water and Freon from lines in the shuttle's midbody were offloaded. The orbital maneuvering system (OMS) pods and forward reaction control system (FRCS) were delivered to the Hazardous Maintenance Facility (HMF) on Feb. 6 from White Sands, N.M. The FRCS was uncrated and transported to OPF-2 on the same day and was installed on Endeavour on Feb. 8. The OMS pods remain at the HMF and are scheduled to be installed on Endeavour in March. Pannullo said that while Atlantis is in the VAB, technicians will be working in the aft compartment to remove components that may be used in future programs, as well as continuing to safe the spacecraft. Future work on Atlantis includes reinstallation of its FRCS and OMS pods once it is moved back to the OPF in late March. Replica Shuttle Main Engines also will be installed, and safing of the pyrotechnic systems will be completed. Atlantis then will be configured for its display site, and prepared for its short trip to the visitor complex just down the road in early 2013. Web posted. (2012). [Historic Shuttles to Arrive at Permanent Homes by Year's End [Online]. Available WWW: <http://www.nasa.gov/> [2012, March 5].]

◆ The director of a local nonprofit established recently to manage science research on the International Space Station's National Lab has resigned. Jeanne Becker cited unrealistic expectations and concerns about a business relationship with a consultant that could threaten nonprofit status for the Center for the Advancement of Science in Space, or CASIS. Formed by Space Florida and selected by NASA last year to take over management of non-NASA research at the space station, CASIS is headquartered at Kennedy Space Center's Space Life Sciences Lab. Space Florida had partnered with consultant ProOrbis to promote a CASIS management concept that sought to increase commercial benefit from microgravity research performed on the station. According to Becker's Feb. 29 resignation letter, the CASIS board pursued an ongoing business partnership with ProOrbis despite a legal opinion saying such an arrangement could endanger the organization's nonprofit status. In a separate statement, ProOrbis officials said potential conflicts of interest had been "satisfactorily addressed," and they "remain committed to the vitally important mission of CASIS to serve the interests of the nation." Web posted. (2012). [Director of KSC-based ISS nonprofit group resigns [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 5].]

◆ The U.S. Air Force's second X-37B space plane marked one year in orbit Monday, continuing its clandestine mission more than 200 miles above Earth. The robotic spacecraft's purpose is secret, but Air Force officials acknowledge the vehicle is performing well one year after it blasted off on a United Launch Alliance Atlas 5 rocket on March 5, 2011. "We are very pleased with the results of the on-going X-37B experiments," said Lt. Col. Tom McIntyre, X-37B program director in the Air Force's Rapid Capabilities Office. "The X-37B program is setting the standard for a reusable space plane and, on this one-year orbital milestone, has returned great value on the experimental investment." The X-37B space plane, also known as the Orbital Test Vehicle, features an unpressurized cargo bay about the size of the

bed of a pickup truck. The Air Force has not disclosed its contents, only saying the mission is experimenting with the spacecraft, which is flying on its second mission. Web posted. (2012). [U.S. Air Force space plane marks one year in orbit [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, March 5].]

March 7: NASA joins the Space Coast Stadium in Viera, Fla., to celebrate Space Day on Thursday, March 8. Major League Baseball's Washington Nationals spring training game with the Houston Astros will start off with a blast as Bob Cabana, director of NASA's Kennedy Space Center in Florida, throws the first pitch at 1:30 p.m. EST. Kennedy will have a booth at the stadium where representatives will highlight some of the contributions the space agency has made to sports, transportation and everyday life. A full-scale test version of NASA's new Orion Multi-Purpose Crew Vehicle also will be located outside the stadium to show the public the spacecraft that will take astronauts farther into space than ever before. ["NASA Celebrates Space Day With the Space Coast Stadium," **NASA Media Advisory #M18-12**, March 7, 2012.]

March 8: NASA's Jet Propulsion Laboratory has put together an excellent video featuring scientist Don Yeomans explaining why most of the doomsday scenarios simply won't come to pass. It starts, of course, by debunking the myth that the Mayan calendar ends on Dec. 21, 2012. It doesn't. It then goes on to cover some of the common apocalyptic scenarios being dangled about, including the Earth being struck by a rogue planet, a solar flare destroying Earth, or a magnetic polar shift. Web posted. (2012). [NASA Scientist explains why the world won't end in 2012 [Online]. Available WWW: <http://www.forbes.com/> [2012, March 8].]

March 11: SpaceX and NASA are in advanced discussions for the private space firm to use Kennedy Space Center's pad 39A, one of the spaceport's Apollo and space shuttle launch sites, as the Florida base for its Falcon Heavy rocket, officials said. NASA and SpaceX are studying how to assemble and launch Falcon Heavy rockets from pad 39A, including adding a facility to horizontally integrate the launcher's core stage, two strap-on boosters and upper stage, according to William Hill, assistant deputy associate administrator for NASA's exploration systems division. With 28 liquid-fueled core, booster and upper stage engines, the Falcon Heavy rocket is a behemoth booster designed to launch human and robotic exploration missions, massive U.S. military satellites, and huge payloads for commercial clients at competitive prices. Its first demonstration launch from California is scheduled for 2013. SpaceX plans to piece the rocket together on its side, then roll it to the launch pad and lift it vertical before liftoff. Fully fueled and assembled for launch, the Falcon Heavy will weigh 3.1 million pounds and stand 227 feet tall, according to SpaceX. "KSC did an assessment of options for SpaceX to consider relative to their non-exclusive use of pad 39A," said Michael Braukus, a NASA spokesperson, in an email to Spaceflight Now. "KSC is currently in a second round of more detailed discussion; however, no decisions have been made by either NASA or SpaceX at this time." The space agency has been looking to turn over some of its mothballed shuttle infrastructure to commercial programs, and one of the space center's three orbiter hangars will be home of final assembly and testing for a Boeing crew capsule bidding to ferry astronauts to the International Space Station. Part of the Vehicle Assembly Building, the shuttle's mobile launch platforms, and the KSC runway are also available to commercial entities. Web posted. (2012). [SpaceX eyes shuttle launch pad for heavy-lift rocket [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, March 11].]

March 12: The 30th Atlas 5 rocket began taking shape Monday as United Launch Alliance technicians hoisted the giant first stage onto the mobile launching platform for next month's mission to deploy an ultra-secure U.S. government communications satellite. At the Vertical Integration Facility adjacent to Cape Canaveral's Complex 41 launch pad, the stacking operations got underway to assemble the vehicle for its planned April 27 blastoff carrying the second Advanced Extremely High Frequency spacecraft.

Web posted. (2012). [Atlas 5 being stacked for its next U.S. military launch [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, March 12].]

March 13: Space Shuttle Discovery, the oldest and most distinguished orbiter in the NASA shuttle fleet, has finished preparations for its final trip to The Smithsonian Institution's National Air & Space Museum's Udvar-Hazy Center in Chantilly, VA. The shuttle, wrapped around a massive structure of scaffolding, sat inside Orbiter Processing Facility Bay 1 (OPF-1) for final inspection and modifications before its ferry flight to DC. The last remaining tasks before closeout involved detail work inside the rear of the space craft. Where the three engines would normally be exposed are now covered by a white tail cone, a sign of the ferry flight soon to come. It will be no easy task to ferry the shuttles to their final destinations. Typically, any ferry flights that occurred during the 30 year span of the shuttle program came from California to Florida. For Discovery, it will mate at Florida's Kennedy Space Center and demate at Dulles International Airport in Virginia. Web posted. (2012). [Shuttle Discovery goes to Washington [Online]. Available WWW: <http://www.washingtontimes.com/> [2012, March 13].]

◆ The Community Redevelopment Agency approved half the money requested for the Space Shuttle Monument Project on Tuesday. The US Space Walk of Fame Foundation requested \$50,000, but the CRA, mostly made up of the city council, voted 5-1 to approve half the money to the project and deferred the decision for the remaining amount. Charlie Mars, president of the US Space Walk of Fame Foundation, said project could be completed within a year with full funding. Web posted. (2012). [Space Shuttle Monument Project granted half of required funding [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 13].]

◆ SpaceX today announced plans for two more launches of commercial communications satellites from Cape Canaveral by 2015. Two Falcon 9 rocket launches will deploy up to four telecommunications satellites in geosynchronous orbits for launch partners Asia Broadcast Satellite (ABS) and Satélites Mexicanos (Satmex). "This announcement marks SpaceX's first launch contract in Mexico," SpaceX CEO Elon Musk said in a statement. "It is also the second launch contract in Asia that we have signed in the last month." SpaceX, of Hawthorne, Calif., said the deal's first launch was expected in late 2014 or early 2015, and the second in the fourth quarter of 2015. The company last month announced plans for two launches from the Cape in 2014 for Asia Satellite Telecommunications Company Ltd. Web posted. (2012). [SpaceX announces 2 more launches from Cape Canaveral [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 13].]

◆ Patty Stratton, Associate Program Manager at United Space Alliance (USA), has been selected by the National Space Club Florida Committee to receive its 2012 Dr. Kurt H. Debus Award. Stratton will be honored at the Debus Award Dinner on Saturday, April 21, 2011. The formal event, which begins at 6:30 pm, will be held at the Debus Conference Facility at the Kennedy Space Center (KSC) Visitor Complex. "The Space Club is proud to honor Patty for this esteemed award," said National Space Club Chair Steve Griffin. "She has over 30 years of service to our nation's space program and in her most recent role she directed integration of all USA Space Shuttle processing activities and oversaw 3,800 employees. Patty's dedication and influence was key to the Shuttle Program success." The Debus Award was created by the National Space Club Florida Committee to recognize significant achievements and contributions made in Florida to American aerospace efforts. It is named for KSC's first Director, Dr. Kurt H. Debus. Web posted. (2012). [Stratton to Receive Prestigious Debus Award [Online]. Available WWW: <http://www.nscfl.org/> [2012, March 13].]

March 14: Space Exploration Technologies Corp. (SpaceX) and United Launch Alliance (ULA) are probing NASA for details about using space shuttle launch infrastructure at the Kennedy Space Center in Florida, a senior agency official said. "NASA has responded to one request by SpaceX and is in the

process of responding to a second data/information request,” Bill Hill, NASA associate administrator for space shuttle operations, said in a March 13 statement. SpaceX is interested in Launch Complex 39A, from which the final shuttle missions launched. The pad was also to be the launch site for the Ares rockets NASA was developing under the canceled Constellation program. Pad 39A “is one of the options we are considering for both Falcon 9 and Falcon Heavy launches, but it depends on being awarded more launches from NASA,” SpaceX spokeswoman Kirstin Grantham said. Hill also said NASA has received requests for information and data about Pad 39A from “other potential commercial users.” United Launch Alliance, the Denver-based Boeing and Lockheed Martin joint venture, is the only other U.S. launch provider with rockets big enough to require use of the space shuttle facilities. “We have been in discussions with NASA about using former space shuttle infrastructure, and those discussions are ongoing,” ULA spokeswoman Jessica Rye told Space News March 12. She declined to provide details about either ULA’s queries to NASA or the agency’s response. Neither SpaceX nor ULA has yet reached any agreement with NASA concerning Pad 39A, the companies said. NASA has been trying to find alternate uses for old shuttle support infrastructure at Kennedy Space Center since before the space shuttle flew its last mission last summer. The planned Space Launch System, a heavy-lift rocket NASA is building for future deep-space missions, would launch from Pad 39A, but NASA wants the site to support multiple customers. Web posted. (2012). SpaceX, United Launch Alliance Eye Shuttle Launch Pad [Online]. Available WWW: <http://www.spacenews.com/> [2012, March 14].]

March 15: A new Headquarters building is set to rise from the ground at the Kennedy Space Center (KSC), a building which is part of the overall revamp of the Florida spaceport. While the noise of spacecraft being launched from KSC won’t be heard again until at least 2014, the sound of construction is already ringing out, as KSC prepares to launch both NASA and commercial vehicles. Preparations for the post Space Shuttle era began even while the orbiters were completing their final role of assembling the International Space Station (ISS). Although work at Pad 39B was in relation to the now defunct Constellation Program (CxP), the follow on program – centered around the Space Launch System (SLS) – benefited from the head start, as the 600 feet tall Lightning Towers rose from the ground, not long before the Shuttle pad’s infrastructure was raised to the ground. With a “clean pad” now residing at 39B – and the remaining shuttle pad mothballed at Pad 39A – KSC is in a position to not only launch NASA’s new SLS vehicle, but also commercial vehicles, either from the clean pad or via 39A – the latter likely to be transferred to “Space Florida” – the State’s aerospace economic development agency – ownership in the not too distant future. This work also stretches back from the pads, down the crawlerway and through to the industrial area, all part of KSC’s transition to a multi-user facility. “It is very challenging making the transition from a government program focused primarily on a single crewed spacecraft to a multi-user program,” noted Trey Carlson, Master Planner for KSC in an interview with NASA.gov this week. “At the same time, we must be careful not to preclude any future uses with decisions that are being made today.” Moving past the renovation work taking place on the launch infrastructure, this week saw the announcement of the plan to build a new headquarters building, to be carried out in two major phases, to become the cornerstone for the Central Campus area. This new building will become an iconic site, backdropped by the massive Vehicle Assembly Building (VAB), for workers and visitors arriving at the spaceport by the middle of this decade. The work on the Central Campus will enable demolition of approximately 900,000 square feet of physical plant in the Industrial Area while rebuilding only about 450,000 square feet. Between the 50 percent reduction in foot print and the considerably lower costs associated with the operation and maintenance of the new energy efficient facilities, KSC will save in the order of \$400 million over the next 40 years. “We’re going to see a dramatic return on investment with new facilities,” Mr Carlson added. “With a constrained budget forecast we owe it to ourselves to look at options of how to operate the Center in a more sustainable manner.” Located between the current HQ building and the Operations & Checkout (O&C) building on D Avenue, Central Campus Phase 1 will be a 200,000 square foot facility that consolidates shared services, data centers, and office space in the Industrial Area. Central Campus Phase 2 is a 150,000 square foot facility that will be integrated to the east side of Phase 1 and provides additional office space. When Phase 2 begins, the current HQ Building will

be demolished. The Central Campus project was originally planned for implementation in four phases over eight years starting in FY2012. The plan included replacement and consolidation of ten buildings in the Industrial Area and a complete gut-and-renovate of the O&C South Wing, a process which has already taken place on the North Wing in preparation for the future KSC programs. The phase 1 building is scheduled to begin construction in September, 2013, which would allow for a completion date of March, 2015. Web posted. (2012). [KSC's revamp to include new centerpiece HQ building on Central Campus [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, March 15].]

◆ United Technologies Corp. (UTC) of Hartford, Conn., said March 15 it intends to sell its rocket-propulsion business, Pratt & Whitney Rocketdyne. Pratt & Whitney Rocketdyne specializes in rocket propulsion and space power systems. Based in Canoga Park, Calif., with major facilities in West Palm Beach, Fla., the company makes the RL-10 upper stage engines used on United Launch Alliance's Atlas 5 and Delta 4 rockets as well as the Delta 4's RS-68 main engine. Rocketdyne is also working on the J-2X upper stage engine for NASA's planned heavy-lift Space Launch System (SLS). NASA has scheduled two SLS flights so far: one in 2017 and one in 2021. Neither mission calls for an SLS stack that includes a J-2X. The possible sale of Rocketdyne, whose business suffered following the retirement of NASA's space shuttle, has been rumored for months. Rocketdyne built and maintained the main engines used on the space shuttle fleet. Web posted. (2012). [Pratt & Whitney Rocketdyne Up for Sale[Online]. Available WWW: <http://www.spacenews.com/> [2012, March 15].]

◆ The honor flag which flew on the final space shuttle mission, STS-135, aboard shuttle Atlantis, was at the funeral of slain Brevard County Sheriff's Office deputy Barbara Ann Pill. Pill was shot and killed during a traffic stop of two alleged suspects. Web posted. (2012). [Honor Flag Flown on Final Shuttle Mission at Funeral of Slain Deputy[Online]. Available WWW: <http://www.americaspace.org/> [2012, March 15].]

◆ The launch of the first commercially built space capsule to the International Space Station will occur at the end of April, NASA officials announced today. California-based Space Exploration Technologies (SpaceX) is now aiming to launch its unmanned Dragon spacecraft on a demonstration flight to the orbiting outpost at 12:22 p.m. EDT (1622 GMT) on April 30, the agency confirmed today via Twitter. This test flight was originally slated to occur in early February, but the mission was delayed to allow extra time to test the spacecraft and its software. The Dragon capsule will launch atop SpaceX's own Falcon 9 rocket and, if successful, will be the first privately built spacecraft ever to rendezvous and dock with the International Space Station. The flight, which represents a crucial step forward for the commercial spaceflight industry, is designed to test the robotic spacecraft's ability to haul cargo to the orbiting complex. Web posted. (2012). [First Commercial Spaceship to Launch to Space Station April 30[Online]. Available WWW: <http://www.space.com/> [2012, March 15].]

March 16: United Launch Alliance donated \$2,500 to the US Space Walk of Fame Foundation today in Titusville to help preserve the history of the space industry. Jerry Jamison, vice president of launch operations for ULA, presented the check to Charlie Mars, president of the Space Walk of Fame Foundation. The US Space Walk of Fame is a monument park on the Indian River that honors astronauts and personnel that worked on American manned space projects. The foundation is also responsible for the US Space Walk of Fame Museum on 4 Main St. "The history they have collected at the museum takes us back to the very roots of our space industry," Jamison said. "The community needs to preserve this history." Web posted. (2012). [ULA donates \$2,500 to US Space Walk of Fame Foundation [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 16].]

◆ Launch of NASA's NuSTAR space observatory is going into an extended delay while engineers continue working on the Pegasus rocket software and await the next available opportunity in the U.S.

military's flight range in the remote Pacific. The Flight Readiness Review was held Thursday with officials at the Kwajalein Atoll launch site, the Pegasus rocket's homeport at Vandenberg Air Force Base in California and Kennedy Space Center where NASA manages the deployment mission. But that meeting concluded with the decision to postpone the launch from the no-earlier-than end-of-March timeframe. "The delay will allow additional time to assure that the flight software to be used with a new Pegasus flight computer will issue commands to the rocket as intended," NASA said in a statement. "The time required to complete the work moves the launch period beyond the timeframe currently available on the range at the launch site." NASA is working with officials at the Reagan Test Site on Kwajalein Atoll to determine a new launch opportunity. That next slot "is anticipated to be within the next couple of months," the NASA statement read. Web posted. (2012). [Circumstances cause long delay for Pegasus launch [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, March 16].]

March 17: Kennedy Space Center on Friday alerted about 2,300 employees that personal information, including their Social Security numbers, was put at risk by the theft of an employee's laptop computer earlier this month. A NASA human resources employee reported the laptop stolen from a car outside their Orange County home on March 5. By March 14, the center realized many more personnel were affected and more personal information was accessible than originally thought, according to Allard Beutel, a spokesman for Kennedy Space Center. In addition to Social Security numbers, the information included names, race, national origin, gender, date of birth, contact information, college affiliation and grade-point average. Beutel said email notification was sent Friday to about 2,300 civil servants and student interns – virtually the center's entire non-contractor workforce – and letters would follow in the mail. The email said there was no evidence the information had been abused and the "probability is low" that it would be, because the computer was password-protected, and the information was not believed to be the reason for the laptop theft. "However, we cannot say with certainty the (personal information) is safe," the e-mail said. As a precaution, NASA will offer the employees a year's worth of identity and credit-monitoring provided by Idexperts. A "breach response team" is also evaluating IT security policies to prevent repeat incidents, and all employees received notices reminding them to protect mobile equipment. "More preventative actions and 'lessons learned' are expected to follow in the coming days and weeks to help stop this from happening again," said Beutel. Web posted. (2012). [KSC employees warned over effects of laptop theft [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 17].]

March 18: With Space Shuttle orbiter Discovery buttoned up in the Vehicle Assembly Building (VAB) ahead of her flight to her retirement home, and with Enterprise ready to make way for Discovery and head to her new display site, the Shuttle team at Kennedy Space Center (KSC) is focused on finishing Transition and Retirement (T&R) work for Atlantis and Endeavour. Atlantis and Endeavour are back in the Orbiter Processing Facility (OPF) after a series of moves back and forth between the OPF and VAB since they returned from their final delivery missions to the International Space Station (ISS) last year. Atlantis was recently moved back into OPF Bay 1, while Endeavour has been back in OPF Bay 2 since February 1. One of the OPF bays, OPF Bay 3, was released from Shuttle processing work last year – allowing it to be converted for use by Boeing and their CST-100 spacecraft – which meant a return to earlier times, when there were more orbiters than available OPF bays to process them. "And that was a question when we first started discussing the ability to turn over OPF-3 before we were done with all the vehicles," Stephanie Stilson, NASA Flow Director for Orbiter Transition and Retirement, noted during an extensive question and answer session with the media while Discovery and Atlantis were trading places on March 9. There are plans to do the same refit operation with OPF Bay 1 – as the Kennedy Space Center (KSC) moves forward with its dual use (NASA and Commercial) transition – which means that Atlantis will make one more trip to the VAB. "Atlantis will go back to the Vehicle Assembly Building for another period of time of storage," Ms Stilson said, "and that's because of our goal to turn over OPF-1 as soon as we can to that new customer. "I don't know who that is, but there is a new customer. So Atlantis will spend some time in the Vehicle Assembly Building, we'll do work while it's there and then

bring it back into the OPF before it goes out to the Visitors Complex.” Atlantis is currently scheduled to make that trip down Kennedy Parkway to the Visitors Complex in November. Web posted. (2012). [Engineers preparing Atlantis and Endeavour for the end of T&R ops [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, March 18].]

March 19: A small but visible sign of the times occurred Saturday at Kennedy Space Center's launch pad 39A when technicians removed the seven slidewire baskets that were part of the emergency escape system for space shuttle astronauts. The baskets were released from the from the 195-foot level of pad's service tower to travel down the wires to the landing zone 1,200 feet to the west for the final time. The baskets are being put in storage. A braking system catch net and drag chain slowed and then halted the baskets sliding down the wire approximately 55 miles per hour in about half a minute. The baskets were the heart of the pad evacuation plan if an emergency arose. Crews would have egressed the orbiter, hurried to the other side of the tower and hopped into the carriers to be whisked off the launch gantry and down to the ground bunker. Each basket could hold up to three suited astronauts. Web posted. (2012). [Escape baskets for shuttle crews removed from pad [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, March 18].]

◆ It's natural for people dealing with post-layoff issues to be bitter and point out flaws in the organization they left behind. The people who've left the space shuttle team are no different. One of their recurring complaints about NASA is that the contractor work force was gutted, but the people who worked for the government have kept their jobs. An analysis last year of federal government payroll data by *USA Today* showed that NASA had among the lowest percentages of people laid off or fired among all federal agencies. In the shuttle's final year of flight, the agency had just 13 people let go out of a nationwide work force of almost 19,000 people. There is some downsizing this year. Some people are voluntarily moving on or retiring, and those jobs are not all necessarily being refilled as NASA adjusts for the future. KSC Director Robert Cabana last week mentioned a reduction in the center's NASA staff of about 50 people. That was focused in center operations, which basically is the more generic administrative support function for a center. That's an area NASA is trying to streamline nationwide and makes sense at a place like KSC. While the government work force is about the same size as during shuttle, the total number of people moving around the center doing things every day is about half what it was. NASA still has a relatively flat budget, with the same amount of money being spent on the same kinds of projects, but they're different ones, and new contractors are being hired. NASA hired the United Space Alliance to operate its space shuttle fleet day to day. After years of service, NASA shut down the shuttle program that was the company's primary reason to exist. So, most of the company's workers were no longer needed after closing flights last year. A few are left preparing the orbiters for museums. USA workers made up a huge portion of the shuttle work force, much larger than their NASA-employed counterparts. Those folks are still needed by NASA to work on other programs, basically on whatever comes next. So the agency has identified its priorities, assigned projects to centers, and workers within the agency were assigned to them. To pick on one guy, Ed Mango, once a leader in the shuttle orbiter projects office for the government side at NASA, isn't needed to do that work anymore. However, Ed is a smart, talented spaceflight veteran and NASA is still in the space-flight business. One of the agency's priorities now is overseeing and coordinating the agency's work with private companies on the initiative to develop commercial space vehicles to take astronauts from Florida to the International Space Station. Mango leads the commercial crew project office, headquartered at Kennedy Space Center. That's what his employer, NASA, needed him to do next. Contractors do the same. Web posted. (2012). [NASA moves contractor jobs as needed [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 19].]

March 21: Lawmakers from Florida's 24th House seat, which includes Kennedy Space Center, have a long tradition of endorsing reduced federal spending — while doing their best to guard NASA dollars. In keeping with that practice, U.S. Rep. Sandy Adams, R-Orlando, this week wrote House appropriators and

asked that they protect spending for several NASA initiatives that would help KSC. These include plans to modernize KSC facilities, build new space taxis and construct a crew capsule that one day could take astronauts to a moon or nearby asteroid. "With our nation's debt topping \$15 trillion it is imperative that Congress stops spending at its reckless rate. I sent a letter to members of the House Appropriations Committee Subcommittee on Commerce, Justice, Science and Related Agencies to request that they prioritize NASA's funding so it can continue its core missions, while still reflecting the need for fiscal discipline in our federal spending," Adams said in a statement. The White House has proposed a \$17.7 billion budget for NASA in 2013. Web posted. (2012). [Adams spells out NASA wish list [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, March 21].]

March 22: Concerned about the design of some propulsion system components in its Dragon capsule, SpaceX engineers turned to a small NASA team for advice. The so-called Partner Integration Team, one of seven assigned to work with each of the companies developing commercial crew vehicles, put SpaceX in touch with the right NASA expert. The connection helped "get us to solution in a timely manner," said Garrett Reisman, head of SpaceX's program to upgrade the Dragon for human spaceflight. NASA is counting on such collaboration to speed the development of private space taxis and restore America's ability to deliver astronauts to the International Space Station. While independent safety advisers recognized the important role the NASA partner teams will play as the Commercial Crew program progresses — company proposals for a third round of NASA funding are due Friday — they also raised concern that government officials could get too cozy with their commercial partners. "It will be important to ensure that the tendency to 'over-identify' with the contractor does not result in a lack of objectivity by the NASA representative," the Aerospace Safety Advisory Panel wrote in its annual report. While supporting the companies, the teams also act as a front line for the agency to monitor work and flag concerns. The panel recommended NASA rotate team members so "a fresh set of eyes are always protecting the government's interest." After working together for barely a year, NASA team leaders and their commercial counterparts don't anticipate problems. "Our religion is not to get SpaceX up there," said Jon Cowart, a Kennedy Space Center engineer who leads the team assigned to the Hawthorne, Calif., company. "Ours is to get the right people doing a good, safe job up there." The partnerships reflect a new way of doing business for a major NASA program, as early development of commercially operated rockets and spacecraft for human spaceflight proceeds under non-traditional contracts called Space Act Agreements. The arrangement means NASA can't dictate vehicle designs or tell the companies how to solve a particular problem, but can only discuss past experience dealing with similar issues during its decades of spaceflight. Like teachers working with students, NASA can provide information but never answers, said Scott Thurston, the KSC manager overseeing the partner teams. If a partner asks for specific help, as SpaceX did with its Dragon propulsion system, it pays NASA for the work under separate agreements. Web posted. (2012). [Safety group warns NASA's Commercial Crew adviser teams to stay objective [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 22].]

March 23: NASA expects to order launches for three Earth science missions by the end of the summer, and United Launch Alliance (ULA) looks like the strongest contender for the job with its medium-lift Delta 2 rocket, an agency official said. NASA sent a request for proposals to its current stable of approved launch services providers — ULA, Space Exploration Technologies Corp. (SpaceX), Orbital Sciences Corp. and Lockheed Martin Corp. — in early February seeking bids for three missions: Soil Moisture Active-Passive, Orbiting Carbon Observatory-2 and the Joint Polar Satellite System-1. Proposals are due April 8, with the launches taking place from 2014-2017. Steve Volz, associate director of flight programs in NASA's Earth Science Division, said only two of the approved NASA Launch Services 2 vendors, ULA and SpaceX, currently have rockets that meet the agency's criteria. But he said the limited flight heritage of SpaceX's Falcon 9 rocket — two successes in two launches, with a third slated for April 30 — puts it at a disadvantage. "Right now, the two possible proposals ... are the Delta 2 from ULA and the SpaceX Falcon 9," Volz told the NASA Advisory Council during a March 21 meeting here. "Delta 2 can bid, and they're certified; it's easy. Falcon 9, they may bid, but they haven't been

certified, so there's a risk on those." The Delta 2, which for years was the most reliable vehicle in the U.S. fleet, is out of production, but ULA has five of the vehicles remaining for sale. ULA spokeswoman Jessica Rye confirmed March 22 that the company will be bidding the Delta 2 for the NASA contract. SpaceX spokeswoman Kirstin Grantham said March 22 that her company will bid for at least a share of the work. "We are submitting a certification plan with our proposal," she said. While Volz was skeptical that Falcon 9 could achieve NASA certification in time to launch any of the three upcoming missions, the vehicle is "likely to be a viable contender" for Earth science missions "that launch in 2018, 2019, 2020." Jim Norman, director of the NASA Launch Services Program, said in a March 22 email that the launch solicitation is open to rockets that "will meet (at minimum) Category 2 certification" requirements. Those requirements call for one to three successful flights and a raft of NASA reviews. NASA previously had given the Orbiting Carbon Observatory-2 launch contract to Orbital, but rescinded the award after an Orbital-built Taurus XL failure destroyed NASA's Glory climate-monitoring satellite last March. An earlier Taurus XL failure destroyed the original Orbiting Carbon Observatory craft. NASA has looked at using the U.S. Air Force Minotaur 4 rocket, assembled by Orbital using excess missile stages, but Volz said the agency is unlikely to go that route. The Delta 2 last launched in October, when it delivered the Suomi NPP climate and weather satellite to orbit. Web posted. (2012). [Delta 2 Seen as Front-runner for 3-Launch NASA Contract [Online]. Available WWW: <http://www.spacenews.com/> [2012, March 23].]

March 24: Space Florida and the NASA Florida Space Grant Consortium sponsored the first Space Flight Payloads Workshop at the Florida Solar Energy Center in Cocoa, Florida this week. The high-tech conference started with a Skype cell phone call from Dr. Alan Stern, director of the Florida Space Institute. His opening comments served to welcome guests to the workshop. Fourteen companies & universities pitched their products in hopes of having customers purchase sub-orbital time in space. Starfighters which is based at Kennedy Space Center's (KSC) Shuttle Landing Facility (SLF) utilizes F-104 aircraft to deliver payloads. This air show act turned payload delivery system has already begun working with Star Lab and 4Frontiers Corp to launch payloads to sub orbit via the same delivery system – that launched missiles at enemy aircraft in years gone by. NASA sent representatives working on the NASA Flight Opportunities Program to encourage attendees to continue to bring their concepts and ideas to the space agency. "We are very excited to hear their ideas once they have their technical information in order," said Nancy Zeitlin with NASA. "We will then work to see their concepts are channeled to the right agency for partnership agreements – as no single organization will be able to do it alone." Web posted. (2012). [Payloads Workshop Highlights Commercial Space Efforts [Online]. Available WWW: <http://www.americaspace.com/> [2012, March 22].]

March 27: After several delays, NASA has launched five rockets from Virginia that are part of a study of the upper level jet stream. The rockets began blasting off just before 5 a.m. Tuesday from NASA's space center on Wallops Island. Bad weather had postponed other planned launches last week. The Anomalous Transport Rocket Experiment (ATREX) will help scientists understand the jet stream, which is located 60 to 65 miles above Earth's surface. After launching, the rockets released a chemical tracer to form white clouds that allowed scientists and the public to visualize the winds. A NASA news release says the launches and clouds were reportedly seen from as far south as Wilmington, N.C.; west to Charleston, W.Va.; and north to Buffalo, N.Y. Web posted. (2012). [NASA launches suborbital rockets from space center on Virginia coast [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, March 27].]

◆ NASA's activities in social media were recognized on Monday in New York when the agency's official Twitter feed, @NASA, received a Shorty Award for the best government use of social media. The Shorty Awards honor the best of social media across sites such as Twitter, Facebook, Tumblr, YouTube, Foursquare and others. NASA's nomination cited multiple aspects of the agency's social-media efforts, including the popular Angry Birds in Space game and encouragement of science among young people.

Web posted. (2012). [NASA's Twitter Account Receives Shorty Award [Online]. Available WWW: <http://www.spaceref.com/> [2012, March 27].]

March 29: Billionaire Jeff Bezos, the founder of Amazon.com, says he has discovered massive Saturn 5 rocket engines on the Atlantic Ocean floor east of Florida, capturing the attention of NASA and space enthusiasts. Using sonar, a team funded by the business magnate located the F-1 rocket engines from the Apollo 11 moon landing mission lying 14,000 feet under the sea, according to Bezos. He said they plan to raise at least one of the engines from the ocean floor. The five F-1 engines on the Saturn 5's first stage collectively produced 7.5 million pounds of thrust and burned for nearly 3 minutes. The first stage was supposed to fall back into the Atlantic Ocean about 400 miles east of Cape Canaveral, Fla. Apollo 11 launched from the Kennedy Space Center on July 16, 1969. Four days later, Neil Armstrong and Buzz Aldrin became the first humans to land on the moon. "Though they've been on the ocean floor for a long time, the engines remain the property of NASA," Bezos wrote. "If we are able to recover one of these F-1 engines that started mankind on its first journey to another heavenly body, I imagine that NASA would decide to make it available to the Smithsonian for all to see." NASA spokesperson Bob Jacobs said the agency foresees no problems with Bezos's plan. Bezos sent NASA Administrator Charlie Bolden an email detailing his work. The Atlantic Ocean east of Cape Canaveral is littered with rocket debris from hundreds of launches since the 1950s. Thousands of rocket boosters, engines and pieces of hardware have fallen into the sea since the dawn of the space program. Another private firm recovered Liberty Bell 7, a sunken Mercury capsule, from the bottom of the Atlantic Ocean in 1999. Liberty Bell 7's escape hatch blew open after splashing down following a 15-minute suborbital flight in 1961. Web posted. (2012). [NASA sees no problem recovering Apollo engines [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, March 29].]

◆ Two lawmakers are asking the investigative arm of Congress to look into the Brevard nonprofit organization NASA hired to manage the International Space Station's national lab following the abrupt resignation of its executive director. Maryland Rep. Donna Edwards, a Democrat, and California Rep. Dana Rohrabacher, a Republican, said they would like the Government Accountability Office to examine whether the Center for the Advancement of Science in Space, or CASIS, is prepared to fulfill the contract it received to coordinate non-NASA research on the station. "It would be a great idea for us to request a look at the center's operations because, for me, the resignation of the executive director and the problems that she highlighted are really troubling," Edwards said during a hearing Wednesday of the House Science, Space and Technology Committee. A spokesman for the center, which was started by Space Florida and began operations about six months ago at Kennedy Space Center, said it would welcome GAO scrutiny. The center's first executive director, Jeanne Becker, resigned Feb. 29, citing concerns about conflicts of interest and political pressure. The center's board, comprised of Space Florida officials, acknowledged disputes over the pace and direction of CASIS' early work, and named Jim Royston, director of strategy and planning, to replace Becker on an interim basis. The change in leadership already has drawn the notice of NASA, which sent a letter to the board last week reminding them of contract obligations CASIS is supposed to meet. "We have objective milestones that we've asked them to meet (and) to give us an extra assurance that they can actually meet those in light of the uncertainties and the problems that they've had during startup," William Gerstenmaier, associate NASA administrator of the Human Exploration and Operations Mission Directorate, told lawmakers. NASA spokesman David Weaver said Wednesday the agency was eager to review and validate the response it had received from CASIS to Gerstenmaier's letter. Web posted. (2012). [Lawmakers want GAO to keep eye on Brevard's CASIS [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 29].]

◆ NASA's commercial crew program came under fire Wednesday from lawmakers who questioned its price tag, its long-term viability and the decision to provide companies hundreds of millions of dollars to develop the rockets and spacecraft that will send astronauts and cargo to the International Space Station

and back. "I believe the core mission of NASA is to build cutting-edge systems that allow us to expand our knowledge of the universe," Alabama Republican Sen. Richard Shelby told NASA Administrator Charles Bolden. "This administration seems to think that NASA's job is to use taxpayer money as venture capital to support speculative commercial companies, the future Solyndras of the space industry." Shelby's comparison of the space agency's commercial crew initiative was to the Energy Department program that loaned more than \$500 million to a California solar panel that went bankrupt was the harshest criticism hurled at Bolden during a Senate Appropriations subcommittee hearing Wednesday. The hearing was to examine NASA's proposed \$17.7 billion budget for the fiscal year that begins Oct. 1. The commercial crew program is one of NASA's top three priorities, along with the James Webb Space Telescope (\$628 million was requested) and the heavy lift rocket and capsule (\$3 billion was requested) that eventually is supposed to carry astronauts to Mars. The budget would give the commercial crew program almost \$830 million, more than twice what Congress provided last year. Bolden and other NASA officials say it's crucial the program be fully funded this year so they no longer have to rely on — or pay — the Russians beyond 2017. Web posted. (2012). [Lawmakers question price, viability of NASA's commercial crew program [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 29].]

◆ Welcome to the Operations and Checkout building at NASA's Kennedy Space Center. Originally built to receive moon-bound Apollo spacecraft, the "O&C" was added to the National Register of Historic Places in the 2000. Now, people call it "The Spacecraft Factory Of The Future." A \$55 million restoration transformed the O&C into a state-of-the-art manufacturing facility for NASA Orion spacecraft. In a first for KSC, the Apollo-style capsules that will take American astronauts to asteroids, the moon, Mars and other interplanetary destinations will be produced at the launch site. "We actually moved the factory here," said Jules Schneider, senior manager for Orion assembly, integration and production operations with spacecraft manufacturer Lockheed Martin. "This is where we'll put Orion together, integrate it, test it, and make sure that we have a spacecraft that will do what it's required to do." Historically, NASA spacecraft have been built elsewhere and then transported cross-country to KSC. But to save time and money, Lockheed Martin took a new approach. "You build and you test on-site, and you save time, schedule and cost," said Glenn Chin, NASA's deputy manager for Orion production operations. And that's a big deal here on Florida's Space Coast, a community still reeling from the shutdown of NASA's shuttle program and the resulting loss of thousands of jobs. This year, Orion production work is starting in earnest. Inside a historic high bay now gleaming anew, 150 people already are hard at work, preparing to build an Orion spacecraft for an inaugural flight test scheduled for early 2014. The factory work force will climb to about 190 by the end of this year, said Jim Kemp, Lockheed Martin's director of Orion assembly, testing and launch operations. And by early 2014, some 350 to 400 people will be working on the production line. A significant percentage of the factory workers have and will come from the shuttle program. The Orion spacecraft for the 2014 flight test will begin coming together at the O&C over the next several months. Web posted. (2012). [KSC site reborn for shuttle successor [Online]. Available WWW: <http://www.floridatoday.com/> [2012, March 29].]

◆ Launch of the Delta 4 rocket has been pushed back to Monday, April 2. The extra few days will give engineers more time to complete an assessment of the Delta 4's second stage engine, according to United Launch Alliance. Liftoff on Monday will be at 4:04 p.m. local time (7:04 p.m. EDT; 2304 GMT). Web posted. (2012). [California launch of Delta 4 rocket slips to Monday [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, March 29].]

March 30: Technicians will load more than 1,000 pounds of food and clothing into SpaceX's Dragon capsule next month for delivery to the International Space Station on the commercial craft's first flight to the outpost. Josh Byerly, a NASA spokesperson, said the cargo is comprised of mostly low-value items such as food, water, and clothing to supplement supplies delivered this week aboard Europe's Automated

Transfer Vehicle. The SpaceX flight will also carry some research payloads, including student experiments and scientific gear for NanoRacks, a company which designs low-cost research platforms for the International Space Station. The space station crew will unload cargo from the Dragon spacecraft after its scheduled arrival at the orbiting lab May 3. The astronauts will replace the supplies with 660 kilograms, or 1,455 pounds, of equipment for return to Earth. Supplies for the Dragon mission are already arriving at the Kennedy Space Center, where they are being packaged and prepared for flight inside the Space Station Processing Facility, according to George Diller, a NASA spokesperson at KSC. The cargo aboard the Dragon craft's first flight to the space station will not go toward the commitment in SpaceX's \$1.6 billion contract to transport 44,000 pounds of supplies to the complex over 12 operational flights. "This was additional cargo that was added so that we could fully check out the cargo capability on the demo mission," Byerly said. SpaceX's operational Commercial Resupply Services missions could begin as soon as August, assuming the upcoming test flight goes well. Web posted. (2012). [Half-ton of cargo on Dragon's space station manifest [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, March 30].]

March 31: The end of the space shuttle program means the end of Shuttles Dugout Sports Bar and Grill. It's a restaurant that catered to NASA employees for several decades. "We were very dependent on workers at the Kennedy Space Center," said Shuttles owner Bill Grillo. Shuttles has been in business since the dawn of the now ended shuttle program thirty years ago. Hundreds of astronauts and KSC employees have stopped by for meals. But once workers at the nearby Kennedy Space Center no longer came in, the owner was forced to put it up for sale. Grillo said in the months following the final shuttle launch, and the layoffs which followed, his business took a 70 percent dip in sales, forcing him to shutter the doors. Grillo adds he hopes the next spaceflight program will bring back enough workers to re-open. Web posted. (2012). ['Shuttles' restaurant up for sale [Online]. Available WWW: <http://www.cfnews13.com/> [2012, March 31].]

APRIL

April 2: After several days of precautionary analysis and reviews, the Delta 4 rocket has been cleared for blastoff Tuesday afternoon at 4:12 p.m. local time (7:12 p.m. EDT; 2312 GMT) from Vandenberg Air Force Base, California. The classified mission to launch a surveillance satellite for the National Reconnaissance Office was postponed from last week to verify the deployable nozzle system on the vehicle's upper stage. At a Monday afternoon gathering of launch officials, the final review was completed and approval granted to move into the countdown activities overnight. Tuesday appears to offer the best weather conditions for the next several days. Forecasters are predicting a 60 percent chance of allowable winds for the rocket to fly. Web posted. (2012). [West Coast Delta 4 rocket poised for launch Tuesday [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, April 2].]

◆ NASA and Space Exploration Technologies (SpaceX) will invite 50 of their social media followers to a two-day NASA Social April 29-30 at NASA's Kennedy Space Center in Florida. The event is expected to culminate in the launch of SpaceX's second Commercial Orbital Transportation Services (COTS) demonstration flight. SpaceX's Falcon 9 rocket is targeted to lift off at 12:22 p.m. EDT on April 30, in an attempt to become the first commercial company to send a spacecraft to the International Space Station. ["NASA, SpaceX Announce NASA Social for Falcon 9 Launch Attempt," **NASA News Release #12-103**, April 2, 2012.]

◆ Unhappy with delays, shifting contracting strategies and a proposed budget increase, lawmakers took aim on NASA's commercial crew initiative last week in a continuing narrative of questioning as the agency fights to maintain the program's relevance. Some legislators, fearing job losses in their constituencies, have viewed the commercial crew program with skepticism since it was announced as NASA's near-term strategy for human spaceflight when the Obama administration canceled the behind-schedule Constellation moon program in 2010. Congress cut NASA's fiscal 2012 commercial crew budget request by more than half, appropriating \$406 million to the program for the fiscal year ending Sept. 30. The budget forced NASA to abandon its procurement strategy in the next phase of the program and return to Space Act Agreements, a more flexible, less rigid mechanism to partner with commercial providers. Instead of signing contracts with the companies developing spacecraft and rockets to carry humans into orbit, NASA will make roughly two-year agreements to fund industrial work without the level of insight gained in traditional federal contracts. Companies in the next stage of the program, due to begin in late summer, will finish the design and much of the development of human-rated launchers and spacecraft, leading to flight tests by mid-decade. But because of the funding hit in fiscal 2012, the start of manned commercial flights to the International Space Station will likely not begin until 2017. Until then, NASA will purchase round-trip flights for U.S. astronauts on Russian Soyuz capsules. Web posted. (2012). [Senate appropriators offer rebuke of commercial crew [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, April 2].]

April 3: NASA should select a destination to explore beyond Earth orbit as soon as possible and also identify milestones to get there, an advisory group says. The failure to do so will delay the planned launch early next decade of American astronauts on solar system expeditions. "Given the budget reality and the development time for new hardware and software, which is estimated to be at least 10 years, now is the time to pick a specific destination," NASA Advisory Council Chairman Steven Squyres said in a recent letter to NASA Administrator Charles Bolden. "In addition, the near and interim steps in order to achieve the ultimate objective should also be defined." President Barack Obama in April 2010 challenged NASA to send American astronauts to an asteroid by 2025 and launch human expeditions to Mars in the 2030s. To that end, NASA is developing a heavy-lift rocket — the Space Launch System — and the Orion multipurpose crew vehicle. An initial flight test of the Apollo-style Orion space capsule is targeted

for early 2014 on a United Launch Alliance Delta IV rocket at Cape Canaveral Air Force Station. A first flight test of an Orion spacecraft on a Space Launch System rocket is slated for 2017, with a crewed test set for 2021. Human expeditions beyond Earth orbit could begin as early as 2022, the advisory council noted. The selection of a specific destination would focus NASA, international space agencies, and contractor teams. Web posted. (2012). [Mission goal crucial soon, NASA advisory panel says [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 3].]

◆ NASA's NuSTAR X-ray astrophysics observatory, grounded in March by concerns with its Pegasus rocket, will have an opportunity to launch in June from a remote Pacific military base, space agency officials said Tuesday. Engineering reviews of the air-launched Orbital Sciences Corp. Pegasus rocket continue, according to NASA, with officials focusing on software to be used by a new computer flying on the Pegasus for the first time. The reviews were not finished in time for the \$165 million mission to be ready before the end of a launch window in late March. "We're still working on the flight software program," said George Diller, a spokesperson at the Kennedy Space Center. The clamshell-like nose cone on the Pegasus rocket has been cleared for launch. Engineers were studying commonality between the Pegasus payload fairing and the shroud on the ground-launched Taurus rocket, another Orbital Sciences vehicle, which failed due to fairing separation problems on back-to-back flights in 2009 and 2011. The Pegasus booster has flown 40 times, and the upcoming launch will mark the 25th mission of the Pegasus XL configuration, which features more powerful rocket motors than earlier versions. The Pegasus XL rocket is fully assembled inside a hangar at Vandenberg Air Force Base, Calif. Technicians will tow the rocket to the base's runway a few weeks before launch and bolt it to an L-1011 carrier aircraft, which will fly the Pegasus and NuSTAR payload to Kwajalein Atoll in the Marshall Islands. Web posted. (2012). [Launch of NASA X-ray telescope targeted for June [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 3].]

◆ Kennedy Space Center Director Robert Cabana said the center is turning the corner and will have a stable work force of about 10,000 in the future, counting contractors. There currently are about 8,000 people working there, including 2,049 NASA employees. Cabana made his comments Tuesday, as he updated the Brevard County Commission on developments at NASA and KSC. "I really believe we have a great future," Cabana told the commissioners, citing efforts to transition from the space shuttle program that ended last year to working on development of a heavy-lift vehicle for transporting future astronauts. Cabana said that a heavy-lift vehicle will be ready for an unmanned flight in 2017 and a manned flight in 2021. "Obviously, we'd like to see it fly sooner, and given more money, we could," he said. Cabana said KSC never will get back to the work force levels it had during the Apollo moon mission program or the space shuttle program. He said partnerships with private companies are the key to the future at KSC, which he envisions as a "multiuser spaceport." Web posted. (2012). [KSC chief sees rise in employment [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 3].]

◆ A NASA Shuttle Carrier Aircraft (SCA), a modified 747 jet, will transport Discovery to Washington Dulles International Airport in Sterling, Va., on Tuesday, April 17.

Tuesday, April 10 -- 5:30 p.m. SCA arrival at Shuttle Landing Facility

Saturday, April 14 -- 5 a.m.-6 p.m. Discovery rollout from Vehicle Assembly Building's high bay 4 to Shuttle Landing Facility mate/demate device

Monday, April 16 -- 7:30 a.m. SCA/Discovery backout of mate/demate device

Tuesday, April 17 -- Discovery departs at first light (approximately 7 a.m.) ["NASA Announces Events for Shuttle Discovery Departure," **NASA Media Advisory #M12-59**, April 3, 2012.]

April 4: The museums awarded retired space shuttle orbiters got a relative bargain. NASA in late 2008 estimated institutions would have to pay \$42.8 million to cover the costs to prepare and transport each orbiter for public display, but the actual cost is now expected to be roughly a quarter of that. First, NASA

agreed to pay to decommission the vehicles after their final flights, dropping the price to \$28.8 million. Then the space agency got a clearer picture of the additional work necessary and how much contractors would charge to do it. New cost estimates range from \$9.6 million to deliver Enterprise to \$13.7 million for Endeavour, with the cost for Atlantis still under negotiation. NASA will pay the \$11.1 million tab for Discovery, which is scheduled to be ferried April 17 from Kennedy Space Center to the Smithsonian Institution's National Air and Space Museum. The lower numbers are good news for the four sites expecting to receive orbiters this year, including KSC Visitor Complex, but raise a question of whether, in hindsight, more museums could have secured the funding necessary to submit competitive bids. Two of 13 finalists — the National Museum of the U.S. Air Force in Dayton, Ohio, and the U.S. Space & Rocket Center in Huntsville, Ala. — acknowledged the day before the decisions were announced April 12 that they couldn't come up with the nearly \$29 million then required, according to a report by NASA's inspector general. Web posted. (2012). [Landing a deal: Estimates fall for preparing shuttles for museums [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 4].]

◆ A rocket carrying a top-secret payload blasted off Tuesday from the California coast. The Delta IV rocket lifted off at 4:12 p.m. from the Vandenberg Air Force Base, about 130 miles northwest of Los Angeles. The reconnaissance office, which oversees the nation's constellation of spy satellites, has kept mum about the purpose of the mission and directed United Launch Alliance to cut off the live broadcast three minutes after liftoff. ULA, the joint venture of rocket builders Lockheed Martin Corp. and Boeing Co., said it was the first time the Delta IV had been launched this way. The launch was delayed nearly a week as engineers worked to fix an issue with the upper stage engine. Web posted. (2012). [Rocket with secret payload launches from Vandenberg AFB [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 4].]

◆ KSC Federal Credit Union recently announced the retirement of Chief Executive Officer Maureen Lowe. Lowe, 54, was appointed president and chief executive officer of the credit union in October 2009. She started at the credit union in 1981 as a teller and ascended through various management positions to become chief executive. The credit union's board of directors voted to hire San Francisco-based O'Rourke and Associates to facilitate the search for a new CEO. Merritt Island-headquartered KSC, the second largest credit union in Brevard County, has 14 branches throughout Brevard and Volusia counties with assets of \$579.5 million and 52,301 members. Web posted. (2012). [KSC Credit Union seeking new CEO [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 4].]

◆ IMAX Corp. is donating its first cameras used to film aboard the space shuttle to the Smithsonian's National Air and Space Museum in Washington. The large-format cameras used to make 70-mm films will be donated to the museum in a ceremony Wednesday. They'll become part of the Smithsonian's permanent collection. Nearly 100 NASA astronauts were trained to operate the IMAX cameras in space. They created the first giant-screen images of Earth and of life in zero gravity. The result was a series of six IMAX space films, including "The Dream is Alive," "Blue Planet," "Destiny in Space" and "Mission to Mir." One camera was kept in the space shuttle cabin and another in its cargo bay. Between 1984 and 1998, IMAX cameras were flown on at least 17 space shuttle missions. Web posted. (2012). [IMAX gives 2 space shuttle cameras to Smithsonian [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 4].]

◆ Sunday night, the CBS newsmagazine "60 Minutes" aired a segment on the impact the retirement of the Space Shuttle program has had on Florida's Space Coast, including profiling some of the people who lost their jobs as a result and the broader economic impact on the community. It's hard not to sympathize with those people who have struggled to find work in the months since losing their jobs. The segment, though, has taken on something of a political dimension as well. "President Obama cancelled NASA's plan to replace the space shuttle in favor of a more modest program," CBS's Scott Pelley said in his

introduction to the segment. “And then, Congress slashed the funding for that.” The implication, also expressed in the segment, was that many or even most would still have jobs there if President Obama hasn’t pushed to cancel Constellation in 2010. (Left unsaid is just how many shuttle-specific workers would have been let go even if Constellation had been retained, especially since the program was at the time of its cancellation still several years from the first Ares 1/Orion flight.) Congress also gets dinged for cutting commercial crew funding, with again the implication that more money would have retained more KSC jobs, although most of the current commercial crew development work is being done outside of Florida. On Tuesday, NASA administrator Charles Bolden argued, “missed an awful lot of important context about the end of that era and where we’re headed from here.” Constellation was behind schedule, lengthening the gap in US human space access, he said, while commercial entities can more quickly to fill that gap, with NASA following with the Space Launch System (SLS) and Orion. He also noted that unemployment is going down in Brevard County, the heart of the Space Coast, and had reached its lowest levels since May 2009, more than two years before the final shuttle flight. By that time, though, the segment had been used as ammunition against the Obama Administration. Web posted. (2012). [“60 Minutes” segment becomes a political football [Online]. Available WWW: <http://www.spacepolitics.com/> [2012, April 4].]

April 5: The Space Coast will get a chance to bid goodbye to Discovery when the orbiter departs Kennedy Space Center later this month and heads to the Smithsonian for retirement. Bolted onto the top of a modified 747 Shuttle Carrier Aircraft, Discovery is scheduled to take off from the three-mile runway at KSC at first light — around 7 a.m. — on April 17. If weather conditions allow, the piggybacking orbiter will be flown over KSC and the KSC Visitor Complex and then south to Patrick Air Force Base. The duo then will doubleback, flying north over Space Coast beaches before making a final pass over KSC and the Shuttle Landing Facility. Then it will depart the vicinity. The 747 will ferry Discovery to Dulles International Airport in Chantilly, Va. The orbiter will be removed from the carrier aircraft and transported to the Smithsonian’s National Air and Space Museum Steven F. Udvar-Hazy Center on April 19. Web posted. (2012). [Discovery prepped for farewell Space Coast flyover [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 5].]

◆ Members of Ohio’s congressional delegation urged NASA to strip a Florida nonprofit of its status as manager of the international space station’s national laboratory and give the job to a Cleveland-based group instead. “In light of the events of the last six months, culminating with the resignation of the head of the Center for Advancement in Science and Space (CASIS), we are writing to encourage you to reconsider your contract, and express our strong support for reconsideration of the Space Laboratory Associates proposal to manage the International Space Station (ISS) National Laboratory,” the lawmakers wrote in an April 4 letter to Mark Uhran, NASA assistant associate administrator for ISS. U.S. Sen. Sherrod Brown (D-Ohio) took the lead on the letter, which was co-signed by 13 of Ohio’s 18 U.S. representatives and published on Brown’s website. NASA spokesman Mike Curie said April 4 that “no decision has been made at this time to take any action to alter the CASIS cooperative agreement.” CASIS spokesman Bobby Block told Space News that the Florida nonprofit “is meeting its milestones established by NASA and we are working at overtime to maximize use of the ISS U.S. National Laboratory. CASIS, a group backed by Florida’s economic development agency Space Florida and headquartered in the Space Life Sciences Laboratory at the southern tip of the Kennedy Space Center, was selected by NASA in July to manage all non-agency science on the U.S. side of the ISS, which an act of Congress has designed a national laboratory. Web posted. (2012). [Ohio Delegation Calls on NASA to Fire ISS Nonprofit [Online]. Available WWW: <http://www.spacenews.com/> [2012, April 5].]

◆ NASA has selected United Launch Services, LLC of Englewood, Colo., to launch the Geostationary Operational Environmental Satellites-R and S, or GOES-R and GOES-S. The spacecraft will launch in October 2015 and February 2017, respectively, aboard Atlas V 541 rockets from Space Launch Complex-

41 at Cape Canaveral Air Force Station, Fla. The total cost of the GOES-R and GOES-S launch services is approximately \$446 million. This estimated cost includes launch service for the Atlas V and additional services under other contracts for payload processing, launch vehicle integration, mission unique launch site ground support, and tracking, data and telemetry services. The advanced spacecraft and instrument technology used on GOES-R and GOES-S will result in more timely and accurate weather forecasts. It will improve detection and observation of meteorological phenomena that directly affect people's lives. The GOES-R and GOES-S Flight Projects Office, which oversees the development of the Space Segment, is managed by NASA's Goddard Space Flight Center in Greenbelt, Md., The overall GOES-R and GOES-S Program is managed by the National Oceanic and Atmospheric Administration. NASA's Launch Services Program, based at the Kennedy Space Center in Florida, is responsible for Atlas V launch vehicle program management and launch services.["NASA Awards Launch Contract for GOES-R and GOES-S Missions," **NASA Contract Release #C12-016**, April 5, 2012.]

April 8: The clock once again is ticking at Kennedy Space Center, but this time the countdown won't end with a space shuttle blasting into orbit. Instead, officials with NASA and the state are racing to find new tenants for several vacant shuttle facilities at KSC before the money to maintain them runs out — which is expected to happen by fall 2013. "We have a short window of opportunity," said Joyce Riquelme, head of the center's development office. "We don't want to have a bunch of abandoned facilities sitting around for who knows how long." With the space-shuttle program ended, NASA either must find someone to lease major buildings — such as the facility where workers repaired shuttle tiles — or abandon them, because the cash-strapped agency lacks the money to demolish them. Besides looking bad, the crumbling buildings would hinder efforts to remake KSC into a modern spaceport, an initiative estimated to cost \$2.3 billion during five years. There has been some success. In October, Boeing agreed to lease one of three shuttle garages — known officially as an Orbiter Processing Facility — to assemble a new space capsule at KSC. The project could employ as many as 550 workers, a major first step in helping KSC recover from the loss of 7,000 shuttle jobs. And officials with NASA and Space Florida, the state's aerospace-development agency, said they're working hard to find tenants for the two other shuttle garages, along with several other buildings. Among the more promising developments is the possibility that Stratolaunch — a new space company launched by Microsoft co-founder Paul Allen and SpaceShipOne designer Burt Rutan — will use KSC's 3-mile-long shuttle landing strip as home for its massive space plane. The giant aircraft is being built to carry spacecraft to high altitudes before launching them into orbit. "We are in discussions with NASA and Space Florida regarding establishing [KSC] as our primary base of operations," said Gary Wentz, Stratolaunch president and CEO. He said he hoped to have an agreement "within the next two months." Last year, NASA floated a list of 19 KSC facilities and complexes worth about \$2.5 billion that it wanted to share or lease; to date, only a handful of deals have been inked. With a plan now in hand, NASA aims to spend \$2.3 billion during five years, much of it to ready the center for the new rocket and capsule, broadly known as the Space Launch System. Web posted. (2012). [NASA races to find tenants for vacant shuttle facilities [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, April 8].]

◆ Given the delays launching the year's first Atlas 5 rocket due to high-altitude winds and scheduling conflicts with a Navy submarine missile test off Cape Canaveral, the next Atlas mission is moving out a week or so as a result. A spokesperson for the Air Force's Space and Missile Systems Center confirmed the targeted April 27 Launch date will slide into early May. But the exact date depends on avoiding another schedule conflict on the Eastern Range at the Cape, which is booked for the planned April 30 blastoff of the SpaceX Falcon 9 rocket and Dragon cargo vessel on the first private spacecraft launch to the International Space Station. That mission has its primary and backup attempts reserved on the Range, pushing the Atlas to May 5. But if the Falcon goes on time or experiences a lengthy delay in advance, the Atlas will be postured to leap forward a couple of days to fly as soon as around May 3. The Air Force-run Range provides all of the critical and necessary tracking, communications and safety services for Cape Canaveral rocket launches. It needs time between missions to reset equipment to support the next vehicle

in the queue. Realigning the Atlas target date will ensure ample time for assembling and preparing the massive 19-story rocket for flight, as well as building slack back into the overall schedule. Web posted. (2012). [A May launching now planned for next Atlas 5 [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, April 8].]

April 9: After recently detailing plans for shuttle Discovery to fly a farewell tour over Space Coast beaches after taking off next Tuesday atop a 747, NASA today confirmed plans for low passes over Washington, D.C. area landmarks before landing there. Discovery is bound for Dulles International Airport, adjacent to the Smithsonian Institution annex in suburban Virginia where it will be permanently exhibited in retirement. NASA said the orbiter and its carrier aircraft would fly about 1,500 feet over landmarks including the National Mall, Reagan National Airport, National Harbor and the Smithsonian's Udvar-Hazy Center between 10 a.m. and 11 a.m. on April 17. The plans were approved in partnership with the Federal Aviation Administration. Weather or technical issues could impact the timing and route. Discovery is expected to be formally transferred to the National Air and Space Museum during a ceremony April 19. Web posted. (2012). [Discovery to fly over DC landmarks [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 9].]

◆ Nearly two months after a burst pipe sent water gushing through a ceiling and cascading down stairs, causing nearly \$5 million in damage, dozens of people are getting ready to return to work in a state-owned lab facility at Kennedy Space Center. “It was quite dramatic,” Steve Bennington, chief scientific officer for Cella Energy, said of the leak at the Space Life Sciences Lab. “You could have taken a kayak down the stairs at one point.” Building owner Space Florida says 75,000 square feet, or 68 percent of the facility, sustained some degree of damage. Fortunately, it was concentrated in office areas on the second floor and mostly spared laboratories and experiments. The state aerospace development agency paid only a \$1,000 deductible, with insurance covering the rest of the estimated \$4.6 million in damage. The facility is expected to resume normal operations April 16. Opened in 2003, the lab is a centerpiece of ongoing efforts to establish the Space Coast as a hub for microgravity research. It’s the anchor of a planned research and development complex called Exploration Park, and current tenants include the nonprofit manager of the International Space Station’s National Lab. Around noon Feb. 17, Bennington heard a loud crack, poked his head above a second-floor cubicle and immediately saw collapsed ceiling tiles and water pouring through the opening. A six-inch main pipe feeding the fire sprinkler system had cracked in the west stairwell in the three-story, 110,000-square foot facility, said Tina Lange, a Space Florida spokeswoman. The system, reacting as if a fire required suppression, began pumping water through the pipe at a rate of 1,500 gallons per minute, until it pooled ankle-deep on parts of the second floor and trickled down to the ground floor. Employees grabbed laptops and belongings and scurried out, setting off an alarm to alert authorities. There was excitement but no panic, Bennington said. KSC firefighters responded quickly. No one was injured. No official cause for the pipe’s break has been determined yet. In recent weeks, crews have replaced extensive amounts of drywall, ceilings, carpets and office furniture on the first and second floors. NASA helped relocate between 60 and 80 employees representing at least seven tenants to temporary offices and labs in KSC’s Space Station Processing Facility. “KSC was extremely accommodating,” Lange said. In addition to Cella Energy, affected tenants included NASA, the Center for the Advancement of Science in Space, Molecular Power Systems, Innovative Health Applications, Kentucky Space Authority and University of Florida. Web posted. (2012). [KSC’s Space Life Sciences Lab nears reopening following flooding [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 9].]

◆ The second annual NASA OPTIMUS PRIME Spinoff Video Contest awards ceremony will be held at the Kennedy Space Center Visitor Complex, Fla., on Thursday, April 12, at 10 a.m. EDT. The contest is run by NASA Goddard Space Flight Center's Innovative Partnerships Office in Greenbelt, Md., and aims to raise student awareness of how NASA technologies provide benefits to the public, as

well as show the similarities with the popular OPTIMUS PRIME character from Hasbro's TRANSFORMERS brand. Students nationwide in grades 3-12 were able to participate in this year's contest. The ceremony will include managers from NASA and Hasbro, the winning students, along with the associated NASA innovators and their commercial partners, and Peter Cullen, the voice of OPTIMUS PRIME. ["NASA OPTIMUS PRIME Spinoff Awards ceremony at Kennedy April 12," **NASA Media Advisory #M19-12**, April 9, 2012.]

April 10: United Launch Alliance this week announced a new division dedicated to supporting NASA's human spaceflight programs. The Human Launch Services team will help NASA and its partners develop capabilities to send crews to low-Earth orbit and beyond, ULA said in a news release. ULA's Atlas V rocket is the anticipated launch vehicle for three of the four companies currently receiving NASA funding to develop commercial spacecraft that could carry astronauts to the International Space Station by 2017. George Sowers, who previously headed ULA's business development and advanced programs team, will lead the new organization, headquartered in Denver with support at NASA centers. Web posted. (2012). [ULA launches support division [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 10].]

April 12: The visitor complex at Kennedy Space Center is offering the public opportunities to see Discovery and meet astronauts who have flown aboard it as NASA prepares to transport the winged spaceship to the Smithsonian. Saturday and Sunday, people can take a special tour that will include a drive-by of Discovery at the Shuttle Landing Facility, where the orbiter will be hoisted atop a 747 carrier aircraft before its departure from KSC next Tuesday. The tour includes a drive-by of launch pad 39A and culminates at the Apollo-Saturn V Center. On Monday, astronauts from the first and last Discovery missions will make appearances. "It should be a really cool program with (members of) both crews there," said visitor complex spokeswoman Andrea Farmer. Next Tuesday, there will be limited availability for guests to watch the 747 and Discovery take off from, and then fly over, the Shuttle Landing Facility. Discovery is expected to depart around 7 a.m. Web posted. (2012). [Here's your shot to see Discovery [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 12].]

◆ The Space and Astronomy Lecture series organized by Brevard Community College Professor Fiorella Terenzi will have its final presentation of the academic year at 7 tonight at Astronaut Memorial Planetarium. America's future in space will be the topic of the panel discussion at the facility at BCC's Cocoa campus. Entitled "What's Next: A Turning Point in the United States Space Program," the panel discussion brings together three leaders from NASA and the private sector. John Kelly, Local Editor for *Florida Today*, will moderate the panel. Panelists include: • Janet Petro, Deputy Director, NASA Kennedy Space Center, who oversees the work of the 9,000 or so government and contractor workers at the space center. • Frank DiBello, President and CEO of Space Florida, which fosters aerospace-related economic development in Florida. Space Florida aims to retain, grow and expand aerospace business in Florida. • Mike Leinbach, Director of Human Spaceflight Operations, United Launch Alliance. Formerly the head of the shuttle launch team at KSC, Leinbach is working to make the company's Atlas V rocket, the next American rocket to carry people to space. Web posted. (2012). [Want to discuss US' space future? Visit planetarium tonight [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 12].]

April 13: United Space Alliance, NASA's lead space shuttle contractor, today shaves its work force by 10 percent with its latest round of layoffs, which include 181 employees based at Kennedy Space Center. In all, 269 employees are leaving company offices in Florida, Texas and Alabama, the majority of them (186) through voluntary layoffs officially called self-nominations. More than half the departing employees were the last to receive a "critical skills" bonus that was offered as an incentive to help retain those skills through flyout of the shuttle program, which completed its last mission last July. All laid off

employees receive a severance package. After today's cuts, Houston-based USA expects to have 2,589 employees, including 1,323 at KSC. Another round of reductions is planned in the fall. Web posted. (2012). [United Space Alliance lays off 10% of work force [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 13].]

◆ Space shuttle Discovery flew the most missions of NASA's five orbiters, 39. But on her inaugural mission, she balked. It was June 25, 1984. Michael Coats, now director of the Johnson Space Center in Houston, was the pilot. As the countdown hit "five," the first of Discovery's three main engines flared, then the second. The shuttle rocked forward and back, pulling at the eight big bolts holding her to the launchpad — a motion known as the "twang." The third engine never lit. "As we were twanging, suddenly it got very quiet," said Coats, whose adrenaline was pumping; this was the Navy flier's first space launch, too. "We could hear seagulls screaming outside. We rocked back and forth for a second. As we're digesting the fact we're not going, the first comment came from Steve Hawley sitting behind us. He said, 'I thought we'd be a lot higher when the engines cut off.'" After technicians replaced the faulty engine, Discovery finally took wing on Aug. 30, spending the first seven of her eventual 365 days in space. Robert Cabana piloted Discovery twice, in 1990 and 1992. Now director of Kennedy Space Center, he recalled the eery tension of riding the elevator up to the cockpit at 4 a.m. for his first launch. "You look at this vehicle and it's venting and it's creaking and it's like it's alive, like it's breathing," he said. "And you just cannot believe you're going to be inside there blasting off in three hours." That time, Discovery launched on schedule. "That first launch, nothing can prepare you for that. It's shaking and vibrating. All those pops and cackles you hear on TV? You hear that in the cockpit, too." Eight-and-half minutes later, the rumbling ride ends. "It's like you're in a freight train that's gotten rear-ended," said Cabana. "It feels like you come to a stop, but you've just stopped accelerating and you're going 17,500 miles per hour. It's just this amazing ride uphill, this sense of speed and acceleration. What a phenomenal vehicle. Once you get off the [solid rocket boosters], it's just as smooth as can be on the three main engines. It's like electric drive. It's amazing." Web posted. (2012). ['What a phenomenal vehicle': Discovery's pilots recall amazing rides [Online]. Available WWW: <http://www.washingtonpost.com/> [2012, April 13].]

◆ It's still a "Field of Dreams" proposition—"if you build it, they will come." Even so, NASA's as-yet-unrealized efforts to offload routine human space access onto the private sector is beginning to ripple across the U.S. launch industry in ways that could go well beyond transporting people and their stuff into space. Brash entrepreneurs like Elon Musk, who openly declares his intention to take over the worldwide launch industry with lower-cost launchers than the competition's, are exerting downward price pressure on traditional launch-vehicle manufacturers. And the possibility of an off-planet economy in low Earth orbit (LEO) has triggered a new round of innovative launcher designs, not all of them "paper rockets" and some of them quite different from traditional vehicles. "We've selected the Atlas V for our test flights through the Commercial Crew Program," says John Mulholland, vice president and manager of Commercial Programs for Boeing Space Exploration. "But we will continue to maintain our design to be compatible with multiple launch vehicles so that we can competitively procure launch vehicles in the future, which is important for us to maintain best value, obviously. The launch vehicle is such a huge portion of our offer." Mulholland's group has just completed the preliminary design review on the CST-100, Boeing's entry into the NASA-run commercial crew development competition. Two other teams have baselined the Atlas V to launch their space taxis, but Atlas-builder United Launch Alliance (ULA) is not resting on its laurels. The Boeing/ Lockheed Martin joint venture is scrambling to cut costs of its Atlas V and Delta IV launcher lines to meet the anticipated competition from Musk and other startups, while stressing the demonstrated reliability of their products and working to improve them. And as ULA goes after the nascent human space-flight market with the Atlas V it uses to launch big government satellites and space probes, new entrants in the commercial cargo and crew game are not pinning their hopes on the human market alone. If a launcher is reliable enough to send astronauts aloft, the argument goes, it certainly is reliable enough to handle high-value satellites and other spacecraft, and perhaps open up new space businesses such as satellite servicing and orbital tourism. If it all works out—and that

remains a pretty large “if”—NASA’s commercial approach to carrying astronauts to low Earth orbit could lower the cost of space access to the point that the business cases for new LEO applications can close. Beginning with the Commercial Orbital Transportation Services (COTS) program initiated by then-Administrator Michael Griffin, NASA has invested about \$925 million of taxpayer seed money to help create a private human spaceflight industry. That money has attracted significant private investment, and the agency is optimistic that this can generate one or more new ways to get humans and cargo to the International Space Station (ISS) for less money than traditional government procurements. The COTS program could start to pay off as early as next month, provided Musk’s Space Exploration Technologies Inc. (SpaceX) succeeds in getting its next Dragon capsule off the ground with its Falcon 9 rocket and berthed at the ISS for the first time, carrying 1,000 lb. of food and other relatively low-value cargo. Orbital Sciences Corp., NASA’s other COTS partner, also hopes to reach the station this year with its Cygnus cargo vehicle riding the company’s new Antares liquid-fueled launcher. That could be just the beginning. With the space shuttle fleet retired, NASA is paying Russia more than \$60 million a seat to train and fly astronauts to the ISS in Soyuz capsules. Starting with \$50 million in federal economic stimulus package funding in fiscal 2009, NASA has been seeding development of commercial space taxis under its Commercial Crew Development (CCDev) and Commercial Crew Integrated Capability (CCiCap) initiatives. Web posted. (2012). [How Commercial Space is Paying Off Now [Online]. Available WWW: <http://www.aviationweek.com/> [2012, April 13].]

April 14: A transporter that hauled Saturn V moon rockets and the space shuttles out to oceanside Kennedy Space Center launch pads is being modified for next-generation rockets that will be larger than any launchers ever developed. Now in High Bay No. 2 of the Vehicle Assembly Building, the crawler is being refurbished by a crew of about 50 to 60 people. Its AC power system is being upgraded with generators that produce twice as much electricity as its shuttle-era generators. Its roller bearings are being replaced. Steering pumps are being refurbished. When the project is finished in 2015, the crawler will be able to handle a load up to 18 million pounds. A Space Shuttle stack and mobile launcher platform weighed about 12 million pounds. Top speed for the crawler will remain the same: 1 mph with a full load; 2 mph unloaded. Odometer mileage to date: 2,100 miles. A trip to pad 39B, where the new heavy-lift rockets will launch: 4.2 miles. Web posted. (2012). [Venerable crawlers get next-generation upgrade [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 14].]

◆ Discovery remains on track to leave Kennedy Space Center for good Tuesday morning despite winds delaying the orbiter’s attachment to a carrier aircraft on Saturday. Crews plan to lift Discovery onto the 747 jumbo jet today. “There’s no impact to the scheduled departure on Tuesday,” said KSC spokeswoman Tracy Young. The ferry flight is expected to take off around 7 a.m. Tuesday on a nonstop trip to Dulles International Airport, near the Smithsonian Institution annex where Discovery will be publicly displayed. It’s the first of four retired shuttles to be shipped to a museum since the final missions last year. Early Saturday, Discovery was towed about two miles from the Vehicle Assembly Building to the shuttle runway. There it was hooked up to a sling in a special gantry used to place orbiters on or remove them from their carrier aircraft. “We’re very happy because everything has gone well to get to this point,” Stephanie Stilson, the KSC manager overseeing the delivery of each orbiter, said Saturday morning. “When I start to think about this (being) the last time we’ll do this with Discovery, it is sad.” But just as happened so often during normal shuttle operations, weather changed the plans. Gusting winds exceeded allowable limits for lifting an orbiter, forcing managers to postpone the move. Assuming conditions have improved today, Discovery will be hoisted 60 feet up to allow the 747 to roll underneath. Then the orbiter will be lowered down and bolted to the plane. The work was expected to start at 5 a.m. and be completed by mid-morning. Early forecasts suggest the ferry flight will be able to proceed on schedule, but a final decision will follow a weather briefing early Tuesday. Before heading north, the piggybacked plane and spaceship plan to fly low over KSC and local beaches north of Patrick Air Force Base. Stilson expects an emotional sendoff from shuttle workers and fans. “I hope that they savor the fact that it is the end of Discovery’s time in space and the end of Kennedy Space Center’s attachment to

Discovery," she said. "I think you'll see a lot of tears." Web posted. (2012). [Windy weather delays Discovery lift [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 14].]

April 15: Space shuttle Discovery has touched the ground at Kennedy Space Center one last time. This morning, the orbiter was hoisted into the air to be secured on top of a modified 747. The jumbo jet, known as a Shuttle Carrier Aircraft, will ferry Discovery to retirement at the Smithsonian. Crews are working today at KSC to complete the attachment and ready Discovery for its Tuesday departure from the Space Coast. They had hoped to mate Discovery to the plane on Saturday but high winds forced a delay. On Tuesday, the piggybacked plane and spaceship will depart KSC, fly low over the KSC Visitor Complex Rocket Garden and then tour local beaches as far south as Patrick Air Force Base, giving the Space Coast a chance to say a final goodbye. Discovery, the shuttle fleet leader, will become the first orbiter to enter retirement. Web posted. (2012). [Discovery secured onto 747 for Tuesday departure [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 15].]

April 16: This week NASA's space shuttle *Discovery* will fly low over Washington, D.C., atop a jumbo jet and roll into its new permanent home with the Smithsonian Institution. *Discovery* will touch down at Dulles International Airport on Tuesday, weather permitting, and the National Air and Space Museum's Steven F. Udvar-Hazy Center in Chantilly, Virginia, will host a big outdoor ceremony on Thursday to welcome their new space-worn acquisition. But once the spaceship is settled into the museum, visitors won't be able to hop into the commander's seat and fiddle with switches—the institution intends to seal up *Discovery* indefinitely. To provide an unprecedented look at *Discovery* and the other retired space shuttles, both inside and out, photographers with National Geographic recently captured more than two dozen ultrahigh-resolution, 360-degree pictures of each orbiter. NASA and United Space Alliance, the agency's prime contractor for servicing the shuttles, made the interactive panoramas possible by granting news organizations unprecedented access to the hundred-ton spaceships after each final shuttle flight. "When the shuttles were flying, workers had to maintain the integrity and cleanliness of the vehicles. We had to keep them safe for spaceflight" and so couldn't allow much outside access, said Lisa Fowler, a NASA spokesperson at Kennedy Space Center in Florida. "Now that they're being readied for display, we've been able to grant more access into them." Web posted. (2012). [Space Shuttle in Extreme Detail: Exclusive New Pictures [Online]. Available WWW: <http://www.nationalgeographic.com/> [2012, April 16].]

April 17: The space shuttle Discovery soared over the Washington Monument, the White House and the Capitol in a high-flying salute to the nation's capital Tuesday. The world's most traveled spaceship, hitching a ride on top a Boeing 747 jet, took a couple of leisurely spins at an easy-to-spot 1,500 feet around Washington after a flight from Cape Canaveral, Fla. Thousands packed the National Mall to watch the pair swoop by. The shuttle-jet combo was set to land at Dulles International Airport. On Thursday, it will be towed to its permanent installation at the Smithsonian's annex in northern Virginia. Discovery departed Florida's Kennedy Space Center at daybreak. Nearly 2,000 people -- former shuttle workers, VIPs, tourists and journalists -- gathered along the old shuttle landing strip to see Discovery off. A cheer went up as the plane taxied down the runway and soared into a clear sky. The plane and shuttle headed south and made one last flight over the beaches of Cape Canaveral -- thousands jammed the shore for a glimpse of Discovery -- then returned to the space center in a final salute. Cheers erupted once more as the pair came in low over the runway it had left 20 minutes earlier and finally turned toward the north. Discovery -- the fleet leader with 39 orbital missions -- is the first of the three retired space shuttles to head to a museum. It will go on display at Dulles International Airport in Virginia, taking the place of the shuttle prototype Enterprise. The Enterprise will go to New York City. Endeavour will head to Los Angeles this fall. Atlantis will remain at Kennedy. NASA ended the shuttle program last summer after a 30-year run to focus on destinations beyond low-Earth orbit. Private U.S. companies hope to pick up the slack, beginning with space station cargo and then, hopefully, astronauts. The first commercial cargo run,

by Space Exploration Technologies Corp., is set to take place in just another few weeks. For at least the next three to five years -- until commercial passenger craft are available in the United States -- NASA astronauts will have to hitch multimillion-dollar rides on Russian Soyuz capsules to get to the International Space Station. Web posted. (2012). [Space shuttle Discovery arrives in D.C. after historic final flight [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, April 17].]

◆ Space Shuttle Discovery, the NASA orbiter that spent a year's worth of time among the stars, completed its final journey Tuesday when it landed at Washington Dulles International Airport on the back of a Boeing 747. Blunt-nosed and blemished, the worn spacecraft atop the jumbo jet elicited cheers from a crowd of thousands gathered around the airport to catch a glimpse of a moment in history. "When are you ever going to see something like that again?" asked Daniel Pallotta, a Boston resident who drove down with his son to watch the shuttle landing. "You're not. This was awe-inspiring." The Discovery, NASA's longest-serving shuttle, traveled from the Kennedy Space Center in Florida to its new permanent home at the Smithsonian National Air and Space Museum's Steven F. Udvar-Hazy Center in Chantilly. Within hours of its landing, the 75-ton, 184-foot-long shuttle was moved to a secure location where crews worked to decouple it from the jet and prepare it for its close-up with its sister shuttle, Enterprise. On Thursday, officials plan to face the two shuttles nose to nose before Discovery moves into the James S. McDonnell Space Hangar attached to the museum. The Enterprise, which never went into space, is set to become the shuttle-in-residence at New York's Intrepid Sea, Air & Space Museum. A public ceremony to commemorate the switch is scheduled for 11 a.m. Thursday and will include a speech by astronaut and former Ohio Sen. John Glenn, the first American to orbit Earth who flew on Discovery at the age of 77. Half of the Discovery's 31 living commanders also will be there. The space shuttle passed low over the Washington area for about an hour Tuesday before landing at Dulles shortly after 11 a.m., drawing spectators to gathering spots atop buildings, along the Mall, and along the Potomac River. Motorists on the Capital Beltway and many other highways pulled over to watch as Discovery circled overhead, causing traffic jams in several spots, officials said. "They had a lot of folks just stopping in various places," said Cpl. Anthony Washington of the Maryland State Police barrack in Forestville. "It just seemed to be pretty chaotic today." No serious accidents were reported, but state police got calls for a number of fender benders and troopers responded to several jammed areas to help get traffic moving again, he said. After watching the shuttle fly directly above him, Daniel Choi, a planetary scientist with the Goddard Space Flight Center in Greenbelt said the experience was "more emotional than I thought it would be." Web posted. (2012). [Shuttle Discovery flyover dazzles D.C. area [Online]. Available WWW: <http://www.washingtontimes.com/> [2012, April 17].]

April 18: A key congressional panel on Wednesday proposed giving NASA less than it wants for the program that will replace the shuttle in ferrying U.S. astronauts to the International Space Station. Members of a House Appropriations subcommittee proposed spending \$500 million in fiscal 2013 on the Commercial Crew program. That's about \$325 million less than the Obama administration requested. The proposal comes a day after a Senate Appropriations subcommittee voted to provide \$525 million for the program. The Commercial Crew program has been helping a handful of private companies develop the spacecraft and rockets that could carry crew to the space station. The program's goal was to move forward with at least two systems that would be capable of transporting astronauts to the outpost by 2017. Though less than the \$829.7 million NASA had requested as part of its fiscal year 2013 budget, both the House and Senate levels are more than the \$406 million Congress gave the program for the current fiscal year. NASA considers the commercial program a top priority. Not only does the agency have to pay Russia about \$450 million a year to ferry astronauts to the space station, but the lack of a vehicle to transport astronauts from the U.S. is a symbolic sore point for a nation that has dominated space travel for decades until the shuttle's retirement in July. Lawmakers say the Commercial Crew program costs too much and have questioned whether the government should spend hundreds of millions of dollars helping private companies develop the rockets. The Senate subcommittee overseeing NASA voted Tuesday to fund the entire agency at \$19.4 billion for fiscal 2013, an increase of \$1.6 billion over the current year.

Most of that increase would result from shifting the acquisition — but not the operation — of weather satellites from the National Oceanic and Atmospheric Administration to NASA. Without the money for satellite procurement, the subcommittee's proposal represents a \$41.5 million cut from NASA's fiscal 2012 budget. The House bill would fund NASA at \$17.6 billion, about \$226 million below fiscal 2012 levels and \$138 million below the president's request. The proposal includes about \$2.9 billion for the heavy-lift rocket and capsule, and \$628 million for the James Webb Space Telescope. Web posted. (2012). [Panel proposes \$500M for shuttle successor [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 18].]

◆ The main stage of NASA's planned heavy-lift Space Launch System exploration rocket will carry four surplus RD-25D space shuttle main engines, as NASA and main-stage prime contractor Boeing move toward preliminary design review (PDR) on the big new rocket by the end of the year. With the first flight scheduled in 2017, Jim Chilton, Boeing vice president and program manager for exploration launch systems, calls the development schedule "sporty." But selection of the basic four-engine configuration is a significant step in developing the launch vehicle NASA plans to use for exploration beyond low Earth orbit in the 2020s and beyond. Engineers considered three- and five-engine versions of the main stage, and settled on four for "money, time and performance" reasons. After the supply of RD-25Ds is used up, plans call for a throwaway version of the reusable shuttle engine designated the RD-25E. "A five-engine version takes another engine, so it costs more; it drives mass into the vehicle, so you end up flying a little higher, you carry a little more prop," Chilton said at the National Space Symposium here. "A three-engine version, for some of the later missions, might have had to be upgraded too soon." Other design features selected in the run-up to PDR include an 8.4-meter-dia. for the stage, which will be extended to the SLS upper stage when its development begins at an as-yet-undetermined point in the future. Chilton says the diameter was selected to minimize ground-infrastructure modifications at Kennedy Space Center, where the SLS will use the Vehicle Assembly Building and launch pad facilities originally built for the Saturn V Moon rocket and later the space shuttle. Still to be determined is precisely how the main stage will accommodate the advanced strap-on booster that NASA plans to build later to increase the vehicle's initial 70-metric-ton capability to 130 metric tons. Web posted. (2012). [SLS Main Stage Will Have Four Engines [Online]. Available WWW: <http://www.aviationweek.com/> [2012, April 18].]

April 19: A little more than a year after its final trip to space, shuttle Discovery on Thursday took its place in the Smithsonian Institution's national collection of aerospace artifacts, beginning a new mission to inspire future explorers. "It will be on display not only as a testament to events of our time, but also as an inspiration to future generations," said Mercury astronaut John Glenn, who flew aboard Discovery in 1998 at age 77. "It will be a symbol for our nation of spaceflight that presents optimism and hope and challenge and leadership, and aspiration to explore and to excel." An estimated crowd of 10,000, many waving small American flags, gathered in a field outside the National Air and Space Museum's Udvar-Hazy Center to cheer Discovery's arrival as an overcast morning turned warm and bright. At 11 a.m., Discovery commanders, including Kennedy Space Center Director Bob Cabana, paraded NASA's oldest surviving orbiter 1,000 feet from the edge of Dulles International Airport, where it had been removed overnight from a 747 carrier aircraft, to a nose-to-nose meeting with orbiter prototype Enterprise. Spectators immediately appreciated the difference between the approach and landing test orbiter and one that flew in space more than any other spacecraft — 39 times, totaling over 148 million miles during 365 days in orbit. Enterprise's white paint gleamed, and its belly was a uniform black. In contrast, Discovery's white thermal blankets looked dingy and scuffed, and its heat-shielding tiles were charcoal gray, evidence of wear and tear and the trauma of fiery re-entries through the atmosphere. In addition to celebrating the engineering marvel shuttles represent, NASA Administrator Charlie Bolden directed the crowd to recognize the work force that made flights possible. "That's when it hit me," said Travis Thompson, a Mims resident and 33-year program veteran who recently departed lead shuttle contractor United Space Alliance, which has been laying off thousands of employees. Along with Thompson, Pat Floyd of Merritt Island, who will leave USA next week, was part of a group of contractors who trailed Discovery with a

banner that read, "We're Behind You, Discovery!" Employees had signed it before the final flight. "It's awesome to watch people around the country that you had no clue really cared that much about the vehicle," he said. "To have (Discovery) come here is poetic justice. This is where it needs to be." Floyd's next task: helping to bolt Enterprise on top of the 747 carrier aircraft that ferried Discovery from Florida on Tuesday. Enterprise is targeting a Monday ferry flight to New York City, its first flight since being delivered to the Smithsonian in 1985. NASA plans to ferry Endeavour to Los Angeles in September and move Atlantis to the KSC Visitor Complex in November. Thursday evening, crews towed Discovery to its final resting spot in the center of the McDonnell Space Hangar at the Udvar-Hazy center, where it will be displayed as if it has just rolled to a stop after landing. Surrounding Discovery are Mercury, Gemini and Apollo-era capsules and other human spaceflight artifacts, and a collection of rockets. Discovery's Canadian-built, 50-foot robotic arm will join the display. Web posted. (2012). [For a retired Discovery, it's Mission: Inspiration [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 19].]

April 20: Kennedy Space Center Director Robert Cabana and 45th Space Wing Vice Commander Col. Rory Welch will be the guest speakers at the May investor meeting of the Economic Development Commission of Florida's Space Coast. Cabana and Welch will provide a look into current Brevard County space and military activities. The update follows a March visit to Washington, D.C., by an EDC-sponsored delegation of community and business leaders which met with key lawmakers to discuss future funding for space and military programs in this area. Web posted. (2012). [Cabana, Welch to speak at EDC event [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 20].]

April 21: With all the fanfare of the shuttle Discovery fly out to Washington this week another great milestone in space was being celebrated over at NASA's Visitor Center. A small group of paying guests participated in a brief talk / question & answer session with former Apollo astronauts to mark the 40 anniversary of the flight of Apollo 16. The thirty minute event was attended by Luna Module Pilots (LMP) from Apollo missions 13, 14 & 16. Astronauts Charlie Duke (Apollo 16), Edgar Mitchell (Apollo 14) and Fred Haise (Apollo 13) gave highlights from their missions before answering questions. Fred Haise gave a jokingly dissertation about the importance to stay away from your back up crew. "Even as we train together the other crew would do anything to become a prime crew member," said Haise. This was the case with the Apollo 13 crew, Command Module Pilot (CMP) Ken Mattingly was replaced with the rookie back-up CMP John Swigert because Mattingly had been exposed to the German measles but was the only crew member that had never had the measles. Both prime and back up crew had been exposed after back up (LMP) Charles Duke contracted German Measles from one of his children. The event ended with each guest receiving a signed copy of Charlie Duke's book 'Moonwalker'. Apollo 16 was the fifth NASA mission to land men on the moon. Web posted. (2012). [Apollo Astronauts Celebrate 40th Anniversary of Apollo 16 at KSC Visitor Complex [Online]. Available WWW: <http://www.americaspace.com/> [2012, April 21].]

April 23: The landmark test mission of the privately built, unmanned Dragon cargo spacecraft to the International Space Station has been pushed back from April 30, with the launch likely being delayed by a week. "After reviewing our recent progress, it was clear that we needed more time," SpaceX spokeswoman Kristin Grantham said in a statement today. "While it is still possible that we could launch on May 3rd, it would be wise to add a few more days of margin in case things take longer than expected. As a result, our launch is likely to be pushed back by one week, pending coordination with NASA." SpaceX and NASA officials met last Monday for a flight-readiness review, and held another review today, NASA says. Web posted. (2012). [SpaceX cargo capsule's mission to ISS delayed to early May [Online]. Available WWW: <http://www.usatoday.com/> [2012, April 23].]

◆ NASA officials will meet this afternoon to review the latest weather forecasts and determine if orbiter prototype Enterprise can be ferried from Northern Virginia to New York City as early as Wednesday.

The flight atop a 747 carrier aircraft was once planned for today, but was postponed indefinitely due to bad weather expected in the Washington, D.C. and New York areas. A large region of low pressure dominating the East Coast has made it difficult to reliably predict an acceptable day for the ferry flight, a NASA spokesman said. NASA will make an announcement if a date is set today. Otherwise, the flight remains targeted for no earlier than Wednesday. NASA last week ferried Discovery from Kennedy Space Center to Dulles International Airport and then delivered the retired orbiter to the Smithsonian National Air and Space Museum's Udvar-Hazy Center in Chantilly, Va. Web posted. (2012). [NASA checks weather for shuttle prototype Enterprise's trip to NYC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 23].]

◆ A gleaming new spacecraft valued at over \$1 billion to serve in the top-notch mission of providing the president and military leaders a secure and survivable communications link in wartime was mounted atop its Atlas 5 rocket at Cape Canaveral today. The second Advanced Extremely High Frequency satellite, AEHF 2, is scheduled for blastoff next week, Thursday, May 3, two days earlier than expected because the Eastern Range suddenly became available. The SpaceX Falcon 9 vehicle on its voyage to the International Space Station had planned to go during an instantaneous liftoff opportunity April 30, with a backup launch date of May 3 to rendezvous with the outpost. That drove the earliest Range slot for the Atlas to May 5. However, lingering problems forced SpaceX to again delay its long-awaited cargo-delivery demonstration trip to the station, scrapping any plans to launch next week and putting the Atlas first in line for blastoff from Cape Canaveral. The Air Force-controlled Range provides all of the necessary tracking, communications and safety services for Cape launches, and needs time in between flights to reset equipment in support of the next booster in the lineup. The Atlas launch window on May 3 extends from 2:46 to 4:46 p.m. EDT (1846-2046 GMT). Web posted. (2012). [Atlas 5 topped with anti-jam communications satellite [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, April 23].]

◆ According to NASA officials, the "Freedom Star" and "Liberty Star" ships are docked at the NH State Pier in Portsmouth in preparation for their next mission involving the SpaceX launch. Trent J. Perrotto, a public affairs office at NASA headquarters in Washington, D.C., wrote in an e-mail on Monday afternoon the two NASA ships will collect video and images when the SpaceX Falcon 9 rocket launches on April 30 at 12:22 p.m. According to NASA's website, this mission is "a demonstration flight by Space Exploration Technologies, or SpaceX, as part of its contract with NASA to have private companies launch cargo safely to the International Space Station." Web posted. (2012). [Two NASA Ships Sail into City [Online]. Available WWW: <http://www.portsmouth-nh.patch.com/> [2012, April 23].]

April 24: NASA has again pushed back Enterprise's ferry flight to New York City because of uncertain weather. Now, the space agency is tentatively targeting Friday. Managers made the decision after a weather briefing Tuesday, saying that a large region of low pressure dominating the East Coast continued to make forecasting difficult. Conditions on Friday are expected to be more stable. Enterprise will fly atop a 747 carrier aircraft from Dulles International Airport outside Washington, D.C., to John F. Kennedy International Airport. The test orbiter is beginning its move from the Smithsonian Institution to its new display home at the Intrepid Sea, Air & Space Museum, where it is expected to arrive by barge in June. During the ferry flight between 9:30 a.m. and 11:30 a.m., the piggybacked Enterprise and 747 plan to fly low over New York City landmarks including the Statue of Liberty. Discovery landed in Washington last week and is now on display. Web posted. (2012). [NASA aims for Friday flight for Enterprise [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 24].]

◆ Senate and House budget bills would cut up to 40 percent from NASA's requested budget to pay for new commercial spacecraft to ferry astronauts to the International Space Station and end U.S. reliance on Russia for crew transportation. The Senate's appropriations subcommittee for NASA marked up a

spending plan with \$525 million allocated for commercial crew. The House's budget calls for the program to receive \$500 million in fiscal year 2013, which begins Oct. 1. The budget proposals were released April 17 and April 19, and the bills still must be passed by each body of Congress, and their differences must be resolved in a joint conference committee. NASA expects any significant reduction from the agency's requested \$830 million for commercial crew development to push back the resumption of domestic human space travel into low Earth orbit, a capability lost after the retirement of the space shuttle. Congress last year cut NASA's budget proposal to \$406 million for fiscal year 2012, which runs through Sept. 30. That is less than half of the space agency's proposal, and NASA officials blamed the budget for a predicted delay in the beginning of crewed space missions from 2016 until 2017. Without the \$830 million next year, NASA's commercial crew program will face another delay, according to top space officials. Web posted. (2012). [Congress wary of fully funding commercial crew [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, April 24].]

◆ Cape Canaveral Air Force Station is gearing up for a busy week in early May with United Launch Alliance and SpaceX targeting rocket launches from neighboring pads on May 3 and May 7, respectively. ULA's Atlas V is carrying a military communications satellite, while SpaceX's Falcon 9 rocket aims to deliver an unmanned Dragon capsule to the International Space Station. "Just confirmed with NASA that May 7th is go for launch of Falcon 9 & Dragon to the Space Station," SpaceX CEO Elon Musk said Tuesday afternoon on Twitter. ULA moved up by two days its scheduled launch of the Air Force's second Advanced Extremely High Frequency program satellite. Blastoff is targeted for 2:46 p.m. May 3, the opening of a two-hour window at Launch Complex 41. Web posted. (2012). [Back-to-back launches set for early May [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 24].]

◆ NASA and local authorities are investigating a custodial worker's death Tuesday near a former shuttle launch pad at Kennedy Space Center. The man was found around 2:15 p.m. in a support building near the liquid oxygen storage tank at launch pad 39A, KSC officials said. "Our emergency response team was unable to revive him," said Lisa Malone, a KSC spokeswoman. Kennedy Space Center security, the Brevard County Sheriff's Office and the Brevard County Medical Examiner's Office were collaborating on the investigation. The deceased man was in his 50s and employed by Rockledge-based Brevard Achievement Center, which has a contract to provide custodial services at the center that involves about 100 employees. The man usually worked at the launch pad, where access is restricted and carefully monitored, Malone said. No hazardous activities were in progress during the relevant period Tuesday, and the liquid oxygen tank is empty and inert. The man had been seen earlier Tuesday, but a pad team leader began looking for him after realizing he had not seen the man for a while, Malone said. That's when the pad leader found the man in the small support building, a facility used to write up reports, make phone calls or perform other administrative work. "We are still gathering facts, and all the authorities are working together to determine what happened," she said. Web posted. (2012). [Worker found dead at KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 24].]

April 25: John Jacobs said that the last time he was in Portsmouth, he was just a child and had arrived in town onboard a ferry along with his parents. Earlier this week, Jacobs made his second visit to the Port City, only this time he arrived onboard the Liberty Star, a special National Aeronautics and Space Administration ship, along with scientists tasked with monitoring a first-of-its-kind space launch. Jacobs, 43, is captain of the Liberty Star, a 180-foot vessel that arrived Sunday at the Port of New Hampshire with another NASA ship, the Freedom Star. Crews on both vessels are preparing for a unique mission at sea, during which they will capture high-definition video and thermal imagery of an upcoming launch of a commercial rocket headed to the International Space Station. The project from SpaceX is the first in which a commercial spacecraft will carry cargo to the space station. The launch of the Falcon 9 rocket and its Dragon capsule was first scheduled to take place at Cape Canaveral, Fla., on Monday, April 30, but has been pushed back to May 7. Jacobs, who works for United Space Alliance as a contractor hired by

NASA, will lead a team of scientists from the Scientifically Calibrated In Flight Imagery team, based at NASA's Langley Research Center, to a destination a few hundred nautical miles off the coast. It will be Jacobs' job, along with Capt. Mike Nicholas of the Freedom Star, to steer the ship as the SCIFLI team attempts to document the launch. Using thruster capability, Jacobs said he will monitor the radar and then maneuver the ship to get the best positions for the imaging equipment on board. Web posted. (2012). [NASA mission 'one-shot' deal [Online]. Available WWW: <http://www.seacoastonline.com/> [2012, April 25].]

◆ A man found dead at Kennedy Space Center on Tuesday appears to have died of natural causes, according to the man's employer. The unidentified custodial worker was found about 2:15 p.m. in a support building near the liquid oxygen storage tank at launch pad 39A, KSC officials said. The man worked for Brevard Achievement Center of Rockledge and had worked at KSC since 2008. "Regarding the cause of death, while we are still waiting on the medical examiner's office to confirm, all indications are that he died of natural causes," reads a statement posted on Brevard Achievement Center's website. The man is described as in his 50s. His family requested he not be identified, said Rosalind Weiss, marketing and development administrator for Brevard Achievement Center. Brevard County sheriff's and KSC officials said they did not have the man's name and confirmed the death was not suspicious. "It's always sad to lose a member of the KSC family," said Lisa Malone, a KSC spokeswoman. Web posted. (2012). [KSC worker died of natural causes [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 25].]

◆ SpaceX engineers have completed loading hypergolic maneuvering propellant into the Dragon capsule at Cape Canaveral, according to a company spokesperson. The propellant will fuel the Dragon spacecraft's 18 Draco thrusters during the ship's flight to the International Space Station. The thrusters, which each generate up to 90 pounds of thrust, will regulate the craft's approach to the space station. The Draco thrusters also control the Dragon's attitude, or orientation, throughout the mission. They can fire in bursts as short as a few milliseconds or for many minutes to adjust the capsule's orbit and return it to Earth, according to SpaceX. SpaceX designed and built the Dragon thrusters in-house. The Draco thrusters burn monomethyl hydrazine fuel and nitrogen tetroxide oxidizer. The Dragon capsule contains eight propellant tanks - four each for the fuel and oxidizer. Launch preparations are continuing while SpaceX and NASA officials review the results of hardware-in-the-loop testing, which validates the performance of the Dragon spacecraft during the final phase of its approach to the space station. Launch remains set for May 7 at 9:38 a.m. EDT (1338 GMT). Web posted. (2012). [SpaceX launch preps press on with Dragon fueling [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, April 25].]

April 26: Enterprise, the prototype space shuttle orbiter, is set to take flight today for the first time in more than 26 years. Bolted atop a 747 jumbo jet, Enterprise is moving from the Washington, D.C., area to its new display home in New York City. The ferry flight from Dulles International Airport to John F. Kennedy International Airport is scheduled to take place between 9:30 and 11:30 a.m., weather permitting. The piggybacked vehicles plan to fly low over Big Apple landmarks, including the Statue of Liberty and the Intrepid, Sea, Air & Space Museum, where Enterprise is expected to go on display in June. Enterprise performed critical approach and landing tests in 1977 and last flew in 1985, when NASA gave it to the Smithsonian Institution. Last week, the retired shuttle Discovery took Enterprise's place on display at the National Air and Space Museum's Udvar-Hazy Center in Chantilly, Va. Web posted. (2012). [Shuttle Enterprise bound for the Big Apple [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 26].]

◆ Former Ohio Sen. and astronaut John Glenn will be among 13 people who will receive the Presidential Medal of Freedom, President Barack Obama announced Thursday. Glenn, a 90-year-old native of New Concord, Ohio, served as a Democratic U.S. senator for 24 years. Before that, he was an astronaut and

U.S. Marine aviator who served in World War II and Korea. Fifty years ago, he became the first American to orbit the Earth. In 1998, at age 77, he became the oldest person to visit space. Glenn said in an interview Thursday that he was surprised when the White House called him a few weeks ago to inform him that he would receive the medal. "I appreciate it very much," he said. "It is a great honor." Last year, Glenn received a Congressional Gold Medal at a ceremony in the U.S. Capitol, along with Apollo 11 astronauts Neil Armstrong, Michael Collins and Buzz Aldrin. Earlier this year, he was honored on the 50th anniversary of his historic space flight. And last week, he participated in the festivities when the Space Shuttle Discovery was retired to the Smithsonian Institution. Web posted. (2012). [Ohio natives John Glenn, Toni Morrison to receive Presidential Medal of Freedom [Online]. Available WWW: <http://www.cleveland.com/> [2012, April 26].]

◆ NASA will be hosting a "tweet chat" tomorrow with the space agency's Commercial Crew & Cargo Program Office manager Ed Mango. The chat will take place at 2 p.m. EDT. The chat is being held to detail NASA's efforts to regain the ability to launch U.S. astronauts to orbit. NASA has been increasing its social media presence with Twitter at the forefront of these efforts. The space agency is preparing for the upcoming launch of SpaceX's Falcon 9 rocket and its Dragon spacecraft. This launch will be crucial in determining how well NASA's commercial efforts are faring. Web posted. (2012). [NASA To Hold "Tweet Chat" With C3PO Program Manager [Online]. Available WWW: <http://www.americaspace.com/> [2012, April 27].]

April 27: Mark Nappi, who led United Space Alliance's Florida operations during the shuttle program's final years of flight, leaves the company today to join another Kennedy Space Center contractor. Nappi oversaw USA's local operations beginning in 2008 when many were concerned about the ability of NASA and its lead shuttle contractor to safely fly out the final missions while simultaneously laying off thousands of contractors. Mark has contributed a unique blend of technical expertise and exceptional leadership," said Virginia Barnes, president and CEO of Houston-based USA. "He has made a permanent and positive impact on our nation's human spaceflight program, and on all those who have worked with him." On Monday, Nappi joins QinetiQ North America as senior vice president and program manager of the company's \$1.9 billion Engineering Services Contract at KSC. The contract's work includes design and development of ground systems needed for processing of launch vehicles, spacecraft, and payloads, flight systems engineering and operation of laboratories and developmental shops, according to QinetiQ's Web site. Nappi's KSC engineering and management career began in 1985 with Lockheed Martin Corp. Nappi moved to USA in 1996 when the 50-50 joint venture owned by Lockheed and The Boeing Co. was formed. Web posted. (2012). [United Space Alliance's local chief takes new KSC role [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 27].]

◆ In a city understandably wary of low-flying aircraft, New Yorkers and tourists alike watched with joy and excitement Friday as space shuttle Enterprise sailed over the skyline on its final flight before it becomes a museum piece. Ten years after 9/11, people gathered on rooftops and the banks of the Hudson River to marvel at the sight of the spacecraft riding piggyback on a modified jumbo jet that flew over the Statue of Liberty and past the skyscrapers along Manhattan's West Side. "It made me feel empowered. I'm going to start crying," Jennifer Patton, a tourist from Canton, Ohio, said after the plane passed over the cheering crowd on the deck of the aircraft carrier USS Intrepid, the floating air-and-space museum that will be the shuttle's permanent home. Onlookers bundled up on the blustery spring day along the piers on the West Side, cameras slung around their necks. The roar of the aircraft could barely be heard over the howling winds. In truth, the camera angles on TV made it seem as if the shuttle was a lot closer to the buildings than it really was. The low-altitude flight was well-publicized, and few people were caught off-guard. Not one person called 911 to report a low-flying plane, police said. That's a striking contrast to what happened in 2009 when the Pentagon conducted a photo-op flyover in lower Manhattan by a passenger jet and F-16 fighter. The sight of the aircraft flying past the Statue of Liberty and lower

Manhattan's financial district set off a flood of 911 calls and sent office workers rushing into the streets in panic. On Friday, the jet carrying the shuttle turned east and flew over central Long Island. Nassau County office workers looked out their windows in delight as it passed over the Roosevelt Field Mall, near the spot where Charles Lindbergh took off for Paris in 1927. The shuttle then touched down at Kennedy Airport, where a controller radioed: "Welcome to New York, and thanks for the show." The shuttle will be taken to the Intrepid by barge in June and is scheduled to open to the public in mid-July. Enterprise never went on an actual space mission; it was a full-scale test vehicle used for flights in the atmosphere and experiments on the ground. Web posted. (2012). [Close encounter: New Yorkers watch with excitement as shuttle passes low over the skyline [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, April 27].]

◆ For 50 years, it's been a critical part of Florida's economy. But now our space industry is struggling to survive. The retirement of the shuttle program has left thousands of workers jobless. And, it's also called into question whether Florida's days as America's pre-eminent space state are over. After 30 years and more than 130 missions, the space shuttle program has disappeared into history. And now the talent, technology and patriotism that helped drive it may be in jeopardy of disappearing, too. Tim Pickens works at Dynetics, a NASA contractor in Huntsville, Alabama. He's committed to reviving Florida's space industry, not least because his company depends on it. Now that manned missions launching from Cape Canaveral are no more...He says it'll be up to a handful of private space flight companies to help inspire a national movement. Pickens says only the government can pioneer that kind of technology, and if enough people ask for it, Washington will pay for it. But, there's no guarantee manned launches will return to Florida. That's why Farrukh Alvi spearheads a research hub aimed at using space technology in other ways. "I suspect that Florida will not be the only one that's going to be launching things - Texas, New Mexico and others. But, you need to have a more diverse economy, so even if it's very successful, you do not want to just invest in there - you need to diversify." Web posted. (2012). [Florida's Space Industry Struggles to Survive [Online]. Available WWW: <http://www.wctv.tv/> [2012, April 27].]

◆ To help spur the development of a new fleet of commercial spacecraft to carry astronauts to and from the International Space Station, NASA has partnered with select private companies to foster the design and testing of the new vehicles. But the firms that received funding from NASA are not the only players in the game. NASA has also made deals with several other commercial companies under so-called unfunded Space Act Agreements. As part of these arrangements, the agency provides expertise that could help the companies develop their vehicles or launch systems, but does not give out any money. Utah-based Alliant Techsystems (ATK), the company that manufactured the space shuttles' solid rocket boosters, signed an unfunded Space Act Agreement (SAA) with NASA in September to jointly work on the company's Liberty rocket, which could launch astronauts into orbit by 2015 or 2016, company officials have said. Web posted. (2012). [NASA Offers Expertise to Help Private Companies Build Rockets, Capsules [Online]. Available WWW: <http://www.space.com/> [2012, April 27].]

◆ It's not going into space, but the mock-up Orion capsule, which arrived at the Kennedy Space Center in Florida this week, at least is a sign of a post-shuttle life. The vehicle comes to Florida from manufacturer Lockheed Martin's plant in Colorado to serve as a test vehicle for the ground processing systems under development for NASA's next human space program, which is designed to fly astronauts to the moon, asteroids, Mars and other destinations in deep space, beyond the space station's 240-mile-high orbit. NASA's first test flight of an Orion capsule is scheduled for 2014. Web posted. (2012). [NASA's New Spaceship Arrives for Tests [Online]. Available WWW: <http://www.news.discovery.com/> [2012, April 27].]

April 30: A powerful Atlas V rocket is being prepped this week for the launch Thursday of an advanced military communications satellite capable of surviving and operating during a nuclear war. The 197-foot-

tall Atlas V is scheduled to blast off during a launch window that will extend from 2:46 p.m. to 4:46 p.m. Thursday. Now stacked in an assembly building at Launch Complex 41 at Cape Canaveral Air Force Station, the rocket will be moved to its launch pad on Wednesday morning. The United Launch Alliance rocket will boost the second in a series of five Air Force Advanced Extremely High Frequency spacecraft. The AEHF-2 is designed to provide survivable, global, secure, protected and jam-resistant communications for high-priority military ground, sea and air assets. A ULA overview of the payload says the satellite says it allows the National Security Council and commanders in all services to “control tactical and strategic forces at all levels of conflict through general nuclear war.” The early weather forecast for the launch indicates there is a 60 percent chance conditions will be acceptable for flight on Thursday. The prime concerns will be the chance that electrically charged clouds could sweep into the area during the launch countdown. A rocket flying through electrically charged cloud trigger destructive bolts of lightning. In the event of a delay, the forecast for Friday called for similar conditions and a 60 percent chance of acceptable weather. Web posted. (2012). [United Launch Alliance gearing up for Atlas launch Thursday [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 30].]

◆ With a brief burst of flame Monday, SpaceX’s Falcon 9 rocket engines appeared to show they were ready for a much longer burn next Monday that could boost a Dragon capsule toward the International Space Station. The two-second, full-power firing of nine first-stage Merlin engines occurred on a second attempt that won’t be available next week. The rocket must launch during a split-second window at 9:38 a.m., or wait at least several days for another try. Computers halted Monday’s initial test countdown with 47 seconds to go because an unspecified technical parameter was set improperly, a SpaceX launch manager said during the company’s live Webcast of the event. Uncertainty about what had happened immediately raised questions about whether SpaceX might need to delay its launch attempt. But after reviewing the incident, engineers resumed the countdown about an hour later, and it continued all the way until fire and smoke bellowed from beneath the 157-foot rocket on its pad at Launch Complex 40. Known as a “static fire” test, the all-white rocket remained bolted to the pad while the engines fired just long enough to test their performance. “So far things look good,” company spokeswoman Kirstin Grantham said in an email. “Engineers will now review data as we continue preparations for the upcoming launch.” The test was the latest in preparations for a NASA demonstration mission that could make the Dragon the first commercial spacecraft to visit the space station. Web posted. (2012). [Falcon 9 engine test delights SpaceX [Online]. Available WWW: <http://www.floridatoday.com/> [2012, April 30].]

MAY

May 1: Twin NASA satellites designed to probe and predict changes in Earth's radiation belts arrived at the Kennedy Space Center on Tuesday, ready to begin several months of testing and assembly before lifting off on an Atlas 5 rocket in August. Riding inside a U.S. military cargo plane from Maryland, the twin spacecraft touched down at the spaceport's runway at 7:54 a.m. EDT (1154 GMT) Tuesday, according to George Diller, a NASA spokesperson. Built at Johns Hopkins University's Applied Physics Laboratory in Laurel, Md., the satellites will investigate what causes the donut-shaped radiation belts surrounding Earth to expand and contract as solar storms erupt and propagate through space. The Radiation Belt Storm Probes are due for launch Aug. 23 aboard a United Launch Alliance Atlas 5 rocket. The \$530 million mission is scheduled to last at least two years. Between now and launch, engineers will install solar panels on each satellite, test each spacecraft's systems, fill their tanks with propellant and encapsulate the eight-sided vehicles inside the Atlas payload fairing. The satellites will be prepared for launch at the commercial Astrotech processing facility near KSC. The spacecraft will fly through the inner and outer Van Allen radiation belts, named for their discoverer, James Van Allen, who was lead scientist for the first U.S. satellite to reach orbit - Explorer 1. Web posted. (2012). [Radiation Belt Storm Probes arrive at Florida launch site [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 1].]

◆ Three more astronaut veterans — Air Force Gen. Kevin Chilton, Dr. Franklin Chang Diaz and Air Force Col. Charlie Precourt — will be joining the Astronaut Hall of Fame Saturday at the Kennedy Space Center Visitor Center. Chang Díaz, a Costa Rican-American with a doctorate in physics, is a veteran of seven space shuttle flights who has logged more than 1,601 hours in space, last flying in 2002. Chilton was the pilot on space shuttle Endeavour's maiden voyage and the commander of Atlantis' STS-76 mission to the Russian space station Mir. He returned to active duty Air Force and became commander of the Strategic Air Command, retiring with four stars in 2011. Precourt flew on four space shuttle missions from 1993 to 1998. They'll be inducted during 3 p.m. public ceremonies at Kennedy Space Center Visitor Complex, on State Road 405 east of Titusville. The trio will be the 80th, 81st and 82nd members of the Astronaut Hall of Fame. Web posted. (2012). [Chilton, Chang Diaz, Precourt headed to Astronaut Hall of Fame [Online]. Available WWW: <http://www.orlandosentinel.com/> *the write stuff blog* [2012, May 1].]

◆ Mission managers met this morning for the Launch Readiness Review, the final formal gathering to examine the status of the Atlas rocket, the AEHF 2 spacecraft, the ground support network and weather forecast for Thursday's planned climb to orbit. The review culminated with a consensus to press ahead with countdown operations starting with Wednesday's rocket rollout to the Complex 41 pad starting at 10 a.m. EDT. Thursday's liftoff of the Atlas rocket from Cape Canaveral is targeted for 2:46 p.m. EDT, the opening of a 120-minute launch opportunity extending to 4:46 p.m. EDT. The launch weather outlook has improved a bit, prompting an increase in odds of acceptable conditions to 70 percent. Web posted. (2012). [Atlas 5 rocket set for rollout to pad and blastoff [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 1].]

◆ The long-awaited launch of a commercial cargo ship bound for the International Space Station almost certainly will be delayed from May 7 to at least May 10 and possibly longer, sources said late Tuesday, to give company engineers additional time to complete pre-flight tests and checkout. Multiple NASA sources said the current May 7 target had been ruled out, although there was confusion in some quarters as to whether there might be a slim chance of keeping on schedule if additional analyses could be completed in time. That did not appear likely, but NASA had no official comment on the launch date discussions because the SpaceX flight is being billed as a commercial operation and "it's up to SpaceX to make any announcements," one official said. Kirstin Brost Grantham, a SpaceX spokeswoman, had no

immediate comment. Because of test requirements and the nature of the space station's orbit, SpaceX cannot attempt back-to-back launch attempts on successive days. For this demonstration flight, attempts can only be made every third day. For a launch on May 7, SpaceX would have a backup opportunity on May 10. After that, the company would have to stand down until May 19 or even later to make way for launch of a Russian Soyuz spacecraft carrying three fresh station crew members. The Soyuz TMA-04M spacecraft is scheduled for launch from the Baikonur Cosmodrome in Kazakhstan at 11:01 p.m. EDT (GMT-4) on May 14 with docking expected two days later. Web posted. (2012). [Next Monday's SpaceX Falcon 9 launch date in doubt [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 1].]

May 2: Sierra Nevada Corp., one of the four companies developing spacecraft that could fly NASA crews to the International Space Station, will visit the Space Coast on Friday [May 4] to discuss interest in locating operations on the Space Coast. Mark Sirangelo, the head of Colorado-based Sierra Nevada Space Systems, will join dignitaries including Lt. Gov. Jennifer Carroll, Kennedy Space Center Director Bob Cabana and local economic development officials for an 11:30 a.m. event at the Cocoa Beach Hilton. Invitations distributed by Space Florida bill the event as the "Launch of Sierra Nevada Corporation in Florida." Sierra Nevada and state officials "will discuss the potential for expanded space operations in Florida and next steps," Space Florida says. Carroll will recognize "near-term employment potential," according to a press release. Sierra Nevada is developing the Dream Chaser spacecraft, which resembles a mini-space shuttle. It plans to launch from Florida atop United Launch Alliance's Atlas V rocket. Web posted. (2012). [Sierra Nevada to discuss potential Florida operations [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 2].]

◆ NASA managers argued Tuesday a proposal by lawmakers to immediately select a single provider for commercial crew transportation services would undermine the agency's strategy of reducing the cost of space travel through private industry. Officials are in the middle of evaluating industrial bids for the commercial crew program's next phase, with a goal of selecting at least two companies by August to continue developing rockets and spacecraft for the next two years. NASA plans to award multiple industry teams each between \$300 million and \$500 million under agreements set to run until at least May 2014. But a House budget bill would direct NASA to immediately choose one provider and sign a development contract. The House spending plan provides \$500 million to NASA's commercial crew program in fiscal year 2013, which begins Oct. 1. A Senate appropriations bill gives NASA a \$525 million mark for commercial crew, but it does not call for a shift in procurement strategy. Both funding levels are less than NASA's request for \$830 million in fiscal 2013. The Senate and House budgets must pass their respective bodies, and their differences must be sorted out in a conference committee. This year's commercial crew budget is set at \$406 million, about half of NASA's request. The less-than-requested budget caused NASA to adjust its schedule for the start of operational astronaut flights to the space station from 2016 until 2017. Web posted. (2012). [NASA: Competition at core of commercial crew program [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 2].]

◆ SpaceX has called off the scheduled launch of its Falcon 9 rocket, which was to carry the company's Dragon capsule to a rendezvous with the International Space Station. Here's the company's latest email message: Update on SpaceX COTS 2 Launch / At this time, a May 7th launch appears unlikely. SpaceX is continuing to work through the software assurance process with NASA. We will issue a statement as soon as a new launch target is set. Web posted. (2012). [Falcon 9 won't launch on Monday [Online]. Available WWW: <http://www.orlandosentinel.com/> *the write stuff blog* [2012, May 2].]

◆ Space Florida this week received the Economic Development Leadership Award from CoreNet Global, a leading business association for corporate real estate professionals and economic developers. The award recognized the deal, brokered by Space Florida, with Enterprise Florida and the Economic Development

Commission of Florida's Space Coast also involved, that brought Boeing to Kennedy Space Center to use Orbiter Processing Facility Bay 3 to manufacture, assemble and test its Crew Space Transportation spacecraft. The Economic Development Leadership Award recognizes leadership, best practices and innovations in economic development representing national, state, regional and local interests. "The Boeing Company's decision to develop and manufacture the CST-100 on the Space Coast will have a tremendous impact not only on the local economy, but also the future of America's commercial space program," said EDC President and CEO Lynda Weatherman. Web posted. (2012). [Space Florida wins honor for KSC deal [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 2].]

◆ Bay Area Houston's mock space shuttle is being prepared for its journey to Clear Lake and will probably arrive here around June 1, Space Center Houston President Richard Allen said Wednesday. After examining the depth of waters the vehicle will travel from Kennedy Space Center in Florida, around the Gulf of Mexico and across Galveston Bay and Clear Lake to its Space Center Houston destination on NASA Parkway, it was determined the waters are deep enough so no dredging will be necessary, Allen explained. The mock shuttle is the full-size orbiter mockup that has been on display at the Kennedy Space Center Visitor Complex in Florida for a number of years. And, it may turn out to be better than a real space shuttle. The advantage is visitors can walk through the mockup while they cannot access the flight and mid-level decks on the real retired shuttles, which were given to Washington, New York, California and Kennedy Space Center. The mock shuttle is sitting in the spot where KSC wants to place Space Shuttle Atlantis, so Kennedy officials called up offering the mock shuttle right after it was learned the Johnson Space Center area had been snubbed when the retired shuttles were passed out. Once approval came, Allen and Bay Area Houston Economic Partnership President Bob Mitchell have been working for a number of months on moving the mock shuttle. There is no cost for the shuttle but there will be for transportation and providing a facility to house it. As Allen said earlier, "The devil is in the details." Chevron donated \$100,000 toward the costs at a December fundraiser in Houston. Most likely, it will travel by barge. Plans for the move are being finalized now, Allen said, promising more news soon. Web posted. (2012). [Mock shuttle due here around June 1 [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 3].]

May 4: One of the private companies developing new commercial spacecraft that could carry equipment and astronauts into space, Sierra Nevada Corp., repeated its interest Friday to bring many of its operations to Florida, only this time the company announced it is seeking state subsidies. Friday's announcement came after a meeting at Space Florida's Kennedy Space Center offices, and included supportive statements from Lt. Gov. Jennifer Carroll and others. Sierra Nevada, which first revealed the prospects of Florida plans last summer, now is seeking incentives packages from Florida that would include facilities and training programs. The company declined to comment on whether it also seeks any tax breaks or cash incentives. Last July 7, Sierra Nevada, of Louisville, Colo., and NASA signed a 30-year deal to allow the company to launch from Cape Canaveral Air Force Station. The company plans to use Atlas V rockets, which must be launched there. In addition to launching from the cape, Sierra Nevada and NASA announced last summer the company could process its Dream Chaser spacecraft and land it here after a flight, with help from KSC technical teams. On Friday, Sierra Nevada announced its desire for a state incentives package first. "Today we announced we are entering our application with Florida and Space Florida to look at using the facilities," said Sierra Nevada Executive Vice President Mark Sirangelo. "What we confirmed today is we are launching from Florida, we are basing our vehicle fleet here and we'll do our post-launch processing here." However, those last two operations may be contingent on negotiations with Space Florida and local officials, he said. Web posted. (2012). [Sierra Nevada repeats its interest in bringing space business to Florida, this time seeking state aid [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, May 4].]

◆ On Friday, NASA Kennedy Space Center Director Bob Cabana participated in an event with federal and state officials to discuss the future plans of Sierra Nevada Corp., one of NASA's industry partners, in Florida. "Partnerships are key to our future success," said Cabana. "We look forward to expanding our partnership with Sierra Nevada here at Kennedy Space Center. "KSC has an extremely talented and dedicated work force, and unique processing capabilities and facilities that can help our commercial partners be successful. "Sierra Nevada is already part of the KSC team through the space act agreement we signed last year, and we look forward to their more visible presence, as we continue to enable the commercial space industry and truly make KSC a multi-user spaceport of the future." ["Kennedy Director Looks Forward to Expanded Industry Partnership," **NASA News Release #22-12**, May 4, 2012.]

May 7: United Launch Alliance workers represented by the International Association of Machinists and Aerospace Workers will report to work today, said Nick Mrdjjenovich, District Lodge 166 business representative. Sunday afternoon, union members voted to reject ULA's proposed three-year contract — but they failed to reach a two-thirds majority vote authorizing a strike, Mrdjjenovich said. The labor pact affects 277 union workers involved in launch operations at Cape Canaveral Air Force Station. Mrdjjenovich did not have vote tallies available, but he said the strike threshold fell five votes short. Therefore, he said the union will accept the contract proposal. Web posted. (2012). [ULA union strike bid falls short [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 7].]

◆ Dianne Ivey parlayed a job making electrical harnesses for Chrysler automobiles into a 32-year career in the nation's space shuttle program. Now she's working on what she calls "a third millennium vehicle," a spacecraft that will carry astronauts on missions to the moon, Mars, asteroids or other interplanetary destinations. Her message to Americans: "We still have a human spaceflight program, and we're building harnesses and getting ready for our mission, and we're working toward that every day." Ivey, 57, of Rockledge is a senior aerospace technician with United Space Alliance, a subcontractor to Lockheed Martin, which holds a \$6.4 billion contract to manufacture Orion spacecraft for human expeditions beyond low Earth orbit. Dressed in a white lab coat, Ivey works in a low bay at the Kennedy Space Center Operations and Checkout Building. She is one of about two dozen people fabricating the wire harnesses that will route power to Orion spacecraft systems, bringing the vehicles electrically to life. In 2008, she began cross-training for work on the Orion spacecraft, making electrical harnesses for capsule development tests. Now Ivey is working on harnesses for the Orion spacecraft that will be launched on an inaugural flight test in early 2014, and she's happy to tell people she still works in U.S. human spaceflight. Web posted. (2012). ['It's the beginning of a new future' [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 7].]

May 8: The Orion spacecraft production line is starting up at Kennedy Space Center, and John Nesbitt is more than ready to begin building the capsule for a first flight test in early 2014. "You'll be able to pop me like a balloon because I'll be so excited. It's going to be great. I mean, everybody feels that way," said Nesbitt, a senior aerospace technician with Orion subcontractor United Space Alliance. "It's the coolness factor of the whole thing — on to the next program." Nesbitt, 44, is one of about 300 people at KSC who already are working on the Orion project, doing prep work for the \$375 million flight test. Funded by NASA, the mission will put the Apollo-style capsule through the type of high-speed re-entry it would need to survive on a return from the moon, Mars, asteroids or other interplanetary destinations. Mounted atop a United Launch Alliance Delta IV Heavy rocket, the Orion will blast off from Launch Complex 37 at Cape Canaveral Air Force Station. Orion manufacturer Lockheed Martin will carry out the flight and provide NASA with data after the mission. With the production line at the Operations and Checkout Building ramping up, Lockheed Martin expects its Orion work force at KSC to grow to 350 to 400 by the end of 2013. Web posted. (2012). [Excitement builds as Orion spacecraft production nears at KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 8].]

◆ NASA has officially set the new launch date of Saturday, May 19, for SpaceX's Falcon 9 rocket and Dragon capsule, which will head for the International Space Station. SpaceX was shooting for April 30, then May 7, but needed to sort through some software issues. Because the U.S. Air Force was launching an Atlas 5 rocket, then the Russians have a May 10 Soyuz to ferry up three fresh astronauts, including Commander Oleg Kononenko of the Russian Federal Space Agency, Flight Engineer Don Pettit of NASA and Flight Engineer Andre Kuipers of the European Space Agency. So the second delay pushed SpaceX back a couple of weeks. Web posted. (2012). [NASA officially sets new launch date for SpaceX: Saturday May 19[Online]. Available WWW: http://www.orlandosentinel.com/the_write_stuff_blog [2012, May 8].]

◆ The International Space Station's National Lab could serve as a platform for pharmaceutical and biotechnology companies to test new drugs and better treatments for conditions like bone loss, scientists advising the lab's nonprofit manager said Tuesday. But the Brevard County-based Center for the Advancement of Science in Space, or CASIS, says there's still much work to be done to raise awareness about the lab's existence and potential commercial benefits, and no guarantee of medical breakthroughs. "The real tough scientific question is, is it really better in space than on Earth?" said Dr. Timothy Yeatman, the center's interim chief scientist, of the research environment. "Now it has to be answered, so now's the time to do that." Yeatman led a panel of scientists in reviewing more than 135 biological experiments NASA flew in space over a decade. Of that batch, he said, there were "no real standouts" that definitively proved commercial opportunities. That is a priority for NASA now that assembly of the \$100 billion station is complete and emphasis is on research, or "utilization." CASIS will announce a solicitation for experiments next month, which officials said could fly aboard U.S. or Russian vehicles as soon as next year. Web posted. (2012). [Center for the Advancement of Science in Space aims to showcase uses of ISS [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 8].]

◆ NASA has signed off on the astronaut layout of SpaceX's planned seven-passenger crew capsule after some NASA engineers and astronauts cozied into one in the SpaceX showroom and pronounced it fit. Officially, NASA declared that SpaceX's plans passed another milestone, the seventh of 10, by demonstrating that the layout will allow astronauts to maneuver effectively in the vehicle. Several veteran space shuttle astronauts and NASA engineers conducted the evaluation during a pair of two-day-long reviews. That news comes just a few days before SpaceX's planned May 19th launch of a cargo version of the Dragon, atop SpaceX's Falcon 9 rocket, from Cape Canaveral Air Force Station. If all goes well with that test flight, the Dragon will dock with the International Space Station and deliver about 1,200 pounds of supplies, marking the first time a commercial vehicle has docked and supplied the station. The bigger goal though is a crew capsule, set for two to five years away. Web posted. (2012). [As SpaceX awaits launch of cargo capsule, crew capsule gets test site [Online]. Available WWW: http://www.orlandosentinel.com/the_write_stuff_blog [2012, May 8].]

May 9: NASA's new super-sized rocket will be ready by late 2017 to launch an unmanned Orion spacecraft on a looping mission around the moon and a high-speed return to Earth, a senior agency manager said Tuesday. A similar mission with astronauts onboard would follow in 2021 from Kennedy Space Center, a flight that will clear the way for a new era of human space exploration. "From that point, we'll be ready to go anywhere you want to go in the solar system," said Todd May, manager of the Space Launch System Program Office at NASA's Marshall Space Flight Center in Huntsville, Ala. "The question is, 'Where do you want to go?'" With the Orion crew exploration vehicle production line starting up at KSC, May briefed industry and community leaders on the gigantic rocket that will launch it. He spoke before a sold-out crowd of about 300 at a National Space Club Florida Committee luncheon at the Radisson Resort at the Port in Cape Canaveral. First, NASA intends to build Space Launch System rockets that can loft 70 metric tons. Then, that system will evolve into rockets that can launch 130 metric tons. At that point, the Space Launch System will rival the NASA Saturn V rocket that propelled Apollo

astronauts on round trips to the moon in the late 1960s and early 1970s. Ultimately, it will be the biggest rocket ever devised by human engineers. Web posted. (2012). [NASA 'super rocket' on schedule for 2017 launch [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 9].]

◆ Sierra Nevada Corp., one of the firms vying to build a commercial space taxi for NASA, plans a series of automated and piloted atmospheric flight tests of its lifting body Dream Chaser spacecraft beginning this summer, ultimately leading to an orbital demonstration mission in 2016, according to company managers. The flight tests will initially prove the Dream Chaser's aerodynamic qualities using an engineering article being outfitted at Sierra Nevada's space campus in Louisville, Colo. Using a combination of public and private funding, Sierra Nevada is developing the Dream Chaser to carry up to seven astronauts to the International Space Station and back to Earth. NASA has promised the company \$125 million so far, with the bulk of the money already awarded to Sierra Nevada upon completion of predetermined development milestones. "Our mission is very specific: to take crew and cargo to the International Space Station and to low Earth orbit," said Mark Sirangelo, Sierra Nevada's executive vice president and chairman of its space systems division. Sierra Nevada has provided the Dream Chaser program with "tens of millions" of dollars in internal funding, but less than NASA's total investment, according to Sirangelo. The remaining NASA funds will be released after the Dream Chaser's preliminary design review, scheduled for late May, and captive and free flight tests over Colorado and California. The Dream Chaser is based on the HL-20 lifting body concept studied by NASA's Langley Research Center from the late 1980s to the early 1990s. Launching into orbit on top of a United Launch Alliance Atlas 5 rocket, the spaceship will dock with the International Space Station and can stay there for more than six months. At the end of its mission, the craft will enter the atmosphere and make a piloted touchdown at the Shuttle Landing Facility at NASA's Kennedy Space Center in Florida. Web posted. (2012). [Dream Chaser test plan outlined by Sierra Nevada [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 9].]

◆ Joining a growing list of aerospace companies competing to build a commercial crew taxi for NASA, rocket contractor ATK announced Wednesday it could launch astronauts into orbit by 2015 aboard the firm's Liberty rocket and a composite module derived from existing programs. But the Liberty bid faces stiff competition from other companies hoping to snare a slice of NASA funding. And Congress is likely to appropriate less funding than NASA requested for the commercial crew program, potentially leading to delays for any company which wins an award. NASA is counting on commercial providers to build a crewed rocket and spacecraft to end U.S. reliance on Russia's Soyuz capsules for astronaut trips to the International Space Station. A proposal for the Liberty rocket and spacecraft was submitted to NASA in March. The space agency expects to announce in August awards of between \$300 million and \$500 million to at least two companies over a 21-month period. ATK is vying for NASA awards with SpaceX, Boeing Co., Sierra Nevada Corp., and other companies working on commercial crew transportation vehicles. Unlike other companies, ATK's Liberty program is currently operating entirely on private funding. But much of Liberty's design, including the rocket's propulsion systems and the composite spacecraft, would recycle previous work on government-funded programs in the United States and Europe. ATK's late 2015 target date for the system's first crewed flight is earlier than its competitors say they will be ready for a similar mission. Web posted. (2012). [ATK adds crew capsule to Liberty rocket proposal [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 9].]

May 10: NASA is being directed to speed up its selection of a company to ferry astronauts to the International Space Station. A spending bill the House approved Thursday says NASA needs to make an "immediate" choice of a company for the commercial crew program. Currently, NASA is providing subsidies to four companies vying to develop a system that could carry astronauts to the station by 2017. And the program calls for NASA to award its next round of funding to at least two companies this summer. The spending measure, which still needs Senate review and approval, was authored by Rep.

Frank Wolf, R-Va., chairman of the House Appropriations subcommittee that oversees NASA's budget. It also covers other federal agencies. The bill would provide about \$17 billion to the space agency in fiscal 2013, including money for its top three priorities: development of a "heavy-lift" rocket and spacecraft for a future crewed mission to Mars, the launch of a powerful new space telescope, and the commercial crew program. The commercial crew effort has come under greater scrutiny lately from lawmakers who question why NASA isn't moving faster. The last shuttle flew in July and NASA is paying Russia more than \$60 million each time it flies a U.S. astronaut to the orbiting lab. Web posted. (2012). [House: NASA needs to step it up [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 10].]

May 12: At 9:58 a.m. this morning (Friday May 11), technicians unplugged Space Shuttle Endeavour marking the final power down of NASA's last powered orbiter and termination of all power flowing to the flight deck. Today, Endeavour was euthanized. The flight deck went dark for the last time as Endeavour is being prepped inside Orbiter Processing Facility-2 (OPF-2) for final departure from the Kennedy Space Center later this year and display at her final resting place in Los Angeles. As Endeavour was powered back up this past week for one final time to carry out decommissioning and safing activities, a tiny media group was invited to crawl inside and photographically record the flight deck as a living spaceship for the last time in history. Endeavour was the youngest in NASA's fleet of three surviving orbiters and designated as vehicle OV-105. She flew 25 missions over a spaceflight career that spanned 19 years from the inaugural flight in 1992 to the final flight in 2011 to deliver the dark matter hunting Alpha Magnetic Spectrometer (AMS) to the International Space Station (ISS). Altogether, Endeavour spent 299 days in space, orbited the Earth 4671 times and traveled over 197 million kilometers (123 million mi). Endeavour's power termination on May 11, 2012 comes almost exactly one year since her final launch on the 16 day long STS-134 mission on May 16, 2011. Since then technicians have been removing hazardous materials and propellants from the orbiters hydraulic and fuel lines and thoroughly cleansing Endeavour to make it safe for museum display to the general public. The power must be on to drain and purge the toxic materials. Power to NASA's two other orbiters, Discovery and Atlantis, was terminated in December on the 16th and 22rd respectively. Web posted. (2012). [Endeavour Unplugged – Last Picture Show from the Flight Deck of a Living Space Shuttle Orbiter [Online]. Available WWW: <http://www.universetoday.com/> [2012, May 12].]

May 13: The space shuttle Enterprise has been separated from the NASA 747 Shuttle Carrier at John F. Kennedy International Airport, just weeks after flying over New York City. The shuttle is now resting under a de-icing shed at the airport. Next month it will be taken by barge to the aircraft carrier USS Intrepid, the floating air-and-space museum that will be the shuttle's permanent home. The shuttle is scheduled to open to the public in mid-July. Enterprise never went on an actual space mission; it was a full-scale test vehicle used for flights in the atmosphere and experiments on the ground. Web posted. (2012). [Enterprise separated from 747 at JFK Airport [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 13].]

May 14: NASA has announced a modification of its NASA Launch Services (NLS) II contract with Space Exploration Technologies (SpaceX) of Hawthorne, Calif., to add an additional configuration of the Falcon 9 rocket to its fleet. The SpaceX Falcon 9 v1.1 launch service will be available to the agency's Launch Services Program to use for future missions in accordance with the on-ramp provision of NLS II. The NLS II on-ramp provision provides an annual opportunity for new launch service providers to compete for future missions and allows existing launch service providers to introduce launch vehicles not currently on their NLS II contracts. The NLS II contracts are multiple award, indefinite delivery/indefinite quantity contracts with ordering periods through June 2020. The NLS II contracts support the goals and objectives of the agency's Science Mission Directorate, Human Exploration and Operations Mission Directorate, and the Office of the Chief Technologist. Under the contract, NASA also can provide launch services to other government agencies, such as the National Oceanic and Atmospheric Administration.

The Launch Services Program Office at NASA's Kennedy Space Center in Florida is responsible for program management. ["NASA Modifies Launch Service Contract To Add Falcon 9 Rocket," **NASA Contract Release #C12-019**, May 14, 2012.]

◆ A U.S. astronaut who once taught science at Melbourne High will rocket up to the International Space Station today on a six-month expedition aboard the orbital laboratory. Veteran shuttle mission specialist Joe Acaba will be the first NASA "educator astronaut" to fly a long-duration mission on the space station, and he is eager to get underway. Acaba is slated to blast off on a Russian Soyuz rocket, commanded by veteran Russian cosmonaut Gennady Padalka, at Baikonur Cosmodrome in Kazakhstan at 11:01 p.m. EDT today. The third seat is being taken by spaceflight rookie Sergei Revin. The trio is scheduled to arrive at the station at 12:39 a.m. EDT Thursday — Acaba's 45th birthday. A hydro-geologist who once managed a marine research center on a remote Bahamian island, Acaba said he is looking forward to being a subject for human research deemed critical to preparing for future interplanetary expeditions. Among the experiments: Research aimed at gauging the effect of weightlessness on the human heart and how the cardiovascular system reacts during a return to normal gravity on Earth. Web posted. (2012). [Former Mel High teacher Joe Acaba ready to rocket to ISS [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 14].]

◆ As the nation's Evolved Expendable Launch Vehicle fleet prepares for its 50th flight next month, the U.S. Air Force on Monday announced the purchase of an Atlas 5 and a Delta 4 for future military satellite deployments. Rocket services provider United Launch Alliance was awarded the \$398 million firm-fixed-price contract to launch the Navy's Mobile User Objective System 4 spacecraft, MUOS 4, aboard the most-powerful version of the Atlas 5 rocket from Cape Canaveral, Florida, and a GPS navigation bird aboard a Delta 4 booster. An Atlas 5 successfully deployed the first MUOS satellite in February, beginning construction of a new mobile communications satellite constellation to create a 3G cellular telephone network for voice, data and video services to military troops on the move. The Atlas 5-551 rocket needed to haul the hefty MUOS spacecraft features a five-meter nose cone, five solid-fuel boosters and single-engine Centaur. Atlas 5 has been tapped to launch MUOS 2 and MUOS 3 as well. The orbiting system is designed to include four primary satellites and one in-space spare. The other launch in Monday's contract covers a Global Positioning System satellite atop a Delta 4 rocket. The announcement did not specify which spacecraft in the GPS sustainment it would cover. A pair of Delta 4 rockets have launched GPS 2F satellites from Cape Canaveral in the past two years, flying in the Medium+ (4,2) configuration with a four-meter upper stage and two strap-on solid motors. The 50th EELV launch is scheduled for June 18 from the Cape when an Atlas 5 flies the classified NROL-38 mission for the National Reconnaissance Office. A Delta 4-Heavy on the 51st mission follow closely behind on June 28 for another NRO deployment from Florida. Web posted. (2012). [Two more military missions booked on EELV rocket fleet [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 14].]

◆ The National Space Society (NSS) calls on Congress to ease export control regulations on spacecraft and related items, as urged by the Departments of Defense and State in their recent, joint "Section 1248" report, "Risk Assessment of the United States Space Export Control Policy". This report concluded that spacecraft and their components, designated as dual-use items, can safely be removed from the U.S. Munitions List (USML), which is controlled under the International Traffic in Arms Regulations (ITAR) by the Department of State. Once off the USML, the report recommends that these items be placed on the Commerce Control List (CCL) managed by the Department of Commerce. Experts maintain that a failure to implement this change not only would continue to cause harm to the American space industrial base, but could actually pose a threat to national security and potentially impede current and future space exploration efforts. ["NSS Urges Congress to Ease Export Control Restrictions on Satellites and Space-Related Items," National Space Society Press Release, May 14, 2012]

May 15: NASA says Boeing is best equipped to provide two cryogenic upper stages derived from the Delta 4 rocket to power the agency's Orion capsule on a test flight around the moon in 2017 and send astronauts on a voyage to lunar orbit in 2021, according to documents posted on a federal government procurement website. The space agency issued a sole-source award to Boeing on April 27 for a feasibility study on the compatibility of the Delta Cryogenic Second Stage, or DCSS, with the Space Launch System, a heavy-lift rocket designed to dispatch astronaut crews on expeditions to the moon, asteroids, Mars, and other deep space destinations. The \$2.4 million contract also covers an evaluation of the upper stage against NASA's human-rating requirements. Boeing will also determine what modifications are needed for the Delta 4 second stage to fly with the Space Launch System. The Delta 4's hydrogen-fueled upper stage includes an RL10B-2 engine built by Pratt & Whitney Rocketdyne, or PWR. The engine generates 24,750 pounds of thrust and has flawlessly flown on all 19 Delta 4 missions to date. Space agency officials declined comment on the upper stage acquisition until they formally select a procurement strategy. But NASA released a justification document for the sole-source study award to Boeing, outlining internal market research and a public request for information solicitation which indicated the Delta 4 second stage is the only propulsion system available to meet NASA requirements. Web posted. (2012). [NASA intends to use Delta 4 upper stage on moon flights [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 15].]

May 16: The best time to do a little renovating is when everyone is out of the house — something homeowners know and something NASA appears to appreciate too. The space agency is experiencing empty-nest syndrome in a big way, with the shuttles heading for museum retirement and the next manned American space vehicle not scheduled to fly until 2016 — unless it's 2018 or 2025 or who knows when? That leaves the huge and now-vacant vehicle assembly building (VAB) quieter than it's been since it first opened its 45-story doors in 1966. With half-century old cables snaking behind its walls, aging electronics running the cranes overhead and leaky plumbing feeding the heating, cooling and water systems, it's crying out for a little This Old House love. And now it's going to get it. The VAB's gross dimensions were headspinning in 1966 — and still are. The iconic old building is 526 ft. tall, by 716 ft. deep by 518 ft. wide (160m by 218m by 158m). It has more than 129 million cu. ft. (3.6 million cu. meter) of space. In the changeable Florida climate, it even has its own *weather*, with tiny cloud-like formations sometimes gathering near its ceiling. The foundations for the building go 160 ft. (49 m) deep. All that space was necessary because the VAB was built to accommodate the massive Saturn V rocket — 363 ft. (111 m) tall and made up of three stages, plus an escape tower. The stages would be lifted and stacked on top of one another, and a massive crawler would then take the completed booster on its 3.5 mi. (5.6 km) journey to the launch pad, moving at the decidedly patient clip of 1 mph (1.6 k/h). Booster and crawler together weighed so much that the gravel that lined the path underneath would be crushed to powder as they passed. After 1973, when the last Saturn V flew, the VAB was retrofitted for its far longer career as an assembly hangar for the 184 ft. (56m) shuttle. But last summer the shuttle program came to an end, and NASA has begun work on a new Saturn-like — and Saturn-sized — booster known prosaically as the space launch system (SLS). The SLS is planned to be a sweet-looking machine, but given NASA's depressing history of start-stop projects, plenty of people are convinced it will never fly. About 13 mi. (20 km) of copper cabling have already been removed, with another 37 mi. (56 km) to go. All of it will be replaced by pinky-width fiber optic cables. The five overhead cranes, which can lift up to 350 tons (317 metric tons), are still sound, but their electronics and other controls will be ripped out and replaced. Spigots and pumps for the fire control system — which was up to code in 1966 but falls short of modern standards — will be removed and replaced next year. Most important, the seven fixed work platforms that are attached to the walls at different heights and were built for the Saturn V will be replaced by 10 new ones that can be repositioned as needed. That's critical in an era in which NASA plans to lean on private contractors like Elon Musk's SpaceX to get humans and cargo to and from low-Earth orbit, while the SLS is used principally for deep space exploration. Such a variety of launch vehicles requires flexibility; if you don't know exactly what rocket you'll be assembling on any one day, after all, you'd better be able to accommodate them all. Even so extensive a renovation will not take all that long. Since the VAB

structure itself is sound, engineers expect to complete their work by 2014. The effort they expend between now and then will make things that much sweeter if the new rockets actually show up — and that much more forlorn if they don't. Web posted. (2012). [NASA Renovates Its Biggest, Baddest House [Online]. Available WWW: <http://www.time.com/> [2012, May 16].]

May 17: The California Science Museum said it has raised nearly half of the \$200 million needed to build a permanent exhibit for the space shuttle Endeavour. The museum recently received a donation from the Mr. and Mrs. Samuel Oschin Family Foundation that will allow it to start the design phase of the project. The museum didn't disclose the amount of the gift, citing an agreement it made with the foundation. When the display opens in 2017, it will be called the Samuel Oschin Air and Space Center in memory of a real estate developer and astronomy enthusiast, and will feature Endeavour in a vertical position, as if it's ready to launch. Until then, Endeavour will be housed in a temporary exhibit currently under construction. It is slated to be bolted to the top of a modified jumbo jet and arrive in Los Angeles in late September. Since NASA retired the shuttle fleet last year, technicians have been busy prepping the shuttles to their final destination as museum pieces. Atlantis remained in Cape Canaveral, Florida. Last month, Discovery wowed crowds by swooping over the nation's capital before landing in Virginia where it will go on display at the Smithsonian Institution's hangar at Dulles International Airport. Several weeks later, the prototype shuttle Enterprise sailed over the Statue of Liberty and past the skyscrapers along Manhattan's West Side before touching down at Kennedy Airport. It will be towed by barge next month to New York City's Intrepid Sea, Air and Space Museum. Web posted. (2012). [California museum gets big gift to build space shuttle exhibit [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 17].]

◆ Putting U.S. astronauts aboard private spacecraft originally was intended to accelerate the pace and slash the cost of manned exploration. But now, National Aeronautics and Space Administration officials are debating whether the plan's main goal should be fostering jobs to stimulate the economy. Tension between boosting science or the economy erupted during a meeting earlier this year at the agency's Washington, D.C., headquarters. Addressing a group of high-level outside advisers, NASA Deputy Administrator Lori Garver emphasized that the primary aim of outsourcing cargo and crew transportation to private industry is to promote thousands of high-tech jobs. Alarmed, aerospace experts on NASA's safety panel shot back that the program's direction should remain focused on long-standing engineering and performance criteria: building rockets and capsules able to reliably reach Earth's orbit. Critics of the agency say moves to play down short-term transportation goals in favor of broader economic stimulus are clouding the future of U.S. human spaceflight and raising questions about safety. Web posted. (2012). [NASA Stresses New Mission [Online]. Available WWW: <http://www.wsj.com/> [2012, May 17].]

May 18: Observers from Cape Canaveral to Capitol Hill will be keenly watching SpaceX's commercial voyage to the International Space Station launching Saturday, and although officials bill the mission as a test flight, its outcome could buoy or blunt support for a private space race in human spaceflight. Recognizing the breadth of attention given Saturday's launch and arrival at the space station three days later, officials from NASA and SpaceX have one message: This is a test flight. And that means to expect the unexpected. SpaceX aims to launch its privately-built Dragon capsule Saturday aboard a Falcon 9 rocket, fly the craft to the International Space Station, and deftly approach the complex for astronauts to grab the free-flying satellite with a robot arm. It is the first time a private company has attempted such a feat. If successful, the flight would be a confidence boost for SpaceX and NASA, which are partners for at least 12 unmanned cargo delivery flights to the space station over the next few years. The space agency has paid SpaceX \$381 million in an agreement to help pay for the design, development, and testing of the Falcon 9 rocket and Dragon spacecraft. SpaceX has spent \$1.2 billion to date, including public and private capital. NASA and SpaceX are also jointly funding the design of a crewed version of the Dragon spacecraft to transport astronauts to the space station later this decade. SpaceX is competing

with other aerospace companies for further NASA financing to support development of rockets and spacecraft for human occupants. Web posted. (2012). [SpaceX's historic commercial mission is 'just a test flight' [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 18].]

May 19: The launching of a privately owned cargo rocket heading to the International Space Station was aborted at the last second on Saturday morning. The rocket's nine engines had ignited, but computers detected a high pressure in the chamber of the center engine and shut them down. The rocket is held down during the final engine checks and never left the launching pad. The rocket and its cargo capsule, both built by the Space Exploration Technologies Corporation of Hawthorne, Calif., represent an important step in NASA's evolution to rely more heavily on commercial companies for its human spaceflight program. If the capsule, the Dragon, reaches the space station, it will be first commercial spacecraft to dock there. All previous vehicles, like NASA's space shuttles and Russia's Soyuz capsules, were government operated. In the evening, SpaceX officials said they had identified a faulty valve as the problem and said the next launching attempt would be on Tuesday at 3:44 a.m. Web posted. (2012). [Launching of Rocket by SpaceX Is Aborted [Online]. Available WWW: <http://www.nytimes.com/> [2012, May 19].]

May 20: For the past half-century, the \$5.6 billion, "irreplaceable" Kennedy Space Center has operated as a NASA-monopolized installation, said master planner Trey Carlson. But looking 20 years ahead, stakeholders will include a growing number of still-unknown commercial space start-ups; NASA's heavy-lift rocket program; federal agencies like the Department of Defense and Department of Energy; and the state of Florida, in conjunction with its other spaceports. How should KSC morph its 144,000-acre footprint to handle this transformation? "(NASA) dictated how we developed, how things went, because they had all the money. How do we go from that to a multi-user spaceport on federal property?" Carlson asked the Space Coast Transportation Planning Organization during a recent meeting. KSC's master plan has not received a major revision since 2003, Carlson said. That was a year before President George W. Bush announced his now-scrapped plan to create a lunar outpost and send astronauts to Mars. Now, Carlson's department has drafted a 44-page master-strategy rewrite through 2031 — much of which "flies in the face" of typical NASA planning. For example, new safety guidelines must be set "so Company A doesn't make a mistake and blow up Company B," he quipped. These concepts were approved in February at NASA headquarters. Now, Carlson's office will spend the next 12 to 15 months fleshing out details. Among infrastructure and operational initiatives discussed during the TPO meeting: * Introduce simplified billing policies offering flexibility for commercial companies, including calculating up-front how much a launch will cost. "They want to buy services by the yard. They don't want to have to pay for a standing army, the way we've been used to operating for a while," Carlson said. * Fashion launch-pad architecture to accommodate multiple vehicles. "We have never used more than one pad for more than one launch vehicle," he said. * Forge maintenance partnerships with the Florida Department of Transportation for KSC's five rail and vehicle bridges. * Establish a rail link with Port Canaveral. "With this vision of diversifying ourselves, we will be in a better position five years from now and 10 years from now," Carlson said. "When — not if, but when — the federal government once again changes its mind of how it wants to use the space center, NASA will adapt and change appropriately," he said. Web posted. (2012). [KSC master-plan rewrite under way for new launches [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 20].]

◆ SpaceX has replaced a check valve in one of the Falcon 9 rocket's first stage engines, but analysis continues before the company proceeds with another launch attempt Tuesday morning. Engineers traced the cause of Saturday's aborted launch countdown to a valve in engine No. 5, the center engine in the Falcon 9 rocket's tic-tac-toe layout of Merlin engines on the first stage. Computers detected higher-than-allowable pressures inside the engine's thrust chamber after ignition and ordered a cutoff of the countdown a half-second before liftoff. The launch opportunity Tuesday comes at 3:44:38 a.m. EDT

(0744:38 GMT). The Falcon 9 rocket remains vertical at Cape Canaveral's Complex 40 launch pad. Web posted. (2012). [Valve replaced on Falcon 9 engine as analysis continues [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, May 20].]

May 22: The second demonstration mission for NASA's Commercial Orbital Transportation Services (COTS) program is under way as SpaceX's Falcon 9 rocket and Dragon spacecraft lifted off Tuesday from Cape Canaveral Air Force Station in Florida at 3:44 a.m. EDT. "I want to congratulate SpaceX for its successful launch and salute the NASA team that worked alongside them to make it happen," NASA Administrator Charles Bolden said. "Today marks the beginning of a new era in exploration; a private company has launched a spacecraft to the International Space Station that will attempt to dock there for the first time. And while there is a lot of work ahead to successfully complete this mission, we are certainly off to good start. Under President Obama's leadership, the nation is embarking upon an ambitious exploration program that will take us farther into space than we have ever traveled before, while helping create good-paying jobs right here in the United States of America." The Dragon capsule will conduct a series of checkout procedures to test and prove its systems, including the capability to rendezvous and berth with the International Space Station. On Thursday, May 24, Dragon will perform a flyby of the space station at a distance of approximately 1.5 miles to validate the operation of sensors and flight systems necessary for a safe rendezvous and approach. Live NASA TV coverage beginning at 2:30 a.m. ["SpaceX Launches NASA Demonstration Mission to Space Station," **NASA News Release #12-161**, May 20 2012]

◆ In addition to a Dragon capsule headed to the International Space Station, SpaceX's Falcon 9 rocket on Tuesday flew an unusual payload the company didn't publicize — human remains. The rocket's second stage carried a canister containing portions of cremated remains from more than 300 people for Houston-based Celestis, Inc., which markets "memorial spaceflights." The ashes included some from Mercury astronaut Gordon Cooper and actor James Doohan, better known as Scotty on the original "Star Trek." The Falcon 9's successful voyage made up for two failed attempts to fly ashes for Celestis aboard SpaceX's first rocket, the smaller Falcon 1. Web posted. (2012). [Falcon 9 carried human remains into space [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 22].]

May 24: The shuttle orbiter replica Explorer is on its way to Houston this morning after departing Kennedy Space Center today atop a barge. Welded down on the vessel, the full-scale, high-fidelity replica departed the turn basin near the Vehicle Assembly Building around 6:40 a.m. and is expected to float through the locks at Port Canaveral at about 9 a.m. The barge then will make its way out into the Atlantic Ocean, round the southern tip of the Florida peninsula, and then cross the Gulf of Mexico to Texas. The trip to Space Center Houston, the visitor complex at NASA's Johnson Space Center, is expected to take about 10 days. Built by Guard Lee in Apopka, Explorer was installed at the Kennedy Space Center Visitor Complex in 1993 and displayed next to a gantry-like tower. Visitors could view a mock-up payload in its cargo bay as well as the replica's cockpit and a mannequin wearing an early version of a bright orange launch-and-entry suit. The model is 122.7 feet long, 54 feet tall and has a wingspan of 78 feet. It was moved to a parking lot at the Launch Complex 39 Press Site late last year to make room for the \$100 million building that will house the orbiter Atlantis in retirement. That building is under construction now. Atlantis will be moved there late this year and the building will open to visitors in mid-2013. Web posted. (2012). [Shuttle replica on way to Houston from Kennedy Space Center [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 24].]

◆ NASA selected URS Corporation of Orlando, Fla., to perform architecture and engineering studies and provide designs and other professional services to replace and restore bridges at NASA's Kennedy Space Center and the adjacent Cape Canaveral Air Force Station in Florida. The maximum potential value of this indefinite delivery, indefinite quantity contract will not exceed \$30 million for work that starts in

May and extends for five years, with four one-year options. Work under the contract includes completing design packages and performing studies, and providing detailed cost estimates, surveys, reports, environmental permit applications and environmental certificates of compliance. URS will provide designs with low environmental impact and use sustainable materials. ["NASA Awards Architecture and Engineering Contract for Bridges," **NASA Contract Release #C12-021**, May 24, 2012]

◆ The Boeing Company has successfully completed a new milestone in the development of software that will operate its Crew Space Transportation (CST) spacecraft. The company is one of NASA's partners developing commercial crew transportation capabilities to ferry U.S. astronauts to and from low Earth orbit and the International Space Station. With the Preliminary Design Review (PDR) of its software on May 18, the company now has completed more than 40 milestones under partnerships supporting NASA's Commercial Crew Program (CCP). "When it comes to designing a spacecraft safe enough to transport humans, software is as important as the hardware," said Ed Mango, CCP manager. "Boeing has made an excellent effort to take safety into consideration while developing critical software components of its spacecraft." Boeing's CST-100 is designed to be a reusable, capsule-shaped spacecraft, capable of transporting up to seven people or a combination of people and cargo. It is compatible with a variety of expendable launch vehicles. Boeing has selected United Launch Alliance's Atlas V rocket for initial CST-100 test flights. Software is essential to all operational aspects of the spacecraft, including launch, orbital maneuvering, docking with and separating from the space station, re-entry and landing. The testing is part of a NASA-funded Space Act Agreement under the second round of the agency's commercial crew development (CCDev2) activities, which could eventually lead toward human spaceflight certification of the CST-100. The Boeing team is on schedule to complete its remaining CCDev2 milestones in the next few months, including an orbital maneuvering/attitude control engine hot fire test that will provide additional data on significant elements of the spacecraft design. All of NASA's industry partners, including Boeing, continue to meet their established milestones in developing commercial crew transportation capabilities. ["NASA Commercial Crew Partner Boeing Meets Software Milestone," **NASA News Release #12-170**, May 24, 2012]

May 29: SpaceX today announced its first commercial contract to launch a heavy-lift rocket still in development. The Falcon Heavy will launch an Intelsat communications satellite to geosynchronous orbit, according to a news release. The timing of the launch and value of the contract were not specified. SpaceX says it offers Falcon Heavy launches for between \$80 million and \$125 million. SpaceX is building a Falcon Heavy launch pad at Vandenberg Air Force Base in California. The first version of the rocket is expected to arrive there late this year and launch a first test flight next year. Featuring three core Falcon 9 boosters strapped together, SpaceX's says the Falcon Heavy will be the most powerful rocket since the Saturn V, blasting off with 3.8 million pounds of thrust from 27 engines first-stage engines. Web posted. (2012). [SpaceX announces Falcon Heavy launch deal with Intelsat [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 29].]

May 30: After 15 months circling the planet on its clandestine military mission, the Pentagon's miniature space shuttle will be coming back to Earth for a pinpoint touchdown at Vandenberg Air Force Base in the next couple of weeks. Launched atop an Atlas 5 rocket from Cape Canaveral on March 5, 2011, the winged craft has been operating in low-Earth-orbit carrying out a mission of unknown purpose. The military considers the payload classified. Built by Boeing's Phantom Works division, the spaceplane is 29 feet long with a wing span of 14 feet. It can weigh up to 11,000 pounds fueled for launch. The in-space design life is 270 days, but good performance on this mission enabled ground controllers to keep it aloft significantly longer. This is the second of the Orbital Test Vehicles to fly in the X-37B program, following the maiden mission in 2010 that spent 224 days in space, frequently maneuvering in what was considered to be a shakedown cruise to demonstrate the spaceplane's capabilities. The original vehicle has been refurbished for shipment to Cape Canaveral and a return to space. Another United Launch Alliance

Atlas 5 rocket will haul the craft to orbit in a liftoff targeted for October. Web posted. (2012). [Air Force's mini space shuttle prepares for landing [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 30].]

◆ A mission 20 years in the making is about to culminate with the launch of a one-of-a-kind satellite. NASA announced today that its NuSTAR telescope could be shot into orbit as early as June 13. NuSTAR, short for Nuclear Spectroscopic Telescope Array, will be able to create images of high energy X-rays, making it capable of studying cosmic phenomenon such as black holes and how exploding stars form the elements that make up our universe. The new telescope will have 10 times the resolution and 100 times the sensitivity of similar telescopes. NuSTAR will undergo a flight readiness review on June 1, if it passes that it will be strapped to an aircraft for transport to a launch pad on Kwajalein Atoll in the central Pacific Ocean. If everything goes according to plan, Orbital Sciences Corp. will shoot NuSTAR into space aboard one of its Pegasus XL rockets. Web posted. (2012). [NASA to launch powerful telescope array [Online]. Available WWW: <http://www.cnn.com/> [2012, May 30].]

May 31: SpaceX's Dragon capsule splashed down this morning in the Pacific Ocean, wrapping up a mission that seemed to hit every target set. The historic flight ended at 11:42 a.m. EDT as the capsule – its bright parachutes deployed – landed right near its target zone off the coast of Southern California. A recovery team including a 185-foot barge and tug, an 80-foot crew boat and two 25-foot rigid hull inflatable boats (RIBs) had reached the recovery spot. The barge was expected to “pluck” Dragon out of the ocean, and begin the two to three day journey back to the Port of Los Angeles. NASA and SpaceX declared the mission, which began at 3:44 a.m. May 22 with a blast off from Cape Canaveral Air Force Station on a Falcon 9 rocket, an unqualified success. Three days after launching, the capsule made history by becoming the first commercial cargo vessel to berth at the International Space Station. And now, SpaceX has done it again: repeating their December 2010 success when Dragon became the first private spacecraft to launch, orbit the Earth and successfully re-enter. Web posted. (2012). [SpaceX's Dragon capsule successfully splashes down [Online]. Available WWW: <http://www.floridatoday.com/> [2012, May 31].]

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June 1: A full-scale shuttle orbiter replica displayed for 18 years at the Kennedy Space Center Visitor Complex has arrived at its dock in Clear Lake near Johnson Space Center. The arrival of the orbiter dubbed “Explorer” kicks off a weekend of “Shuttlebration” events at Space Center Houston, JSC’s visitor center. Explorer is set to be loaded onto a transfer vehicle Saturday. On Sunday, it will make a three-hour parade down NASA Parkway from the dock near the Nassau Bay Hilton to its new display site at Space Center Houston, escorted by scout troops and marching bands. The mock-up orbiter left Kennedy Space Center on a barge last Thursday, after months parked in a lot at the center’s turn basin, near the Vehicle Assembly Building. The Visitor Complex moved the high-fidelity replica, built by Guard-Lee Inc. of Apopka, to make way for a \$100 million exhibit building that will house NASA’s retired flown orbiter Atlantis. Houston, the home of Mission Control and the astronaut corps, was not one of the four sites NASA awarded retired shuttles, so the replica has been dubbed a consolation prize. Web posted. (2012). [Former KSC orbiter mockup set for ‘shuttlebration’ [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 1].]

June 2: Loaded with an X-ray telescope payload for NASA, the winged Pegasus rocket left the assembly hangar and joined up with its L-1011 carrier aircraft Saturday at Vandenberg Air Force Base in California. The Orbital Sciences booster will depart the West Coast on Tuesday for a two-day ferry flight to the Kwajalein Atoll in the central Pacific Ocean, part of the U.S. Army’s vast missile range. On launch day, currently targeted for June 13 (U.S. time), the carrier jet will haul the rocket to 39,000 feet and release it at 11:30 a.m. EDT (1530 GMT), allowing the three-stage Pegasus to propel the NuSTAR satellite into orbit. The remote site was selected for the NuSTAR launch since the Pegasus will be aiming for an equatorial orbit, the type of perch that Kwajalein is well positioned to reach. Weighing 772 pounds, the spacecraft is ideally sized for the Pegasus launch that will be making its 41st flight. Its heritage includes deploying over 70 satellites since 1990 for NASA, commercial customers and the U.S. military. Web posted. (2012). [L-1011 and Pegasus tour at Vandenberg [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June 2].]

June 4: The prototype space shuttle Enterprise has arrived in New Jersey, the first half of its trip to the flight deck of a decommissioned aircraft carrier in New York City. The shuttle left Kennedy Airport Sunday morning on a barge and was towed past thousands of spectators to Jersey City. The shuttle had been at JFK since it flew from Washington atop a 747 jet earlier this spring. A spokeswoman for the Intrepid Sea, Air & Space Museum says the shuttle’s wingtip sustained light cosmetic damage during the trip when a gust of wind caused it to graze a wood piling. No other damage was reported. On Tuesday, the Enterprise is to be taken to the Intrepid on Manhattan’s West Side where a crane will lift it onto the flight deck. Web posted. (2012). [Shuttle prototype Enterprise towed to NJ before final NYC stop [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 4].]

◆ A mini-shuttle competing to ferry astronauts to the International Space Station began a series of low-altitude flight tests this week in Colorado. On Tuesday, a heavy-lift Erickson Air-Crane helicopter hoisted Sierra Nevada Corp.’s Dream Chaser spacecraft into the sky for about an hour near Rocky Mountain Metropolitan Airport. The test assessed the full-scale Dream Chaser’s aerodynamic flight performance, and is a precursor to an autonomous approach and landing test planned later this summer at Edwards Air Force Base in California. The Dream Chaser is one of four vehicles being developed with NASA seed money, and a contender to fly astronauts by 2017. NASA’s Commercial Crew Program, based at KSC, plans to award its next round of development funding this summer to at least two systems. Other companies currently receiving funding include Blue Origin, The Boeing Co. and SpaceX. Web posted.

(2012). [Dream chaser begins test flight [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 4].]

◆ The U.S. human spaceflight program is undergoing a monumental transformation that will usher in a new era of low-cost commercial space exploration, a senior NASA official said Monday. More than a half-century after the world's first human space missions, NASA is preparing to shift U.S. operations in low-Earth orbit to commercial companies. "We are loosening our grip and working with the private sector in new ways so that we can reduce the cost of getting to and from low-Earth orbit," NASA Deputy Administrator Lori Garver told young aerospace students and professionals at the opening of International Space University's 25th Space Studies Program. The move is enabling NASA to develop the launch system and spacecraft required for human expeditions to deep space destinations, Garver said. And it will be the young students and professionals who will orchestrate space exploration in the future. About 130 people from 31 nations gathered at Florida Institute of Technology for the opening of the nine-week ISU program, which is being hosted by the university and NASA's Kennedy Space Center. Between now and early August, the attendees will take part in core courses and workshops that cover all aspects of space programs and enterprises — from space science and systems engineering to space policy, business management and satellite applications. Then they'll split into teams and tackle tough issues, such as micrometeorite and orbital debris, future spaceports and next-generation space stations. Web posted. (2012). [Space U 'a natural fit' [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 4].]

◆ Sheriff's officials have launched an investigation after a group of about 30 employees for a contractor at Kennedy Space Center and Cape Canaveral Air Force Station reported they are victims of identity theft and unable to receive their taxes. "I have 27 complainees documented that when they filed their tax returns they were compromised," Brevard County Sheriff's Agent Fernando Dominicus said. Dominicus is investigating how the employees' personal information was shared. The victims are all employees of G4S Government Solutions and most worked as firefighters at KSC and Cape Canaveral Air Force Station, according to Kevin Smith, president of Transport Workers Union Local 525 in Cocoa Beach, which represents some of the employees. Most of the victims tried to file taxes electronically and were then notified that their taxes had already been filed, Smith said. Of more than 100 total firefighters, "about 35 percent of them have had their identities stolen at some point or somehow." The number of victims isn't strange, according to Dominicus, a fraud investigator. "Unfortunately, it happens all year round throughout the country," he said. What is unusual is that they all work together, Dominicus said. G4S conducted an internal review of systems and procedures after being notified of the group of potential victims, company officials said. They also contacted benefits providers to see if there were any breaches. "Based on our internal review and discussions with our benefits vendors, we determined that all personal information has been handled appropriately," G4S spokeswoman Susan Pitcher said in a statement. "G4S GS and our vendors are committed to taking every reasonable precaution to maintain the security of personal identifiable information." Web posted. (2012). [27 in Brevard go to file taxes, find refunds ripped off [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 4].]

June 5: Slung beneath the belly of its L-1011 carrier jet, a three-stage Pegasus XL rocket and its NASA space telescope payload flew away from Vandenberg Air Force Base Tuesday afternoon en route to a distant atoll in the equatorial Pacific where the launch will originate next week. The fully assembled rocket left its home port at 12:58 p.m. local (3:58 p.m. EDT; 1958 GMT) destined for the Kwajalein Atoll in the Marshall Islands, part of the U.S. Army's vast missile range in the central Pacific Ocean. The rocket will be powered throughout the ferry flight so engineers stationed aboard the aircraft can monitor Pegasus systems and its state of health. Arrival at Kwajalein will kick off several days of final tests, rehearsals and reviews before the June 13 (U.S. time) launch to deliver NASA's NuSTAR X-ray space observatory into orbit around Earth on a \$180 million mission to seek out black holes. Web posted. (2012). [Pegasus

rocket sets sail to launch NASA telescope[Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June 5].]

June 6: Enterprise has landed on the deck of its new retirement home, the Intrepid Sea, Air & Space Museum in New York City. A crane hoisted the prototype shuttle orbiter on to the World War II aircraft carrier docked on Midtown Manhattan's West Side around 4:15 p.m., completing a nearly seven-week journey from its previous display site at the Smithsonian Institution's National Air and Space Museum. Enterprise left the Smithsonian's Udvar-Hazy Center April 19 to make way for Discovery, and was ferried April 27 from Dulles International Airport to John F. Kennedy International Airport. Starting Sunday, a barge carried Enterprise through New York Harbor and up the Hudson River -- a journey that included a scrape with a Jersey City, N.J., railroad bridge that caused minor damage to the right wing. The barge left Jersey City around 10:15 a.m. today, carrying the orbiter past the Statue of Liberty and Lower Manhattan. The Intrepid will build a climate-controlled pavilion around the orbiter -- with its ferry flight tail cone still attached -- on the carrier's flight deck. A public exhibit is expected to open next month, and fundraising is under way to build a permanent land-based exhibit facility. Enterprise flew approach and landing tests for NASA in 1977 and performed other early shuttle program tasks, like fit checks at a Kennedy Space Center launch pad. It was transferred to the Smithsonian in 1985. It will be displayed at the Intrepid. NASA awarded Enterprise and three retired space-flown orbiters to museums in April 2011. Discovery went to the Smithsonian in April. Later this year, Endeavour is bound for the California Science Center and Atlantis for the Kennedy Space Center Visitor Complex. Web posted. (2012). [Enterprise prototype lands on aircraft carrier in Manhattan [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 6].]

◆ The Obama administration is asking Congress to continue the federally sponsored insurance program for the nation's growing commercial space industry. The program expires Dec. 31. Administration officials and aerospace industry representatives told a House Science, Space and Technology subcommittee Wednesday it's imperative such indemnification for launch and re-entry of spacecraft be renewed for another five years or the economic benefits of commercial space might fly overseas. "Extension of the indemnification provision would continue to enable the industry to attract and maintain a customer base in the face of international competitors" that carry such coverage, said George Nield, who heads the Federal Aviation Administration's Office of Commercial Space Transportation. Congress created the insurance program in 1988, the year before the first commercial launch, when Space Services Inc. fired the CONSORT-1 satellite into orbit from the White Sands Missile Range in New Mexico. There have been 206 launches since then, including last month's much-heralded flight by SpaceX's Falcon 9 rocket that sent the unmanned Dragon capsule to the International Space Station. FAA officials predict 290 commercial launches will take place around the world from 2012 to 2021 to support telecommunications, satellite imagery, and missions to the ISS and science payloads, according to the House Science, Space and Technology Committee. Modeled after the insurance system for the nuclear power industry, the indemnification program is comprised of a risk-sharing arrangement between the federal government and the private sector to cover third-party claims in the event of a catastrophic loss during launch or re-entry. A company must buy a fixed amount of insurance for each launch under a formula set by the FAA. The federal government is liable for claims above that amount. Web posted. (2012). [Reps urge renewal of commercial space insurance [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 6].]

◆ A senior House member dropped a demand that NASA cut short its competition to develop commercial space taxis and quickly pick a single partner to fly astronauts to the International Space Station. U.S. Rep. Frank Wolf, R-Va., head of the subcommittee that oversees NASA's budget, said Tuesday he would support full funding for two crew systems and partial funding for a third when the agency awards its next round of development funding in July or August. Those awards, expected to total \$300 million to \$500

million per system over nearly two years, are intended to complete designs of vehicles that could fly crews to the outpost by 2017. In April, the House Appropriations Committee recommended NASA quickly select a single crew transportation provider to speed up its availability. The committee said continued funding for multiple competitors — NASA this year is funding development of four spacecraft — risked wasting money in an attempt to create a commercial market for crewed orbital spaceflight. Wolf also said he would support the Senate's slightly higher suggested program budget in 2013 of \$525 million instead of \$500 million. Both amounts are well below the \$830 million the Obama administration requested. Wolf asked NASA to assess commercial partners' finances, management and business viability to limit the risk to taxpayers, and requested an updated multi-year "roadmap" for the program. The Obama administration's strategy to fly both cargo and crews commercially gained momentum last month when SpaceX successfully flew an unmanned cargo capsule to the space station and returned it to Earth, becoming the first private company to do so. After the shuttle's retirement last year, the U.S. must pay Russia for rides to the station until the commercial systems are ready. Web posted. (2012). [Lawmaker now backs plan to fund several crew-capsule competitors [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 6].]

◆ Commander Doug Waller of the Brevard County Sheriff's Office and Jeffrey Eberts of United Space Alliance have won this year's top management awards from the Florida Space Coast Council. The FSCC is part of the National Management Association, the leadership organization devoted to "the personal and professional development of America's work force." It is comprised of five chapters that include members from Boeing, Lockheed Martin, Spacelift Range Systems, United Space Alliance, and a community chapter. Waller and Eberts received their awards at a recent banquet at Tradewinds Restaurant at the Duran Golf Course in Viera. Web posted. (2012). [FSCC honors BCSO's Waller and USA's Eberts with its top management award [Online]. Available WWW: <http://www.brevardbusinessnews.com/> [2012, June 6].]

June 7: Kennedy Space Center technicians on Thursday repaired leaks in rocket propellant pipes a day after potentially hazardous fumes prompted the evacuation of two shuttle hangars. Nearly 60 people evacuated Orbiter Processing Facilities Nos. 1 and 2 around 1:30 p.m. Wednesday after a technician in the latter reported smelling a whiff of highly toxic hydrazine. "The standard procedure is if you smell hydrazine, we're evacuating," said center spokesman Mike Curie. "Hydrazine is corrosive and it's very dangerous if you were to come in contact with it or to breathe it." Safety personnel wearing protective suits confirmed hydrazine levels exceeded the permissible amount of 0.01 parts per million, Curie said. The problem with the pipes was detected Tuesday as crews began the process of cleaning and removing them, part of efforts to de-service the hangars after the shuttle program's retirement last year. The pipes are mostly clear and capped but contain residual amounts of liquid, particularly in elbows and joints, Curie said. On Tuesday, air was blown through the pipes to find potential leaks before workers flushed the pipes with cleaning fluids. Some leaks were found in OPF-2 and repairs were scheduled for Thursday. Employees were not considered to be at any immediate risk since the pipes are essentially empty. They are trained, however, to spot hydrazine's fishy or ammonia-like smell and report it immediately. A technician did that Wednesday. Both hangars were evacuated because they are connected to each other. No one was injured or received medical treatment. On Thursday, workers wearing protective "SCAPE" suits, or Self-Contained Atmospheric Protective Ensembles, completed the previously scheduled repairs. The hangars reopened for normal operations by early afternoon. Shuttle Endeavour is currently housed in OPF-2, and Atlantis is next door in OPF-1. The retired orbiters are awaiting delivery to museums in September and November, respectively. Atlantis is coming to the KSC Visitor Complex. Web posted. (2012). [KSC repairs hydrazine leak after evacuation [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 7].]

◆ Space Exploration Technologies Corp. (SpaceX) is one small step closer to beginning routine supply runs to the international space station (ISS) now that NASA has verified that the company safely returned 35 kilograms of time-sensitive cargo from the orbiting outpost. This so-called early return cargo, packed into four bags, reached NASA's Johnson Space Center in Houston June 2 — 57 hours after splashing down aboard SpaceX's Dragon capsule in the Pacific Ocean. Preliminary assessments by ISS program officials at Johnson show that the shipment is in good condition, NASA spokesman Josh Byerly said June 7. The safe return of this cargo was one of the objectives SpaceX had to fulfill for its historic demonstration flight to be considered a success. Web posted. (2012). [SpaceX Returns Cargo To NASA in Good Shape [Online]. Available WWW: <http://www.spacenews.com/> [2012, June 8].]

June 8: NASA is canceling an X-ray astronomy mission that would have launched from Florida's Space Coast in late 2014. The reason: It's over budget. A small explorer spacecraft equipped with sophisticated X-ray telescopes would have been launched on a Pegasus XL-class rocket into an orbit inclined 28.5 degrees to the equator. U.S. missions launching into that type of orbit typically blast off from either NASA's Kennedy Space Center or Cape Canaveral Air Force Station. The contract would have most likely gone to Orbital Sciences Corp. of Dulles, Va., which manufactures and launches Pegasus XL-rockets. The vehicles are carried aloft by an L-1011 aircraft, released at an altitude of about 40,000 feet, and then launched into low Earth orbit. Pegasus missions have flown out of the Shuttle Landing Facility at KSC in the past. But other companies, including Lockheed Martin Space Systems Co. of Denver, Space Exploration Technologies of Hawthorne, Calif., and United Launch Alliance of Littleton, Colo., also could have bid. NASA selected the Gravity and Extreme Magnetism SMEX, or GEMS, mission in 2007. SMEX is a NASA acronym for Small Explorer, a class of relatively low-cost science missions. The GEMS mission was cost-capped at \$105 million, a figure revised to \$119 million in 2012 dollars. Paul Hertz, director of NASA's Astrophysics Division, said Thursday an independent cost analysis showed the cost of the mission would have been 20 to 30 percent more than the cost cap. So NASA "made the very difficult decision" to cancel the mission, Hertz said. To date, NASA has spent about \$37 million on the project. Total estimated cost of terminating contracts is an additional \$13 million, Hertz said. The project still was in the formulation phase; no instruments for the mission had been developed yet. Web posted. (2012). [Budget woes force NASA to cancel 2014 launch [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 8].]

◆ Space Florida President Frank DiBello will speak at the National Space Club meeting Tuesday. He will discuss the possibilities for economic development in a presentation titled, "Future Directions for Florida's Space Industry." Since May 2009, DiBello has led Space Florida, which serves as the single point of contact for aerospace-related economic development in Florida. Web posted. (2012). [DiBello to speak at Space Club luncheon [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 8].]

◆ A panel session for the International Space University's Space Studies Program 2012 participants [will be held] at NASA's Kennedy Space Center in Florida at 8 p.m. on June 12. The Soffen Memorial Panel session will provide the opportunity for SSP participants to engage with today's leaders in the planetary science field. The panel session is in honor of Gerald Soffen, NASA scientist and leader of NASA's Viking Mars mission. Reporters planning to attend need to meet Tracy Young in the lobby of the Operations Support Building II at 7:30 p.m. The OSB II is the five-story building adjacent to the Press Site. The session will be moderated by George Tahu, NASA program executive, Planetary Science Division, NASA Headquarters. Panelists include: --Pete Worden, director, NASA Ames Research Center; --Claudia Alexander, project scientist, Jet Propulsion Laboratory; --Scott Hubbard, professor, Stanford University; --Bill Nye, CEO, The Planetary Society. ["NASA Invites Media to Soffen Memorial Panel Session June 12," **NASA Media Advisory #M28-12**, June 8, 2012.]

June 10: The NASA control center that gave the command to launch rockets to the moon and send space shuttles into orbit will be opened for public tours this week for the first time in more than 30 years. NASA's Kennedy Space Center Visitor Complex in Florida announced that beginning this Friday (June 15), a limited number of daily tours will take guests into the spaceport's historic Launch Control Center (LCC). Tour-goers will have the rare opportunity to enter the room where directors and engineers supervised the countdown for all 152 launches of the Apollo moon landing and space shuttle programs. "This is [a] rare opportunity that NASA has worked with us to provide — access to the Launch Control Center," Bill Moore, chief operating officer of visitor complex, said in a statement. "It might be another 30 years before guests will receive a behind-the-scenes opportunity like this again." The KSC Up-Close: Launch Control Center (LCC) Tour will run through the end of the year. The new tour takes visitors inside Firing Room 4, one of the Launch Control Center's four firing rooms and the one from which the shuttle's final 21 launches were controlled. Inside, guests will pass by the consoles where engineers monitored the computerized control system's thousands of system checks every minute leading up to launch. They'll see the countdown clock and the large video monitors on the walls. Visitors will also enter the "bubble room," with its wall of interior windows through which the Kennedy Space Center management team viewed what went on in the firing room below. "With so much on the line, the people who worked in this room were under tremendous pressure not only in daily operations but particularly as the countdown proceeded," Bob Sieck, a former launch director, said in a statement. "They had to handle the tension and their emotions as the tests became faster, the astronauts took their place in the shuttle and thousands of people and news media were gathered outside to watch the launch." In addition to the "bubble" looking in, visitors will look out the LCC's iconic windows — windows "through which you could see mankind's future," said architect Martin Stein. His concept for the LCC won an award for industrial design from the American Institute of Architecture in 1965. In addition to the firing room, the tour also showcases the LCC's lobby, which features 152 wall plaques — one for every mission guided there since its first, the unmanned Apollo 4 in 1967. Included are the manned Apollo moon missions, the international Apollo-Soyuz Test Project in 1975, the Saturn rocket launches for Skylab space station in the mid-1970s, and the launches for the 30-year shuttle program. The tour also includes drive-by views of one of the shuttle launch pads and then ends at the Apollo/Saturn V Center, where guests can see one of the three remaining Saturn V rockets, and then join the visitor complex's regular tour. The Launch Control Center Tour is the second in a series of rare access tours celebrating Kennedy Space Center's 50th anniversary. Web posted. (2012). [‘Go’ for tours: Public invited inside NASA’s historic Launch Control Center [Online]. Available WWW: <http://www.collectspace.com/> [2012, June 10].]

June 11: The final days of preparations are underway at Cape Canaveral for next Monday morning's Atlas 5 rocket flight on a milestone-setting mission for America's Evolved Expendable Launch Vehicle fleet. Now topped with its secret satellite cargo for the U.S. National Reconnaissance Office, the United Launch Alliance-built rocket is targeting liftoff sometime between 8 and 10 a.m. EDT (1200-1400 GMT) from the Cape's Complex 41 pad. The exact time has not yet been revealed, given the hush-hush nature of the mission. The Launch Readiness Review is planned for Friday, which gives approval to transport the 19-story rocket aboard its mobile platform from the vehicle assembly building to the pad. Rollout is slated for Saturday 10 a.m. EDT (1400 GMT). Web posted. (2012). [50th EELV rocket set for launch next Monday[Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June 11].]

June 12: The U.S. and Canada are setting the stage for a lunar prospecting mission aimed at demonstrating technologies that could open the solar system to human exploration. In a sandy yard at Kennedy Space Center, engineers and scientists are developing a prototype of a rover designed to extract oxygen from hydrogen-rich lunar soil and produce water. The four-wheeled prototype will face critical field tests in Hawaii in July. A fully tested, flight-ready rover still needs to be developed, and a launch vehicle still must be procured. But project managers are confident that their technology development project eventually will be elevated to a fully funded mission — one that would be cost-capped at \$250 million. "It is the next logical step" in lunar exploration, said William Larson, whose title is In Situ

Utilization Project Manager at KSC. Manufacturing water on the moon would yield oxygen for astronauts to breathe, as well as provide water for drinking, cooling systems, radiation shielding, growing plants and even for rocket propellant. Deep-space mission costs would drop dramatically because spacecraft would be able to refuel at propellant depots — eliminating the need to carry up all fuel from Earth's surface. The prototype being developed at KSC — dubbed Artemis Jr. — is equipped with a U-shaped Canadian rover, Canadian excavating tools, and U.S. science instruments. It would use a scientific divining rod — a neutron spectrometer — to locate hydrogen-rich soils, likely at a site near the moon's south poles. Lunar soils contain abundant oxygen. Rotary, percussion and corkscrewing drills and augers would extract regolith from the lunar surface to a depth of one meter. Then samples would be heated up in an oven that could convert oxygen and hydrogen to water vapor and ultimately, water drops. A second oven would analyze samples for hydrogen, helium, carbon monoxide, carbon dioxide, methane, nitrogen, ammonia and other chemical constituents. Methane is another useful rocket propellant. Hydrogen and carbon monoxide can be combined to make it. The next big step for the technology development project is to travel to Hilo, on the island of Hawaii, for field tests near Mauna Kea, a towering volcano that last erupted 4,600 years ago. Larson said the Mauna Kea region provides the most lunar-like soil on Earth, and the goal is to simulate a full nine-day mission for the solar-powered rover, one in which more than two dozen soil samples are extracted and processed. The rover will travel about three kilometers, or 1.8 miles, and Ewan Reid, an operations engineer with the Canadian Neptec Design Group, will be one of the people driving the prototype. Web posted. (2012). [Do deep space quests start with this rover prototype? [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 12].]

June 13: Space industry pioneer Sam Beddingfield, whose career spanned from Project Mercury to the shuttle program, died Wednesday. He was 78. Beddingfield, who lived in Titusville, joined NASA in 1959 at the urging of Gus Grissom, whom he'd flown with at Wright-Patterson Air Force Base in Dayton, Ohio. Grissom became one of the seven original Mercury astronauts, and he thought Beddingfield, an aeronautical engineer, should work in the space industry, too. As the story goes, Beddingfield said, "I don't know anything about space," recalled Charlie Mars, president of the U.S. Space Walk of Fame Foundation. Grissom apparently replied: "Nobody else does, either." Beddingfield came to Florida, starting work at Cape Canaveral Air Force Station in 1959. At the time, NASA had 33 employees. All were assigned ID numbers. Beddingfield's: No. 4. It was Beddingfield who strapped Alan Shepard, the first American in space, into his capsule. Sam was an icon of the space industry," Mars said. "He was here in the very beginning." Beddingfield's engineering career took him through the Mercury program and the Apollo launches. When NASA embarked on a new program, Beddingfield was one of the engineers to design the shuttle. He left the program as deputy director of shuttle operations in 1985. "I had worked through 23 launches and decided enough was enough," Beddingfield was quoted as saying in a NASA story about him being honored with a Lifetime Achievement Award by the National Space Club in 2006. Web posted. (2012). [Space pioneer's career spanned history of NASA [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 13].]

◆ A small X-ray telescope was boosted into orbit by an air-launched Pegasus XL rocket Wednesday, the first step in an ambitious low-cost mission to study supermassive black holes believed to be lurking at the cores of galaxies like Earth's Milky Way and to probe the creation of heavy elements in the cataclysmic death throes of massive stars. The mission got underway with a dramatic pre-dawn launch from an L-1011 jet at an altitude of about 40,000 feet above the Pacific Ocean some 120 miles south of the Kwajalein Atoll in the Marshall Islands. Tucked into the nose cone of a three-stage solid-fuel Pegasus XL rocket, the NuSTAR spacecraft was dropped like a bomb at 12 p.m. EDT (GMT-4; 4 a.m. Thursday local time). After a five-second fall, the first stage of the winged Pegasus booster ignited with a rush of flame to begin the steep climb to orbit. Orbital Sciences Corp. of Dulles, Va., provided the carrier aircraft, the Pegasus XL booster and the NuSTAR satellite to NASA and the mission operations team at the California Institute of Technology under a "Small Explorer" program contract valued at nearly \$180 million. The Pacific Ocean launch zone was selected to enable the spacecraft to reach a scientifically favorable orbit

tilted just six degrees to the equator. Web posted. (2012). [Air-launched Pegasus boosts NASA telescope to space [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June 13].]

June 16: An unmanned Air Force space plane steered itself to a landing early Saturday at a California military base, capping a 15-month clandestine mission. The spacecraft, which was launched from Cape Canaveral Air Force Station in Florida in March 2011, conducted in-orbit experiments during the mission, officials said. It was the second such autonomous landing at Vandenberg Air Force Base, 130 miles northwest of Los Angeles. In 2010, an identical unmanned spacecraft returned to Earth after seven months and 91 million miles in orbit. The latest homecoming was set in motion when the stubby-winged robotic X-37B fired its engine to slip out of orbit, then pierced through the atmosphere and glided down the runway like an airplane. “With the retirement of the space shuttle fleet, the X-37B OTV program brings a singular capability to space technology development,” said Lt. Col. Tom McIntyre, the X-37B’s program manager. “The return capability allows the Air Force to test new technologies without the same risk commitment faced by other programs. We’re proud of the entire team’s successful efforts to bring this mission to an outstanding conclusion.” With the second X-37B on the ground, the Air Force planned to launch the first one again later this year. An exact date has not been set. The twin X-37B vehicles are part of a military program testing robotically controlled reusable spacecraft technologies. Web posted. (2012). [Unmanned space plane lands in Calif. [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 16].]

June 17: Marking only the fifth delay-and-rollback scenario in 27 flights from Cape Canaveral, the Atlas 5 rocket returned to the assembly hangar today to fix a ground equipment issue. The Atlas was moved from the nearby Vertical Integration Facility to the Complex 41 pad Saturday morning. After uncovering an environmental control system duct problem, officials determined the rocket platform needed moved back into the VIF to perform this repair. Technicians will get to work fixing the issue today, then return the vehicle to the pad on Monday, give the crew its sleep-sync day on Tuesday and launch on Wednesday, with the countdown starting a little after 1 a.m. Wednesday's launch is targeted to occur at 8:28 a.m. EDT (1228 GMT). Weather forecasters, in their most recent outlook issued yesterday, predicted a 70 percent chance of acceptable conditions for a Wednesday morning launch. Cumulus clouds and gusty winds were the worries. Meteorologists expected scattered low- and high-level clouds, isolated showers in the area, good visibility, easterly winds of 14 gusting to 20 knots and a temperature of 77 degrees. Web posted. (2012). [Atlas 5 rocket launch reset for Wednesday morning [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June 17].]

June 18: Launch conductor by day, star of stage by night, Doug Lebo is a character. And he hopes to put on a show Wednesday as he oversees the countdown to the planned launch of an Atlas V rocket and a super-secret national security satellite. The United Launch Alliance Atlas V rocket had been scheduled to blast off from Launch Complex 41 at Cape Canaveral Air Force Station this morning. But the launch was delayed 48 hours after the launch team discovered that an environmental control system duct had failed near its connection with the mobile launch tower and needed to be replaced. The weather forecast for launch Wednesday remains favorable. Meteorologists with the Air Force 45th Space Wing Weather Squadron say there is a 70 percent chance conditions will be acceptable for flight. When Lebo and the rest of the Atlas V launch team report for duty, they’ll be stepping through a highly choreographed sequence of countdown activities including fueling the towering rocket for flight. Inside the Launch Control Center at the Atlas Space Operations Center, Lebo planned to oversee an assistant being certified to be a full-fledged launch conductor. The person in that job is responsible for coordinating the work of two-dozen engineers operating various rocket or spacecraft systems as countdown clocks tick toward zero, and liftoff. Web posted. (2012). [ULA launch director sets stage, awaits ‘thrill’ of Atlas V liftoff [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 18].]

◆ Sally Ride was the sort of trail blazer who literally blazed a trail across the sky. When the first female NASA astronaut blasted off into space on June 18, 1983, her rocket burned a path to the stars that showed women could have the Right Stuff, too. “In an instant, little girls learned that even the sky wasn't the limit,” Ride’s NASA bio says. At 31, she was also the youngest American ever in space. Web posted. (2012). [Sally Ride, NASA’s first female astronaut, took flight 29 years ago [Online]. Available WWW: <http://www.nydailynews.com/> [2012, June 18].]

June 19: As it does with passenger planes, the Federal Aviation Administration will license flights of commercial rockets and spacecraft carrying astronauts. But when NASA crews are on board, the space agency will continue to certify that the flights are safe. An agreement announced Monday outlined those roles, clarifying how the two agencies plan to share oversight of commercial crew flights to the International Space Station. NASA hopes to begin flying crews commercially by 2017 and is working with a group of companies to fund the development of new vehicles. The agency expects to announce around mid-July the winners of its next round of seed funding to complete system designs, Bolden said. The agency plans to fund three companies, two with full awards — expected to range from \$300 million to \$500 million over nearly two years — and one with a partial award. Monday’s announcement confirmed industry expectations for how NASA and the FAA would partner to sign off on crewed flights to the station. The process will work much like it did during SpaceX’s recent unmanned demonstration flight to the outpost. The FAA, which licenses commercial space missions, approved the launch and re-entry of the company’s Dragon capsule, focused on the safety of the general public. NASA, meanwhile, was concerned about the Dragon’s ability to safely fly around and berth with the space station to deliver its cargo. For future crewed missions, the agency has published the human-rating standards it will use to certify commercial vehicles’ safety, and it will perform flight readiness reviews before giving a “go” for launch. NASA will have no involvement in flights of non-NASA astronauts to private space stations or other destinations. That will be up to the FAA and the flights’ customers. Web posted. (2012). [NASA, FAA to share space crew safety oversight [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 19].]

June 20: United Launch Alliance Atlas V rocket is scheduled to blast off from Launch Complex 41 at Cape Canaveral Air Force Station. This will be:

- The 613th launch for Atlas program since 1957
- The 325th Atlas to occur from Cape Canaveral
- The 202nd mission for the Centaur upper stage
- The 179th use of Centaur by an Atlas rocket
- The 31st launch of an Atlas 5 since 2002
- The 50th Evolved Expendable Launch Vehicle flight
- The 27th Atlas 5 to occur from the Cape
- The 23rd Atlas 5 under United Launch Alliance
- The 10th Atlas 5 launch overseen by the Air Force
- The 20th 400-series flight of the Atlas 5
- The 12th Atlas 5 to fly in the 401 configuration
- The 13th Atlas launch for the National Reconnaissance Office
- The 6th Atlas 5 launch for the NRO
- The 3rd Atlas launch of 2012

Web posted. (2012). [Here’s a look at some stats about today’s mission. [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June20].]

◆ The 50th Evolved Expendable Launch Vehicle launch successfully lifted a national security payload into orbit from Cape Canaveral Air Force Station today. EELV provides the U.S. access to space by

making launch vehicles more affordable and reliable through the use of two families of launch vehicles, United Launch Alliance's Atlas V and Delta IV. "Evolved Expendable Launch Vehicle has allowed us to successfully launch 50 nationally critical missions over the last 10 years," said Gen. William L. Shelton, commander Air Force Space Command. "We are proud of this launch success record, an amazing record in the history of space flight." The 45th Space Wing conducted today's successful launch of a United Launch Alliance-built Atlas V launch vehicle carrying a classified National Reconnaissance Office satellite from Space Launch Complex 41. The EELV program launches from both CCAFS and Vandenberg Air Force Base, Calif. Web posted. (2012). [50th Successful Evolved Expendable Launch Vehicle Launch [Online]. Available WWW: <http://www.afspc.af.mil/news/> [2012, June 20].]

◆ It may seem hard to believe, but the NASA Kennedy Space Center in Orlando, Fla. is 50 years old. NASA, which is 53, is offering visitors access to several key areas of the facility that weren't accessible before. A special Kennedy Space Center Up-Close Tour runs through the end of 2012 to provide visitors a look inside the 525-foot-tall vehicle assembly building where the Apollo rockets and space shuttles were assembled. One of the world's largest buildings, it had been off limits to the public for more than 30 years, until the tour was added in November. The tour gives visitors a chance to check out rocket and space shuttle launch pads and the 6 million-pound crawler-transporters, which moved the shuttle from the building to its launch pad. Center officials said the opportunity to visit the vehicle assembly building is being offered for a limited time. Web posted. (2012). [Kennedy Space Center marks 50th year [Online]. Available WWW: <http://www.boston.com/> [2012, June20].]

◆ At a Senate Commerce subcommittee hearing today, three Senators directed mostly friendly questions at a panel of government and private sector witnesses regarding the risks and opportunities of commercial spaceflight. Senator Kay Bailey Hutchison (R-TX) emphasized that while commercial crew is needed for the near term, NASA should not "shortchange the future." NASA needs to adequately fund the Space Launch System (SLS) and its Orion capsule, she insisted. As for that future, subcommittee chairman Bill Nelson (D-FL) and Michael Gold of Bigelow Aerospace were bullish on the future of microgravity research for the pharmaceutical industry in particular. Hutchison sternly chastised NASA Administrator Charlie Bolden at an earlier hearing for, in her view, baldly taking \$300 million from the SLS/Orion effort to put into commercial crew in the FY2013 budget request. Today, she wanted an assurance from NASA's Associate Administrator for Human Exploration and Operations Bill Gerstenmaier that NASA would not do that again. He said his job was to deliver commercial crew as well as SLS/Orion in a timely manner "and we're working hard to do that" within existing budget constraints. He agreed that NASA is committed to move both forward and to "find the balance to keep human spaceflight in this nation strong." While that was not an explicit "yes," Hutchison appeared to accept the answer as the assurance she requested. Her focus was on ensuring that "in 2020, when ISS will go away, most likely," the United States does not face another gap in human spaceflight like today. Web posted. (2012). [Commercial Crew Critical for ISS, but SLS/Orion Needed for Future, Senators Stress [Online]. Available WWW: <http://www.spacepolicyonline.com/> [2012, June 20].]

June 21: Presidential Science Advisor John Holdren told the House Science, Space and Technology Committee yesterday that despite what some people say, the United States is the world leader in space activities. "We continue ... to lead the world in space, although sometimes the contrary is asserted," he told Rep. Lynn Woolsey (D- CA). "Our planetary exploration programs have absolutely no peer. some people say China is overtaking [us]. China just put its first woman in space a few days ago. We put our first woman in space, Sally Ride, in 1983. One can go through the list. China is talking about maybe being able to land someone on the moon in 2020. We did it in 1969." Holdren strongly disagreed. "By any respectable set of metrics I know of, the United States is still number one in space and intends to stay that way." On more specific NASA issues, Holdren told committee chairman Ralph Hall (R-TX) that he

and President Obama are confident NASA can specify and oversee safety requirements for commercial crew systems even though NASA currently is using Space Act Agreements instead of Federal Acquisition Regulation (FAR)-based contracting. Rep. Steve Palazzo (R-MS), chair of the space and aeronautics subcommittee, asked what would happen if the companies did not perform or went out of business -- what would NASA own for the money it is expending. Holdren replied that NASA's funding is an investment in the private sector that will yield more efficient and less expensive space missions and the idea is not for NASA to "own" anything. Holdren defended NASA's planetary science budget, which was cut 20% in the President's FY2013 budget request. Repeating what others in the administration have been saying, Holdren told Rep. Donna Edwards (D-MD) the Mars program is "robust" despite the budget constraints and "we have not, by any means, given up our leadership in planetary exploration." Web posted. (2012). [Holdren: U.S. is Number One in Space and Intends to Stay That Way [Online]. Available WWW: <http://www.spacepolicyonline.com/> [2012, June 21].]

June 22: NASA has awarded a contract extension to United Space Alliance of Houston to provide mission and flight crew operations support for the International Space Station and future human space exploration. The \$17.4 million extension of the Integrated Mission Operations Contract covers ground-based human spaceflight operations capability development and execution. This contract includes support for mission planning and preparation, crew and flight controller training, and real-time mission execution. The initial period of extension runs from Oct. 1, 2012 through Sept. 30, 2013. There is a \$17.8 million option to extend the contract for another year effective from Oct. 1, 2013, through Sept. 30, 2014. The total potential value of the cost-plus-award-fee contract would be \$35 million, if the option is exercised. This contract extends the original contract, which was in effect from November 2008 through September 2012. ["NASA Extends Contract for Mission, Crew Operations Support," **NASA Contract Release #C12-024**, June 22, 2012.]

June 24: The Delta 4-Heavy rocket, sporting more-powerful main engines, is counting down the days to blastoff this week carrying a super-secret payload for the National Reconnaissance Office. Liftoff of the triple-barreled booster will occur sometime Thursday morning during a period of 5:30 to 10:30 a.m. EDT (0930-1430 GMT), officials say. At last check Friday, engineers were looking at a vent relief valve on the rocket that could need replacing. But officials said if such a swapout got ordered the unplanned work should fit within the existing schedule with no impact to the targeted Thursday launch date. It will mark the debut launch of the upgraded RS-68A powerplant on the three booster cores. Built by Pratt & Whitney Rocketdyne, each hydrogen-fueled engine will deliver 702,000 pounds of liftoff thrust, an increase of 39,000 pounds over the current RS-68 engines successfully flown 29 times to date. The Heavy will be flying for the sixth time in history and the Delta 4 program will be achieving its 20th mission to date. Web posted. (2012). [Launch week is here for Delta 4-Heavy rocket [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June 24].]

June 25: The forecast doesn't look great for Thursday morning's planned launch of a classified satellite atop a Delta IV Heavy rocket. There's only a 30 percent chance of conditions good enough for a planned 6:16 a.m. liftoff from Launch Complex 37 at Cape Canaveral Air Force Station, according to the Air Force's 45th Weather Squadron. Heavy clouds and strong ground winds could pose problems during a launch planning period that extends to 10:30 a.m. The forecast improves slightly on Friday, to a 40 percent chance of favorable weather. The National Reconnaissance Office mission would be the sixth by United Launch Alliance's Delta IV Heavy, which features three first-stage boosters strapped together. It would be the first launch using Pratt and Whitney Rocketdyne's upgraded RS-68A main engines, the most powerful hydrogen-fueled liquid rocket engines ever built. The launch is planned just eight days after an Atlas V lifted another NRO satellite to orbit from the Cape. Web posted. (2012). [Weather may bump Thursday's rocket launch to Friday [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 25].]

June 26: Already having been powered off for the final time, the shells of rocket pods installed on her tail and nose and key components removed for future use, technicians Tuesday finished inserting replica main engines on space shuttle orbiter Atlantis for permanent display at Kennedy Space Center's Visitor Complex. Using old-generation nozzles to give a realistic-looking appearance, the replica engines do not include the internal turbopumps, controllers or other parts that an actual shuttle powerplant featured. NASA is keeping its allotment of current-generation engines in protective storage to power the future Space Launch System heavy-lift rocket. Installation began Monday when the first engine was mounted to Atlantis' center-engine position. The lower-left engine was installed early Tuesday, then after a break for a passing rain shower, the third engine was hauled from the prep shop over to Orbiter Processing Facility bay 1 for the shuttle's lower-right position. Atlantis will be rolled out of the hangar Friday morning, weather permitting, and moved to the Vehicle Assembly Building for storage. The orbiter is scheduled for delivery to KSC's museum this fall where a new display exhibit is being constructed to give the public an up-close look at the retired spaceplane with her payload bay doors open as if orbiting the planet. The facility opens next July, around the second anniversary of the final space shuttle mission. Web posted. (2012). [Atlantis fitted with engine replicas for museum [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June 26].]

◆ Lockheed Martin Corp. is preparing to ship the pressure shell for the first space-bound Orion capsule from a Louisiana factory to the Kennedy Space Center, where it will be readied for liftoff on an orbital test flight in 2014. Technicians at Lockheed Martin's Michoud plant in New Orleans completed the final weld on the Orion spacecraft's core structure Thursday. Arrival at the Kennedy Space Center is scheduled for July 2. Officials do not expect any impact to the shipment plans from Tropical Storm Debby, which is swamping Florida with flooding rains this week. Forecasters expect the system to move over the Atlantic Ocean by the end of the week. The Orion capsule's first voyage in space - called Exploration Flight Test 1 - will verify the spacecraft's heat shield during re-entry at speeds mimicking what the capsule will experience on subsequent missions to the moon, asteroids, or other deep space destinations. Speeds during the craft's re-entry will reach more than 20,000 mph as it plunges back to Earth from a peak altitude of 3,000 miles. NASA officials say the Orion spacecraft will experience temperatures up to 4,000 degrees Fahrenheit during re-entry. The EFT-1 mission will blast off on a United Launch Alliance Delta 4-Heavy rocket in 2014. ULA is modifying the Delta 4 rocket's launch pad at Cape Canaveral Air Force Station for the Orion test flight. The company is changing the configuration of the pad's work platforms and adding a new swing arm to reach the Orion spacecraft on top of the powerful booster. Lockheed Martin and United Space Alliance employees will work on the Orion spacecraft inside the Operations and Checkout Building at the space center in the same high bay used to prepare Apollo missions for launch to the moon. Web posted. (2012). [Space-bound Orion capsule to arrive in Florida next week [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, June 26].]

◆ NASA has modified its NASA Launch Services (NLS) II contract with Orbital Sciences Corporation of Dulles, Va., to add the Antares launch vehicle; formerly known as Taurus II, for future missions. The NLS II on-ramp provision provides an opportunity annually for launch service providers not presently under NLS II contract to compete for future missions, and allows launch service providers already under contract to introduce launch vehicles not currently on their NLS II contracts, such as Antares. NLS II contracts are multiple award, indefinite delivery/indefinite-quantity contracts with ordering periods through June 2020. The contracts provide for a minimum capability of delivering agency payloads weighing approximately 550 pounds or more to a minimum 124-mile-high circular orbit with a launch inclination of 28.5 degrees. The launch service providers also may offer a range of vehicles to NASA to meet higher payload mass and orbit requirements. These contracts support the goals and objectives of the agency's Science Mission Directorate, Human Exploration and Operations Mission Directorate, and Office of the Chief Technologist. Under the contract, NASA also can provide launch services to other government agencies, such as the National Oceanic and Atmospheric Administration. The Launch Services Program Office at NASA's Kennedy Space Center in Florida is responsible for program

management. [“NASA Adds Orbital’s Antares To Launch Services II Contract,” **NASA Contract Release #C12-027**, June 26, 2012.]

◆ Pratt and Whitney Rocketdyne has successfully completed a series of tests on a thruster destined for Boeing’s Commercial Space Transportation spacecraft, designated CST-100. Boeing is one of several companies working to develop crew transportation capabilities under the Commercial Crew Development Round 2 agreement with NASA’s Commercial Crew Program. The goal of the program is to help spur innovation and development of safe, reliable and cost-effective spacecraft and launch vehicles capable of transporting astronauts to low Earth orbit and the International Space Station. Twenty-four thrusters will be part of the spacecraft’s orbital maneuvering and attitude control system (OMAC), giving the CST-100 the ability to maneuver in space and during re-entry. The thrusters also will allow the spacecraft to separate from its launch vehicle if an abort becomes necessary during launch or ascent. During tests conducted at the White Sands Space Harbor in Las Cruces, N.M., an OMAC thruster was fired in a vacuum chamber that simulated a space-like environment of 100,000 feet. The tests verified the durability of the thrusters in extreme heat, evaluated the opening and closing of its valves and confirmed continuous combustion and performance. All of NASA’s industry partners, including Boeing, continue to meet their established milestones in developing commercial crew transportation capabilities. [“Thruster Tests Complete for NASA Partner Boeing’s Crew Capsule,” **NASA News Release #12-214**, June 26, 2012.]

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June 28: A Cape Canaveral facility with a long history serving the space shuttle program will remain open under new management, preserving a local manufacturing capability and expanding its operations beyond the space industry. Craig Technologies will take over the NASA Shuttle Logistics Depot on Astronaut Boulevard and maintain roughly 1,600 pieces of NASA equipment housed there, the company and space agency confirmed Thursday. Starting Jan. 1, the facility operated for years by United Space Alliance will become the new headquarters for Melbourne-based Craig Technologies, which will use the equipment on loan from NASA to bolster a recently launched machine and tool division. The move could help the engineering and technology services contractor win new business that creates jobs. The depot, known as the “NSLD,” was developed for the shuttle program and used to inspect, test and build thousands of space system components, some no longer available from original manufacturers. The agreement with Craig Technologies enables NASA to preserve that capability for future spaceflight programs without having to bear the annual cost of maintaining equipment it doesn’t need during a gap in spaceflight programs. “Partnering with Craig Technologies will benefit new customers who will use this

valuable equipment in the near-term, while enabling Kennedy to retain ownership so that when we are ready, we will use it for future spaceflight endeavors,” said Mike Curie, a Kennedy Space Center spokesman. Web posted. (2012). [Company will keep Cape’s shuttle shop open [Online]. Available WWW: <http://www.floridatoday.com/> [2012, June 28].]

◆ NASA has selected three companies to provide architect and engineering professional environmental remediation services at Kennedy Space Center, Fla., the adjacent Cape Canaveral Air Force Station (CCAFS) and other NASA locations. The combined maximum potential value for the three contracts is \$91 million. Services will be performed during a five-year period beginning this year. The companies selected are Geosyntec Consultants of Boca Raton, Fla.; Jacobs Engineering Group Inc. of Cape Canaveral, Fla.; and Tetra Tech of Pittsburgh, Pa. Under the contract, the three companies will compete for fixed-price work orders to develop and implement contamination assessment and remediation requirements for Resource Conservation and Recovery Act sites and petroleum contamination for NASA at Kennedy and CCAFS. [“NASA Selects Contracts for Environmental Remediation Services, **NASA Contract Release #C12-026**, June 28, 2012.]

June 29: Consolidating NASA’s sprawling network of field centers came to the forefront of discussions here between top agency officials and an independent panel established to carry out a congressionally mandated review of NASA’s structure and management. NASA says its 10 field centers employ about 18,000 civil servants and four times as many contractors. These centers, some of which predate the 1958 National Aeronautics and Space Act that created NASA, house a variety of specialized scientific and engineering facilities, many of which are underutilized today. The ad hoc panel of the National Research Council (NRC) has its origins in the Consolidated and Further Continuing Appropriations Act of 2012 (H.R. 2112), which funded NASA and other federal agencies. The law set aside \$1 million for the NASA inspector general “to commission a comprehensive independent assessment of NASA’s strategic direction and agency management.” The inspector general delegated the task to the NRC. The final report should “recommend how NASA could establish and effectively communicate a common, unifying vision for NASA’s strategic direction that encompasses NASA’s varied missions,” the agency’s inspector general said in its directives to the panel. Speaking to the panel June 26, James Beggs, who ran NASA from 1981 to 1985 said, “There is too much institution for the program, and there is too much program for the budget. If we are stuck with a budget of the current size, \$17 billion plus ... then we’ve got too much institution for a long time and we’ve got to figure out a way to shut part of it down.” Web posted. (2012). [NASA Review Committee Mulls Field Center Consolidation [Online]. Available WWW: <http://www.spacenews.com/> [2012, June 29].]

◆ The United Launch Alliance (ULA) Delta IV rocket has made its twentieth launch Friday morning from Space Launch Complex 37B at the Cape Canaveral Air Force Station, carrying the classified NROL-15 payload for the United States National Reconnaissance Office. The launch time was 13:15 UTC (09:15 local time) – after the countdown suffered three holds in a row during the terminal count stage – two of which related to out of family Fill and Drain valve indications. For the NROL-15 mission, the Delta IV, Delta 360, flew in the Heavy configuration, which consists of three Common Booster Cores (CBCs); one as the first stage and two as boosters. The Common Booster Cores are 40.8 metres (133.9 feet) long, and 5.1 metres (16.7 feet) in diameter. Each is powered by a single Pratt & Whitney Rocketdyne RS-68A engine. Web posted. (2012). [Delta IV Heavy launches NROL-15 from Cape Canaveral [Online]. Available WWW: <http://www.nasaspacelight.com/> [2012, June 29].]

◆ On Sunday, NASA’s Kennedy Space Center in Florida celebrates 50 years of launching humans and machines to other planets and into low Earth orbit. Since its inception as the Launch Operations Center on July 1, 1962, Kennedy has supported a variety of launch vehicles and payloads. The Mercury, Gemini and Apollo programs carried astronauts on space missions that culminated in moon landings. Planetary probes

lifted off on journeys that expanded our knowledge. The space shuttles launched 135 times and helped build the International Space Station. Kennedy Director Bob Cabana said, "In 50 years, less than a lifetime, Americans first pioneered paths into orbit, then made confident strides onto the surface of another world and sent instrument-laden machines into the perilous reaches of space beyond the solar system. All those voyages began here, made possible in large measure by the professionalism, determination and boldness of the Kennedy team." A 50th Anniversary website charts the five-decade history of Kennedy Space Center and includes a video that chronicles some of the center's most impressive milestones. As it turns 50, Kennedy is transitioning to the launch complex of the future, revamping existing infrastructure and facilities to provide the flexibility to host a variety of vehicles. "We have learned so much about exploring new horizons," Cabana said. "In our endeavors, we've also come to realize that there is so much out there for us to discover. Kennedy is the linchpin to NASA's new undertakings because we are, and always have been, the nation's premier launch site." In partnership with NASA's Johnson Space Center in Houston, the Commercial Crew Program at Kennedy is spurring the innovation and development of commercial spacecraft and launch vehicles to transport our astronauts to and from low Earth orbit and the International Space Station. Kennedy also will be the starting point for NASA's Orion crew capsule and Space Launch System heavy-lift rocket, which will provide an entirely new capability for human exploration beyond low Earth orbit. Kennedy's Launch Services Program is preparing for at least 25 missions to various destinations, including Mars, Pluto and our sun. ["NASA's Kennedy Space Center Celebrates 50th Anniversary July 1," **NASA News Release #31-12**, June 29, 2012.]

JULY



July 1: Fifty years ago today, NASA activated a lunar launch center on North Merritt Island, setting the stage for some of the greatest adventures in history. Created to meet an extraordinary Cold War challenge, what we now call Kennedy Space Center began rising from mosquito-infested marshland in east-central Florida. The Space Coast was born. NASA and the Army Corp. of Engineers would begin negotiations with land owners on North Merritt Island to acquire 80,000 acres for “a large space vehicle launch facility.” Three months after President John F. Kennedy’s call to send American astronauts to the moon, NASA wanted to expand its presence at Cape Canaveral and build a spaceport for manned lunar launches. What followed was a four-year, \$800 million project that the industry trade magazine *Architectural Forum* called “one of the most awesome construction jobs ever attempted by Earth-bound men.” Launch Complex 39 at KSC required a hangar big enough to assemble Saturn V moon rockets that stood 363 feet tall and 33 feet wide. At 525 feet tall, the Vehicle Assembly Building covers 8 acres and is one of the largest buildings by volume in the world. Launch gantries standing 45 stories tall would top mobile launch platforms. Giant tracked crawler transporters would be needed to haul the mammoth rockets to the launch pad. To support the 12 million-pound load, NASA would have to build a 100-foot-wide “crawlerway” comprising a 7-foot-deep bed of stones topped by a layer of asphalt and a surface made of Alabama river rocks. On July 1, 1962, NASA officially activated its Launch Operations Center, now known as KSC, granting the lunar launch site equal status with other agency field centers. Previously, it had been the Launch Operations Directorate of NASA’s Marshall Space Flight Center in Huntsville, Ala. The John F. Kennedy Space Center, so named by Executive Order 11129 on Nov. 29, 1963, just seven days after the assassination of America’s 35th president. Web posted. (2012). [A brief history of Kennedy Space Center’s 50 years [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 1].]

◆ Editorial: By Robert Cabana: A vibrant future: Fifty years after NASA established a spaceport to launch men to the moon and probes to explore the far reaches of our solar system, Kennedy Space Center's mission has not wavered. This week, our team is celebrating five decades of extraordinary accomplishments and unprecedented abilities. We're also gearing up for a vibrant future full of processing, testing and launching the most complex machines ever built. When the spaceport commenced on July 1, 1962, as the Launch Operations Center, its founders knew the complex would be a national resource capable of supporting a wide array of vehicles. During this decade, we're going back to those roots with the help of the Ground Systems Development and Operations Program by revamping existing infrastructure and facilities to give us the flexibility to host a variety of vehicles as we transition to the launch complex of the future. As our namesake, President John F. Kennedy, stated many years ago when he challenged the country to send astronauts to the lunar surface, this business is hard. But this team was up to the challenge then, and we will rise above it again as we reach even greater heights during the years ahead. We have learned so much about exploring new horizons. In our endeavors, we've also come to realize there is so much out there for us to discover. I often tell my team Kennedy Space Center is the linchpin to NASA's new undertakings because we are, and always have been, the nation's premier launch site. This complex still is a national resource, but it will take the continued support of this community to

take bold new steps in space. It was difficult to say farewell to our beloved space shuttles and the many folks who dedicated their lives to that phenomenal program. I hope each one of you gets the opportunity to visit the shuttle Atlantis once it's on display at the Kennedy Space Center Visitor Complex. It might help you understand the sheer magnitude of what can be accomplished when you combine tenacity with innovative thinking and the ability to adapt. The agency recently entrusted us with its newest human spaceflight program, a first for the center. In partnership with the Johnson Space Center in Houston, the Commercial Crew Program at KSC is spurring the innovation and development of commercial spacecraft and launch vehicles to transport our astronauts to and from low Earth orbit and the International Space Station. We'll also be the starting point for NASA's Orion crew capsule and Space Launch System heavy-lift rocket, which will provide an entirely new capability for human exploration beyond low Earth orbit. Our Launch Services Program is as busy as ever, too, gearing up for at least 25 missions to study places, such as Mars, Pluto and our sun. It's hard to convey everything our center is working on right now, but rest assured we are busier than ever. Our lights are still on, our doors are still open and the list of extraordinary things we plan to accomplish in this lifetime is long. Cabana is the director of Kennedy Space Center and a former space shuttle astronaut and commander. Web posted. (2012). [Op-Ed; Robert Cabana: A vibrant future [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 1].]

July 2: More than 450 guests at NASA's Kennedy Space Center in Florida welcomed the arrival of the agency's first space-bound Orion spacecraft Monday, marking a major milestone in the construction of the vehicle that will carry astronauts farther into space than ever before. "Orion's arrival at Kennedy is an important step in meeting the president's goal to send humans to an asteroid by 2025 and to Mars in the 2030s," NASA Deputy Administrator Lori Garver said. "As NASA acquires services for delivery of cargo and crew to the International Space Station and other low-Earth destinations from private companies, NASA can concentrate its efforts on building America's next generation space exploration system to reach destinations for discovery in deep space. Delivery of the first space-bound Orion, coupled with recent successes in commercial spaceflight, is proof this national strategy is working." The space-bound Orion will launch on Exploration Flight Test-1, an uncrewed mission planned for 2014. The spacecraft will travel 3,600 miles above the Earth's surface, 15 times farther than the International Space Station's orbital position. This is farther than any spacecraft designed to carry humans has gone in more than 40 years. The primary flight objective is to understand Orion's heat shield performance at speeds generated during a return from deep space. In advance of the 2014 launch from Cape Canaveral Air Force Station, Fla., a 400-person Orion production team at Kennedy will apply heat shielding thermal protection systems, avionics and other subsystems to the spacecraft. Web posted. (2012). [Space-bound Orion capsule arrives at Kennedy Space Center [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, July 2].]

◆ The first space-bound Orion capsule, the centerpiece of NASA's post-shuttle push to break out of low-Earth orbit for eventual manned flights to a variety of deep space targets, was officially unveiled at NASA's Florida spaceport Monday. The spacecraft will be outfitted for an unmanned test flight in 2014. "As KSC celebrates its 50th anniversary this month, I can't think of a more appropriate way to celebrate than by having the very first Orion Multi-Purpose Crew Vehicle here at KSC," Center Director Robert Cabana, a former shuttle commander, told more than 400 managers, engineers and technicians gathered at Kennedy's Operations and Checkout Building. "Orion is ushering in a new era of space exploration beyond our home planet, enabling us to go farther than we've ever gone before. The future is here, now, and the vehicle we see here today is not a Powerpoint chart. It's a real spacecraft, moving toward a test flight in 2014." The green interior pressure vessel that will make up the core of the first Orion capsule was delivered to Kennedy last week. Over the next year or so, engineers will attach a heat shield, install avionics systems and flight computers, along with other critical components. If all goes well, the capsule will be launched on an unmanned test flight -- Exploration Flight Test 1, or EFT-1 -- in 2014. NASA is designing a new Saturn 5-class heavy-lift rocket known as the Space Launch System, or SLS, for future manned exploration missions into deep space using Orion capsules. But the first test flight in 2014 will be

launched using a Delta 4 rocket built by United Launch Alliance. The flight plan calls for the Delta 4 to put the Orion MPCV on a trajectory carrying it to an altitude of some 3,600 miles before it slams back into the atmosphere at more than 20,000 mph, roughly comparable to the velocities that will be experienced by astronauts returning from deep space missions. If that mission goes well, NASA managers hope to launch another unmanned Orion atop an SLS rocket in 2017 to characterize the performance of the system in an integrated test. A third flight in the 2021 timeframe will include a crew of up to four astronauts. Along with developing new rockets and capsules for deep space missions, NASA also is funding development of commercial manned spacecraft intended to ferry astronauts to and from the International Space Station. The first manned test flight of a commercial spacecraft could come as early as 2015. But the first crewed NASA flight to the space station is not expected until 2017 at the earliest. Web posted. (2012). [NASA shows off first Orion capsule with KSC ceremony [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, July 2].]

◆ Editorial: By Lori Garver, NASA deputy administrator : "Lift off." For 50 years those words have not only signaled another launch from Kennedy Space Center, they have symbolized America's unquestioned leadership in the exploration of our solar system. Since its formal opening on July 1, 1962, NASA's John F. Kennedy Space Center has served as the departure gate for every American manned mission and hundreds of advanced scientific spacecraft. From Project Mercury to the Apollo moon missions, from our 30-year space shuttle program and International Space Station to the Hubble Space Telescope and Mars rovers, KSC has served as NASA's premier space launch center. This week, as KSC celebrates its 50th anniversary, we have more evidence that its future will be even brighter. On Monday, I joined Florida Sen. Bill Nelson and KSC Director Bob Cabana in a ceremony at the center celebrating the arrival of the Orion spacecraft, part of NASA's next generation exploration system. When Orion takes its first test flight in 2014, it will go farther than any spacecraft developed for human spaceflight has flown since astronauts returned from the moon. President Obama has set a goal of sending humans to an asteroid by 2025 and to Mars in the 2030s. Congress agreed that the best way to do that was for NASA to let our industry partners take the lead on delivery of cargo and crew to the International Space Station and other low Earth orbit destinations so that we could concentrate on building America's next generation exploration system, the Orion spacecraft and the Space Launch System. It is estimated that final construction and integration work on Orion will support at least 350 Space Coast jobs. Our new strategy is producing tangible results. In May, SpaceX became the first private company to launch from Cape Canaveral, dock to the space station and return its Dragon 9 capsule safely back to Earth. And President Obama has proposed \$500 million in investments in NASA's 21st century Space Launch Complex, including millions to transform KSC's launch infrastructure for government and commercial users. For 50 years, Kennedy has been America's gateway to space. With new missions and infrastructure improvements in the works, we are confident that the road to space will continue to go through KSC. Web posted. (2012). [My Word: Even brighter future ahead for KSC [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, July 2].]

◆ U.S. Navy Capt. Alan Poindexter, a retired NASA astronaut, was killed in a water scooter accident in Florida over the weekend. Poindexter flew two space shuttle missions, one aboard Atlantis as pilot and one on Discovery as commander, logging more than 669 hours in space before retiring from NASA in December 2010 to return to the Naval Postgraduate School in California. Web posted. (2012). [Retired NASA astronaut Alan Poindexter, 1961-2012 [Online]. Available WWW: <http://www.cnn.com/> [2012, July 2].]

July 3: In the quiet, peaceful setting of a storage bay in the northwest corner of NASA's cavernous Vehicle Assembly Building at the Kennedy Space Center on Monday afternoon, a handful of photographers got the chance to walk underneath, around and above the orbiter Atlantis, the spaceship that flew the final space shuttle mission a year ago this month. The spaceplane flew 33 missions in a

quarter-century of spaceflight, accumulating 307 days in space, 4,848 orbits of Earth and 125,935,769 miles traveled. She deployed memorable planetary probes, the Magellan radar mapper to Venus and Galileo to tour Jupiter, the Compton Gamma Ray Observatory, plus numerous military and commercial satellites, conducted a majority of cooperative dockings to the Russian space station Mir, gave the Hubble Space Telescope its last tuneup and labored to construct the International Space Station by hauling multiple modules. She then sailed into history with a final climb to orbit last July 8 and one final landing on July 21, bringing the wheels of the space shuttle program to a stop. Atlantis is in temporary storage as NASA closes down its orbiter hangars one by one. After Endeavour is finished undergoing her museum display preps in the sole remaining hangar next month, the two ships will swap places. For now, tourists from the KSC Visitor Complex can go inside the VAB to see Atlantis. The bustling crowds break up the silence of the building with periodic bus stops, emitting "oooo's" and "ahhh's" as they get to see a spaceship for the first time. Web posted. (2012). [The majesty of a spaceship: Up-close with Atlantis [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, July 3].]

◆ ATK announced Tuesday its Liberty space transportation system will comprise crew and cargo modules to haul seven astronauts and up to 5,000 pounds of supplies and science experiments to the International Space Station on the same flight. The combined crew and cargo capability differentiates ATK from its commercial competitors, which plan to offer only limited resupply capacity on crewed missions. "Liberty's expanded service allows us to bring a commercial capability delivering up to seven crew members, 5,000 pounds of pressurized cargo, along with external cargo in a single flight," said Kent Rominger, ATK vice president and program manager for Liberty. "This results in tremendous value since all other commercial offerings would need two flights to accomplish what Liberty does in one." Astronauts and cargo will blast off on a Liberty rocket, which ATK is proposing for NASA's commercial crew program. NASA expects to award two companies between \$300 million and \$500 million in 21-month agreements beginning as soon as this month. The space agency plans to release about half that amount of funding to a third company, which will continue development of a commercial crew transportation system at a slower pace. ATK is currently working on the Liberty proposal with private funding, and company officials say government financing is necessary to meet a schedule calling for a first piloted mission to low Earth orbit by late 2015. The aerospace firm has an unfunded Space Act Agreement with NASA, where the space agency shares expertise with ATK but does not pay an award. Web posted. (2012). [ATK extends Liberty proposal to include cargo resupply [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, July 3].]

◆ NASA has signed a new partnership with Craig Technologies of Melbourne, Fla., to maintain an inventory of unique processing and manufacturing equipment for future mission support at the agency's Kennedy Space Center in Florida. Under a five-year, non-reimbursable Space Act Agreement, NASA will loan 1,600 pieces of equipment to Craig Technologies. The equipment supported Space Shuttle Program capabilities such as flight hardware and cable fabrication. It was used in manufacturing, repair and inspection processes necessary for spaceflight hardware, avionics and ground processing. "This is an innovative way to ensure that space shuttle era technology and tools are reused for other hi-tech, private sector purposes along the Space Coast," said David Weaver, NASA's associate administrator for the Office of Communications. "This is all part of NASA's plan to support the transition to the next era of exploration, creating good-paying American jobs and keeping the United States the world leader in space." Craig Technologies will be able to use the equipment for five years beginning January 2013 or until NASA requires use of it, whichever comes first. Craig will be required to operate, maintain and store the property at a single location within a 50-mile radius of Kennedy. The equipment currently is located in the NASA Shuttle Logistics Depot in Cape Canaveral, Fla., and managed by United Space Alliance (USA). The equipment will remain there through the end of the year when the current USA lease expires. ["NASA Signs Agreement with Craig Technologies for Kennedy's Unique Equipment," **NASA News Release #12-223**, July 3, 2012.]

July 6: Excalibur Almaz Inc. (EAI) has successfully completed its Commercial Crew Development Round 2 (CCDev2) partnership with NASA's Commercial Crew Program. Through CCDev2, NASA is spurring innovation and development of safe, reliable and cost-effective spacecraft and launch vehicles capable of transporting astronauts to low Earth orbit and the International Space Station. EAI, based in Houston, began exchanging technical information with NASA about its human spacecraft concept for low Earth orbit crew transportation in October 2011 under an unfunded Space Act Agreement (SAA). The company and NASA reviewed the design of the spacecraft, its systems requirements and compatibility with launch vehicle alternatives. Additional milestones included presentations on how the company plans to test and integrate its spacecraft in advance of a crewed launch. All of the EAI SAA milestones were completed by June 19. "During this unfunded Space Act Agreement with EAI, NASA learned valuable information about how the company plans to upgrade the existing capsule with modern flight capabilities," CCP Manager Ed Mango said. "We commend the EAI team for completing all of their established milestones during this partnership." EAI plans to upgrade human space capsules built and tested decades earlier with new internal systems and a service module. The spacecraft can accommodate three crew members and accompanying cargo during trips to low Earth orbit. It will consist of a reusable reentry capsule, launch abort system and expendable service module. EAI plans to outfit the spacecraft with the ability to land on the ground, rather than in the ocean. All of NASA's industry partners continue to meet their established milestones in developing commercial crew transportation capabilities. Web posted. (2012). [NASA and Excalibur Almaz Inc. Complete Space Act Agreement [Online]. Available WWW: <http://www.spaceref.biz/> [2012, July 6].]

July 8: One year ago, the shuttle Atlantis thundered into history on the 135th and final launch of America's Space Transportation System after 31 years of service. Web posted. (2012). [The final shuttle launch [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, July 8].]

July 9: The Aerospace Safety Advisory Panel (ASAP) will hold its 3rd Quarterly Meeting for 2012 at the Kennedy Space Center Visitor Complex. This discussion is pursuant to carrying out its statutory duties for which the Panel reviews, identifies, evaluates, and advises on those program activities, systems, procedures, and management activities that can contribute to program risk. Priority is given to those programs that involve the safety of human flight. The agenda will include: Updates on the Space Launch System; Updates on the Multi-Purpose Crew Vehicle; Updates on the Commercial Crew Program; Kennedy Space Center Safety Program Overview; NASA Responses to ASAP Recommendations. Web posted. (2012). [NASA Aerospace Safety Advisory Panel, 11:30-12:30 ET, Kennedy Space Center [Online]. Available WWW: <http://www.spacepolicyonline.com/> [2012, July 9].]

◆ NASA's Kennedy Space Center in Florida has announced a new partnership with Cella Energy Inc. that could result in vehicles being powered by hydrogen, which is cleaner and produces no greenhouse gases. This new approach to hydrogen will be the focus of research, development and possible production during the five-year Space Act Agreement (SAA) between Kennedy and Cella. The company has formulated a way to store hydrogen safely in tiny pellets that still allow the fuel to be burned in an engine. Because of its rocket work, Kennedy has the infrastructure and experience necessary to handle hydrogen safely. Cella hopes to make its micro-bead technology practical enough to be used as a fuel in most kinds of machinery, cars, and perhaps even spacesuits and portable electronics. The eventual goal is to use it in fuel-cell engines, which combine hydrogen and oxygen to generate electricity and produce water as the only exhaust product. Kennedy has worked with fuel-cell technology in Apollo spacecraft and space shuttles. The company already has offices in the Space Life Sciences Laboratory at Kennedy and is expected to become an early tenant at Exploration Park, a research center now under construction at the space center. Under the agreement, Kennedy will serve as a consultant to Cella for developing an integrated solution for hydrogen storage and help Cella incorporate Kennedy-developed hydrogen sensing color-changing polymers. Cella also is interested in working with lightweight aerofoam and aeroplastic,

another NASA innovation, notable for their thermal-insulating properties. [“NASA Partners With Cella Energy on Hydrogen Technology,” **NASA News Release #34-12**, July 9, 2012.]

July 10: Brevard County is back in the space race. That was the reaction from lawmakers, economic development officials and the founders of a Utah-based company called Rocket Crafters Inc., which on Tuesday announced plans to move its fledgling high-tech aerospace operation to Titusville. A soon-to-be-manufacturer of suborbital space planes and developer of innovative propulsion systems, Rocket Crafters laid out an ambitious program to create hundreds of jobs for the area over the next several years while dramatically advancing the concept of point-to-point transportation. Filling those jobs would be aerospace engineers, designers, pilots, program managers, administrators and others. According to its ambitious production schedule, the company would have about 1,300 employees by 2017-18. Rocket Crafters’ plan is to build aircraft that would take off like traditional jets, fly into sub-orbit and then land like a jet thousands of miles away, completing a journey that would take about one-sixth the time it would take a traditional airliner. The company selected Titusville over sites in Colorado, New Mexico, Utah and Texas mainly because of its space resources — including experienced aerospace workers and knowledgeable officials — and an incentive package that included the city of Titusville providing the company a temporary, 23,000-square-foot hangar, testing facility and headquarters on the edge of Space Coast Regional Airport. The state and county also agreed to several performance-based incentives. In two years, Rocket Crafters hopes to complete a 400,000-square-foot facility on 33 acres of airport land that it would fill with equipment. Total cost: More than \$70 million. Web posted. (2012). [Rocket Crafters move brings Titusville back to the future [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 10].]

July 11: NASA partner Sierra Nevada Corporation (SNC) has completed a successful test of the nose landing gear for its full-scale Dream Chaser engineering flight test vehicle. The completed test and an upcoming flight test are part of SNC's Commercial Crew Development Round 2 (CCDev2) agreement with NASA's Commercial Crew Program. The gear test is an important milestone to prepare for the upcoming approach and landing test of the Dream Chaser Space System later this year. It evaluated the impact the nose landing gear will experience on touchdown in order to ensure a safe runway landing. SNC is one of seven companies developing commercial crew transportation capabilities to ferry U.S. astronauts to and from low Earth orbit and the International Space Station. The Dream Chaser is the only spacecraft under CCDev2 that is winged and designed to land on a conventional runway. It is designed to carry as many as seven astronauts to space. SNC tested the spacecraft's main landing gear in February. This nose landing gear test completes the milestones leading up to the upcoming approach and landing test, which will complete the CCDev2 partnership. All of NASA's industry partners, including SNC, continue to meet their established milestones in developing commercial crew transportation capabilities under CCDev2. [“NASA’s Commercial Crew Partner Sierra Nevada Completes Dream Chaser Nose landing Gear Test,” **NASA News Release #12-231**, July 11, 2012.]

◆ Production work on NASA's first space-bound Orion spacecraft is beginning at Kennedy Space Center and manufacturer Lockheed Martin is on track for a first flight test in 2014, a company official said today. James Kemp, Lockheed Martin's senior Orion production manager at KSC, told a crowd of about 200 people, that about four months of production work is beginning at the Operations and Checkout Building at KSC. The work on the spacecraft crew module is cranking up in the wake of its delivery last week. Designed to fly four astronauts on deep space missions, the module will be outfitted with various subsystems over the coming months. Then the crew module will be integrated with a service module, a heat shield and a launch abort system. It represents the first time spacecraft factory production work has been done at KSC. The fully integrated spacecraft is scheduled to be launched in 2014 aboard a Delta IV Heavy rocket at Cape Canaveral Air Force Station, Kemp said at a National Space Club luncheon. The flight will test the spacecraft's heat shield during the type of high-speed reentry a vehicle would make

during a return from an asteroid, the moon, Mars or other deep space destinations. Web posted. (2012). [Production work begins on Orion spacecraft at KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 11].]

July 12: NASA partner Space Exploration Technologies (SpaceX) has completed an important design review of the crewed version of its Dragon spacecraft. The concept baseline review presented NASA with the primary and secondary design elements of its Dragon capsule designed to carry astronauts into low Earth orbit, including the International Space Station. SpaceX is one of several companies working to develop crew transportation capabilities under the Commercial Crew Development Round 2 (CCDev2) agreement with NASA's Commercial Crew Program (CCP). Through CCDev2, NASA is helping the private sector develop and test new spacecraft and rockets with the goal of making commercial human spaceflight services available to commercial and government customers. In the June 14 review conducted at the company's headquarters in Hawthorne, Calif., SpaceX provided details about each phase of a potential crewed mission. This included how the company plans to modify its launch pads to support such missions, Dragon's docking capabilities, the weight and power requirements for the spacecraft, and prospective ground landing sites and techniques. The company also outlined crew living arrangements, such as environmental control and life support equipment, displays and controls. "SpaceX has made significant progress on its crew transportation capabilities," NASA CCP Manager Ed Mango said. "We commend the SpaceX team on its diligence in meeting its CCDev2 goals to mature the company's technology as this nation continues to build a real capability for America's commercial spaceflight needs." Safety was a key focus of the review. The SpaceX team presented NASA with analyses on how its SuperDraco launch abort system would perform if an emergency were to occur during launch or ascent. The review also outlined plans for getting astronauts away from danger quickly and safely on the way to low Earth orbit, in space and during the return home. ["NASA Commercial Partner SpaceX Completes Dragon Design Review," **NASA News Release #12-233**, July 12, 2012.]

◆ Drastic cuts to NASA's budget are threatening pay and benefits for Kennedy Space Center's fire and rescue personnel, workers said Thursday, sparking a union protest outside the space center. "We are here today to send a very poignant message to both the company G4S and NASA to keep their hands off what the fireman have already earned," said Kevin Smith, president of Transport Workers Union Local 525. The union represents workers for G4S Government Solutions, formerly Wackenhut. It took over NASA's fire and rescue contract at Kennedy Space Center eight months ago. The workers are negotiating a new contract, which is to begin in December. During the first year of its contract, G4S agreed that salaries and benefits would remain unchanged. But now, fire and rescue workers say the company wants to cut pay by 20% and eliminate the workers' pension plan. NASA spokesman Mike Curie told CNN, "no new employees will be covered under the previous pension plan," going forward. "G4S is attempting to negotiate a 401k plan with the union." Curie also said that "under the Kennedy protective service contract, workers who are covered under the previous contract benefit plan are not losing any benefits." The protest comes more than a year after NASA ended its 30-year space shuttle program and the loss of thousands of related jobs throughout Florida's Space Coast. Web posted. (2012). [Firefighters at Kennedy Space Center protest possible pay cuts [Online]. Available WWW: <http://www.cnn.com/> [2012, July 12].]

◆ NASA invites its social media followers to a two-day NASA Social Aug. 2-3 to celebrate Kennedy Space Center's 50 years of human spaceflight. NASA Socials are in-person meetings with people who engage with the agency through Twitter, Facebook, Google+ and other social networks. Participants will receive a unique perspective into Kennedy's 50 years of launching humans and machines into low Earth orbit and to other planets. They will be treated to speakers from Kennedy's past, present and future, and tour the historical launch pads of NASA's early days through the present-day facilities that supported the Space Shuttle Program and Kennedy's transition to the future. The event will culminate with Kennedy's participation in NASA's first-ever multi-center simulcast to preview the landing of the Mars Science

Laboratory's Curiosity rover. The simulcast will be held at the Kennedy Space Center Visitor Complex. ["NASA Invites Social Media Followers to Kennedy Space Center, **NASA Media Advisory #M12-130**, July 12, 2012.]

July 13: Four companies will split \$200 million in NASA funds to study concepts for the side-mounted boosters needed to power future configurations of the planned heavy-lift Space Launch System (SLS), the U.S. space agency said July 13. The selected companies will now begin contract negotiations with NASA, the agency said in a press release. Awards for the 30-month study contracts are due in October, said NASA spokeswoman Kim Henry. NASA will use the results of the studies it funds to develop a solicitation for the next-generation SLS booster system. That solicitation is due out in 2015, according to NASA's press release. SLS is the congression-ally mandated heavy-lift rocket NASA is designing for future deep-space missions. Early SLS flights will launch with five-segment solid rocket boosters developed by ATK Launch Systems of Magna, Utah, for the cancelled Constellation program. Future SLS configurations, however, must be able to lift 130 metric tons to low Earth orbit. To do that, SLS will need new boosters that are more powerful than the ATK-developed solids. These next-generation boosters could be either solid- or liquid-fueled, NASA has said. Web posted. (2012). [Four Companies Picked for Advanced Booster Studies [Online]. Available WWW: <http://www.spacenews.com/> [2012, July 13].]

◆ The United Launch Alliance Atlas 5 rocket that will hurl two satellites into orbit next month to probe the harsh environment of Earth's radiation belts and understand the extremes of space weather began taking shape Friday at Cape Canaveral. At the Vertical Integration Facility adjacent to Cape Canaveral's Complex 41 launch pad, technicians hoisted the giant first stage onto the mobile launching platform as the stacking operations got underway to assemble the vehicle for its planned Aug. 23 blastoff with NASA's Radiation Belt Storm Probes mission. Friday's operation featured the first stage, known as the Common Core Booster, being rotated vertical, maneuvered into the 30-story VIF building and then the 106.6-foot-long stage stood upright on the mobile platform. Bronze in color and 12.5 feet in diameter, the stage is equipped with a dual-nozzle RD-180 main engine that will burn kerosene fuel and supercold liquid oxygen during the initial four minutes of flight. Stacking was delayed by two days due to unfavorable weather conditions. Once the first stage was locked into position, the interstage adapter was scheduled to be set in place. This barrel-like structure tapers from the first stage's large diameter to the skinner Centaur upper stage that will be installed on Monday. The payload and nose cone, already encapsulated together, come to the VIF for installation in early August to complete the 19-story-tall vehicle for flight in the Atlas' 401 configuration. Rollout to the launch complex occurs Aug. 21 as the 1.4-million pound platform rides the rail tracks 1,800 feet from the VIF to the pad. The seven-and-a-half-hour countdown operation begins at 8:38 p.m. EDT on Aug. 22, leading to cryogenic liquid oxygen and liquid hydrogen fueling operations in the overnight hours for a planned blastoff at 4:08 a.m. EDT Aug. 23. The day's launch window stretches 20 minutes. There is another Atlas 5 launch between now and then, however. At California's Vandenberg Air Force Base, an Aug. 2 blastoff is planned with a classified payload for the National Reconnaissance Office. Also coming up later this year for the busy Atlas program is the Oct. 26 deployment of Pentagon's X-37B orbital spaceplane taking its third voyage and launch of NASA's next Tracking and Data Relay Satellite on Dec. 6. Web posted. (2012). [Atlas 5 rocket being stacked for NASA science mission [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, July 13].]

◆ Job hunters hoping for a shot at work on a next-generation human spacecraft resembling a miniature shuttle filled a hotel conference room and lined hallways here Thursday morning. "I'm encouraged there's so many good and talented people available, but it's sad that there are so many people that are looking for work that have been helping our nation's space program in the past," said Jim Voss, a former astronaut who heads development of Sierra Nevada Corp.'s winged Dream Chaser spacecraft. The Dream Chaser is among the private sector vehicles competing to fly NASA crews to the International Space Station by 2017. NASA plans to give two companies "full" awards worth \$300 million to \$500 million

over 21 months, and one company a “half” award. An announcement is expected in late July or early August. Sierra Nevada eventually expects to employ about 200 people on the Space Coast, gradually ramping up to that total as two planned test launches approach in 2016. Web posted. (2012). [Space-related job seekers flood Sierra Nevada event in Brevard [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 13].]

July 16: One of the world's most reliable space boosters ever built, suspended in a state of uncertainty for the past several months, won a rebirth today when NASA purchased three more Delta 2 rockets for future launches. The United Launch Alliance-made vehicle was dealt a bleak future when the U.S. Air Force left as the Delta 2's anchor tenant in 2009 and NASA flew what was its final planned payload on the medium-class launcher last October. With no future missions on the manifest, it was possible that the workhorse rocket would fade away into history despite hardware available to build five more vehicles. NASA's contracting arrangement established in 2010 didn't even include the Delta 2 as an option when buying rockets for science spacecraft deployments, but that changed with an "on-ramp" deal last fall that put the rocket back in the lineup for space agency satellites to choose. Then came today's announcement that literally breathed new life into venerable rocket program, assigning three satellite launches to the Delta 2 that will occur from Vandenberg Air Force Base, California. The launch trio and all of the assorted processing support, oversight, engineering and telemetry costs amount to \$412 million. "ULA is honored NASA has selected the Delta 2 launch vehicle to launch these critical science payloads," said Michael Gass, ULA president and CEO. Web posted. (2012). [NASA gives the Delta 2 rocket a new lease on life [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, July 16].]

◆ NASA tapped United Launch Alliance (ULA) and Space Exploration Technologies Corp. (SpaceX) to launch a total of four Earth Science missions between 2014 and 2016, the agency said in a pair of press releases issued late July 16. United Launch Alliance of Littleton, Colo., got a \$412 million contract to launch three of the missions aboard Delta 2 rockets from Space Launch Complex 2 at Vandenberg Air Force Base, Calif. ULA will launch NASA's Soil Moisture Active Passive spacecraft in October 2014, the Orbiting Carbon Observatory-2 in July 2014, and the Joint Polar Satellite System-1 in November 2016. NASA in March said that ULA was likely to get a contract for these missions. Hawthorne, Calif.-based SpaceX, meanwhile, will get \$82 million to launch Jason-3, which a French-U.S. satellite that will measure the height of global sea surfaces. The mission will ride to space aboard a Falcon 9 in December 2014 from Vandenberg's Space Launch Complex 4, NASA said. The missions stand to be SpaceX's first launch of a NASA science satellite. SpaceX also bid on the trio of Earth Science launches that went to ULA. ULA has parts for five Delta 2 rockets left in its inventory. The rocket last flew in October, when it launched NASA's Suomi NPP weather and climate satellite from Vandenberg. NASA Earth Science officials have said that they are willing to pay a premium price for launch reliability to avoid losing any more payloads. Back-to-back failures of Orbital Sciences Corp.'s Taurus XL rocket in 2009 and 2011 doomed two Earth science satellites at a cost of about \$1 billion to the agency, NASA Earth Science Director Michael Freilich said July 10. Web posted. (2012). [NASA Taps ULA, SpaceX for Earth Science Launches [Online]. Available WWW: <http://www.spacenews.com/> [2012, July 16].]

July 17: A Brevard Community College training facility for space workers has moved off Kennedy Space Center and will expand the scope of technology courses it offers as part of an effort to better prepare workers for some of the new industries gaining a foothold on the Space Coast. “We’re going to take what we learned in aerospace and broaden it to other technologies,” said Al Koller, executive director of the SpaceTEC/ CertTEC Testing and Certification Center in Cape Canaveral. The center is not abandoning its space focus, though. It also plans to train workers for SpaceX, which recently sent a commercial cargo module to the International Space Station. “The center has done a superb job training space workers and will continue providing that service as NASA and the nation’s space program move

into a new era," BCC President Jim Richey said. Web posted. (2012). [BCC's SpaceTEC training center expands horizons [Online]. Available WWW: <http://www.spacenews.com/> [2012, July 17].]

◆ NASA is conducting a nine-day field test starting Tuesday outside Hilo, Hawaii, to evaluate new exploration techniques for the surface of the moon. These mission simulations, known as analog missions, are performed at extreme and often remote Earth locations to prepare for robotic and human missions to extraterrestrial destinations. The In-Situ Resource Utilization (ISRU) analog mission is a collaboration of NASA partners, primarily the Canadian Space Agency (CSA), with help from the Pacific International Space Center for Exploration Systems (PISCES). The ISRU analog mission will demonstrate techniques to prospect for lunar ice. The testing site near Hilo features lava-covered mountain soil similar to the ancient volcanic plains on the moon. The two main tests under way are the Regolith and Environment Science and Oxygen and Lunar Volatile Extraction (RESOLVE) and Moon Mars Analog Mission Activities (MMAMA). The demonstration includes CSA's Artemis Jr. rover and a drill. These devices support the NASA RESOLVE payload. RESOLVE is designed to prospect for water, ice and other lunar resources. It also will demonstrate how future explorers can take advantage of resources at potential landing sites. The rover and its onboard instrumentation are about as tall as a human and weigh about 660 pounds, three times heavier than the equipment that would be used on an actual mission. Lessons learned from the ISRU project will become increasingly important as NASA embarks on deep-space missions. Instead of having to launch from Earth with all the supplies needed, a human crew could go into space knowing that natural resources already are waiting for them. ["NASA Conducts Mission Simulations in Hawaii," **NASA News Release #12-237**, July 17, 2012.]

July 18: Forrest S. McCartney, former director of NASA's John F. Kennedy Space Center, died July 17, 2012, with his family in attendance. He was 81 years old. McCartney, of Indialantic, Fla., was Kennedy's director from Sept. 1, 1987, until Dec. 21, 1991. "It is with great sadness that I learned of the passing of former Kennedy Space Center Director Forrest McCartney," said Kennedy Director Robert Cabana. "Forrest was one of the finest gentlemen I have ever known, and no one cared more for the KSC team than Gen. McCartney. He was always out in the processing areas talking with the troops and getting the pulse of KSC. He was a man with the highest integrity who always did the right thing. He will most certainly be missed." McCartney served as director of Kennedy under detail from the U. S. Air Force beginning Oct. 1, 1986. He came to NASA from the position of commander, Air Force Space Division and concluded a distinguished 35-year military career on Aug. 31, 1987, with a retirement ceremony at the office of the Secretary of the Air Force in the Pentagon. Web posted. (2012). [NASA Mourns Loss of Former Kennedy Director Forrest McCartney [Online]. Available WWW: <http://www.spaceref.com/> [2012, July 18].]

◆ NASA Administrator Charles Bolden issued the following statement Wednesday on the death of former Kennedy Space Center Director Forrest McCartney: "On behalf of the entire NASA family, I wish to express our condolences on the passing of Retired United States Air Force Lt. General and former Kennedy Space Center Director Forrest S. McCartney. After 35 years of distinguished service in the United States Air Force, McCartney was named Kennedy Space Center director in 1987, only months after the fateful Challenger accident had shocked the nation and put the shuttle program on hiatus. McCartney's visionary leadership resulted in the shuttle's return-to-flight and a stellar safety record during his five-year tenure. In the 50-year history of Kennedy Space Center there have been only 10 directors. Forrest McCartney was one of the finest. As an engineer, a patriot and a leader, McCartney leaves an indelible mark on America's space program. His service to his country and to Kennedy earned him distinguished service medals from both the Air Force and NASA. We are grateful for his many contributions and we honor his legacy by rededicating ourselves to the values of exploration, education and inspiration that were the hallmarks of his life. Our thoughts and prayers are with his wife Ruth and

the McCartney family." ["NASA Administrator Offers Condolences on the Passing of Former Kennedy Center Director Forrest McCartney," **NASA News Release #12-242**, July 18, 2012.]

◆ Friends and family on Wednesday remembered Forrest McCartney as an American patriot who led a devastated Kennedy Space Center work force through the difficult recovery from the 1986 Challenger disaster. McCartney, 81, a retired Air Force lieutenant general and the fourth director of KSC, died late Tuesday after a short illness. Family surrounded him when he passed away at a hospice in Palm Bay. At McCartney's request, no services are planned. "Forrest was a good man. He was a good husband, a good father, a good grandfather, a good friend and a great patriot," said George English, the former director of KSC's Executive Management Office and a close friend. "He was a good man." A strong, personable leader, McCartney, a longtime resident of Indian Harbour Beach, played a huge role in rebuilding the shuttle program after the Challenger disaster. His leadership paved the way to the successful launches of critical national security satellites, the Hubble Space Telescope, the Magellan Venus radar mapper, the Galileo Jupiter probe, the Ulysses solar explorer and, ultimately, the International Space Station. "Everyone here at Kennedy will miss him greatly," said KSC spokeswoman Lisa Malone. "He came into Kennedy at a critical time. It was a time when the workforce needed healing, and he knew that and took that to heart. He got the center through a difficult transition time — through the return to flight after Challenger." He'll best be remembered for being loved not only on the fourth floor of KSC's headquarters building, but on shop floors, too. "I've always felt that the real work gets done on the floor, and not up in the front office," McCartney told *Florida Today* in a recent interview. So after Challenger, McCartney spent at least half of his time visiting work sites around the center. "I never realized it would be such a wonderful adventure. Not in my wildest imagination did I believe that I would have as much satisfaction, and just plain fun, as being the center director at Kennedy Space Center," McCartney said. Web posted. (2012). [McCartney crucial in healing a heartbroken KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 18].]

July 19: The Intrepid Sea, Air and Space Museum's brand-new exhibit showcasing the space shuttle Enterprise officially opened to the public today (July 19), and hundreds of excited men, women and children waited patiently in line for the chance to get up-close and personal with the city's newest and most impressive space artifact. To celebrate the opening of the new Space Shuttle Pavilion, the Intrepid hosted a special ceremony Thursday morning at the museum here, which is located at Pier 86 on Manhattan's West Side. Web posted. (2012). [Space Shuttle Enterprise Wows New Yorkers at Intrepid Museum [Online]. Available WWW: <http://www.space.com/> [2012, July 19].]

◆ NASA partner United Launch Alliance (ULA) has completed a review of its Atlas V rocket to assess its compliance with NASA human spaceflight safety and performance requirements. ULA has partnered to launch Boeing's CST-100, Sierra Nevada's Dream Chaser and Blue Origin's Space Vehicle on missions to low Earth orbit and the International Space Station. NASA provided technical consultation during the ULA review. ULA is one of several companies working to develop crew transportation capabilities under the Commercial Crew Development Round 2 (CCDev2) agreement with NASA's Commercial Crew Program (CCP). Through CCDev2, NASA is helping the private sector develop and test new spacecraft and rockets with the goal of making commercial human spaceflight services available to commercial and government customers. The Atlas V has launched numerous satellites and robotic missions into space for NASA, including the Mars Science Laboratory Curiosity rover and the Juno probe to Jupiter. Requirements to launch humans will require more stringent criteria, so the company has to show its rocket can meet the extra demands. Among adjustments required to evolve the Atlas V for human spaceflight, designers would have to modify the launch pad so crew members can board the spacecraft. The upper stage of a crewed Atlas V would require the use of two Centaur engines, stronger than the current Atlas V upper stage that uses a single engine. The onboard flight computers would be programmed to guide the rocket on a more managed path through the sky into orbit. Sensors also would

be added to the rocket to detect emergency situations for the crew. All of NASA's industry partners, including ULA, continue to meet their established milestones in developing commercial crew transportation capabilities under CCDev2. ["NASA Partner United Launch Alliance completes Two Atlas V Reviews," **NASA News Release #12-245**, July 19, 2012.]

July 20: The NASA launch pad from which Apollo 11 lifted off for the first manned moon landing and Atlantis left Earth to fly the last space shuttle mission is now open to the public for tours. Launch Pad 39A at the Kennedy Space Center (KSC) in Florida is the latest, limited-time tour stop being offered by the NASA spaceport's visitor complex. The tours — which also include separate trips to KSC's 52-story tall Vehicle Assembly Building (VAB) and the Launch Control Center (LCC) — are now being offered as part of the center's 50th anniversary celebration. "These are very rare opportunities that NASA has worked with us to provide to our visitors from Florida, across the United States and overseas," Bill Moore, chief operating officer of NASA's Kennedy Space Center Visitor Complex, said in a statement. "With exciting new space exploration programs coming to the Kennedy Space Center, we may never have access to such historic places like this again." Pad 39A was one of two large launch complexes built in the 1960s to support the Saturn V launches to the moon, Saturn IB launches to the Skylab space station and space shuttle launches to deploy and service satellites and build the International Space Station. Pad 39A's twin, Pad 39B, was stripped of its iconic launch support towers last year to make way for possible future commercial and government launch vehicles. Pad 39A, which supported 92 launches since November 1967 — 12 Saturn V rockets and 80 shuttles — is being maintained to support NASA's Space Launch System (SLS) heavy-lift next generation booster now being developed. The current downtime between launches has allowed the opportunity for the visitor complex to bring guests closer to the launch pad than ever before. Web posted. (2012). [Next stop, the launch pad: NASA's Apollo, shuttle launch site opens for tours [Online]. Available WWW: <http://www.collectspace.com/> [2012, July 20].]

July 23: Former NASA astronaut Sally Ride died today after losing her battle with pancreatic cancer. A physicist, Dr. Ride was the first American woman in space and spent the rest of her career encouraging girls and young women to pursue science careers. Ride was among the first group of NASA astronauts to include women in 1978. In 1983, she became the first American woman to fly in space on the seventh space shuttle mission, STS-7. She flew a second time on STS-41G in 1984. She was assigned to another mission, but it was delayed following the 1986 space shuttle Challenger tragedy. Ride served on the presidential commission that investigated the Challenger accident and afterwards was assigned to NASA headquarters to look at the future of the space program. The 1987 "Ride Report" recommended a return to the Moon and, someday, journeys to Mars, but cautioned that Mars missions should be a step, but not the next step, for the U.S. program. Her report also recommended a Mission to Planet Earth, which popularized the phrase as describing a long term series of robotic earth observing missions that came to include NASA's Terra, Aqua and Aura spacecraft. Ride left NASA soon after the report's completion to return to academia. In addition to academic posts at Stanford and UC San Diego, she founded Sally Ride Science to motivate girls and young women to study science. She also was a member of the commission that investigated the space shuttle Columbia tragedy in 2003, the only person to serve on both space shuttle accident investigations. Web posted. (2012). [Sally Ride Loses Battle With Cancer [Online]. Available WWW: <http://www.nytimes.com/> [2012, July 23].]

◆ NASA has launched a rocket carrying an inflatable heat-shield technology demonstration flight from its Wallops Flight Facility in Virginia. The agency says a Black Brant XI sounding rocket carrying the Inflatable Reentry Vehicle Experiment was launched Monday morning. It's projected to splash down about 100 miles east of Cape Hatteras, NC. Web posted. (2012). [NASA launches rocket from Virginia facility [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 23].]

July 24: Florida Highway Patrol troopers are investigating a deadly crash involving a car and a bicyclist near the Kennedy Space Center. The crash happened at about 8:50 a.m. today at Kennedy Parkway near

Jerome Road, not far from the Main Gate 3 entrance to Kennedy Space Center on Merritt Island. The identity of the person killed has not been released. "The (troopers) are still investigating it. But what we have right now is that it is a vehicle that may have struck a person on a bike," said Trooper Wanda Diaz of the Florida Highway Patrol. A medical helicopter from First Flight had initially been called to the scene but was then cancelled, officials report. Brevard County Fire Rescue and Kennedy Space Center Fire Rescue crews also responded. Web posted. (2012). [1 killed with car hits bicycle near KSC Main Gate 3 [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 24].]

July 25: Brevard County commissioners approved \$182,400 in incentives to help persuade rocket maker XCOR Aerospace Inc., to open a manufacturing and operations center at Kennedy Space Center, a project the company said would create 152 jobs. In a presentation prepared for delivery at Tuesday's County Commission meeting, XCOR indicated that the potential Florida operation would be at KSC and its shuttle landing facility. The project would include hangar and flight operations, vehicle manufacturing, engine assembly and space tourism elements. Because the project would be on KSC property, a more traditional approach of the county providing property-tax breaks for the company tied to job creation would not work in this case, according to Assistant County Manager Stockton Whitten. The county incentives will act as a local match for nearly \$1 million worth of state incentives under the Florida Qualified Target Industry Tax Refund Program. XCOR builds, tests, sells and operates reusable, rocket-powered space vehicles and rocket engines that can be used for suborbital, orbital and deep-space applications. It hopes to develop such businesses as launching small satellites to low-earth orbit, as well as having a role in environmental and military-related missions. Web posted. (2012). [Brevard County approves a deal for XCOR [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 25].]

July 26: NASA has selected RTD Construction, Inc., of Zephyrhills, Fla., to provide construction services for the revitalization of Kennedy Space Center's water distribution and waste water collection systems. The maximum potential value for the two-year fixed price contract is approximately \$25.6 million. RTD Construction, Inc. will replace more than 125,000 feet of existing water mains and various water valves, hydrants, fittings and connections. The company also will replace or refurbish 33 sewer systems and replace more than 25,000 feet of sewer pipes and associated electrical and communications systems and wiring. Subcontractors working with RTD Construction on the revitalization contract include MIL-CON Electric Company of Merritt Island, Fla.; Santis Engineering, Inc. of Cape Canaveral, Fla.; Killebrew Inc. of Lakeland, Fla.; and EE&G Construction & Electrical, LLC of Melbourne, Fla. ["NASA Selects Contract For Water and Waste Water Revitalization," **NASA Contract Release #C12-031B**, July 26, 2012.]

July 30: United Space Alliance plans to lay off 148 workers at Kennedy Space Center in September, according to a notice filed last week with the state Department of Economic Opportunity. The notice said employees working in administrative and support, waste management and remediation services would be affected. "It's a continuation of the ramp-down following the end of the space shuttle program, so there's not one particular group of people targeted," USA spokeswoman Kari Fluegel in Houston said. The last shuttle mission ended July 21, 2011. About 8,000 space industry workers have lost their jobs as the 30-year-old shuttle program came to an end. The latest layoff will take place on Sept. 28. "We expect additional layoffs as we continue to complete the transition and retirement work (on the space shuttles)," Fluegel said. Just over 2,500 remain at work for USA in Alabama, Houston and Florida, with nearly 1,300 in Florida. Web posted. (2012). [Shuttle contractor USA to lay off 148 at Kennedy Space Center [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 30].]

◆ Fifty years ago, on Feb. 23, 1962, President John F. Kennedy traveled to Florida to honor Mercury astronaut John Glenn at historic Hangar S on Cape Canaveral Air Force Station. Three days earlier, Glenn made history, becoming the first American to orbit Earth — a feat that put the fledgling U.S. space program on equal footing with the Soviet Union in a Cold War battle for technological and ideological

supremacy. The space agency is in the midst of a post-shuttle era examination of all its facilities at KSC and Cape Canaveral. The goal: Determine which facilities will be needed to move ahead with the development of new rockets and spacecraft for deep space missions; which facilities might entice commercial space taxi companies, and which facilities no longer have a reason for being. “Unfortunately, there are some buildings that aren’t sustainable anymore, some that we can’t really afford to maintain,” said Tom Engler, deputy manager of the Center Planning and Development Office at KSC. “This is a 60-plus-year-old building. It has a lot of maintenance issues, and it’s actually beneficial to the center to put them on the abandon list and then eventually demolish them because they are too expensive for us to maintain.” The annual operating cost at Hangar S: \$148,000. NASA this summer will request proposals for a demolition design contract, and then select a company to develop the ways and means to bring the building down. It’s unclear exactly when the demolition contractor will be selected, but the entire process is likely to take a year. Web posted. (2012). [NASA’s historic Hangar S faces bitter end [Online]. Available WWW: <http://www.floridatoday.com/> [2012, July 30].]

July 31: Top-secret surveillance spacecraft and several smaller research satellites will be launched aboard an Atlas 5 rocket scheduled for blastoff from Vandenberg Air Force Base early Thursday. The United Launch Alliance rocket is sitting at Space Launch Complex-3 East on South Base, where crews have spent the past several months preparing the booster for blastoff. The team is shooting for liftoff at 12:40 a.m. Thursday, Air Force officials said. The actual launch window remains top secret but officials earlier said the liftoff would occur by 1:30 a.m. However, unfavorable weather or technical troubles can delay launches. Mission managers are set to meet today for a final launch readiness review. Web posted. (2012). [Top-secret spacecraft set for launch [Online]. Available WWW: <http://www.lompocrecord.com/> [2012, July 31].]

◆ NASA has paid off the \$511 million that was needed to cover a pension shortfall at United Space Alliance (USA), which maintained and operated the space shuttle fleet until its retirement last year, the agency confirmed July 31. “NASA received the final voucher for payment on Wednesday, July 18, and paid it on Monday July 23,” agency spokesman Josh Buck wrote in a July 31 email to *Space News*. The payment closes the books on NASA’s biggest unsettled expense from the shuttle era. The agency had to cover the pension shortfall because its contract with Houston-based USA, a joint venture of Boeing Co. and Lockheed Martin Corp., allows the company to charge NASA for all personnel expenses. NASA has known since 2010 that covering the USA pension shortfall — created by stock market declines prior to that time, and by provisions in contract law that affected when USA could bill the government for retirement expenses — likely would cost \$500 million or more. The agency asked Congress for \$548 million to be paid out in 2012 so that it could write USA the check, but lawmakers appropriated only \$470 million, instructing NASA to make up the difference by diverting money budgeted for USA-led shuttle retirement activity. Buck said NASA followed that directive. USA was established 17 years ago to operate the space shuttle fleet on NASA’s behalf. The shuttle program ended last July. Web posted. (2012). [NASA Settles Space Shuttle Contractor Pension Liability [Online]. Available WWW: <http://www.spacenews.com/> [2012, August 1].]

AUGUST

August 1: NASA's highly anticipated announcement about the winners of its next awards for development of commercial crew spacecraft is planned for 9 a.m. Friday, the agency said this afternoon. Kennedy Space Center, home of the Commercial Crew Program, will host a press conference at 10 a.m. featuring NASA Administrator Charles Bolden, Kennedy Space Center Director Robert Cabana and Commercial Crew Program Manager Ed Mango. The agency is expected to name up to three companies it will provide up to \$500 million in funding through the spring of 2014. ATK, The Boeing Co., Sierra Nevada Corp. and SpaceX are considered the finalists. One or more of those firms could win NASA contracts to ferry astronauts to the International Space Station by 2017. Web posted. (2012). [NASA to announce commercial crew awards Friday [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 1].]

◆ NASA's social media followers at seven field centers around the nation will virtually come together at a NASA Social on Friday, Aug. 3, to preview the landing of the Mars Science Laboratory's (MSL) Curiosity rover on Aug. 6 EDT (Aug. 5 PDT). NASA Socials are in-person meetings with people who engage with the agency through Twitter, Facebook, Google+ and other social networks. Events will be held simultaneously at the Ames Research Center in Moffett Field, Calif.; Glenn Research Center in Cleveland; Goddard Space Flight Center in Greenbelt, Md.; Jet Propulsion Laboratory (JPL) in Pasadena, Calif.; Johnson Space Center in Houston; Kennedy Space Center in Cape Canaveral, Fla., and Langley Research Center in Hampton, Va. Kennedy will be celebrating its 50th anniversary during its NASA Social. From 12:30 to 2:30 p.m. EDT, every center will be connected with JPL, which manages the MSL mission for NASA, via a multi-center NASA Television simulcast. NASA Social participants at each center will have the opportunity to ask questions of the JPL science and engineering teams during the simulcast. More than 150 social media followers also will tour their respective host NASA center. "NASA Hosts Social Media Events Across Seven Agency Field Centers," **NASA Media Advisory #M21-144**, August 1, 2012.]

August 2: A team at KSC will be starting a series of tests of a prototype lander that won't fly in space but is developing technologies future human or robotic missions might use. Called Morpheus — after the Greek god of dreams — the 10-foot diameter, 2,300-pound "spacecraft" consists of four silver spherical propellant tanks topped by avionics boxes and a web of wires. It arrived at KSC from Houston last week after 18 months of work at Johnson Space Center that included low test flights while tethered to a crane. A first untethered flight could be performed as soon as next week, working up within several months to a roughly half-mile hop across a simulated lunar landscape set up near the north edge of the center's 15,000-foot shuttle runway. In all, 16 flights are planned to test new propulsion and navigation systems. Work on some of the systems began in 2006, when NASA's Constellation program planned a human return to the moon. Kennedy's wide-open space at the end of the shuttle runway provided a convenient location for the test flights, which will climb as high as 1,600 feet, reach up to 70 mph and last as long as two minutes. The 330-by-330-foot "hazard field" includes five potential landing pads, 311 piles of rocks and 24 craters that mimic an area on the moon's south pole. "We're not landing on something that looks like a big open grass field, we're landing on something that looks like a planetary body," said Gregory Gaddis, the project's KSC manager. The field's surface and craters were formed from fine rocks that lined the center's crawlerway before its most recent refurbishment ahead of the shuttle program's end. Web posted. (2012). [Morpheus lander prototype ready for KSC tests [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 2].]

◆ The Atlas 5 rocket was fueled up and ready for launch early Thursday on the NROL-36 mission from Vandenberg Air Force Base in California. However, a mandatory piece of equipment for the Range went down and the issue couldn't be resolved in time for liftoff before the day's launch opportunity ran out. Officials ordered a 24-hour scrub. The new liftoff time for the next launch attempt tonight is 12:27 a.m.

local. Web posted. (2012). [Atlas 5 rocket launch from California scrubbed 24 hours [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 2].]

◆ NASA's Kennedy Space Center is celebrating its 50th anniversary by opening its gates for virtual tours through a partnership with Google Maps. The launch pads that sent Americans to the moon, probes to distant planets and space shuttles into Earth orbit are just a few clicks away through Google's largest special collection of Street View imagery to date, totaling 6,000 panoramic images of Kennedy. Google Maps with Street View lets you explore Kennedy's facilities, roads and structures through 360-degree street-level imagery that includes the Apollo/Saturn V Center, Space Shuttle Main Engine shop, Orbiter Processing Facility-3, the Launch Control Center, the Space Station Processing Facility and the center's iconic Vehicle Assembly Building. Users may go directly to Google Maps, search for "NASA Shuttle Landing Facility," and drag the orange "pegman" icon on the left-hand side to an area outlined in blue. From there, users can navigate around the area by moving up and down pathways and looking around in 360 degrees. The Street View feature in Google Maps enables users to see Kennedy as it transitions to the multipurpose launch complex of the future, revamping existing infrastructure and facilities to provide the flexibility to host a variety of commercial and government spacecraft, rockets and other craft. ["NASA and Google Partner to Release 360-Degree Interactive Images of Kennedy Space Center on 50th Anniversary, NASA News Release #42-12, August 2, 2012.]

August 3: NASA on Aug. 3 announced its selection of Boeing Space Exploration of Houston and SpaceX of Hawthorne, Calif., for final-phase development funding under its Commercial Crew Program, designed to provide domestic astronaut transportation services to and from the international space station. Boeing will receive \$460 million during the 21-month performance period of its Commercial Crew Integrated Capability (CCiCap) Space Act Agreement; SpaceX garnered \$440 million. Whereas Boeing and SpaceX are developing wingless capsules, Sierra Nevada Space Systems of Louisville, Colo., is offering a more maneuverable lifting body design borrowed from an old NASA program dubbed HL-20. Sierra Nevada's Space Act Agreement is valued at \$212.5 million. Passed over for a CCiCap award was ATK Aerospace of Magna, Utah, the longtime supplier of solid rocket motors for NASA's now-retired space shuttle fleet. If Boeing and SpaceX meet all of their self-imposed, NASA-approved milestones in the 21-month CCiCap base period, their designs for astronaut taxi systems will undergo a critical design review, the final hurdle to clear before construction can begin. Sierra Nevada's crew transportation system would not undergo a critical design review at the end of its Space Act Agreement. Web posted. (2012). [Boeing, SpaceX and Sierra Nevada Stay in Race for Commercial Crew [Online]. Available WWW: <http://www.spacenews.com/> [2012, August 3].]

August 4: As announced on Friday by NASA officials as they revealed the winners of the Commercial Crew Integrated Capability (CCiCap) awards, Kennedy Space Center (KSC) will hold an industry forum on August 8, 2012 at KSC to provide an update on NASA's plans. KSC's procurement office released the details yesterday. The forum will be from 1:00-2:00 pm ET at the KSC press site and will be webcast and available via teleconference. Details are in NASA/ KSC's announcement. Topics will be: * An update from Program Forum held February 7, 2012; * Overview of Commercial Crew Certification Strategy; * Commercial Crew Program's (CCP) intentions for future procurement opportunities; * Two Phase Acquisition Approach for Certification; * Phase 1 - Certification Products Contract (CPC) Procurement Summary; * Short clarification question and answer session. Web posted. (2012). [NASA To Hold Commercial Crew Program Forum at KSC on August 8 [Online]. Available WWW: <http://www.spacepolicyonline.com/> [2012, August 4].]

August 6: Kennedy Space Center crews this morning attached a tail cone to the orbiter Endeavour, one of the last major preparations for its planned ferry flight to California next month. Endeavour is expected to depart its processing hangar for the final time to move into the Vehicle Assembly Building on Aug. 16, swapping places with Atlantis. A multi-day ferry flight to Los Angeles International Airport is officially

still planned for mid-September, but tentatively targeting a Sept. 17 start. Based on that plan, the orbiter would be rolled to the Shuttle Landing Facility on Sept. 14 to be hoisted atop a 747 carrier aircraft. Endeavour is bound for public display at the California Science Center. The shuttle program's youngest orbiter, Endeavour flew 25 times between 1992 and 2011. NASA has already delivered Discovery to the Smithsonian National Air and Space Museum's Udvar-Hazy Center in Chantilly, Va., and Enterprise to the Intrepid Sea, Air & Space Museum in New York City. Atlantis could be moved to the KSC Visitor Complex in November. Endeavour's tail cone was moved into Orbiter Processing Facility-2 on Friday and installation began this morning. The operation will be completed Tuesday. Web posted. (2012). [Preparations for shuttle Endeavour's trip to California near end [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 6].]

August 7: Sierra Nevada Corporation (SNC) have stepped up their evaluations into finding a suitable facility to house the Dream Chaser fleet in Florida. With the Kennedy Space Center (KSC) confirmed as their fleet's HQ, several buildings – ranging from an Orbiter Processing Facility (OPF) to other available buildings at the famous spaceport – may become viable options. Pitted against two capsules – SpaceX's Dragon and Boeing's CST-100 – Dream Chaser is the only option that is a lifting body vehicle, derived from the NASA Langley HL-20 spaceplane concept from the 1980s. Being different is a positive angle for SNC, who have previously cited Dream Chaser's "dissimilar redundancy" when compared to its competitors. Dream Chaser will not launch from the Shuttle launch pads at Complex 39, instead it will launch atop an Atlas V from SLC-41 at Cape Canaveral. However, of the three main commercial contenders, it will be the most active at the Kennedy Space Center (KSC), utilizing the Shuttle Landing Facility (SLF) for its return from space, but also using the spaceport for its processing needs. Web posted. (2012). [SNC evaluating KSC processing facilities to house the Dream Chaser fleet [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, August 7].]

◆ NASA's Ed Mango will be guest speaker at Tuesday's Aug. 14 luncheon meeting of the National Space Club at the Radisson Resort at the Port, Cape Canaveral. The program manager of the Commercial Crew Program at Kennedy Space Center will speak on "Innovation and the Next Step in U.S. Space Transportation." Web posted. (2012). [NASA leader to speak at space lunch [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 7].]

August 8: With no more space shuttles to land, Kennedy Space Center is seeking an outside partner to take over operation of its 15,000-foot runway known as the Shuttle Landing Facility. A commercial or government operator could start managing the facility as soon as October 2013, working to broaden its use to include takeoffs and landings of suborbital space vehicles carrying tourists or satellites. "The direction we're moving is away from merely a landing facility to a launch and landing facility," said Mario Busacca, chief of KSC's Spaceport Planning Office. Release of the facility to an outside manager could be the first step toward a new model for how the entire center is run. Master planners have envisioned a future in which the spaceport is managed more like an airport, with NASA one of many customers sharing the costs. "This will be a good test case for us to understand how that (concept) would work in the long term," said Tom Engler, deputy manager of KSC's Center Planning and Development Office. On Wednesday, KSC asked interested parties to submit proposals for how they would operate and maintain the runway and surrounding facilities. Located two-and-a-half miles northwest of the Vehicle Assembly Building, the Shuttle Landing Facility, or SLF, opened in 1976. It supported the landings of 78 shuttle missions between 1984 and 2011. Various NASA and Defense Department aircraft also use the runway. NASA is now testing a prototype lunar lander in a field at its northwest end. Kennedy is completing an assessment of the potential environmental impact resulting from greater use of the runway. A recent study funded by Space Florida and the Federal Aviation Administration estimated the suborbital market could be worth up to \$1.6 billion within a decade. According to a draft environmental assessment released in May, multiple suborbital operators could each perform hundreds of takeoffs and landings a

year there by 2015. Web posted. (2012). [KSC looks for runway partner [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 8].]

◆ The lineup of Atlas 5 rocket launches this month -- a national security satellite deployment from California and a NASA space weather research project from Florida -- will flip-flop in order to give the Air Force more time to sort out Range instrumentation troubles that stalled the West Coast blastoff originally planned Aug. 2. The lineup of Atlas 5 rocket launches this month -- a national security satellite deployment from California and a NASA space weather research project from Florida -- will flip-flop in order to give the Air Force more time to sort out Range instrumentation troubles that stalled the West Coast blastoff originally planned Aug. 2. That puts the Aug. 23 launch of the Radiation Belt Storm Probes from Cape Canaveral next in the firing order. The rocket has been assembled and is scheduled to be topped by the tandem spacecraft on Thursday. At Vandenberg Air Force Base, meanwhile, engineers continue their analysis and troubleshooting to understand a problem with the Western Range that cropped up late in the countdown on Aug. 2. The issue scrubbed the rocket's attempt to launch that day and the vehicle remains grounded awaiting a new liftoff date. "During (the) countdown, Western Range Operations Control Center safety personnel identified an issue in the Mission Flight Control Center. The center processes radar, optical and telemetry data from instrumentation sites located on and off Vandenberg and displays and processes commands for the mission flight control officer, whose main responsibility is to terminate the flight of the launch vehicle should we need to for public safety reasons," the Air Force said in a statement to Spaceflight Now. Hoping the Range trouble would be fixed sooner rather than later, officials tentatively retargeted the launch for Aug. 14 or 15, the last opportunities to perform the California mission without impacting the Florida flight on Aug. 23. The time necessary to complete the review of data from one launch before granting clearance to the next one requires about a week between missions. But in meetings this week, the decision was made to stand down from the California launch for now and focus on getting the Aug. 23 flight performed for NASA. Whenever that rocket does launch, it will carry a classified payload for the National Reconnaissance Office known as NROL-36. Web posted. (2012). [California Atlas 5 launch delayed a few more weeks [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, August 8].]

August 9: NASA Inspector General Paul K. Martin today released an audit examining NASA's leasing practices for its underused facilities. NASA is the ninth largest property holder in the Federal Government, controlling approximately 5,400 buildings and structures that support NASA research, development, and flight activities. In total, these assets occupy 44 million square feet and are estimated to cost more than \$29 billion to replace. Given the programmatic and fiscal challenges facing NASA, Agency managers must balance the need to reduce NASA's real property footprint with ensuring that NASA retains currently underutilized facilities that it may need to support future missions. NASA has several options after identifying real property as underutilized, including making the property available for lease to other Federal, state, or private organizations. Properly implemented, leasing can generate revenue to offset facilities operations and maintenance costs. However, Federal law requires NASA to dispose of property for which it does not have a current or future mission use. Moreover, leasing unneeded property cuts against the Agency's efforts to reduce its real property footprint. Accordingly, NASA must be careful not to use leasing as a substitute for disposing of underutilized property for which it has no current or future use. This Office of Inspector General (OIG) review found that while NASA has made improvements to its leasing program in recent years, the Agency faces significant challenges to maximizing the benefits of its leasing program. Specifically, we found that NASA did not have clear guidance to ensure that property identified for leasing had a current or future mission use; lacked a complete inventory of space available for lease as well as an effective marketing program to attract potential tenants; lacked internal controls to ensure that its leases provide the best value to NASA and are fair to potential partners; and did not have guidance to ensure that in kind consideration that it accepts as part of a leasing arrangement benefits NASA. Absent better controls and improved guidance, the OIG concluded that NASA will be hard-pressed to maximize the full potential of its leasing program to help

reduce the cost of maintaining underutilized facilities while meeting its obligation to ensure that leasing does not become a substitute for disposing of excess property. As NASA considers expanding its leasing agreements to help manage its infrastructure challenges, the OIG recommended that the Agency strengthen its guidance, training, and documentation requirements to ensure it is receiving the highest possible benefits from its lease agreements and that the agreements are made in the most transparent manner to ensure fairness to all parties. NASA agreed to take actions to address each of our recommendations. Web posted. (2012). [NASA's Infrastructure and Facilities: Assessment of Agency's Real property Leasing Practices [Online]. Available WWW: <http://www.spaceref.com/> [2012, August 9].]

◆ A small vertical-takeoff-and-landing rocket being used to test advanced technologies veered off course an instant after liftoff from the Kennedy Space Center Thursday, crashed and exploded in a spectacular burst of fire and smoke. There were no injuries or other property damage, officials said. The Morpheus rocket was designed and built by engineers at NASA's Johnson Space Center in Houston to test advanced technologies and approaches to integrated propulsion and guidance, navigation and control that could be used in the future for cargo missions to the moon. The rocket's engine burns liquid oxygen and methane, a propellant that can be easily stored in space. The Morpheus rocket has been test fired while attached to a crane, but engineers were staging its first untethered free flight Thursday near the Kennedy Space Center's shuttle runway. The rocket's engine appeared to ignite normally and the vehicle climbed vertically for just an instant before tipping over and crashing on its side. A few moments later, as the wreckage burned, a secondary explosion erupted, presumably the result of a ruptured tank. "During today's free-flight test at Kennedy Space Center, the Project Morpheus vehicle lifted off the ground and then experienced a hardware component failure, which prevented it from maintaining stable flight," NASA said in a brief statement. "No one was injured and the resulting fire was extinguished by Kennedy fire personnel. "Engineers are looking into the test data and the agency will release information as it comes available. Failures such as these were anticipated prior to the test, and are part of the development process for any complex spaceflight hardware. What we learn from these tests will help us build the best possible system in the future." On its web page, Morpheus engineers described the rocket as a demonstration test bed for "green propellant propulsion systems and autonomous landing and hazard detection technology. Web posted. (2012). [Small test vehicle veers out of control, crashes at KSC [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, August 9].]

◆ A Titusville priest is credited with saving the life of another clergy member caught in the waves off Playalinda Beach during a Wednesday afternoon excursion. The incident happened about 1 p.m. Wednesday as 52-year-old priest at St. Teresa of Avila Catholic Church in Titusville and the unidentified priest were at the popular, undeveloped beach, located along the Canaveral National Seashore. The priest, who was revived, was airlifted to Holmes Regional Medical Center in Melbourne where is expected to survive, reported Jeff Taylor, spokesman for Brevard County Fire-Rescue. The near drowning unfolded near pier one of the popular beach. Witnesses said the priest was in the water when he appeared in distress. Rescue crews from Brevard County and the Kennedy Space Center responded. Kennedy Space Center's public safety officers were investigating the incident. Web posted. (2012). [Priest saves priest from drowning at Playalinda Beach [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 9].]

August 10: NASA's Radiation Belt Storm Probes, RBSP, are set to launch aboard a United Launch Alliance Atlas V 401 rocket Aug. 23. The 20-minute launch window for the twin probes at Cape Canaveral Air Force Station's Space Launch Complex 41 begins at 4:08 a.m. EDT. Launch commentary coverage, as well as prelaunch media briefings, will be carried live on NASA Television and the agency's website. RBSP will explore space weather -- changes in Earth's space environment caused by the sun -- that can disable satellites, create power-grid failures and disrupt GPS service. The mission also will allow researchers to understand fundamental radiation and particle acceleration processes throughout the

universe. [“NASA Sets Radiation Belt Storm Probes Mission/Atlas V Launch Events Coverage,” **NASA Media Advisory #M44-12**, August 10, 2012.]

August 12: The Exploration Flight Test Orion (EFT-1) is into its first month of outfitting operations, aimed at turning what is a shell of a structure into a real spaceship. The outfitting operations at the Kennedy Space Center (KSC) will take 17 months, using the bulk of the processing flow timeline ahead of its scheduled launch atop of a Delta IV Heavy in 2014. As many as 400 members of the Orion team will work on final assembly and integration operations prior to the EFT-1 uncrewed launch in 2014, outfitting the vehicle’s structure to that of the Orion depicted in NASA pictures and videos. One of the first tasks is to install the windows on the crew module – as much as there won’t be a crew onboard to take in the view. “The Exploration Flight Test (EFT-1) Crew Module pressurized structure was relocated into its processing station within the High-Efficiency Particulate Air (HEPA) clean area at KSC’s Operations & Checkout building in preparation for installation of the secondary structures,” noted Orion status. “The crew impact attenuation system (CIAS) bracket drilling operations and installations have been completed and the team has started work on installing the windows on the vehicle as well as the development flight instrumentation sensors. Over the next 17 months, it will undergo outfitting with subsystem components and testing in support of the EFT-1 flight test in 2014.” Web posted. (2012). [NASA EFT-1 Orion into 17 months of outfitting at KSC [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, August 12].]

August 14: A pair of hardened spacecraft that will explore the harsh environment of Earth's radiation belts and the United Launch Alliance Atlas 5 rocket that will provide the singular power to hurl the two satellites into looping orbits will undergo a combined checkout Tuesday. The Integrated Systems Test for the rocket and the twin Radiation Belt Storm Probes will be run to confirm the booster and payload are ready for their departure from the launch pad next week. The tip-to-tail electrical checkout verifies systems throughout the 19-story vehicle and stacked satellites are working properly ahead of the predawn blastoff Aug. 23. RBSP and the Atlas have been operating on separate paths during manufacturing and assembly. But they finally met last Friday, getting bolted together in preparation for the launch. Current operations are being performed in the Vertical Integration Facility next to the Complex 41 pad at Cape Canaveral. Rollout of the rocket to the pad atop its mobile platform is planned for next Tuesday. The satellites were readied for flight at the commercially-run Astrotech satellite processing campus in Titusville. After the two spacecraft were placed one on top of the other, then encapsulated in the rocket's two-piece nose cone in the cleanroom and placed aboard board a trailer-like transporter for the drive to the rocket's assembly building. Web posted. (2012). [Radiation probes and Atlas 5 getting ready to fly [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, August 14].]

August 15: NASA has selected A-P-T Research Inc. of Huntsville, Ala., to provide mission assurance, engineering and risk assessment services at the agency's Kennedy Space Center in Florida. The maximum potential value for the four-year cost-plus-award-fee Safety and Mission Support Services II (S-MASS II) contract is \$36 million. A-P-T Research Inc. will perform the mission assurance, engineering and risk assessment services in the disciplines of safety, reliability, and quality at Kennedy and all Kennedy-assigned facilities at sites that include Vandenberg Air Force Base and NASA's Dryden Flight Research Center in California. Subcontractors working on the S-MASS II contract include Mantech International Corp. of Fairfax, Va.; SAIC of McLean, Va.; GP Strategies Corp. of Elkridge, Md.; Davis Strategic Innovations Inc. of Huntsville; and Cummings Aerospace of Huntsville. [“NASA Awards Contract for Kennedy Space Center Safety and Mission Support Services,” **NASA Contract Release #C12-041**, August 15, 2012.]

◆ Eight years after space experts, astronauts and other influential people in aerospace gathered for what turned out to be the last Space Congress, organizers are attempting to revive the program. Promising a leaner version of past gatherings that will reflect the changing landscape of the space industry in Brevard

County, one that still involves government support of programs but also recognizes the growing influence of private and commercial industry participants, organizers have announced a Space Congress will be held Dec. 7. "We're expecting 100 to 150 coming to the event, as opposed to twice that number before," said Frederick Martin, general chairman of the new Space Congress. "And it's going to be one day instead of three. Once considered the world's premier aerospace conference, the Space Congress made its debut in 1962 and was staged annually by the Canaveral Council of Technical Societies. Then, in 2005, the congress was combined with the Cape Canaveral Spaceport Symposium. In 2006, the joint event was moved to Orlando and subsequently canceled. David Fleming, chairman of the Canaveral Council of Technical Societies and one of the organizers of this year's event, said no one expects the new Space Congress to look like past ones. Fleming attended the final two Space Congresses and said they were impressive. But the landscape has changed dramatically since then, said Fleming, an associate professor of aerospace engineering at the Florida Institute of Technology. A speakers list is under development, and organizers hope to get some top names in aerospace from Brevard County to speak at the event. The Space Congress will focus on what's happening on the Space Coast as far as aerospace and detail what needs to be done to promote the space industry. Web posted. (2012). [Rebooted Space Congress changes with industry [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 15].]

August 16: During another occasion marking a shuttle program "last," Kennedy Space Center crews on Thursday lightened the mood with a likely first: a shuttle sporting "bling." Endeavour backed out of its processing hangar for the last time with one wheel covered by a spinning silver hubcap with cutouts of five orbiters, the number that flew in space. "It just kind of shows we're trying to keep it light," said NASA's Stephanie Stilson, who is overseeing the orbiters' preparations for public display and said it was her first time seeing the accessory she called "a little bit of bling." "There's a lot of negativity in the sense that (shuttle contractors) are losing their jobs, and we're well aware of that. We live that every day," she said. "They're not going to let the negativity of losing jobs affect them enjoying the moment, and that's what's really important." Endeavour swapped places with Atlantis, pausing for a final meeting before both depart Kennedy for museums — Endeavour across the country to the California Science Center in Los Angeles and Atlantis down the road to the KSC Visitor Complex. Endeavour is scheduled to take off atop a 747 carrier aircraft one month from today. It will spend its final weeks here inside the Vehicle Assembly Building, before moving to the runway Sept. 14. Atlantis is targeting a Nov. 2 roll to the Visitor Complex. "We've finished all the work on Endeavour," Stilson said. "Atlantis is close to being complete." Atlantis took Endeavour's spot in Orbiter Processing Facility-2, the last of three orbiter hangars that is still actively used. Remaining work includes the installation of mock-up airlock and cameras, and finishing touches in the crew compartment and around a set of replica main engines. Atlantis is expected to return to the assembly building in mid-October, a move that will mark the end of the orbiters' involvement in NASA's Shuttle Transition and Retirement program. The Visitor Complex will handle Atlantis from there. Back in April, NASA and United Space Alliance teams delivered Discovery to the Smithsonian Institution's National Air and Space Museum in Chantilly, Va., and the prototype Enterprise to New York, where it recently opened for display at the Intrepid Sea, Air & Space Museum. On Thursday, dozens of employees gathered to watch and take pictures of KSC's two remaining orbiters as they met nose to nose. Between them, the space ships logged 58 of the 135 shuttle missions. Stilson said she and her team were happy to have reached another milestone in the more-than-yearlong effort to prepare the shuttles for public display. But it was sad for many to see Endeavour — fitted with a tail cone for its upcoming ferry flight — exit its hangar for the last time, especially for those who had spent entire careers working on that orbiter. At least they got to see it. Another round of layoffs is expected in September. Endeavour's custom hubcap was actually designed before the final shuttle mission, which Atlantis flew last July, and was signed by some of its crew members. On Thursday, they had a little fun with a little bling, shuttle style. Web posted. (2012). [Last two shuttles at Kennedy Space Center swap places [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 16].]

August 17: Weighing less than 31 pounds, Explorer 1 was America's first satellite. It was launched Jan. 31, 1958 in the International Geophysical Year (IGY), on a Juno I rocket. The Juno I was basically a Redstone missile with more powerful fuel. Instead of alcohol, a hydine and liquid oxygen (LOX) fuel combination provided 10 percent more thrust. Pioneering rocket fuel scientist Mary Sherman Morgan, who engineered the fuel mixture, suggested calling her new fuel invention "bagel and LOX," but "hydine" was chosen instead by the U.S. Army. This was the only Juno launch to use this fuel. Explorer 1 produced the first scientific discovery of the Space Age: the Van Allen Radiation Belts. Over 50 years later, the Van Allen Radiation Belts still present a mystery. A mystery that will now be probed by a new mission: the Radiation Belt Storm Probe (RBSP), due to launch at 4:08 a.m. Thursday. The launch window extends for 20 minutes. This time an Atlas V rocket will loft twin probes into a highly elliptical orbit that will skim just 373 miles above the Earth's surface to a maximum altitude of approximately 23,000 miles, the distance of the geosynchronous satellites. To measure the differences between different layers of the radiation belts, one satellite will slightly overtake the other, changing the distance between them. In addition, the orbits will slowly turn, taking in all time zones over the course of two years to measure the effect of the angle of the Sun on the processing going on between the solar wind and the Earth's magnetosphere. Web posted. (2012). [Stargazing: New mission zooms through Van Allen belts [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 17].]

August 19: This week's planned launch of an Atlas V rocket carrying a pair of NASA science satellites has been delayed by a day, to Friday, United Launch Alliance reported Sunday evening. ULA needed time to ensure that an engine problem discovered on a different Atlas V rocket during testing in an Alabama factory does not also exist on the rocket at Cape Canaveral Air Force Station's Launch Complex 41. Launch of NASA's Radiation Belt Storm Probes mission is now scheduled for 4:07 a.m. EDT Friday. Forecasts show a 60 percent chance of favorable conditions during the 20-minute launch window. A Launch Readiness Review was planned Monday morning at Kennedy Space Center, to be followed by press briefings on the mission and its science objectives starting at 1 p.m. Web posted. (2012). [Launch of NASA science satellites delayed to Friday [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 20].]

August 20: Launch teams conducted tests Monday on an Atlas V rocket scheduled to launch later this week from Cape Canaveral Air Force Station to ensure there's no problem with the system that controls the steering of its main engine. An issue arose Saturday evening during testing of another RD-180 engine at United Launch Alliance's factory in Decatur, Ala. Monday's test and data review were expected to provide the confidence necessary to proceed with a 4:07 a.m. Friday launch attempt. A final review to sign off on Friday's launch attempt was planned for this afternoon at Kennedy Space Center. "We did have high confidence that we would be able to get through this, but we did want to perform today's confidence testing as well as complete a data review," Tim Dunn, the NASA launch director for the mission, said Monday during a press conference at KSC. The testing prompted a one-day delay in the launch of the twin satellites flying NASA's \$686 million Radiation Belt Storm Probes mission, or RBSP. If the launch team is satisfied, the 189-foot rocket would roll a quarter-mile to its Launch Complex 41 pad around 10 a.m. Wednesday at Cape Canaveral Air Force Station. There's a 60 percent chance of favorable weather during Friday's 20-minute launch window, with a chance of thick cloud cover. Web posted. (2012). [Teams run tests on Atlas V [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 20].]

◆ NASA's weird traditions detailed. When the launch team was preparing for STS-1 — the first orbital shuttle flight — people would bring in covered dishes to share during prelaunch and postlaunch operations. NASA test director Norm Carlson joined in the potluck, and on April 12, 1981 — launch day — he brought a small crock pot of beans and cornbread. The launch was a success, and the beans and cornbread disappeared. Carlson doubled his offering of beans and cornbread for STS-2's November 12 launch, and again they were devoured after the shuttles reached orbit. He kept bringing in larger quantities

of beans until it got to be too much. Instead, he set up an 18 quart cooker on the fourth floor of the Launch Control Center. The call of “Beans are Go!” became the traditional signal of a successful launch that was celebrated with a helping of beans made to Carlson’s recipe: Successful Launch Beans, *Courtesy of Norm Carlson, former NASA Test Director Chief*

Put 6 lbs. of dried Great Northern Beans in an 18-quart electric cooker.

Cut 10 lbs. of smoked ham into cubes.

Add ham and ham bones to beans.

Add ½ shaker of lemon pepper.

Add 3 lbs. chopped onions.

Add 2 stalks chopped celery.

Add 1 tsp. liquid smoke.

Cover with water and cook for at least 8 hours.

Enjoy! Famous Launch Day Cornbread: Martha White Self-Rising Corn Muffin Mix / Follow directions on box. Web posted. (2012). [Steak, Beans and Vests: NASA’s Weird Traditions [Online]. Available WWW: <http://news.discovery.com/> [2012, August 20].] Web posted. (2012). [Launch tradition gets its start [Online]. Available WWW: <http://www.nasa.gov/> *Spaceport News*[2001, April 12].]

August 21: Rocketing away on its maiden mission, an inaugural ascent loaded with a paying passenger, the Atlas 5 debuted 10 years ago Tuesday in a flight packed with compelling suspense. It was August 21, 2002, the Lockheed Martin-made booster was fueled up on its Cape Canaveral launch pad at Complex 41, counting down to blastoff at 6:05 p.m. EDT (2205 GMT). Web posted. (2012). [Atlas 5 rocket @ 10 years: A decade since debut launch [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, August 21].]

◆ One of the iconic ships that ferried the space shuttle’s solid rocket boosters (SRBs) back to shore after they splashed down in the Atlantic Ocean – will be leaving the shores of the Space Coast. NASA’s MV Liberty Star will be sent to the U.S. Merchant Marine Academy in Kings Point, N.Y. This is part of a memorandum of understanding or MOU signed by NASA and the Transportation Department’s Maritime Administration (MARAD). Under this agreement signed on Tuesday Aug. 21 Liberty Star will be used by the National Defense Reserve Fleet – as a training vessel. In this capacity, the ship will be used by midshipmen at the Merchant Marine Academy. Liberty Star will be used to teach these midshipmen modern towing techniques and other required skills. NASA will still retain access to Liberty Star if the space agency needs it and if it is available. “Liberty Star served NASA well during the Space Shuttle Program,” said NASA’s Acting Associate Administrator Robert Lightfoot. “We know it will greatly benefit the Kings Point midshipmen, and we’re proud that Liberty Star will continue to serve the United States with distinction.” There are two SRB recovery vessels, MV Liberty Star and MV Freedom Star. Each of these vessels are currently operated by United Space Alliance (USA). According to a NASA press release, NASA is also looking for a suitable use for Freedom Star as well. As such, this vessel might also be leaving Florida in the near future. Both SRB recovery ships were launched in 1981 and worked to recover the spent shuttle SRBs after they had completed their task of sending space shuttle crews to orbit. These ships were constructed at the Atlantic Marine Shipyard on Fort George Island in Florida. Each recovery ship is capable of towing approximately 60,000 pounds (27,000 kilograms). The ships utilize auxiliary engines and other measures so when they coasted up the Banana River they would avoid harming Florida’s Manatee population. These vessels have been used by other agencies as well as for other purposes by NASA. NASA’s sister organization, the National Oceanic & Atmospheric Administration or NOAA, has used the recovery ships in the past. NASA has employed them in the agency’s Commercial Orbital Transportation Services (COTS) program to monitor launch vehicles during ascent. Web posted. (2012). [Another Piece of Shuttle History Leaving Cape Canaveral [Online]. Available WWW: <http://www.americaspace.com/> [2012, August 21].]

August 22: A 19-story Atlas V rocket carrying twin NASA satellites rolled to its pad this morning in preparation for a 4:07 a.m. Friday launch from Cape Canaveral Air Force Station. The United Launch Alliance rocket began rolling from its vertical integration tower around 8 a.m. and took about 30 minutes to travel a quarter-mile to the Launch Complex 41 pad just south of Kennedy Space Center's former shuttle pads. The move was made early enough so rocket-grade kerosene fuel can be loaded into the first stage booster today before expected afternoon thunderstorms arrive. More propellant will be loaded on launch day. The rocket is set to launch NASA's \$686 million Radiation Belt Storm Probes mission, which will use a pair of satellites to study the Van Allen radiation belts for two years. The launch was delayed a day to test the steering system on the rocket's RD-180 main engine, but a Launch Readiness Review on Tuesday concluded there were no problems. Air Force meteorologists' most recent forecast has improved slightly to a 70 percent chance of favorable weather during Friday's 20-minute launch window, with a chance for thick clouds. Web posted. (2012). [Atlas V rolls to Cape Canaveral launch pad [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 22].]

◆ Early Friday, thousands of gallons of cryogenic propellant are scheduled to be pumped into a 19-story Atlas V rocket at Cape Canaveral Air Force Station, a few hours before its planned 4:07 a.m. blastoff with a pair of NASA satellites. Security personnel will set up roadblocks to secure a perimeter around the rocket's blast zone. Fire crews will be on hand in case something goes wrong. In the Atlas Spaceflight Operations Center a few miles from Launch Complex 41, Jason Buckley will watch the countdown unfold, knowing he helped put each of those elements in place to enable the rocket's thundering liftoff. "It's bright and it's loud and you can feel it," Buckley said of his close-up launch view. "It's a big rumble that you feel. The whole building kind of shakes." The 45-year-old Rockledge resident and United Launch Alliance employee specializes in providing "base support" for Cape launches. He coordinates and schedules a wide variety of tasks that support engineers' and technicians' work to ready a launch vehicle for flight. Web posted. (2012). [Meet Atlas V's right-hand man [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 22].]

August 23: Kennedy Space Center's goal to become a more commercial spaceport received a boost Thursday with XCOR Aerospace's announcement that it planned to test, fly and eventually build suborbital spacecraft here. The Mojave, Calif.-based company's two-seater Lynx space plane could start taking off and landing at the shuttle runway in 2014, with a next-generation version flying customers regularly the following year. XCOR estimates it could hire more than 150 people locally by 2018, and executives said the area's skilled former shuttle workforce was key to their decision to base a manufacturing site on the Space Coast. "Thanks to NASA's long history here, there was just the right group of people here with exactly the right skills we need," President and co-founder Jeff Greason said during an announcement at the KSC Visitor Complex. "I really look forward to taking advantage of it as we move forward to serial production of vehicles where, just like a lot of other operations, it really has to be done right every time." State and local agencies have offered the company \$2.7 million in incentives, according to Space Florida President Frank DiBello. Space Florida also will offer financing that could help build a hangar and manufacturing facility near KSC's three-mile runway, though no agreements are final yet. Web posted. (2012). [At KSC, XCOR sees right people, right place [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 24].]

◆ NASA Administrator Charles Bolden announced Thursday new milestones in the nation's commercial space initiatives from the agency's Kennedy Space Center in Florida. The latest advances made by NASA's commercial space partners pave the way for the first contracted flight of cargo to the International Space Station (ISS) this fall and mark progress toward a launch of astronauts from U.S. soil in the next five years. Bolden announced Space Exploration Technologies (SpaceX) has completed its Space Act Agreement with NASA for Commercial Orbital Transportation Services (COTS). SpaceX is scheduled to launch the first of its 12 contracted cargo flights to the space station from Cape Canaveral in October, under NASA's Commercial Resupply Services Program. Through the COTS program, NASA

provides investments to stimulate the American commercial space industry. As part of its COTS partnership, SpaceX became the first commercial company to resupply the space station in May, successfully launching its Falcon 9 rocket and Dragon spacecraft to the orbiting complex. During the historic mission, the Dragon was captured by astronauts using the station's robot arm, unloaded and safely returned to Earth carrying experiments conducted aboard ISS. Later this winter, Orbital Sciences Corp. plans to carry out its first test flight under COTS. Bolden also announced NASA partner Sierra Nevada Corp. has conducted its first milestone under the agency's recently announced Commercial Crew Integrated Capability (CCiCap) initiative. The milestone, a program implementation plan review, marks an important first step in Sierra Nevada's efforts to develop a crew transportation system with its Dream Chaser spacecraft. CCiCap is an initiative of NASA's Commercial Crew Program (CCP) and an Obama administration priority. The objective of the CCP is to facilitate the development of a U.S. commercial crew space transportation capability with the goal of achieving safe, reliable and cost-effective access to and from the space station and low Earth orbit. After the capability is matured, it is expected to be available to the government and other customers. NASA could contract to purchase commercial services to meet its station crew transportation needs later this decade. [“NASA Administrator Announces New Commercial Crew and Cargo Milestone,” **NASA News Release #12-293**, August 23, 2012.]

August 24: NASA hopes to make a second attempt to launch its Radiation Belt Storm Probes mission at 4:07 a.m. Saturday, after today's attempt scrubbed due to a problem with equipment needed to track the Atlas V rocket during flight. A new launch time won't be confirmed until engineers understand a problem with a tracking beacon required to be working properly for a launch to proceed. “The frequency of that C-band tracking beacon was drifting from the range systems that are picking that up,” said Tim Dunn, NASA launch director for the \$686 million mission. “We don't launch unless we're absolutely certain, so this is one of those cases.” The problem could lie with the beacon on the 189-foot United Launch Alliance rocket or with Eastern Range equipment. Dunn said launch teams would review data to assess the problem and probably know more within a few hours after the scrub. Today's countdown to a planned 4:07 a.m. liftoff appeared to be proceeding smoothly and the weather forecast was excellent. But as the launch team began its final readiness poll to pick up the countdown from a planned hold at T-minus four minutes, the range reported it was no-go. There wasn't enough time to resolve the beacon issue during the 20-minute launch window. Saturday's launch window is the same: It opens at 4:07 a.m. and lasts 20 minutes. There's a 60 percent chance of favorable weather conditions. The RBSP mission consists of twin spacecraft that will spend two years studying Earth's Van Allen radiation belts to better understand how they respond to solar storms. Web posted. (2012). [Atlas launch scrubbed until Saturday [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 24].]

August 25: Neil Alden Armstrong, who made the “giant leap for mankind” as the first human to set foot on the moon, died on Saturday. He was 82. His family said in a statement that the cause was “complications resulting from cardiovascular procedures.” He had undergone heart bypass surgery this month in Cincinnati, near where he lived. His recovery had been going well, according to those who spoke with him after the surgery, and his death came as a surprise to many close to him, including his fellow Apollo astronauts. The family did not say where he died. A quiet, private man, at heart an engineer and crack test pilot, Mr. Armstrong made history on July 20, 1969, as the commander of the Apollo 11 spacecraft on the mission that culminated the Soviet-American space race in the 1960s. President John F. Kennedy had committed the nation “to achieving the goal, before the decade is out, of landing a man on the Moon and returning him safely to Earth.” It was done with more than five months to spare. On that day, Mr. Armstrong and his co-pilot, Col. Edwin E. Aldrin Jr., known as Buzz, steered their lunar landing craft, Eagle, to a level, rock-strewn plain near the southwestern shore of the Sea of Tranquility. It was touch and go the last minute or two, with computer alarms sounding and fuel running low. But they made it. “Houston, Tranquility Base here,” Mr. Armstrong radioed to mission control. “The Eagle has landed.” A few hours later, there was Mr. Armstrong bundled in a white spacesuit and helmet on the ladder of the landing craft. Planting his feet on the lunar surface, he said, “That's one small

step for man, one giant leap for mankind.” (His words would become the subject of a minor historical debate, as to whether he said “man” or an indistinct “a man.”) In all, 12 American astronauts walked on the moon between then and the Apollo 17 mission in 1972. The Apollo 11 mission capped a tumultuous and consequential decade. The '60s in America had started with such promise, with the election of a youthful president, mixed with the ever-present anxieties of the cold war. Then it touched greatness in the civil rights movement, only to implode in the years of assassinations and burning city streets and campus riots. But before it ended, human beings had reached that longtime symbol of the unreachable. The moonwalk lasted 2 hours and 19 minutes, long enough to let the astronauts test their footing in the fine and powdery surface — Mr. Armstrong noted that his boot print was less than an inch deep — and set up a television camera and scientific instruments and collect rock samples. After news of Mr. Armstrong’s death was reported, President Obama, in a statement from the White House, said, “Neil was among the greatest of American heroes.” “And when Neil stepped foot on the surface of the moon for the first time,” the president added, “he delivered a moment of human achievement that will never be forgotten.” Charles F. Bolden Jr., the current NASA administrator, said, “As long as there are history books, Neil Armstrong will be included in them, remembered for taking humankind’s first small step on a world beyond our own.” Mr. Bolden also noted that in the years after the moonwalk, Mr. Armstrong “carried himself with a grace and humility that was an example to us all.” The historian Douglas Brinkley, who interviewed Mr. Armstrong for a NASA oral history, described him as “our nation’s most bashful Galahad.” His family called him “a reluctant hero who always believed he was just doing his job.” Indeed, some space officials have cited these characteristics, as well as his engineering skills and experience piloting X-15 rocket planes, as reasons that Mr. Armstrong stood out in the astronaut corps. After the post-flight parades and a world tour for the three Apollo 11 astronauts, Mr. Armstrong gradually withdrew from the public eye. He was not reclusive, but as much as possible he sought to lead a private life, first as an associate administrator in the space program, then as a university professor and director of a number of corporations. Web posted. (2012). [Neil Armstrong, First Man on the Moon, Dies at 82 [Online]. Available WWW: <http://www.nytimes.com/> [2012, August 25].]

◆ Norm Carlson, NASA's lead test conductor for the Apollo 11 launch, first met Neil Armstrong at the KSC astronaut quarters for a flight briefing prior to launch to brief the crew on what to expect and go through prelaunch procedures. "He was a great man and very personable with the people he worked with," Carlson said. "He was very appreciative to the launch team and all the NASA folks." Carlson believes the loss of Armstrong will be felt beyond the United States. "He will be greatly missed, not only by the NASA people but the world." Web posted. (2012). [Carlson reacts to Armstrong's passing [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 25].]

◆ Jay Honeycutt, former KSC director, worked with Neil Armstrong during his Apollo flight and again when Armstrong was deputy chair of the shuttle Challenger disaster investigation. “He certainly deserved every accolade he could ever have gotten, but it was his belief that it was the entire team that was successful, and it wasn’t just he and Buzz that made that flight what it was,” Honeycutt said. It was his 1966 Gemini 8 mission where Armstrong really showed his mettle. The capsule had a “struck thruster that certainly was a heartbeat away from disaster, and he pulled that off and saved the mission.” It was Honeycutt who put crews through lunar landing simulations. “Neil never blinked, even with the best we could throw at him,” he said. Web posted. (2012). [Astronaut was one cool customer [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 25].]

◆ The following is a statement from NASA Kennedy Space Center Director Robert Cabana regarding the death of former test pilot and NASA astronaut Neil Armstrong. He was 82. "Neil Armstrong was a true American hero, and one of the nicest gentlemen around. He was the epitome of what an engineering test pilot should be, and a role model for everyone who aspired to be an astronaut. "He always took the time to share his thoughts on technical issues and his experiences from the past. "I feel very privileged to

have known him. He will be missed." Web posted. (2012). [Kennedy Space Center Director Statement on Neil Armstrong's Death [Online]. Available WWW: <http://www.spaceref.com/> [2012, August 25].]

August 26: NASA will let Tropical Storm Isaac pass before making a third attempt to launch a pair of radiation belt probes, possibly Thursday. With the forecast expected to deteriorate, launch managers early Saturday decided against asking launch teams to perform a third countdown in as many days. A first launch attempt Friday scrubbed due to a technical problem. Saturday, thunderstorms, clouds and lightning kept the 189-foot United Launch Alliance Atlas V rocket grounded. Today, the rocket carrying twin spacecraft will roll back to the shelter of its vertical processing tower at Cape Canaveral Air Force Station's Launch Complex 41. "It just made sense in this case to take it off the launch pad, let the storm pass, and make another attempt next week," NASA spokesman Allard Beutel said. The next launch opportunity is at 4:05 a.m. Thursday, pending approval by the Air Force's Eastern Range. The \$686 million RBSP mission aims to send twin satellites on a two-year study of the Van Allen radiation belts. The inner and outer belts, ranging from hundreds to about 25,000 miles above the planet, can damage satellites and power grids and endanger astronauts. Scientists hope to improve their understanding of how the belts respond to solar storms and better predict their behavior. Web posted. (2012). [NASA sits tight on flight until Isaac drifts away [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 26].]

August 28: A week after being scrubbed due to various issues, an Atlas V rocket will be rolled back out to the launch pad. Launch is scheduled for Thursday, Aug. 30 at 4:05 a.m. The rocket is carrying the Radiation Belt Storm Probes, which is a pair of spacecraft that will be released into earth's Van Allen radiation belts. Solar storms can cause those belts to contract and expand, posing a risk to communication satellites, crippling GPS services, TV and cell phone signals, and even shutting down power grids. Web posted. (2012). [Atlas V rocket to roll out to launch pad today [Online]. Available WWW: <http://www.cfnews13.com/> [2012, August 28].]

◆ Out in the Florida sunshine and surviving thunderstorms, rain, hail, lightning, tornadoes, hurricanes and even a rare snow flurry sits the large illuminated digital countdown clock. Close to the edge of NASA's Kennedy Space Center's (KSC) turn basin facing the press site this is one of the most-watched timepieces in the world. Recently this historic landmark received a touch up. Included in television coverage and launch photos this clock dates back to the Apollo days. Using standard incandescent 40 watt light bulbs the timepiece is controlled from a room in the Launch Control Center (LCC). From this location the 'Timing & Imaging Support Group' technicians monitor and distribute the official time to NASA facilities including firing rooms. Before a launch, the clock counts down, showing the remaining time until T-zero, after launch the clock counts forward in + mission elapsed time. About a week before launch activity the clock bulbs are checked and replaced as needed. Now that the space shuttle era is over, the clock will not go dark, it will illuminate the countdown of NASA launches that liftoff from nearby Cape Canaveral Air Force Station (CCAFS). Web posted. (2012). [Countdown Clock Touched Up for Future Missions [Online]. Available WWW: <http://www.americaspace.com/> [2012, August 28].]

August 29: Media are invited to attend a KSC ceremony to honor former test pilot and NASA astronaut Neil Armstrong at 1 p.m. EDT, Friday, Aug. 31, at the Apollo/Saturn V Center. Kennedy Space Center Director Bob Cabana will lead the ceremony. Web posted. (2012). [Kennedy Space Center Honors Neil Armstrong Friday [Online]. Available WWW: <http://www.spaceref.com/> [2012, August 26].]

August 30: A two-year mission to study Earth's Van Allen radiation belts is under way after a successful launch this morning from Cape Canaveral Air Force Station. Twin NASA probes were deployed about 80 minutes and 90 minutes after their 4:05 a.m. blastoff atop a United Launch Alliance Atlas V rocket, prompting cheers from the launch team. "I'm very happy to report we have two healthy spacecraft on orbit," Rick Fitzgerald, mission project manager from the Johns Hopkins University Applied Physics

Laboratory, said in a post-launch press conference. The spacecraft have already successfully deployed power-generating solar panels. Liftoff came on the third attempt to launch NASA's \$686 million Radiation Belt Storm Probes mission, after scrubs last Friday and Saturday. A smooth countdown culminated in the 189-foot rocket rumbling from Launch Complex 41 at the opening of a 20-minute launch window. The rocket quickly disappeared into a low bank of clouds above the pad before emerging as a bright streak of orange light in a night sky shared by a nearly full moon. The two spacecraft, for now named RBSP-A and RBSP-B, will study how the radiation belts respond to solar storms. Web posted. (2012). [Atlas V lifts NASA radiation belt probes to orbit [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 30.]

August 31: Though the Space Coast is less than 150 miles from Tampa, it might as well be on Mars for the attention given to NASA by Mitt Romney during the Republican convention this week. As has been the case for most of the campaign, Romney largely ignored the issue — heightening anxiety even among some Republicans about how a Romney administration would impact NASA and Kennedy Space Center. But before making any decisions, Romney first needs to win the White House. That path runs through Florida and — to a small degree — the KSC area, which has been battered since NASA retired the shuttle and slashed thousands of KSC jobs. Though the shuttle's 2011 retirement had been in the works since the Bush administration, many Space Coast residents still blame Obama, especially since he also canceled Constellation. Romney doesn't need to worry about these votes, but he may have to contend with growing support in Florida for Obama's efforts to jump-start the commercial-rocket industry. The commercial push is helping to bring hundreds of jobs back to the KSC area, such as Boeing's decision last year to hire as many as 550 workers to build so-called space taxis out of an abandoned KSC shuttle garage. Web posted. (2012). [Romney stays quiet about his views on NASA [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 30.]

◆ The orbiter Endeavour will fly over Cocoa Beach on its way to California later this month, weather permitting, but it won't be flying over the Cocoa Beach Air Show. Despite a request from event organizers, NASA is not postponing Endeavour's scheduled Sept. 17 departure from Kennedy Space Center. Mounted atop a modified Boeing 747 Shuttle Carrier Aircraft, Endeavour will make stopovers in Houston and a back-up shuttle landing site in the Mojave Desert before arriving at Los Angeles International Airport on Sept. 20. The Cocoa Beach Air Show is scheduled to take place the following weekend: Sept. 22 and Sept. 23. Event organizers wanted NASA to delay departure and fly the orbiter over the air show, saying it would be an economic boon for an area hit hard by layoffs resulting from shuttle fleet retirement. The request was backed in writing by U.S. Sen. Bill Nelson, D-Orlando; U.S. Sen. Marco Rubio, R-Miami; U.S. Rep. Bill Posey, R-Rockledge; and U.S. Rep. Sandy Adams, R-Orlando. Endeavour is headed for the California Science Center, which is 12 miles away from the airport in Los Angeles. Jeff Rudolph, CEO of the museum, told Posey in an Aug. 8 letter that the logistics involved in the move made a departure delay unrealistic. Web posted. (2012). [Endeavour will not delay exit for air show [Online]. Available WWW: <http://www.floridatoday.com/> [2012, August 31.]

◆ There's a rare blue moon tonight, a fitting wink to Neil Armstrong by the cosmic calendar. Today is the day of a private service for Armstrong, the first man to walk on the moon, who died last Saturday in Ohio at age 82. A blue moon occurs when there's a second full moon in one calendar month. It won't happen again until July 2015. The full moon cycle is 29.5 days so a blue moon is uncommon and has come to mean something rare. The moon actually won't be colored blue. Armstrong's family has suggested paying tribute to him by looking at the moon and giving the astronaut a wink. Web posted. (2012). [Blue moon on same day as Neil Armstrong service [Online]. Available WWW: <http://www.usatoday.com/> [2012, August 31.]

◆ Dozens of family and invited friends paid final tributes Friday in private services to Ohio native and rocket man Neil Armstrong, a week after the first man to walk on the moon died at age 82. Media were

barred from the invitation-only event, held at a club in Indian Hill, the upscale suburb that Armstrong called home. Armstrong sons Rick and Mark were to give eulogies to their father. Also expected to speak: businessman and friend Charles Mechem; and Sen. Rob Portman, R-Ohio. Astronaut William Anders and NASA Administrator Charles Bolden are on the guest list. A public memorial will be Sept. 12 in Washington with a final resting place still undetermined. President Barack Obama ordered flags to fly at half-staff to honor Armstrong. Armstrong's family has suggested memorial contributions to two scholarship funds in his name or to the Neil Armstrong New Frontiers Initiative at Cincinnati Children's Hospital. His wife, Carol, is on the hospital's board. Web posted. (2012). [Family, friends pay tribute to moonwalker Neil Armstrong [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 1].]

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September 3: Space shuttle Endeavour's final 12-mile journey through the streets of South Los Angeles already promises to be a meticulously planned spectacle: a two-day parade, an overnight slumber party in Inglewood and enough hoopla to create a giant traffic mess. But for some residents in South L.A., the excitement of the shuttle rumbling through their neighborhoods quickly faded when they learned that 400 trees will be chopped down to make room for the behemoth. The California Science Center — Endeavour's final home — has agreed to replant twice as many trees along the route from the shuttle's docking place at Los Angeles International Airport to Exposition Park. Many worry that the replacements — young, wiry trees that will provide little shade — will pale in comparison to the mature magnolias that line the Crenshaw corridor. Others are concerned that the bare streets will further depreciate property values. City officials and the science center are hoping the historical significance of housing the shuttle will offset the tree loss. Web posted. (2012). [Tree removal for space shuttle arrival tempers excitement [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 3].]

September 4: Western Range officials at Vandenberg Air Force Base said final testing Tuesday confirmed the troubles that postponed an Atlas 5 rocket launch last month have been resolved. Liftoff of the United Launch Alliance-made booster carrying a classified spy satellite payload for the National Reconnaissance Office is rescheduled for Sept. 13 sometime during a period between 1:45 and 4:15 p.m. local PDT (4:45-7:15 p.m. EDT; 2045-2315 GMT). The software issue during the Aug. 2 launch attempt hit Vandenberg's Mission Flight Control Center that computes radar, optical and telemetry data for safety specialists who track the rocket's path. The center has over 80 servers, eight operating systems and thousands of software processes, the Air Force says. Web posted. (2012). [Range now good to go for upcoming California Atlas 5 [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 4].]

September 5: Bearing handwritten messages like “Welcome home,” “Our very own” and “May you always be preserved and protected,” a 38-foot beam was hoisted into place Wednesday to top off the future home of space shuttle Atlantis. A crane lifted the nearly 2,000-pound steel beam 116 feet up to the highest point on the \$100 million facility, the peak of a sweeping arc facing the entrance to the Kennedy Space Center Visitor Complex. An American flag and short cypress tree were mounted on the beam, following the tradition for such “topping out” ceremonies. Journeyman ironworker Bobby Corley of Kissimmee helped bang home four bolts that secured the beam. “Awesome,” he said afterward of the experience. “We’re building the place they’re going to house the new space shuttle at. Most of us have been out here since the first column was stood up and watched it come up out of the ground, so it’s been a memorable job.” Atlantis is two months from a daylong, 9.8-mile journey outside KSC’s gates to its 90,000-square-foot retirement home. The route will roll down Kennedy Parkway, detour by KSC headquarters, cut back across 5th street and pause at the Space Life Sciences Lab before winding around Space Commerce Way to the Visitor Complex. The shell of the exhibit structure is complete and will be walled in on three sides by Atlantis’ planned Nov. 2 arrival. It’s set to open to the public in July. “This is her permanent home,” said Tim Macy, director of project development at the Visitor Complex. “You will be very proud of it.” Visitors entering the Atlantis exhibit will walk by high-fidelity models of the white solid rocket boosters and orange external tank used to launch shuttles. Reaching 195 feet above sea level, they should be visible from much of northern Brevard County, Macy said. Guests will enter a second story “reveal theater” to see Atlantis suspended 18 feet above the ground and angled 43 degrees with its payload bay doors open and a replica robotic arm deployed, as if it was within 150 yards of the International Space Station. Then, winding their way down to floor level, they’ll see a full-scale replica of the Hubble Space Telescope and interactive exhibits on shuttle program operations and history — 62 exhibits in all. “You’ll be completely immersed in all things shuttle as soon as you get in here, from the

how it started to the people that were involved in it, the missions that went on,” Macy said. “We’re going to blow you away.” For now, the facility is a construction site bustling with up to 180 workers each day. On Wednesday, many took turns signing and writing messages with a white marker on the ceremonial beam before it was lifted into place at 10:48 a.m. KSC veteran Roy Tharpe also signed the beam, just like he had during the 525-foot Vehicle Assembly Building’s construction more than 45 years ago. “It’s really poetic that we have Atlantis’ beam today just like we had the VAB ceremony in the 60s,” said Tharpe, president of Space Gateway Support. The tradition of using trees in topping out ceremonies dates to ancient Scandinavian religious practices, when the topmost bough of a tree used to build a new home was placed on the roof to appease tree spirits, according to *The Ironworker*, a union publication. KSC Director Bob Cabana remembered a ceremony that unfolded in space, when astronaut Joe Tanner affixed a sticker of an evergreen tree to the International Space Station during a 2000 spacewalk. “This topping out of a building, it’s always a special occasion,” he said. “Atlantis, the last space shuttle to ever fly in space, is going to look like it actually is in space here at the Kennedy Space Center, and I can’t think of a more fitting place to tell that story. Web posted. (2012). [KSC marks ‘topping out’ of future Atlantis exhibit [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 5].]

◆ Speaking at a press conference today, NASA officials said that the first operational SpaceX cargo launch to ISS is scheduled for October 9 or 10, but could be as early as October 5. The reason for the launch date uncertainty is when the Cape Canaveral Air Force Station will be available for the launch. SpaceX launches from Space Launch Complex 40 (SLC-40) on that range, which is adjacent to NASA’s Kennedy Space Center. Right now the range is not free until October 9 or 10, but SpaceX will be ready to go as early as October 5. NASA said it would prefer the 5th because it is trying to squeeze in the mission before the arrival of a Soyuz spacecraft with three new ISS crewmembers. That Soyuz is scheduled for launch on October 15 and would dock on October 17 if it follows the usual profile. SpaceX completed the test phase of its commercial cargo program in May with the successful launch, berthing and recovery of the Dragon capsule. Now the program moves into the operational phase. SpaceX is under contract to provide 12 cargo launches for NASA between now and 2015. Web posted. (2012). [First Operational SpaceX Launch Set for October 9 or 10, But Could Be Earlier [Online]. Available WWW: <http://www.spacepolicyonline.com/> [2012, September 5].]

◆ Retired space shuttles are being readied for museums, but there’s one piece of equipment at the Kennedy Space Center that dates back to before the moon landing and it’s not going anywhere. NASA’s giant crawler transporter is the only machine with enough muscle to move Apollo rockets and space shuttles out to the launch pad, and after nearly 50 years on the job the agency’s decided there’s still no better way to transport heavy loads. It’s about as wide as a six lane highway, higher than a two story building, with huge caterpillar treads at each of its four corners. With the mobile launch platform and a rocket or space shuttle on its back, the crawler en route for the launch pad was like a skyscraper rolling slowly down a highway. Regular roads can’t handle the five and a half million pound weight of the crawler. NASA has two crawler transporters. Crawler two is being upgraded from its current lifting capacity of 12 million pounds — the combined weight of the shuttle and mobile launcher — to 18 million pounds, for NASA’s new heavy lift rocket. The crawler re-fit is part of a \$2 billion plan to modernize the Kennedy Space Center, and as NASA moves to partner with commercial rocket companies it aims to make the center as versatile as possible. Web posted. (2012). [NASA’s Historic Giant Crawler Gets a Tune Up for Modern Times (PICS) [Online]. Available WWW: <http://www.transportationnation.org/> [2012, September 5].]

September 6: There was a powerful roar in Utah on Thursday as rocket testers fired one of the boosters used by Delta 4 vehicles for added thrust during launches of military communications satellites, reconnaissance spacecraft and the Global Positioning System. ATK ignited the booster in a horizontal test-stand at 11:15 a.m. Mountain Time (1:15 p.m. EDT; 1715 GMT) as part of nozzle qualification

efforts. The successful event built further confidence in the nozzle design that the aerospace company has made in-house to replace the previous nozzle hardware purchased from a subcontractor for production of the Delta 4 motors. Delta 4 rockets can use either two or four strap-on motors depending on the weight and targeted orbit of satellite payloads, providing the necessary thrust to propel the vehicle off the launch pad at Cape Canaveral and Vandenberg Air Force Base. The solids are larger, more powerful cousins to the Delta 2 and Delta 3 rockets. Web posted. (2012). [Solid rocket booster design test-fired for Delta 4 [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, September 6].]

◆ NASA's Kennedy Space Center (KSC) strives to be innovative in all of its programs, projects and practices, and that ingenuity comes from the center's greatest asset, its workforce. As part of a new initiative to help foster worker innovation and creativity, Kennedy on Thursday hosted its first Innovation Expo, which is designed to highlight employee innovations in the workplace that help shape the future of the center and the agency. The expo provided an opportunity for employees to hear from outside speakers and to pitch their own ideas of ways to improve Kennedy. "Our NASA history demonstrates the greatness of American innovation, and KSC has always played a key role in that history," Kennedy Director Bob Cabana said. "Innovation is a part of our jobs, and now more than ever, we need to collaborate and innovate in new and exciting ways to fulfill our goal of transforming KSC into a vibrant, multiuser spaceport." Throughout the day, employees toured labs and facilities across the center that normally are not open to the general workforce. In addition, they heard from innovative and inspirational speakers from companies such as Disney, Sierra Nevada Corp., and the Boy Scouts of America. The expo also featured Kennedy Kick-Start, a competition for employees to receive as much as \$5,000 for equipment needed to implement their ideas at the center. The selected innovators will be announced Friday, Sept. 7. Kennedy works to spur innovation on a daily basis. By retrofitting its world-class ground systems and facilities for both government and commercial users, and infusing innovative ideas into ongoing and forward-looking programs such as Launch Services, International Space Station, Commercial Crew, Orion and Space Launch Systems, the center helps NASA reach America's space exploration goals. ["Kennedy Hosts First Innovation Expo for Employees to Spur New NASA Ideas," **NASA News Release #49-12**, September 6, 2012.]

September 7: ATK's Liberty rocket and crew capsule scored lower than competitors on technical and business grounds in NASA's commercial crew competition, in which Boeing Co., SpaceX, and Sierra Nevada Corp. netted \$1.1 billion in government funding, according to a selection statement posted on NASA's website. The document describes NASA's rationale for bypassing ATK and selecting other proposals to receive a cache of financing. NASA announced Aug. 3 it will award more than \$1.1 billion to Boeing, SpaceX and Sierra Nevada. The money will be paid as the companies accomplish predefined milestones, such as design reviews and tests, over the next 21 months. NASA expects one or more of the companies will offer operational crew transportation services to the International Space Station by 2017. NASA had low technical confidence in the Liberty proposal, which included contributions from Lockheed Martin Corp. and Europe's EADS Astrium aerospace and defense conglomerate, according to the selection statement, which was signed by Bill Gerstenmaier, head of NASA's human exploration and operations directorate. "I found the ATK proposal to be the weakest of the four proposals," Gerstenmaier wrote. Trina Helquist, an ATK spokesperson, said the company was assessing the future of the Liberty program. ATK officials previously said Liberty's development would be significantly slowed without a NASA investment. With government funding, ATK projected Liberty's first piloted orbital test flight in 2015. Web posted. (2012). [ATK 'moving on' after Liberty commercial proposal loss [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, September 7].]

◆ Armstrong, the first man to set foot on the moon, told his family this was how he wanted to be buried. "It was his wish," family spokesman Rick Miller said. Details of the burial have not been released and might not be. The Navy confirmed it would perform the ceremony, but it would not say where, when or

from which ship, citing the Armstrong family's wishes for privacy. It was not known whether the burial will be a full-body burial or a dropping of ashes. Web posted. (2012). [Neil Armstrong to be buried at sea [Online]. Available WWW: <http://www.usatoday.com/> [2012, September 7].]

◆ As part of a new initiative to help foster worker innovation and creativity, NASA's Kennedy Space Center is funding a dozen employee ideas designed to improve the center. The funding comes from Kennedy Kick-Start, an employee competition to further encourage innovation. The new competition was held Thursday during the first Innovation Expo. The event highlighted employee innovative work and showed how it helps to shape the future of the center and NASA. Sixteen employees gave 90-second pitches of potential center improvements that would cost less than \$5,000 in equipment. The ideas ranged from 3-D printing of a working robot hand to commissioning artists to recycle space shuttle hardware as art. A panel of eight judges consisting of Kennedy Center Director Bob Cabana and senior management from organizations across the center selected 12 projects to fund immediately and complete within four-to-six months. The selected innovations were announced Friday, and they are: - Publish mission audio on an Internet radio station to provide a more consistent and inexpensive feed; - Purchase 150 smart-surge protectors to distribute across the center to save on energy expenses; - Commission artists to recycle space shuttle hardware into art pieces that can be displayed across the center; - Study the artificial gravity effects on hydroponics grown on the International Space Station; - Study the benefits of a virtual control panel, which would enable employees to shut off valves, and do work remotely; - Encourage online collaboration, which could in turn reduce travel expenses and increase productivity; - Study planetary ice mining by down-hole energy injection; - Study the ability to generate power for the center through waste heat recovery; - 3-D printing of a functional robotic hand; - Separation of water ice from regolith in vacuum by methods of melting; - Pneumatic conveyor for large volumes of regolith which could reduce the time and expense of studies and student programs, such as lunabotics; - "Quick-Attach" to Humvee vehicle mounting interface for exploration payloads and excavation implements. Kennedy works to spur innovation on a daily basis. By retrofitting its world-class ground systems and facilities for both government and commercial users, and infusing innovative ideas into ongoing and forward-looking programs such as Launch Services, International Space Station, Commercial Crew, Orion and Space Launch Systems, the center helps NASA reach America's space exploration goal. ["NASA Kennedy Space Center Funds Employee Innovations," **NASA News Release #51-12**, September 7, 2012.]

September 10: NASA cited SpaceX's flight experience with the Dragon spacecraft and Boeing's methodical approach to designing a crew capsule in its decision to award the companies \$900 million to develop a human-rated commercial spaceship, according to a document released last week. Proposals by Boeing and SpaceX were the strongest received by NASA in the commercial crew competition, which bypassed a bid submitted by rocket-builder ATK and selected Sierra Nevada Corp. for a partial award of \$212 million, according to a selection statement posted on a NASA website. The 21-month agreements with Boeing, SpaceX and Sierra Nevada were signed to fulfill NASA's Commercial Crew Integrated Capability, or CCIcap, phase of the commercial crew program, which aims to develop a privately-owned human space transportation system to deliver astronauts to the International Space Station by 2017. Web posted. (2012). [NASA's commercial trio: Winning strengths outlined [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, September 10].]

◆ Endeavour is one week from departing Kennedy Space Center for good. On Tuesday, NASA's 747 carrier aircraft will fly from California to Kennedy Space Center to pick up the retired shuttle orbiter. Early Friday, Endeavour is scheduled to roll from the Vehicle Assembly Building to the shuttle runway, where it will be hoisted and bolted atop the Boeing jumbo jet. The piggybacked vehicles will back out of a large gantry Sunday morning in preparation for a planned takeoff around 7 a.m. next Monday. A low fly-over of Brevard County's coastline is planned before Endeavour moves on to Texas and then California. It's expected to arrive at Los Angeles International Airport on Sept. 20, weather permitting. In

mid-October, Endeavour will roll 12 miles through downtown L.A. streets to its new display home at the California Science Center. The ferry flight is the shuttle program's last. Discovery was ferried to the Smithsonian Institution in Chantilly, Va., in mid-April, and Enterprise left there for New York City days later. Atlantis will be towed, not flown, about 10 miles to the KSC Visitor Complex. That trip is planned Nov. 2. Web posted. (2012). [Endeavour in final week at Kennedy Space Center [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 10].]

◆ The giant High Bay 3 (HB-3) platforms – previously used during the stacking and mating of Space Shuttle hardware – are being dismantled and removed from the Vehicle Assembly Building (VAB). The giant facility at the Kennedy Space Center (KSC) is being transitioned from Shuttle operations to accommodate the Space Launch System (SLS). The VAB is an iconic building at the heart of the Florida spaceport, originally built to handle the integration and processing needs of the giant Saturn V launch vehicle, including the mating of the Apollo crew capsule. The huge facility stands 525 feet tall and consists of four High Bays and a transfer aisle, including two giant bridge cranes that can span its upper reaches to transport hardware across its expanses. High Bays 1 and 3 were used for integration and stacking of the complete Space Shuttle vehicle. High Bay 2 was used to process the Shuttle's External Tank (ET) after its arrival from the Michoud Assembly Facility (MAF), in what were known as checkout cells. High Bay 4 was also used for ET checkout and storage, as well as for payload canister operations and Solid Rocket Booster (SRB) contingency handling. While no commercial vehicles have committed to using the VAB at this time, the next big government vehicle – the Space Launch System (SLS) – will be using the famous building, not least because it's the only facility on the Space Coast that can host the Heavy Lift Launch Vehicle (HLV). The only problem is the fixed platforms in the High Bays are still configured for use only with the Space Shuttle, meaning they have to be removed, ahead of the installation of a new set of "relocatable" platforms. The work, designed by BRPH Architects-Engineers, Inc. – and contracted to Ivey's Construction, Inc. – is expected to last until March, 2013. The fate of the famous platforms is not known, although the contract includes their disposal, likely to involve the breaking down of the large structures on site, prior to being sent for scrap. Web posted. (2012). [Vehicle Assembly Building High Bay 3 platform removal begins for SLS [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, September 10].]

September 11: A Boeing 747 touched down at Kennedy Space Center at 5:05 p.m. today, six days before its planned departure from Florida with the retired space shuttle Endeavour. The Shuttle Carrier Aircraft labeled NASA 905 took off from Edwards Air Force Base in California at 11:30 a.m. Eastern time and made a direct flight to Kennedy, approaching the shuttle runway from the northwest to the southeast. The modified jumbo jet parked on an apron near a gantry that will be used to hoist Endeavour and bolt it atop the 747 on Friday. Weather permitting, the piggybacked aircraft and spaceship plan to take off around 7 a.m. Monday to begin the shuttle program's final ferry flight. Flyovers are likely of the KSC Visitor Complex, Patrick Air Force Base and other parts of the Space Coast. The cross-country ferry flight to Los Angeles International Airport is the shuttle program's last. It's expected to end Sept. 20, including stops at Ellington Field in Houston and the Dryden Flight Research Center in California. In mid-October, Endeavour will roll from LAX to the California Science Center to take up residence in a new display hangar slated to open Oct. 30. An advance team of NASA and United Space Alliance personnel is already in Los Angeles setting up the special equipment that will be used to remove Endeavour from the 747. In April, NASA 905 ferried Discovery to the National Air and Space Museum's Udvar-Hazy Center in Chantilly, Va., where it replaced the prototype orbiter Enterprise. Enterprise then was flown to New York's John F. Kennedy Airport and barged to the Intrepid Sea, Air and Space Museum in Manhattan. Atlantis is scheduled to roll from KSC to its nearby Visitor Complex on Nov. 2, completing NASA's transfer of retired orbiters to their public display sites. Web posted. (2012). [747 arrives at KSC for Endeavour ferry flight [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 11].]

◆ The owner of three local general-aviation airports now wants to take over operations of Kennedy Space Center's Shuttle Landing Facility as part of a two-pronged approach to attract more space-related companies to the area. The Titusville-Cocoa Airport Authority tonight will seek Brevard County Commission support in its bid to operate the Shuttle Landing Facility, a 15,000-foot-long runway that opened in 1976. It is asking the County Commission to approve a resolution to indicate that the authority "is the logical choice to be the entity responsible for assisting NASA in repurposing the Shuttle Landing Facility as a multiuser spaceport." Kennedy Space Center is seeking applications by Sept. 24 to operate and maintain the landing site and surrounding facilities, and could decide on a governmental or commercial operator by next spring. The new operator could take over as early as October 2013. Titusville-Cocoa Airport Authority Board Chairman Jerry Sansom said being selected by KSC to operate the Shuttle Landing Facility would work well in conjunction with the authority's separate ongoing effort to have its Space Coast Regional Airport in Titusville designated a spaceport by the Federal Aviation Administration. Sansom said he expects FAA approval by the end of next year. For example, Rocket Crafters, a Utah-based company that recently decided to establish operations at Space Coast Regional Airport, is hoping to demonstrate that its project to provide high-speed, point-to-point air transport could operate from a conventional airport, Sansom said. It would be able to take off and land from Space Coast Regional Airport if that airport gets a spaceport license. At the Titusville airport, Rocket Crafters plans to design, test and launch suborbital spacecraft -- powered by jet engines and hybrid rockets -- that eventually could travel to Europe, South America, Africa and other international hubs as part of a point-to-point transportation system. A conventional airport operator like the Titusville-Cocoa Airport Authority could qualify for certain federal and state transportation grants for upgrades to the Shuttle Landing Facility, grants not available to a commercial entity. Web posted. (2012). [Titusville-Cocoa Airport Authority pursues shuttle strip [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 11].]

◆ A suborbital rocket that was to perform test flights at Cape Canaveral as soon as this fall crashed today during a test flight in Mojave, Calif. Masten Space Systems said its reusable Xaero vehicle, which launches and lands vertically, was lost during a flight to about 3,300 feet. "Our test objectives were met and initial results show the vehicle performed better than expected at altitude," the company said in a statement. "However, the vehicle was lost during final approach to landing, and the initial cause appears to be a throttle valve failure." Masten in May 2011 signed a \$400,000 agreement with Space Florida to perform a series of demonstration flights from the state-owned Launch Complex 36 at Cape Canaveral Air Force Station. The tests were described as pathfinders to help Space Florida develop operational requirements for vertically launched and landed suborbital rockets, and for Masten to evaluate the Cape as a potential base for flight operations. Space Florida recently said the Cape tests were expected no earlier than Oct. 1. Web posted. (2012). [Masten Space Systems rocket mishap could delay Florida tests [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 11].]

September 12: NASA on Wednesday released a request for proposals for the first of two contract phases to certify commercially developed space systems in support of crewed missions to the International Space Station. Through these certification products contracts, NASA's Commercial Crew Program (CCP) will ensure commercial missions are held to the agency's safety requirements and standards for human space transportation system missions to the space station. NASA's request for proposals outlines a two-phase approach in which the first phase awards will be made to multiple companies. The companies will provide data related to the development of their Crew Transportation System (CTS) design, including a spacecraft, launch vehicle, ground and mission operations and recovery. NASA plans to award up to \$10 million to each company in early 2013 for the first phase. The first phase will last about 15 months, during which companies will outline their strategies to meet the agency's required standards and safety requirements before a CTS could be approved to fly NASA astronauts to the space station. "We're looking forward to a strong U.S. industry response for this certification phase," said Ed Mango, NASA's

CCP manager. "This is a major step in certifying transportation systems that can meet America's goal of transporting our astronauts to and from the space station." At the conclusion of the first phase, the agency anticipates more than one company will be ready to compete for the second certification phase contract. The second phase will be open to any company with systems at the design maturity level of Phase 1. The second phase will include development, testing, evaluation and certification activities enabling NASA to assess and approve the CTS capability for performing space station missions in compliance with NASA requirements. The objective of CCP is to facilitate the development of a U.S. commercial crew space transportation capability with the goal of achieving safe, reliable and cost-effective access to and from the space station and low Earth orbit. After the capability is matured and expected to be available to the government and other customers, NASA could contract to purchase commercial services to meet its station crew transportation needs. Web posted. (2012). [NASA Requests Proposals for Initial Contracts to Certify Commercial Crew Transportation Systems [Online]. Available WWW: <http://www.spaceref.com/> [2012, September 12].]

◆ A top NASA official told lawmakers Wednesday the agency is on track with its next crewed mission into deep space: A trip to an asteroid and then to Mars. But lawmakers and outside experts raised concerns during the congressional hearing about the program's cost, particularly the \$30 billion price tag connected to the "heavy lift" rocket, and the relatively few test flights planned before embarking on a key deep space mission. Dan Dumbacher, NASA's deputy associate administrator for Exploration Systems Development, told members of a House Science, Space and Technology subcommittee that NASA and its team of private contractors are "making excellent progress" toward launching an unmanned test flight in 2017 in preparation for the real mission by 2025. Tests measuring water impact, acoustics, vibrations and parachute landings of the Orion crew vehicle are either under way or nearly complete, and the manufacturing of its heat shield has begun, he said. Design work is under way on the \$30 billion "heavy lift" rocket known as the Space Launch System that will carry Orion, Dumbacher said. His comments Wednesday came nearly a year after NASA unveiled the design of the rocket, which is billed as the most powerful U.S. rocket since the Saturn V that took Apollo astronauts to the moon in the late 1960s and early 1970s. If the timeline holds, a manned test flight of the Space Launch System and Orion capsule will take place in 2021. If that's successful, an asteroid landing would be targeted by 2025, followed by a landing on Mars sometime in the 2030s. Web posted. (2012). [Mission to Mars may be pricey [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 12].]

◆ After a six-week delay to unravel a puzzling Range software glitch, United Launch Alliance's Atlas 5 rocket will try again Thursday afternoon to deploy a classified national security payload and batch of hitchhiking cubesats into space from California. Liftoff is targeted for 2:39 p.m. local (5:39 p.m. EDT; 2139 GMT). The steady march of the payload orbit moved the launch about 10 hours earlier than the original blastoff time from the late-night try Aug. 2. The mission will originate from Vandenberg Air Force Base's Space Launch Complex 3-East, a "classic pad" with a retractable service gantry and fixed umbilical tower. It stands in contrast to the Atlas 5's launch site at Cape Canaveral that assembles its rockets in an adjacent building and rolls the vehicles out to the spartan pad on a mobile platform. Web posted. (2012). [Atlas 5 rocket launch set to go Thursday from California [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, September 12].]

◆ Space Florida's board on Wednesday approved funding to modernize a former shuttle hangar for use by The Boeing Co. and for work that could lead to the acquisition of the shuttle runway and other Kennedy Space Center property to support commercial space operations. "We have several specific sites in mind that we want to pursue, one of which I don't mind commenting on, is the Shuttle Landing Facility," said Space Florida President Frank DiBello. Under a unanimously approved resolution, up to \$2.3 million could be spent to perform environmental reviews, land surveys, title searches and other activity that DiBello said could expedite or encourage the transfer of U.S. government property to the

state to advance commercial space opportunities. Lt. Gov. Jennifer Carroll, the head of Space Florida's board, said such work would increase the state's flexibility to attract new commercial business, as it did when it acquired a shuttle hangar, Orbiter Processing Facility-3, where Boeing plans to assemble a private space capsule. The board had previously approved \$5 million to demolish old infrastructure inside the hangar, work that has just begun. On Wednesday, it approved another \$5 million for the project's second modernization phase. The funding comes from the Florida Department of Transportation's budget for space-related infrastructure improvements. KSC has been seeking commercial and government partners to take over facilities it no longer needs. DiBello must submit a proposal to NASA and the U.S. Department of Transportation detailing sites it is interested in acquiring and the benefits to the federal government. Web posted. (2012). [Space Florida approves funds to work KSC sites [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 12].]

September 13: Canaveral National Seashore officials wiped out plans for a November surf festival at Playalinda Beach, but the organizers don't want to take no for an answer. Keith Lyerly, who is seeking to resurrect a charity event held 33 years ago at Playalinda, is asking the park service to balance its mission to protect the seashore with the needs of the community. Canaveral National Seashore Superintendent Myrna Palfrey denied the request for a special-use permit last month, saying the festival would create significant conflict and limit the use of beach facilities for other visitors. "The activity is inconsistent with the purpose of the seashore," Palfrey said. "He would really have to tone down the activity and the numbers." Organizers appealed to National Park Service regional director David Vela, who stood by the decision to deny the permit. Web posted. (2012). [Park wipes out Playalinda fest [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 13].]

◆ A public memorial service will be held today for Neil Armstrong at the Washington National Cathedral. Armstrong, who awed Americans and the world when he became the first person to stand on the moon, died Aug. 25 at age 82. The memorial service begins at 10 a.m. and will be broadcast live on NASA Television. Among those attending: NASA chief Charles Bolden, members of Armstrong's family and current and former astronauts. Bolden, former Secretary of the Treasury John Snow and Apollo 17 mission commander Eugene Cernan will offer tributes. Armstrong's Apollo 11 crewmate, Michael Collins, who orbited the moon while Armstrong and Buzz Aldrin touched its surface, will lead prayers. Jazz singer-songwriter Diana Krall is scheduled to sing at the service. In 1974, Armstrong, Aldrin and Collins presented the National Cathedral with a moon rock brought back during their mission as part of the 5th anniversary celebrations of their historic moon mission. Web posted. (2012). [Memorial Service planned for Neil Armstrong today [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 13].]

◆ An Atlas 5 rocket carrying a classified satellite for the U.S. National Reconnaissance Office blasted off Thursday from the central California coast. The launch vehicle's main engine ignited on time at 2:39 p.m. PDT for a mission described only as being in support of national defense. Web posted. (2012). [US launches classified defense satellite for National Reconnaissance Office [Online]. Available WWW: <http://www.washingtonpost.com/> [2012, September 13].]

September 14: Kennedy Space Center crews this morning rolled Endeavour from the Vehicle Assembly Building to the shuttle runway, where it will be lifted and set atop a 747 carrier aircraft today. The move, which began around 5 a.m., was the last step before Endeavour's planned takeoff Monday morning atop the Shuttle Carrier Aircraft to start the shuttle program's final ferry flight. A planned four-day, cross-country journey will take Endeavour to Los Angeles International Airport. In mid-October, the retired orbiter will roll about 12 more miles through downtown L.A. to its permanent display home at the California Science Center. The flight will include stops in Texas and California and flyovers of NASA facilities that have supported the shuttle program. After takeoff around 7 a.m. Monday, weather

permitting, the piggybacked aircraft and spaceship are expected to fly over Cape Canaveral Air Force Station, down the Brevard County coast to Patrick Air Force Base, over the Pineda Causeway and back up the Indian River Lagoon, then angle over the KSC Visitor Complex and Shuttle Landing Facility for a final farewell to the Space Coast. Web posted. (2012). [Space Shuttle Endeavour rolls toward final exit from Brevard [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 14].]

◆ A black granite plaque marks the spot where space shuttle Endeavour rolled to a stop to end its final mission on June 1 last year, 9,641 feet from the northwest end of Kennedy Space Center's runway. Around 7 a.m. Monday, a modified 747 jumbo jet carrying Endeavour will take off from the 15,000-foot runway officially called the Shuttle Landing Facility, marking its last use by a shuttle. The shuttle program's final ferry flight will take Endeavour to its permanent display site in Los Angeles. It follows Discovery's departure from Kennedy and Enterprise's commute from Washington, D.C. to New York City, both in April. "Those are hard partings," said Michael Ciannilli, a NASA test director and landing recovery director. "A lot of the workforce here worked their entire life on these vehicles and gave their blood, sweat and tears, along with their family support, to do this mission, and now it's saying goodbye to that time in their life." The runway will remain, but NASA doesn't want to pay to operate and maintain it anymore. The agency recently requested proposals, due Sept. 24, from government or commercial partners that could take over the facility within a year. NASA envisions commercial space planes launching and landing on the runway, taking people or payloads on suborbital and orbital flights. XCOR Aerospace recently announced plans to test and eventually manufacture its reusable Lynx suborbital spacecraft at KSC, flying as often as four times a day. Space Florida and the Titusville-Cocoa Airport Authority have publicly expressed interest in managing the facility known as the SLF. With its shuttle days over, Center Director Bob Cabana is mulling a name change. Riquelme said one option was Space Landing Facility, which would preserve the original acronym but fails to capture the anticipated horizontal launches. The top contenders now are the Space Launch and Landing Facility or Horizontal Launch and Landing Facility. From the beginning of the shuttle program, a runway was as important as a launch pad. Unlike any U.S. space vehicle before it, the shuttle would not splash down in the ocean but glide back through the atmosphere and touch down like an airplane. By 1976, a three-mile concrete strip as wide as a football field was open for business at KSC. But it was not until the 10th shuttle mission in 1984 that NASA's confidence in the orbiters' handling and weather conditions combined to permit a landing in Florida. Earlier landings were at Edwards Air Force Base in California, with one at White Sands Space Harbor in New Mexico. Challenger blew out a tire on that first landing in 1984, prompting a smoothing out of the deep grooves that had been carved to help water runoff. Orbiter wheels touched down 77 more times at KSC through 2011. The last three "wheels stop" locations are commemorated with etchings on the runway's centerline. A granite plaque sits parallel to each etching on the runway's eastern edge, where they won't interfere with ongoing operations. They note the final landing date and location where the nose gear stopped, and some career statistics: total number of missions flown, days in space and miles flown. Designed by local artist Chad Stout, owner of C Spray Glass Blasting in Cocoa, the 2.5-inch-thick markers are made to last. Flying at Mach 25, a shuttle had begun its re-entry halfway around the world and would be home within an hour. Twin sonic booms announced the orbiter's approach, building excitement. After it touched down and rolled to a stop — 58 times during the day and 20 times at night at KSC — the convoy swarmed the orbiter to ensure the safety of the crew and vehicle. Web posted. (2012). [Space shuttle's runway harbors own set of stories [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 14].]

◆ The Boeing Company completed its first performance milestone Aug. 23 for NASA's Commercial Crew Integrated Capability (CCiCap) initiative, which is intended to lead to the availability of human spaceflight transportation services for government and commercial customers. In its Integrated Systems Review (ISR), Boeing presented the latest designs of its CST-100 spacecraft, United Launch Alliance's Atlas V rocket launch system, and ground and mission operations. These designs will serve as the baseline for further development work to be accomplished during CCiCap. The company also discussed

its plans for safety and mission assurance, which ultimately will contribute to achieving certification of the system for human spaceflight. Technical experts from NASA's Commercial Crew Program (CCP) participated in the review in Houston. They are in the process of providing comments and advice based on more than 50 years of human spaceflight experience. "All of our industry partners are gearing up to push their human spaceflight technologies further than ever before so America can have its own crew transportation system around the middle of the decade," said Ed Mango, CCP's program manager. "This review was just the first of many exciting and valuable milestones Boeing is expected to complete during its funded partnership with NASA." At the review, Boeing also presented results from numerous tests that were conducted as part of its earlier Commercial Crew Development Round Two Space Act Agreement with NASA. These tests included parachute and air bag drops, abort engine firings and wind tunnel tests. NASA's new CCIcap agreements follow two previous commercial endeavors by the agency to spur the development of crew transportation systems and subsystems. Work by NASA's industry partners during CCIcap will set the stage for a crewed orbital demonstration mission around the middle of the decade. Future development and certification initiatives eventually will lead to the availability of human spaceflight services for NASA to send its astronauts to the International Space Station, where critical research is taking place daily to benefit all of humanity. The overall goal of NASA's commercial space efforts is to make low Earth orbit more accessible and open for business for other government and commercial customers. ["Boeing Completes First Milestone For NASA's Commercial Crew Initiative," **NASA News Release #12-311**, September 14, 2012.]

◆ Prime contractors on NASA's next-generation human space exploration vehicles are finding it unusually difficult to obtain the space-qualified electronics and other components they need to stay on schedule, a situation they say will likely get worse if there is instability in the space agency's out-year funding for the projects. Testifying before the House Science space and aeronautics subcommittee, Lockheed Martin Vice President and Orion Program Manager Cleon Lacefield said today that the lead times for radiation-hardened electronic parts and other specialized hardware is a major challenge for meeting schedule. "I think our supply chain in the United States is very fragile," Lacefield said. "When we look at the triple-e parts needed for avionics, all the electronic components, in the environment that we see, which is a radiation environment in deep space, those components are very hard to find in the United States right now." Lacefield's remarks were echoed by Jim Chilton, exploration vice president at Boeing, who is responsible for Space Launch System (SLS) stage development. Chilton told Aviation Week his company, too, is finding it difficult to purchase needed parts in the small lots needed for civil space development when the dwindling list of suppliers of all types of space-qualified hardware is hard-pressed to keep up with demand from customers that order in larger quantities. Both programs have flight test schedules to meet, beginning with Lockheed Martin. NASA plans to fly an Orion testbed on a Delta IV launch vehicle in 2014 to evaluate how well its thermal protection system performs in a planetary return simulated by a two-orbit, high-apogee trajectory. Lacefield said the supply chain problem extends beyond electronic components able to withstand the environment outside the Van Allen Belts, and include the weight-saving composite parts that make up about 40% of the Orion capsule's structure. Web posted. (2012). [Supply Chain Seen Slowing NASA Capsule, Rocket Development [Online]. Available WWW: <http://www.aviationweek.com/> [2012, September 14].]

September 15: A long-anticipated analysis of an obligatory across-the-board cut to the US government's budget reveals the devastating impact the cut would have on federal science agencies. Known as the 'sequester', Congressional lawmakers inserted the sweeping cut into legislation that raised the government's debt ceiling deal last year so that it would act as a negative incentive. Its deep proposed cuts in both defense and non-defense spending were set to kick in come January 2013 — but only if Congress failed to agree on how to lower the US deficit. Now, with efforts to reach agreement long abandoned and the cuts looming, the White House's Office of Management and Budget (OMB) released a document on 14 September that describes the projected carnage across federal departments including those that fund science. "Today's OMB report confirms the worst," said Hunter Rawlings, President of

the Association of American Universities in a statement. "A budget sequester in January would have a terrible short- and long-term impact on the nation's investments in scientific research and education." While neither side of Congress wants this mixture of cuts to actually take place, no one believes that politicians can negotiate a better deal until after November's election. By that point, they will have a scant few weeks to figure out a better plan. Web posted. (2012). [Impact of impending US budget cut on science revealed [Online]. Available WWW: <http://www.nature.com/> [2012, September 15].]

◆ The KSC Visitor Complex recently instituted a \$10 parking fee for automobiles and motorcycles and \$15 for motor homes and RVs. Admission is \$50 for adults. Parking remains free for annual passholders. The attraction showcasing man's accomplishments in space exploration is following a practice used by other popular theme parks in Central Florida to generate revenue. "That fee goes to support the maintenance, development and operations of the visitor complex," said Andrea Farmer, spokesman for the KSC Visitor Complex. Web posted. (2012). [KSC visitor complex adds \$10 parking fee [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 15].]

September 17: NASA says bad weather has forced it to put off the piggyback flight of the space shuttle Endeavour to California, where the now-retired spacecraft will be put on display. The space agency announced Sunday that it has pushed back the start of the multi-day flight until Tuesday, a day later than planned. Storms forecast over the Southeast prompted the delay, NASA said in a statement announcing the postponement. NASA still hopes to deliver Endeavour, the baby of the shuttle fleet, to Los Angeles by Thursday, the agency said. The spacecraft and its Boeing 747 carrier are slated to make several stops and low-level flyovers along the route, with overnight stops in Houston -- home to the mission control center for the U.S. manned space program -- and at NASA's Dryden Flight Research Center in southern California. Dryden is located at Edwards Air Force Base, the landing site for the first shuttle missions. The jet-shuttle combo will make low-altitude passes over NASA's Stennis Space Center on the Mississippi Gulf Coast and the agency's Michoud Assembly plant near New Orleans, where the shuttles' external fuel tanks were built; over the White Sands Test Facility in New Mexico, a last-resort landing site where shuttle pilots trained; and over San Francisco, Sacramento and other northern California sites. Endeavor is scheduled to be on display at the California Science Center in Los Angeles by late October. Built as a replacement for the ill-fated shuttle Challenger, it made 25 flights into space between 1992 and 2011. The other two surviving orbiters, Discovery and Atlantis, are also being put on display at museums. Atlantis will be at the Kennedy Space Center at Cape Canaveral, Florida; Discovery at the Smithsonian Institution's National Air and Space Museum annex in Virginia. Web posted. (2012). [Bad weather delays Endeavour's last trip [Online]. Available WWW: <http://www.cnn.com/> [2012, September 17].]

September 18: United Launch Alliance's Atlas-Centaur rocket has been put together for deploying the Air Force's third Orbital Test Vehicle flight, a mission that will demonstrate the reusability of the X-37B spaceplane when it blasts off Oct. 25. The bronze first stage of the vehicle was erected atop the mobile launch platform inside the Vertical Integration Facility at Cape Canaveral on Thursday, Sept. 13. After setting the interstage adapter hardware in place, the Centaur upper stage was hoisted high into the assembly building on Saturday, Sept. 15. The upcoming spaceflight will be the second for this particular X-37B vehicle, which spent 224 days, 9 hours and 24 minutes aloft between April and December 2010 on the inaugural OTV shakedown cruise. A second vehicle spent 468 days, 13 hours and 2 minutes on a voyage from March 2011 to this past June that circled the globe more than 7,000 times. Web posted. (2012). [Another Atlas 5 readied to launch mini space shuttle [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, September 18].]

September 19: NASA managers and aerospace industry representatives met Sept. 19 for a chance to discuss the request for proposals that will begin NASA's certification process for integrated crew transportation systems. This certification process will help NASA to eventually purchase service missions

to fly astronauts to and from the International Space Station. During the Certification Products Contract (CPC) Pre-Proposal Conference at NASA's Kennedy Space Center in Florida, commercial crew and space station program officials made presentations and answered industry questions about the two-phase acquisition strategy the agency is taking to certify these new systems to meet its crew transportation needs no later than 2017. "Why is this (CPC) important?" asked Maria Collura, program certification manager. "It reduces the risk for us as we enter Phase 2 and also gives us confidence in enabling the readiness for services as soon as possible." Beginning in February 2013 when awards are anticipated, Phase 1, called CPC, will allow NASA to work with CPC contractors to establish critical systems engineering and safety tools and certification plans so that Phase 2 can be spent actually building, verifying and validating the systems. It will be up to the companies to decide how they prove their systems are safe enough to fly to low Earth orbit, but the agency will certify the systems through the use of this phased contract prior to allowing missions crewed by NASA astronauts. "We believe this will benefit both parties so that we can move forward together into Phase 2 on common ground," said Tom Simon, chair of the CPC Evaluation Team. "It's very important to agree on what's required for a NASA certification and to have common expectations so that when the plans are executed we can focus on determining if the results meet the criteria defined in the plans." Up to this point, NASA's Commercial Crew Program (CCP) and its industry partners have been operating under Space Act Agreements. That strategy has continued to advance the development of systems for the country as a whole through NASA's Commercial Crew Development Rounds 1 and 2 and the newly awarded Commercial Crew Development Integrated Capability (CCiCap). CCP's phased acquisition will allow NASA and industry to iron out how systems in development could meet all of NASA's safety and performance requirements for crewed missions to the space station. "Just to be clear, those requirements have been locked in place for quite some time," said Ed Mango, CCP manager. "All we have been doing is updating them with clarifications and expanding our supporting information helping to make sure that they are clearer for industry to understand." "The CPC effort is critical to defining a complete system that is safe enough to fly our astronauts to the International Space Station," Mango said. The transition between the two phases is expected to take place in mid-2014. While both phases will be open to any company to submit a proposal, Collura said Phase 2 will build on Phase 1 and companies that are interested in receiving a contract for NASA crew transportation are encouraged to submit proposals for Phase 1. Web posted. (2012). [Common Ground Key to Certifying Commercial Systems [Online]. Available WWW: <http://www.nasa.gov/> [2012, October 1].]

◆ Space shuttle Endeavour is on its way to California after taking off from Kennedy Space Center to begin an orbiter's final ferry flight atop a 747 carrier aircraft. The piggybacked jumbo jet and spaceship took off from KSC's 15,000-foot shuttle runway at 7:22 a.m. to begin a low loop 1,500 feet over the Space Coast. About 20 minutes later they made a final farewell pass just 200 feet over the shuttle runway before banking west toward Orlando and disappearing behind low clouds. "For those of us that worked on a space shuttle, and especially for those of us who had the privilege to fly on board, we see a great beauty," said NASA astronaut Kay Hire, a former shuttle engineer at KSC. "So the first thought is, what a beautiful ship. But also, for me personally, I'm experiencing a great deal of pride, because this is now an opportunity to share Endeavour with the world." There was a smattering of applause from the estimated 2,400 invited and paying guests watching Endeavour's departure from the runway midfield, but it was mostly quiet. The first leg of a planned three-day ferry flight will take Endeavour to Ellington Field near Johnson Space Center in Houston, where it is expected to land after 11:45 a.m. EDT. After reaching Los Angeles International Airport on Friday, Endeavour will go on permanent display at the California Science Center next month. Endeavour, which was built to replace the lost Challenger, flew 25 shuttle missions starting in 1992. Web posted. (2012). [Endeavour leaves Space Coast [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 19].]

◆ Astronauts from NASA's earlier missions would get to keep — and sell — some of the space artifacts and other items they acquired during their historic flights, under bipartisan legislation the House passed

Wednesday. The legislation was proposed after NASA contested astronaut Jim Lovell's auction last year of the checklist he kept from the ill-fated Apollo 13 flight that never made it to the moon. The checklist, complete with handwritten calculations Lovell made to steer the damaged spacecraft back to Earth, fetched nearly \$389,000 in November. Other cases came to light later. NASA officials were forced to explain why for the past several years they have been challenging ownership of the same mementos agency managers had told astronauts decades before they could keep. The House bill now heads to the Senate. Web posted. (2012). [House approves bill to let astronauts keep space artifacts [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 19].]

September 20: Disappointed with the direction of NASA's human spaceflight program over the past two decades, two Texas congressmen introduced legislation Thursday aimed at de-politicizing the agency. Rep. John Culberson, a Houston Republican, said the lawmakers were pushing the proposal "today to restore the NASA we know and love." The proposal, called the Space Leadership Preservation Act of 2012, would create a 10-year term for the NASA administrator - inspired by the 10-year term of the nonpartisan FBI director - and the establishment of an 11-member board of directors. Under the act, the president, speaker of the House and president pro tempore of the Senate would each appoint three members of the board and the Senate and House minority leaders would each select one. It is co-sponsored by Culberson, Sugar Land Rep. Pete Olson, Florida Rep. Bill Posey and Virginia Rep. Frank Wolf. The measure has no Democratic sponsors. The bill has virtually no chance of winning passage in the waning days of the current Congress. But GOP lawmakers were laying down a marker for debate over NASA's future in the next Congress. Web posted. (2012). [Legislation would change how NASA is led [Online]. Available WWW: <http://www.chron.com/> [2012, September 20].]

◆ NASA says the space shuttle Endeavour will honor former Arizona congresswoman Gabrielle Giffords with a flyover of her hometown, Tucson, on its way from Texas to a California museum where it will be displayed. NASA spokeswoman Lisa Malone says Thursday's flyover was requested by Giffords' husband, retired astronaut Mark Kelly, who is the last person to fly the shuttle. Malone says the flyover gives NASA the chance to recognize Giffords' legacy as a longtime advocate and champion of American human spaceflight. Giffords resigned from Congress earlier this year to focus on her recovery from wounds suffered in a 2011 attack in Tucson in which six people were killed and she and 12 others were injured. The plane carrying the shuttle will fly low over several cities en route to California. Web posted. (2012). [Endeavour to honor Giffords with Tucson flyover [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 20].]

◆ Space shuttle Endeavour has departed Houston on its trek west to retirement in a Los Angeles museum. Endeavour, atop a modified jumbo jet, left Thursday morning after a one-day stop at the home of NASA's Mission Control. The retired shuttle took off Wednesday from its old home in Kennedy Space Center in Brevard County. It continues its journey to Los Angeles International Airport, where it's scheduled to land Friday. In mid-October, Endeavour will be transported down city streets to the California Science Center. This is the last flight for a space shuttle. The plane transporting the Endeavor will do a flyover of Tucson, Ariz., along the way to honor former Congresswoman Gabrielle Giffords. Houston's bid for one of the retired shuttles was rejected, and it has instead received a replica. Web posted. (2012). [Endeavour leaves Houston for new home in Calif. [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 20].]

◆ Space shuttle Endeavour is generating excitement Thursday as it flies from Texas to Edwards Air Force Base in California's Mojave Desert. People took to Twitter, Facebook and other social media (see below) as the shuttle departed Houston and made a flyover of Austin, posting their photos of the retired orbiter as it passed near local landmarks. The shuttle left Houston shortly after 5 a.m. PDT on Thursday en route for Edwards Air Force Base, where it is expected to touch down around 12:30 p.m. after a 30-

minute flyover around the base. Riding atop a modified Boeing 747, the shuttle has already dipped low over the Texas state Capitol in Austin. It landed at El Paso's Biggs Army Airfield at 7:12 PDT for refueling, NASA officials said, and is scheduled to fly over NASA's White Sands Test Facility in New Mexico before heading to Tucson for another low pass. To welcome the space shuttle to Southern California, NASA has invited 40 of its social media followers, including space enthusiasts, to the Dryden Flight Research Center on the Edwards base. The participants were randomly selected from online registrations that took place in August, according to information published by the space agency. Web posted. (2012). [Space shuttle Endeavour flyovers generate social media buzz [Online]. Available WWW: <http://latimesblogs.latimes.com/> [2012, September 20].]

◆ There is a photography saying that sometimes the most important thing to do for a great photo is to “be there.” And when the “there” is from special access, the photos are often unique. A recent example was Wednesday’s final flight of space shuttle Endeavour from the Kennedy Space Center. There were lots of great photos from news photographers on the scene but some of the best photos were made from the chase planes escorting the 747 carrying the shuttle. The good news for us is that since the photos were made by NASA, they are easy for you to see. The photos are posted to their nasahqphoto account on flickr.com and you can even download high-resolution versions for non-commercial use. Web posted. (2012). [See shuttle photos on the NASA Flickr account [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, September 20].]

September 21: SpaceX will begin its first official resupply flight to International Space Station on October 7, NASA announced Thursday. Following the success of a demonstration flight in May, the privately owned space company is scheduled to transport about 1,000 pounds of supplies to the space station and bring back more than 1,200 pounds of scientific material and space station hardware. It will be the first of 12 such missions, NASA said. SpaceX's Falcon 9 rocket and unmanned Dragon cargo spacecraft will launch from Cape Canaveral at 8:34 p.m. ET on October 7, with the next day as a backup date. The CRS-1 mission should reach the space station on October 10 and return several weeks later. Web posted. (2012). [NASA, SpaceX set launch date for first official resupply flight [Online]. Available WWW: <http://www.cnn.com/> [2012, September 21].]

◆ The state wants to develop a commercial launch complex at Kennedy Space Center, a move that could persuade SpaceX not to pursue a similar site elsewhere in the country. In a letter sent Thursday to NASA Administrator Charles Bolden and U.S. Transportation Secretary Ray LaHood, Lt. Gov. Jennifer Carroll requested 150 undeveloped acres at the northern end of the space center, near the former citrus community of Shiloh. With Federal Aviation Administration approval, the site would operate outside the jurisdiction of the U.S. Air Force’s Eastern Range, which provides safety and tracking for launches from KSC and Cape Canaveral. “The State proposes to develop and operate this site as a commercial launch complex independent of the neighboring federal range and spaceports,” Carroll wrote. In addition to the launch site property bordering Brevard and Volusia counties, the state requested facilities and land at KSC’s shuttle runway, which NASA has said it intends to turn over to an outside operator. The letter was sent a week after Space Florida’s board, chaired by Carroll, unanimously passed a resolution to acquire KSC property to support commercial space operations and to spend up to \$2.3 million for environmental and other studies. SpaceX CEO Elon Musk has said he wants another pad exclusively for launches of commercial satellites that would complement the Hawthorne, Calif.-company’s existing complex at the Cape. He anticipates launching 12 to 15 times a year within several years and wants more control over schedules, so commercial customers would not have to wait in line behind high-priority national security or science payloads. SpaceX is already performing an environmental review of property on Texas’ coast near the Mexican border, and has reportedly explored other sites. Carroll’s letter did not identify SpaceX as the intended user of the proposed launch complex, but Space Florida has said it is scouting for locations that would satisfy the company’s needs. A SpaceX spokeswoman declined to comment on the

company's interest in the Florida proposal. NASA did not immediately respond to a request for comment. KSC is currently modifying one of its two former shuttle launch pads for a planned deep space exploration rocket, and has said it intends to make the other shuttle pad available for commercial use. In 2008, a NASA study of potential commercial launch complex sites, including one located in the northern part of KSC, drew opposition from residents concerned about wildlife and loss of refuge access. Carroll's letter requested cooperation from the Secretary of the Interior, acknowledging the sensitivity of the property within the Merritt Island National Wildlife Refuge, but said the state believes its proposed activity "will pose no significant impacts to the environment." Carroll noted Florida's longstanding support of the space program, including granting NASA the use of more than 56,000 acres and investing a half-billion dollars in infrastructure. "Florida is experienced in space-related endeavors, and is well prepared to become a public steward of the requested assets," she wrote. Web posted. (2012). [Florida makes play for launch pad [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 21].]

◆ Space shuttle Endeavour has landed safely at the Los Angeles International Airport after a whirlwind aerial tour around California landmarks. Strapped to the back of a 747 jumbo jet, Endeavour touched down Friday afternoon after a nearly 5-hour flyover. Endeavour will retire at the California Science Center. Before its retirement, it took to the skies, looping over the state Capitol, Golden Gate Bridge, Hollywood Sign and other icons. Thousands turned out to see Endeavour soar one last time. Endeavour flew 25 missions and spent 299 days in space. Web posted. (2012). [Endeavour on the ground at Los Angeles airport [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 21].]

September 22: Top NASA officials have picked a leading candidate for the agency's next major mission: construction of a new outpost that would send astronauts farther from Earth than at any time in history. The so-called "gateway spacecraft" would hover in orbit on the far side of the moon, support a small astronaut crew and function as a staging area for future missions to the moon and Mars. At 277,000 miles from Earth, the outpost would be far more remote than the current space station, which orbits a little more than 200 miles above Earth. The distance raises complex questions of how to protect astronauts from the radiation of deep space — and rescue them if something goes wrong. NASA Chief Charlie Bolden briefed the White House earlier this month on details of the proposal, but it's unclear whether it has the administration's support. Of critical importance is the price tag, which would certainly run into the billions of dollars. Placing a "spacecraft at the Earth-Moon Lagrange point beyond the moon as a test area for human access to deep space is the best near-term option to develop required flight experience and mitigate risk," concluded the NASA report. From NASA's perspective, the outpost solves several problems. It gives purpose to the Orion space capsule and the Space Launch System rocket, which are being developed at a cost of about \$3 billion annually. It involves NASA's international partners, as blueprints for the outpost suggest using a Russian-built module and components from Italy. And the outpost would represent a baby step toward NASA's ultimate goal: human footprints on Mars. But how the idea — and cost — play with President Barack Obama, Congress and the public remains a major question. The price tag is never mentioned in the NASA report. Web posted. (2012). [Sentinel Exclusive: NASA wants to send astronauts beyond the moon [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, September 22].]

September 23: As of June 30, Brevard Workforce had \$9.1 million left to spend of a \$15 million National Emergency Grant awarded in 2010 to help displaced shuttle workers. The U.S. Department of Labor provided a first grant installment of \$7.8 million. In April of this year, it approved the remaining \$7.2 million and extended the grant one year to June 14, 2013. Any money not spent by then must be returned. Brevard Workforce has refocused the resources on "core and intensive" services such as workshops and one-on-one counseling that experts say are less expensive and can serve more people than job training. Most of the cost is for the staff needed to provide the services. The On-the-Job Training

program that was the grant's original focus was costly because it anticipated paying portions of the salaries of high-wage aerospace workers while they were trained in new fields. There is no penalty if Brevard Workforce fails to achieve the grant's goals for numbers of people served and employed, but agency officials said doing so could make it harder to win similar grants in the future. Web posted. (2012). [Missed goals may hurt grant efforts [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 23].]

September 25: Space Florida has used its ability to help with financing to provide \$62.5 million in credit to support the construction of the Space Shuttle Atlantis Exhibit at Kennedy Space Center Visitor Complex with the help of Bank of America. Delaware North Companies Parks & Resorts, operator of Kennedy Space Center Visitor Complex for NASA since 1995, will use the loan to complete construction on the \$73 million permanent showcase facility for the retired Atlantis Orbiter. Scheduled to open next summer, the \$100 million project includes the 90,000-square-foot Atlantis exhibit, orbiter display preparation, transportation, interactive exhibits and utilization of space shuttle program artifacts. The loan will be repaid with Visitor Complex concessions. The Atlantis exhibit will tell the story of the 30-year space shuttle program through more than 60 interactive, hands-on experiences. The exhibit is expected to bring 326 new construction jobs to the Space Coast during the next two years. Other phases of the exhibit will be under construction after the opening in 2013. Web posted. (2012). [Local business briefs: Space Florida helps finance exhibit [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 25].]

◆ The Turner Classic Movies cable channel is joining with NASA to give an out-of-this-world opening to a series of film screenings. "Forbidden Planet," the 1956 science fiction film that introduced Robby the Robot, will be the first movie in the next Road to Hollywood screening series sponsored by TCM, part of the Turner Broadcasting System unit of Time Warner. The film is scheduled to be shown Oct. 13 at the Kennedy Space Center Visitor Complex in Florida, and also transmitted to the International Space Station for viewing by the astronauts on board; movies are part of what NASA calls psych support, or psychological support, for astronauts aboard the space station. One of those astronauts, the American Sunita Williams, is to introduce "Forbidden Planet" from space to the attendees at the Kennedy Space Center screening. Web posted. (2012). [TCM to Screen 'Forbidden Planet' on Land and on the Space Station [Online]. Available WWW: <http://www.nytimes.com/> [2012, September 25].]

September 26: NASA's decision to spend more than \$60 million to retrofit a mobile launch tower built for the now-canceled Ares I rocket, enabling it to support a new heavy-lift rocket, was "technically feasible and the most cost-effective option," an audit said Tuesday. But it's still uncertain whether the modified mobile launcher, which stands more than 400 feet tall at Kennedy Space Center and has cost \$234 million to date, will be suitable for larger planned versions of the rocket called the Space Launch System, or SLS. Two NASA-backed studies supporting the decision were based on limited information about preliminary SLS designs, according to the audit by the NASA Office of Inspector General. "Because SLS vehicles will increase in size as they evolve, those early studies may not have addressed all the challenges or costs associated with launching the larger vehicles," the report says. The studies estimated it would cost between \$54 million and \$74 million to modify the mobile launcher's base and tower. Kennedy now expects to spend \$62 million to strengthen the mobile launcher's base and widen its exhaust port by February 2015. Another \$112 million will outfit the structure with propellant, gas, power and communications lines, and test and activate the system in time for an unmanned SLS test launch planned in 2017. In all, the entire retrofit is estimated to cost \$174 million. Other options to modify a space shuttle mobile launcher platform or build a new mobile launcher were projected to cost \$93 million and \$122 million, respectively, according to an internal study by Kennedy and contractor personnel. The modification work is necessary because the first version of the SLS is more than twice as heavy as the Ares I. Also, the SLS blasts off with two solid rocket boosters and a set of liquid-fueled engines,

compared to the single solid first stage that was envisioned for Ares I. In addition to cost considerations, modifying the existing mobile launcher met congressional direction for the new exploration program to maximize prior investments in the shuttle and Constellation programs. Over time, the SLS design is supposed to “evolve” to increase the weight it can lift to space from 70 tons to 130 tons. And between 2017 and the 2030 timeframe, the rocket is expected to grow from 320 feet to 389 feet and add more than 1 million pounds while integrating new propulsion technologies. The increasing height may change where umbilical lines providing power, gases and propellant connect from the launch tower to the rocket, and the location of a crew access arm and emergency escape system. The audit acknowledged those changes are years away. The auditors recommended close coordination between Kennedy and the two centers managing development of the SLS and Orion crew capsule to ensure that changes in the rocket’s design are clearly communicated and understood. Web posted. (2012). [Audit supports retrofitting mobile launch tower at KSC [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 26].]

September 28: The first SpaceX launch for NASA's Commercial Resupply Services (CRS) contract is scheduled for Sunday, Oct. 7, from Space Launch Complex 40 on Cape Canaveral Air Force Station in Florida. There is a single instantaneous launch opportunity for the Falcon 9 rocket and Dragon capsule at 8:35 p.m. EDT. Backup launch opportunities are available on Oct. 8 and Oct. 9, if needed. The launch of the Dragon spacecraft, designated SpaceX CRS-1, will be the first of 12 contracted flights by the company to resupply the International Space Station and is the second trip by a Dragon to the station, following a successful demonstration mission in May. Under the CRS contract, SpaceX will restore an American capability to deliver and return significant amounts of cargo, including science experiments, to the orbiting laboratory -- a capability not available since the retirement of the space shuttle. The Dragon will be filled with about 1,000 pounds of supplies. This includes critical materials to support the 166 investigations planned for the station's Expedition 33 crew, including 63 new investigations. The Dragon will return about 734 pounds of scientific materials, including results from human research, biotechnology, materials and educational experiments, as well as about 504 pounds of space station hardware. [“NASA Coverage Set for Oct. 7 SpaceX Launch to Space Station,” **NASA Media Advisory #M12-194**, September 28, 2012.]

September 29: Prime shuttle contractor United Space Alliance on Friday shaved its workforce by another 6 percent, cutting 157 jobs, including 121 at Kennedy Space Center. The cuts reduced USA’s Florida employee count to 1,073, down from about 5,500 at the start of 2010. Company-wide, 2,263 employees remain. In addition to the layoffs here, USA cut 35 positions in Texas and one in Alabama. USA spokeswoman Tracy Yates said the Houston-based company’s latest quarterly layoffs were part of continued downsizing as NASA’s shuttle Transition and Retirement program winds down. “As this work scope continues to decrease, additional employees will be released from the company,” Yates said. “The next workforce reductions are tentatively scheduled for December and January.” Since the last shuttle mission in July 2011, NASA and USA have ferried three retired orbiters (including the prototype Enterprise) to museums. Atlantis, the last shuttle left at KSC, is scheduled to move to the KSC Visitor Complex on Nov. 2. While readying the orbiters for public display, USA has also been closing out facilities no longer needed for the shuttle. Some of those, such as hangars, a launch pad and the runway, could be turned over to new commercial or government users. USA, a 50-50 joint venture between The Boeing Co. and Lockheed Martin Corp., will continue work that supports ground operations at KSC, the International Space Station, development of the Orion crew capsule and other contracts, Yates said. As with earlier rounds of layoffs, employees departing Friday left with severance packages ranging from four to 26 weeks of pay based on their years of service. The company no longer awards additional “critical skills” bonuses that were implemented as incentives to help retain key personnel to ensure safe flyout of the shuttle. Those bonuses were last paid out in April. Web posted. (2012). [USA further reduces staff at KSC, other installations [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 29].]

September 30: The military's mysterious mini-shuttle operations might be consolidated on Florida's Space Coast, and the upcoming third flight of the Air Force vehicle might land at Kennedy Space Center's three-mile shuttle runway. In what could be an economic boon for an area still reeling from the 2011 retirement of the U.S. shuttle fleet, the Air Force said Thursday it was considering moving X-37B operations to KSC or Cape Canaveral Air Force Station. Moreover, the upcoming third flight of the unmanned X-37B — a hush-hush vehicle also known as the Orbital Test Vehicle, or OTV — could be capped with a return to NASA's Shuttle Landing Facility. Maj. Tracy Bunko, a spokesperson for the Air Force Rapid Capabilities Office, said the service is "looking at space shuttle infrastructure for possible cost-saving measures, including the potential for consolidating landing, refurbishment and launch operations at Kennedy Space Center or Cape Canaveral Air Force Station." It was not immediately clear how many jobs might be brought to the Space Coast if the Air Force consolidates X-37B operations here. But such a move would almost certainly add dozens, if not hundreds, of civil service and contractor jobs that would help fuel a next-generation economic engine on Florida's Space Coast. Two of the military mini-shuttles were built for the Air Force, and each has flown in space once. The vehicles are launched on United Launch Alliance Atlas V rockets. The first two flights ended with ground-breaking autonomous atmospheric re-entries and landings at Vandenberg Air Force Base in California. The third flight of an X-37B is scheduled to launch in late October aboard an Atlas V rocket at Space Launch Complex 41 at the Cape. The mission will mark the first X-37B re-flight. The spacecraft launched on the inaugural X-37B mission in April 2010. It flew in space for about 225 days. The second X-37B spacecraft launched in March 2011 and spent 469 days in space — well beyond its 270-day orbital warranty. Web posted. (2012). [Mini-shuttle X-37B talk stirs optimism on Space Coast [Online]. Available WWW: <http://www.floridatoday.com/> [2012, September 30].]

OCTOBER

October 1: New plans to convert an abandoned citrus town into a Space Coast rocket hub has triggered another round of fighting between environmentalists and the aerospace industry — and this time the rocketeers could have an edge. At issue is the ghost town of Shiloh, which straddles the border between Volusia County and Brevard and sits at the northern boundary of Kennedy Space Center. State officials envision a new launchpad for commercial-rocket companies and they've asked NASA to give about 150 acres of undeveloped KSC land around Shiloh to Space Florida, a public-private agency that wants to create the proposed facility. Though NASA has yet to respond, the request has drawn the notice of Florida environmentalists, who successfully opposed a similar effort four years ago on the grounds that it would scar Merritt Island National Wildlife Refuge, a 140,000-acre sanctuary that overlays KSC. "Some of these bad ideas have a way of being reborn," said Charles Lee of Audubon Florida. Lee said a Shiloh site could harm rare wildlife — including the scrub-jay, one of at least 15 threatened or endangered species at the refuge — and also curtail fishing and other outdoor recreation at neighboring Canaveral National Seashore. "The problems would be either magnified or lessened depending upon exactly where the [launch] site is," Lee said. "But suffice it to say it is in an area where the losses to the national wildlife refuge could be severe." Details on its exact location are vague. Space Florida, which acts as a state booster to the aerospace industry, recently commissioned a \$2.3 million study of the Shiloh area to determine the best place to build a launchpad and its impact on the environment. Frank DiBello, head of Space Florida, said the impact study should be done by next summer. "Until we do the environmental and engineering studies, we won't be able to draw the lines for you," he said. But DiBello added that he hoped that Space Florida could avoid another brawl with bird-watchers and other naturalists, who in 2008 helped shelve a similar proposal to build a spaceport with two launchpads at a cost of at least \$500 million. Space Florida didn't provide cost estimates for the current proposal, nor how payments would be split between the agency and interested rocket companies. DiBello said what was important at this point was bringing together all the interested parties, including environmentalists. Web posted. (2012). [Plan for new Launchpad worries environmentalists [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, October 1].]

◆ A Delta IV rocket is being prepped for launch this week from Cape Canaveral Air Force Station but the weather likely will be a factor on launch day. The United Launch Alliance rocket is scheduled to blast off from Launch Complex 37 at Cape Canaveral Air Force Station at 8:10 a.m. Thursday, the opening of a 19-minute launch window. Its payload: an advance U.S. Air Force Global Positioning System (GPS) spacecraft that will help guide American and allied military troops on missions around the world. A civilian signal also is in ubiquitous use around the globe. A forecast from the Air Force 45th Space Wing Weather Squadron calls for a 60 percent probability of acceptable weather on launch day. But there is a 40 percent chance that thick clouds and rain could force a launch delay. A rocket flying in those conditions could trigger destructive bolts of lightning. The forecast for Friday is the same. On Saturday, there would be a 70 percent chance of acceptable launch weather, the forecast says. Web posted. (2012). [Delta IV rocket prepped for Thursday launch [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 1].]

◆ While SpaceX's prepares to launch the first commercial cargo resupply mission to the International Space Station, planned at 8:35 p.m. Sunday, NASA's other commercial cargo partner took a long-awaited step forward today. Orbital Sciences Corp. rolled the first stage of its Antares rocket to a Virginia launch

pad to mark the formal start operations there, after four years of development and months of delays completing the pad at the state-run Mid-Atlantic Regional Spaceport on Wallops Island. The Dulles, Va.-based company now must complete a series of tests before space station resupply missions can begin next year under a \$1.9 billion contract. The Antares rocket's two liquid-fueled first-stage engines will be test-fired in four to five weeks, leading up to a first test launch of the rocket. By December or early next year, the Antares will launch a Cygnus cargo spacecraft on a demonstration mission to the space station, similar to one SpaceX's Dragon capsule flew successfully in May. The tests will be performed under NASA's Commercial Orbital Transportation Services demonstration program. SpaceX, of Hawthorne, Calif., recently graduated from that program to begin operational flights under a \$1.6 billion Commercial Resupply Services contract. Web posted. (2012). [Orbital Sciences rolls out Antares rocket stage at Va. Launch pad [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 1].]

October 2: Inside Orbiter Processing Facility-2 at NASA's Kennedy Space Center in Florida, Tim Keyser, the midbody mechanical lead with United Space Alliance (USA), and Ray Propst, USA Atlantis flow manager, watched as space shuttle Atlantis' two 60-foot-long payload bay doors were closed for the final time Sept. 20. "It's a proud moment for me helping to prepare this orbiter for display," Keyser said. "It doesn't get any better than this." Propst said, "It's an honor to work with these folks, who continue to skillfully perform these complex tasks in spite of the obvious distractions." During shuttle missions, the payload bay doors were controlled from the flight deck. But since the final power down of Atlantis occurred on Dec. 22, 2011, the operation to close the doors would have to be accomplished a different way. In his role as move director for the Atlantis payload bay door closure operation, Keyser carefully monitored all of the activities and gave the "go" to close the doors. Bob Emerson, a USA mechanical engineer, used the payload retention latch control box, which was connected to Atlantis' door drive motors, to begin the process of slowly closing the left, or portside door, and then the right, or starboard door. The entire process took only about an hour, with the actual closing of both doors taking under two minutes. Technicians on platforms at both ends of the payload bay doors used speed wrenches in gear boxes located on Atlantis to lock the doors in place. Another technician slowly was moved along in a bridge bucket above Atlantis to lock the centerline latches in place. Closing the payload bay doors is part of NASA's Transition and Retirement work on the remaining space shuttle at Kennedy. Web posted. (2012). [Atlantis' Payload Bay Doors Closed for Final Time [Online]. Available WWW: <http://www.nasa.gov/> [2012, October 2].]

◆ The head of Florida's aerospace development agency said plans for a new commercial launch complex at Kennedy Space Center do not include closing State Road 3, Volusia County's only access to the Merritt Island National Wildlife Refuge and Playalinda Beach. "There is no plan on our part to close down any part of (the former State Road 3)," Frank DiBello, president and CEO of Space Florida said during a telephone interview Monday. In a letter dated Sept. 20, sent to U.S. Transportation Secretary Ray LaHood and NASA Administrator Charles Bolden, Lt. Gov. Jennifer Carroll requested that 150 acres of undeveloped land near the former citrus community of Shiloh, close to the northern boundary of Kennedy Space Center, be transferred to the state. The land would be developed for a commercial spaceport. In the same letter, Carroll, who is chairwoman of the Space Florida board, said the state wanted to reacquire "existing highway right-of-way and improvements of the former State Road 3, from its intersection in Volusia County to a point appropriate for the access requirements of the proposed launch complex." Despite that statement, DiBello said that there is "nothing in any plan or document that we have that even considered closing State Road 3." DiBello said officials still haven't decided what specific site they want to acquire for the launch complex. Web posted. (2012). [State request for land near KSC rekindles environmental worries [Online]. Available WWW: <http://www.news-journalonline.gov/> [2012, October 2].]

October 3: The nation's newest GPS satellite is mounted atop a United Launch Alliance Delta IV Medium rocket at Cape Canaveral. Standing 206 feet tall at Launch Complex 37, the powerful rocket is scheduled to blast off at 8:10 a.m. Thursday [October 4], the opening of a 19-minute launch opportunity. A liftoff anytime during that launch window would put the satellite on course for an operating orbit 11,000 miles above the planet. The weather forecast is favorable. There is a 60 percent chance conditions will be acceptable for launch. The main concerns: a chance of thick electrically charged clouds or rain in the area. A rocket flying in those conditions could trigger destructive bolts of lightning on its way toward orbit. The launch will be the 52nd GPS mission for Delaney — a string that dates back to Feb. 14, 1989. The Delta IV payload is the third in a series of 12 advanced navigation spacecraft being built by Boeing for the U.S. Air Force. Web posted. (2012). [Thursday's Delta IV launch will deliver crucial GPS satellite [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 3].]

October 5: The latest forecast continues to show a 60 percent chance of weather good enough to allow a SpaceX Falcon 9 rocket to blast off from Cape Canaveral at 8:35 p.m. Sunday. Atop the rocket are a Dragon capsule packed with cargo for the International Space Station and a small communications satellite. A weak frontal boundary moving slowly through the Florida peninsula could produce thick clouds and scattered showers Sunday evening. The launch window is instantaneous. If the launch should delay for a day or two, the forecast is excellent Monday and Tuesday, with an 80 percent chance of favorable conditions both days. The space station resupply mission is the first of 12 SpaceX plans to fly under a \$1.6 billion NASA contract. Flying as a secondary payload is the first in a new generation of satellites being fielded by New Jersey-based Orbcomm. Web posted. (2012). [Falcon 9 forecast 60 percent 'go' for Sunday night [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 5].]

October 6: Generating less than its normal 25,000 pounds of thrust because of a still unknown problem, the upper stage engine on the Delta 4 rocket had to fire for longer periods of time Thursday morning before ultimately delivering the GPS payload into the right orbit, overcoming the adversity to achieve success. Delta 4 rocket-maker United Launch Alliance and RL10B-2 engine provider Pratt & Whitney Rocketdyne have convened a review panel to look into the telemetry recorded during the ascent and determine what caused the low-thrust condition. Officials say it is too soon to know what, if any, impact the situation will have on plans to launch an Atlas 5 rocket with the Pentagon's X-37B miniature space shuttle using a Centaur upper stage equipped with a similar-yet-different RL10 powerplant Oct. 25. Thursday's voyage of the 20-story rocket set sail at 8:10 a.m. EDT (1210 GMT) from pad 37B at Cape Canaveral Air Force Station topped with the Global Positioning System 2F-3 navigation satellite. A pair of strap-on solid-fuel boosters provided extra power for the first 95 seconds of flight, assisting the cryogenic first stage in climbing away from Earth. Web posted. (2012). [Delta 4 rocket overcomes engine issue during launch [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, October 6].]

October 7: A private spacecraft is on its way to resupply the International Space Station for the first time, opening a new era for NASA and the commercial spaceflight industry. SpaceX's Dragon cargo capsule blasted off from Cape Canaveral Air Force Station atop a Falcon 9 rocket at 8:35 p.m. tonight, lighting the night sky with an orange glow as it roared northeast over the Atlantic Ocean. The unmanned Dragon spacecraft separated from the rocket in what SpaceX called a "picture-perfect" orbit to start a roughly two-day flight to the station, where three astronauts and cosmonauts await its arrival. "We are right where we need to be at this stage in the mission," SpaceX CEO Elon Musk said in a statement after the launch. "We still have a lot of work to do, of course, as we guide Dragon's approach to the space station. But the launch was an unqualified success." SpaceX President Gwynne Shotwell said later that one of the rocket's nine first-stage Merlin engines apparently shut down prematurely, but the anomaly did not affect the flight. A video showed debris falling from the bottom of the rocket 80 seconds into flight, but it wasn't immediately clear if it was related to the engine problem. The launch made real a concept

first proposed in 2004, when NASA announced plans to retire the shuttle after completing the space station and to rely on commercial vehicles to ship cargo to the outpost. NASA in 2006 picked SpaceX for a program that helped develop and test its new rocket and spacecraft, and in 2008 awarded the company a \$1.6 billion contract for 12 commercial resupply missions. The Dragon's successful test run to the station in May this year paved the way for contracted missions to begin. NASA Administrator Charlie Bolden called Sunday's launch "a historical event in the annals of spaceflight." The Dragon is carrying about 1,000 pounds of food and crew supplies, spare parts and science experiments, and is expected to return late this month with twice as much cargo. A freezer used to store biological samples won attention for its more palatable payload on the ride up: cups of vanilla and swirled chocolate ice cream for a microgravity treat. Web posted. (2012). [SpaceX's Falcon 9 launch lights up night sky [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 7].]

October 8: A Falcon 9 rocket engine suddenly lost pressure and shut down early in Sunday night's launch, causing a protective fairing to rupture and spew debris from the bottom of the rocket, SpaceX confirmed Monday. The company said the failure did not affect eight remaining first-stage engines that performed as designed to deploy a Dragon cargo craft headed for a Wednesday morning rendezvous with the International Space Station. "Falcon 9 did exactly what it was designed to do," SpaceX said in a statement Monday. "Like the Saturn V, which experienced engine loss on two flights, Falcon 9 is designed to handle an engine out situation and still complete its mission." The Hawthorne-Calif., company, however, did fall short on one objective: a prototype commercial communications satellite that hitched a ride as a secondary payload was deposited in a lower-than-intended orbit. The satellite's owner, New Jersey-based Orbcomm, said they were working to determine if the orbit could be raised using the satellite's on-board propulsion system. The Falcon 9 blasted off from Cape Canaveral Air Force Station at 8:35 p.m. Sunday, beginning the first of 12 station resupply missions planned under a \$1.6 billion contract. Seventy-nine seconds into the flight, one of nine Merlin 1C engines suddenly lost pressure and computers commanded it to shut down, SpaceX said. Slow-motion video replays showing chunks of debris blowing away from the rocket fueled speculation that the engine had exploded. NASA will support the review led by SpaceX, said agency spokesman Josh Byerly. "NASA will provide any technical expertise or advice that we can, but we are confident that SpaceX will conduct a robust examination," he said. The Falcon 9 anomaly came three days after a United Launch Alliance Delta IV rocket experienced an unexpected loss of pressure in its upper stage RL-10 engine. The Delta IV successfully lifted a Global Positioning System satellite to orbit for the Air Force. ULA is studying the issue to see if it could impact the planned Oct. 25 launch of an Atlas V rocket that flies with a similar engine. The launches were the fourth for the Falcon 9 since 2010, and the 21st for the Delta IV since 2002. SpaceX said that was not the case because it continued to receive data from Engine No. 1, which occupies the bottom-right slot in a group arranged like a tic-tac-toe box. Rather, the company said its initial reviews suggested that the engine's release of trapped pressure shattered a fairing designed to protect it from aerodynamic stress. SpaceX said it would continue to investigate the failure's cause and apply lessons learned to future flights. The next Falcon 9 launch is tentatively planned in January. Web posted. (2012). [SpaceX Falcon 9 engine fails during flight [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 9].]

October 9: SpaceX said today that a Falcon 9 rocket engine shut down prematurely during Sunday's launch but did not explode, and the rocket performed as designed to send a Dragon capsule on its way to the International Space Station. According to a company statement, initial reviews suggest that the sudden loss of pressure and shutdown of Engine No. 1 may have caused a protective fairing around the engine to rupture "due to the engine pressure release," creating the debris seen in video replays of the launch. "We know the engine did not explode, because we continued to receive data from it," the statement says. The engine problem one minute, 19 seconds into the flight from Cape Canaveral did not impact the remaining eight first-stage Merlin engines, which burned for extra time to compensate for the lost thrust. The rocket deployed a Dragon cargo carrier close to its intended orbit and the spacecraft is on

its way to a Wednesday morning rendezvous with the station. Web posted. (2012). [SpaceX: rocket engine did not explode [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 9].]

October 10: He's responsible for overseeing NASA's multimillion-dollar investment in the development of commercial space taxis that will ferry American astronauts to the International Space Station. Ed Mango is the program manager at NASA's Commercial Crew Program Office at Kennedy Space Center. Veteran space reporter Todd Halvorson and reporter Michelle Spitzer interviewed Mango ahead of SpaceX's Falcon 9 rocket launch. They asked him about candidate spacecraft and the challenges that lie ahead. *QUESTION: Ed runs the commercial crew program, and that's the next step in this transition, away from shuttle and to the next generation of U.S. human space flight. The next step is to procure astronaut transportation from commercial companies. Now Ed, you recently decided to continue funding three different companies for the development of commercial crew transportation services. Could you tell us who you picked, a little bit about their vehicles, and why you selected them?* MANGO: We have three companies that we're working with today. The first is SpaceX. SpaceX plans to take their Dragon cargo vehicle and convert it into a crew vehicle. In order to do that, obviously flying in space is very hard . . . when you put crew on it you just add a level of risk and you have to mitigate those risks. So you have to have an abort system which can keep the crew alive and be able to work within the crew environment. The second company we have is Boeing Aerospace. Boeing has their CTS-100 which is also a capsule-type vehicle. It will fly on an Atlas V rocket right here from the Cape as well. And their system is trying to use as many systems that have already been developed . . . repackaging stuff that works very well, and trying to keep the costs down that way. And our third company is Sierra Nevada Corporation. And Sierra Nevada is a blended-body vehicle. Their company is out of Boulder, Colo. Their idea is you launch a vehicle with wings and it lands on a runway – very similar to shuttle. That vehicle will also launch on an Atlas V. And so right now, we're in a competitive mode with all three companies. They're all designing their systems . . . and by the middle of 2014, we'll have another competition, really to figure out who we want to take through certification and then we hope to fly by the middle of 2017. *QUESTION: So at the end of this particular phase of the program, where will these three companies be in terms of the development process?* MANGO: All of them have slightly different paths to get to the same end point because there's always more than one route to get there. In the case of SpaceX . . . they will also have a couple of launch abort tests right here from the Cape by the middle of 2014, one with just their capsule and one with their entire vehicle and then they'll abort going halfway up in to the atmosphere to really check out maximum drag and how their abort system works at that point. Boeing will be going also through an integrative design state . . . and then they're doing a lot of testing on multiple systems and they're bringing all their systems together in this integrated design. Sierra Nevada is continuing to develop their Dream Chaser vehicle and they will basically fly that vehicle on automated landings at first and eventually with crew. They're going to be flying those vehicles with automated landings throughout the middle of 2014, about 10 or so landings, at Edwards Air Force Base. *QUESTION: What do you say to get (people) excited about the next step?* MANGO: Well, I would tell you for the Space Coast, all three of these vehicles are going to fly right from here. So that is outstanding. Obviously, SpaceX is going to be doing work here also. Space X also has a number of missions for the (cargo resupply) contract. Boeing, if they were to continue on through these competition phases and get in the next couple rounds, they're going to be building their vehicle right here in Florida. And Sierra also will be launching from here and doing landings from here. *QUESTION: How big a deal is it for Brevard to actually make the transition from being more than just the launch operation, but being able to manufacture spacecraft in that period before you go into a launch?* MANGO: I think it's outstanding for the Brevard area. I think a number of these companies have all figured out that we have great skills and great talent here in Brevard County. Most of them would like to have started a couple years ago to get the shuttle folks as they were coming off the shuttle work, but . . . that skill base is still here and I think all those companies would like to be building on that skill base. And once you start building manufacturing capability, like here in Brevard County, as they begin to build those vehicles here, that will become the mainstay, probably for a whole generation of building spacecraft here. So all this kind of work being done here says that the nation, and

these companies, are looking to the skilled workforce right here on the Space Coast. QUESTION: *We did lose a lot of people after the shuttle stopping flying. The last mission was last July. And I'm wondering with the transition into being both launch and manufacturing operations, do you think that that will enable us to offset the number of job losses we've seen in the last several years?* MANGO: I can't tell you about the number of jobs because I don't know that. But I think as Brevard County grows, in order to have a manufacturing capability, whether it be airplanes, spacecraft, rockets, whatever it might be, we're now moving into the high-tech arena in which those are very good jobs, jobs that have longevity. When you're building a vehicle, type one today and type two tomorrow, it continues, it becomes a generational thing . . . Once you get into the manufacturing mode, that will become a mainstay for the Brevard county area. QUESTION: *What does it feel like to be part of a team that is reclaiming, if you will, an American indigenous capability to get our own astronauts into space?* MANGO: My team is so motivated to make this happen because we do want an American vehicle to be flying again. It embodies everything that we do. Web posted. (2012). [Commercial crew chief bullish on Brevard [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 10].]

◆ Jim Bolton spent a quarter-century working on the nation's shuttle program at Kennedy Space Center. For seven years and seven months, he even served as NASA's vehicle manager for the orbiter Atlantis. Now Bolton, 54, is playing a key role in an extreme makeover: modifying the landmark Vehicle Assembly Building for supersized rockets being designed to send American astronauts to deep space destinations. Back in the early 1960s, President John F. Kennedy challenged America to send astronauts to the moon and return them safely to Earth by the end of the decade. To that end, NASA designed the 363-foot-tall Saturn V rocket. Sketching with pencil on paper, German rocket scientist Kurt Debus conceived a huge hangar for Saturn V assembly. Etched into the drawing are high bays in each corner of the giant, boxlike building, and there is a transfer aisle in between for the delivery of rocket stages and other hardware. Construction began in July 1963 and was completed in early 1966. Still one of the largest buildings by volume in the world, the VAB covers eight acres and is 525 feet, 10 inches tall. NASA modified the building for the shuttle program in the late 1970s, and now, with the orbiter fleet retired, engineers are preparing the VAB for its next role: rockets that will rival the Saturn V. NASA's Space Launch System is being developed to launch Orion crew vehicles and astronauts on missions to asteroids, the moon, Mars and other destinations, starting in the mid-2020s. The first version of what will be an evolvable family of rockets will stand 320 feet tall and be capable of lofting 70 metric tons — more than double any operational vehicle today. A first unmanned flight test of the 320-foot rocket, and an Orion capsule is scheduled for late 2017, and hardware for the vehicle will begin arriving at KSC in 2016. NASA also is developing a 130 metric-ton behemoth that will stand 384 feet tall — 21 feet taller than the Saturn V moon rockets. So Bolton and other engineers with NASA's Ground Systems Development and Operation Program are in the midst of the most extensive renovation ever of the VAB. Much of the building's infrastructure is original. So NASA's aim in part is to bring the facility up to modern building and safety codes. A corroded fire suppression system will be replaced along with aging boilers and chillers that feed hot and cold water to the facility. More than 50 miles of Apollo-era copper cabling is being pulled out, and a modern fiber-optic network will be put in. The building's electrical system will be upgraded. Also to be refurbished: Four 456-foot doors to the four high bays — the world's largest — and five primary overhead cranes that hoist rocket stages and other hardware. Bolton, a married father of two, is now focusing on the removal of work platforms in High Bay 3, which is being renovated for the super-sized rockets. The work platforms enabled technicians, engineers and inspectors to assemble and check out Saturn V rockets and space shuttles. "They will be taken down, and they are going to be deconstructed and the components will be taken away, and that will leave a high bay basically a shell," Bolton said. During the next few years, NASA will install 20 new platforms to provide access to towering Space Launch System rockets. "The idea is we will be able to accommodate the Space Launch System rocket and any derivations of the design that we can foresee," Bolton said. Web posted. (2012). [NASA gets VAB ready for the next generation [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 10].]

October 11: Just before 11:30 p.m. Thursday, the massive hangar doors opened, revealing the last space shuttle ever built. Lights beamed onto the belly of the spacecraft as the shuttle made its first steps toward its final retirement home, the California Science Center. The shuttle emerged into the darkness of a crisp, chilly fall night, below partly cloudy skies. Soon enough, the shuttle disappeared onto a taxiway into the darkness. Over the next two days, the 170,000-pound shuttle is expected to travel at no more than 2 mph along a 12-mile route that includes Westchester Parkway, La Tijera Boulevard, Crenshaw Boulevard and Martin Luther King Jr. Boulevard. The shuttle is moved by four computer-controlled transporters that will help it negotiate complex turns and avoid streetside obstacles. At points along the way, the space vehicle will be inches away from buildings and protrude onto driveways and sidewalks. Because of the enormous weight of the shuttle, thousands of heavy steel plates have been used to reinforce city streets. Endeavour is scheduled to arrive at the California Science Center by 9 p.m. Saturday. En route, the public can see the shuttle at a number of public viewing areas on Friday along Manchester Boulevard in Inglewood, including Isis, Hindry and Glasgow avenues as well as La Cienega Boulevard. On Saturday, there will be several designated public viewing areas, including the Forum in Inglewood, the intersection of Crenshaw and Martin Luther King Jr. Boulevard, and certain parking lots in Exposition Park. Web posted. (2012). [NASA gets VAB ready for the next generation [Online]. Available WWW: <http://www.latimes.com/> [2012, October 12].]

◆ Satellite messaging service provider Orbcomm on Oct. 11 said its prototype second-generation satellite, launched Oct. 7 into a bad orbit by a Space Exploration Technologies Corp. (SpaceX) Falcon 9 rocket, had fallen out of orbit but had provided enough data to proceed with the launch of the full constellation starting next year. Fort Lee, N.J.-based Orbcomm, which plans to launch all 18 second-generation satellites aboard two SpaceX Falcon 9 rockets, said it would be filing an insurance claim of \$10 million to cover the loss of the satellite and the cost of the launch and the insurance policy. Web posted. (2012). [Satellite left stranded by SpaceX rocket falls from space [Online]. Available WWW: <http://www.nbcnews.com/> [2012, October 13].]

October 12: A team of experts from NASA and SpaceX will examine what went wrong Sunday when one of nine engines aboard a SpaceX rocket failed during a NASA mission to the International Space Station. The joint investigative team, announced today by NASA and SpaceX, is expected to piece together data from the Falcon 9 launch, specifically the failure of its Engine 1 about 79 seconds after take-off. Though the rocket survived the malfunction and ultimately was successful in completing its primary mission — getting a capsule filled with NASA supplies to the station — it failed in its secondary mission, the delivery of an Orbcomm satellite to orbit. Web posted. (2012). [NASA, SpaceX joint to investigate launch glitch [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, October 12].]

◆ Felix Baumgartner stood alone at the edge of space, poised in the open doorway of a capsule suspended above Earth and wondering if he would make it back alive. A second later, he stepped off the capsule and barreled toward the New Mexico desert as a tiny white speck against a darkly-tinted sky. Baumgartner, a 43-year-old Austrian, hit Mach 1.24, or 833.9 mph, according to preliminary data, and became the first person to reach supersonic speed without traveling in a jet or a spacecraft. The capsule he jumped from had reached an altitude of 128,100 feet above Earth, carried by a 55-story ultra-thin helium balloon. Web posted. (2012). [Millions soar as 'Fearless Felix' jumps from edge of space [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 12].]

October 14: Since the massive shuttle program ended, small businesses are being sought out by the federal government. NASA acknowledges that small businesses are innovation hubs and can complete space industry jobs more quickly for less. That might be why NASA has passed its annual small-business contracting goal by more than 28 percent, spending \$2.6 billion on small-business contracts. NASA has made bold moves to harness the innovation and efficiency of smaller companies. "We're actually being

given free rein. They're counting on rapid development and lower costs and overhead," said Don Platt, founder of Micro Aerospace Solutions Inc. in Melbourne. "We're working on a pretty large mission with a company in Los Angeles for a solar cell project for a small satellite." NASA is overseeing the project, but has tried not to micromanage the operation, which is developing software for the spacecraft. "NASA told us to push back on them when we feel the requirements are overbearing," Platt said. "They've actually been very flexible." The new NASA effort extends from Melbourne to New York. Honeybee Robotics, for example, is a small space technology company of about 40 employees in Manhattan. On its resume: a sample storage system that acts as a robotic lab assistant for the Mars Curiosity Rover, which landed in August, as well as a robotic dust-removal tool to brush off Martian rock samples. Honeybee Robotics aims to perform work on the Orion capsule, which is being built in Brevard County. Using smaller companies helps NASA reach its goal of creating more business opportunities to put more people to work. While NASA has surpassed its small-business contracting goal for two years in a row, the administration still lags in contracting goals for areas including women-owned businesses and service-disabled veteran-owned businesses. Web posted. (2012). [NASA taps into small businesses [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 14].]

◆ It was supposed to be a slow but smooth journey to retirement, a parade through city streets for a shuttle that logged millions of miles in space. But Endeavour's final mission turned out to be a logistical headache that delayed its arrival to its museum resting place by about 17 hours. After a 12-mile weave past trees and utility poles that included thousands of adoring onlookers, flashing cameras and even the filming of a TV commercial, Endeavour arrived at the California Science Center on Sunday to a greeting party of city leaders and other dignitaries that had expected it many hours earlier. Endeavour was still inching toward a hangar on the grounds of the museum mid-Sunday afternoon. "It's like Christmas!" said Mark Behn, 55, a member of the museum ground support team who watched the shuttle's snail-like approach from inside the hangar. "We've waited so long and been told so many things about when it would get here. But here it is, and it's a dream come true." Movers had planned a slow trip, saying the shuttle that once orbited at more than 17,000 mph would move at just 2 mph in its final voyage through Inglewood and southern Los Angeles. But that estimate turned out to be generous, with Endeavour often creeping along at a barely detectable pace when it wasn't at a dead stop due to difficult-to-manuever obstacles like tree branches and light posts. Despite the holdups, the team charged with transporting the shuttle felt a "great sense of accomplishment" when it made it onto the museum grounds, said Jim Hennessy, a spokesman for Sarens, the contract mover. Web posted. (2012). [Shuttle Endeavour reaches LA museum home [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 15].]

October 17: A few days after the high-visibility move of Space Shuttle Orbiter Endeavour to her retirement home, a quieter move marked the end of an era October 17th at Kennedy Space Center (KSC) when NASA and United Space Alliance (USA) workers rolled Orbiter Atlantis out of Bay 2 of the Orbiter Processing Facility (OPF) for the final time, en route to High Bay 4 of the Vehicle Assembly Building (VAB). Riding on top of the Orbiter Transporter System (OTS), Atlantis looked at a distance like she was getting ready for another launch; however, the Shuttle integration cells in the VAB are now being dismantled, much as the veteran spaceship's systems were decommissioned over the past fifteen months. Atlantis' move also marks the completion of major Transition and Retirement (T&R) processing and the vehicle is now ready for her move down the road to the Kennedy Space Center Visitor Center on November 2. The OTS was parked on the tow-way in front of OPF Bay 3 for a few hours as a part of an employee event to give time for the gathered employees to walk around the orbiter, take pictures, and eat ice-cream provided for the event. The roll to the VAB was one of the last in a long series for Atlantis this year, as all around the spaceship facilities have been decommissioned and retired and her sisterships have said goodbye to the Space Center. As it turned out, the vehicle stayed in OPF-2 longer than originally planned, with the vehicle being powered down for the final time on December 22. In the last few months in OPF-2, work to configure Atlantis for museum display was completed. Web posted. (2012). [Atlantis'

team comforted by the orbiter retiring at her home port of KSC [Online]. Available WWW: <http://www.nasaspaceflight.com/> [2012, October 17].]

◆ Despite hopes to restore massive government spending for the aerospace industry, the trajectory of Brevard County's space industry likely will be guided by this concept: commercial. "I think we'll be back to passing budgets the way they ought to be passed," U.S. Rep. Bill Posey said Wednesday at an Aerospace and Defense Roundtable in Melbourne. "There is going to be less (government) spending in the future, no doubt about it." Posey plans to introduce a bill to put NASA funding on a long-range basis, which would make it more secure. Roundtable participants were from Harris Corp., Lockheed Martin, Space Florida, United Launch Alliance, SpaceX, ATK Aerospace Group and the University of Central Florida. However, at the meeting, the most impressive numbers were announced by Scott Henderson, director of mission assurance and integration for SpaceX, the first commercial company to launch a capsule to the International Space Station. The California company plans six launches in 2013, eight in 2014 and 10 in 2015. All the launches will be paid for by commercial enterprises, most of which are lofting communications satellites. In addition, SpaceX is developing a manned capsule for NASA that it hopes will be selected to someday carry astronauts to the International Space Station. In 1980, the U.S. launched 100 percent of the world's commercial payloads, a percentage which has fallen to virtually nothing. By 2015, some 17 percent of launches will lift off from the U.S. on SpaceX rockets, Henderson said. "We're starting to bring some of them back," he added. Military and aerospace companies in Brevard are fearful that the sequester budget cuts, which could go into effect after Jan. 1, could drain their budgets deeply and disrupt the focus of the U.S. space industry. Web posted. (2012). [Space industry executives discuss commercial space's potential on Space Coast [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 17].]

October 18: Mustachioed Terry White is still known as "The Mayor of the OPF," three shuttle processing hangars collectively called the Orbiter Processing Facility at Kennedy Space Center. Now 63, the North Merritt Island resident was there on March 25, 1979, when Columbia rolled into OPF Bay No. 1 in advance of the first flight of NASA's then-nascent shuttle program. Let the record show that White also was here 33 years, six months and 23 days later, when Atlantis became the last shuttle orbiter to roll out of one of the hangars. Mounted atop a 76-wheeled, yellow transporter, the spaceship on Wednesday rolled over to the KSC Vehicle Assembly Building, finishing the first leg of a final journey to its new home, a \$100 million facility being built at KSC Visitor Complex. "It's a little bit of a dry-moment-in-the-throat because this is the last time we'll roll an orbiter out of an Orbiter Processing Facility," White said. "In 1979, we rolled the first one in, and now today, the last one is going out, and the saddest part of it is, it's not going out for flight." Stephanie Stilson, the NASA manager in charge of prepping shuttle orbiters for museum display, called it "a somber event." Fleet leader Discovery already has been delivered to the Smithsonian National Air and Space Museum's Stephen F. Udvar Hazy Center in Chantilly, Va., outside Washington, D.C. The prototype Enterprise is at the Intrepid Sea, Air and Space Museum in New York city. Endeavour inched its way through the streets of Los Angeles this past weekend and now is at the California Science Center. Now Atlantis, the last of NASA's orbiters, is scheduled to make its way Nov. 2 to the KSC Visitor Complex. Back on April 29, 2011, White escorted President Barack Obama, First Lady Michelle Obama, their daughters Malia and Sasha, and First Mother-In-Law Marian Robinson on a tour. The presidential VIPs walked into an OPF hangar, and when they looked up, they were surprised to see the black tile-covered belly of Atlantis. White gave them a hands-on tutorial of the shuttle's Thermal Protection System — the tiles, blankets and composite carbon components designed to withstand extreme temperatures encountered during atmospheric re-entry — up to 3,000 degrees Fahrenheit. The First Family went upstairs to peer into the ship's crew cabin. They walked alongside the ship's starboard wing and checked out its landing gear. They got multiple photo ops. So how did White get that assignment? "Well, because they call me 'The Mayor of the OPF,' and for years I've been handling guests," he said. Obama was impressed with White's alabaster moustache,

and with the shuttle's heat shield system. Web posted. (2012). [Atlantis rolls out, heads to VAB for last visit [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 18].]

◆ Orbital Sciences Corp. is in a "final push" to launch its first Antares rocket by the end of this year, assuming a successful completion of a series of fueling and engine tests due to begin next week, the company's chief executive said Thursday. Engineers moved an Antares first stage to the launch pad at Wallops Island, Va., on Oct. 1 to begin several weeks of testing ahead of a 30-second hotfire of the rocket's two AJ26 engines, which is now expected in early November. "We really are in that final push leading up to the flight test," said David Thompson, Orbital's chairman and CEO, in a conference call with investors Thursday. Orbital Sciences is developing the Antares rocket and the Cygnus automated cargo freighter to resupply the International Space Station under a \$1.9 billion contract with NASA. NASA and Orbital are partners in funding development of the Antares and Cygnus programs. NASA is providing up to \$288 million in government money to support the design and testing of the vehicles. Several propellant loading, or cold flow, tests are planned before the hotfire to demonstrate the launch pad's fueling systems and rehearse countdown procedures. The first fueling rehearsal is scheduled for next week, according to Thompson. Launch pad 0A, a facility owned by the Commonwealth of Virginia, lies on the property of NASA's Wallops Flight Facility on Virginia's Eastern Shore. The 30-second firing in early November will generate about 680,000 pounds of thrust, checking the integrity of the launch pad and first stage structure, which is designed by Yuzhnoye and built by Yuzhmash in Ukraine. "Assuming these tests go smoothly we will replace the rocket that is now on the launch pad with the second Antares vehicle and conduct the test flight in December," Thompson said. The first stage on the launch pad now will be recycled and used on a future flight. Web posted. (2012). [Orbital making process in Antares launch preparations [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, October 18].]

October 22: Blue Origin completed a launch pad abort demonstration of its pusher escape system last week, notching the final milestone in a cost-sharing development agreement with NASA's commercial crew program, the company announced Monday. Designed to facilitate full reusability of Blue Origin's suborbital New Shepard spacecraft, the pusher-type abort system lifted a full-scale crew capsule to an altitude of 2,307 feet in a simulated escape from a launch pad emergency. The capsule parachuted to a soft landing 1,630 feet away from the launch site, according to Blue Origin, the start-up space firm established by Amazon.com founder Jeff Bezos. The test occurred at Blue Origin's facility near Van Horn, Texas. The abort system will provide passengers on the suborbital New Shepard vehicle with an escape capability throughout the launch sequence, and it also will inform the design of the escape system on Blue Origin's orbital spacecraft. Last week's test flight was the final milestone outlined in a \$22 million agreement in the second, or CCDev 2, phase of NASA's commercial crew program. Blue Origin received \$3.7 million in the first round of commercial crew agreements, which began in 2010. Web posted. (2012). [Start-up space firm tests pusher escape system [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, October 22].]

October 24: The Cape Canaveral Lighthouse Foundation has advocated and worked toward the complete restoration of the site at Cape Canaveral Air Force Station that is home to the only lighthouse operated by the U.S. Air Force. The initial lighthouse was built at Cape Canaveral in 1848. A second taller one at 167 feet was completed in 1868 and was moved to its present site, about one mile inland, in 1893. The foundation was established in 2002 to help the 45th Space Wing preserve and protect the lighthouse. Work has been ongoing since then, but more remains. Web posted. (2012). [Cape Canaveral lighthouse renovations off to a good start [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 24].]

October 28: A patch of cracked, overgrown asphalt beside State Road 3 marks the spot where Bob Hogan's childhood home stood in Shiloh, just inside the northern Brevard County line. In the 1950s, the

citrus community of roughly 20 families was a stop on the road down to the Beacon 42 and Allenhurst fish camps, hot spots that drew celebrities such as baseball great Joe DiMaggio and country music star Little Jimmy Dickens. The people and groves are long gone, forced out in the early 1960s when NASA chose to base its Apollo program moonport on Merritt Island, buying or seizing by eminent domain 140,000 acres that included a wide buffer stretching north to Shiloh. Now, 50 years later, Shiloh is again drawing government interest. But this time for its potential value to a modern version of the space program: a launching site for the private rockets and spacecraft expected to fuel the industry's post-space shuttle growth. The state recently asked NASA to give it 150 acres in that area of Kennedy Space Center and the Merritt Island National Wildlife Refuge so it can develop a state-owned, commercial spaceport. It's not a sure thing: environmental concerns doomed two previous proposals to develop within the refuge, and some are bracing for another fight. And California-based SpaceX, the company expected to use the complex if the state's proposal moves forward, remains noncommittal as it explores sites across the country. "We are looking at capability here, just north of the Cape," company President Gwynne Shotwell said before the Oct. 7 launch of a Falcon 9 rocket and Dragon capsule from Cape Canaveral Air Force Station to the International Space Station. "But there's a number in play at this point." The other contenders she mentioned: Texas, Georgia, Hawaii and Puerto Rico. SpaceX, whose Dragon spacecraft is set to return to Earth today, is seeking an additional location that offers more freedom to operate outside the confines of existing NASA and military-controlled pads. The company believes it can launch more often and efficiently that way, helping to lower costs, win more launches and create more jobs. The new state proposal hopes to succeed where the two before it failed. In 2008, area residents packed public hearings to pan a NASA feasibility study that suggested two locations for a multi-user launch complex. One was near Black Point Wildlife Drive and Playalinda Beach, both huge draws for visitors to the refuge and Canaveral National Seashore. Shiloh didn't make the cut at the time because it fell within two or three miles of inhabited areas. That failed to satisfy the conservative five-mile buffer requirement NASA set for the study, but is now considered adequate by the state. Less well-remembered is a state-funded study that identified Shiloh as a finalist for a commercial spaceport in 1989, just as the state was establishing the authority that evolved into Space Florida. The governor and house speaker immediately yanked it from consideration, with the speaker calling the study sloppy. Some environmentalists and refuge supporters viewed the latest proposal just as skeptically. But Space Florida and some who lined up against NASA in 2008 say the current situation is completely different and applies lessons learned from the past. Shiloh is far north of the NASA site that upset so many four years ago, and therefore is expected to have less impact on access to popular recreation areas. The state is now proposing to develop a fraction of the 12,000 acres it envisioned back in 1989. Since the state sent its request to NASA on Sept. 20, Space Florida representatives have begun meeting with stakeholders including Audubon Florida and the Merritt Island Wildlife Association, a refuge support organization. They are promising to work collaboratively to select land that imposes the least impact and are offering assurances that the development would be limited. Since its creation in 1963, the refuge has faced the threat that NASA could take back the land for space operations. As part of its new proposal, the state recommends NASA transfer the area north of Haulover to the Department of the Interior to ensure its permanent protection. Space Florida's board has approved spending up to \$2.3 million for environmental and engineering studies that are expected to help identify the optimal location for a Shiloh launch complex, which may fall all or partially in Volusia County. Charles Lee, Audubon's director of advocacy, isn't yet convinced by the pitch. It raises all the same issues the NASA study did, he said, just shifting the impacts to wildlife and visitors farther north. As before, he questions why vacant facilities at Kennedy and the Cape can't be put to use, especially after the shuttle program's retirement. If there are barriers to smooth commercial launch operations on government-run facilities, he said, those should be the focus of negotiations. He described Space Florida's proposal as "unrefined" and a speculative attempt to satisfy one company's desires. DiBello says multiple companies are interested in the state's commercial spaceport concept, which also envisions management of the shuttle runway for use by spacecraft launched or landed like planes. Layne Hamilton, the refuge's manager from the U.S. Fish and Wildlife Service, wants more detail about the complex's location, but offered a long list of potential environmental, cultural and

economic impacts for any site north of Haulover Canal. Protected species, including Florida scrub jays and Eastern indigo snakes, frequent the area, as do large concentrations of waterfowl and wildlife, including white-tailed deer, bobcat, coyotes, hawks and owls. The north end of the refuge offers the best waterfowl hunting in Central Florida, Hamilton said, and 6,000 upland acres are slated to be opened for deer and hog hunting by 2014. "Significant" pre-Columbian and colonial historic sites, including a British plantation ruin, are also located throughout the area. The concerns arise as the refuge prepares to celebrate its 50th anniversary in January with the slogan, "50 years of space for wildlife." The Merritt Island Wildlife Association, which opposed the NASA study along with the refuge in 2008, recently heard a presentation by Space Florida and took no formal position. The association's board includes space program veterans and current and former elected officials along with traditional environmentalists. Board President Dan Click said early discussion reflected a broad range of opinion but concluded there's no point worrying about environmental impacts until NASA weighs in on the request and any site is better defined. NASA has offered little comment so far. "We've worked with state of Florida previously in working out commercial ventures," said KSC spokesman Mike Curie. "We've had a number of beneficial agreements with Space Florida, and I'm sure everyone will evaluate this one and see how we can proceed." While it was obvious environmental issues would present obstacles, other factors have changed considerably since the NASA debate. Back then, the shuttle program was still in full swing and many doubted its end was near. Now more than 7,000 shuttle contractors are out of work, with more layoffs coming. SpaceX was still largely unknown. Now it's a key NASA contractor and the best hope to win back commercial satellite launches that have abandoned the U.S. And previously, commercial space wasn't seen as ready. Now NASA is asking commercial providers to launch cargo and crews to the space station, the Air Force is seeking competition to reduce launch costs and suborbital spacelines are close to taking flight. Web posted. (2012). [Launch-pad talk focuses on long-gone hometown [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 28].]

October 29: With satellites playing increasingly important roles in everyday life, NASA is developing the technology to build Earth-orbiting, roving "service stations" capable of extending the life of these spacecraft. Engineers at the Kennedy Space Center in Florida are assisting the space agency's Goddard Space Flight Center in Greenbelt, Md., in developing the concept for bringing a high-technology gas pump, robotic mechanic and tow truck to satellites in space. There are 149 government-owned spacecraft and 275 commercial satellites currently in geosynchronous Earth orbit, or GEO, around the Earth. Placed 22,300 miles above the Earth, these satellites play key roles in communications, science, defense and weather monitoring. GEO permits these spacecraft essentially to stay over the same point, allowing for constant coverage of a designated position. This is crucial for satellites relaying meteorology and television signals covering specific portions of the globe. According to Tom Aranyos, technical integration manager in NASA's Fluids and Propulsion Division at Kennedy, engineers at the Florida spaceport are supporting the hypergolic propellant refueling portion of the Goddard-led study examining how free-flying servicing spacecraft could expand options in orbit for government and commercial satellite owners. Preliminary work with a technology demonstrator is underway on the International Space Station. The crew of space shuttle Atlantis' STS-135 flight delivered the Robotic Refueling Mission, or RRM, hardware to the station in July 2011. During a spacewalk, astronauts Mike Fossum and Ron Garan transferred the RRM onto a temporary platform on the Special Purpose Dexterous Manipulator, also known as Dextre, a two-armed robot developed by the Canadian Space Agency that serves as part of the station's Mobile Servicing System. RRM now resides on the Express Logistics Carrier 4 platform outside the station. "Kennedy, as part of the Goddard team, is studying and performing preliminary tests for the design, development and qualification testing of the critical subsystem for an in-orbit hypergolic propellant transfer system," said Aranyos, who is leading Kennedy's technical team for the project. "That will include a pumping system with high metering accuracy and hose management system to transfer propellant to multiple client locations on existing orbiting satellites." In the near future, Kennedy's engineering team will design and perform functional risk reduction tests on a propellant transfer module

similar to a flight-like unit. Web posted. (2012). [NASA Centers Work on Satellite Servicing Technologies [Online]. Available WWW: <http://www.parabolicarc.com/> [2012, October 29].]

October 30: Throwing open the doors to schoolchildren and the world Tuesday, the California Science Center's display of the retired space shuttle Endeavour is up and running in Los Angeles. Just over two weeks ago, the ship made a three-day trek through the LA city streets in a surreal procession from the international airport to the learning center at Exposition Park. Tuesday's grand opening featured California Gov. Jerry Brown, local dignitaries and museum officials, Bill Nye the Science Guy, several former shuttle astronauts and scores of youngsters to commemorate the event. Web posted. (2012). [Museum display of shuttle Endeavour opens to public [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, October 30].]

◆ NASA Television will provide live coverage of events surrounding space shuttle Atlantis' move to the Kennedy Space Center Visitor Complex in Florida for permanent public display. At 2 p.m. EDT Thursday, Nov. 1, NASA TV's media channel will air a news briefing about the transformation of Kennedy Space Center to a multiuser spaceport. The briefing participants are: -- Lisa Colloredo, associate manager, Commercial Crew Program; -- Scott Colloredo, chief architect, Ground Systems Development and operations Program; -- Bruce Reid, Kennedy Space Center mission manager for Landsat Data Continuity Mission; -- Jody Singer, deputy manager, Space Launch System Program. At 3:30 p.m., NASA TV's media channel will air a briefing about the future of human spaceflight. The participants are: -- Robert Cabana, director, Kennedy Space Center; -- Bill Hill, assistant deputy associate administrator for Exploration Systems Development; -- Ed Mango, manager, NASA Commercial Crew Program. On Friday, Nov. 2, NASA TV will begin coverage at 7 a.m. as Atlantis departs Kennedy's Vehicle Assembly Building (VAB). The shuttle will make the 10-mile journey from the VAB to the visitor complex atop a 76-wheel flatbed vehicle called the Orbiter Transportation System, stopping along the route for a retirement ceremony at about 10 a.m. Ceremony participants include: -- NASA Administrator Charles Bolden; -- Robert Cabana, NASA Kennedy Space Center director; -- Current and former astronauts of Atlantis' final mission, STS-135; -- Bill Moore, chief operating officer, Delaware North Companies Parks and Resorts, Kennedy Space Center Visitor Complex. Following the ceremony, Atlantis will travel to Space Florida's Exploration Park for a presentation and viewing opportunity for visitor complex guests before departing for its new home. NASA retains the title to Atlantis and is providing it to the visitor complex for the public to view. Engineers have been preparing the shuttle for public display as part of NASA's transition and retirement processing of the shuttle fleet. A grand opening of Atlantis' new home at the Kennedy Space Center Visitor Complex is planned for July 2013. ["NASA Television Airs Space Shuttle Atlantis' Final Move," **Media Advisory #M12-210**, October 30, 2012.]

October 31: More than 30 astronauts will lead space shuttle Atlantis on the homestretch of its 9.8-mile trip Friday to its new home at the Kennedy Space Center Visitor Complex. Tim Macy, director of project development and construction for Delaware North Companies Parks & Resorts, which operates the Visitor Complex, said the parade of astronauts was just added to Friday's schedule. Final preparations are under way for the orbiter's daylong trip to the Visitor Complex from KSC Vehicle Assembly Building. Atlantis' journey aboard a 76-wheeled Orbiter Transporter System vehicle will start at 6:30 a.m. and end at 6 p.m., with several planned stops along the way, including a three-hour stop at Space Florida's Exploration Park. More than 300 people are helping coordinate the move. The public will be able to buy tickets to view part of the journey and see Atlantis up close that day. About 8,000 spectators are expected, not counting current and former space workers. Macy said the final 150 yards of the trip will be the most challenging, as the massive orbiter must make a right turn from State Road 405/NASA Parkway into the Visitor Complex area. It then will be maneuvered into its new building with only about 2 feet of clearance available on either side of its wings. Atlantis must then be put in place within 6 to 8 inches of its final mark. It later will be adjusted to within about 1.5 inches of the designated spot. The Atlantis exhibit

building and exhibits are still under construction, with the attraction scheduled to open in July. Macy said Atlantis will be surrounded by 62 interactive exhibits, including ones designed by creative specialists who have worked for such entertainment giants as Disney and Universal. "It's going to blow you away," Macy said. The 90,000-square-foot building itself is about 60 percent complete, although most of the exhibits won't be added until several months before the opening. One early arrival during a media tour of the building Tuesday afternoon was a vent hood, nicknamed the "beanie cap," that was used to vent gaseous oxygen vapors away from the space shuttle prior to liftoff. Web posted. (2012). [Astronauts will lead Atlantis home at Visitor Complex [Online]. Available WWW: <http://www.floridatoday.com/> [2012, October 31].]

NOVEMBER

November 1: A perception persists in some quarters that Atlantis' exit today from Kennedy Space Center, the last move of a retired shuttle, marks the end of human spaceflight and even of the center itself. Not so, NASA officials repeated Thursday. In fact, with a little more than half the workforce it had a few years ago – still more than 8,000 employees – KSC will continue a busy transition intended to transform it into a multi-user spaceport and the launching point for deep-space exploration. “It finally brings finality to our shuttle program, a phenomenal, 30-year history in that program, and it accomplished a great deal,” center Director Bob Cabana said of Atlantis' 9.8-mile roll to its new home at the Visitor Complex. “But we have not been standing still for the last year.” As Atlantis leaves, crews are tearing out the equipment from one former orbiter processing hangar to set it up for The Boeing Co.'s planned assembly of a commercial crew capsule. KSC is the home of NASA's Commercial Crew Program, under which the agency is helping Boeing and two other companies to fund and design privately operated space taxis. Cabana said an agreement with a potential tenant for the other shuttle hangars was in the works. Meanwhile, a high bay in the Vehicle Assembly Building, which Atlantis is expected to depart around 7 a.m. today, is being renovated to support a heavy-lift rocket NASA is developing to carry astronauts to the moon, an asteroid or eventually Mars. The Space Launch System is slated for a first, unmanned test launch in 2017 from pad 39B, a former shuttle pad now in a “clean” pad configuration that could potentially support launches of different kinds of rockets. In the Operations and Checkout Building, a prototype of the Orion crew capsule that will eventually fly atop the giant rocket is being prepared for an unmanned test flight in 2014 from Cape Canaveral. A mobile launch tower, crawler-transporter and a firing room have also undergone renovations. And NASA is reviewing proposals to take over operation of the former shuttle runway as a commercial airport and spaceport that would support horizontal launches and landings. Cabana said KSC is helping NASA headquarters respond to a request from the state of Florida for roughly 150 acres at the north end of the center for development of a commercial launch complex. “We are going to take a close look at it and provide a response that I think will be the right answer for this area and for the state and for what we want to go do,” Cabana said. Atlantis' move will feel bittersweet, Cabana said, but he'll also feel pride in the shuttle program's accomplishments and knowledge that the history will be shared with millions of visitors. “It's going to be phenomenal, and to know that we are going to share that with everybody that comes here, that gives me great pride,” he said. “That makes me happy.” Web posted. (2012). [Cabana: KSC's future is wide-ranging [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 1].]

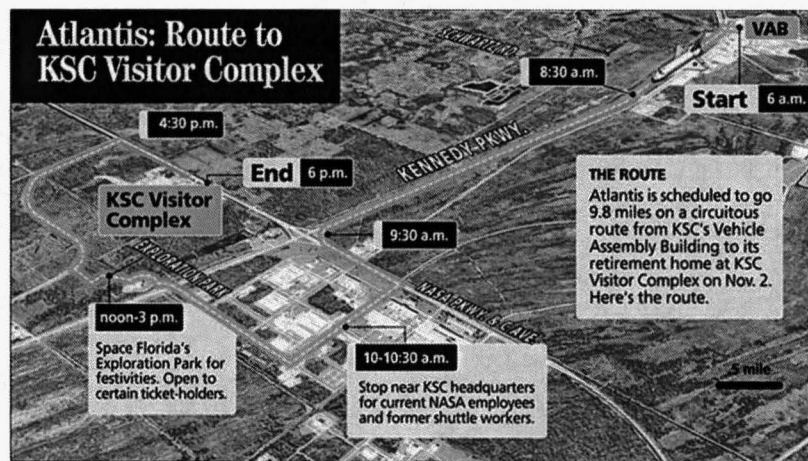
◆ Even after space shuttle Atlantis is safely inside its new home at the Kennedy Space Center Visitor Complex tonight, much work will remain to get the exhibit ready for its planned opening in July. And while the orbiter will be the star of the show, officials promise much more to catch your eye. Among Tim Macy's favorite features is an interactive wall with touchscreens offering highlights of individual shuttle missions, as well as simulators that will give visitors a taste of what it takes to land an orbiter. Macy, director of project development and construction for Delaware North Companies Parks & Resorts, which operates the Visitor Complex for NASA, said, for 13-year-old boys, a memorable exhibit may be one detailing how astronauts go to the bathroom in space. In promotional material, Visitor Complex officials described the exterior of the Atlantis exhibit as “comprised of two sweeping architectural elements, or wings, representing the space shuttle's launch and return. The outer layer of the building, which will be cloaked in iridescent hues of orange and gold, represents the fiery glow of re-entry. The taller, internal wing of the building will be covered in a shimmering tile pattern in varying tones of gray, designed to represent the tiled underside of the orbiter.” Even the entryway is designed to be a spectacle. This is how Visitor Complex officials describe it: “At the entrance to the Atlantis exhibit, guests will be greeted by a full-size, upright, replica external tank and two solid rocket boosters. On the opposite side of the tank and booster assembly, a silhouette of the orbiter is attached to show guests its exact size and placement.”

Web posted. (2012). [Spotlight's on shuttle Atlantis, but that's not all [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 1].]

◆ Stephanie Stilson's latest project is about to come to a climactic finish, one complete with pomp, circumstance and spectacular fireworks. "We're finally here," Stilson said Oct. 17 as Atlantis rolled out of its hangar at Kennedy Space Center's Launch Complex 39, heading temporarily to the 52-story Vehicle Assembly Building. The short move was a somber first leg of a final journey that will culminate today with the orbiter's delivery to the KSC Visitor Complex. "I think, when we started working (shuttle fleet) retirement, nobody could actually visualize this moment," said Stilson, the NASA manager in charge of prepping the winged spaceships for museum display, and ensuring safe delivery to their retirement roosts. "We knew it would come eventually." Atlantis is the final orbiter to depart. For Stilson, 42, of Canaveral Groves, today's cross-center move largely will bring an end to an 18-month shuttle "transition and retirement" effort. "I think it will be mixed emotions," said Stilson, who previously had served as the "Flow Director" — the NASA ground processing manager — for Discovery, for 11 years and 11 flights. On the one hand, ceremonies today will celebrate Atlantis and its significant role in space exploration. On the other hand, "it will be difficult for us to know it'll be the last time she'll be in the LC-39 area," Stilson said. "But at least we're going to keep her close by." Web posted. (2012). [Stephanie Stilson: 'We knew it would come eventually' [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 1].]

November 2: Space shuttle Atlantis' 10-mile move to the Kennedy Space Center Visitor Complex is well under way this morning following departure from Kennedy's Vehicle Assembly Building at about 6:30 a.m. EDT. The 76-wheeled orbiter transporter carrying Atlantis will stop near Kennedy's Headquarters building for a 20-minute signing ceremony at 10 a.m., then travel to Space Florida's Exploration Park for a viewing opportunity for visitor complex guests before departing for its new home. To clear the way for Atlantis, 120 light poles, 23 traffic signals, 56 traffic signs and one high-voltage line were temporarily removed prior to start of today's journey. Atlantis arrived at Kennedy in April 1985. The spacecraft traveled 125,935,769 miles during 33 spaceflights, including 12 missions to the International Space Station. Its final flight, STS-135, closed out the Space Shuttle Program era with a landing on July 21, 2011. Since then, engineers have been preparing Atlantis for public display as part of NASA's transition and retirement processing of the space shuttle fleet. A grand opening of Atlantis' new home at the Kennedy Space Center Visitor Complex is planned for July 2013. Web posted. (2012). [Atlantis' 10-Mile Move Continues to Go Smoothly [Online]. Available WWW: <http://www.nasa.gov/> [2012, November 2].]

◆ Atlantis route to KSC visitor Complex is depicted in the following map.



Sources: NASA; Kennedy Space Center Visitor Complex; Google Earth

Arrival times and distances are approximate; shuttle not to scale.

Web posted. (2012). [Atlantis: Route to KSC Visitor Complex [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 2].]

◆ Atlantis in 1998 became the first orbiter outfitted with a modern “glass cockpit,” one that replaced old-fashioned mechanical dials, gauges and green cathode ray displays. And a look back at its 33 flights shows a history of firsts — some stellar, world-renown successes, others still hush-hush, super-secret. “An amazing career,” said Stephanie Stilson, the NASA manager in charge of prepping Atlantis for display at the Kennedy Space Center Visitor Complex. “A storied past for sure.” NASA’s OV-104 (Orbiter Vehicle 104) was contractually born on Jan. 29, 1979. Assembly of its crew module began on March 3, 1980, and its delta-shaped wings arrived at Air Force Plant 42 in Palmdale, Calif., three months later. Atlantis rolled out of the plant on March 6, 1985, and then over to nearby Edwards Air Force Base. Flying atop a 747 carrier aircraft, Atlantis arrived at Kennedy Space Center on April 9, 1985. Its first flight — STS-51J — blasted off from Launch Complex 39A on Oct. 3, 1985. The spaceship landed at Edwards four days later. In between, five astronauts reportedly deployed two advanced military communications satellites. The classified mission was the second of 10 fully dedicated Department of Defense shuttle flights flown between 1985 and the end of 1992. Atlantis was a military workhorse, flying five of those clandestine missions — more than any other shuttle. And Atlantis, which is named for a research vessel operated by Woods Hole Oceanographic Institute, also made its mark in solar system and galactic exploration. The orbiter in 1989 launched NASA’s first interplanetary flight from the shuttle, dispatching the Magellan Venus radar mapper. NASA’s Galileo mission to Jupiter launched aboard Atlantis that same year, and the orbiter in 1990 hauled up the Compton Gamma Ray Observatory, which studied highly energetic explosions in distant galaxies. But Atlantis might best be remembered for its contributions to the International Space Station — particularly a tenuous first phase when the U.S. and the former Soviet Union joined to fly shuttle missions to the Mir space station. Atlantis flew the first seven of nine shuttle docking missions to Mir. Seven NASA astronauts completed long-duration tours on Mir, and America and Russia bridged significant language, cultural and operational barriers. Dubbed “Phase One,” the shuttle-Mir program paved the way for the assembly of the International Space Station. People who worked on Atlantis at KSC remember OV-104 as a record-setter. In the shuttle processing world, minimizing “turnaround time” — the time between a shuttle landing and its next launch — always was a key goal. In 1985, Atlantis laid down a benchmark that still stands. Atlantis capped its first flight with a California landing, was transported back to KSC and launched again in fast fashion. “It returned to space 50 days after it landed,” said Terry White, 63, a longtime shuttle processing facility manager. “We had it in the hangar 26 days,” White said, far short of the more typical three- to six-month processing time. Web posted. (2012). [“An amazing career”: Atlantis painted a proud legacy [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 2].]

◆ Accompanied by a fleet of astronauts spanning NASA's entire existence, Atlantis made a slow, solemn journey to retirement Friday, the last space shuttle to orbit the world and the last to leave NASA's nest. Atlantis reached its new home at the Kennedy Space Center's main tourist stop close to sundown, after a one-way road trip that spanned nearly 12 hours. A couple dozen astronauts spanning NASA's Mercury, Gemini, Apollo and space shuttle programs — moonwalkers included — welcomed Atlantis to its new \$100 million exhibit, still under construction. The hardier ones walked alongside the spaceship for the home stretch. Among the big astronaut names: Mercury's Scott Carpenter, Apollo 11's Buzz Aldrin and Eileen Collins, the first female shuttle commander. It was a day full of fanfare and farewells. Atlantis began the 10-mile trek just before dawn, emerging from the massive Vehicle Assembly Building and riding atop a 76-wheeled platform. About 200 workers gathered in the early morning chill to see the spaceship out in the open for the final time. They were joined by the four astronauts who closed out the shuttle program aboard Atlantis more than a year ago. Portions of Atlantis' final launch countdown boomed over loudspeakers before the shuttle hit the road. Employees gathered in front of a long white banner that read, "We Made History," and below that the single word "Atlantis." They followed the

spaceship for a block or two, then scattered as the shuttle transporter revved up to its maximum 2 mph. The convoy included a dozen trucks and vans, their lights blinking. The fact that several hundred shuttle workers are about to lose their jobs, now that Atlantis is being turned over to the visitor complex, dampened the mood. Thousands already have been laid off. "The untold story of the last couple years, the last missions that we flew, is the work force. I mean, the contractors knew that their numbers were going to go down ... and yet they kept doing their jobs," said NASA's Angie Brewer, who was once in charge of getting Atlantis ready for flight. Some were too upset to even show up. Friday's event marked the true end to the 30-year shuttle program. Atlantis made its way down broad industrial avenues, most of them off-limits to the public. So the trek did not replicate the narrow, stop-and-go turns Endeavour encountered last month while navigating downtown Los Angeles. Web posted. (2012). [Final 10-mile trek for shuttle Atlantis, staying at Kennedy Space Center as tourist exhibit [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, November 2].]

◆ Talk about pomp and circumstance. Merritt Island High's honor guard and the Titusville High Marching Band fronted Atlantis. Trailing the orbiter were about three dozen shuttle astronauts. A sleek, white-and-blue T-38 Talon jet soared overhead, and 7,000 people – NASA and contractor workers and their families – showed up to see the orbiter at a once-in-a-lifetime photo opportunity Friday near NASA Headquarters in the KSC Industrial Area. Sometimes sober, sometimes rousing, it was a fitting change-of-command ceremony for the last NASA shuttle orbiter to be transferred to a museum. Gathered NASA officials and other dignitaries, including NASA chief Charles Bolden, put Atlantis under the stewardship of Delaware North Park Services, the company that operates the KSC Visitor Complex. "Although it's the end of Atlantis flying in space, it's not the end. It's not the end for KSC," former astronaut Bob Cabana, the 10th and current director of KSC, told the assembled crowd. "We're charging into the future, preparing for commercial operations to low Earth orbit, for exploration once again beyond our home planet, continuing to meet the needs of NASA's science mission with our expendable rockets. And it's not the end of Atlantis, because Atlantis now takes on a mission of inspiration of future generations." Web posted. (2012). [With new owner of Atlantis, an all-new mission [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 3].]

◆ United Launch Alliance plans to blast a U.S. Air Force space plane into orbit Nov. 27, pushing back the launch to complete investigating a rocket engine anomaly that occurred during an Oct. 4 mission. The Centennial-based rocket company, the main launch contractor for the nation's military and intelligence services, has been studying why the second-stage engine on a Delta IV rocket lost pressure while putting an Air Force GPS into orbit last month. The GPS satellite was placed in the right orbit, and the mission is considered a success. Still, ULA and the Air Force are delaying the space plane-launch aboard an Atlas V rocket until the Delta IV's engine investigation is completed. The Nov. 27 space plane mission, which had been tentatively set for Nov. 14, will be the third test flight for the Air Force's unmanned X-37B Orbital Test Vehicle (OTV-3). The reusable, Boeing-built space plane was last launched on March 5, 2011. The pilotless craft stayed in orbit for 469 days and landed June 16. Web posted. (2012). [Air Force space launch delayed as engine investigation continues [Online]. Available WWW: <http://www.bizjournals.com/> [2012, November 2].]

◆ The flying machine that ushered in NASA's space shuttle program has suffered storm damage in New York City [October 30th]. Shuttle prototype Enterprise weathered Superstorm Sandy this week at the Intrepid Sea, Air and Space Museum, but it sustained minor damage to its vertical stabilizer, or tail. A small piece of foam came off, said a museum spokesman. The damage was confirmed Friday by both the museum and NASA as shuttle Atlantis concluded its journey to retirement at Florida's Kennedy Space Center. Enterprise will be repaired at the earliest opportunity, the Intrepid museum said in a statement. The museum remains closed because of storm damage. Enterprise was flown atop a modified jumbo jet to New York in April and moved to the Intrepid museum in June. Web posted. (2012). [Space Shuttle

Enterprise suffers damage from Sandy [Online]. Available WWW: <http://www.nydailynews.com/> [2012, November 3].]

November 4: Although the new \$100 million facility to showcase the space shuttle Atlantis won't be finished and opened to the public until next July, tourists can get a "sneak peak" of the retired orbiter this week parked inside the exhibit hall at the Kennedy Space Center Visitor Complex. The viewing opportunity is available through next Sunday during daily windows of 2 to 5 p.m., when construction work will not be occurring. You can access the area to see Atlantis through the gift shop at the Shuttle Launch Experience attraction. "Sneak-a-Peek" is part of regular admission to the Visitor Complex, officials said. "We are excited to offer this rare opportunity for Kennedy Space Center Visitor Complex patrons," said Bill Moore, chief operating officer of Kennedy Space Center Visitor Complex. "We know they will cherish seeing Atlantis in this unique setting before construction is completed and the exhibit is unveiled to the world next July." In the next few weeks, Atlantis will be removed from the 76-wheel transporter that hauled the shuttle to the Visitor Complex last Friday, wrapped in a protective covering to keep dirt and dust off the spacecraft and raised 36 feet above the ground and tilted 43.21 degrees to its final display orientation for support pedestals to be brought into place. Erecting the final wall of the building and establishing air conditioning should be finished early next month. Web posted. (2012). [Early peak at Atlantis inside retirement home [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, November 4].]

◆ After SpaceX's Dragon capsule berthed at the International Space Station last month, the action from the first private resupply mission was essentially over until Dragon's departure weeks later. Why not take advantage of the lull to sell some T-shirts? "While Dragon's at the space station, get your 'Year of the Dragon' tee and more here," SpaceX tweeted, providing a link to an online store offering shirts, hats and onesies. Talk about commercial spaceflight. Other NASA contractors sell merchandise but rarely promote it during the high-stakes, high-cost space missions to which they contribute, either preferring or being asked to keep a low profile behind their government customer. But flying a commercial mission in which it led the operation of both a rocket and spacecraft it designed, SpaceX seized the opportunity to promote its brand and connect with fans through the gear and social media. "(The store) was launched as a response to public demand," said Katherine Nelson, vice president for marketing and communications for the Hawthorne, Calif.-based company. "We heard loud and clear through social media, and directly, that the general public wanted the opportunity to purchase SpaceX gear. We hope to evolve our product offerings in the future." A pair of experts in marketing and space memorabilia saw the product placement as reflective of the modern communications era in which 10-year-old SpaceX came of age, and as evidence that private space efforts are rekindling old enthusiasm for spaceflight. Web posted. (2012). [Sales launch: SpaceX uses Dragon's success to roll out merchandise [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 4].]

November 6: Work to redesign a launch complex at Cape Canaveral Air Force Station to support human flights could create 250 to 300 aerospace and construction jobs in Brevard County, United Launch Alliance says. ULA is expected today to announce it has selected Hensel Phelps Construction Co. of Orlando to help plan modifications to Space Launch Complex 41 that would enable commercial crew missions on Atlas V rockets. During 21 months, Hensel Phelps will assist Denver, Colo.-based ULA with the design and development of an access tower and an access arm astronauts would use to enter a spacecraft sitting atop the Atlas V. The firm also will work on the system astronauts and support personnel would use to escape the rocket in an emergency and a safe haven where they could take shelter before fully evacuating the pad area. The work is being performed in partnership with The Boeing Co., whose CST-100 capsule is one of three private space taxis being developed with support from NASA's Commercial Crew Program. The CST-100 would launch atop an Atlas V. In August, the Kennedy Space Center-based program awarded Boeing \$460 million, SpaceX \$440 million and Sierra Nevada Corp. \$212.5 million to complete system designs — including the rocket, ground and mission systems — by

May 2014. Web posted. (2012). [ULA taps company to modify pad 41 [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 6].]

November 7: Rocket-maker United Launch Alliance is putting in motion efforts to modify its Atlas 5 rocket pad at Cape Canaveral into a human launch site capable of loading astronaut crews in commercial spacecraft of the future. The firm announced this week it has hired Hensel Phelps Construction Co. of Orlando, which built the site a dozen years ago, to manage the upcoming project. ULA says the project could ultimately create 250-300 aerospace and construction jobs in Brevard County. Hensel Phelps will partner with ULA, officials said, to design the crew accommodation tower and access arm needed for astronauts at Complex 41 to board their spacecraft. What's more, an emergency egress system will be created to provide astronauts and pad workers a way to rapidly evacuate the area in the event of a dangerous situation. The deal also includes developing the overall project requirements, cost and schedule projections, and risk mitigation for modifying to the existing launch facilities for commercial crew operations in a 21-month program. Work to build Complex 41 began in 1963 and the pad opened for business in 1965, hosting 27 Titan rocket launches through 1999 that sent NASA's Viking landers to Mars, the twin Voyager probes to the solar system's outer planets and various other communications and military satellites into Earth orbit. Atlas 5 is the rocket of choice for Boeing's CST-100 capsule and Sierra Nevada's Dream Chaser vehicle in NASA's Commercial Crew Integrated Capability (CCiCap) program to launch astronauts from U.S. soil into low-Earth orbit, ending the gap in human spaceflight after retirement of the space shuttles. Web posted. (2012). [Atlas 5 pad modifications add astronaut accommodations [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, November 7].]

November 8: Space Florida's board today approved spending up to \$5 million to repurpose Kennedy Space Center facilities for potential use by a classified military program. Labeled Project Coyote, the program was not discussed but is widely speculated to be the U.S. Air Force's X-37B reusable mini-shuttle. The Air Force has previously said it is exploring cost-savings that could be achieved by consolidating X-37B launch, landing and refurbishment operations in one location. Landing and refurbishment currently are performed in California, but the Air Force has also said the third unmanned X-37B mission -- targeted for a Nov. 27 launch from Cape Canaveral Air Force Station atop an Atlas V rocket -- could land on KSC's shuttle runway. During its meeting at the Rosen Shingle Creek hotel today, Space Florida's board made no mention of the KSC facilities in question. But documents have linked Project Coyote to the former shuttle hangars officially called Orbiter Processing Facilities 1 and 2. Separately, the board approved another \$5 million to continue work to ready a third shuttle hangar -- OPF-3 -- for use by The Boeing Co. to assemble a commercial crew capsule. A first \$5-million demolition phase is already under way. The additional funding approved today would go toward a second modernization phase. All the funding for work on the hangars comes from the Florida Department of Transportation, which has a \$15 million budget this fiscal year for space infrastructure upgrades. Web posted. (2012). [Kennedy Space Center could house secret Air Force X-37B program [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 8].]

◆ Officials from NASA partner United Launch Alliance announced Thursday that they've chosen an Orlando company to provide construction services on a Cape Canaveral launch pad. A NASA manager says Central Floridians can expect a growing demand for workers at Cape Canaveral over the next few years. Ed Mango heads up NASA's Commercial Crew Program, which works closely with private companies like Boeing, Sierra Nevada Corporation, and Space X to develop new vehicles for manned spaceflight. He says ULA's choice of Hensel Phelps Construction Company in Orlando for work on the launch pad is just the start. "All these companies we're engaged with today, all three of them, have significant work that they're going to be doing at the Cape," Mango says. "So the picture looks quite bright over the next...two to four years here around the Cape for high-tech jobs, both in the engineering world and the construction world, and also in the technician and quality world for processing hardware." ULA has said the work at the launch pad will eventually create up to 300 jobs. Web posted. (2012).

[NASA Official: Space Jobs Slowly Coming Back to Cape Canaveral [Online]. Available WWW: <http://www.wmfe.org/> [2012, November 8].]

◆ Planning and discussion took about 16 years. But it was the push of local and state officials that persuaded the Navy to start refurbishing and updating a 1950s-era missile test complex at Naval Ordnance Test Unit into the new Strategic Weapons System Ashore facility that prompted action. Work is under way on what will be a large missile test facility that consolidates work currently conducted by defense contractors from at least four sites around the country. It also initially will bring dozens of military and civilian jobs to the Space Coast — some estimates saying as many as 100 within three years — and then possibly more. The construction is take place over an existing underground structure at launch complexes 25 and 29, where Fleet Ballistic Missile test launches were fired in the 1950s. Web posted. (2012). [Cape's Navy missile site will expand [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 8].]

November 9: NASA has renamed two satellites launched in August for James Van Allen, a pioneering astrophysicist who discovered the radiation belts surrounding Earth. Formerly known as the Radiation Belt Storm Probes, the Van Allen Probes began their two-year science mission Oct. 28 after a 60-day commissioning phase. The Van Allen Probes are investigating what causes Earth's donut-shaped radiation belts to swell and contract as solar storms erupt and propagate through space. James Van Allen is credited with the 1958 discovery of the radiation belts using Explorer 1, the first successful U.S. satellite. Web posted. (2012). [NASA's radiation belt probes named for James Van Allen [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, November 9].]

November 10: Sixteen months after NASA's last shuttle flight, the final four astronauts to fly on one of America's winged orbiters have moved on. Two now are working in the private sector, still involved in the American aerospace industry. Two remain at NASA, working on the future of U.S. human spaceflight, preparing for missions beyond Earth orbit. Together, they are representative of a NASA Astronaut Office in the midst of dramatic change -- a corps that is just a third of the size it was in the year 2000. "Last night, we asked the question: 'Where do you think we're all going to be in five years?' And it makes me wonder," mission commander Chris Ferguson said a week ago Friday as he and his crew escorted Atlantis to the Kennedy Space Center Visitor Complex, where it will be displayed in retirement. Ferguson guided Atlantis to a July 21, 2011, landing at Kennedy Space Center's three-mile shuttle runway, winding up NASA's 135th shuttle mission and more than three decades of shuttle fleet operations. NASA now is investing in the development of commercial spacecraft to ferry U.S. and partner nation astronauts to the International Space Station, which will operate until at least 2020 and perhaps 2028. At the same time, NASA is developing supersized rockets and the Orion crew exploration vehicle for missions into deep space. But it likely will be 2017 or later before U.S. astronauts are flying on commercial space taxis or the Apollo-style Orion deep space explorer. Consequently, the size of the Astronaut Office is dwindling. The corps now numbers 52 -- about 66 percent less than the 149 astronauts employed by the office in 2000. NASA in 2013 will select nine to 15 new astronaut candidates from a pool of 6,372 applications submitted in response to an announcement of opportunity in late 2011. NASA in the post-shuttle era of U.S. human spaceflight aims to keep the size of the astronaut corps at about 65 -- the number needed to support International Space Station operations. The members of NASA's 21st astronaut class will be announced in the spring of 2013. They will replace some of about two dozen high-achieving astronauts who have left the agency since the beginning of 2011 -- the final year of shuttle operations. Web posted. (2012). [Spacefarers fewer, but recruits wait in wings [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 10].]

◆ The Vehicle Assembly Building, or VAB, at NASA's Kennedy Space Center in Florida is undergoing renovations to accommodate future launch vehicles. A project of Ground Systems Development and Operations, or GSDO, space shuttle-era work platforms have been removed from the VAB's High Bay 3

and accommodations are being made to support a variety of future spacecraft, including NASA's Space Launch System (SLS) heavy-lift rocket. The changes are part of a centerwide modernization and refurbishment initiative in preparation for the next generation of human spaceflight. One of the largest buildings in the world, the VAB was constructed in the mid-1960s to support stacking of the Apollo Saturn V rockets that took American astronauts to the moon. In the late 1970s, the facility was refurbished to accommodate the space shuttle. Following three decades of flight, the space shuttle was retired in 2011.

Plans now call for the VAB to be able to support multiple types of space vehicles, including the SLS, Orion spacecraft and commercial rockets. NASA is partnering with private industry on rockets and spacecraft to take astronauts to low-Earth orbit and the International Space Station. SLS will be an advanced heavy-lift launch vehicle providing a new capability for human exploration beyond Earth orbit. "After more than 45 years of use, it was time to clear out and update the garage," said Jose Lopez, VAB senior project manager in the Vehicle Integration and Launch Support Branch of GSDO. "What makes this project such a major undertaking is the size." The VAB is 526 feet tall, 716 feet long and 518 feet wide. It covers eight acres and encloses more than 129 million cubic feet of space. The building was constructed to withstand hurricanes and tropical storms with a foundation consisting of 30,000 cubic yards of concrete and 4,225 steel pilings driven 160 feet into bedrock. The first step in the plan was to remove space shuttle-era work platforms, a project that presented numerous challenges. There were eight box-like support structures surrounding the shuttles during stacking in the VAB. One box platform structure had been removed in 2009 in preparation for the launch of the Ares I-X test vehicle in October 2009. Each platform structure had work stands, connections for electricity, water, pneumatics and other commodities. Ivey's Construction Inc. of Merritt Island, Fla., began the task in early September. Working closely with NASA and other Kennedy contractors such as United Space Alliance and URS, as well as an on-call architectural and engineering firm BRPH, they helped ensure all systems in the VAB were disconnected from the platforms. Web posted. (2012). [NASA's Vehicle Assembly Building Prepared for Multiple Rockets [Online]. Available WWW: <http://www.brevardtimes.com/> [2012, November 10].]

November 14: Stephen Whitney is one of about 85 firefighters at Kennedy Space Center whose situations changed dramatically when the security contract at the spaceport changed hands near the end of the space shuttle program. As the nature of the work needed at KSC changed, NASA opened the security contract to new bids. G4S Government Solutions in Palm Beach Gardens lost the contract at first, but the British company got the decision overturned after a lengthy legal battle. This year, G4S tried to reduce costs during union negotiations, prompting picketing by firefighters. The protests were called off Oct. 1 when the deadline to settle the contract passed and G4S implemented new terms without the union's approval, said Kevin Smith, president of the Transport Workers Union. Firefighters' salaries, which average about \$25 per hour, were not cut. But the union estimates each firefighter lost about \$20,000 per year from the combined impact of reductions in benefits such as retirement, stipends and uniform allowances, among others. Reductions in hours and overtime also impacted take-home pay. Insurance premiums more than doubled, according to the firefighters. The union has filed complaints with the National Labor Relations Board, Smith said. The union also appealed to NASA, but spokesman Mike Curie said federal regulations prevent the agency from getting involved. Web posted. (2012). [Shuttle era's end triggered contract change [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 14].]

◆ Engineers are combing through data from SpaceX's October cargo mission to the International Space Station, examining a rocket engine failure, electronics glitches from suspected radiation, and a power loss that could have imperiled precious medical samples returned from the outpost, NASA officials said Wednesday. SpaceX's Dragon spacecraft successfully completed the commercial resupply flight, but the mission had to overcome several anomalies almost from the moment of its Oct. 7 launch. The mission's Falcon 9 booster suffered an engine failure moments after liftoff from Cape Canaveral, Fla., and investigators from SpaceX and NASA have found "no smoking gun" on the cause of the problem,

according to Mike Suffredini, NASA's space station program manager. The rocket's computer detected a sudden loss in pressure in the combustion chamber of one of the first stage's Merlin 1C engines and commanded the engine to shut down 79 seconds after liftoff, according to SpaceX. The company formed a joint review team with NASA to find the cause of the engine failure, but despite going over an "enormous amount of data" in the last month, investigators have not determined the root cause of the engine problem, Suffredini said Wednesday in a meeting of the NASA Advisory Council's human exploration and operations subcommittee. Elon Musk, SpaceX's CEO and chief technology officer, said Wednesday it will "probably be several weeks" before the investigation releases any findings. Web posted. (2012). [SpaceX, NASA scrutinize anomalies from cargo flight [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, November 14].]

◆ The business and science of launching payloads into space happens in Brevard, and when Atlas and Delta rockets ascend, they do so under the banner of United Launch Alliance, a venture owned by Lockheed Martin and Boeing. Having launched 64 successful missions, it is set to launch nine more in 2013 and 10 the next year. The company also is committed to the community its employees live and work in, and is generous. Its 600 employees have contributed about 14,000 hours of community service and ULA has donated more than \$5 million to various causes. Thus, ULA is a candidate for Business of the Year in *Florida Today's* annual Volunteer Recognition Awards. "Since the formation of United Launch Alliance in December 2006, the company has been committed to a robust corporate citizenship program that primarily targets the need to excite our next generation of engineers," said Rob Rains, president of the United Way of Brevard, who nominated ULA for the VRA. "Every year, ULA has team volunteer events, making an impact with a great variety of local nonprofit organizations." Rains added that ULA and its employees raised more than \$336,000 for United Way in the past seven years. Web posted. (2012). [ULA's Brevard help goes well beyond launch pads [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 14].]

◆ The morning of Nov. 14th, 1969, was stormy at NASA's Cape Canaveral launch site, but the [Apollo 12] Saturn V on the launchpad was going to the moon regardless. Conditions weren't bad enough to force a scrub, and President Nixon was on site so no one wanted to see the schedule slip. At 11:22 a.m., the monster rocket roared to life and cleared the tower. It was a perfect launch for the first 37 seconds. Then, *all hell broke loose*. Inside the Command Module, Commander Pete Conrad saw a flash through the window at the same time as he felt the rocket shudder. Almost immediately the spacecraft's master alarm rang through the cabin and the control panel lit up like a Christmas tree with warning lights. Conrad joked that they might have been hit by lightning. They didn't know it at the time but they had. *Twice*. As the Saturn V rose through the electrically charged storm clouds, it turned into a lightning rod. Two separate bolts struck the rocket then followed its contrails all the way to the launch pad to strike again. Two and a half minutes after the first strike took out their displays, everything in the spacecraft was running normally. The crew, displaying the characteristic giddiness of three men who had nearly escaped a fatality, spent the rest of their ascent to orbit in fits of laughter. Web posted. (2012). [History of Space [Online]. Available WWW: <http://www.discovery.com/> [2012, November 14].]

November 15: The space shuttle Atlantis has been encased in a protective plastic, a wrap that will keep the spacecraft dust-free while construction crews finish building the exhibit hall to showcase her to the public. Atlantis arrived at the Kennedy Space Center Visitor Complex on Nov. 2, rolling into the \$100 million attraction that will be finished and opened to the world next July. Since reaching the retirement home, Atlantis was offloaded from the 76-wheel motorized transporter and secured to beams that will be used for lifting the 152,700-pound craft into its display configuration. Workers this week covered the shuttle with the same type of wrapping you might see around boats being shipped down the highway. It will keep the dust and debris from coming in contact with the priceless artifact in the construction zone. The final wall of the building, left unassembled in order to get the massive orbiter inside, will be finished in the coming weeks. The facility should have the air conditioning system established in early December.

In the next few days, the crane and rigging company hired by KSCVC will finish the delicate job of raising Atlantis 36 feet off the ground and tilting the orbiter 43.21 degrees to the port side, the final display orientation to mimic the shuttle still flying in space. Next spring, the plastic will be removed in preparation for opening Atlantis' payload bay doors. Web posted. (2012). [Shuttle Atlantis wrapped in protective covering [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, November 15].]

November 16: The Kennedy Space Center Visitor Complex has ended its traditional free “Salute to Brevard Residents” weekend after 12 years. Instead, Brevard’s most popular paid tourist attraction is introducing an alternative: a month of 70-percent-off tickets for Brevard residents and their guests in a program being called “30 Days of Giving.” That reduces the basic ticket price to \$15 plus tax for adults and \$10 plus tax for children ages 3 to 11, compared with the regular price of \$50 for adults and \$40 for children. To participate in the discount, which starts Saturday and runs through Dec. 16, Brevard residents are encouraged to bring canned goods and other non-perishable food items to the entry plaza, with the suggested donation of at least one food item per guest. Through food contributions, local visitors to the complex support the Central Brevard Sharing Center in Cocoa, North Brevard Charities Sharing Center in Titusville and South Brevard Sharing Center in Melbourne. Representatives of local sharing centers said that, while they appreciate the visitor complex’s continued support for local food pantries, they’re concerned the new setup might not yield as much food as the free weekend did. Up to 15 percent of annual food donations to the local pantries had been generated by the free weekend. David Brubaker, vice president of the Central Brevard Sharing Center, who coordinates with the visitor complex staff on behalf of the three sharing centers, said he believes the change was a business decision that operators the visitor complex had to make. Delaware North Companies Parks & Resorts operates the tourist complex for NASA. Andrea Farmer, public relations manager of the visitor complex, said the change is caused in part by the increased expense of staffing and maintenance costs at the complex during the three-day Salute to Brevard Residents weekend, when attendance might reach 20,000, but many guests get in free. Farmer said the visitor complex plans to promote the “30 Days of Giving” program heavily. Delaware North also is encouraging its more than 600 employees to contribute to the food drive. Delaware North also matches employee contributions to the United Way of Brevard campaign. Web posted. (2012). [KSC visitor Complex ends annual free weekend for Brevard residents [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 16].]

◆ After seven years in the top spot at Johnson Space Center, director Mike Coats told employees Friday that he will retire at year's end. The center's deputy director, four-time space flight veteran Ellen Ochoa, will replace Coats. Web posted. (2012). [Johnson Space Center director announces his retirement [Online]. Available WWW: <http://www.chron.com/> [2012, November 16].]

November 19: Submerged beneath the concrete of Kennedy Space Center's launching pad that sent humans to the moon resides a fortified bunker and network of tunnels to save the lives of workers and astronauts in a cataclysmic disaster. It is the Apollo-era Emergency Escape System, and this piece of spaceflight history remains in place at pad 39A almost 45 years after its construction in the midst of the space race. Picture the mighty Saturn 5 moon rocket, fueled and poised for blastoff from the Florida spaceport. But something goes wrong and everyone at the seaside complex must evacuate to safety. The answer that designers created for men to survive a detonating rocket was this protective cocoon built under the sloping northwest corner of both twin pads at Complex 39. For the astronauts or crew support personnel at the top of the rocket, they would rely on a high-speed descent elevator to reach the base of the mobile platform. They join technicians working on the platform to jump down a chute on the north-side of the platform that connected to the teflon-lined slide that rapidly gets them underground. That 200-foot slide empties into the aptly-named "rubber room" with its rubber floors meant to absorb the impact of the explosion occurring on the pad surface 40 feet above them. Hopping off the landing ramp, the people would scurry to their left into the fallout shelter, a domed room suspended on shock-dampening springs and sealed off with massive blast-proof doors. Inside, the chamber held 20 chairs, a

toilet and carbon dioxide scrubbing equipment to keep the occupants alive until rescue teams arrive. And, if a further escape is required, on the opposite side of the dome is another door leading out into an airlock and the entrance to a tunnel burrowed under the western field of both pads. It was the elaborate safety measures put in place as the Apollo Program got underway. Later, a slide-wire system would be added to evacuate crews from atop the umbilical tower, whisking them out and away from the pad instead of relying on the elevator to go down for accessing the "rubber room" slide. Still, the dimly-lit cavern, draped in mystique and almost spooky to walk through, has stood the test of time as space shuttle after space shuttle thundered away from pads 39A and 39B above. The rooms on both neighboring complexes were capped off and removed from use. The 1,200-foot escape tunnels were converted into air-intakes, funneling fresh air into the environmental control system and used in purges to the space shuttle. The B pad room was condemned due to lead paint concerns, but the A pad room remains accessible through the airlock doorway next to the hub of the environmental control system below the pad deck. Web posted. (2012). [Photos: the safety cavern under Apollo launch pads [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, November 19].]

November 20: In the Kennedy Space Center hangar that Discovery once called home, an excavator's jaws on a recent afternoon clamped onto a third-floor catwalk, ripped a section away and dropped it into a tangled pile. Thundering booms echoed as another excavator smashed a mound of scrap metal in the opposite corner. It was a loud and jarring scene inside the 25-year-old hangar previously known as Orbiter Processing Facility 3, or OPF-3, a place shuttle workers took extensive precautions to keep free of dirt and debris that could damage an orbiter being readied for flight. And it's the most tangible evidence yet that unneeded shuttle infrastructure may have a future serving private spacecraft, and that KSC is shifting to a new way of doing business after the shuttle's retirement. The renamed Commercial Crew and Cargo Processing Facility, or C3PF, and other nearby facilities are being readied for The Boeing Co. to manufacture, assemble and test its CST-100 commercial crew capsules, work that could eventually create 550 jobs. Boeing is one of three companies competing to carry NASA astronauts to the International Space Station, flights targeted to begin in 2017. The seven-person capsule's command module would be assembled in the high bay, and its service module in an adjacent low bay where space shuttle main engines were once refurbished between flights. Boeing also plans to lease the nearby Processing Control Center, a three-story office building, bringing its planned footprint to more than 227,000 square feet. Web posted. (2012). [Former KSC shuttle hangar undergoes massive transformation [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 20].]

November 21: A Kennedy Space Center crew today is moving a massive crawler-transporter several miles as part of tests of recent modifications to upgrade the Apollo-era hardware for NASA's next heavy-lift rocket. The 6.3 million pound machine, whose base is the size of a baseball diamond, carried Saturn V rockets and space shuttles from the Vehicle Assembly Building out to their launch pads. The eight-tracked crawler-transporter recently rolled 3.4 miles out to pad 39A, where it climbed up the stand and lifted and lowered a mobile launcher platform. Today it is returning to a park site near the VAB, a trip expected to take about six hours at an average speed of 0.8 mph. The crawler's \$50 million overhaul is expected to be completed in 2015. "It's almost 50 years old, and some of the systems, it's about time to change it up and get ready and prepare for the new program," said Mary Hanna, NASA Crawler-Transporter Project Manager. "We've had a very, very successful two weeks of testing." Web posted. (2012). [KSC tests upgraded crawler-transporter [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 21].]

◆ Next week's planned launch of the U.S. military's mini-shuttle is being delayed another two weeks, presumably to complete an investigation into engine trouble during a recent Delta rocket launch. Now the third flight of an Air Force X-37B is being tentatively targeted for Dec. 11, officials said Wednesday. No exact launch time or launch window has been announced. Launch of the Orbital Test Vehicle aboard an United Launch Alliance Atlas V rocket at Cape Canaveral Air Force Station had been set for next

Tuesday. The delay follows three previous slips in the launch date. The OTV-3 mission had been slated for Oct. 25. That target date subsequently slipped to Oct. 30. Then it was moved to Nov. 13. The slips stem from engine trouble encountered during the Oct. 4 launch of a ULA Delta IV rocket and an Air Force Global Positioning System satellite. Engineers detected reduced thrust levels during the firing of the Delta IV's second-stage Pratt & Whitney Rocketdyne RL 10 engine. The \$122 million navigation satellite was delivered to its intended orbit despite the problem. The Atlas V rocket employs a different version of the Rocketdyne RL 10 engine. Mission managers want to ensure the same type of engine trouble is not encountered on the Atlas V flight. Web posted. (2012). [Mini shuttle launch delayed again [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 21].]

◆ Robert Cabana is the director of NASA's John F. Kennedy Space Center in Florida, where he manages a team of about 8,600 civil service and contractor employees. He completed his astronaut training in 1986 and has flown four space shuttle missions, notably serving as commander of Endeavour in 1988 on the first space station assembly mission. Cabana spoke with Tom Fox, who writes the Washington Post's Federal Coach blog and is the vice president for leadership and innovation at the Partnership for Public Service. Fox also heads up the Partnership's Center for Government Leadership. *How did your career path lead you to NASA?* When I was five-years old, my mom and I took a trip to D.C. and I distinctly remember seeing the Wright Flyer and Spirit of St. Louis at the Smithsonian. After that, all I ever wanted to do was to fly. I went off to the Naval Academy because I wanted to be a naval aviator, and then I ended up taking a commission in the Marine Corps. After flying in the Marine Corps and becoming a test pilot, I learned NASA was taking applications for the shuttle program. I met all the qualifications and said, "Hey, I can actually do this." Folks often ask me how someone becomes an astronaut. I tell them, "persistence." I didn't get into flight school the first try and I didn't get into the astronaut program the first try. *The Kennedy Space Center is celebrating its 50th anniversary this year. What are some of your aspirations for the next 50 years?* We're transforming the Kennedy Space Center into a 21st-century launch complex. We want to make it a multi-user space port, where there are government and commercial launches for crew and cargo, for suborbital, orbital and flights of exploration beyond earth. We're expanding partnerships with commercial companies to utilize excess shuttle capabilities that we no longer need. We're exploring contract options with SpaceX, Sierra Nevada Corporation and Boeing to fly our crews to the International Space Station, so we don't have to rely on our Russian partners. In the meantime, we will continue to meet NASA's science needs by launching science missions. So it's a time of transition, but an exciting time. It's going to be progressive and evolutionary, but the key is that we're putting the infrastructure in place to make it happen. *How do you engage your employees during the transition from the space shuttle program?* You have to chart a clear course to the future and get the team to buy in to it, be a part of it and give them the responsibility to make it happen. The very first thing I told my team when I came here four years ago was that the shuttle program was going to end. I said that we have to be ready for that transition, and it's going to be hard. I told my team there's going to be a lot of people who are going to be out of work, and we have to do our best to help find work for them, and help them get through this transition. I think it's critical to be clear about the path forward. *What leadership techniques do you use to connect with your staff?* I really believe in servant leadership. You have to put the welfare of your people above your own. Good leaders care for their people. Leaders don't say, "I did it." They give credit to the team. Leaders also need to get down onto the floor and talk with the people that you work with. Ask them what they're doing. They want to tell you about the things that they're working on. You'll learn more from walking around on the floor than you'll ever learn sitting in some conference room up on the top floor. *What other leadership qualities are important?* You have to have integrity. Nothing can cause you to lose respect of your people and not be a good leader if you don't have integrity. They know when you're not telling the truth. Charting a clear path for the future is essential. And never stop learning. You've got to be open to new things. As we grow older change is hard. Learning new things is hard. *How does NASA attract and motivate young scientists and engineers?* I'm so impressed with the new hires who are coming out of college. They have computer skills that are just phenomenal. They have so many tools that we never had. We allow them to use some of those tools. We give them a challenging task, let

them learn and give them the opportunity to be innovative. We listen to what they have to say, and are amazed at what they come up with. We're fortunate at NASA. Young people want to be part of this program. How many people can come to work every day and know that they're making the difference not just in the future of our nation, but of our planet? *Who are your top leadership role models and what have you learned from them?* I've been fortunate to serve under so many good leaders, I would hate to single one out as better than the rest. From my vantage point, what made me respect them and want to follow them, was that they were technically excellent in their field, they excelled at what they did. They challenged me and I didn't want to let them down. They had integrity and could be trusted. They clearly communicated what they wanted accomplished and held people accountable. They genuinely cared for the people that worked for them, and helped them to be successful. Web posted. (2012). [Out of this world: Talking leadership with Kennedy Space Center director Robert Cabana [Online]. Available WWW: <http://www.washingtonpost.com/> [2012, November 21].]

November 22: Like a symbol of the space program itself, a historic transporter inched closer to its post-shuttle future at Kennedy Space Center on Wednesday. The six-million pound crawler-transporter, one of two built to haul Saturn V rockets, fired up a new pair of generators and — surprisingly quietly for such a massive machine — rolled slowly away from a launch pad where it spent two weeks testing upgraded systems. Forty-six years after it became operational, the eight-tracked “crawler” is undergoing an extensive overhaul to support NASA's next heavy-lift rocket, the Space Launch System, which will be its heaviest load yet with an initial estimated weight of 14 million pounds. After a year of work, NASA and contractor teams are wrapping up the first phase of a \$50 million upgrade expected to be completed in 2015. Original generators and engines have been replaced with a more powerful set, along with the brakes, lubrication and software systems and miles of cables and wiring. Still to be improved: roller bearing assemblies, the jacking and leveling system and gearbox. When the work is done, the crawler will be able to carry up to 18 million pounds, well above the 12 million-pound load of a shuttle on its mobile launcher platform. “It was pretty extraordinary before, and we're making it even more extraordinary,” said Terry Berman, the United Space Alliance project manager. The crawler was put through tests, including climbing launch pad 39A's ramp, where brakes are needed, and picking up and lowering a mobile launcher platform. Despite a few bugs, the new systems have “done phenomenal,” Hanna said. The crawler's base, which is the size of a baseball infield, appeared to be a gleaming, freshly painted gray. Its eight tracks, and the belts of one-ton shoes snaking around them, looked worn from their years and miles traveled over the center's river-rock crawlerway. A team of about 30 USA personnel monitored the crawler's systems and progress, which averaged 0.8 mph and was expected to peak at just over 1 mph. A truck hosed down the path ahead to minimize loose dirt and debris that could cause a jam. All the crawler needed was a rocket to carry. Web posted. (2012). [“Crawler” aces tests in post-shuttle life [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 22].]

November 24: Some of the most satisfied employees year-in, year-out work at the Nuclear Regulatory Commission and the National Aeronautics and Space Administration, according to the Partnership for Public Service, a nonprofit that encourages careers in government. Employment specialists say job satisfaction is critical for doing the public's business. “All the research shows that the more engaged employees are, the more committed they are, the more effective an organization is,” said John Palguta, vice president of policy with the Partnership, which ranks hundreds of federal agencies each year in a report entitled “Best Places to Work.” The partnership develops its rankings using employee responses to a survey by the Office of Personnel Management. The 2012 survey of more than 687,000 workers was released last week. The OPM said 80 percent of them enjoyed their work, and more than two-thirds would recommend their agency to others. The partnership's report for 2012 is due out next month. Web posted. (2012). [Ranking agencies by job satisfaction [Online]. Available WWW: <http://www.baltimoresun.com/> [2012, November 24].]

◆ SpaceX has delivered a Falcon 9 rocket to Cape Canaveral while continuing an engine-problem investigation that will delay the booster's planned launch from mid-January to early March. Company and NASA engineers are still sorting out what caused one of nine Merlin engines to shut down early during the Oct. 7 launch of a Dragon cargo capsule to the International Space Station, NASA officials told an advisory committee. The NASA Advisory Council's Human Exploration and Operations Committee also learned at its Nov. 14 meeting about several anomalies the Dragon spacecraft experienced during its first commercial resupply mission to the station. 'But Mike Suffredini, NASA's ISS program manager, said last month that the outpost is well-stocked, and there is no urgency to fly the next Dragon mission, the second of 12 under a \$1.6 billion contract. The Falcon 9 successfully delivered the Dragon to orbit despite the engine shutdown 79 seconds after liftoff. A commercial satellite flown as a secondary payload, however, was left in a lower-than-desired orbit and re-entered the atmosphere within days. Debris blew away from the rocket when the engine suddenly lost pressure. That was not an explosion, SpaceX said, but likely a release of pressure that shattered an aerodynamic shell around the engine. Web posted. (2012). [SpaceX engine probe delays Jan. flight [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 24].]

November 26: NASA's first orbital flight-model Orion crew capsule will have to be repaired before its planned 2014 debut after its aft bulkhead cracked during recent pressure testing at the Kennedy Space Center in Florida, a NASA spokeswoman said last week. The cracks were discovered during a proof pressure test the week of Nov. 5. Proof testing, in which a pressure vessel is subject to stresses greater than those it is expected to encounter during routine use, is one of the many preflight tests NASA is performing on Orion to certify the craft is safe for astronauts, agency spokeswoman Rachel Kraft said. "The cracks are in three adjacent, radial ribs of this integrally machined, aluminum bulkhead," Kraft wrote in an email. "This hardware will be repaired and will not need to be remanufactured." It took Orion prime contractor Lockheed Martin Space Systems of Denver about a year to make the vehicle that was damaged. Kraft did not say how long it would take to repair the capsule, built as part of a program intended to take astronauts to destinations beyond low Earth orbit. Lockheed Martin's Orion prime contract, awarded in 2006, is worth \$6.23 billion. NASA added \$375 million to that award in December so Lockheed Martin could buy a Delta 4 Heavy rocket for the Exploration Flight Test 1 launch. Delta 4 is not Orion's primary carrier rocket. NASA is building the massive Space Launch System rocket at the Marshall Space Flight Center in Huntsville, Ala., to loft Orion on missions beyond low Earth orbit. Web posted. (2012). [NASA discovers cracks in its deep-space Orion capsule [Online]. Available WWW: <http://www.msnbc.msn.com/> [2012, November 26].]

◆ At the north end of Cape Canaveral Air Force Station is a launch complex where unmanned Atlas rockets blast off with super-secret national-security satellites. Four towering lightning protection masts surround the pad, which also has been the embarkation point for robotic NASA spacecraft flying missions to the moon, Mars, Jupiter and Pluto. Mike Leinbach looks out over the landscape and envisions something else: American astronauts riding an elevator to the top of a 22-story crew access tower, crossing a swing arm, and then boarding a U.S. spacecraft atop a United Launch Alliance Atlas V rocket. Fifty-one years after Alan Shepard's inaugural U.S. human spaceflight, America no longer is capable of launching its own astronauts into orbit. NASA's shuttle orbiters are ensconced in museums. And in a post-Cold War irony, the U.S. is reliant on Russia to fly astronauts into space. "This is going to happen. We are going to put American astronauts into orbit on American rockets again," said Leinbach, 59, the longtime NASA shuttle launch director who now is director of human space flight operations for ULA. "It's just a question of time." The clock is ticking. Literally for Chris Ferguson, the veteran U.S. astronaut who commanded the last space shuttle mission and is on a short list to command the first piloted test flight of the Boeing spacecraft being developed to carry U.S. crews. Ferguson tracks "Mission Elapsed Time," or MET, a measure of days, hours and minutes since liftoff of an American manned space mission, on his Omega Speedmaster X-33, the watch of choice for U.S. astronauts. At 11:29 a.m. EDT today, the Mission Elapsed Time on his watch will reach 507 days — 507 days since liftoff of Atlantis,

NASA's final shuttle mission and the end, temporarily, of America's manned launch capability. Ferguson has no plans to reset his MET tracker until liftoff of the Boeing CST-100's test flight atop an Atlas V rocket, which is being targeted for 2016. Ferguson, who joined Boeing last December, and Leinbach are on the front lines of an epic effort to restore U.S. human spaceflight capability — and a crucial, alternative means of getting people to and from the International Space Station. "This is an active launch pad, for national security space, and NASA. And so in order to build a new structure out here, while we're launching off this facility, is going to be a trick," Leinbach said. Modular components will be built off-site. "We'll bring them in. We'll stack them up like dominoes in between launches," he said. "So you'll see, in time, the construction of this tower. It's going to be a permanent structure here, and we're really excited about it." The skyline at America's rocket ranch is in for a slight change. And in time, U.S. astronauts will be flying once again on U.S. rockets and spacecraft. Web posted. (2012). [U.S. on the clock to return to orbit [Online]. Available WWW: <http://www.msnbc.msn.com/> [2012, November 26].]

◆ NASA's original jumbo jet, which was used to ferry the space shuttles around the country, has landed at Ellington Field in Houston, where it is to stay. The Shuttle Carrier Aircraft (SCA), often referred to using its tail number, NASA 905, was most recently used to fly space shuttle Endeavour to Los Angeles in September. The 747 jetliner was seen by millions of people as it made its way from the Kennedy Space Center in Florida to California, where it performed a scenic flyover of the state with Endeavour riding piggyback. After Endeavour was offloaded, the SCA took off from Los Angeles International Airport, without fanfare, on what was reported to be its final flight: a 20 minute trip to NASA's Dryden Flight Research Center at Edwards Air Force Base in southern California. There, it was to join its sister SCA, NASA 911, as a parts donor for another of NASA's 747 jetliner-based programs, the Stratospheric Observatory for Infrared Astronomy (SOFIA). Then a flight plan was filed for Ellington Field. NASA 905 was flown to Houston on Oct. 24, just in time for it to be on hand for the Wings Over Houston Air Show. The rumor on the flight line was that the public display was a preview of things to come. Web posted. (2012). [NASA Space shuttle-carrying jet lands for good [Online]. Available WWW: <http://www.cbsnews.com/> [2012, November 26].]

November 27: NASA is evaluating options for repairing the first Orion crew capsule slated to fly in space after it suffered cracks during recent pressure testing at Kennedy Space Center. The damage is not expected to delay a planned launch of the unmanned spacecraft from Cape Canaveral on a test flight in 2014, officials say. "The intent is to diagnose root cause and repair the cracks in time to support a second scheduled window for loads testing early next year," NASA spokeswoman Rachel Kraft said in an e-mail. The cracks appeared during a "proof pressure" test in KSC's Operations and Checkout building. NASA is developing Orion to fly astronauts on deep space exploration missions to the moon, an asteroid or beyond. A first crewed flight from KSC is targeted for 2021. Web posted. (2012). [Pressure test reveals cracks in Orion space capsule [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 27].]

◆ Space launch company Stratolaunch has parted ways with manufacturer Space X, dissolving a partnership dating from the project's inception. "Stratolaunch and Space X have amicably agreed to end our contractual relationship because the current launch vehicle design has departed significantly from the Falcon derivative vehicle envisioned by SpaceX and does not fit well with their long-term strategic business model," says Gary Wentz, Stratolaunch CEO, in a 27 November email. "Moving forward, Stratolaunch has engaged Orbital Sciences Corporation to evaluate and develop alternative solutions with the objective of arriving at a design decision in the early spring timeframe. The other segment contractors will continue to proceed forward in accordance with existing plans since their interfaces have been defined," he adds. Despite the close relations, Stratolaunch's updated designs required "significant structural mods to incorporate a fin/chine configuration," according to Wentz. Initial concepts did not include a chine, which is a structural extension of the wing root along the sides of the vehicle, useful for providing lift at high speeds. According to a source familiar with the matter, the design changes necessary

would have forced SpaceX to make substantial modifications of their manufacturing process, which would effectively negate crucial commonalities with the company's signature Falcon 9 launch vehicle. Web posted. (2012). [Stratolaunch and SpaceX part ways [Online]. Available WWW: <http://www.flightglobal.com/> [2012, November 27].]

November 28: NASA's Mars rover Curiosity marked one year away from Earth Monday (Nov. 26), but the car-size robot's work on the Red Planet is just getting started. Curiosity launched from Florida's Cape Canaveral Air Force Station on Nov. 26, 2011, then endured an eight-month cruise through deep space to the Red Planet. The \$2.5 billion rover touched down on Aug. 5, executing an unprecedented series of maneuvers that saw it lowered to the Martian surface on cables by a rocket-powered sky crane. Since that dramatic landing, Curiosity has driven 1,696 feet (517 meters) and returned more than 23,000 raw images to its handlers here on Earth, NASA officials said. But there's much more to come. Curiosity is just 16 weeks into a two-year prime mission that aims to determine if its Gale Crater landing site can, or ever could, support microbial life. The rover carries 10 different science instruments to help it in this quest, including one called Sample Analysis at Mars, or SAM, which can identify organic compounds — the carbon-containing building blocks of life as we know it. Web posted. (2012). [Mars Rover Curiosity Celebrates 1st Birthday Off Earth [Online]. Available WWW: <http://www.space.com/> [2012, November 28].]

◆ This week and next, all 5,300 sixth-graders in Brevard County will be bused to Kennedy Space Center Visitor Complex on a mission aimed at stoking interest in science, technology, engineering and mathematics (STEM) careers. Herb Yamada, an engaging engineer from Lockheed Martin, is the central figure in a sidesplitting introduction to the principles of aeronautics and astronautics. And there is the Shuttle Launch Experience — the attraction that allows kids to sense an earth-shaking nine-minute flight into orbit. “I want to see how it is to go up into space like the other astronauts,” said Bibiana Dolcin, 11, of MILA Elementary on Merritt Island. Working side-by-side with other classmates, Dolcin put together a prototype of an International Space Station truss. The kids used plastic K’Nex toys to build their small-scale girders, and then tested them on stands with weighted loads. Previous programs focused on science, technology and mathematics, but the K’Nex truss work involved engineering. Students are steeped in both academic and hands-on experience with the engineering process. “The kids really love it,” MILA teacher Sherri Wallauer said. “It’s just really important because we connected what we do with the trusses here (at Space Week) with the trusses on the International Space Station.” More than 60 schools will send sixth-graders to the 10th annual Brevard Space Week. Web posted. (2012). [KSC to kids during Space Week: Aim high [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 28].]

November 29: Researchers from several local companies and universities have won opportunities to fly small payloads aboard the International Space Station. They were among eight winners of the ISS Research Competition sponsored by Space Florida and NanoRacks, announced today at the American Society for Gravitational and Space Research’s meeting this week in New Orleans. The local winners included scientists at Kennedy Space Center-based Cella Energy and CSS-Dynamac, plus Florida Tech, the University of Central Florida and the Sanford-Burnham Medical Institute at Lake Nona. In “NanoLab” boxes provided by NanoRacks, the eight research payloads are expected to be flown to the station’s U.S. National Lab on a SpaceX Falcon 9 rocket and Dragon capsule tentatively scheduled for launch in December 2013. Space Florida, the state aerospace development agency, will cover the transportation cost. Web posted. (2012). [Brevard researchers to fly payloads aboard ISS [Online]. Available WWW: <http://www.floridatoday.com/> [2012, November 29].]

◆ It is a space shuttle orbiter like you've never seen before -- wrapped in a plastic cocoon, perched atop pedestals and tilted at a steep angle -- while construction crews finish building a massive exhibit hall around the spaceship. The site is the Kennedy Space Center Visitor Complex and the star of the new \$100 million, privately-financed attraction is Atlantis. The museum, dedicated to telling the story of the 30-year

shuttle program, is set for a grand opening to the world next July. Now secure atop beefy support columns and rolled at a 43.21-degree angle, the 152,700-pound spacecraft will sit patiently for the next several months while the interior of the facility is decked out with 62 exhibits, many of them hands-on experiences, plus a full-size replica of the Hubble Space Telescope that spans the first and second floors, an International Space Station presentation, a memorial area for remembrance, a small theater and even the gaseous oxygen vent hood taken from the old shuttle launch pad 39B. Atlantis is wrapped with the protective covering to keep dirt and debris off the vehicle while construction continues around her. It will be removed in March and the payload bay doors opened in April, a four-to-five-day process, Macy said, as the 60-foot-long clamshell doors get swung open and then supported with tiny wires dropped from the ceiling above. The open side of the building where the orbiter rolled in now has its skeletal frame in place and should be fully erected by mid-December, allowing the air conditioning system to be started up. A dehumidifier will extract water from the air for reuse flushing the toilets and rainwater collected from the roof will be recycled for irrigation around the complex. What's more, that wall will support a 125 by 40 foot LED television to show Earth's horizon and scenes behind the orbiter as the public walks around Atlantis. The ship arrived aboard a 76-wheel, V12 transporter, trekking 9.8 miles from the Vehicle Assembly Building at KSC's Complex 39 to the Visitor Complex on Nov. 2. Following green lines painted on freshly-laid asphalt, motorized hauler shimmied into the building to park Atlantis in her final resting place. Atlantis flew into space 33 times, traveling 125,935,769 miles and covering 4,848 orbits during 307 days aloft. Web posted. (2012). [Shuttle Atlantis lifted, tilted in museum home [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, November 29].]

November 30: NASA's top administrators, baffled by continued congressional resistance to funding the agency's commercial crew program, this week said supporters should revamp how they advocate for privatized human spaceflight. After the retirement of the space shuttle, NASA is turning to the private sector to supply U.S. crew transportation to the International Space Station. Until a domestic provider becomes operational, NASA has procured astronaut seats on Russian Soyuz vehicles. The commercial crew transportation initiative was announced by the Obama administration in February 2010, but nearly three years later, NASA's top managers are still selling the program's merits to lawmakers. In August, NASA announced Boeing Co., SpaceX and Sierra Nevada Corp. won agreements to receive up to \$1.1 billion through May 2014 to continue designing and testing human-rated commercial rockets and spaceships. NASA expects at least one of the companies will have an operational crew transportation system by 2017. Concerned that NASA was shortchanging other priorities, including the government-owned Space Launch System and Orion exploration programs, Congress declined to appropriate the White House's requested funding for the commercial crew program for the last two years. The space agency is spending less than half the money it said it needed for fiscal year 2013, which began Oct. 1. Congress was unable to pass a federal budget before the last fiscal year's spending package expired, and lawmakers extended funding to NASA and other agencies at fiscal 2012 levels. The continuing resolution runs until March 27 and extends the commercial crew program's \$406 million annual budget for the first six months of fiscal 2013, affecting the rate at which the program can spend money. The Obama administration proposed giving the commercial crew program \$830 million in fiscal 2013. "We are obviously not communicating this well," said Lori Garver, NASA's deputy administrator, who said the agency has had a tough time selling commercial crew transportation and technology development funding on Capitol Hill. "I can't believe we're losing this argument." So far, NASA expects the commercial crew milestones to remain on schedule through the timeframe of the continuing resolution, according to Candrea Thomas, an agency spokesperson. Web posted. (2012). [NASA still making the case for commercial crew [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, November 30].]

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December 3: Workers at the Kennedy Space Center Visitor Complex in Florida shrink-wrapped, lifted and then last week, slowly and carefully tilted the 152,700-pound (69,300 kilograms) retired spacecraft, such that they placed Atlantis at an angle only previously seen when it was in space. The steep angle and raised position was designed to give visitors an eye-level view of Atlantis, as if they were on board the International Space Station (ISS) and the shuttle had just backed away. The illusion will be enhanced by a backdrop of the Earth from space, as will be projected on a 125- by 40-foot (38 by 12 meters) LED screen. Despite the precarious angle, Atlantis is secure in its final orientation. The lift and tilt was achieved using industrial jacks from below, rather than cranes from above. The team practiced before raising the shuttle using a 130,000-pound block of concrete to stand in for the weight of the orbiter. Angling Atlantis was the last of the planned moves for the retired winged spacecraft, which logged 125,935,769 miles (202,673,974 km) while flying 33 times to space, including on NASA's final mission of the 30-year space shuttle program. Earlier this month, Atlantis was delivered to the visitor complex from the nearby Kennedy Space Center and rolled into its new 90,000 square-foot home. Before being raising the full 36 feet (11 m) into the air, Atlantis was shrink-wrapped — from nose to tail — in plastic, to protect it as its exhibition building is completed and more than 60 related displays and artifacts are moved in and positioned around it. Supported by massive steel beams and held in place by the same hardware that kept the shuttle mounted on top of NASA's Shuttle Carrier Aircraft, Atlantis' final resting place has its left wing just 7.5 feet (2.3 m) off the ground. Atlantis' nose sits 26.5 feet (8 m) high. Atlantis will remain wrapped until March, when the plastic will be removed and preparations will begin to open its two 60-foot (18 meter) payload bay doors using a cable and pulley system suspended from the ceiling of the five-story building. In the meantime, work will continue on finishing the facility, including sealing its fourth wall, through which Atlantis entered. Preparations also continue on the building's exterior, which was designed to immerse visitors in the space shuttle's story. Web posted. (2012). [Tilt! Space shuttle Atlantis posed for museum display [Online]. Available WWW: <http://www.nbcnews.com/> [2012, December 3].]

December 5: A new report examining ways to improve NASA's efficiency offers a simple but politically volatile suggestion: Think about downsizing the agency's 10 field centers, including Kennedy Space Center. The report, requested by Congress and released Wednesday by the National Research Council, acknowledges the benefits of spreading facilities around the country, "where they can tap into localized talent." But that decentralized system also makes it harder for NASA to redeploy workers and missions where they make the most sense, the report says. In addition, civil service protections and other constraints complicate broad workforce reductions and disposal of excess property. As a result, NASA has underutilized facilities, significant deferred maintenance and modernization costs, and workforce skill-maintenance issues. Albert Carnesale, who chaired the commission that authored the report, told reporters the panel is not recommending that centers be closed or downsized, partly because they didn't analyze which tasks could be consolidated and who should be doing them. "But we do know if you're tight on resources, that you've got to look at everything," he said. Carnesale noted that NASA spends only about 3 percent of its budget on the aeronautics program yet the four centers established for aeronautics projects employ nearly 25 percent of the agency's workforce. It doesn't mean those workers are unproductive but suggests NASA might not be using them efficiently, he said. The report notes that multiple field centers were established during the early years of the space race for different reasons, including supporting regional economic development and increasing political support for NASA. And that's precisely why it's unlikely any centers would close. Web posted. (2012). [Panel suggests NASA look at downsizing centers [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 5].]

◆ Florida Tech and the International Space University recently agreed to further cooperation between the two institutions, including joint study activities, lectures and student exchanges. The two universities began working together this summer when the ISU Space Studies Program took place in Florida and was hosted by Florida Tech and Kennedy Space Center. "Occasionally one is fortunate enough to develop a relationship that makes both institutions better," said T. Dwayne McCay, Florida Tech's executive vice president and chief operating officer. "The (agreement) we signed extends those opportunities for at least the next five years and, we hope, even longer." The memorandum of understanding was signed in November at ISU in Strasbourg, France. Web posted. (2012). [Florida Tech, space university agree to continued partnership [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 5].]

◆ SpaceX has been awarded its first two Evolved Expendable Launch Vehicle (EELV)-class missions. The Air Force Space and Missile Systems Center will use SpaceX Falcon rockets in 2014 and 2015 to launch DSCOVR (Deep Space Climate Observatory) and STP-2 (Space Test Program 2). The DSCOVR mission will be launched aboard a Falcon 9 in late 2014, while STP-2 will be launched aboard the Falcon Heavy in mid-2015. Both will launch from Space Launch Complex 40 at Cape Canaveral Air Force Station. The Air Force contract is designed to bring new entrants to the EELV program. Web posted. (2012). [SpaceX awarded Air Force launch contracts [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 5].]

December 6: Fly you to the moon? That's what a company launched by several ex-NASA executives would like to do — for the right price. The Golden Spike Company bills itself as the first private venture planning to offer routine exploration expeditions to the lunar surface. It joins a growing roster of commercial entries, such as SpaceX, Moon Express and Virgin Galactic, that are developing spacecraft capable of traveling beyond the Earth's atmosphere. The firm is the brainchild of former NASA science chief Alan Stern and Gerry Griffin, a former Apollo flight director and former director of NASA Johnson Space Center. They hope to start launching the flights by the end of the decade, assuming financial backing and sufficient advance ticket sales. Griffin, who also served as deputy director of Kennedy Space Center, said the technical know-how to explore space has grown so widespread over recent years that it's spawned a slew of private-sector start-ups, including Golden Spike, that wouldn't have existed a decade ago. "We're in the midst of a historic era in commercial space flight," he said during a news conference at the National Press Club on Thursday to unveil the company's plans. He said Golden Spike will help customers achieve objectives "based around science, business, national prestige and personal accomplishment." Golden Spike will market trips to "nations, individuals, and corporations with lunar exploration objectives and ambitions." It expects to do its first lunar mission at a cost of about \$7 billion and pay for expenses by charging for transport and selling naming rights, among other creative methods, Stern said. But the company still needs financial backers. Web posted. (2012). [Golden Spike Company promises lunar visits in this decade [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 6].]

◆ Air Force and United Launch Alliance officials will meet today hoping to confirm plans for a Tuesday afternoon launch of a secret military space plane from Cape Canaveral. The Air Force's 45th Space Wing said in a news release Thursday that launch of the X-37B Orbital Test Vehicle atop an Atlas V rocket was scheduled for a five-hour window between 1:03 p.m. and 6:03 p.m. Tuesday. The launch follows weeks of investigation into an upper-stage engine problem during ULA's Oct. 4 launch of a GPS satellite on a Delta IV rocket. Next week's launch from Cape Canaveral Air Force Station would be the third by an unmanned OTV, which resembles a miniature space shuttle measuring 29 feet long and 15 feet wide. The Air Force says its two OTV spacecraft are testing advanced guidance, navigation and control systems. They are also a rapid-turnaround technology demonstrator. Officials have said that the spacecraft launching next week, making its second voyage, could land on Kennedy Space Center's runway. The first

two missions touched down in California. Web posted. (2012). [Military's secret X-37B Orbital Test Vehicle awaits OK [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 6].]

December 7: United Space Alliance today bids goodbye to 119 Kennedy Space Center employees in its latest round of layoffs. NASA's lead shuttle contractor, a joint venture between The Boeing Co. and Lockheed Martin Corp., is continuing a multi-year downsizing as closeout of the shuttle program nears completion. Today's cuts will drop the Houston-based USA's Florida headcount to slightly more than 900 employees. Another 129 are slated to leave Jan. 4. All laid-off employees have been eligible for severance packages and help finding new jobs. Web posted. (2012). [119 KSC United Space Alliance workers lose jobs today [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 7].]

◆ United Launch Alliance (ULA) said a fuel leak was behind a performance issue with a Delta 4 rocket's upper-stage during an Oct. 4 launch but that the hiccup should not affect similar hardware aboard the Atlas 5 rocket now being prepped to launch a U.S. Air Force space plane Dec. 11. The launch of the X-37B space plane from Cape Canaveral Air Force Station, Fla., had been scheduled for Oct. 25 but was delayed to allow ULA and the Air Force to investigate the earlier anomaly. The space plane's mission is classified. The fuel leak, in the interior of the thrust chamber of the Delta 4's Pratt & Whitney-built RL-10 engine, occurred during the successful launch of a GPS satellite from Florida. It started during the first engine start sequence of the launch, ULA said in a Dec. 7 press release. The Atlas 5 slated to launch the X-37B space plane, or Orbital Test Vehicle (OTV), uses a different variant of the RL-10 engine. ULA spokeswoman Jessica Rye said company inspectors at the Cape performed extra work ahead of a Dec. 7 launch readiness review to make sure the Atlas 5 was not at risk of having the same issue. "What we're doing is looking at [the Atlas 5's] upper engine, doing borescope inspections and making sure at this point about that engine, that one in particular," Rye said. "Typically, we would not do that type of inspection, but it's something that we can do if we want to get a better look at the engine." ULA said its investigation into the Oct. 4 anomaly continues. However, "all credible crossover implications from the Delta anomaly for the OTV-3 Atlas vehicle and engine system have been thoroughly addressed and mitigated, culminating in the flight clearance decision for the OTV-3 launch," the company said. The Boeing-built X-37B scheduled to launch Dec. 11 has flown in space once before, logging 225 days in orbit following its April 22, 2010, launch. Another X-37B returned to Earth in June after 469 days in space. The next spacecraft slated to fly on a Delta 4 is the Wideband Global Satcom 5, a military communications satellite that will launch from Cape Canaveral. Due to the ongoing ULA and Air Force investigations, there is no launch date for that mission, which had been scheduled for early 2013. Web posted. (2012). [Leak cited in Delta 4 Anomaly; X-37B Is Cleared to Launch [Online]. Available WWW: <http://www.spacenews.com/> [2012, December 7].]

December 8: The early forecast is iffy for the planned 1:03 p.m. Tuesday launch of a secret military min-shuttle from Cape Canaveral atop an Atlas V rocket. Air Force meteorologists predict there's a 40 percent chance of favorable weather during a five-hour launch window. An approaching cold front is likely to produce chances of lightning, cumulus and thick clouds and disturbed weather. The odds are the same if the launch slips to Wednesday. The Air Force is attempting to launch an unmanned X-37B Orbital Test Vehicle for the third time. United Launch Alliance on Friday confirmed the rocket's readiness for launch. While an investigation continues into an upper-stage engine glitch during an October Delta IV rocket flight, officials are confident they have addressed "all credible crossover implications" for the Atlas V, which uses a similar engine. Web posted. (2012). [Weather iffy for Tuesday's planned mini-shuttle launch [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 8].]

December 11: A classified military space plane blasted off into orbit Tuesday (Dec. 11) on the third mission of the U.S. Air Force's X-37B program. The X-37B vehicle, also called Orbital Test Vehicle-3, or OTV-3, launched atop an Atlas 5 rocket from Florida's Cape Canaveral Air Force Station (CCAFS) at

1:03 p.m. EST (1803 GMT). The Air Force has been secretive about the details of the space plane's mission and its classified payload, which sits in a payload bay about the size of a pickup truck bed. Experts have suggested the vehicle could be used for materials science, space surveillance, imaging and reconnaissance. The mission is being managed by the Air Force Rapid Capabilities Office. Web posted. (2012). [Classified Air Force Space Plane Launches on Secret Mission [Online]. Available WWW: <http://www.space.com/> [2012, December 11].]

December 12: NASA has awarded contracts to Boeing Co., SpaceX and Sierra Nevada Corp. to begin the process of ensuring commercial crew spacecraft meet the space agency's stringent safety standards for human spaceflight. The contracts open the next phase of NASA's commercial crew program. NASA expects the two-step certification strategy to last up to four years, culminating in test flights to the International Space Station by 2017. Each company will receive about \$10 million. The contract period begins Jan. 22 and runs through May 2014. "I congratulate the three companies for their selection," said Ed Mango, commercial crew program manager at NASA's Kennedy Space Center in Florida. "This is the program's first major, fixed-price contract. The effort will bring space system designs within NASA's safety and performance expectations for future flights to the International Space Station." Boeing, SpaceX and Sierra Nevada won federal investments in August to continue designing, building and testing vehicles to carry astronauts to the International Space Station. After the space shuttle's retirement, NASA is turning to privately-owned, government-supported transport systems for low Earth orbit. The Space Act Agreements have a combined value worth up to \$1.1 billion. Like the certification contracts, the development deals run through May 2014. Boeing is developing the seven-person CST-100 crew capsule, SpaceX is upgrading its Dragon cargo spacecraft for human passengers, and Sierra Nevada is working on the Dream Chaser, a lifting body spacecraft designed to land on a runway. Web posted. (2012). [NASA kicks off commercial crew certification process [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, December 12].]

◆ Space Exploration Technologies Corp. (SpaceX) has discovered the root cause of a premature engine shutdown during the company's first paid cargo flight to the international space station in October, but the Hawthorne, Calif., rocket and spacecraft maker is not ready to make the results of its months-long investigation public, a company executive said. "We're doing one of the final out briefs on the most probable cause for the engine issue with [NASA's international space station program manager, Michael Suffredini] later this week," SpaceX President Gwynne Shotwell said Dec. 11 at a Washington Space Business Roundtable luncheon here. "We're not going to release what we found but I think we've got a good most probable cause identified. The data supports that." One of the nine first-stage engines on SpaceX's Falcon 9 rocket shut down prematurely 79 seconds after liftoff Oct. 7 at the start of an otherwise successful space station cargo run. The only publicly released details about the engine failure so far come from a statement SpaceX put out the day after the launch, which boosted the company's Dragon cargo capsule toward the station. "We know the engine did not explode because we continued to receive data from it," SpaceX said in an Oct. 8 press release. "Our review indicates that the fairing that protects the engine from aerodynamic loads ruptured due to the engine pressure release, and that none of Falcon 9's other eight engines were impacted by this event." SpaceX has at least seven launches on the manifest for 2013, including the debut of the Falcon Heavy from the company's new West Coast launch pad at Vandenberg Air Force Base, Calif. The first NASA mission in which a Falcon 9 with Merlin 1D engines will be used is a space station cargo run now scheduled for July, according to an internal NASA manifest. Before that mission, which would be SpaceX's third for NASA under a \$1.6 billion Commercial Resupply Services contract awarded in 2008, the company plans to launch three commercial payloads with the upgraded Falcon 9. However, Shotwell said, there is no contractual requirement for SpaceX to test the upgraded Falcon 9 before using it to resupply the space station. Web posted. (2012). [SpaceX Discovers Cause of October Falcon 9 Engine Failure [Online]. Available WWW: <http://www.spacenews.com/> [2012, December 12].]

December 13: Federal scientific agencies stand to lose thousands of jobs from sequestration, an industry report predicted Thursday. The Aerospace Industries Association, a trade group for government contractors, found in its study that the automatic cuts set to take effect on Jan. 2, 2013, unless there is a deficit reduction deal would cost 20,500 NASA contractors their jobs in 2013, while the National Oceanographic and Atmospheric Administration could shed more than 2,500, largely in satellite building and operation. AIA based its estimates on the Office of Management and Budget's guidelines that sequestration would slash both agencies' budgets by 8.2 percent. "Such a deep and reckless cut to these agencies would senselessly jeopardize U.S. space leadership and stifle exactly the kind of investment in innovation that our economy needs," the group wrote in its report. AIA speculated that because the 2010 NASA Authorization Act prohibits any cuts to its federal workforce through fiscal year 2013, all the jobs the agency losses would come from the private sector contractors. NASA did not rule out the potential for non-civil servant job loss, saying that while it has begun preliminary discussions to plan for sequestration, it does not believe the cuts will ultimately take place. Web posted. (2012). [Study: Thousands would lose jobs from NASA, NOAA budget cuts [Online]. Available WWW: <http://www.govexec.com/> [2012, December 13].]

◆ It probably won't be able to fuel Doc Brown's flux capacitor on his DeLorean time machine, but NASA researchers are hoping a new device that will be tested on the International Space Station can turn trash into power. The Trash to Gas Reactor is a miniature version of large waste incineration facilities on Earth that generate electricity or fuel. This could help with the accumulating trash on the ISS and be used on future missions beyond Earth orbit, as well as help the trash problem in areas of the world where there are neither large power plants nor garbage processing facilities. The prototype of the Trash to Gas Reactor is a meter-long (3 foot-long) device that looks strikingly similar to the "Mr. Fusion" reactor in the second "Back to the Future" movie. Just like Doc Brown and Marty, astronauts can throw in things like food wrappers, used clothing, food scraps, tape, packaging and other garbage accumulated by the crew and the reactor will turn it into potential power, such as methane gas, or even oxygen or water. The team developing the reactor is hoping to have their prototype ready to fly on the ISS by 2018. A team led by Paul Hintze at the Kennedy Space Center has built an 80-pound small reactor to test theories about incinerating a variety of trash ranging from used clothes to uneaten food. The reactor holds more than three quarts of material and burns at about 1,000 degrees F, about twice the maximum temperature of an average household oven. It's expected to take astronauts four hours to burn a day's worth of trash from a crew of four. The team estimates that during the course of a year in space – one half the length of time a mission to Mars is expected to take – trash processing for a crew of four would create about 2,200 pounds of methane fuel, enough to power a launch from the lunar surface, Hintze said. Web posted. (2012). [NASA's Version of Mr. Fusion [Online]. Available WWW: <http://www.universetoday.com/> [2012, December 13].]

December 14: The Obama administration is seeking \$60.4 billion in federal aid for Hurricane Sandy relief efforts, which would include repairs at the National Air and Space Museum and NASA's launch facilities on the East Coast. The White House's requests were outlined in a letter sent late last week to congressional leaders from Jeff Zeints, director of the Office of Management and Budget. The bulk of the proposed aid money would go toward efforts to repair homes and public infrastructure ravaged by the record-breaking superstorm and infuse cash into efforts to prepare for future storms. But the White House also asked for \$4 million to allow NASA to fix eroded dunes and berms that protect launch sites at the Wallops Flight Facility in Virginia and the Kennedy Space Center in Florida. Under the plan, another \$2 million would go to the Smithsonian to help the institution fix roof damage at its network of museums in the Washington, D.C., area, including the National Museum of Natural History, National Museum of American History, National Air and Space Museum and National Zoo. But all that rides on approval from Congress. The Senate is to begin debating its own version of the package Monday afternoon. That proposal matches the White House's requested \$60.4 billion, although it would make available \$15 million for repairs at NASA facilities through 2018, according to a senate summary of the bill. Web

posted. (2012). [Proposed Sandy Aid Package Would Help NASA, Smithsonian [Online]. Available WWW: <http://www.space.com/> [2012, December 14].]

December 16: The United Space Alliance sign on its Cape Canaveral building came down over the weekend, becoming yet another local symbolic event marking the end of the U.S. Space Shuttle program. The NASA contractor has recently undergone several rounds of layoffs, including announced layoffs of over 100 employees at Kennedy Space Center to take place this month through January, and 148 employees last September, according to documents filed with the Florida Department of Economic Opportunity. Similar to the end of the Apollo program, the end of the shuttle program has had a devastating economic impact on Florida's Space Coast which now has the highest foreclosure rate in the U.S. Web posted. (2012). [United Space Alliance Sign Comes Down [Online]. Available WWW: <http://www.space.brevardtimes.com/> [2012, December 14.]

December 17: After a Taurus XL launch vehicle failed to loft the Orbiting Carbon Observatory (OCO) in February 2009, NASA used another Taurus XL to launch the Glory climate-monitoring spacecraft despite a recommendation from its own engineering safety office to ground the Orbital Sciences Corp. rocket until key components could be requalified. The agency accepted a risk of a similar mishap on the March 2011 launch attempt that was calculated as high as 50%, a gamble that resulted in the loss of the \$424 million mission when the vehicle's payload shroud once again failed to open and pulled the satellite into the ocean off Antarctica. Since then, NASA has decided against using a Taurus XL to launch the replacement OCO-2 mission. Other Orbital vehicles, including the air-launched Pegasus and a new Antares rocket, use a version of the same fairing separation system that is most likely responsible for the combined \$700 million loss of two key climate-study satellites. Orbital's original name for Antares was Taurus II. Web posted. (2012). [NASA Launched Glory Despite Open Component Questions [Online]. Available WWW: <http://www.aviationweek.com/> [2012, December 17.]

◆ Santa and Mrs. Claus have stopped by the Kennedy Space Center Visitor Complex located in Florida. This marks the second year that the duo have used hypergolic-fueled reindeer to travel from the North Pole to the new home of space shuttle *Atlantis*. The operators of the Visitor Complex, Delaware North Parks & Companies, invited Mr. and Mrs. Claus to greet guests and to host "Holidays in Space," which includes a broad array of events and activities honoring this festive time of year. The event began this year on November 23 and will last through January 1. Web posted. (2012). [Kennedy Space Center Celebrates 'Holidays in Space' [Online]. Available WWW: <http://www.americaspace.com/> [2012, December 17.]

December 18: NASA on Monday awarded a contract worth up to \$1.4 billion over nearly 10 years to manage the ground systems and facilities that will be needed to launch astronauts on exploration missions from Kennedy Space Center. Jacobs Technology of Tullahoma, Tenn., won the Test and Operations Support Contract, or TOSC, which essentially replaces United Space Alliance's contract to operate the space shuttle fleet, which NASA retired from flight last year. The work will include activities such as assembling NASA's planned heavy-lift Space Launch System rocket and mating it with an Orion crew capsule inside the Vehicle Assembly Building, mounting the vehicles on a mobile launcher and rolling them out to pad 39B for launch. NASA is targeting a 2017 test flight of the rocket without a crew, and a 2021 launch with a crew. Maintenance of facilities such as a VAB high bay, the launch pad, a crawler-transporter and mobile launcher are included in the work. The contract also replaces one held by The Boeing Co. to prepare payloads for launch to the International Space Station. The ISS cargo will be prepared for launch on commercial or international partner vehicles. Some work may also be performed for NASA's KSC-based Launch Services Program, which procures expendable rockets for launches of science satellites from Cape Canaveral Air Force Station and other sites. USA, which has laid off more than 4,000 KSC shuttle workers in recent years, did not bid on the contract. NASA did not immediately

name other finalists. Web posted. (2012). [Tenn. Company lands NASA contract [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 18.]

◆ The next addition to NASA's constellation of Tracking and Data Relay Satellites has arrived at the Kennedy Space Center, landing this morning aboard a military transport aircraft after a cross-country ride inside a shipping container from Boeing's factory in Los Angeles. Dubbed TDRS K, this latest spacecraft for the agency's global communications infrastructure is scheduled for launch atop an Atlas 5 rocket from Cape Canaveral's Complex 41 on Jan. 29. Today's arrival, touching down at the Shuttle Landing Facility at 8:29 a.m. EST in the Air Force C-17, kicks off the launch campaign for the satellite, which will include final testing, the loading of maneuvering propellant and encapsulation within the rocket's nose cone. Those activities will be performed in the spacecraft preparation facilities at the commercial Astrotech campus in Titusville over the next month. Once packed within the Atlas shroud, TDRS K will be hauled across the river to the rocket's assembly hangar Jan. 17 for mounting atop the booster. Stacking of the Atlas at the Vertical Integration Facility aboard a mobile launch platform begins with the first stage's erection on Jan. 3. After putting the interstage in place, the Centaur upper stage gets hoisted on Jan. 4. Web posted. (2012). [NASA's TDRS K shipped to the Cape for Jan. 29 launch [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, December 18.]

December 19: United Space Alliance (USA), the Boeing-Lockheed Martin joint venture established to operate and maintain NASA's now-retired space shuttle fleet, has shut down its Washington lobbying operation, a company spokeswoman said. In a Dec. 18 email, USA spokeswoman Tracy Yates confirmed the early December departure of Meghan Allen, who last year succeeded Kate Kronmiller as the company's vice president of government affairs. "The USA Government Affairs position in Washington has been eliminated," Yates said. "USA does not have a Washington, D.C. lobbying operation." There were only about 2,500 people working for USA as of July 31, down from as many as 11,000 in 2005, when the shuttle program was still going strong. The Houston based company still holds several government contracts, which are keeping what remains of its workforce busy in Florida and Texas. Web posted. (2012). [USA Shuttters Washington Office [Online]. Available WWW: <http://www.spacenews.com/> [2012, December 19.]

◆ The Kennedy Space Center Visitor Complex has a new, temporary ticket deal: One child, age 11 and younger) gets in free with one paid adult admission. The offer is valid through Jan. 7. Now through Jan. 7, 2013 at Kennedy Space Center Visitor Complex children under 11 are free with a paid adult ticket. Web posted. (2012). [Kids free at Kennedy Space Center Visitor Complex until Jan. 7 [Online]. Available WWW: <http://www.orlandosentinel.com/> [2012, December 19.]

December 20: LDCM [Landsat Data Continuity Mission] was shipped to Vandenberg assembled and nearly ready to fly. A Comprehensive Performance Test will be performed on Dec. 27, followed by the loading of maneuvering fuel on Jan. 3. Cleaning of the satellite will be completed before final inspections on Jan. 6 and closeouts on Jan. 11. The two halves of the rocket's nose cone will be brought together to encapsulate the spacecraft on Jan. 23 in preparation for delivery of the payload to the Space Launch Complex 3-East pad on Jan. 25. The United Launch Alliance Atlas 5 rocket has been on the pad since October, undergoing its own set of pre-flight checkouts. This will be NASA's first California launch of the Atlas 5. Liftoff is planned for Feb. 11 at 10:04 a.m. local time (1:04 p.m. EST; 1804 GMT). The day's launch window extends 44 minutes to 10:48 a.m. local. Web posted. (2012). [Next Landsat shipped to Vandenberg for launch [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, December 20.]

◆ The KSC Visitor Complex is looking for help naming the new home of space shuttle Atlantis. Current and former KSC employees can submit a name that will be an icon of the KSC Visitor Complex for

decades to come. The name should evoke a powerful emotion and create a sense of must see; represent the legacy of the Space Shuttle Program; appeal to all ages, particularly children and families; sound exciting and interactive, as well as easy to use and remember; and motivate people to visit Kennedy Space Center and see Atlantis. Submissions for suggested names are being accepted now through 5 p.m. Friday, Dec. 28. E-mail distribution. (2012). [KSC Daily News Re: "Orbiter Home Naming Contest" [Electronic]. December 20, 2012.]

December 21: A 38-year-old woman who handles public affairs for NASA faces charges she faked driving permits to cover up her DUI-related driver license suspensions, federal and state investigators report. She was charged with five third-degree felony counts of forgery involving public records after agents from the Inspector General's office raised questions in October over whether she misrepresented her driving status by presenting falsified temporary driving permits made on a home computer, records show. Investigators said she used the counterfeit permits to use government-owned vehicles to drive media representatives on Kennedy Space Center grounds. The civil servant was arrested by Brevard County sheriff's investigators at Kennedy Space Center on Thursday and was back at work today. Web posted. (2012). [NASA public affairs employee arrested on forgery charge [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 21.]

December 27: Tourists coming to America's spaceport at the Kennedy Space Center Visitor Complex are being greeted by a modernized entrance, a facelift officially unveiled Thursday as part of the park's expansion in the coming years. Privately run by Delaware North Companies Parks & Resorts, the KSCVC is the public's gateway into the Kennedy Space Center, where men launched to the moon and all 135 space shuttle missions originated. Now, the museum is in the midst of a makeover that will see the shuttle Atlantis attraction open next July, the Astronaut Hall of Fame relocate to the main KSCVC campus from its original location across the river, renovations made to the eateries and gift shops and the bus tour loading dock that shuttles the public into operational areas of the space center spruced up for boarding guests. "We are self-funded," said Bill Moore, chief operating officer of the Kennedy Space Center Visitor Complex, who added that a portion of revenue generated by guests is reinvested to make the upgrades. The new entry plaza, replacing the design of yesteryear, features a three-dimensional NASA "meatball" logo and a 75-foot-long, 30-foot-high, 5,000-gallon blue-granite water fountain with an etching of former President John F. Kennedy and his words from the immortal 1962 "moon speech" that launched mankind's quest to land astronauts on the lunar surface. There's also new ticket stations, self-service admission kiosks and turnstiles to bring tourists into the park. A new 2,500-square-foot gift shop has been built outside the turnstiles, allowing customers to purchase space items without having to enter the complex. In all, KSCVC has spent \$16 million on the entrance area, which leads into the Rocket Garden, where launchers of the past stand on display. There's even a full-scale replica of the Mercury-Atlas booster, complete with the capsule markings of Friendship 7 that took John Glenn into orbit nearly 51 years ago. Lining the sidewalks are trails with embedded Tennessee River rocks, the same material that coats the "crawlerway" connecting the Vehicle Assembly Building and twin launch pads at Complex 39. The park now "flows" from west to east, taking guests from the Rocket Garden, through the center section where the IMAX theaters are located and eventually culminating with the Atlantis exhibit and the Shuttle Launch Experience thrill ride. The old design had the entrance positioned in the middle of the park. With the entrance now rejuvenated, KSCVC is preparing to open its star attraction in July -- the permanent home for the retired space shuttle orbiter Atlantis. Web posted. (2012). [KSC museum gets makeover ahead of Atlantis opening [Online]. Available WWW: <http://www.spaceflightnow.com/> [2012, December 27.]

◆ A billionaire-backed commercial space venture unveiled with fanfare a year ago has undergone a major change but continues to eye Kennedy Space Center as its eventual base of operations as it moves toward a 2017 test launch. Stratolaunch Systems, funded by Microsoft co-founder Paul Allen, is

developing the world's largest aircraft -- boasting a wingspan longer than a football field -- to carry rockets that would launch satellites from the sky and, possibly someday, people. The company and SpaceX recently ended their partnership after SpaceX, which was to contribute a smaller version of its Falcon 9 rocket to the project, determined changes to its production lines would be too disruptive. Stratolaunch is now studying rocket designs with Orbital Sciences Corp., and CEO Gary Wentz said the company is targeting a 2017 test launch from KSC, where a hangar and integration facilities would likely be built near the former space shuttle runway. "That is our current thinking, yes, that we intend to come there," said Wentz, a University of Central Florida graduate. He began his career at KSC before moving to NASA's Marshall Space Flight Center in Huntsville, Ala., where Stratolaunch is headquartered. "We'd like to conduct a demo mission from the Cape, so all the planning that we're doing right now would focus that effort there at Kennedy." Kennedy's wide, three-mile runway and distance from population centers are good fits for Stratolaunch's early flight operations, though other locations may be considered, Wentz said. Stratolaunch, which was publicly introduced in December 2011, hopes to provide lower-cost launches by freeing itself from ground-based range infrastructure and weather restrictions and enabling quicker flight turnarounds. Web posted. (2012). [Despite shift, KSC's in Stratolaunch's sight for 2017 [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 27.]

◆ They typically winter no farther south than New Jersey. Maybe Hurricane Sandy steered them off course or disrupted their usual diet of schooling fish. Biologists aren't sure why razorbills, penguin-like birds, have flocked to the Space Coast and elsewhere in Florida. The black birds with white underbellies flapped their way to Kennedy Space Center, where Audubon members spotted a few recently during their annual Christmas Bird Count. "Everybody's talking about it," said Ned Steel, who coordinates the Audubon count on Merritt Island, which includes the secure area of the space center. Blogging birders have dubbed it a "razorbill invasion of Florida," posting their photos as proof on a Google pin map. Before this year, there had been only 17 sightings of razorbills reported to Florida's bird surveillance program, state wildlife officials said. During this month's local Audubon counts, participants identified two razorbills at the Merritt Island National Wildlife Refuge, the first time the species had been spotted there in more than 40 years, Steel said. Another Audubon count this month in Cocoa spotted one of the birds for the first time in more than 60 years. The International Union for Conservation of Nature includes razorbills on its annual list of threatened species, labeling them as of "least concern," among the less serious of several categories of endangerment. Web posted. (2012). [Penguin-like bird pops up in Brevard [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 27.]

December 28: After years of rising costs, the U.S. Air Force will change the way it purchases space launches for the U.S. Government. A memo, made public earlier this month, from Department of Defense acquisition chief Frank Kendall, reportedly supports two approaches to purchasing space launches in an affordable way. The government will pursue a block buy of 36 cores from experienced rocket builder United Launch Alliance, and will open 14 launches to competitive bids. ULA's Delta IV and Atlas V rockets, known as evolved expendable launch vehicles, have a remarkable record of success since their development in the late 1990s. The company has a monopoly on large government launches. However, Boeing and Lockheed Martin merged to create ULA in 2006 and could not compete with Russian and European competitors for commercial launches. The new approach will put more pressure on ULA to compete for commercial launches. Web posted. (2012). [Air Force revises launch purchases [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 28.]

December 30: After assisting in the dramatic deliveries of four orbiters to museums across the country, Kennedy Space Center is close to completing a massive but otherwise unglamorous mission: shutting down the shuttle program. Over 30 years of flight, the program occupied more than 270 facilities at KSC — from small sheds to the giant Vehicle Assembly Building — and accumulated hundreds of thousands of pieces of property, all of which must find new owners or be thrown away. On a recent morning,

roughly 20 large cardboard boxes provided a sample of what's left. In box No. 122921, an electric typewriter topped a pile of dusty television sets. Others held scrap metal, pipes, tote trays, foam mats and signs. "It's not the glory stuff," said George Jacobs, manager of KSC's shuttle closeout effort. "It's the PVC pipes, it's the old TVs. It's everything we needed to do our job to fly the shuttle." That job ended in July 2011 when Atlantis returned from the International Space Station on the 135th and final mission. KSC teams shifted their focus to preparing three space-flown orbiters for public display and transportation to their new homes. Each journey — from Discovery's piggyback flight to the Smithsonian Institution outside Washington D.C. to Endeavour's trip through the streets of Los Angeles — drew throngs of onlookers who stopped cars and gathered on rooftops for a chance to "spot the shuttle." No one is watching now. "All the fun stuff that's very visible had been done, and now it's all the stuff that no one really wants to do," said Dorothy Rasco, head of NASA's Shuttle Transition and Retirement program, or "T&R," at Johnson Space Center in Houston. Across NASA, the initiative began with a million line items of property worth \$18 billion (including the orbiters), Rasco said, and a team comprised of about 200 civil servants and 1,000 contractors. Just 150,000 of those line items remain, the majority of which will be transferred to KSC's new contractor for ground systems operations, Jacobs Technology. By January, the Transition and Retirement team will have shrunk to about 20 civil servants and 200 contractors. By next month at KSC, the last facilities will be "safed" of hazardous materials and turned over to the center. They include the VAB, Orbiter Processing Facility-2 — the last of three orbiter hangars to be cleared out — a tile shop, logistics warehouse and a solid rocket booster facility at Cape Canaveral Air Force Station. The center will decide what to reuse or, in some cases, to demolish. By late March, months ahead of schedule, the work will be done for all but a few people. The shuttle shutdown will have cost \$400 million, not including another \$500 million in pension payments to lead shuttle contractor United Space Alliance. NASA needed some components and facilities for future programs. The heavy-lift Space Launch System rocket, for example, plans to fly initially with shuttle main engines and shuttle-derived solid rocket boosters. It will be processed in a VAB high bay, carried by a crawler-transporter and launched from pad 39B, all former shuttle infrastructure. If NASA didn't need the property, it was made available to federal agencies or other potential owners through the General Services Administration. The Navy, for example, snagged landing aids from the shuttle runway. A partnership with the state transitioned an orbiter hangar to The Boeing Co. as a manufacturing site for commercial crew capsules. During Transition and Retirement, an average of 6,000 items a month were moved to KSC's excess property site on Ransom Road for pickup by new owners or disposal, up from 1,600 during normal operations. "This is not rocket science," said Jacobs, a shuttle engineer and manager since 1987. "We're getting rid of stuff." That's harder than it sounds. Careful thought has been given to whether items should be tossed or kept for future programs, and there's always concern about making mistakes. The process can be fraught with emotion as specialized, sometimes expensive pieces of equipment are labeled obsolete. Near the boxed items inside Orbiter Processing Facility-2, a metal-and-Plexiglas frame rested on the floor. It used to protect an orbiter's nose. Red plastic shells, neatly stacked on a pallet, once fitted together to guard lines in the orbiter's aft section from dings while workers were inside. A silver, refrigerator-sized machine equipped with dials and hoses measured pressure in the small gaps between shuttle cockpit windowpanes, a test that won't be performed again. And then there was an apparent keeper: one sealed wooden box was labeled as holding an unidentified "Critical Space Item." Crews found Apollo-era consoles in a VAB room, evidence of that program's less orderly shutdown in the early 1970s. Someone found a book that pitched the early shuttle concept to Congress, promising a 96-hour turnaround between flights — considerably faster than the five-month reality. A roped-off section of the VAB's cavernous center transfer aisle serves as another staging area for excess items. Recently, rows of tall file cabinets and shelves stood in front of a wall-mounted diagram titled "VAB Space Shuttle Processing Flow." Contractor layoffs have followed each orbiter delivery, each facility closeout that brought the job nearer to its end. USA cut another 119 local employees on Dec. 7, and plans to cut hundreds more positions by next spring. NASA's civil servant team is dispersing to other assignments. Brewer will stay on, one of the very last KSC employees linked to the shuttle program. "We'll turn off the

lights, I guess,” she said. Web posted. (2012). [Making way for the future at Kennedy Space Center [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 30.]

December 31: The U.S. House of Representatives on Monday passed a bill that would rename NASA's aeronautics facility at Edwards Air Force Base in California after Neil Armstrong, the first man to set foot on the moon. One of the most famous men of the 20th century, Armstrong was born August 5, 1930 in Wapakoneta, Ohio. He was a naval aviator in the Korean War, flew the X-15, served as command pilot for Gemini 8 in 1966 and led Apollo 11 in 1969. Under the House bill sponsored by Rep. Kevin McCarthy, NASA's Hugh L. Dryden Flight Research Center in Edwards, California, would be redesignated as the Neil A. Armstrong Flight Research Center. The House passed the measure 404-0. But the Senate has to act before the renaming moves forward. Web posted. (2012). [House passes bill to rename NASA facility for Armstrong [Online]. Available WWW: <http://www.floridatoday.com/> [2012, December 31.]

APPENDIX A

SPACE SHUTTLE ORBITERS DEPARTURES

Discovery OV-103

<i>Ferry flight departure</i>	April 17, 2012 Shuttle Landing Facility, KSC
<i>Ferry flight arrival</i>	April 17, 2012 Dulles International Airport, Washington D.C.
<i>Overland transport</i>	April 19, 2012 Smithsonian National Air & Space Museum, Steven F. Udvar Hazy Center, Chantilly, Virginia
<i>Museum installation</i>	April 19, 2012 James S. McDonnell Space Hangar

Endeavour OV-105

<i>Ferry flight departure</i>	September 19, 2012 Shuttle Landing Facility, KSC
<i>Ferry flight stopover</i>	September 19-20, 2012 Ellington Field, Houston, Texas
<i>Ferry flight refueling stop</i>	September 20, 2012 Biggs Army Airfield, El Paso, Texas
<i>Ferry flight stopover</i>	September 20, 2012 Edwards Air Force Base, California
<i>Ferry flight arrival</i>	September 21, 2012 Los Angeles International Airport, Los Angeles, California
<i>Overland transport</i>	October 13-14, 2012 California Science Center, Los Angeles, California
<i>Museum installation</i>	October 14, 2012 Samuel Oschin Space Shuttle Endeavour Display Pavilion

Atlantis OV-104

<i>Overland transport</i>	November 2, 2012 Vehicle Assembly Building, KSC
<i>Transport stopover</i>	November 2, 2012 Space Exploration Park
<i>Museum installation</i>	November 2, 2012 Kennedy Space Center Visitor Complex, Florida

APPENDIX B

2012 MAJOR NASA LAUNCHES

<i>Spacecraft:</i>	<i>NuSTAR [Nuclear Spectroscopic Telescope Array]</i>
<i>Launch Vehicle:</i>	Pegasus
<i>Launch Site:</i>	Kwajalein Atoll
<i>Launch Date:</i>	June 13, 2012

<i>Spacecraft:</i>	<i>RBSP [Radiation Belt Storm Probes]</i>
<i>Launch Vehicle:</i>	Atlas V
<i>Launch Site:</i>	Cape Canaveral Air Force Station
<i>Launch Date:</i>	August 30, 2012

APPENDIX C

2012 MAJOR LAUNCHES CAPE CANAVERAL

Spacecraft:	WGS-4
Launch Vehicle:	Delta 4
Launch Site:	Cape Canaveral AFS, Complex 37B
Launch Date:	January 20, 2012
Spacecraft:	MUOS
Launch Vehicle:	Atlas 5
Launch Site:	Cape Canaveral AFS, Complex 41
Launch Date:	February 24, 2012
Spacecraft:	AEHF-2
Launch Vehicle:	Atlas 5
Launch Site:	Cape Canaveral AFS, Complex 41
Launch Date:	May 4, 2012
Spacecraft:	NRO
Launch Vehicle:	Atlas 5
Launch Site:	Cape Canaveral AFS, Complex 41
Launch Date:	June 20, 2012
Spacecraft:	NRO
Launch Vehicle:	Delta 4
Launch Site:	Cape Canaveral AFS, Complex 37B
Launch Date:	June 29, 2012
Spacecraft:	GPS
Launch Vehicle:	Delta 4
Launch Site:	Cape Canaveral AFS, Complex 37B
Launch Date:	October 4, 2012
Spacecraft:	X-37B Orbital Test Vehicle
Launch Vehicle:	Atlas 5
Launch Site:	Cape Canaveral AFS, Complex 41
Launch Date:	December 11, 2012

APPENDIX D

2012 COMMERCIAL LAUNCHES CAPE CANAVERAL

<i>Spacecraft:</i>	<i>Dragon</i>
<i>Launch Vehicle:</i>	Falcon 9
<i>Launch Site:</i>	CCAFS, Complex 40
<i>Launch Date:</i>	May 22, 2012
<i>Company:</i>	SpaceX

<i>Spacecraft:</i>	<i>CRS-1 [Commercial Resupply Services Flight]</i>
<i>Launch Vehicle:</i>	Falcon 9
<i>Launch Site:</i>	CCAFS, Complex 40
<i>Launch Date:</i>	October 8, 2012
<i>Company:</i>	SpaceX