FY 2005 Scientific and Technical Reports, Articles, Papers, and Presentations

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K.A. Narmore
Marshall Space Flight Center, Marshall Space Flight Center, Alabama

June 2007
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Compiled by
K.A. Narmore

Marshall Space Flight Center, Marshall Space Flight Center, Alabama

National Aeronautics and
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June 2007
FOREWORD

In accordance with the NASA Space Act of 1958, the George C. Marshall Space Flight Center (MSFC) has provided for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof.

Since July 1, 1960, when MSFC was organized, the reporting of scientific and engineering information has been considered a prime responsibility of the Center. Our credo has been that “research and development work is valuable, but only if its results can be communicated and made understandable to others.”
GEORGE C. MARSHALL SPACE FLIGHT CENTER  
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FY 2005 SCIENTIFIC AND TECHNICAL REPORTS,  
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Monitoring the atmospheric composition of a crewed spacecraft cabin is central to successfully expanding the breadth and depth of first-hand human knowledge and understanding of space. Highly reliable technologies must be identified and developed to monitor atmospheric composition. This will enable crewed space missions that last weeks, months, and eventually years. Atmospheric composition monitoring is a primary component of any environmental control and life support system. Instrumentation employed to monitor atmospheric composition must be inexpensive, simple, and lightweight and provide robust performance. Such a system will ensure an environment that promotes human safety and health, and that the environment can be maintained with a high degree of confidence. Key to this confidence is the capability for any technology to operate autonomously, with little intervention from the crew or mission control personnel. A study has been conducted using technologies that, with further development, may reach these goals.


Launch vehicles consume large quantities of propellant quickly, causing the mass properties and structural dynamics of the vehicle to change dramatically. Currently, structural load assessments account for this change with a large collection of structural models representing various propellant fill levels. This creates a large database of models complicating the delivery of reduced models and requiring extensive work for model changes. Presented here is a method to account for these mass changes in a more efficient manner. The method allows for the subtraction of propellant mass as the propellant is used in the simulation. This subtraction is done in the modal domain of the vehicle generalized model. Additional computation required is primarily for constructing the used propellant mass matrix from an initial propellant model and further matrix multiplications and subtractions. An additional eigenvalue solution is required to uncouple the new equations of motion; however, this is a much simpler calculation starting from a system that is already substantially uncoupled. The method was successfully tested in a simulation of Saturn V loads. Results from the method are compared to results from separate structural models for several propellant levels, showing excellent agreement. Further development to encompass more complicated propellant models, including slosh dynamics, is possible.


Quartz crystal microbalances (QCMs) are commonly used to measure the rate of deposition of molecular species on a surface. The measurement is often used to select materials with a low outgassing rate for applications where the material has a line of sight to a contamination-sensitive surface. A quantitative, in situ calibration of the balance, or balances, using a pure material for which the enthalpy of sublimation is known, is described in this Technical Memorandum. Supporting calculations for surface dwell times of deposited materials and the effusion cell Clausius factor are presented along with examples of multiple QCM measurements of outgassing from a common source.


Many microgravity space-science experiments require vibratory acceleration levels that are unachievable without active isolation. The Boeing Corporation’s active rack isolation system (ARIS) employs a novel combination of magnetic actuation and mechanical linkages to address these isolation requirements on the International Space Station.

Effective model-based vibration isolation requires: (1) An isolation device, (2) an adequate dynamic; i.e., mathematical, model of that isolator, and (3) a suitable, corresponding controller. This Technical Memorandum documents the validation of that high-fidelity dynamic model of ARIS.

The verification of this dynamics model was achieved by utilizing two commercial off-the-shelf (COTS) software tools: Deneb’s ENVISION®, and Online Dynamics’ Autolev™. ENVISION is a robotics software package developed for the automotive industry that employs three-dimensional computer-aided design models to facilitate both forward and inverse kinematics analyses. Autolev is a DOS-based interpreter designed, in general, to solve vector-based mathematical problems and specifically to solve dynamics problems using Kane’s method.

The simplification of this model was achieved using the small-angle theorem for the joint angle of the ARIS actuators. This simplification has a profound effect on the overall complexity of the closed-form solution while yielding a closed-form solution easily employed using COTS control hardware.
This Technical Memorandum describes the development of several high-strength aluminum (Al) alloys that are compatible with hydrogen peroxide ($H_2O_2$) propellant for NASA Hyper-sonic-X (Hyper-X) vehicles’ fuel tanks and structures. The yield strengths for some of these Al-magnesium-based alloys are more than 3 times stronger than the conventional 5254–H112 Al alloy, while maintaining excellent $H_2O_2$ compatibility similar to class 1 5254 alloy. The alloy development strategy is to add scandium, zirconium, and other transitional metals with unique electrochemical properties, which will not act as catalysts, to decompose the highly concentrated 90 percent $H_2O_2$. Test coupons are machined from sheet metals for $H_2O_2$ long-term exposure testing and mechanical properties testing. In addition, the ability to weld the new alloys using friction stir welding has also been explored. The new high-strength alloys could represent an enabling material technology for Hyper-X vehicles, where flight weight reduction is a critical requirement.

This Technical Memorandum (TM) presents formal NASA technical reports, papers published in technical journals, and presentations by Marshall Space Flight Center (MSFC) personnel in FY 2003. It also includes papers of MSFC contractors. After being announced in STAR, all NASA series reports may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

The information in this TM may be of value to the scientific and engineering community in determining what information has been published and what is available.

A potential fission power system for in-space missions is a heat pipe-cooled reactor using electrical resistance heaters on the ground. This Technical Memorandum documents the thermal and structural assessment of the HX used in the SAFE-100a program.

This Technical Memorandum covers revolutionary ideas for space radiation shielding that would mitigate mission costs while limiting human exposure, as studied in a workshop held at Marshall Space Flight Center at the request of NASA Headquarters. None of the revolutionary new ideas examined for the first time in this workshop showed clear promise. The workshop attendees felt that some previously examined concepts were definitely useful and should be pursued. The workshop attendees also concluded that several of the new concepts warranted further investigation to clarify their value.

The International Space Station (ISS) uses high-efficiency particulate air filters to remove particulate matter from the cabin atmosphere. Known as bacteria filter elements (BFEs), there are 13 elements deployed on board the ISS’s U.S. segment in the flight 4R assembly level. The preflight service life prediction of 1 yr for the BFEs is based upon engineering analysis of data collected during developmental testing that used a synthetic dust challenge. While this challenge is considered reasonable and conservative from a design perspective, an understanding of the actual filter loading is required to best manage the critical ISS program resources. Testing was conducted on BFEs returned from the ISS to refine the service life prediction. Results from this testing and implications to ISS resource management are provided.

In the late 1980s, microgravity researchers began to voice their concern that umbilical-transmitted energy could significantly degrade the acceleration environment of microgravity
space science experiments onboard manned spacecraft. Since umbilicals are necessary for many experiments, control designers began to seek ways to compensate for these “indirect” disturbances.

Hampton et al. used the Kane’s method to develop a model of the active rack isolation system (ARIS) that includes (1) actuator control forces, (2) direct disturbance forces, and (3) indirect, actuator-transmitted disturbances. Their model does not, however, include the indirect, umbilical-transmitted disturbances. Since the umbilical stiffnesses are not negligible, these indirect disturbances must be included in the model. Until the umbilicals have been appropriately included, the model will be incomplete.

This Technical Memorandum presents a nonlinear model of ARIS with umbilicals included. Model verification was achieved by utilizing two commercial-off-the-shelf software tools. Various forces and moments were applied to the model to yield simulated responses of the system. Plots of the simulation results show how various critical points on an ARIS-outfitted international standard payload rack behave under the application of direct disturbances, indirect disturbances, and control forces. Simulations also show system response to a variety of initial conditions.

TM—2005–213902
Method for Determination of <5 ppm Oxygen in Sodium Samples. R.S. Reid, J.J. Martin, and G.L. Schmidt*. Propulsion Research Center, Space Transportation Directorate and *New Mexico Institute of Mining and Technology.

Alkali metals used in pumped loops or heat pipes must be sufficiently free of nonmetallic impurities to ensure long heat rejection system life. Life issues are well established for alkali metal systems. Impurities can form ternary compounds between the container and working fluid, leading to corrosion. This Technical Memorandum discusses the consequences of impurities and candidate measurement techniques to determine whether impurities have been reduced to sufficiently low levels within a single-phase liquid metal loop or a closed two-phase heat transfer system, such as a heat pipe. These techniques include the vanadium wire equilibration, neutron activation analysis, plug traps, distillation, and chemical analysis. Conceptual procedures for performing vanadium wire equilibration purity measurements on sodium contained in a heat pipe are discussed in detail.

TM—2005–214007

Human exploration and utilization of space requires habitats to provide appropriate conditions for working and living. These conditions are provided by environmental control and life support systems (ECLSS) that ensure appropriate atmosphere composition, pressure, and temperature; manage and distribute water, process waste matter, provide fire detection and suppression; and other functions as necessary.

The tables in appendix I of NASA RP–1324 “Designing for Human Presence in Space” summarize the life support functions and processes used onboard U.S. and U.S.S.R/Russian space habitats. These tables have been updated to include information on thermal control methods and to provide additional information on the ECLS systems.

TM—2005–214008
An Assessment of the International Space Station’s Trace Contaminant Control Subassembly Process Economics. J.L. Perry, H.E. Cole,* and H.N. El-Lesser**. Spacecraft and Vehicle Systems Department, Engineering Directorate *The Boeing Company, Huntsville, AL, and **The Boeing Company, Houston, TX.

The International Space Station (ISS) Environmental Control and Life Support System includes equipment specifically designed to actively remove trace chemical contamination from the cabin atmosphere. In the U.S. on-orbit segment, this function is provided by the trace contaminant control subassembly (TCCS) located in the atmosphere revitalization subsystem rack housed in the laboratory module, Destiny. The TCCS employs expendable adsorbent beds to accomplish its function leading to a potentially significant life cycle cost over the life of the ISS. Because maintaining the TCCSs proper can be logistically intensive, its performance in flight has been studied in detail to determine where savings may be achieved. Details of these studies and recommendations for improving the TCCS’s process economics without compromising its performance or crew health and safety are presented and discussed.

TM—2005–214061

Contaminated air, whether in a crewed spacecraft cabin or terrestrial work and living spaces, is a pervasive problem affecting human health, performance, and well-being. The need for highly effective, economical air quality processes spans a wide range of terrestrial and space flight applications. Typically, air quality control processes rely on absorption-based processes. Most industrial packed-bed adsorption processes use activated
Once saturated, the carbon is either dumped or regenerated. In either case, the dumped carbon and concentrated waste streams constitute a hazardous waste that must be handled safely while minimizing environmental impact. Thermal catalytic oxidation processes designed to address waste handling issues are moving to the forefront of cleaner air quality control and process gas decontamination processes. Careful consideration in designing the catalyst substrate and reactor can lead to more complete contaminant destruction and poisoning resistance. Maintenance improvements leading to reduced waste handling and process downtime can also be realized. Performance of a prototype thermal catalytic reaction based on ultrashort waste channel, monolith catalyst substrate design, under a variety of process flow and contaminating loading conditions, is discussed.

TM—2005–214184 September 2005
In-Space Propulsion: Connectivity to In-Space Fabrication and Repair. L. Johnson, D. Harris, A. Trausch, G.L. Matloff,* T. Taylor,*** and K. Cutting**. In-Space propulsion Technology Office, Space Transportation Programs/Projects Office, *New York City College of Technology, **BAE Systems, and ***Gray Research.

The connectivity between new in-space propulsion technologies and the ultimate development of an in-space fabrication and repair infrastructure are described in this Technical Memorandum. A number of advanced in-space propulsion technologies are being developed by NASA, many of which are directly relevant to the establishment of such an in-space infrastructure. These include aerocapture, advanced solar-electric propulsion, solar-thermal propulsion, advanced chemical propulsion, tethers, and solar photon sails. Other, further term technologies have also been studied to assess their utility to the development of such an infrastructure.

TM—2005–214186 September 2005

The Advanced Sensor Concepts project was conducted under the Center Director’s Discretionary Fund at the Marshall Space Flight Center. Its objective was to advance the technology originally developed for the Glovebox Integrated Microgravity Isolation Technology project. The objective of this effort was to develop and test several new motion sensors. To date, the investigators have invented seven new technologies during this endeavor and have conceived several others. The innovative basic sensor technology is an absolute position sensor. It employs only two active components, and it is simple, inexpensive, reliable, repeatable, lightweight, and relatively unobtrusive. Two sensors can be utilized in the same physical space to achieve redundancy. The sensor has micrometer positional accuracy and can be configured as a two- or three-dimensional sensor. The sensor technology has the potential to pioneer a new class of linear and rotary sensors. This sensor is the enabling technology for autonomous assembly of modular structures in space and on extraterrestrial locations.

TM—2005–214189 September 2005

During the 113 missions of the Space Transportation System (STS) to date, the Space Shuttle fleet has been exposed to the elements on the launch pad for ≈4,195 days. The Natural Environments Branch at Marshall Space Flight Center archives atmospheric environments to which the Space Shuttle vehicles are exposed. This Technical Memorandum (TM) provides a summary of the historical record of the meteorological conditions encountered by the Space Shuttle fleet during the pad exposure period. Parameters included in this TM are temperature, relative humidity, wind speed, wind direction, sea level pressure, and precipitation. Extremes for each of these parameters for each mission are also summarized. Sources for the data include meteorological towers and hourly surface observations. Data are provided from the first launch of the STS in 1981 through the launch of STS–107 in 2003.

Spotless days are examined as a predictor for the size and timing of a sunspot cycle. For cycles 16–23, the first spotless day for a new cycle, which occurs during the decline of the old cycle, is found to precede minimum amplitude for the new cycle by about ≈34 mo, having a range of 25–40 mo. Reports indicate that the first spotless day for cycle 24 occurred in January 2004, suggesting that minimum amplitude for cycle 24 should be expected before April 2007, probably sometime during the latter half of 2006. If true, then cycle 23 will be classified as a cycle of shorter period, inferring further that cycle 24 likely will be a cycle of shorter than average minimum and maximum amplitudes and faster than average rise, peaking sometime in 2010.


A multimegawatt-class nuclear fission powered closed cycle magnetohydrodynamic space power plant using a helium/xenon working gas has been studied, to include a comprehensive system analysis. Total plant efficiency was expected to be 55.2 percent including preionization power. The effects of compressor stage number, regenerator efficiency, and radiation cooler temperature on plant efficiency were investigated. The specific mass of the power generation plant was also examined. System specific mass was estimated to be 3 kg/kWe for a net electrical output power of 1 MWe, 2–3 kg/kWe at 2 MWe, and ≈2 kg/kWe at >3 MWe. Three phases of research and development plan were proposed: (1) Phase I—proof of principle, (2) Phase II—demonstration of power generation, and (3) Phase III—prototypical closed loop test.


A computational method for the analysis of longitudinal-mode liquid rocket combustion instability has been developed based on the unsteady, quasi-one-dimensional Euler equations where the combustion process source terms were introduced through the incorporation of a two-zone, linearized representation: (1) A two-parameter collapsed combustion zone at the
This document contains the proceedings of the Fifth International Symposium on Liquid Space Propulsion, held October 27–30, 2003, in Chattanooga, TN. The International Liquid Space Propulsion Symposia provide the principal forum for all aspects of liquid rocket propulsion. The aim of the symposium series is to gather international experts in the field of liquid rocket engines on a regular basis for presentations and discussions of the current status of research and development. Besides an exchange of information about future trends, it also fortifies existing cooperation and acts as a nucleus to establish networks to enhance international scientific collaboration in the liquid rocket propulsion area.

The objective of this Technical Interchange Meeting was to increase the quantity and quality of technical, cost, and programmatic data used to model the impact of investing in different technologies. The focus of this meeting was the Technology Tool Box (TTB), a database of performance, operations, and programmatic parameters provided by technologists and used by systems engineers. The TTB is the data repository used by a system of models known as the Advanced Technology Lifecycle Analysis System (ATLAS). This report describes the result of the November meeting, and also provides background information on ATLAS and the TTB.

As a space faring nation, we are at a critical juncture in the evolution of space exploration. NASA has announced its Vision for Space Exploration, a vision of returning humans to the Moon, sending robots and eventually humans to Mars, and exploring the outer solar system via automated spacecraft. However, mission concepts have become increasingly complex, with the potential to yield a wealth of scientific knowledge. Meanwhile, there are significant resource challenges to be met. Launch costs remain a barrier to routine space flight; the ever-changing fiscal and political environments can wreak havoc on mission planning; and technologies are constantly improving, and systems that were state of the art when a program began can quickly become outmoded before a mission is even launched. This Conference Publication describes the workshop and featured presentations by world-class experts presenting leading-edge technologies and applications in the areas of power and propulsion; communications; automation, robotics, computing, and intelligent systems; and transformational techniques for space activities. Workshops such as this one provide an excellent medium for capturing the broadest possible array of insights and expertise, learning from researchers in universities, national laboratories, NASA field Centers, and industry to help better our future in space.
On Structural Design of a Mobile Lunar Habitat With Multi-Layered Environmental Shielding. M. Rais-Rohani. NASA’s Faculty Fellowship Program, Mississippi State University.

This report presents an overview of a Mobile Lunar Habitat (MLH) structural design consisting of advanced composite materials. The habitat design is derived from the cylindrical-shaped U.S. Lab module aboard the International Space Station (ISS) and includes two lateral ports and a hatch at each end that geometrically match those of the ISS Nodes. Thus, several MLH units can be connected together to form a larger lunar outpost of various architectures. For enhanced mobility over the lunar terrain, the MLH uses six articulated insect-like robotic, retractable legs enabling the habitat to fit aboard a launch vehicle. The carbon-composite shell is sandwiched between two layers of hydrogen-rich polyethylene for enhanced radiation shielding. The pressure vessel is covered by modular double-wall panels for meteoroid impact shielding supported by externally mounted stiffeners. The habitat’s structure is an assembly of multiple parts manufactured separately and bonded together. Based on the geometric complexity of a part and its material system, an appropriate fabrication process is proposed.


Single-crystal super alloys are commonly used for components in the hot sections of contemporary jet and rocket engines. Due to the anisotropic nature of single-crystal materials, the use of existing isotropic fracture mechanics calculations leads to errors in stress intensity factors. The difference can be substantial.

Presented in this report is the solution for calculating stress intensity factors in generally anisotropic materials using the $M$-integral. Included are examples of this solution applied to Brazilian disk crack growth specimens.
ABBAS, M.M. XD12
TANKOSIC, D. UAH
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ADAMS, M.L. XD12
NASA Celebrates the World Year of Physics—Abstract Only. For presentation at the American Association of Physics Teachers, Albuquerque, NM, January 8–12, 2005.

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<td>Are We There Yet? Developing In Situ Fabrication and Repair (ISFR) Technologies to Explore and Live on the Moon and Mars—Final Paper. For presentation at the AIAA 1st Exploration Conference, Orlando, FL, January 31–February 1, 2005.</td>
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<td>FISKE, M.R. Morgan Research Corp.</td>
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<td>BODIFORD, M.P.</td>
<td>SD40</td>
<td>BONAMENTE, M. UAH</td>
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<td>JOY, M. XD12</td>
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<td>LAROQUE, S. University of Chicago</td>
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<td>REESE, E. University of California, Davis</td>
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BONAMENTE, M. UAH
LIEU, R. UAH
MITTATZ, P.D. UAH
KAASTRA, J.S. SRON Ulrecht
NEVALAINEN, J. Harvard-Smithsonian


BONOMETTI, J.A. NP40
SORENSEN, K.F. NP23
JANSEN, R. University of Toledo
DANKANICH, J.W. Gray Research, Inc.
FRAME, K.L. Gray Research, Inc.


BRADSHAW, R.C. University of Massachusetts
SCHMIDT, D.P. University of Massachusetts
ROGERS, J.R. XD42
KELTON, K.F. Washington University
HYERS, R.W. University of Massachusetts


BRAGG-SITTON, S.M. ER11


BRAGG-SITTON, S.M. ER11


BRAGG-SITTON, S.M. ER11
MORTON, T.J. University of New Mexico


CECIL, D. GOODMAN, S.J. BOCCIPPIO, D.J. UAH XD11 XP11


CHANDLER, M.O. AVANOV, L.A. XD12 XD12


CHANG, H. SCHMIDT, W.K.H. ADAMS, J.H. Ahn, H.S. BASHINDZHAGYAN, G.L. BATKOV, K.E. CHRISTL, M. FAZELY, A.F. GANEL, O. ET AL. Max-Planck-Institut für Aeronomie XD12 University of Maryland Moscow State University Moscow State University Louisiana State University Southern University

ZIPSER, E.J. NESBITT, S.W. University of Utah Colorado State University


CHAVERS, D.G. XD22
BENGTSON, R. University of Texas at Austin
BREIZMAN, B. University of Texas at Austin
CHANG-DIAZ, F. XD22
JONES, J. XD22
DOBSON, C. XD22

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MITCHELL, M.L. EM03

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CHENG, G.C. UAB
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CHEW, G. SAIC
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CHIROUX, R. SAIC
PERVAN, S. SAIC
RAUWOLF, G.A. SAIC
WHITE, C. ER11

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CHOU, S-H. XD11
ZAVODSKY, B. XD11
LAPENTA, W.M. XD11
JEDLOVEC, G.J. XD11


CHOUHARY, D.P. SD50


CHRISTIAN, H.J. XD11


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CHUNG, Y.T. The Boeing Company
LO, W. The Boeing Company
FOWLER, S.B. XP01
TOWNER, R. Jacobs Sverdrup


CLINTON, R.G. XD40
SZOFRAN, F.R. XD40
BASSLER, J.A. XD40
SCHLAGHECK, R.A. XD40
COOK, M.B. XD40


COFFEY, V.N. XD12
SINGH, N. UAH
AVANOV, L.A. XD12

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CROSSON, W.L. XD11
LIMAYE, A. XD11
LAYMON, C.A. ISO4


CRUZEN, C.A. EO03
DYER, S.V. EO03
GIBBS III, R.E. The Boeing Company
CECH, J.G. Teledyne Brown Engineering


CURRERI, P.A. XD40


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In Situ Resources in Space—Abstract Only. For presentation at the National Space and Missile Materials Symposium, Summerlin, NV, June 27–July 1, 2005.

DARDEN, C. National Weather Service Forecast Office
GATLIN, P. National Weather Service Forecast Office
BURKS, J. National Weather Service Forecast Office
GOODMAN, S.J. XD11
BUECHLER, D. The Global Hydrology and Climate Center
HALL, J. The Global Hydrology and Climate Center


DARROUZET, F. Belgian Institute for Space Aeronomy
DE KEYSER, J. Belgian Institute for Space Aeronomy
DECREAU, P. Laboratoire de Physique et Chimie de l’Environnement
GALLAGHER, D.L. XD12
PIERRARD, V. Belgian Institute for Space Aeronomy
LEMAIRE, J. Belgian Institute for Space Aeronomy
DANDOURAS, I. Centre d’Etude Spatiale des Rayonnements

MATSUI, H. Space Science Center
DUNLOP, M. Rutherford Appleton Laboratory
ANDRE, M. Swedish Institute of Space Physics

Analysis of Plasmaspheric Plumes: CLUSTER and IMAGE Observations and Numerical Simulations—Abstract Only. For presentation at and publication in proceedings of the Session C5 of the General Congress of the French Physical Society (SFP) and Belgian Physical Society (BPS), Lille, France, August 29–September 2, 2005.

DAVIS, J.M. XD12
WEST, E.A. XD12
MOORE, R.L. XD12
GARY, G.A. XD12
KOBA YASHI, K. XD12
OBERRIGHT, J.E. GSFC
EVANS, D.C. GSFC
WOOD, H.J. GSFC
SABA, J. LMSAL, GSFC
ALEXANDER, D. Rice University


DAVIS, J.M. XD12
WEST, E.A. XD12
MOORE, R.L. XD12
GARY, G.A. XD12
KOBA YASHI, K. XD12
OBERRIGHT, J.E. GSFC
EVANS, D.C. GSFC
SABA, J. LMSAL, GSFC
ALEXANDER, D. Rice University


DAVIS, S.E. EM10
HERALD, S.D. ICRC Aerospace Services
STOLZFUS, J.M. NASA White Sands Test Facility
ENGEL, C.D. Qualis Corp.
BOHLEN, J.W. Northrop Grumman Integrated Systems
PALM, T. Northrop Grumman Integrated Systems
ROBINSON, J.J. The Boeing Company Phantom Works

DECKER, R.  
LEACH, R. Morgan Research Corp.  

DECKER, R.  
PRICKETT, T.  
ROBERTS, B.  

DELAY, T.  

DICKERSON, T.  
MYRABO, L.N. Rensselaer Polytechnic Institute  

DING, J.  

DISCHINGER, JR., H.C.  
MULLINS, J.B.  

DISCHINGER, P.  

DISCHINGER, P.  

DOMINIAK, P.  
CISZAK, E.M.  

DORNEY, D.J.  
SONDAK, D.L. Boston University  

DORNEY, S.M.  
HAIMES, B. MIT  

DOYLE, M.  
O’NEIL, D.A. SAIC  
A New Family of Ionic Liquids 1-Amino-3-Alkyl-1,2,3-Triazolium Nitrates—Abstract Only. For publication in the Journal of Chemical Crystallography.

DRAKE, G.W.  
KAPLAN, G. ERC, INC./AFRL/PRSP  
HALL, L. AFRL/PRSP  
HAWKINGS, T. AFRL/PRSP  
LARUE, J. AFRL/PRSP  
A New Family of Ionic Liquids 1-Amino-3-Alkyl-1,2,3-Triazolium Nitrates—Abstract Only. For publication in the Journal of Chemical Crystallography.

DUARTE, L.A.  

ECCLES, W.  
KASZYNSKI, P. Vanderbilt University  
STULGIES, B. Vanderbilt University  
GOSTOWSKI, R. XD22  
BLEVINS, J.A. XD22  
Strained Hydrocarbons at Potential Hypergolic Fuels—Abstract and Presentation. For presentation at the

ECCLES, W. XD20

ELAM, S. ER32
HOLMES, R. ER32
HICKMAN, R. ER32
MCKECHNIE, T. ER32
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ELAM, S. ER32
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REYNOLDS, D. ER32
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VPS Functional Gradient Coatings for Injector Faceplates—Abstract Only. For presentation at the 53rd JANNAF Propulsion Meeting/2nd Liquid Propulsion Subcommittee/1st Spacecraft Propulsion Joint Meeting, Monterey, CA, December 5–8, 2005.

ELSNER, R.F. XD12
BHARDWAJ, A. XD12/NRC
GLADSTONE, G.R. SWRI
WAITE, JR., J.H. University of Michigan
CRAVENS, T.E. University of Kansas
FORD, P.G. Center for Space Research
BRANDUARDI-RAYMONT, G. UCL, MSSL
RAMSAY, G. UCL, MSSL
RAMSEY, B.O. XD12
Chandra X-Ray Observatory Observations of the Jovian System—Abstract Only. For presentation at the Six Years of Science With Chandra Symposium Chandra X-Ray Center, Cambridge, MA, November 2–4, 2005.

ELSNER, R.F. XD12
BHARDWAJ, A. XD12
GLADSTONE, G.R. SWRI
WAITE, JR., J.H. University of Michigan
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FORD, P.G. Center for Space Research
BRANDUARDI-RAYMONT, G. UCL, MSSL

EMRICH, W. XD21

EMRICH, W. XD21

EMRICH, W. XD21

ENG, R. XD33
CARPENTER, J. XD33
HAIGHT, H.J. XD33
HOUGE, W.D. XD33
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WRIGHT, E.R. XD33
KANE, D. Trex Advanced Materials
HADAWAY, J. UAH
<table>
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<tr>
<th>Authors</th>
<th>Affiliation</th>
<th>Title and Details</th>
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<tr>
<td>ENG, R.</td>
<td>XD33</td>
<td>Cryogenic Performance of Trex SiC Mirror—Abstract Only. For presentation at the Mirror Technology Days, Huntsville, AL, August 16–18, 2005.</td>
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<td>WRIGHT, E.R.</td>
<td>XD33</td>
<td>The Business Case for Spiral Development in Heavy Launch Vehicle Systems—Final Paper. For presentation</td>
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FARR, R.A. EV11
WILET, J.T. EV23
VITARIUS, P. Freel Innovations

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FERGUSON, D.C. NP23
VAYNER, B.V. Ohio Aerospace Institute

FERGUSON, K.R. XD41


GALOFARO, J.T. NASA GRC
HILLARD, G.B. NASA GRC

FERNANDEZ, K.R. XD41


Arcing in LEO—Does the Whole Array Discharge?—Final Paper. For presentation at the 9th Spacecraft Charging Technology Conference, Tsukuba, Japan, April 4–8, 2005.

GARRINGTON, S.T. University of Manchester
PARAGI, Z. Joint Institute for VLBI in Europe
TUDOSE, V. University of Amsterdam/Astronomical Institute of the Romanian Academy
MILLER-JONES, J.C.A. University of Amsterdam


FERGUSON, C.K. EI51
ENGLISH, J.M. UAH
NORDIN, G.P. UAH
ASHLEY, P.R. U.S. Army AMRDEC
ABUSHAGUR, M.A.G. RIT


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ET AL.

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GENNARINO, M.M. EM50


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ET AL.


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PARAGI, Z. Joint Institute for VLBI in Europe
TUDOSE, V. University of Amsterdam/Astronomical Institute of the Romanian Academy
MILLER-JONES, J.C.A. University of Amsterdam
ET AL.
FISHMAN, G.J. XD12

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PENDLETON, G. Dynetics Corp.

FLACHBART, R.H. ER23
HASTINGS, L.J. ER23
HEDAYAT, A. ER23
NELSON, S.L. ER23
TUCKER, S.P. Alpha Technology Inc.

FLYNN, K. NP60
GUBERT, M. NP60

FOOTE, J.P. XD21
LITCHFORD, R.J. XD21

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LITCHFORD, R.J. XD21

FORD, P.G. MIT Kavli Institute for Astrophysics and Space Research
ELSNER, R.F. XD12

FRADY, G. ER41
GALLAGHER, D.L. XD12
ADRIAN, M.L. SD50
LIEMOHN, M. SD50


GALLAGHER, D.L. XD12
GREEN, J.L. XD12


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HORWITZ, J.L. University of Texas in Arlington
PEREZ, J.D. Auburn University
QUENBY, J.J. Blackett Laboratory

Introduction to Particle Acceleration in the Cosmos—Abstract Only. For publication in the Acceleration in Astrophysical Plasma in Geospace and Beyond.

GALLAGHER, D.L. XD12
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SMITH, Z. XD12


GAMAYUNOV, K.V. USRA
KHAZANOV, G.V. XD12

Strong Pitch-Angle diffusion of the Ring Current Ions Induced by Electromagnetic Ion Cyclotron Waves—Abstract Only. For presentation at the American Geophysical Union Fall Meeting, San Francisco, CA, December 5–9, 2005.

GANGOPADHYAY, A.K. Washington University
LEE, G.W. Washington University
KELTON, K.F. Washington University
ROGERS, J.R. Ames Lab/USDOE/Iowa State University
GOLDMAN, A.I. Ames Lab/USDOE/Iowa State University
ROBINSON, D.S. Ames Lab/USDOE/Iowa State University
RATHZ, T.J. UAH
HYERS, R.W. University of Massachusetts


GARY, G.A. XD12
DEMOLIN, P. Observatoire de Paris


GARY, G.A. XD12


GATLIN, P. XD11
GOODMAN, S.J. XD11


GATTIS, G.B. ED21
SHEPARD, W.S. University of Alabama

Smart Structures for Vibration Control on Long-Term Space Exploration and Habitation Missions—Abstract Only. For presentation at the AIAA 1st Space Exploration Conference, Orlando, FL, January 30–February 1, 2005.

GAVRIIL, F. McGill University
KASPI, V.M. McGill University
WOODS, P.M. XD12
LYUTIKOV, M. University of British Columbia


GELFAND, J.D. Harvard-Smithsonian Center for Astrophysics
LYUBARSKY, Y.E. Department of Physics
EICHLER, D. Department of Physics
GAENSLER, B.M. Harvard-Smithsonian Center for Astrophysics
TAYLOR, G.B. Stanford University
GRANOT, J. Stanford University
NEWTON-MCGEE, K.J. University of Sydney/CSIRO
RAMIREZ-RUIZ, E. Institute for Advanced Study
KOVELIOTOU, C. XD12
WIJERS, R.A.M.J. University of Amsterdam


GHOSH, K.K. Universities Space Research Association (USRA)
SWARTZ, D.A. SD50
TENNANT, A.F. SD50

GOODMAN, S.J. XD11
BLAKESLEE, R.J. XD11
BOCCIPPIO, D.J. XD11
CHRISTIAN, H.J. XD11
KOSHK, W.J. XD11
PETERSEN, W.A. UAH

GORTI, S. SD46
FORSYTHE, E.L. SD46/BAE Systems
PUSEY, M.L. SD46
Kinetic Roughening and Energetics of Tetragonal Lysozyme Crystal Growth: A Preliminary Atomic Force Microscopy Investigation—Abstract Only. For publication in Acta Crystallographica D.

GRADL, P.R. ER32
STEPHENS, W. MP21

GRANOT, J. XD12
RAMIREZ-RUIZ, E. KIPAC, Stanford University
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KIPAC, Stanford University/National Radio Astronomy Observatory
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KOUVEVIOTOU, C. XD12

GRANT, J. XD31

GRANT, J. XD31

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GREENWOOD, T. MP31
TWICHELL, W. Lockheed Martin
FERRARI, D. Lockheed Martin
KUCK, F. Boeing-Rocketdyne

GREGORY, D.A. UAH
HERREN, K.A. XD31
Ion Milling of Sapphire—Abstract Only. For publication in Electrochemical and Solid-State Letters and American Institute of Physics.

GRIFFEY, A.M. IS04

GRIFFEY, K. IS01

GRUGEL, R.N. SD46
High Tensile Strength Amalgams for In-Space Repair and Fabrication—Abstract Only. For presentation at the Continuing the Voyage of Discovery—1st Space Exploration Conference, Orlando, FL, February 2–4, 2005.


GWALTNEY, D.A.  
FERGUSON, M.I.  
JPL  

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GWALTNEY, D.A.  
DUTTON, K.  
Jacobs Sverdrup  

GWALTNEY, D.A.  
BRISCOE, J.M.  
Jacobs Sverdrup  

GWALTNEY, D.A.  
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Jacobs Sverdrup  

HAMILTON, J.T.  
ET01  

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HARMSEN, E.  
LUVALL, J.C.  
GONZALEZ, J.  
XD11  

HATHAWAY, D.H.  
WILSON, R.M.  
XD12  

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XD12  

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XD12  
HATHAWAY, D.H. XD12
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HATHAWAY, D.H. XD12
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HEATON, A.F. EV40

HEDAYAT, A. ER23
NELSON, S.L. ER23
HASTINGS, L.J. Alpha Technology, Inc.

HEDAYAT, A. ER23
NELSON, S.L. ER23
HASTINGS, L.J. Alpha Technology Inc.

HERALD, S.D. ICRC Aerospace Services
ENGEL, C.D. Qualis Corp.
DAVIS, S.E. EM10

HERMILLER, J. Cornerstone Research Group, Inc.
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HICKMAN, R. ER11
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HISSAM, D.A. ER34
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MCLEROY, R. ERC

HJORTH, J. University of Copenhagen
SOLLERMAN, J. University of Copenhagen/Stockholm University
GOROSABEL, J. Instituto de Astrofisica de Andalucia
GRANOT, J. Kavli Institute
KLOSE, S. Thuringer Landessternwarte
KOUVELIOTOU, C. XD12
MELINDER, J. Stockholm University
RAMIREZ-RUIZ, E. Institute for Advanced Study
STARLING, R. University of Amsterdam ET AL.
HOLLINGER, G.A. Swarthmore College
BRISCOE, J.M. EI21

HOOVER, R.B. XD12

HOOVER, R.B. XD12

HOUTS, M.G. NP50
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MIRELES, O. ER11
ET AL.

HOUTS, M.G. NP50

HOUTS, M.G. NP50
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BOOK, M.L. EV21
Simulation and Ground Testing with the AVGS—Final Paper. For presentation at the SPIE Defense and Security Symposium, Orlando, FL, March 28–April 1, 2005.

HOWARD, R.W. SY10
In Situ Fabrication Technologies: Meeting the Challenge for Exploration—Presentation. For presentation at the National Space and Missile Materials Symposium, Las Vegas, NV, June 27–July 1, 2005.

HOWELL, J.T. FD02
FIKES, J.C. SP20
O’NEILL, M.J. Entech, Inc.
Novel Space-Based Solar Power Technologies and Architectures for Earth and Beyond—Abstract Only. For presentation at the 56th International Astronautical Congress, Fukuoka, Japan, October 17–21, 2005.

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FIKES, J.C. SP20
MANKINS, J.C. NASA Headquarters
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O’NEILL, M.J. Entech, Inc.
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HOWELL, J. T. FD02
CARRINGTON, C.K. SP20
MANKINS, J.C. NASA Headquarters

HUEBNER, L.D. NP60
SAIYED, N.H. NASA Headquarters
Advanced Development Projects for Constellation From the Next Generation Launch Technology Program Elements—Abstract Only. For presentation at the 56th International Astronautical Congress, Fukuoka, Japan, October 17–22, 2005.

HOWARD, R.T. EV21
JOHNSTON, A.S. EV21
BRYAN, T.C. EV21
HULCHER, A.B. ED34
YOUNG, G. ATK Thiokol Propulsion
Film Delivery Module for Fiber Replacement Fabrication of Hybridized Composite Structures—Abstract Only. For
presentation at the SAMPE Conference, Long Beach, CA, May 1–5, 2005.

HULL, M.S.\hspace{1cm}Luna Innovations Inc.
TASSELL, V.\hspace{1cm}Luna Innovations Inc.
PENNINGTON, C.D.\hspace{1cm}Luna Innovations Inc.
ROMAN, M.C.\hspace{1cm}EV52

HULL, P.V.\hspace{1cm}EV11/Jacobs Sverdrup
KITTREDGE, K.\hspace{1cm}EV34
TINKER, M.L.\hspace{1cm}EV11
SANSOUCIE, M.P.\hspace{1cm}EV11

HULL, P.V.\hspace{1cm}EV11/Jacobs Sverdrup
TINKER, M.L.\hspace{1cm}EV11
DOZIER, G.\hspace{1cm}Auburn University

HULL, P.V.\hspace{1cm}EV11/Jacobs Sverdrup
CANDFIELD, S.L.\hspace{1cm}Tennessee Technological University

HYERS, R.W.\hspace{1cm}University of Massachusetts
LEE, J.\hspace{1cm}University of Massachusetts
BRADSHAW, R.C.\hspace{1cm}University of Massachusetts
ROGERS, J.R.\hspace{1cm}XD42
RATHZ, T.J.\hspace{1cm}UAH
WALL, J.J.\hspace{1cm}University of Tennessee
CHOO, H.\hspace{1cm}University of Tennessee
LIAW, P.K.\hspace{1cm}University of Tennessee

HYERS, R.W.\hspace{1cm}University of Massachusetts
SANSOUCIE, M.P.\hspace{1cm}EV11
PEPYNE, D.\hspace{1cm}University of Massachusetts
HANLON, A.B.\hspace{1cm}University of Massachusetts
DESHMUKH, A.\hspace{1cm}University of Massachusetts

IGNATIEV, A.\hspace{1cm}University of Houston
FREUNDLICH, A.\hspace{1cm}University of Houston
ALEMU, A.\hspace{1cm}University of Houston
SIBILLE, L.\hspace{1cm}BAE Systems
CURRERI, P.A.\hspace{1cm}XD40

ING, S.H.\hspace{1cm}IS05

IRWIN, D.E.\hspace{1cm}XD11
SERVER, T.\hspace{1cm}XD11
GRAVES, S.\hspace{1cm}UAH
HARDIN, D.\hspace{1cm}UAH
SIAM-SERVER: An Environmental Monitoring and Decision Support System for Meso-america—Abstract Only. For presentation at the Lecture for the City of Knowledge, City of Knowledge Foundation, Panama City, Panama, August 18, 2005.

IRWIN, R.W.\hspace{1cm}Purdue University
TINKER, M.L.\hspace{1cm}EV11

JAAP, J.\hspace{1cm}EO50
PHILLIPS, S.\hspace{1cm}EO50

JAAP, J.\hspace{1cm}EO50
PHILLIPS, S.\hspace{1cm}EO50


The Optomechanical Design and Operation of the Ionospheric Mapping and Geocoronal Experiment — Abstract Only. For presentation at and publication in the proceedings of the SPIE Optics and Photonics, San Diego, CA, July 31–August 4, 2005.


Millimeter Wave Detection of Localized Anomalies in the Space Shuttle External Fuel Tank Insulating Foam—Final Paper. For publication in the Institute of Electronical and Electronics.

KHAZANOV, G.V. XD12
GALLAGHER, D.L. XD12
GAMAYUNOV, K.V. XD12


KHAZANOV, G.V. XD12
KRIVORUTSKY, E.N. NRC

Grid-Sphere Current Collection in View of the TSS–1, TSS–1R Mission Results—Abstract Only. For publication in the Journal of Geophysical Research.

KHAZANOV, G.V. XD12
KRIVORUTSKY, E.N. NRC

Current Collection by Grid-Sphere Electrode in Space—Abstract Only. For presentation at and publication in the proceedings of the 53rd JANNAF Propulsion Meeting/2nd Liquid Propulsion Subcommittee/1st Spacecraft Propulsion Joint Meeting, Monterey, CA, December 5–8, 2005.

KHAZANOV, G.V. XD12
KRIVORUTSKY, E.N. NRC
SORENSEN, K. XD12

Analysis of Bare-Tether Systems as a Thruster for MXER Studies—Abstract Only. For publication in the Journal of Geophysical Research.

KHAZANOV, G.V. XD12
GAMAYUNOV, K.V. XD12
GALLAGHER, D.L. XD12
SPANN, J.F. XD12

Strong Pitch-Angle Diffusion of Ring Current Ions in Geomagnetic Storm-Associated Conditions—Abstract Only. For publication in AGU Monograph.

KHAZANOV, G.V. XD12
KRIVORUTSKY, E.N. NRC
SORENSEN, K. XD12

Cross-Scale Coupling in the Inner Magnetosphere—Abstract Only. For presentation at the American Geophysical Union, San Francisco, CA, November 5–9, 2005.

KHAZANOV, G.V. XD12
GAMAYUNOV, K.V. XD12

Do Electromagnetic Ion Cyclotron Waves Cause the Strong Pitch-Angle Diffusion of Ring Current Ions?—Abstract Only. For presentation at the American Geophysical Union, San Francisco, CA, December 5–9, 2005.
KHAZANOV, G.V. 	XD12
GALLAGHER, D.L. 	XD12
Self-Consistent Ionosphere-Magnetosphere Electrodynamc Coupling—Abstract Only. For presentation at the Workshop of Penetration Electric Fields and Their Effects on the Inner Magnetosphere and Ionosphere, Westford MA, November 7–9, 2005.

KHODABANDEH, J.W. 	EI3

KHOSHNEVIS, B. 	University of Southern California
BODIFORD, M.P. 	SY10
BURKS, K.H. 	SY10
ETHRIDGE, E. 	SY10
TUCKER, D. 	SY10
KIM, W. 	NASA JPL
TOUTANJI, H. 	UAH
FISKE, M.R. 	SY10

KHOSHNEVIS, B. 	University of Southern California
BODIFORD, M.P. 	SY10
BURKS, K.H. 	SY10
ETHRIDGE, E. 	SY10
TUCKER, D. 	SY10
KIM, W. 	NASA JPL
TOUTANJI, H. 	UAH
FISKE, M.R. 	Morgan Research

KNOX, J.C. 
CAMPBELL, M. 
MURDOCH, K. 
MILLER, L. 
JENG, F. 
Integrated Test and Evaluation of a 4-Bed Molecular Sieve (4BMS) Carbon Dioxide Removal System (CDRA), Mechanical Compressor Engineering Development Unit (EDU), and Sabatier Engineering Development Unit (EDU)—Final Paper. For presentaton at the International Conference on Environmental Systems (ICES), Rome, Italy, July 11–14, 2005.

KOSKAK, W.J. 	XD11
MACH, D. M. 	XD11
Retrving Storm Electric Fields From Aircraft Field Mill Data. Part II: Applications—Abstract Only. For publication in the Journal Of Atmospheric and Oceanic Technology/AMS.

KOUVELIOTOU, C. 	XD12

KOUVELIOTOU, C. 	XD12
Observatons of Soft Gamma Repeaters—Abstract Only. For presentaton at the Triggering Relatvstc Jets Meetng, Cozumel, Mexico, March 28–April 1, 2005.

KOUVELIOTOU, C. 	XD12

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KOUVELIOTOU, C. 	XD12
Magnetars—Abstract Only. For presentaton at A Life With Stars, Amsterdam, Netherlands, August 21–26, 2005.

KRIVORUTSKY, E.N. 
KHAZANOV, G.V. 
GAMAYUNOV, K.V. 
AVANOVA, L.A. 

LAL, R.B. 
CLINTON, R.G. 
FRAZIER, D.O. 
Advanced Sensors for NASA’s Exploration Missions—Presentation. For presentaton at the National Science Foundation (NSF) Workshop on Sensors, Huntsville, AL, June 7, 2005.
LAYMON, C.A. XD11
CROSSON, W.L. XD11
LIMAYE, A. XD11
MANU, A. XD11
ARCHER, F. XD11

LEE, G.W. Washington University
GANGOPADHYAY, A.K. Washington University
KELTON, K.F. Washington University
BRADSHAW, R.C. University of Massachusetts
HYERS, R.W. University of Massachusetts
RATHZ, T.J. UAH
ROGERS, J.R. XD42

LEE, J.A. EM30

LEEMKUEHLER, T.O. Honeywell, Inc.
PATEL, H. Honeywell, Inc.
REEVES, D.R. The Boeing Company
HOLT, J.M. EV34

LEOPARD, L. ER30

LESLIE, F.W. XD42
RAMACHANDRAN, N. BAE Systems

LEVAN, A. University of Leicester/
Space Telescope Science Institute
Space Telescope Science Institute
Space Telescope Science Institute
Space Telescope Science Institute
University of Hertfordshire
Space Telescope Science Institute
University of Hertfordshire/University of Amsterdam
Brown University/National Optical Astronomy Observatory

LEWIS, R.A.
ROBERTSON, G.A.
R Lewis Company
XD21

LI, C.
SU, C-H.
LEHOCZKY, S.L.
SCRIPA, R.N.
BAN, H.
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LI, C.
SU, C-H.
LEHOCZKY, S.L.
SCRIPA, R.N.
BAN, H.
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Impurity Studies of Cd0.8Zn0.2Te Crystals Using Photoluminescence and Glow Discharge Mass Spectroscopy—Abstract Only. For presentation at the 16th American Conference on Crystal Growth and Epitaxy, Big Sky, MT, July 10–15, 2005.

LI, C.
SU, C-H.
LEHOCZKY, S.L.
SCRIPA, R.N.
BAN, H.
LIN, B.
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LI, C.
SU, C-H.
LEHOCZKY, S.L.
SCRIPA, R.N.
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BARGHOUTY, A.F.
UAB
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BARGHOUTY, A.F.
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UAB
BARGHOUTY, A.F.
XD41
Effects of Nuclear Interactions on Accuracy of Space Radiation Transport—Abstract Only. For presentation at and publication in the proceedings of the Space Nuclear Conference 2005, San Diego, CA, June 5–9, 2005.

LIN, Z-W. UAH
ADAMS, J.H. XD12

LUVALL, J.C. XD11
RICKMAN, D.L. XD11
QUATTROCHI, D.A. XD11
ESTES, M.E. XD11

MAASHA, R. EV31
GRADL, P.R. ER32
KINNEY, T. Qualis Corp.
LAVEDE, B. ERC Inc.
PECK, J. EV31
Space Shuttle Main Engine Testing and Analysis Approach to External Debris Environments—Abstract Only. For presentation at the 53rd JPM/2nd LPS/SP Joint Meeting—JANNAF, Monterey, CA, December 5–8, 2005.

MACLEOD, T.C. EI51
PHILLIPS, T.A. EI51
HO, F.D. UAH
Characteristics of Ferroelectric Logic Gates Using a Spice-Based Model—Abstract Only. For presentation at the International Meeting on Ferroelectricity, Foz do Igacu, Brazil, September 5–9, 2005, and publication in the Ferroelectrics Journal.

MANKINS, J.C. NASA Headquarters
HOWELL, J.T. FD02

MANKINS, J.C. NASA Headquarters
HOWELL, J.T. FD02

MARCUS, B. The Boeing Company
HADID, A. The Boeing Company
LIN, P. The Boeing Company
BALCAZAR, D. The Boeing Company
RAI, M.M. Ames Research Center
DORNEY, D.J. TD64

MARTIN, A.K. XD22
ESKRIDGE, R.H. XD22

MARTIN, A.K. XD22
ESKRIDGE, R.H. XD22
MARTIN, A.K. XD22
ESKRIDGE, R.H. XD22
FIMOGNARI III, P.J. UAH

MARTIN, A.K. XD22
ESKRIDGE, R.H. XD22
LEE, M. XD22
FIMOGNARI III, P.H. UAH

MARTIN, J.J. ER11
REID, R.S. ER11

MATLIK, J.F. Rolls Royce Corp.
FARRIS, T.N. Purdue University
HAYNES, J. United Technologies Corp.
SWANSON, G.R. EM20
HAM-BATTISTA, G. Jacobs Sverdrup


Reuse of International Space Station (ISS) Modules as Lunar Habitat—Abstract Only. For presentation at the 1st Space Exploration Conference, Orlando, FL, January 30–February 1, 2005.


MOONEY, J.T. UAH
STAHL, H.P. XD30

MOORE, R.L. XD12
STERLING, A.C. XD12
FALCONER, D.A. XD12
DAVIS, J.M. XD12

MOORE, R.L. XD12
STERLING, A.C. XD12
FALCONER, D.A. XD12
DAVIS, J.M. XD12

MOORE, R.E. EM10
SCOTT, J.P. EM10
WISE, H. EM10
Considerations for Storage of High-Test Hydrogen Peroxide (HTP) Utilizing Non-Metal Containers—Abstract Only. For presentation at the 8th International Hydrogen Peroxide Propulsion Conference, West Lafayette, IN, September 18–22, 2005.

MOORE, R.L. XD12
STERLING, A.C. XD12
FALCONER, D.A. XD12
GARY, G.A. XD12

MOORE, R.L. XD12
STERLING, A.C. XD12

MORRIS, C.I. XD22

MORRISON, R.H. The Boeing Company
HOLT, J.M. EV34

MOUSHON, B. Jacobs Sverdrup
MCDUFFEE, P. ED03

MOUSHON, B. Jacobs Sverdrup
MCDUFFEE, P. ED03

MULDER, A.D. ER42
SUBBARAMAN, M.R. Boeing-Rocketdyne
LARIVIERE, B.W. Boeing-Rocketdyne

MURDOCH, K. Hamilton Sundstrand Space Systems International, Inc.
GOLDBLATT, L. Hamilton Sundstrand Space Systems International, Inc.
CARRASQUILLO, R.L. EV50
HARRIS, D. SV10

NALETTE, T. Hamilton Sundstrand
REISS, J. Hamilton Sundstrand
FILBURN, T. University of Hartford
SEERY, T. University of Connecticut
WEISS, B. University of Connecticut
SMITH, F. EV51
PERRY, J. EV51

MSFC ABSTRACTS, ARTICLES, PAPERS, AND PRESENTATIONS CLEARED FOR DISSEMINATION
(Publicly available. Dates are conference dates.)

NALL, M. SR10

NERNEY, S. SD50
SUSS, S.T. SD50

NEUMANN, B. HQS
MCMILLAN, V. EDO3

NGUYEN, H. The Boeing Company
CHANDLER, F. The Boeing Company
MAZURKIVICH, P. NP60

NIELSEN, D. ATK Thiokol Inc.
TOWNSEND, J. ED21
KAPPUS, K. ED21
DRISKILL, T. ED21
TORRES, I. ED21
PARKS, R. ED21

NISHIKAWA, K.I. University of Alabama/Tuscaloosa
HEGEDAL, C.B. Niels Bohr Institute/Department of Astrophysics

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HARDEE, P. University of Alabama/Tuscaloosa
HEGEDAL, C.B. Niels Bohr Institute/Department of Astrophysics
RICHARDSON, G. UAH
SOL, H. LUTH
PREECE, R. UAH
FISHPHAN, G.J. XDI2

NISHIKAWA, K.I. University of Alabama/Tuscaloosa
HARDEE, P. University of Alabama/Tuscaloosa
HEGEDAL, C.B. Niels Bohr Institute/Department of Astrophysics
RICHARDSON, G. UAH
SOL, H. LUTH
PREECE, R. UAH
FISHPHAN, G.J. XDI2
 Particle Acceleration, Magnetic Field Generation in Relativistic Shocks—Abstract Only. For presentation at and publication in the proceedings of the International Workshop on Particles and Radiation From Cosmic Accelerators, Chiba, Japan, March 2–4, 2005.

NISHIKAWA, K.I. University of Alabama/Tuscaloosa
RAMIREZ-RUIZ, E. Institute for Advanced Study
HARDEE, P. University of Alabama/Tuscaloosa
HEGEDAL, C.B. Niels Bohr Institute/Department of Astrophysics
KOUVELIOTOU, C. XDI2
FISHPHAN, G.J. XDI2

NISHIKAWA, K.I. University of Alabama/Tuscaloosa
RICHARDSON, G. UAH
PREECE, R. UAH
SOL, H. LUTH
FISHPHAN, G.J. XDI2
 Particle Acceleration, Magnetic Field Generation, and Emission in Relativistic Pair Jets—Abstract Only. For presentation at and publication in the proceedings of the Astrophysical Sources of High-Energy Particles and Radiation, Torun, Poland, June 20–24, 2005.

PARTICLE ACCELERATION, MAGNETIC FIELD GENERATION, AND EMISSION IN RELATIVISTIC PAIR JETS—ABSTRACT ONLY. RELATIVISTIC ASTROPHYSICS AND COSMOLOGY: EINSTEIN LEGACY, MUNICH, GERMANY, NOVEMBER 7–11, 2005.


OELGOETZ, P. Boeing Rocketdyne Propulsion and Power

GRADL, P.R. ER32

BRYANT, M. Madison Research Corp.

DANIEL, R. Boeing Rocketdyne

WOFFORD, S. MP21

Systematic Improvements in Leak Detection and Repair Techniques of the Space Shuttle Main Engine Nozzle—Abstract Only. For presentation at the 53rd JPM/2nd LPS/SP Joint Meeting—JANNAF, Monterey, CA, December 5–8, 2005.

OLIVER, S.T. EV31

Analysis of a Circular Composite Disk Subjected to Edge Rotations and Hydrostatic Pressure—Final Paper. Thesis to be presented to the Department of Mechanical and Aerospace Engineering, UAH, Huntsville, AL, October 2004.

OSTROGORSKY, A. Rensselaer Polytechnic Institute

MARIN, C. Rensselaer Polytechnic Institute

VOLZ, M.P. XD42

BONNER, W.A. Crystallod, Inc.


OVERBEY, B.G. Raytheon

ROBERTS, B.C. ED44


PALOSZ, W. SD42/BAE Systems

VOLZ, M.P. SD46

COBB, S. SD46

MOTAKEF, S. Cape Simulations, Inc.

SZOFRAN, F.R. SD46


PALOSZ, W. SD42/BAE Systems

Vapor Transport of ZnO in Closed Ampoules—Abstract Only. For publication in the Journal of Crystal Growth.

PARIS, D. NAFP—Clark Atlanta

TREVINO, L.C. EV23

WATSON, M.D. EV23


PARKER, L.N. ED44/Jacobs Sverdrup

MINOW, J.I. EV13

DAVIS, V.A. SAIC

GARDNER, B.M. SAIC

MANDELL, M.J. SAIC

Analytical Surface Charging for a Candidate Solar Sail Mission Using NASCAP–2K—Presentation. For presentation at the 9th Spacecraft Charging Technology Conference, Tsukuba, Japan, April 4–8, 2005.

PARKER, L.N. ED44/Jacobs Sverdrup

MINOW, J.I. EV13

DAVIS, V.A. SAIC

GARDNER, B.M. SAIC

Analysis of Surface Charging for a Candidate Solar Sail Mission Using NASCAP–2K—Abstract Only. For presentation at the 9th Spacecraft Charging Technology Conference, Tsukuba, Japan, April 4–8, 2005.
Analysis of Surface Charging for a Candidate Solar Sail Mission Using NASCAP–2K—Final Paper. For presentation at the 9th Spacecraft Charging Technology Conference, Tsukuba, Japan, April 4–8, 2005.

PARKER, L.N. ED44/Jacobs Sverdrup
MINOW, J.I. EV13
DAVIS, V.A. SAIC
MANDELL, M.J. SAIC
GARDNER, B.M. SAIC


PARKER, L.N. ED44/Jacobs Sverdrup
MINOW, J.I. EV13
DAVIS, V.A. SAIC
MANDELL, M.J. SAIC
GARDNER, B.M. SAIC


PETERSEN, W.A. XD11
KNUPP, K. XD11
WALTERS, J. XD11
DEIERLING, W. XD11
GAUTHIER, M. XD11
DOLAN, B. XD11
DICE, J.P. XD11
SATTERFIELD, D. XD11
CARTER, C. XD11


PATRICK, M.P. ED12
COOPER, A.E. ED12
POWERS, W.T. ED12

Modeling of a Metal–Ferroelectric–Semiconductor Field-Effect Transistor Nand Gate—Abstract Only. For presentation at the 11th International Meeting on Ferroelectricity, Foz do Iguacu, Brazil, September 5–9, 2005, and to be published in the Ferroelectrics Journal.

PETERSEN, W.A. XD11
CHRISTIAN, H.J. XD11
RUTLEDGE, S.A. XD11


LEWIS, R.A. R Lewis Company


PHILLIPS, T.A. EI52
MACLEOD, T.C. EI52
HO, F.D. UAH


PEARSON, J.B. XD21
LEWIS, R.A. R Lewis Company


PERY, J.L. EV51
TOMES, K.M. EV51
ROYCHOUDHURY, S. Precision Combustion, Inc.
TATARA, J.D. Qualis Corp.

Anaerobic Decomposition of Cellulose by Alkaliphilic Microbial Community of Owens Lake, California—

PIKUTA, E.V. XD12
ITOH, T. RIKEN BioResource Center
HOOVER, R.B. XD12


PERRY, J.L. EV51
GONZALEZ, J.E. Santa Clara University
LUVALL, J.C. XD11
RICKMAN, D.L. XD11


PERRY, J.L. EV51
GONZALEZ, J.E. Santa Clara University
LUVALL, J.C. XD11
RICKMAN, D.L. XD11

Modeling of a Metal–Ferroelectric–Semiconductor Field-Effect Transistor Nand Gate—Abstract Only. For presentation at the 11th International Meeting on Ferroelectricity, Foz do Iguacu, Brazil, September 5–9, 2005, and to be published in the Ferroelectrics Journal.

PIKUTA, E.V. XD12
ITOH, T. RIKEN BioResource Center
HOOVER, R.B. XD12


PERRY, J.L. EV51
GONZALEZ, J.E. Santa Clara University
LUVALL, J.C. XD11
RICKMAN, D.L. XD11


PERRY, J.L. EV51
GONZALEZ, J.E. Santa Clara University
LUVALL, J.C. XD11
RICKMAN, D.L. XD11


PERRY, J.L. EV51
GONZALEZ, J.E. Santa Clara University
LUVALL, J.C. XD11
RICKMAN, D.L. XD11

Abstract Only. For presentation at and publication in the proceedings of The International Symposium of Optical Science and Technology 50th Annual Meeting—Instruments, Methods, and Missions for Astrobiology IX, San Diego, CA, July 31–August 4, 2005.

PITTMAN, J.V. XD11/USRA
FUEGLISTALER, S. University of Washington
MILLER, T.L. XD11
WEINSTOCK, E.M. Harvard University

PITTMAN, J.V. XD11/USRA
ROBERTSON, F.R. XD11
MILLER, T.L. XD11

POLZIN, K.A. XD20
MARKUSIC, T.E. XD20

POLZIN, K.A. XD20
MARKUSIC, T.E. XD20
RAITSES, Y. Princeton University
SMIRNOV, A. Princeton University
FISCH, N.J. Princeton University

POLZIN, K.A. XD20
MARKUSIC, T.E. XD20
Galium Electromagnetic (GEM) Thruster Concept and Design—Abstract Only. For presentation at the 53rd JANNAF Propulsion Meeting/2nd Liquid Propulsion Subcommittee/1st Spacecraft Propulsion Joint Meeting, Monterey, CA, December 5–8, 2005.

POLZIN, K.A. XD20
MARKUSIC, T.E. XD20
STANOJEV, B.J. ER11
DEHOYOS, A. ER11
RAITSES, Y. Princeton University
SMIRNOV, A. Princeton University
FISCH, N.J. Princeton University

POOLE, E. XD21
MYRABO, L.N. Rensselaer Polytechnic Institute

PUSEY, M.L. XD42
FORSYTHE, E. BAE Systems

PUSEY, M.L. XD42
FORSYTHE, E. BAE Systems
ACHAN, A. Raytheon

POLZIN, K.A. XD20
MARKUSIC, T.E. XD20
QUATTROCHI, D.A. XD11
ESTES, JR., M.G. USRA
CROSSON, W.L. XD11
KHAN, M. Georgia Environmental Protection Division
Remote Sensing Characteristic of the Urban Landscape for Improvement of Air Quality Modeling. For presentation

QUATTROCHI, D.A. XD11
ESTES, JR., M.G. XD11
CROSSON, W.L. XD11
KHAN, M. — Georgia Environmental Protection Division

QUATTROCHI, D.A. XD11
NISKAR, A.S. — Centers for Disease Control and Prevention

RAMACHANDRAN, N. XD42

RAMACHANDRAN, N. XD42
Space Laboratory on a Table Top—A Next Generation ECLSS Design and Diagnostic Tool—Abstract Only. For presentation at the 35th International Conference on Environmental Systems (ICES), Rome, Italy, July 11–14, 2005.

RAMACHANDRAN, N. XD42

RAMACHANDRAN, N. XD42

LESLIE, F.W. XD42

RAMPINI, R. — Alenia Spazio S.p.A.
LOBASCIO, C. — Alenia Spazio S.p.A.
PERRY, J.L. — EV51
HINDERER, S. — EADS Space Transportation GmBH

RAMSEY, B.D. XD12

RAMSEY, B.D. XD12

RAO, S. — Intelligent Optical Systems
MALAK, H. — American Environmental Systems, Inc.
BISHOP, A. — UAH
CISZAK, E. — UAH
RICHMOND, R.C. — XD42

RAY, C.S. XD42
REIS, S.T. — University of Missouri-Rolla
BROW, R.K. — University of Missouri-Rolla
HOLAND, W. — Ivoclar Vivadent AG
RHEINERGER, V. — Ivoclar Vivadent AG

ROBERTSON, C.S. XD42
REIS, S.T. University of Missouri-Rolla
SENE, F.F. Energy and Nuclear Research Institute
YANG, J.B. University of Missouri-Rolla
PONTUSCHKA, W.M. Physics Institute
GIEHL, J.M. Physics Institute
KIM, C.W. University of Missouri-Rolla


RICHARDSON, E.H. NP40
MUNK, M.M. NP40
JAMES, B.F. NP40
MOON, S.A. Gray Research

Review of NASA In-Space Propulsion Technology Program Inflatable Decelerator Investments—Final paper. For presentation at the 18th AIAA Aerodynamic Decelerator Technology Conference and Seminar, Munich, Germany, May 23–26, 2005.

RICHMOND, R.C. XD42


RISON, W. New Mexico Institute of Mining and Technology


ROBERTSON, F.R. XD11
WICK, G. NOAA/Environmental Technology Laboratory
BOSILOVICH, M.G. NASA Goddard Space Flight Center


ROBERTSON, F.R. XD11
LU, H.-I. USRA

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