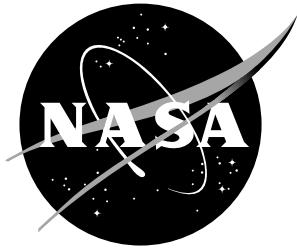


NASA Technical Memorandum 108502  
Volume I

# FY 1995 Scientific and Technical Reports, Articles, Papers, and Presentations

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*Compiled by*  
*Joyce E. Turner*



NASA Technical Memorandum 108502

Volume I

# FY 1995 Scientific and Technical Reports, Articles, Papers, and Presentations

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*Compiled by*

*Joyce E. Turner*

*Marshall Space Flight Center • MSFC, Alabama*

National Aeronautics and Space Administration  
Marshall Space Flight Center • MSFC, Alabama 35812

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October 1995

## **FOREWORD**

In accordance with the NASA Space Act of 1958, the MSFC has provided for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof.

Since July 1, 1960, when the George C. Marshall Space Flight Center 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."

The N number shown for the reports listed is assigned by the Center for AeroSpace Information (CASI), Baltimore, Maryland, indicating that the material is unclassified and unlimited and is available for public use. These publications can be purchased from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161. The N number should be cited when ordering.



**GEORGE C. MARSHALL SPACE FLIGHT CENTER**  
Marshall Space Flight Center, Alabama

**FY 1995 SCIENTIFIC AND TECHNICAL REPORTS,  
ARTICLES, PAPERS, AND PRESENTATIONS**

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# NASA TECHNICAL MEMORANDUM

TM-4715 August 1995  
The NASA/MSFC Global Reference Atmospheric Model—1995 Version (GRAM-95). C.G. Justus,\* W.R. Jeffries III, S.P. Yung,\* and D.L. Johnson. Systems Integration and Analysis Laboratory. \*Computer Sciences Corp.  
N96-11695

The latest version of the Global Reference Atmospheric Model (GRAM-95) is presented and discussed. GRAM-95 uses the new Global Upper Air Climatic Atlas (GUACA) CD-ROM data set, for 0- to 27-km altitudes. As with earlier versions, GRAM-95 provides complete geographical and altitude coverage for each month of the year. Individual years 1985 to 1991 and a period-of-record (1980 to 1991) can be simulated for the GUACA height range. GRAM-95 uses a specially developed data set, based on Middle Atmosphere Program (MAP) data, for the 20- to 120-km height range, and the NASA Marshall Engineering Thermosphere (MET) model for heights above 90 km. Fairing techniques assure a smooth transition in the overlap height ranges (20 to 27 km and 90 to 120 km). In addition to the traditional GRAM variables of pressure, density, temperature, and wind components, GRAM-95 now includes water vapor and 11 other atmospheric constituents ( $O_3$ ,  $N_2O$ , CO,  $CH_4$ ,  $CO_2$ ,  $N_2$ ,  $O_2$ , O, A, He, and H). A new, variable-scale perturbation model provides both large-scale and small-scale deviations from mean values for the thermodynamic variables and horizontal and vertical wind components. The perturbation model includes new features that simulate intermittency (patchiness) in turbulence and small-scale perturbation fields. The density perturbations and density gradients (density shears) computed by the new model compare favorably in their statistical characteristics with observed density perturbations and density shears from 32 space shuttle reentry profiles. GRAM-95 provides considerable improvement in wind estimates from the new GUACA data set, compared to winds calculated from the geostrophic wind relations previously used in the 0- to 25-km height range. The GRAM-95 code has been put into a more modular form, easier to incorporate as subroutines in other programs (e.g., trajectory codes). A complete user's guide for running the program, plus sample input and output, is provided.

TM-108468 October 1994  
Dynamics Explorer 1, Retarding Ion Mass Spectrometer Summary Spectrograms—82/001 to 82/109 Spin-Time Spectrograms for  $H^+$ ,  $He^+$ ,  $O^+$ ,  $N^+$ ,  $O^{++}$ ,  $M/Z = 2$ , and Molecular Ions. By DE 1/RIMS Investigators. Space Sciences Laboratory.  
N95-15607

The Retarding Ion Mass Spectrometer (RIMS) experiment onboard the Dynamics Explorer 1 (DE 1) satellite was designed to perform energy and mass-per-charge analysis on low-energy ions (<50 eV) with mass/charge ratios ranging from 1 to 40 amu/Z. The DE 1 satellite, carrying the RIMS experiment, was launched into an elliptical polar orbit on August 3, 1981. The ~7.5 hour orbit has perigee of 675 km altitude and apogee of 24,875 km altitude. This document, and those that follow in this series, contains summary RIMS data spectrograms for each orbit for which RIMS data are available. The RIMS instrument began returning science data on day 280 of 1981 and continued to return usable data until the end of the DE mission in March 1991. It should be noted that studies of the RIMS data set should be conducted only with a thorough awareness of the material described in the introduction section presented here, or in collaboration with a scientist familiar with RIMS data analysis.

TM-108469 October 1994  
Metrication in a Global Environment. J. Aberg.  
Systems Analysis and Integration Laboratory.  
N95-14919

A brief history about the development of the metric system of measurement. The need for the U.S. to implement the "SI" metric system in the international markets, especially in the aerospace and general trade. Development of metric implementation and experiences locally, nationally, and internationally are included.

TM-108471 December 1994  
NASA Marshall Space Flight Center Solar Observatory Report—March–May 1994. J.E. Smith. Space Sciences Laboratory. N95-70576

This report provides a description of the NASA Marshall Space Flight Center's Solar Vector Magnetograph Facility and gives a summary of its observations and data reduction during March–May 1994. The systems that make up the facility are a magnetograph telescope, an  $H-\alpha$  telescope, a Questar telescope, and a computer code.

TM-108472 November 1994  
Vehicle Health Management Using Adaptive Techniques—CDDF Final Report (No. 92-12). J.H. Kim and R. Kissel. Program Development Office.  
N95-15609

Automated engine diagnostics using cognitive computing methodologies are investigated. Space shuttle main engine vibrational data are used to test the algorithms.

## NASA TECHNICAL MEMORANDUM

TM-108473

December 1994

Analytical Control Test Plan and Microbiological Methods for the Water Recovery Test. M.S. Traweek and J.D. Tatara,\* editors. Structures and Dynamics Laboratory. \*ION Electronics.

N95-19061

Qualitative and quantitative laboratory results are important to the decision-making process. In some cases, they may represent the only basis for deciding between two or more given options or processes. Therefore, it is essential that handling of laboratory samples and analytical operations employed are performed at a deliberate level of conscientious effort. Reporting erroneous results can lead to faulty interpretations and result in misinformed decisions.

This document provides analytical control specifications which will govern future test procedures related to all Water Recovery Test (WRT) Phase III activities to be conducted at the National Aeronautics and Space Administration/Marshall Space Flight Center (NASA/MSFC). This document addresses the process which will be used to verify analytical data generated throughout the test period, and to identify responsibilities of key personnel and participating laboratories, the chains of communication to be followed, and ensure that approved methodology and procedures are used during WRT activities. This document does not outline specifics, but provides a minimum guideline by which sampling protocols, analysis methodologies, test site operations, and laboratory operations should be developed.

TM-108474

January 1995

Guidelines for Qualifying Cleaning and Verification Materials. D. Webb. Materials and Processes Laboratory.

N95-20694

This document is intended to provide guidance in identifying technical issues which must be addressed in a comprehensive qualification plan for materials used in cleaning and cleanliness verification processes. Information presented in this report is intended to facilitate development of a definitive checklist that should address all pertinent materials issues when down selecting a cleaning/verification media.

TM-108475

January 1995

A 20-k Payload Launch Vehicle Fast Track Development Concept Using an RD-180 Engine and a Centaur Upper Stage. Compiled by Ronald Toelle. Space Transportation and Exploration Office.

N95-19648

A launch vehicle concept to deliver 20,000 lb of payload to a 100-nmi orbit has been defined. A new liquid oxygen/kerosene booster powered by an RD-180 engine was designed while using a slightly modified Centaur upper stage. The design, development, and test program met the imposed 40-month schedule by elimination of major structural testing by increased factors of safety and concurrent engineering concepts. A growth path to attain 65,000 lb payload is developed.

TM-108476

January 1995

Preliminary Control System Design and Analysis for the Space Station Furnace Facility Thermal Control System. M.E. Jackson. Structures and Dynamics Laboratory.

N95-20560

This report presents Space Station Furnace Facility (SSFF) thermal control system (TCS) preliminary control system design and analysis. The SSFF provides the necessary core systems to operate various materials processing furnaces. The TCS is defined as one of the core systems, and its function is to collect excess heat from furnaces and to provide precise cold temperature control of components and of certain furnace zones. Physical interconnection of parallel thermal control subsystems through a common pump implies the description of the TCS by coupled nonlinear differential equations in pressure and flow. This report formulates the system equations and develops the controllers that cause the interconnected subsystems to satisfy flow rate tracking requirements. Extensive digital simulation results are presented to show the flow rate tracking performance.

TM-108477

January 1995

Advanced Liquid Oxygen (LO<sub>2</sub>) Propellant Conditioning Concept Testing. G.L.E. Perry, J.D. Suter, and S.G. Turner. Propulsion Laboratory.

N95-22672

Advanced methods of liquid oxygen (LO<sub>2</sub>) propellant conditioning were studied as part of an effort for increasing reliability and operability while reducing cost of future heavy lift launch vehicles. The most promising conditioning concept evaluated was no-bleed (passive recirculation) followed by low-bleed, helium injection, and use of a recirculation line. Full-scale cryogenic testing was performed with a sloped feedline test article to validate models of behavior of LO<sub>2</sub> in the feedline and to prove no-bleed feasibility. Test data are also intended to help generate design guidelines for the development of a main propulsion system feed duct. A design-of-experiments matrix of over 100 tests was developed to test all four propellant conditioning concepts and the impact of design parameters on the concepts.

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Liquid nitrogen was used as the test fluid. The work for this project was conducted from October 1992 through January 1994 at the hydrogen cold flow facility of the west test area of MSFC. Test data have shown that satisfactory temperatures are being obtained for the no-bleed conditioning concept.

TM-108479 February 1995  
Transport Phenomena in the Micropores of Plug-Type Phase Separators. M.M. Fazah. Propulsion Laboratory N95-20561

This study numerically investigates the transport phenomena within and across a porous-plug phase separator. The effect of temperature differential across a single pore and of the sidewall boundary conditions, i.e., isothermal or linear thermal gradient, are presented and discussed. The effects are quantified in terms of the evaporation mass flux across the boundary and the mean surface temperature. A two-dimensional finite element model is used to solve the continuity, momentum, and energy equations for the liquid.

The temperature differentials across the pore interface of 1.0, 1.25, and 1.5 K are examined and their effect on evaporation flux and mean surface temperature is shown. For isothermal side boundary conditions, the evaporation flux across the pore is directly proportional and linear with  $\Delta T$ . For the case of an imposed linear thermal gradient on the side boundaries, Biot numbers of 0.0, 0.15, and 0.5 are examined. The most significant effect of Biot number is to lower the overall surface temperature and evaporation flux.

TM-108480 October 1994  
FY 1994 Scientific and Technical Reports, Articles, Papers, and Presentations. Compiled by Joyce E. Turner. Management Operations Office. N95-23225

This document presents formal NASA technical reports, papers published in technical journals, and presentations by MSFC personnel in FY94. It also includes papers of MSFC contractors.

After being announced in STAR, all of the NASA series reports may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

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

TM-108481 February 1995  
Statistically Generated Weighted Curve Fit of Residual Functions for Modal Analysis of Structures. P.S. Bookout. Structures and Dynamics Laboratory. N95-22950

A statistically generated weighting function for a second-order polynomial curve fit of residual functions has been developed. The residual flexibility test method, from which a residual function is generated, is a procedure for modal testing large structures in an external constraint-free environment to measure the effects of higher order modes and interface stiffness. This test method is applicable to structures with distinct degree-of-freedom interfaces to other system components. A theoretical residual function in the displacement/force domain has the characteristics of a relatively flat line in the lower frequencies and a slight upward curvature in the higher frequency range. In the test residual function, the above-mentioned characteristics can be seen in the data, but due to the present limitations in the modal parameter evaluation (natural frequencies and mode shapes) of test data, the residual function has regions of ragged data. A second-order polynomial curve fit is required to obtain the residual flexibility term. A weighting function of the data is generated by examining the variances between neighboring data points. From a weighted second-order polynomial curve fit, an accurate residual flexibility value can be obtained. The residual flexibility value and free-free modes from testing are used to improve a mathematical model of the structure. The residual flexibility modal test method is applied to a straight beam with a trunnion appendage and a space shuttle payload pallet simulator.

TM-108482 March 1995  
Simplified Liquid Oxygen Propellant Conditioning Concepts. N.L. Cleary, K.A. Holt, and R.H. Flachbart. Propulsion Laboratory. N95-24558

Current liquid oxygen feed systems waste propellant and use hardware, unnecessary during flight, to condition the propellant at the engine turbopumps prior to launch. Simplified liquid oxygen propellant conditioning concepts are being sought for future launch vehicles. During a joint program, four alternative propellant conditioning options were studied: (1) passive recirculation, (2) low bleed through the engine, (3) recirculation lines, and (4) helium bubbling. The test configuration for this program was based on a vehicle design which used a main recirculation loop that was insulated on the downcomer and uninsulated on the upcomer. This produces a natural convection recirculation flow. The test article for this program simulated a feedline

## NASA TECHNICAL MEMORANDUM

which ran from the main recirculation loop to the turbopump. The objective was to measure the temperature profile of this test article. Several parameters were varied from the baseline case to determine their effects on the temperature profile. These parameters included: flow configuration, feedline slope, heat flux, main recirculation loop velocity, pressure, bleed rate, helium bubbling, and recirculation lines. The heat flux, bleed rate, and recirculation line configurations produced the greatest changes from the baseline temperature profile. However, the temperatures in the feedline remained subcooled. Any of the options studied could be used in future vehicles.

**TM-108483** March 1995  
Permeability Testing of Composite Material and Adhesive Bonds for the DC-XA Composite Feedline Program. A.T. Nettles. Materials and Processes Laboratory. N95-23551

Hercules™ IM7/8552 carbon/epoxy and Hysol™ EA 9394 epoxy adhesive bonded between composite/titanium were tested for permeability after various numbers of thermal cycles between 100 °C and liquid nitrogen (-196 °C). The specimens were quenched from the 100 °C temperature into liquid nitrogen to induce thermal shock into the material. Results showed that the carbon/epoxy system was practically impermeable even after 12 thermal cycles. The EA 9394 adhesive bondline was more permeable than the carbon/epoxy, but vacuum mixing tended to minimize the permeability and keep it within allowable limits. Thermal cycling had little effects on the permeability values of the bondline specimens.

**TM-108484** April 1995  
Space Sciences Laboratory Publications and Presentations, January 1–December 31, 1994. Compiled by T.W. Moorehead. Space Sciences Laboratory. N95-30780

This document lists the significant publications and presentations of the Space Sciences Laboratory during the period January 1–December 31, 1994. Entries in the main part of the document are categorized according to NASA Reports (arranged by report number), Open Literature, and Presentations (arranged alphabetically by title). Also included for completeness is an appendix (arranged by report number) listing preprints issued by the Laboratory during this reporting period. Some of the preprints have not been published; those already published are so indicated. Most of the articles listed under Open Literature have appeared in refereed professional journals, books, monographs, or conference proceedings. Although many published abstracts are even-

tually expanded into full papers for publications in scientific and technical journals, they are often sufficiently comprehensive to include the significant results of the research reported. Therefore, published abstracts are listed separately in a subsection under Open Literature. Questions or requests for additional information about the entries in this report should be directed to Gregory S. Wilson (ES01, 544-7579) or to one of the authors. The organizational code of the cognizant SSL branch or office is given at the end of each entry.

**TM-108485** March 1995  
Dynamics Explorer 1, Retarding Ion Mass Spectrometer Summary Spectrograms—82/110 to 82/229 Spin-Time Spectrograms for H<sup>+</sup>, He<sup>+</sup>, O<sup>+</sup>, N<sup>+</sup>, O<sup>++</sup>, M/Z = 2, and Molecular Ions. DE 1/RIMS Investigators. Space Sciences Laboratory. N95-24763

The Retarding Ion Mass Spectrometer (RIMS) experiment onboard the Dynamics Explorer 1 (DE 1) satellite was designed to perform energy and mass-per-charge analysis on low-energy ions (<50 eV) with mass/charge ratios ranging from 1 to 40 amu/Z. The DE 1 satellite, carrying the RIMS experiment, was launched into an elliptical polar orbit on August 3, 1981. The ~7.5 hour orbit has perigee of 675 km altitude and apogee of 24,875 km altitude. This document, and those that follow in this series, contains summary RIMS data spectrograms for each orbit for which RIMS data are available. The RIMS instrument began returning science data on day 280 of 1981 and continued to return usable data until the end of the DE mission in March 1991. It should be noted that studies of the RIMS data set should be conducted only with a thorough awareness of the material described in the introduction section presented here, or in collaboration with a scientist familiar with RIMS data analysis.

**TM-108486** March 1995  
Dynamics Explorer 1, Retarding Ion Mass Spectrometer Summary Spectrograms—82/230 to 82/265 Spin-Time Spectrograms for H<sup>+</sup>, He<sup>+</sup>, O<sup>+</sup>, N<sup>+</sup>, O<sup>++</sup>, M/Z = 2, and Molecular Ions. DE 1/RIMS Investigators. Space Sciences Laboratory. N95-24764

The Retarding Ion Mass Spectrometer (RIMS) experiment onboard the Dynamics Explorer 1 (DE 1) satellite was designed to perform energy and mass-per-charge analysis on low-energy ions (<50 eV) with mass/charge ratios ranging from 1 to 40 amu/Z. The DE 1 satellite, carrying the RIMS experiment, was launched into an elliptical polar orbit on August 3, 1981. The ~7.5 hour orbit has perigee of 675 km altitude and apogee of 24,875 km altitude. This

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document, and those that follow in this series, contains summary RIMS data spectrograms for each orbit for which RIMS data are available. The RIMS instrument began returning science data on day 280 of 1981 and continued to return usable data until the end of the DE mission in March 1991. It should be noted that studies of the RIMS data set should be conducted only with a thorough awareness of the material described in the introduction section presented here, or in collaboration with a scientist familiar with RIMS data analysis.

TM-108487 April 1995  
The Spacelab Scientific Missions: A Comprehensive Bibliography of Scientific Publications.  
Compiled by Dr. Marsha Torr, Payloads Project Office. N95-26084

November 1993 represented the 10-year anniversary of the flight of Spacelab 1 mission, with the first precursor mission (OSTA-1) being launched 2 years earlier. Since that time, a total of 27 shuttle missions have been flown, using the Spacelab system as a facility for conducting scientific research in space. The missions flown to date have allowed a total of approximately 500 Principle Investigator class investigations to be conducted in orbit. These investigations have constituted major scientific efforts in astronomy/astrophysics, atmospheric science, Earth observation, life sciences, microgravity science, and space plasma physics.

An initial survey of the scientific products gleaned from Spacelab missions already flown was sent to the Principle Investigators. In that survey, information was gathered from the investigators on the scientific highlights of their investigations and statistical measurements of overall success—such as papers published. This document is a compilation of the papers that have been published to date in refereed literature.

TM-108488 March 1995  
*International Space Station Alpha Trace Contaminant Control Subassembly Life Test Final Report.* J.D. Tatara\* and J.L. Perry. Structures and Dynamics Laboratory. \*ION Electronics.  
N95-26364

The environmental control and life support system (ECLSS) life test program (ELTP) began with trace contaminant control subassembly (TCCS) life testing on November 9, 1992, at 0745. The purpose of the test, as stated in the NASA document "Requirements for Trace Contaminant Control Sub-assembly High Temperature Catalytic Oxidizer Life Testing (Revision A)," was to "provide for the long duration operation of the ECLSS TCCS HTCO (high temperature catalytic oxidizer) at normal operating

conditions. . . (and thus). . . to determine the useful life of ECLSS hardware for use on long duration manned space missions." Specifically, the test was designed to demonstrate thermal stability of the HTCO catalyst. The report details TCCS stability throughout the test. Graphs are included to aid in evaluating trends and subsystem anomalies. The report summarizes activities through the final day of testing, January 17, 1995 (test day 762).

TM-108489 March 1995  
Transonic Aerodynamic Characteristics of a  
Proposed Wing-Body Reusable Launch Vehicle  
Concept. A.M. Springer. Structures and Dynam-  
ics Laboratory. N95-30712

A proposed wing-body reusable launch vehicle was tested in the NASA Marshall Space Flight Center's 14×14-inch trisonic wind tunnel during the winter of 1994. This test resulted in the vehicle's subsonic and transonic, Mach 0.3 to 1.96, longitudinal and lateral aerodynamic characteristics. The effects of control surface deflections on the basic vehicle's aerodynamics, including a body flap, elevons, ailerons, and tip fins, are presented.

TM-108490 May 1995  
Analysis of Stress Concentration in the Dutton  
Groove Regions of the Super Lightweight  
External Tank. R. Ahmed. Structures and  
Dynamics Laboratory. N95-30328

Because the 2195 aluminum-lithium material of the super lightweight external tank (SLWT ET) has a lower toughness than the 2219 aluminum used in previous ET's, careful attention must be paid to stress concentrations. This report details the analysis performed on some of the stress concentrations in the orthogrid panels of the liquid hydrogen tank.

TM-108491 May 1995  
Bearing Defect Signature Analysis Using  
Advanced Nonlinear Signal Analysis in a Con-  
trolled Environment, CDDF Final Report (No.  
93-10). T. Zoladz, E. Earhart, and T. Fiorucci.  
Structures and Dynamics Laboratory. N95-28364

Utilizing high-frequency data from a highly instrumented rotor assembly, seeded bearing defect signatures are characterized using both conventional linear approaches, such as power spectral density analysis, and recently developed nonlinear techniques such as bicoherence analysis. Traditional low-frequency (less than 20 kHz) analysis and high-frequency envelope analysis of both accelerometer and acoustic emission data are used to recover characteristic bearing distress information buried

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deeply in acquired data. The successful coupling of newly developed nonlinear signal analysis with recovered wideband envelope data from accelerometers and acoustic emission sensors is the innovative focus of this research.

TM-108492 May 1995  
ANSYS Duplicate Finite-Element Checker Routine. R. Ortega. Structures and Dynamics Laboratory. N95-29824

An ANSYS finite-element code routine to check for duplicated elements within the volume of a three-dimensional (3-D) finite-element mesh was developed. The routine developed is used for checking floating elements within a mesh, identically duplicated elements, and intersecting elements with a common face. A space shuttle main engine alternate turbopump development high pressure oxidizer turbopump finite-element model check using the developed subroutine is discussed. Finally, recommendations are provided for duplicate element checking of 3-D finite-element models.

TM-108493 June 1995  
Probability of Detection of Defects in Coatings With Electronic Shearography. S.S. Russell, M.D. Lansing,\* C.M. Horton,\* and W.J. Gnacek.\* Materials and Processes Laboratory. \*The University of Alabama, Huntsville. N95-29374

The goal of this research was to utilize statistical methods to evaluate the probability of detection (POD) of defects in coatings using electronic shearography. The coating system utilized in the POD studies was to be the paint system currently utilized on the external casings of the NASA space transportation system reusable solid rocket motor boosters. The population of samples was to be large enough to determine the minimum defect size for 90-percent POD of 95-percent confidence POD on these coatings. Also, the best methods to excite coatings on aerospace components to induce deformations for measurement by electronic shearography were to be determined.

TM-108494 June 1995  
CRRES Combined Radiation and Release Effects Satellite Program. Compiled by B.L. Giles, M.A. McCook,\* M.W. McCook,\* and G.P. Miller.\* Space Sciences Laboratory \*The University of Alabama, Huntsville. N96-11211

The various regions of the magnetosphere-ionosphere system are coupled by flows of charged particle beams and electromagnetic waves. This coupling gives rise to processes that affect both technical and nontechnical aspects of life on Earth.

The CRRES program sponsored experiments which were designed to produce controlled and known input to the space environment and the effects were measured with arrays of diagnostic instruments. Large amounts of material were used to modify and perturb the environment in a controlled manner, and response to this was studied. The CRRES and PEGSAT satellites were dual-mission spacecraft with a NASA mission to perform active chemical-release experiments, grouped into categories of tracer, modification, and simulation experiments. Two sounding rocket chemical release campaigns completed the study.

TM-108495 June 1995  
Composite Processing Development to Improve Interlaminar Strength Using Ply Interface Particles, MSFC Center Director's Discretionary Fund Final Report, Project No. 93-13. A. Nettles. Materials and Processes Laboratory. N95-30334

The interlaminar shear strength of carbon/epoxy laminates was to be improved by placing particles of aluminum between plies of prepreg tape used for the layup. Difficulty in aligning the aluminum whiskers in the transverse direction prevented any gain in strength. A discussion of shear within a laminate is presented to better understand the results.

TM-108496 July 1995  
Utility Aspects of Space Power: Load Management Versus Source Management. B. Walls. Astrionics Laboratory. N96-11963

Electrical power, as an area of study, is relatively young as compared to language, chemistry, physics, mathematics, philosophy, metallurgy, textiles, transportation, or farming. Practically all of the technology that has enabled the huge, continent-spanning power grids that have become ubiquitous in developed countries was developed in the last 150 years. In fact, Tesla's advocacy of alternating current for transmission just won out in the beginning of this century. Despite the novelty of the field as a whole, space power applications are, of course, much newer. This paper will look at the history of space power and compare it to its older sibling on Earth, forming a basis for determining appropriate transitions of technology from the terrestrial realm to space applications.

TM-108497 August 1995  
Trace Chemical Contaminant Generation Rates for Spacecraft Contamination Control System Design. J.L. Perry. Structures and Dynamics Laboratory.

# NASA TECHNICAL MEMORANDUM

A spacecraft presents a unique design challenge with respect to providing a comfortable environment in which people can live and work. All aspects of the spacecraft environmental design including the size of the habitable volume, its temperature, relative humidity, and composition must be considered to ensure the comfort and health of the occupants. The crew members and the materials selected for outfitting the spacecraft play an integral part in designing a habitable spacecraft because material off-gassing and human metabolism are the primary sources for continuous trace chemical contaminant generation onboard a spacecraft. Since these contamination sources cannot be completely eliminated, active control processes must be designed and deployed onboard the spacecraft to ensure an acceptably clean cabin atmosphere. Knowledge of the expected rates at which contaminants are generated is very important to the design of these processes. Data from past spacecraft missions and human contaminant production studies have been analyzed to provide this knowledge. The resulting compilation of contaminants and generation rates serve as a firm basis for past, present, and future contamination control system designs for space and aeronautics applications.

TM-108499 September 1995  
Interim Report on the Space Station Water Degradation Study Covering the First 24 Months of Exposure. P.S. McRight and M.C. Roman. Propulsion Laboratory.

This report describes the MSFC space station water degradation study (WDS) and presents interim results from the first 24 months of testing. The WDS simulates the stagnant storage of water in distribution lines before the activation of the space station's water processor by storing processed water at ambient temperature in valved sections of 1-in stainless steel and titanium tube. The WDS seeks to determine whether the water quality will degrade unacceptably

and whether microbial growth will proceed to an unmanageable extent during extended stagnation. During the first 24 months, significant changes have occurred. Although iodine, which is used as a biocide, was nearly depleted within the first 6 months of testing, microbial growth has been minimal. This report describes the decrease in iodine concentration and the results of microbial and biofilm analyses. Increases in total organic carbon, iodide, chloride, nickel, iron, and chromium concentrations are presented and discussed. The observed increase in conductivity and the decreases in pH and turbidity are also presented. The authors conclude that, with proper preparation, potable water can be stored under stagnant conditions without unmanageable degradation in water quality; a flushing operation and subsequent processing of the degraded water should render the water system ready for use.

TM-108500 September 1995  
A Guidance and Control Assessment of Three  
Vertical Landing Options for RLV. M. Gallaher,  
D. Coughlin, and K. Krupp. Structures and  
Dynamics Laboratory.

The National Aeronautics and Space Administration is considering a vertical lander as a candidate concept for a single-stage-to-orbit reusable launch vehicle (RLV). Three strategies for guiding and controlling the inversion of a reentering RLV from a nose-first attitude to a vertical landing attitude are suggested. Each option is simulated from a common reentry state to touchdown, using a common guidance algorithm and different controllers. Results demonstrate the characteristics that typify and distinguish each concept and help to identify peculiar problems, level of guidance and control sophistication required, feasibility concerns, and areas in which stringent subsystem requirements will be imposed by guidance and control.

## NASA TECHNICAL PAPERS

TP-3512 October 1994  
Buckling of Composite Beams (CDDF Final  
Report, Project 91-20). P. Thompson. Structures  
and Dynamics Laboratory. N95-14913

Presented in this report are the results of an investigation of the twisting/warping deformations occurring in open-section composite beams. A series of C and L channels were manufactured using both hand layup and the innovative "hot-drape forming" techniques. A transverse tip load was applied at the free end of the cantilevered open-section beams. The test setup allowed the tip load to be applied at various locations along the plane of and at the beam's shear center. Charts are included in this report depicting various angles of ply layups, loads applied, and load application points.

A major verification resulting from this study is that the shear center of an open section composite beam can be altered, if not completely controlled, through laminate layup. Also, it was observed that the choice of the material system does not have an effect on the amount of deformation, as expected, and the material affects the location of an unsymmetric open section composite beam's true shear center. The results from this study have provided a foundation for further investigation into the apparent shifting of the shear center location in open-section composite beams.

TP-3534 February 1995  
The Corrosion Protection of 2219-T87  
Aluminum by Organic and Inorganic Zinc-Rich  
Primers. M.D. Danford, D.W. Walsh,\* and M.J.  
Mendrek. Materials and Processes Laboratory.  
\*California Polytechnic State University.

The behavior of zinc-rich primer-coated 2219-T87 aluminum in a 3.5-percent Na-Cl was investigated using electrochemical techniques. The alternating current (ac) method of electrochemical impedance spectroscopy (EIS), in the frequency range of 0.001 to 40,000 Hz, and the direct current (dc) method of polarization resistance (PR) were used to evaluate the characteristics of an organic, epoxy zinc-rich primer and an inorganic, ethyl silicate zinc-rich primer. A dc electrochemical galvanic corrosion test was also used to determine the corrosion current of each zinc-rich primer anode coupled to a 2219-T87 aluminum cathode. Duration of the EIS/PR and galvanic testing was 21 days and 24 h, respectively. The galvanic test results demonstrated a very high galvanic current between the aluminum cathode and both zinc-rich primer anodes ( $37.9 \mu\text{A}/\text{cm}^2$  and  $23.7 \mu\text{A}/\text{cm}^2$  for the organic and inorganic primers, respectively). The PR results demonstrated a much higher corrosion rate of the zinc in the inorganic primer than in the organic primer, due primarily to the higher porosity in the former. Based on this investigation, the inorganic

zinc-rich primer appears to provide superior galvanic protection and is recommended for additional study for application in the solid rocket booster aft skirt.

TP-3535 February 1995  
Launch Vehicle Flight Control Augmentation  
Using Smart Materials and Advanced  
Composites (CDDF 93-05). C. Barret. Structures  
and Dynamics Laboratory. N95-21346

The Marshall Space Flight Center has a rich heritage of launch vehicles that have used aerodynamic surfaces for flight stability such as the Saturn vehicles and flight control such as on the Redstone. Recently, due to aft center-of-gravity locations on launch vehicles currently being studied, the need has arisen for the vehicle control augmentation that is provided by these flight controls. Aerodynamic flight control can also reduce engine gimbaling requirements, provide actuator failure protection, enhance crew safety, and increase vehicle reliability, and payload capability. In the Saturn era, NASA went to the Moon with 300 ft<sup>2</sup> of aerodynamic surfaces on the Saturn V.

Since those days, the wealth of smart materials and advanced composites that have been developed allow for the design of very lightweight, strong, and innovative launch vehicle flight control surfaces. This paper presents an overview of the advanced composites and smart materials that are directly applicable to launch vehicle control surfaces.

TP-3545 March 1995  
The Corrosion Protection of AISI™ 1010 Steel  
by Organic and Inorganic Zinc-Rich Primers.  
M.D. Danford and M.J. Mendrek. Materials and  
Processes Laboratory. N95-25677

The behavior of zinc-rich primer-coated AISI™ 1010 steel in 3.5-percent Na-Cl was investigated using electrochemical techniques. The alternating current (ac) method of electrochemical impedance spectroscopy (EIS), in the frequency range of 0.001 to 40,000 Hz, and the direct current (dc) method of polarization resistance (PR), were used to evaluate the characteristics of an organic, epoxy zinc-rich primer and an inorganic, ethyl silicate zinc-rich primer. A dc electrochemical galvanic corrosion test was also used to determine the corrosion current of each zinc-rich primer anode coupled to a 1010 steel cathode. Duration of the EIS/PR and galvanic testing was 21 days and 24 h, respectively. The galvanic test results demonstrated a very high current between the steel cathode and both zinc-rich primer anodes (38.8 and 135.2  $\mu\text{A}/\text{cm}^2$  for the organic and inorganic primers, respectively). The results of corrosion rate determinations demonstrated a much higher corrosion rate of the zinc in the inorganic primer than in the organic primer, due primarily to the

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higher porosity in the former. EIS equivalent circuit parameters confirmed this conclusion. Based on this investigation, the inorganic zinc-rich primer appears to provide superior galvanic protection and is recommended for additional study for application on solid rocket booster steel hardware.

**TP-3550** March 1995  
Effect of Processing Parameters on Surface Finish for Fused Deposition Machinable Wax Patterns. F.E. Roberts III. Materials and Processes Laboratory. N95-26769

This report presents a study on the effect of material processing parameters used in layer-by-layer material construction on the surface finish of a model to be used as an investment casting pattern. The data presented relate specifically to fused deposition modeling using a machinable wax.

**TP-3551** May 1995  
CORSSTOL: Cylinder Optimization of Rings, Skin, and Stringers With Tolerance Sensitivity. J. Finckenor and M. Bevill. Structures and Dynamics Laboratory. N95-28215

Cylinder optimization of rings, skin, and stringers with tolerance (CORSSTOL) sensitivity is a design optimization program incorporating a method to examine the effects of user-provided manufacturing tolerances on weight and failure. CORSSTOL gives designers a tool to determine tolerances based on need. This is a decisive way to choose the best design among several manufacturing methods with differing capabilities and costs.

CORSSTOL initially optimizes a stringer-stiffened cylinder for weight without tolerances. The skin and stringer geometry are varied, subject to stress and buckling constraints. Then the same analysis and optimization routines are used to minimize the maximum material condition weight subject to the least favorable combination of tolerances. The adjusted optimum dimensions are provided with the weight and constraint sensitivities of each design variable. The designer can immediately identify critical tolerances. The safety of parts made out of tolerance can also be determined.

During design and development of weight-critical systems, design/analysis tools that provide product-oriented results are of vital significance. The development of this program and methodology provides designers with an effective cost- and weight-saving design tool. The tolerance sensitivity method can be applied to any system defined by a set of deterministic equations.

**TP-3553** May 1995  
Developmental Problems and Their Solution for the Space Shuttle Main Engine Alternate Liquid Oxygen High-Pressure Turbopump: Anomaly or Failure Investigation the Key. R. Ryan and L.A. Gross. Structures and Dynamics Laboratory. N95-28263

The space shuttle main engine (SSME) alternate high-pressure liquid oxygen pump experienced synchronous vibration and ball bearing life problems that were program threatening. The success of the program hinged on the ability to solve these development problems. The design and the solutions to these problems are engirded in the lessons learned and experiences from prior programs, technology programs, and the ability to properly conduct failure or anomaly investigations. The failure investigation determines the problem cause and is the basis for recommending design solutions. For a complex problem, a comprehensive solution requires that formal investigation procedures be used, including fault trees, resolution logic, and action items worked through a concurrent engineering-multidiscipline team. The normal tendency to use an intuitive, cut-and-try approach will usually prove to be costly, both in money and time, and will reach a less than optimum, poorly understood answer. The SSME alternate high-pressure oxidizer turbopump development has had two complex problems critical to program success: (1) high synchronous vibrations and (2) excessive ball bearing wear. This paper will use these two problems as examples of this formal failure investigation approach. The results of the team's investigation provides insight into the complexity of the turbomachinery technical discipline interacting/sensitivities and the fine balance of competing investigations required to solve problems and guarantee program success. It is very important to the solution process that maximum use be made of the resources that both the contractor and Government can bring to the problem in a supporting and noncompeting way. There is no place for the not-invented-here attitude. The resources include, but are not limited to: (1) specially skilled professionals, (2) supporting technologies, (3) computation codes and capabilities, and (4) test and manufacturing facilities.

**TP-3554** May 1995  
Analysis of Stress Concentration at Holes in Components Made of 2195 Aluminum-Lithium. R. Ahmed. Structures and Dynamics Laboratory. N95-30613

Because the 2195 aluminum-lithium of the super lightweight external tank (SLWT ET) has a lower toughness than the 2219 aluminum used in previous ET's, careful attention must be paid to stress concentration in the SLWT ET. This report details

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the initial analysis performed by NASA to determine the material properties required to ensure structural integrity in these critical areas.

TP-3556 May 1995  
The Solar Array-Induced Disturbance of the Hubble Space Telescope Pointing System. C.L. Foster, M.L. Tinker, G.S. Nurre, and W.A. Till. Structures and Dynamics Laboratory.  
N95-28214

The investigation of the vibrational disturbances of the Hubble space telescope that were discovered soon after deployment in orbit is described in detail. It was found that the disturbances were particularly evident during orbital day-night crossings, and that the magnitudes of the disturbances were considerably larger than the design jitter requirements. This paper describes the process by which the vibrations were characterized and isolated to a particular mechanism. The analysis of the flight data and comparisons with computer simulation results showed that the source of disturbances was the thermally driven deformation of the solar arrays in conjunction with frictional effects in the array mechanisms. The control system was successfully modified to attenuate the disturbances to tolerable levels pending mechanical and thermal redesign of the solar arrays. The new arrays were installed during the first space telescope servicing mission and, in combination with the enhanced control system algorithm, reduced the disturbances to satisfactory levels.

TP-3558 May 1995  
Test Load Verification Through Strain Data Analysis. V. Verderame and F. Harrington. Structures and Dynamics Laboratory.  
N95-28718

A traditional binding acceptance criterion on polycrystalline structures is the experimental verification of the ultimate factor of safety. At fracture, the induced strain is inelastic and about an order-of-magnitude greater than designed for maximum expected operational limit. At this extreme strained condition, the structure may rotate and displace at the applied verification load such as to unknowingly distort the load transfer into the static test article. Testing may result in erroneously accepting a submarginal design or rejecting a reliable one. A technique was developed to identify, monitor, and assess the load transmission error through two back-to-back surface-measured strain data. The technique is programmed for expediency and convenience. Though the method was developed to support affordable aerostructures, the method is also applicable for most high-performance air and surface transportation structural systems.

TP-3560 May 1995  
A Conceptual Design for the Attitude Control and Determination System for the Magnetosphere Imager Spacecraft. M.E. Polites and C.K. Carrington. Structures and Dynamics Laboratory.  
N95-28721

This paper presents a conceptual design for the attitude control and determination (ACAD) system for the Magnetosphere Imager (MI) spacecraft. The MI is a small spin-stabilized spacecraft that has been proposed for launch on a Taurus-S expendable launch vehicle into a highly elliptical polar Earth orbit. Presently, launch is projected for 1999. The paper describes the MI mission and the ACAD requirements and then proposes an ACAD system for meeting these requirements. The proposed design is low-power, low-mass, very simple conceptually, highly passive, and consistent with the overall MI design philosophy, which is faster-better-cheaper. Still, the MI ACAD system is extremely robust and can handle a number of unexpected, adverse situations on orbit without impacting the mission as a whole. Simulation results are presented that support the soundness of the design approach.

TP-3562 May 1995  
Study of Localized Corrosion in Aluminum Alloys by the Scanning Reference Electrode Technique. M.D. Danford. Materials and Processes Laboratory.

Localized corrosion in 2219-T87 aluminum (Al) alloy, 2195 aluminum-lithium (Al-Li) alloy, and welded 2195 Al-Li alloy (4043 filler) have been investigated using the relatively new scanning reference electrode technique (SRET). Anodic sites are more frequent and of greater strength in the 2195 Al-Li alloy than in the 2219-T87 Al alloy, indicating a greater tendency toward pitting for the latter. However, the overall corrosion rates are about the same for these two alloys, as determined using the polarization resistance technique. In the welded 2195 Al-Li alloy, the weld bead is entirely cathodic, with rather strongly anodic heat affected zones (HAZ) bordering both sides, indicating a high probability of corrosion in the HAZ parallel to the weld bead.

TP-3578 August 1995  
Low-Pressure Electrical Discharge Experiment to Simulate High-Altitude Lightning Above Thunderclouds. M.A. Jarzembski and V. Srivastava.\* Space Sciences Laboratory.  
\*Global Hydrology and Climate Center.

Recently, extremely interesting high-altitude cloud-ionosphere electrical discharges, like lightning above thunderstorms, have been observed from NASA's space shuttle missions and during airborne and ground-based experiments. To understand these

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discharges, a new experiment was conceived to simulate a thundercloud in a vacuum chamber using a dielectric in particulate form into which electrodes were inserted to create charge centers analogous to those in an electrified cloud. To represent the ionosphere, a conducting medium (metallic plate) was introduced at the top of the chamber. It was found that for different pressures between ~1 and 300 mb, corresponding to various upper atmospheric altitudes, different discharges occurred above the simulated thundercloud, and these bore a remarkable similarity to the observed atmospheric phenomena. At pressures greater than 300 mb, these discharges were rare and only discharges within the simulated thundercloud were observed. Use of a particulate dielectric was critical for the successful simulation of the high-altitude lightning.

TP-3581 August 1995  
Aluminum U-Groove Weld Enhancement Based on Experimental Stress Analysis. V. Verderame and R. Vaughan. Structures and Dynamics Laboratory N96-10864

Though butt-welds are among the most preferred joining methods in aerostructures because of their sealing and assembly integrity and general elastic performance, their inelastic mechanics are generally the least understood. This study investigated experimental strain distributions across a thick aluminum U-grooved weld and identified two weld process considerations for improving the multipass weld strength. The extreme thermal expansion and contraction gradient of the fusion heat input across

the tab thickness between the grooves produce severe peaking, which induces bending moment under uniaxial loading. The filler strain hardening decreased with increasing filler pass sequence. These combined effects reduce the weld strength, and a depeaking index model was developed to select filler pass thicknesses, pass numbers, and sequences to improve the welding process results over the current normal weld schedule.

TP-3583 September 1995  
Impact Damage Resistance of Carbon/Epoxy Composite Tubes for the DC-XA Liquid Hydrogen Feedlines. A.T. Nettles. Materials and Processes Laboratory. N96-11539

Low-velocity impacts were inflicted upon two elbow sections of carbon/epoxy feedline that are to be a part of the Delta Clipper-XA flight vehicle. A soap-based liquid leak detector solution was used to inspect the impact sites for leaks of pressurized gas that was pumped into the tube. Visual surface damage was noted and recorded for each impact site. After impact testing of each of the two sections of tubes was completed, the damage zones were dissected from the tube and cross sectioned through the impact site. These specimens were polished after potting them in epoxy and were examined for microcracking using a fluorescent dye penetrant technique. The results showed that nonvisible damage could cause microcracking, thereby resulting in leaks through the tube wall.

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The 1994 NASA Aerospace Battery Workshop.  
Jeff Brewer.

N95-26785

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N95-31350

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N95-31746

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N95-33199

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The National Space Environment Effects on Spacecraft. Bonnie James, Coordinator; Al Norton, Compiler; and Margaret Alexander, Editor.

N95-25875

RP-1351

Basic Mechanics of Laminated Composite Plates. Alan Nettles.

N95-15763

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N95-18932

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RP-1374

Electronic Systems Failures and Anomalies Attributed to Electromagnetic Interference. R.D. Leach.

RP-1375

Failures and Anomalies Attributed to Spacecraft Charging. R.D. Leach.

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RP-1378

Magnetosphere Imager Science Definition Team Interim report. T.P. Armstrong and C.L. Johnson.

RP-1379

Magnetosphere Imager Science Definition Team Executive Summary. T.P. Armstrong, D.L. Gallagher, and C.L. Johnson.

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CR-196550	February 1, 1995 Moving Temperature Gradient Heat Pipe Furnace System for Microgravity Crystal Growth—SBIR Phase II Final Report (June 1992 to September 1994). NAS8-39359. Thermacore, Inc.	CR-196560	March 24, 1995 Launch Vehicle Flight Dynamics—Final Report January 20, 1994 to January 19, 1995. NAS8-39131, D.O. No. 27. Auburn University.
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MICHELSEN, H.A.	Harvard University		
GUNSON, M.R.	Jet Propulsion Laboratory		
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ABEL, T.M.	Lockheed		
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ADAMS, M.		ES82	
MUSIELAK, Z.E.	UAH		
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AGGARWAL, M.D.		ES76	
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AGGARWAL, M.D.	Alabama A&M University		
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GANGULI, G.	Naval Research Lab		
Lower-Hybrid Wave Excitation and Ion Heating in Narrow Velocity-Shear Layers. For presentation at the Third International Workshop on Interrelationship between Plasma Experiments in the Laboratory and in Space, Pitlochry, Scotland, July 24–28, 1995.			
AMBASTHA, A.	Udaipur Solar Observatory		
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HAGYARD, M.J.	ES82		
Electric Currents and Magnetic Shear Variations During Some Flares of M- and X-Class. For presentation at the IAU Colloquium 153, Tokyo, Japan, May 22–26, 1995.			
AMES, G.			Blue Line Eng.
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LINDNER, J.			
MONTGOMERY, S.			
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BALDESSARRE, G.J. GERNERT, N.J. GILLIES, D.C. LEHOCZKY, S.L.	Thermacore, Inc. Thermacore, Inc. ES75 ES75	BOOKOUT, P.S. ED26 RICKS, E. ED26 JONES, R. ED26
The Moving Gradient Heat Pipe Furnace for Microgravity Crystal Growth. For presentation at the IX International Heat Pipe Conference, Albuquerque, NM, April 1–5, 1995.		Mini Pressurized Logistics Module (MPLM)/International Standard Payload Rack (ISPR) Coupled Load Study. For presentation at the AIAA Dynamics Specialists Conference, Salt Lake City, UT, April 18–19, 1996.
BANKSTON, C.D. GILBERT, J.A.	EB53	BOOKOUT, P.S. ED26
A Satellite-Based Imaging System for Attitude Determination and Remote Sensing. For presentation at the 1995 Society for Experimental Mechanics Spring Conference and Exhibit, Grand Rapids, MI, June 12–14, 1995.		Statistically Generated Weighted Curve Fit of Residual Functions for Modal Analysis of Structures. For publication in Shock and Vibration Journal, 1995.
BARRET, C.	ED15	BOOKOUT, P.S. ED26
Is Aeroelasticity Important to a Launch Vehicle? For presentation at the Society of Women Engineers National Convention, Boston, MA, June 26–July 1, 1995.		Statistically Generated Weighted Curve Fit for Test Generated Residual Functions. For presentation as Masters Thesis in ESM Department, University of Tennessee, Knoxville, TN, December 18, 1994.
BARRET, C.	ED15	BORDELON, W.J., JR. ED31
Flight Control Augmentation for Aft CG Launch Vehicles. For presentation at the AIAA 34th Aerospace Science Meeting, Reno, Nevada, January 15–18, 1996.		GADDIS, S.W. ED31 NESMAN, T.E. ED31
BECHTEL, R.T. HALL, D.K.	EB71 EB71	Cavitation Environment of the Alternate High Pressure Oxygen Turbopump Inducer. For presentation at the 1995 ASME Fluids Engineering Division Summer Meeting, Hilton Head, SC, August 13–18, 1995.
BIGLARI, H. GALABOFF, Z.J.	Sverdrup ED13	BOWDLE, D.A. UAH SRIVASTAVA, V. USRA CUTTEN, D.R. UAH MCCAUL, E.W. USRA ROTHERMEL, J. ES43 JARZEMBSKI, M.A. ES43
An Extended Kalman Filter for Observing the Skiprope Phenomenon of the Tethered Satellite System. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.		The GLObal Backscatter Experiment (GLOBE): Overview, Results, and Applications. For presentation at the Eighth Coherent Laser Radar Conference, Keystone, CO, July 23–27, 1995.
BOCCIPPIO, D.J. GOODMAN, S.J. CHRISTIAN, H.J. WILLIAMS, E.R. BOLDI, R. HECKMAN, S.J. WONG, C.	ES44 ES44 ES44 MIT MIT Phillips Lab. MIT	BRADFORD, J. GP01 NASA Procurements on the Internet. For presentation at the CALS Expo 95, Long Beach, CA, October 23–26, 1995.
Schumann Resonance (SR) Analysis of Large Lightning Events Seen by the Optical Transient Detector (OTD). For presentation at the American Geophysical Union 1995 Fall Meeting, San Francisco, CA, December 11–15,		BRAINERD, J.J. UAH MEEGAN, C.A. ES84 BRIGGS, M.S. UAH PENDLETON, G.N. UAH BROCK, M.N. ES84
		Time Dependent Clustering Analysis of the Second BATSE Gamma-Ray Burst Catalog. For publication in Applied Journal Letters, Chicago, IL.

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SPENCER, R.W.	ES43	
Diurnal Differences in Thick Layer Temperatures from TOVS Pathfinder MSU Temperature Fields. For presentation at the 1995 AGU Meeting, Baltimore, MD, May 29–June 2, 1995.		
BRAY, B.	EO45	
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Reaching the Public Through the World-Wide Web. For presentation at the 1995 AIAA Space Programs and Technologies Conference, Huntsville, AL, September 26–28, 1995.		
BREWER, J.C.	EB74	
JACKSON, L.G.	EB72	
LURIE, C.	TRW	
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MEEGAN, C.A.	ES84	
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BATSE Observations of the Large-Scale Isotropy of Gamma-Ray Bursts. For publication in The Astrophysical Journal, Chicago, IL.		
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NOEVER, D.A.	ES76	
Enhancement of Gas-Liquid Exchange by Bioconvection. For presentation at the 95th General Meeting of the American Society for Microbiology, Washington, DC, May 21–25, 1995.		
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BROWN, R.W.	PD34	
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HUANG, G.		
LI, J.		
CARTER, D.		
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LEMONS, J.A.		
MURPHY, K.M.		
WEAVER, C.T.		
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BUECHLER, D.E.		
RAGHAVAN, R.		
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		Rainfall and Lightning Variability Over the United States. For presentation at the American Geophysical Union 1995 Spring Meeting, Baltimore, MD, May – June 1995.
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MULQUEEN, J.A.		PS02
		Global Emergency Observation, Warning and Relief Network. For presentation at The International Emergency Management and Engineering Conference, Nice, France, May 9–12, 1995.
BULLOCH, J.L.		Michigan Tech University
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BUNE, A.V. GILLIES, D.C. LEHOCZKY, S.L.	NRC Fellow ES75 ES75	EP22 EP22
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BUTLER, B.L. Science Applications International GAUSE, R.L. Science Applications International LOOMIS, W.C. Science Applications International KUBLIN, T.	PT21	CAMPBELL, J.W. STOCKTON, R.
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A Solution to the Problem of Determining the Relative 6 DOF State for Spacecraft Automated Rendezvous and Docking. For presentation at the SPIE's 1995 International Symposium on Aerospace, Orlando, FL, April 17–21, 1995.		PS02 PS02 PS02 PS02 PS02 PS02
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CALVERT, W. BENSON, R.F. CARPENTER, D.L. FUNG, S.F. GALLAGHER, D.L. GREEN, J.L. HAINES, D.M. ET AL.	University of Iowa GSFC Stanford University GSFC ES83 GSFC University of Massachusetts	CARLSTROM, J.E. California Institute of Tech. JOY, M. ES84 GREGO, L. California Institute of Technology Interferometric Imaging of the Sunyaev Zel'dovich Effect at 30 GHz. For publication in Astrophysical Journal Letters, Cambridge, MA.
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		Hybrid Propulsion for Launch Vehicle Boosters: A Program Status Update. For presentation at 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 10–12, 1995.
		CARTER, D.C. WRIGHT, B. TWIGG, P. HO, J.X. LIM, K. KEELING, K.
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		Growth and Characterization of Protein Crystals. For presentation at the PITTCON 95, New Orleans, LA, March 8–10, 1995.
		CASEY, D.M. MCNIDER, R.T. SONG, A.J. JEDLOVEC, G.J.
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CHAMPION, R.H., JR.	EP23		
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CHAPMAN, J.C.	EO32		
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CHEN, K.-T.	ES75		
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Post-Growth Annealing of CdS Crystals Grown by Physical Vapour Transport. For presentation at ICCG XI, The Hague, The Netherlands, June 18–23, 1995.			
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CHOU, S.-H.	ES42		
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CHRISTIAN, H.J.	ES44		
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CLANCEY, B.L. HAND, D.W. HOKANSON, D.R. CRITTENDEN, J.C. CARTER, D.L. GARR, J.D., II FINN, J.	Michigan Tech University Michigan Tech University Michigan Tech University Michigan Tech University ED62 ION Electronics ARC	
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CLARK, T. CAMPBELL, P.	EL54 EB36	
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COLE, J. ROBERTSON, A. CAMPBELL, J.	XX01 XX01 XX01	
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COOK, M. BETH	EH42	
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		The Reusable Launch Vehicle Technology Program and the X-33 Advanced Technology Demonstrator. For presentation at the AIAA Sixth Aerospace Plane and Hypersonic Technologies Conference, Chattanooga, TN, April 4, 1995.
CRAFT, H.G., JR. SHEEHAN, W. JOHNSON, A. THORNTON, R.	LA01 KSC SSC	
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CROELL, A. SZOFRAN, F.R. DOLD, P. BENZ, K.W. LEHOCZKY, S.L.	ES75 ES75 University of Freiburg, Germany University of Freiburg, Germany ES75	
		Floating-Zone Growth of Silicon Under Large Axial Magnetic Fields. For presentation at the 11th International Conference on Crystal Growth, The Hague, Netherlands, June 18-23, 1995.
CRONISE, R. J. NOEVER, D. A. BRITTAINE, A.	ES76	
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CROSSON, W.L.	ES44	DARBY, S.P. EH01
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A Remote Sensing Based Approach to Account for Sub-Grid Scale Variability of Land Surface Properties. For presentation at the Conference on Hydrology, AMS annual meeting, Dallas, TX, January 15-20, 1995.		Assessment of Uncertainty in the Determination of Kinetic Reaction Parameters for Polymeric Materials. For presentation at the 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, San Diego, CA, July 10-12, 1995.
CURRERI, P.A.	ES75	DARWISH, A. Alabama A&M University
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X-Ray Transmission Microscopy Study of the Dynamics of Solid/Liquid Interfacial Breakdown During Metal Alloy Solidification. For presentation at the Eighth International Symposium on Experimental Methods for Microgravity Materials Science, Anaheim, CA, February 4-8, 1996.		BRYANT, W. Alabama A&M University
CUTTEN, D.R.	UAH	VENKATESWARLU, P. Alabama A&M University
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SRIVASTAVA, V.	USRA	PENDLETON, G.N. UAH
Multiwavelength Comparison of Modeled and Measured Remote Tropospheric Aerosol Backscatter over Pacific Ocean. For publication in Journal of Geophysical Research-Atmospheres, Baltimore, MD, May 1995.		HARMON, A. ES84
D'AGOSTINO, M.	ED33	ET AL.
MNASA Plume Radiation Data. For presentation at 22nd JANNAF Exhaust Plume Technology Subcommittee Meeting, MSFC, AL, October 23-27, 1995.		BATSE Observations of the Hard X-Ray Transient GRS1915+105. For presentation at the American Astronomical Society, Tucson, AZ, January 8-13, 1995.
D'AGOSTINO, M.	ED33	DEAN, W.G. Dean Applied Tech.
PESSTS Plume Radiation Data. For presentation at 22nd JANNAF Exhaust Plume Technology Subcommittee Meeting, MSFC, AL, October 23-27, 1995.		WESTRA, D.G. ED63
DAHLEM, M. Space Telescope Science Institute		Pulse Tube Refrigeration for Spacecraft and Commercial Applications. For presentation at Technology 2005, Chicago IL, Oct. 24-26, 1995.
KREYSING, H.-C.		DENG, Z.-T. ED33
Astronomisches Institut der Universitat Tubingen		LIAW, G.-S. ED33
WHITE, S.M. University of Maryland		CHOU, L.C. ED33
ENGELS, D. Hamberger Sternwarte		MACH, K.D.
CONDON, J.J. National Radio Observatory		Exhausted Plume Flow Field Prediction Near the Afterbody of Hypersonic Flight Vehicles in High Altitudes. For presentation at the AIAA Sixth International Aerospace Plane and Hypersonic Technology Conference, Chattanooga, TN, April 3-7, 1995.
HARMON, B.A.	ES84	DENG, Z.-T. Alabama A&M University
ET AL.		LIAW, G-S. Alabama A&M University
		CHOU, L.C. ED33
		Computation of Low-Density Axisymmetric Nozzle Flow Fields by Solving Burnett Equations. For presentation at the AIAA 29th

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DEXTER, C.E.	EP33	SHIBASAKI, K. ES82
HUTT, J.J.	EP33	Coronal Magnetic Fields From Polarization Observations at Microwaves. For presentation at the IAU Colloquium No. 153, Tokyo, Japan, May 22–26, 1995.
HULKA, J.R.	Aerojet	
DENISOV, K.P.	NIIHIMMASH, Russia	
Scaling Techniques in Liquid Rocket Engine Combustion Devices Testing. For presentation at the Second International Symposium on Liquid Rocket Propulsion Liquid Rocket Combustion Devices, Chatillon, France, June 19–21, 1995.		
DIETZ, K.L.	ES84	DRISCOLL, K.T. UAH
ELSNER, R.F.	ES84	BLAKESLEE, R.J. ES43
JOY, M.K.	ES84	A Comment to "Current Budget of the Atmosphere Electric Global Circuit" by Heinz W. Kasemir. For publication in JGR/Atmospheres, Washington, DC.
O'DELL, S.L.	ES84	
RAMSEY, B.D.	ES84	
WEISSKOPF, M.C.	ES84	
ARMSTRONG, T.W.	SAIC	
COLBORN, B.L.	SAIC	
KANVEC, N.	TRW	
Shielding Simulations of the Advanced X-Ray Astrophysics Facility (AXAF). For publication in EUV, X-Ray, and Gamma-Ray Instrumentation for Astronomy VI, Bellingham, Washington.		DUGAL-WHITEHEAD, N.R. EB72
DISCHINGER, H.C., JR.	EO23	WALLS, B.K. EB72
Application of Standardized Human Engineering Methods to Design the Delivery Hardware for the Space Station Remote Manipulator System. For presentation at the 1995 AIAA Technologies Conference, Huntsville, AL, September 1995.		Intermediate Levels of Autonomy Within the SSM/PMAD Breadboard. For publication in Conference Proceedings of the Intersociety Energy Conversion Engineering Conference, Orlando, FL, July 30–August 4, 1995.
DOTY, P.M.	FA64	DUKEMAN, G.A. ED11
What is Necessary to Get Your Ideas to NASA. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.		CALISE, A.J. Georgia Inst. of Tech.
DOUGLAS, F., III	SSC	Hybrid Near-Optimal Aeroassisted Orbit Transfer Plane Change Trajectories. For presentation at 1995 AIAA GN&C Conference, Baltimore, MD, August 7–9, 1995.
FOGLE, F.R.	EJ33	ELROD, M. PD25
MOG, R.A.	QuantiTech, Inc.	ADAMS, A. PS05
WILLIAMSON, A.S.	QuantiTech, Inc.	Considerations of a Lunar Habitat Design. For presentation at the 32nd Space Congress, Merritt Island, FL, April 26, 1995.
RIGGS, J.L.	QuantiTech, Inc.	
Maintenance Budget Allocations in Fiscally Constrained Environments Using Risk Constrained Optimized Maintenance Planning (RCOMP). For presentation at the Fifth Annual Symposium of the National Council on Systems Engineering (NCOSE), St. Louis, MO, July 23–26, 1995.		EMRICH, W. J., JR. PS05
DRAGO, F.C.	ES82	Design Considerations for Space Transfer Vehicles Using Solar Thermal Propulsion. For presentation at the 1995 AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 10–13, 1995.
ALISSANDRAKIS, C.E.	ES82	EULER, H.C. EL54
BORGOLI, F.	ES82	NIEHUSS, K. EL65
HAGYARD, M.	ES82	Future Solar Activity Environment Estimation Methodologies. For presentation at the 1995 AIAA Space Programs and Technologies Conference, Huntsville, AL, September 26, 1995.
EVANS, S.W.		EVANS, S.W. EL58
Comparison of Predicted and Actual Orbital Lifetimes for the SEDS-2 Mission. For presentation at Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.		
EWING, F.L.		EWING, F.L. Mevatec Corp.
FORSYTHE, E.L.		
PUSEY, M.L.		USRA ES76
The Effects of Purification on the Crystallization of Lysozyme at Basic pH. For publication		

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FALCONER, D.A.	ES82	
MOORE, R.L.	ES82	
PORTER, J.G.	ES82	
GARY, G.A.	ES82	
SHIMIZU, T.	University of Tokyo	
Neutral-Line Magnetic Shear and Enhanced Coronal Heating in Solar Active Regions. For presentation at the American Geophysical Union Fall 1995 Annual Meeting, San Francisco, CA, December 11–15, 1995.		
FAWCETT, S.C.	EB53	
Development of Thermally Stabilized Aluminum Mirrors for the Composite Infrared Spectrometer. For presentation at the ASPE 1994 Annual Meeting, Cincinnati, OH, October 2–5, 1994.		
FAZAH, M.M.	EP25	
SCHMIDT, G.R.	EP25	
KARR, G.R.	UAH	
Transport Phenomena in the Micropores of Plug-Type Phase Separators. For presentation at the 33rd AIAA Aerospace Science Meeting and Exhibit, Reno, NV, January 9–12, 1995.		
FINCKENOR, J.	ED52	
ROGERS, P.	ED24	
OTTE, N.	ED24	
BEVILL, M.	EP12	
CORSSTol: Cylinder Optimization of Rings, Skin and Stringers with Tolerance Sensitivity. For presentation at the OPTI 1995, Miami, FL, October 19–21, 1995.		
FISHMAN, G.J.	ES81	
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FISHMAN, G.J.	ES81	
Gamma-Ray Bursts: Observational Overview and Counterpart Prospects. For presentation at the IAU Colloquium No. 151, Flares and Flashes, Sonneberg, Germany, December 5–9, 1994.		
FISHMAN, G.J.	ES81	
MALLOZZI, R.	UAH	
HORACK, J.M.	ES84	
PENDLETON, G.M.	UAH	
ET AL.		
Observations of Gamma-Ray Flashes of Upper Atmospheric Origin. For presentation at the 1995 IUGG XXI Meeting, Boulder, CO, July 2–14, 1995.		
FISHMAN, G.J.	ES81	
The Bursting, Pulsing and Transient High Energy Sky as Seen by the BATSE Experiment on the Compton Observatory. For presentation at The American Astronomical Society, Pittsburgh, PA, June 11–15, 1995.		
FITZJARRALD, D.	ES42	
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CHRISTY, J.	ES42	
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The Scale and Persistence of Soil Moisture Anomalies as Simulated in a Global Model. For presentation at the AMS Conference on Hydrology, Dallas, TX, January 15–20, 1995.		
FOK, M.-C.	ES83	
CRAVEN, P.D.	ES83	
MOORE, T.E.	ES83	
RICHARDS, P.G.	UAH	
Ring Current-Plasmasphere Coupling Through Coulomb Collisions. For publication in American Geophysical Union.		
FOK, M.-C.	ES83	
MOORE, T.E.	ES83	
KOZYRA, J.U.	University of Michigan	
HO, G.C.	University of Michigan	
HAMILTON, D.C.	ES83	
A Three-Dimensional Ring Current Decay Model. For publication in Journal of Geophysical Research, Washington, DC.		
FOK, M.-C.	ES83	
MOORE, T.E.	ES83	
Ring Current Development During Storm Main Phase. For presentation at the IUGG XXI General Assembly, Boulder, CO, July 2–14, 1995.		
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RICHARDS, P.G.	ES83	
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FORD, E.	Columbia University	
TAVANI, M.	Columbia University	
KAARET, P.	Columbia University	
HARMON, B.A.	ES84	
ZHANG, S.N.	USRA	
A Search for Hard X-Ray Emission From Globular Clusters. For publication in Binaries in Clusters Conference Proceedings, Calgary, CA., June 1995.		

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FORSYTHE, E.	ES76	GALLOWAY, P.N.	Teledyne Brown
PUSEY, M.		AVDUEVSKY, V.S.	AVMAR Company
The Effects of Acetate Buffer Concentration on the Solubility of Tetragonal Lysozyme at pH4.0. For publication in The Journal of Protein Crystal Growth, Amsterdam, The Netherlands.		MAROV, M.Y.	AVMAR Company
		DELOACH, A.	FA24
FRAIL, D.A.		Data Base of Russian Microgravity Materials Processing Experiments and Related Technology. For presentation at the 1995 AIAA Space Programs and Technologies Conference, Huntsville, Alabama, September 26–28, 1995.	
National Radio Astronomy Observatory			
KULKARNI, S.R.	California Institute Tech.	GARCIA, R.	ED32
HURLEY, K.C.	University of California	Computational Fluid Dynamics (CFD) in the Design of a Water-Jet-Drive System. For publication in Proceedings of Propulsion Engineering Research Center Sixth Annual Propulsion Symposium, Cleveland, OH, September 13–14, 1994.	
FISHMAN, G.J.	ES81		
ET AL.			
A Search for the Radio Counterpart to the March 1, 1994 Gamma Ray Burst. For publication in The Astrophysical Journal Letters, Chicago, IL.			
FRAZIER, D.O.	ES01	GARCIA, R.	ED32
PALEY, M.S.	ES01	GRIFFIN, L.W.	ED32
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Ground- and Microgravity-Based Photo-deposition and Characterization of Organic Nonlinear Optical Thin Films. For presentation at the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, March 4–10, 1995.		RUF, J.H.	ED32
FRAZIER, D.O.	ES01	WILLIAMS, R.W.	ED32
PALEY, M.S.	ES01	Computational Fluid Dynamics Analysis in Support of the Simplex Turbopump Design. For publication in Proceedings of the Propulsion Engineering Research Center Sixth Annual Propulsion Symposium, Cleveland, OH, September 13–14, 1994.	
ABDEL DAYEM, H.A.	ES01		
ROGERS, J.R.	ES01		
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GALLAGHER, D.L.	ES83	GARY, G.A.	ES82
FOK, M.-C.	ES83	Potential Field Extrapolation Using Three Components of a Solar Vector Magnetogram With a Finite Field of View. For publication in Solar Physics, The Netherlands.	
MOORE, T.E.	ES83		
PEREZ, J.D.	ES83		
KEADY, J.P.	ES83		
Instrument Requirements for Magnetospheric Imaging. For presentation at the Chapman Conference/AGU, Santa Fe, NM, April 3–7, 1995.			
GALLAGHER, D.L.	ES83	GILES, B.L.	ES83
CRAVEN, P.D.	ES83	CHANDLER, M.O.	ES83
COMFORT, R.H.	UAH	WAITE, J.H., JR.	Southwest Research Institute
GREEN, J.L.	GSFC	Thermal Analysis of the Light Ion Polar Wind. For presentation at the 1995 Fall American Geophysical Union Meeting, San Francisco, CA, December 10–15, 1995.	
FUNG, S.F.	GSFC		
Modeling of the Earth's Plasmasphere. For presentation at the IUGG, XXI General Assembly, Boulder, CO, July 2–14, 1995.			
		GOLDEN, H.	EO01
		CORNELL, K.	EO31
		Enhanced MSFC Operational Data System. For presentation at the First International Symposium on Reducing the Cost of Spacecraft Ground Systems and Operations, Chilton, Oxfordshire, UK, September 1995.	
		GOODMAN, S.J.	ES44
		CHRISTIAN, H.J.	ES44
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BUECHLER, D.	ES44	GREINER, J.	Max-Planck Institut	
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ET AL.		ET AL.		
Cross-Sensor Validation of OTD (Optical Transient Detector) Observed Lightning. For presentation at the American Geophysical Union 1995 Fall Meeting, San Francisco, CA, December 11–15, 1995. For publication in EOS, Transactions of the American Geophysical Union.				
GOODMAN, S.J.	ES44	GRiffin, L.W.	ED32	
CHRISTIAN, H.J.	ES44	HUBER, F.W.	Pratt & Whitney	
BLAKESLEE, R.J.	ES44	SHARMA, O.P.	Pratt & Whitney	
KOSHAk, W.J.	ES44	Performance Improvement Through Indexing of Turbine Airfoils Part 2—Numerical Simulation. For presentation at the ASME International Gas Turbine Conference, Houston, TX, June 4–8, 1995. For publication in Journal of Turbomachinery.		
MACH, D.M.	ES44	GRINDLAY, J.E.	Harvard Observatory	
BOECK, W.L.	ES44	PRINCE, T.A.	Caltech	
The Optical Transient Detector: First Results. For presentation at the 1995 IUGG XXI Meeting, Boulder, CO, July 2–14, 1995.				
GORACKE, B.D.	Rockwell	GEHRELS, N.	GSFC	
LEVACK, D.J.H.	Rockwell	TUELLER, J.	GSFC	
JOHNSON, G.W.	PT51	HAILEY, C.J.	Columbia University	
Tripropellant Engine Drive Cycle Considerations for the SSTO Application. For presentation at 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 10–12, 1995.				
GORACKE, B. D.	Rockwell	RAMSEY, B.D.	ES84	
LEVACK, D.J.H.	Rockwell	WEISSKOPF, M.C.	ES84	
JOHNSON, G.W.	PT51	UBERTINI, P.	Instituto di Astrofisica Spaziale	
Tripropellant Engine Drive Cycle Considerations for the SSTO Application. For presentation at 31st Joint Propulsion Conference and Exhibit, San Diego, CA, July 10–13, 1995.				
GORACKE, B.D.	Rockwell	SKINNER, G.K.	University of Birmingham (UK)	
LEVACK, D.J.H.	Rockwell	Energetic X-Ray Imaging Survey Telescope (EXIST). For publication in EUV, X-Ray, and Gamma-Ray Instrumentation for Astronomy VI, Bellingham, WA.		
JOHNSON, G.W.	PT51	GRINER, C.S.	DD01	
Tripropellant Engine Option Comparison for SSTO. For presentation at the AIAA Space Programs and Technologies Conference and Exhibit, Huntsville, AL, Sept. 26–28, 1995.				
GREGORY, J.C.	UAH	GOLDEN, H.	EO01	
RAIKAR, G.N.	UAH	Technology and the Science, Engineering and Technology Institute. For presentation at the International Astronautical Federation (IAF), Oslo, Norway, October 1995.		
CROSS, J.B.	Los Alamos Nat Lab	GUFFIN, O.T.	EO45	
HOFFBAUER, M.A.	Los Alamos Nat Lab	LYONS, A.T.	EO45	
PETERS, P.N.	ES75	NEWHOUSE, M.	Computer Sciences Corp.	
Surface Processing of Semiconductor Materials with Fast Atomic Oxygen. For presentation at the 12th Symposium on Space Nuclear Power Propulsion, Albuquerque, NM, January 8–12, 1995.				
Operations Support Software Design for the Advanced X-Ray Astrophysics Facility (AXAF). For presentation at the AIAA Space Programs and Technologies Conference Exhibit, Huntsville, AL, September 26–28, 1995.				
GUILLORY, A.R.	ES41			
JEDLOVEC, G.J.	ES43			
Variability of Integrated Water Content (IWC) from GOES Pathfinder Data. For presentation at the AMS, Eighth Conference on Satellite Meteorology and Oceanography, Atlanta, GA, Jan. 28–Feb. 2, 1996.				

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GUITER, S.M.	ES83	HAGOPIAN, J.	EO45
MOORE, T.E.	ES83	HOWELL, E.	EO45
KHAZANOV, G.V.	University of Michigan Modeling of O+ Ions in the Plasmasphere. For publication in Journal of Geophysical Research, April 1995.	Architecture for Payload Planning System (PPS) Software Distribution. For presentation at the 1995 AIAA Space Programs and Technologies Conference and Exhibit, Huntsville, AL, September 26–28, 1995.	
GUITER, S.M.	ES83	HAGYARD, M.J.	ES82
CRAVEN, P.D.	ES83	WEST, E.A.	ES82
MOORE, T.E.	ES83	SMITH, J.E.	ES82
RICHARDS, P.G.	ES83	VENKATAKRISHNAN, P.	Indian Inst. Astrophys. A Search for Vector Magnetic Field Variations Associated with the M-Class Flares of 1991 June 10 in AR 6659. For presentation at the Annual Meeting of Solar Physics Division of American Astronomical Society, Memphis, TN, June 4–8, 1995.
GUO, H.	NM Highlands University	HAKKILA, J.	Mankato State University
MARTINEZ, A.	NM Highlands University	MEEGAN, C.A.	ES84
SANGHADASA, M.	UAH	PENDLETON, G.N.	UAH
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CLARK, R.D.	NM Highlands University Synthesis of Phthalocyanines for Nonlinear Optics. For presentation at the American Chemical Society Norm/Rocky Mountain Meeting, Park City, UT, June 14–16, 1995.	BRIGGS, M.S.	UAH
GUO, K.L.	Alabama A&M University	PACIESAS, W.S.	UAH
LIAW, G.S.	Alabama A&M University	EMSLIE, A.G.	UAH
CHOU, L.C.	ED33	Galactic Gamma-Ray Burst Models: Constraints on the Intrinsic Luminosity Function. For publication in Astrophysical Journal, Chicago, IL.	
MACH, K.D.	Wright Lab Shock Structure Prediction by a Modified Direct Simulation Monte Carlo Method. For presentation at the 30th AIAA Thermophysics Conference, San Diego, CA, June 19–22, 1995.	HAKKILA, J.	Mankato State University
GUO, W.P.	UAH	MEEGAN, C.A.	ES84
WU, S.T.	UAH	HORACK, J.M.	ES84
TANDBERG-HANSSEN, E.	ES01	PENDLETON, G.N.	UAH
Disruption of Helmet Streamers by Current Emergence. For publication in The Astrophysical Journal, Tucson, AZ.		BRIGGS, M.S.	UAH
HAGOPIAN, J.	EO45	MALLOZZI, R.S.	UAH
MAXWELL, T.	EO45	KOSHUT, T.M.	UAH
An Approach for Implementing Distributed Planning for Space Station Payload Operations. For presentation at the 1995 AIAA Space Programs and Technologies Conference and Exhibit, Huntsville, AL, September 26–28, 1995.		PREECE, R.D.	UAH
HAGOPIAN, J.	EO45	PACIESAS, W.S.	UAH
HOWELL, E.	Boeing	Luminosity Distributions of Cosmological Gamma-Ray Bursts. For publication in Astrophysical Journal Letters, Cambridge, MA.	
Architecture for Payload Planning System (PPS) Software Distribution. For presentation at the American Institute of Aeronautics and Astronautics (AIAA), Huntsville, AL, September 26–28, 1995.		HAKKILA, J.	Mankato State University
		VO, V.C.	Mankato State University
		MEEGAN, C.A.	ES84
		FISHMAN, G.J.	ES81
		HORACK, J.M.	ES84
		HARTMANN, D.H.	Clemson University
		PENDLETON, G.N.	UAH
		BRIGGS, M.S.	UAH
		PACIESAS, W.S.	UAH
		Selection Effects and Tests of Repetition (Clustering) in the BATSE 1B Catalog. For presentation at the 29th ESLAB Symposium, Nordwijk, The Netherlands, April 25–27, 1995.	

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HAKKILA, J.	Mankato State University		tation at Southeastern Simulation Conference, Orlando, FL, October 22–24, 1995.
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HORACK, J.M.		ES84	
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PACIESAS, W.S.		UAH	
EMSLIE, A.G.		UAH	
	Constraints on the Luminosities of Gamma-Ray Bursts. For presentation at the 29th ESLAB Symposium, Nordwijk, The Netherlands, April 25–27, 1995.		
HAKKILA, J.	Mankato State University		
MEEGAN, C.A.		ES84	
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	Constraints on the Luminosities of Galactic Gamma-Ray Bursts. For presentation at the High-Velocity Neutron Stars and Gamma-Ray Bursts, San Diego, CA, March 15–17, 1995.		
HALE, J.P.		EO23	
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SANDERS, E. B.-N.		EO23	
	Preparing for the Human Factors/Ergonomics Job Market. For presentation at the 39th Annual Meeting of the Human Factors and Ergonomics Society, San Diego, CA, October 9–13, 1995.		
HALE, J.P.		EO23	
	Human Factors Issues and Approaches in the Spatial Layout of a Space Station Control Room, Including the Use of Virtual Reality as a Design Analysis Tool. For presentation at the AIAA Space Programs and Technologies Conference, Huntsville, AL, September 26–28, 1995.		
HALE, J.P.		EO23	
	Applied Virtual Reality Research and Applications at NASA/Marshall Space Flight Center. For presentation at HCI International 1995, Yokohama, Japan, July 9–14, 1995.		
HAMAKER, J.W.		PP03	
	Marshall Space Flight Center Cost Reduction. For presentation at the National Space Society, San Diego, CA, November 13, 1994.		
HAMILTON, G.S.		EO23	
	Ergonomic Microgravity Glove Box Design Using Computer Human Models. For presen-		
			HANSON, J.M. ED11
			DUKEMAN, G.A. ED11
			Optimization of Many-Burn Orbital Transfer. For presentation at the AAS/AIAA Astrodynamics Conference, Halifax, Nova Scotia, Canada, August 14–17, 1995. For publication in AIAA Journal of Guidance and Control.
			HARDIN, D.M. ES44
			GOODMAN, H.M. ES44
			The Hydrologic Cycle Distributed Active Archive Center. For presentation at the 15th Annual Hydrology Days Conference, Ft. Collins, CO, April 3–7, 1995.
			HARMON, B.A. ES84
			WILSON, C.A. ES84
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			PACIESAS, W.S. UAH
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			ZHANG, S.N. Universities Space Research Assoc.
			RUBIN, B.C. Universities Space Research Assoc.
			SCOTT, D.M. Universities Space Research Assoc.
			HJELLMING, R.M.
			National Radio Astronomy Observatory
			RUPEN, M.
			National Radio Astronomy Observatory
			X-Ray/Radio Correlations in X-Ray Nova Scorpii 1994. For publication in Nature, Washington, DC.
			HARMON, B.A. ES84
			A New X-Ray Source Blasts Out Matter at Relativistic Speed. For publication in AAS Meeting, Tucson, AZ.
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			WILSON, C.A. ES84
			FISHMAN, G.J. ES81
			PACIESAS, W.S. UAH
			BRIGGS, M.S. UAH
			ZHANG, S.N. USRA
			RUBIN, B.C. USRA
			SCOTT, D.M. USRA
			Discovery of the Bright, Unusual X-Ray Nova in Scorpius, GRO J1655-40. For publication in Nature, London, England.
			HARMON, B.A. ES84
			ZHANG, S.N. ES84
			PACIESAS, W.S. ES84
			TAVANI, M. ES84
			KAARET, P. ES84
			FORD, E. ES84
			Search for Hard X-Ray Emission from the Soft X-Ray Transient Aquila X-1. For presen-

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tation at American Astronomical Society, Tucson, AZ, January 8–13, 1995.		
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WILSON, C.A.	ES84	
RUBIN, B.C.	ES84	
PACIESAS, W.S.	UAH	
BRIGGS, M.S.	UAH	
Search for Periodic Behavior in GX 339-4 Hard X-Ray Emission. For presentation at the HEAD Meeting, Napa Valley, CA, November 2–5, 1994.		
HARRISON, J.K.	FA66	
SEDS/SEDSAT Project Overview. For presenta- tion at The Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.		
HATHAWAY, D.H.	ES82	
Variations in the Sun's Meridional Flow. For publication in Astrophysical Journal, Chicago, IL.		
HATHAWAY, D.H.	ES82	
Temporal Variations of the Sun's Meridional Flow. For presentation at the 26th Solar Physics Division/American Astronomical Society Meeting, Memphis, TN, June 4–8, 1995.		
HAYASHIDA, K.B.	ED52	
ROBINSON, J.H.	ED52	
HILL, S.A.	ED52	
Micro-Meteoroid and Orbital Debris Damage Analyses on SEDS Tether. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10– 14, 1995.		
HAYASHIDA, K.B.	ED52	
HILL, S.A.	ED52	
Comparisons of Hydrocode Simulation Results Using CTH and SPHINX. For presentation at the AIAA Space Programs and Technologies Conference, Huntsville, AL, September 26–28, 1995.		
HINMAN-SWEENEY, E.	EB62	
CRABB, T.M.	EB62	
Smart Sensing for Laboratory Applications. For publication in Laboratory Robotics and Automation Journal, Hershey, PA, December 20, 1994.		
HO, J.	ES76	
CARTER, D.C.	ES76	
CHANG, B.	ES76	
KEELING, K.	ES76	
KRISHNASAMI, Z.	ES76	
Preliminary Crystallographic Studies of Four Crystal Forms of Serum Albumin. For publi- cation in European Journal of Biochemistry, Zurich, Switzerland.		
HO, J.	ES76	
CARTER, D.	ES76	
RUKER, F.	ES76	
LIM, K.	ES76	
KEELING, K.	ES76	
GILLILAND, G.	ES76	
JI, X.	ES76	
Fusion Proteins as Alternate Crystallization Paths to Difficult Structure Problems. For publication in Protein and Peptide Letters, London, UK.		
HOLDER, D.W., JR.	ED62	
CARTER, D.L.	ED62	
HUTCHENS, C.F.	ED62	
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HORACK, J.M.	ES84	
MALLOZZI, R.S.	UAH	
KOSHUT, T.M.	UAH	
Recent GRB Time Dilation Measurements in the Context of Standard Cosmology. For pub- lication in Astrophysics Journal, Chicago, IL.		
HORACK, J.M.	ES84	
HAKKILA, J.	Mankato State University	
EMSLIE, A.G.	UAH	
MEEGAN, C.A.	ES84	
Analytic Constraints on Gamma-Ray Burst Luminosity Functions. For publication in Astrophysical Journal Letters, Cambridge, MA.		
HUDSON, S.T.	ED34	
COLEMAN, H.W.		
A Preliminary Assessment of Methods for Determining Turbine Efficiency. For presen- tation at 34th Aerospace Sciences Meeting, Reno, NV, January 15–18, 1996.		
HUDSON, S.T.	ED34	
MINOR, J.L.	ED34	
JOHNSON, P.D.	Pratt & Whitney	
Performance Testing of Highly Loaded Single Stage Oxidizer Turbine with Volute Mani- folds. For presentation at the 31st Joint Propulsion Conference, San Diego, CA, July 10–12, 1995.		

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| HUFFAKER, C.F.   | PT31       |  |
| Reliability, Maintainability and Logistic Support Planning for RLV. For presentation at the Strategic Avionics Technology Working Group NASA/Industry National Meeting, Huntsville, AL, May 16–18, 1995.                   |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
| LONG, Y.T.   | ES41 (UAH) |  |
| Response and Decay of Rotating Cryogenic Liquid Helium Reacted to Impulsive Acceleration in Microgravity. For publication in Transactions of the Japan Society of Aeronautical and Space Sciences, Tokyo, Japan.           |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
| PAN, H.L.  | ES41 (UAH) |  |
| Orbital Spacecraft Cryogenic Helium Dewar Sloshing Dynamics Driven by Gravity Gradient Acceleration Associated With Slew Motion. For publication in International Journal of Fluids and Thermal Engineering, Tokyo, Japan. |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
| PAN, H.L.  | ES41 (UAH) |  |
| Sloshing Induced Moment Driven by the Gravity Gradient Associated With Spacecraft Slew Motion. For publication in AIAA Journal of Spacecraft and Rockets, New York, NY.  |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
| PAN, H.L.  | ES41 (UAH) |  |
| Rotational Speed and Wrapping of Different Size Cryogenic Helium Bubbles Around Dewar Well in Microgravity. For publication in Aeronautical Journal, New York, NY.   |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
| LONG, Y.T.   | UAH        |  |
| ZU, G.J.   | UAH        |  |
| Sloshing of Cryogenic Helium Driven by Lateral Impulse/Gravity Gradient-Dominated/Or G-Jitter-Dominated Accelerations and Orbital Dynamics. For publication in Cryogenics.   |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
| PAN, H.L.  | ES41 (UAH) |  |
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| HUNG, R.J.   | ES41 (UAH) |  |
| PAN, H.L.  | ES41 (UAH) |  |
| Mathematical Model of Bubble Sloshing Dynamics for Cryogenic Liquid Helium in Orbital Spacecraft Dewar Container. For publication in Applied Mathematical Modeling, Elsevier Sciences, New York, 1995.                     |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
| PAN, H.L.  | ES41 (UAH) |  |
| Three-Dimensional Transient Flow of Spin-Up in a Filled Cylinder With Oblique Gravity Force. For publication in Japan Society for Aeronautical and Space Sciences, 1995.   |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
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| HUNG, R.J.   | ES41 (UAH) |  |
| PAN, H.L.  | UAH        |  |
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| HUNG, R.J.   | ES41 (UAH) |  |
| LEE, C.C.  | UAH        |  |
| Effect of Baffles on Gravity Gradient Driving Bubble Imbalance Perturbations in Microgravity. For publication in Canadian Aeronautics and Space Journal, Canada.   |            |  |
| HUNG, R.J.   | ES41 (UAH) |  |
| LEE, C.C.  | UAH        |  |
| Effect of Baffle on Gravity Gradient Excited Slosh Waves and Spacecraft Moment and Angular Momentum Fluctuations in Microgravity. For publication in Il Nuovo Cimento, Italy.  |            |  |
| HUTCHENS, C.F.   | ED62       |  |
| RETHKE, D.W.   | ED62       |  |
| Urine Pretreatment Methods and Testing for Microgravity Application. For presentation at the 25th International Conference on Environmental Systems, San Diego, CA, July 10–13, 1995.                                      |            |  |
| JACKSON, M.E.  | ED14       |  |
| SHTESSEL, Y.B.   | UAH        |  |
| Decoupled Thermal Control for Space Station Furnace Facility Using Sliding Mode Techniques. For presentation at the Space  |            |  |

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Technology and Applications International Forum, Albuquerque, NM, January 7-11, 1996.		JONG, J.	AI Signal Research
JARZEMBSKI, M.A.	ES43	NESMAN, T.	ED33
SRIVASTAVA, V.	(ES43) USRA	BORDELON, W.	ED33
Low Pressure Experimental Simulation of Above-Cloud and Intracloud Electrical Discharges. For publication in Geophysical Research Letters, Washington, DC.		JONES, J.	ED33
JARZEMBSKI, M.A.	ES43	ZOLADZ, T.	ED33
SRIVASTAVA, V.	(ES43) USRA	Coherent Phase Wide Band Demodulation Technique for Turbomachinery Cavitation Detection and Monitoring. For presentation at the Society for Machinery Failure Prevention Technology Conference, Mobile, AL, April 22-26, 1996.	
Low Pressure Experimental Simulation of Electrical Discharges Above and Inside a Cloud. For publication in Journal of Atmospheric and Terrestrial Physics, Cranfield, U.K.		KANKELBORG, C.C.	Stanford University
JARZEMBSKI, M.A.	ES43	WALKER, A.B.C., JR.	Stanford University
SRIVASTAVA, V.	(ES43) USRA	HOOVER, R.B.	ES82
CHAMBERS, D.M.	Micro Craft, Inc.	BARBEE, T.W., JR.	Lawrence Livermore
A New Lidar Calibration Technique Using Aerosols. For presentation at the 1995 Coherent Laser Radar Tropical Meeting, Keystone, CO, July 24-27, 1995.		Observation and Modeling of Soft X-Ray Bright Points. I. Initial Results. For publication in The Astrophysical Journal, Chicago, IL.	
JAYROE, R.R., JR.	JA01	KARR, L.J.	ES76
ASTRO-2: Reflections and Lesson Learned. For presentation at the AIAA 1995 Space Programs and Technologies Conference, Huntsville, AL, September 26-28, 1995.		PANOSKALTSIS-MORTARI, A.	
JEDLOVEC, G.J.	ES41	LI, J.	
ATKINSON, R.J.	Lockheed-Martin	DEVORE-CARTER, D.	
Quality and Control of Water Vapor Winds. For presentation at the AMS Eighth Conference on Satellite Meteorology and Oceanography, Atlanta, GA, January 28-February 2, 1996.		WEAVER, C.T.	
JOHNSON, D.L.	EL54	BUKY, R.P.	
JEFFRIES, W.R., III	EL54	In Situ Hybridization for Cytokine mRNA With Digoxigenin Labeled Riboprobes: Sensitivity of Detection and Double Label Applications. For publication in Elsevier Biomedical Press, Amsterdam, The Netherlands.	
YUNG, S.	EL54	KAUKLER, W.F.	UAH
JUSTUS, C.G.	EL54	CURRERI, P.A.	ES75
Improved Global Reference Atmospheric Model (GRAM) Data Base: 0-25Km Altitude. For presentation at the 33rd AIAA Aerospace Sciences Meeting, Reno, Nevada, January 9-12, 1995.		X-Ray Transmission Microscopy of Al-Pb Monotectic Alloys During Solidification. For presentation at the Eighth International Symposium on Experimental Methods for Microgravity Materials Science, Anaheim, CA, February 4-8, 1996.	
JOHNSTON, A.S.	EO63	KAVAYA, M.J.	EB54
HICKAM, H.H.	EO63	Design of a Doppler Lidar for Global Profiling of Tropospheric Winds. For presentation at the Conference on Coherent Laser Radar, Keystone, CO, July 23-27, 1995.	
Lessons Learned—Payload Training in the International Arena. For presentation at the AIAA 1995 Space Programs and Technologies Conference, Huntsville, AL, Sept. 26-28, 1995.		KAVAYA, M.J.	EB54
JOHNSTON, A.S.	EO63	Instrument and Mission Design of a Space Doppler Wind Lidar at NASA. For presentation at the Doppler Wind Lidar Workshop in ESTEC, Noordwijk, the Netherlands, September 20-22, 1995.	
HICKAM, H.H.	EO63	KHAZANOV, G.V.	ES83
Lessons Learned—Payload Training in the International Arena. For presentation at the AIAA 1995 Space Programs and Technologies Conference, Huntsville, AL, Sept. 26-28, 1995.		MOORE, T.E.	ES83
		FOK, M.C.	ES83
		LIEMOHN, M.W.	University of Michigan
		JORDANOVA, V.K.	University of Michigan

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Global Superthermal Electron Model. For presentation at the 1995 American Geophysical Union Meeting, San Francisco, CA, December 10–15, 1995. For publication in Geophysical Research Letter.		International Conference on Atmospheric Electricity, Osaka, Japan, June 10–14, 1996.
KIM, J.H. PD14		KOSHAK, W.J. ES43
Automation Based on Knowledge Modeling Theory and Its Applications in Engine Diagnostic Systems Using Space Shuttle Main Engine Vibrational Data. For presentation as Master's Thesis, Huntsville, AL, April 1995.		SOLAKIEWICZ, R.J. Chicago State Univ.
KINDT, L.M. Michigan Tech University		On the Retrieval of Lightning Radio Sources from Time-of-Arrival Data. For publication in Journal of Geophysical Research, Washington, DC.
MULLINS, M.E. Michigan Tech University		
HAND, D.W. Michigan Tech University		
KLINKE, A.A. Michigan Tech University		
CARTER, D.L. ED62		
GARR, J.D., II ION Electronics, Inc.		
Catalytic Oxidation Model Development of the Volatile Reactor Assembly Unit for the International Space Station Alpha Water Processor. For presentation at the International Conference on Environmental Systems, San Diego, CA, July 10–15, 1995.		
KITTREDGE, S.L. ED63		
The Small Expendable Deployer System (SEDS) Missions 1 and 2 Thermal Analysis and Flight. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.		
KOLODZIEJCZAK, J.J. USRA		KOSHUT, T.M. UAH
AUSTIN, R.A. USRA		KOUVELIOTOU, C. USRA
ELSNER, R.F. ES84		PACIESAS, W.S. UAH
JOY, M.K. ES84		VAN PARADIJS, J. UAH
SULKANEN, M. ES84		PENDLETON, G.N. UAH
KELLOGG, E.M. Harvard-Smithsonian		BRIGGS, M.S. UAH
WARGELIN, B.J. Harvard-Smithsonian		FISHMAN, G.J. ES81
X-Ray Source System at the MSFC X-Ray Calibration Facility. For publication in SPIE—The International Society for Optical Engineering, Bellingham, WA.		MEEGAN, C.A. ES84
KOLODZIEJCZAK, J.J. USRA		Gamma Ray Burst Precursor Activity as Observed with BATSE. For publication in Astrophysical Journal, Chicago, IL.
RAMSEY, B.D. ES84		
Performance of a Liquid Xenon Microstrip Proportional Counter. For publication in SPIE—The International Society for Optical Engineering, Bellingham, WA.		
KOSHAK, W. ES43		KROES, R.L. ES76
BERGSTROM, J.		REISS, D.A. ES76
STEWARD, M.		LEHOCZKY, S.L. ES76
CHRISTIAN, H.		Nucleation of Crystals From Solution in Microgravity. For publication in Microgravity Science and Technology, Munich, Germany.
HALL, J.		
SOLAKIEWICZ, R.		
Calibration of the Optical Transient Detector (OTD). For presentation at the 1996 10th		
KUKHTAREV, N. Alabama A&M University		
ABDELDAYEM, H. USRA		
CAULFIELD, H.J. Alabama A&M University		
DARWISH, A. Alabama A&M University		
FRAZIER, D.O. ES01		
MOGBEL, M. Alabama A&M University		
NOGINOV, M.A. Alabama A&M University		
NOGINOV, N.E. Alabama A&M University		

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VENKATESWARLU, P.		
	Alabama A&M University	
Dynamic Memory in Phase Conjugation of Nonoverlapping in Time Picosecond Pulses.		
For publication in SPIE, Bellingham, WA.		
LAM, N.S-N.	Louisiana State University	
QUATTROCHI, D.A.	ES44	
A GIS for the Characterization and Modeling of Multiscale Remote-Sensing Data Using Fractals and Selected Spatial Techniques. For presentation at the Annual Meeting of Association of American Geographers, Chicago, IL, March 14-18, 1995.		
LANSING, M.	EH13	
RUSSELL, S.	EH13	
WALKER, J.	EH13	
WORKMAN, G.	EH13	
Materials Characterization of Damage in Filament Wound Composite Pressure Vessels. For presentation at the ASNT 1995 Spring Conference, Las Vegas, NV, March 21, 1995.		
LAPENTA, W.	ES42	
ROBERTSON, F.R.	ES42	
LU, H.I.	USRA	
JEDLOVEC, G.	ES43	
Variability of Tropical Divergent Circulations During 1987-1988 as Depicted in Two Reanalysis Data Sets. For presentation at the AMS Conference on Global Ocean-Atmosphere-Land Systems, Atlanta, GA, January 1996.		
LAPENTA, W.M.	ES42	
PERKEY, D.J.	Inst. of Global Change	
KREITZBERG, C.W.	Drexel Univ.	
ROBERTSON, F.R.	ES42	
Potential Vorticity Generation Forced by the North Wall Gulf Stream Front Prior to Explosive Cyclogenesis. For presentation at the Ninth Extratropical Cyclone Workshop, Monterey, CA, December 1995.		
LAROSA, T.N.	Kennesaw State College	
MOORE, R.L.	ES82	
MILLER, J.A.	UAH	
SHORE, S.N.	Indiana University at South Bend	
New Promise for Electron Bulk Energization in Solar Flares: Preferential Fermi Acceleration of Electrons Over Protons in Reconnection-Driven MHD Turbulence. For publication in The Astrophysical Journal, Chicago, IL.		
LASSITER, J.	ED74	
Marshall Space Flight Center Vibration Test Facilities. For publication in Shock and Vibration Technology Review.		
LASSITER, J.	ED74	
Microgravity Acceleration Measurements for Payload Isolation Development. For presentation at 66th Shock and Vibration Symposium, Biloxi, MS, October 30-November 3, 1995.		
LAYMON, C.A.	ES44	
CROSSON, W.L.	ES44	
Regional-Scale Hydrology With a New Land Surface Processes Model. For presentation at the American Meteorological Society, Dallas, TX, January 15-20, 1995.		
LAYMON, C.A.	ES44	
QUATTROCHI, D.A.	ES44	
Characterization of Land Surface Energy Fluxes Within a Great Basin Desert Valley Region Using Satellite Remote Sensing Data. For presentation at the 1995 AGU Meeting, Baltimore, MD, May 29-June 2, 1995.		
LEE, J.E.	PT41	
National Oxidizer Rich Materials Synergy Team. For presentation at the 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 10-12, 1995.		
LEHOCZKY, S.L.	ES75	
GILLIES, D.C.	ES75	
SZOFRAN, F.R.	ES75	
REEVES, F.A.	ES75	
ET AL.		
Crystal Growth of HgCdTe in the AADSF on the USMP-2 Mission. For presentation at the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, January 9-12, 1995.		
LERNER, J.A.	UAH	
JEDLOVEC, G.J.	ES43	
An Intercomparison of Precipitable Water Variability Using the SSM/I and GOES VAS Pathfinder Data Sets. For presentation at the AMS, Eighth Conference on Satellite Meteorology and Oceanography, Atlanta, GA, Jan. 28-Feb. 2, 1996.		
LI, M.	UAH	
NADARAJAH, A.	UAH	
PUSEY, M.L.	ES76	
Modeling the Growth Rates of Tetragonal Lysozyme Crystals. For publication in The Journal of Crystal Growth, Amsterdam, Netherlands.		
LIAW, P.	ED32	
CHEN, Y.-S.	ED32	
SHANG, H.-M.	ED32	
Numerical Investigation of the Slag Behavior in the Aft-End Cavity of Solid Rocket Motors. For presentation at the 33rd Aerospace		

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Sciences Meeting and Exhibit, Reno, NV, January 9–12, 1995.		Energy Conversion Engineering Conference, Orlando, FL, July 31–August 4, 1995.
LIGHTFOOT, R.M.	EP85	LURIE, D. TRW
MCCONNAUGHEY, H.V.	EP01	FOROOZAN, S. TRW
Technology Test Bed for Engine Development. For presentation at the International Symposium on Liquid Rocket Propulsion, Chatillon, France, June 19–21, 1995. For publication in Proceedings of the International Symposium on Liquid Rocket Propulsion, Chatillon, France, June 19–21, 1995.		BREWER, J.C. EB74
		JACKSON, L. EB72
		Nickel-Hydrogen Battery State of Charge Management in the Absence of Active Cooling. For presentation at the 30th Intersociety Energy Conversion Engineering Conference, Orlando, FL, July 31–August 4, 1995.
LIM, K.	ES76	MAJUMDAR, A.K. Sverdrup
HO, J.X.	ES76	VAN HOOSER, K.P. EP32
WRIGHT, B.	ES76	A General Fluid System Simulation Program to Model Secondary Flows in Turbomachinery. For presentation at the 31st AIAA/ASME/SAE Joint Propulsion Conference, San Diego, CA, July 10–12, 1995.
TWIGG, P.D.	ES76	MALLOZZI, R.S. UAH
CARTER, D.C.	ES76	PACIESAS, W.S. UAH
Analysis and Crystallographic Refinement of Hen Egg White Lysozyme at 1.4 Å from Crystals Produced in Microgravity. For publication in Protein Science Magazine.		PENDLETON, G.N. UAH
LORENZINI, E.C.		BRIGGS, M.S. UAH
Harvard-Smithsonian Center for Astrophysics		PREECE, R.D. UAH
BORTOLAMI, S.B.	University of Padova, Italy	MEEGAN, C.A. ES84
RUPP, C.C.	PS04	FISHMAN, G.J. ES81
ANGRILLI, F.	University of Padova, Italy	The vFv Peak Energy Distributions of Gamma-Ray Bursts Observed by BATSE. For publication in The Astrophysical Journal, Chicago, IL.
LU, H.-I.	ES42	MARMANN, R.A. JA01
MILLER, T.L.	ES42	Using <i>Spacelab</i> as a Precursor of Science Operations for the Space Station. For presentation at the International Astronautical Federation (IAF), Oslo, Norway, October 1995.
Characteristics of Annulus Baroclinic Flow Structure During Amplitude Vacillation. For publication in Tellus, Stockholm, Sweden.		MARTINEZ, A. NM Highlands University
LU, H.-I.	IGCRE	ROMERO, E. NM Highlands University
MILLER, T.L.	ES42	TAN, L. NM Highlands University
Characteristics of Annulus Baroclinic Wave Structure During Amplitude Vacillation. For publication in Dynamic Meteorology and Oceanography, Stockholm, Sweden, 1994.		SANGHADASA, M. UAH
LU, H.-I.	ES42	MCCALL, S. Spelman College
MILLER, T.L.	ES42	CARDELINE, B. Spelman College
Baroclinic Waves Dispersion in a Constant F Plan. For presentation at the 10th Conference on Atmospheric and Oceanic Waves and Stability, Big Sky, MT, June 5–6, 1995.		MOORE, C. ES76
LURIE, C.	TRW	PENN, B. ES76
FOROOZAN, S.	TRW	CLARK, R.D. NM Highlands University
BREWER, J.C.	EB74	Synthesis of Substituted 4-Nitroanilines for Nonlinear Optics. For presentation at the American Chemical Society Norm/Rocky Mountain Meet, Park City, UT, June 14–16, 1995.
JACKSON, L.G.	EB72	MARTINEZ, M. NM Highlands University
Nickel-Hydrogen Battery State of Charge Management in the Absence of Active Cooling. For presentation at the 30th Intersociety		ROMERO, E. NM Highlands University
		MARTINEZ, A. NM Highlands University
		ROMERO, L. NM Highlands University
		MCCALL, S. Spelman College

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CARDELINO, B.	Spelman College	
MOORE, C.	ES76	
PENN, B.	ES76	
CLARK, R.D.	NM Highlands University	
	Synthesis of N-Alkyl Substituted 4-Nitroaniline and N-(4-Nitrophenyl) -N-Methylaminacetonitrile Derivatives. For presentation at the American Chemical Society Norm/Rocky Mountain Meeting, Park City, UT, June 14-16, 1995.	
MAXWELL, T.	EO45	
HOWELL, E.	(EO45) Boeing	
	Planning as a Precursor to Scheduling for Space Station Payload Operations. For presentation at the American Institute of Aeronautics and Astronautics (AIAA), Huntsville, AL, September 26-28, 1995.	
MAXWELL, T.	EO45	
HOWELL, E.	EO45	
	Planning as a Precursor to Scheduling for Space Station Payload Operations. For presentation at the 1995 AUAA Space Programs and Technologies Conference and Exhibit, Huntsville, AL, September 26-28, 1995.	
MAZURUK, K.	USRA	
VOLZ, M. P.	ES75	
	The Effect of a Rotating Magnetic Field on Fluid Flow in Crystal Growth Configurations. For presentation at the Ninth Alabama Materials Research Conference, Birmingham, AL, September 26-27, 1995.	
MCCOLLUM, M.B.	EL54	
JAVOR, K.J.	Sverdrup	
	Control of Susceptibility to Unintentionally Generated Radio Frequency Fields. For presentation at 1995 AIAA Space Programs and Technologies Conference, Huntsville, AL, September 27, 1995.	
MCCONNAUGHEY, H.V.	EP01	
BURTON, J. W.	EP81	
THOMPSON, R.L.	EP81	
	Propulsion Testing at NASA/Marshall Space Flight Center for Next-Generation RLV Propulsion Technology Development. For presentation at the 1995 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 9-13, 1995. For publication in Proceedings of 1995 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 9-13, 1995.	
MCCONNAUGHEY, P.K.	ED32	
RUF, J.	ED32	
MCDANIELS, D.	ED32	
	Flow Characterization of Enabling Technologies for Advanced Propulsion Development: CFD Analysis and Cold Flow Testing at NASA Marshall. For presentation at the 31st AIAA/SAE/ASME/ASEE Joint Propulsion Conference, San Diego, CA, July 10-12, 1995.	
MCCONNAUGHEY, P.K.	ED32	
STEWART, E.T.	ED32	
RESKE, E.J.	ED32	
DILL, R.A.	ED32	
WHITESIDES, R.H.	ED32	
	The Use of CFD in the Development and Assessment of Solid Rocket Motor Internal Flows. For presentation at the AIAA Conference, Large Solid Rockets: Advances Through Experience, Monterey, CA, October 4-6, 1994.	
MCGAUGHEY, G.	Texas A&M University	
ZIPSER, E.J.	Texas A&M University	
SPENCER, R.W.	ES43	
HOOD, R.E.	ES43	
	High Resolution Passive Microwave Observations of Convective Systems Over the Tropical Pacific Ocean. For publication in AMS Journal of Applied Meteorology, Boston, MA, February 16, 1995.	
MCKECHNIE, T.	Rockwell	
KROTZ, P.	Rockwell	
LIAW, Y.	Rockwell	
HOLMES, R.	EJ22	
ZIMMERMAN, F.	EH25	
	Enhanced Near-Net-Shape Ceramic Refractory Composite High Temperature Cartridges by VPS Metallurgical Alloying Technique. For presentation at the ASM International's National Thermal Spray Conference, Houston, TX, September 1995.	
MCKECHNIE, T.N.	Plasma Processes, Inc.	
BEASON, G.P.	Plasma Processes, Inc.	
ZIMMERMAN, F.R.	EH25	
	Bell-Contoured, Parallel Flow Nozzles for Reducing Overspray in Thermal Spray Processes. For presentation at the ASM International's National Thermal Spray Conference, Houston, TX, September 11, 1995.	
MCQUEEN, D.H., JR.	EP44	
	The Solar X-Ray Imager Vacuum Door Assembly. For presentation at the 29th Aerospace Mechanisms Symposium, Houston, TX, May 17-19, 1995.	
MEEGAN, C.	ES84	
HORACK, J.	ES84	

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STECHER, T.	GSFC	
CODE, A.	University of Wisconsin	
	The Astro-2 Ultraviolet Mission. For presentation at the 186th Meeting of the American Astronomical Society, Pittsburgh, PA, June 11–15, 1995.	
MILLER, T.L.	ES42	
SMITH, S.A.	ES42	
KAYE, J.A.	NASA HQ's	
	ATLAS-3 Space Shuttle Mission Studies Earth Atmosphere and Solar Input. For publication in EOS, Washington, DC.	
MILLER, T.L.	ES42	
SMITH, S.A.	ES42	
KAYE, J.A.	ES42	
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MITROFANOV, I.G.	Space Research Institute	
CHERNENKO, A.M.	Space Research Institute	
POZANENKO, A.S.	Space Research Institute	
BRIGG, M.S.	Space Research Institute	
FISHMAN, G.J.	ES81	
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POZANENKO, A.S.	Space Research Inst.	
BRIGGS, M.S.	UAH	
PACIESAS, W.S.	UAH	
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SAGDEEV, R.Z.	University of Maryland	
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MONTGOMERY, E.E.	PS04	
BENNETT, H.E.	PS04	
	Commercial Applications for Adaptive Segmented Mirrors. For presentation at PHOTONICS West '95, San Jose, CA, February 8–9, 1995.	
MOORE, R.L.	ES82	
MUSIELAK, Z.E.	UAH	
KROGULEE, M.	University of Gdansk	
SUESS, S.T.	ES82	
	Propagating Alfvén Waves, Intermittent Magnetic Levitation, and Coronal Heating in Coro-	
	nal Holes. For presentation at the 26th Meeting of Solar Physics Division of American Astronomical Society, Memphis, TN, June 4–8, 1995.	
MOORE, R.L.		ES82
LAROSA, T.N.		
MILLER, J.A.		
SHORE, S.N.		
	IAU Colloquium No. 153. For presentation at Makuhari, Japan, May 22–26, 1995.	
MOORE, T.E.		ES83
CHANDLER, M.O.		ES83
POLLOCK, C.J.		ES83
REASONER, D.L.		ES83
ET AL.		
	Plasma Heating and Flow in an Auroral Arc. For publication in Journal of Geophysical Research, Washington, DC.	
MOORE, T.E.		ES83
	Evaluating Microscale Effects on Mesoscale Transport. For publication in Proceedings of 1994 Huntsville Workshop, Guntersville, AL, October 16–19, 1994.	
MOORE, T.E.		ES83
FOK, M.-C.		ES83
KEADY, J.P.		ES83
PEREZ, J.D.		ES83
	Microphysics From Global Images. For presentation at the 1995 Cambridge Symposium Workshop, Hamilton, Bermuda, February 19–23, 1995.	
MULLINS, L.D.		EL58
EVANS, S.W.		
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MULQUEEN, J.		PD32
BUKLEY, A.		PD32
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PORTER, J.G.		ES82
DAVIS, J.M.		ES82
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Klein-Gordon Equation and the Local Critical Frequency for Alfvén Waves Propagating in an Isothermal Atmosphere. For publication in The Astrophysical Journal, Chicago, IL, May 1995.		NESMAN, T. ED33
MYERS, T.	NM Highland University	
ROMERO, M.	NM Highland University	
PARHAM, T.	NM Highland University	
MCCALL, S.	Spelman College	
CARDELINO, B.	Spelman College	
MOORE, C.	ES76	
PENN, B.	ES76	
CLARK, R.D.	NM Highland University	
Synthesis of 1, 1-Dicyanovinylbenzene, Compounds for Nonlinear Optics. For presentation at the American Chemical Society Norm/Rocky Mountain Meeting, Park City, UT, June 14–16, 1995.		
NADERI, M.H.	EO22	
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NEIN, M.E.	PS02	
Technology Requirements for a Pathfinder Lunar Telescope. For presentation at the 32nd Space Congress, Merritt Island, FL, April 25–28, 1995.		
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NERNEY, S.	ES82	
Problems in American Education: Teaching Science and Mathematics. For publication in Kappa Delta Pi Records, West Lafayette, IN.		
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SUESS, S.T.	ES82	
Potential Flow Downstream of the Heliospheric Terminal Shock: A Non-Spherical Shock. For publication in Geophysical Research Letters, Washington, DC, October 1994.		
		NETTLES, A. EH33
		Impact Characteristics of Candidate Materials for Single-Stage-to-Orbit (SSTO) Technology. For presentation at the 40th International SAMPE Symposium and Exhibition, Anaheim, CA, May 8–11, 1995.
		NETTLES, A. EH33
		DANIEL, V. EH33
		BRANSCOMB, C. EH33
		The Effects of Tensile Preloads on the Impact Response of Carbon/Epoxy Laminates. For presentation at the 40th International SAMPE Technical Conference, Anaheim, CA, May 8–11, 1995.
		NETTLES, A.T. EH33
		The Effects of Compressive Preloads on the Compression-After-Impact Strength of Carbon/Epoxy. For presentation at the 26th SAMPE Technical Conference, Atlanta, GA, October 17–20, 1994.
		NEUGEBAUER, M. California Inst. of Tech.
		GOLDSTEIN, B.E. California Inst. of Tech.
		MCCOMAS, D.J. Los Alamos Nat. Lab.
		SUESS, S.T. ES82
		BALOGH, A. Imperial College, London, UK
		Velocity Variations in the High-Latitude Solar Wind. For publication in Solar Wind 8, Pasadena, CA.
		NEUGEBAUER, M. JPL
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		MCCOMAS, D.J. Los Alamos Nat. Lab.
		SUESS, S.T. ES82
		BALOGH, A. Imperial College, UK
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		NICHOLS, M. ES43
		FUELBERG, H. ES43
		RUSCHER, P. ES43
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PUSEY, M.L.	ES76	
FORSYTHE, E.L.	USRA	
BASKARAN, S.	Hughes STX Corp.	
	Artificial Neural Network Prediction of Tetragonal Lysozyme Face Growth Rate. For publication in Journal of Crystal Growth, The Netherlands.	
NOEVER, D.	ES76	
BASKARAN, S.	ES76	
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LOOGER, L.L.	ES76	
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NOEVER, D.A.	ES76	
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CRONISE, R.	ES76	
MATSOS, H.C.	ES76	
	Preferred Negative Geotactic Orientation in Mobile Cells: Tetrahymena Results. For publication in Biophysical Journal, Baltimore, MD.	
ONKEN, J.F.	EO43	
HORVATH, T.	EO43	
MEADOWS, R.	EO43	
MENEES, S.		
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	Technologies Conference, Huntsville, AL, September 26-28, 1995.	
ORVILLE, R.E.	ES44	
ZIPSER, E.J.	ES44	
AULICH, G.	ES44	
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	Lightning Characteristics in the Equatorial Region of the Western Pacific. For presentation at the 1994 American Geophysical Union Fall Meeting, San Francisco, CA, December 4-9, 1994.	
PACIESAS, W.S.	UAH	
FINGER, M.H.	USRA	
WILSON, R.B.	ES84	
FISHMAN, G.J.	ES81	
	A Study of Pulse Profile Variations From EXO 2030+375 With BATSE. For presentation at the American Astronomical Society, Tucson, AZ, January 8-13, 1995.	
PALEY, M.S.	ES01	
FRAZIER, D.O.	ES01	
ABDELDEYEM, H.	ES01	
MCMANUS, S.P.	ES01	
	Photo-Deposition of Amorphous Polydiacetylene Films From Monomer Solutions Onto Transparent Substrates. For publication in Journal of the American Chemical Society, Washington, DC.	
PALEY, M.S.	ES76	
ARMSTRONG, S.		
WITHEROW, W.K.		
FRAZIER, D.O.		
	Kinetic Studies on Photo-Deposition of Polydiacetylene Thin Films From Solutions: Preliminary Determination of the Rate Law. For publication in Journal of the American Chemical Society, NW University, Evanston, IL.	
PALOSZ, W.	NRC/NASA	
DUROSE, K.	University of Durham	
GILLIES, D.	ES75	
GRASZA, K.	IP PAS	
JERMAN, G.	ES75	
	Growth and Properties of Cadmium-Zinc Telluride Crystals Grown by "Contactless" by PVT. For presentation at the 11th International Conference on Crystal Growth, The Hague, Netherlands, June 18-23, 1995.	
PALOSZ, W.	NRC/NASA	
SZOFRAN, F.R.	ES75	
GEORGE, M.A.	Fisk University	
COLLINS, E.E.	Fisk University	
CHEN, K.-T.	Fisk University	
ZHANG, Y.	Fisk University	

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HU, Z.	Fisk University		
Growth and Properties of Cadmium-Zinc Telluride Crystals Grown by Seeded PVT. For presentation at the 11th International Conference on Crystal Growth, The Hague, Netherlands, June 18-23, 1995.			
PALOSZ, W.	NRC/NASA		
SZOFTRAN, F.R.	ES75		
Development of Residual Gas in Sealed Silica Glass Ampoules. For presentation at the 11th International Conference on Crystal Growth, The Hague, Netherlands, June 18-23, 1995.			
PEARSON, S.D.	EL54		
JAMES, B.F.	EL54		
VAUGHN, W.W.	EL54		
From Red Tape to Results: A Systems Engineering Approach to Natural Space Environments Challenges. For presentation at the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, January 9-12, 1995.			
PENDLETON, G.N.	ES84		
PACIESAS, W.S.	ES84		
FISHMAN, G.J.	ES81		
MEEGAN, C.A.	ES84		
WILSON, R.B.	ES84		
Balloon-Borne Measurements of the SN1987A Hard X-Ray Continuum. For publication in Astrophysical Journal, New York, NY.			
PENDLETON, G.N.	UAH		
PACIESAS, W.S.	UAH		
BRIGGS, M.S.	UAH		
PREECE, R.D.	UAH		
FISHMAN, G.J.	ES81		
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An Overview of the Gamma-Ray Burst Population Continuum Spectral Properties Measured with BATSE. For presentation at the American Astronomical Society HEAD Meeting, Napa Valley, CA, November 2-5, 1994.			
PERRY, J.L.	ED62		
GRAFT, J.C.	JSC		
Spacecraft Cabin Air Quality Control and Its Application to Tight Buildings. For presentation at the NASA/AIAA Life Sciences and Space Medicine Conference, Houston, TX, April 3-5, 1995.			
PETERS, P.N.	ES75		
HOOVER, R.B.	ES75		
WATTS, R.	ES75		
TARRIO, C.	ES75		
WALKER, A.B.C., JR.	ES75		
Fabrication of Multilayer Optics by Sputtering; Application to EUV Optics With Greater Than 30% Normal Reflectance. For presenta-			
		tion at SPIE's 1995 International Symposium, San Diego, CA, July 9-14, 1995.	
PHILLIPS, J.L.	Los Alamos Nat. Lab.		
BAME, S.J.	Los Alamos Nat. Lab.		
FELDMAN, W.C.	Los Alamos Nat. Lab.		
GOLDSTEIN, B.E.	JPL		
SUESS, S.T.	ES82		
ET AL			
Ulysses Solar Wind Plasma Observations at High Southerly Latitudes. For publication in Science, Washington, DC.			
PHILLIPS, J.L.	Los Alamos Nat. Lab.		
BAME, S.J.	Los Alamos Nat. Lab.		
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FELDMAN, W.C.	Los Alamos Nat. Lab.		
SUESS, S.T.	ES82		
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Pole to Pole and More: Ulysses Solar Wind Plasma Observations. For presentation at the American Geophysical Union 1995 Fall Meeting, San Francisco, CA, December 11-15, 1995.			
POLLOCK, C.J.	ES83		
MOORE, T.E.	ES83		
REASONER, D.L.	ES83		
Quasi-Parabolic Electrostatic Charged Particle Mirror. For publication in Review of Scientific Instruments, New York, NY.			
POLLOCK, C.J.	ES53		
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Low Energy Differential Electron Measurements for Diagnosing Ionospheric Plasma Processes. For presentation at the Chapman Conference, AGU, Santa Fe, NM, April 3-7, 1995.			
PORTER, J.G.	ES82		
FALCONER, D.A.	ES82		
MOORE, R.L.	ES82		
HARVEY, K.L.	ES82		
ET AL			
Photospheric Origins of Enhanced High Coronal Loops. For presentation at the 26th Meeting of the Solar Physics Division of the AAS, Memphis, TN, March 14, 1995.			
PORTER, J.G.	ES82		
FALCONER, D.A.	NAS/NRC		
MOORE, R.L.	ES82		
HARVEY, K.L.	SPRC		
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PRAVDO, S.H.	JPL	presentation at the IUGG General Assembly, Boulder, CO, July 2–14, 1995.
DAY, C.S.R.	USRA	
ANGELINI, L.	USRA	
HARMON, B.A.	ES84	
YOSHIDA, A.	Japan	
SARASWAT, P.	Japan	
	ASCA and GRO Observations of GX301-2. For publication in Astrophysical Journal, Chicago, IL, December 1995.	
PUSEY, M.	ES76	
FORSYTHE, E.		
LI, M.		
SIBILLE, L.		
NADARAJAH, A.		
	The Tetragonal Lysozyme Crystal Growth Solution. For publication in The Journal of Protein Crystal Growth, Amsterdam, The Netherlands.	
PUSEY, M.	ES76	
	Tetragonal Lysozyme Crystal Growth. For presentation at the Protein Crystal Growth Conference, Panama City Beach, FL, April 21– 24, 1995.	
QUATTROCHI, D.A.	ES44	
RIDD, M.K.	University of UT	
	Analysis of Vegetation Within an Arid Urban Environment Using High Spatial Resolution Airborne Thermal Infrared Remote Sensing Data. For publication in Atmospheric Environment, Amsterdam, Netherlands.	
RAGHAVAN, R.	ES44	
CHADRASEKAR, V.	ES44	
	Multiparameter Radar Study of Rainfall: Po- tential Application to Area Time Integral Studies. For publication in Journal of Applied Meteorology, AMS, Boston, MA.	
RAGHAVAN, R.	ES41	
RAMACHANDRAN, N.	ES41	
GOODMAN, S.J.	ES41	
	Retrieval of Cloud Properties Using Lightning Observations From Space. For presentation at the American Geophysical Union 1995 Fall Meeting, San Francisco, CA, December 11–15, 1995. For publication in EOS, Transactions of the American Geophysical Union.	
RAGHAVAN, R.	ES42	
BUECHLER, D.	ES42	
SMITH, M.	ES42	
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	Lightning and Rainfall Maps of the United States for Climate and Hydrology Studies. For	
RAIKAR, G.N.	UAH	
GREGORY, J.C.	UAH	
WEIMER, J.J.	UAH	
YOUNG, P.R.	LaRC	
PETERS, P.N.	ES75	
	Surface Modification of Polyimide Films Exposed to Low-Earth Orbit Environment. For presentation at the 17th Annual Symposium on Applied Surface Analysis, University Park, PA, June 7–9, 1995.	
RAIKAR, G.N.	UAH	
GREGORY, J.C.	UAH	
CONNATSER, R.W.	UAH	
PETERS, P.N.	ES75	
	Space Environmental Effects on Thin Metallic Films. For presentation at the 1995 AIAA Space Programs and Technologies Conference and Exhibit, Huntsville, AL, September 26–28, 1995.	
RAMACHANDRAN, N.	USRA	
BAUGHER, C.R.	ES75	
	G-Jitter Effects in Protein Crystal Growth—A Numerical Study. For presentation at the 26th AIAA Fluid Dynamics Conference, San Diego, CA, June 19–22, 1995.	
RAMACHANDRAN, N.	ED36	
SMITH, A.	ED36	
GERRY, G.	ED36	
KAUFFMAN, W.	ED36	
	High Reynolds Effects on Multi-hole Probes and Hot Wire Anemometers. For presentation at the AIAA 26th Fluid Dynamics Conference, San Diego, CA, June 19–22, 1995.	
RAMSEY, B.D.	ES84	
	Imaging Gas Counters for X- and Gamma Ray Astronomy. For presentation at Imaging in High Energy Astronomy, Frascati, Italy, September 26–30, 1994.	
REIFF, P.H.	ES83	
GREEN, J.L.	ES83	
BENSON, R.F.	ES83	
CARPENTER, D.L.	ES83	
CALVERT, W.	ES83	
FUNG, S.F.	ES83	
GALLAGHER, D.L.	ES83	
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	Remote Sensing of Substorm Dynamics Via Radio Sounding. For publication in Proceed- ings of the Second International Conference on Substorms, American Geophysical Union, Washington, DC.	

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RHODES, P.H.	ES76	SRIVASTAVA, V.	USRA
SNYDER, R.S.	ES76	Mid-Tropospheric Aerosol Backscatter Back-	
ROBERTS, G.O.	ES76	ground Mode Over the Pacific Ocean at 9.1	
Role of Dielectric Constant in Electrohydro-		Microns Wavelength. For publication in Geo-	
dynamics of Conducting Fluids. For publica-		physical Research Letters, American Geophys-	
tion in Journal of Colloid and Interface		ical Union, Baltimore, MD.	
Science, San Diego, CA.			
RHODES, P.H.	ES76	ROTHERMEL, J.	ES43
Influence of Conductivity and Dielectric		HARDESTY, R.M.	NOAA
Constant in Electrokinetic Separations. For		MENZIES, R.T.	JPL
presentation at PITTCOM 95, New Orleans,		Airborne Scanning Pulsed Coherent Doppler	
LA, March 5–11, 1995.		Laser Radar for Atmospheric Measurement	
		and Satellite Doppler Lidar Simulation. For	
ROBERTSON, F.R.	ES42	presentation at the Coherent Laser Radar	
MCCAULE, E.W.	ES42	Meeting, Keystone, CO, July 23–27, 1995.	
COHEN, C.	ES42	RUBIN, B.C.	USRA
Large-Scale Water Vapor and Condensate		FINGER, M.H.	USRA
Balance Over the TOGA-COARE Region. For		HARMON, B.A.	ES84
presentation at Water Vapor in the Climate		PACIESAS, W.S.	UAH
System, AGU, Jekyll Island, GA, October 25–		FISHMAN, G.J.	ES81
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SZOFRAN, F.R.	ES75	BROCK, M.N.	ES84
Determination of the Electrical Conductivity		BRIGGS, M.S.	UAH
of Liquid GE0.95Si0.05. For publication in		ET AL.	
Journal of Crystal Growth, The Netherlands.		Observations of 4U1700-37 With BATSE. For	
ROOD, R.	EB53	publication in Astrophysical Journal, Chicago,	
FAWCETT, S.	EB53	IL.	
GRIFFITH, C.	EB53	RUNKLE, R.E.	EE13
KHANIJOW, R.	EB53	WOLF, D.	EE13
ENGELHAUPT, D.E.	UAH	Space Shuttle Solid Rocket Booster	
Replicate Wolter-I X-Ray Mirrors. For presen-		Lightweight Recovery System. For presenta-	
tation at the Conference on Manufacturing		tion at the AIAA Aero Dynamics Decelerator	
Process Development in Photonics, Redstone		System Conference, Clearwater, FL, May 15,	
Arsenal, AL, November 1–2, 1994.		1995.	
ROSNER, R.	University of Chicago	RUPP, C.C.	PS02
MUSIELAK, Z.E.	UAH	SEDS/SEDSAT Mission Plans. For presenta-	
CATTANEO, F.	University of Chicago	tion at the Fourth International Conference on	
MOORE, R.L.	ES52	Tethers in Space, Washington, DC, April 10–	
SUESS, S.T.	ES52	14, 1995.	
On the Origin of “Dividing Lines” for Late-		RUPP, C.C.	PS02
Type Giants and Supergiants. For publication		Flight Data From the First and Second Flights	
in Astrophysical Journal, Chicago, IL.		of the Small Expendable Deployer System	
ROTHERMEL, J.	ES43	(SEDS). For presentation at the Fourth	
CHAMBERS, D.M.	ES43	International Conference on Tethers in Space,	
JARZEMBSKI, M.A.	ES43	Washington, DC, April 10–14, 1995.	
SRIVASTAVA, V.	ES43	RYAN, R.S.	ED01
JONES, W.D.	ES43	Propulsion Systems Lessons Learned. For pre-	
Atmospheric Backscatter Measurement with		sentation at the 31st AIAA/ASME/SAE/ASEE	
Continuous-Wave Focused CO <sub>2</sub> Doppler		Joint Propulsion Meeting, San Diego, CA, July	
Lidars. For publication in Applied Optics,		7–13, 1995.	
Washington, DC.		SAMBAMURTHI, J.K.	ED33
ROTHERMEL, J.	ES43	ALVARADO, A.	ED33
BOWDLE, D. A.	UAH	MATHIAS, E.C.	Thiokol

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Plume Diagnostics of SRM Static Firings for Pressure Perturbation Studies. For publication in Journal of Propulsion and Power.		SCHMIDT, G.R.	EP25
SAMBAMURTHI, J.K.	ED33	NADARAJAH, A.	UAH
Plume Particle Collection and Sizing From Static Firing of Solid Rocket Motors. For publication in Journal of Propulsion and Power.		CHUNG, T.J.	UAH
SAMBAMURTHI, J.K.	ED33	Influence of Two-Phase Thermocapillary Flow on Liquid Surface Morphology. For presentation at the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, January 9–12, 1995.	
ALVARADO, A.	ED33	SCHORR, A.A.	EE53
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Plume Diagnostics of the RSRM Static Firings for the Pressure Perturbation Studied. For presentation at the 31st AIAA Joint Propulsion Conference, San Diego, CA, July 10–13, 1995.		WALKER, R.	Thiokol
SAMBAMURTHI, J.K.	ED33	Redesigned Solid Rocket Motor (RSRM) Pressure Perturbation Characterization—An Overview. For presentation at the 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 10–13, 1995.	
Plume Particle Collection and Sizing from Static Firing of Solid Rocket Motors. For presentation at the 31st AIAA Joint Propulsion Conference, San Diego, CA, July 10–13, 1995.		SCHUTZENHOFER, L.A.	ED26
SANGHADASA, M.	UAH	BLALOCK, S.J.	ED26
BARR, T.A., JR.	UAH	JOHNSTON, L.M.	ED26
CLARK, R.D.	NM Highlands University	MIMS, K.K.	ED26
MARTINEZ, A.	NM Highlands University	PERKINS, L.A.	ED26
ROMERO, E.	NM Highlands University	SISK, J.M.	ED26
TAN, L.	NM Highlands University	STALLWORTH, R.	ED26
CARDELINO, B.H.	Atlanta University Center	TINKER, M.L.	ED26
MOORE, C.E.	ES75	Space Program Supporting Technologies: Structures, Materials, and Signal Processing. For presentation at the AIAA 36th Structures, Structural Dynamics and Materials Conference, New Orleans, LA, April 10–12, 1995.	
PENN, B.	ES76	SCOTT, D.M.	ES84
Nonlinear Optical Characterization of Substituted 4-Nitro-N, N-Dimethylanilines. For presentation at the Optical Society of America, Portland, OR, September 10–15, 1995.		FINGER, M.H.	ES84
SANGHADASA, M.	UAH	WILSON, R.B.	ES84
WU, B.	UAH	PRINCE, T.A.	ES84
BARR, T.A., JR.	UAH	4U 0115+634. For publication in IAU Circular No. 5990, Cambridge, MA.	
CLARK, R.D.	NM Highlands University	SEN, S.	USRA
PENN, B.	ES76	STEFANESCU, D.M.	University of Alabama
Investigation of Solvent Effect on the Optical Nonlinearity Using ESHLS Technique. For presentation at the Optical Society of America, Portland, OR, September 10–15, 1995.		CURRERI, P.A.	ES75
SARKISOV, S.	Alabama A&M University	DHINDAW, B.K.	University of Alabama
DARWISH, A.	Alabama A&M University	Convective Force Effects on the Critical Velocity of Engulfment of Particles by a Planar Solid/Liquid Interface. For presentation at the Eighth International Symposium on Experimental Methods for Microgravity Materials Science, Anaheim, CA, February 4–8, 1996.	
BRYANT, W.	Alabama A&M University	SHANG, H.M.	Engineering Sciences, Inc.
VENKATESWARLU, P.	Alabama A&M University	CHEN, Y.S.	Engineering Sciences, Inc.
ABDELDAYEM, H.	USRA	LIAW, P.	Engineering Sciences, Inc.
FRAZIER, D.O.	ES01	WANG, T.-S.	ED32
Nonlinear Optical Characterization of Poly(Methyl Methacrylate) Polymer Doped With Different Dyes for Laser Waveguide Fabrication. For publication in SPIE, Bellingham, WA.		Investigation of Chemical Kinetics Integration Algorithms for Reacting Flows. For presentation at the 33rd Aerospace Sciences Meeting and Exhibit, Reno, NV, January 9–12, 1995.	

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SHTESSEL, Y.B.	UAH	
JACKSON, M.E.	ED14	
Sliding Mode Thermal Control System for Space Station Furnace Facility. For presentation at the 27th IEEE Southeastern Symposium on System Theory, Starkville, MS, March 12–14, 1995.		
SIBILLE, L.	ES76	
NADARAJAH, A.	ES76	
PUSEY, M.L.	ES76	
Chloride Ion Binding Promotes the Aggregation of Hen Egg White Lysozyme. For publication in American Chemical Society Journal of Biochemistry, Durham, NC.		
SILVA, A.V.R.	University of California, Berkley	
HAGYARD, M.J.	ES82	
ET AL.		
Comprehensive Multiwavelength Observations of the 1992 January 7 Solar Flare. For publication in Astrophysical Journal, Chicago, IL.		
SINGH, J.	Pennsylvania State University	
JERMAN, G.	EH23	
POORMAN, R.	EH23	
BHAT, B.N.	EH23	
KURUVILLA, A.K.	IIT Research Institute	
Mechanical Properties and Microstructural Stability of Wrought, Laser, and Electron Beam Glazed Narloy-Z Alloy at Elevated Temperatures. For publication in Metallurgical Transactions.		
SMITH, D.D.	ES76	
ABDELDAYEM, H.		
PALEY, M.S.		
SHIELDS, A.		
WITHEROW, W.K.		
FRAZIER, D.O.		
GREGORY, D.		
Z-Scan of Amorphous Polydiacetylene Thin Films. For publication in Optical Society of America, Washington, DC.		
SMITH, D.M.	University of Maryland	
LEVENTHAL, M.	University of Maryland	
CAVALLO, R.	University of Maryland	
GEHRELS, N.	GSFC	
TUELLER, J.	GSFC	
FISHMAN, G.	ES81	
Limits on Reported Transient Emission Events Near 0.5 MeV from the Crab and 1E 1740.7-2942. For publication in Astrophysical Journal Letters, Chicago, IL.		
SMITH, H.F.	EJ23	
The First and Second Flights of the Small Expendable Deployer System. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.		
SMITH, O.E.	Computer Sciences Corp.	
ADELFANG, S.I.	Computer Sciences Corp.	
ANDERSON, B.J.	EL54	
Extreme Value Statistical Analysis of Solar Activity for Space Station. For presentation at the AIAA 33rd Aerospace Sciences Meeting, Reno, NV, January 1995.		
SMITH, S.A.	ES42	
Mesoscale Wind Variability and Profiler Precision. For publication in Journal of Atmospheric and Oceanic Technology, Norman, OK.		
SMITHERMAN, D.V., JR.	PP02	
Finding a Commercial Development Path for Getting People in Space. For presentation at the AIAA 1995 Space Programs and Technologies Conference, Huntsville, AL, September 26–28, 1995.		
SNYDER, R.S.	ES71	
Conducting Research in Space. For presentation at The Pittsburg Conference, New Orleans, LA, March 5–10, 1995.		
SORENSEN, J.E.	ES83	
STONE, N.H.	ES83	
Ionization Near a Positively Biased Plate Exposed to Ionospheric-Like Conditions. For presentation at the American Geophysical Union Meeting, Baltimore, MD, May 30–June 2, 1995.		
SOUTULLO, B.C.	JA71	
CLARDY, D.J.	JA71	
Reflight of the Tethered Satellite System Mission. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.		
SPENCER, R.W.	ES43	
LAPENTA, W.M.	ES43	
ROBERTSON, F.R.	ES43	
Vorticity and Vertical Motions Diagnosed from Satellite Deep Layer Temperatures. For publication in Monthly Weather Reviews, Boston, MA.		
SPENCER, R.W.	ES43	
BRASWELL, W.D.	ES43	
Microwave Sounding Unit Six-Hourly Datasets for Climate and Process Studies. For presentation at the 1995 AGU Meeting, Baltimore, MD, May 29–June 2, 1995.		

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SPRINGER, A.M.	ED34	Instituto Fisica Spazio Interplanetario/CNR, Italy
Transonic Aerodynamic Characteristics of a Proposed Wing Body Reusable Launch Vehicle Concept. For presentation at the CFD Workshop, MSFC, AL, April 25–27, 1995.		Identification of Charge Carriers in the Ionospheric Branch of the TSS-1 Tether-Generated Current System. For publication in Journal of Geophysical Research.
SRIVASTAVA, V.	USRA	STONE, N.H. ES83
BOWDLE, D.A.	UAH	WRIGHT, K.H., JR. UAH
JARZEMBSKI, M.A.	ES43	WINNINGHAM, J.D. Southwest Research Inst.
ROTHERMEL, J.	ES43	GURGIOLO, C. Southwest Research inst.
CHAMBERS, D.M.	Micro Craft Inc.	SAMIR, U. Tel Aviv University
CUTTEN, D.R.	UAH	BONIFAZI, B. Italian Space Agency
High-Resolution Remote Sensing of Atmospheric Sulfate Aerosols from Backscatter Using Focused CO <sub>2</sub> Doppler Lidars. For publication in Geophysical Research Letters, Baltimore, MD.		GILCHRIST, B. University of Michigan
DOBROWOLNY, M.		DOBROWOLNY, M. Instituto Fisica Spazio Interplanetario/CNR, Italy
STEFANESCU, D.M.	University of Alabama	Identification of Charge Carriers in the Ionospheric Branch of the TSS-1 Tether-Generated Current System. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.
SEN, S.	USRA	SU, C.-H. ES75
CURRERI, P.A.	ES75	SHA, Y.-G. ES75
DHINDAW, B.K.	University of Alabama	Growth of Wide Band Gap II-VI Compound Semiconductors by Physical Vapor Transport. For publication in Crystal Growth Research, Washington, DC.
LEON, J.	University of Alabama	SU, C.-H. ES75
Micro- and Macro-Segregation in Alloys Solidifying with Equiaxed Morphology. For presentation at the Eighth International Symposium on Experimental Methods for Microgravity Materials Science, Anaheim, CA, February 4–8, 1996.		GILLIES, D.C. ES75
STIGLER, R.-D.	Universitat of Bodenkultur, Austria	SZOFRAN, F.R. ES75
RUKER, F.	Universitat of Bodenkultur, Austria	WATRING, D.A. ES75
KATINGER, D.	Universitat of Bodenkultur, Austria	LEHOCZKY, S.L. ES75
ELLIOT, G.	University of Bath, UK	The Influence of Reduced Gravity on the Crystal Growth of Electronic Materials. For presentation at the Sixth International Space Conference of Pacific-Basin Societies, Marina del Ray, CA, December 6–8, 1995.
HENKLEIN, P.	Humboldt-Universitat of Berlin, Germany	SU, C.-H. ES75
HE, X.M.	ES76	SHA, Y.-G. ES75
CARTER, D.C.	ES76	VOLZ, M.P. ES75
NUGEL, E.	Humboldt-Universitat of Berlin, Germany	GILLIES, D.C. ES75
KRAMER, A.	Humboldt-Universitat of Berlin, Germany	MAZURAK, K. ES75
ET AL	Interaction Between a Fab Fragment Against GP41 of HIV-1 and Its Peptide Epitope: Characterization Using a Peptide Epitope Library and Molecular Modeling. For publication in Protein Engineering, Oxford, UK.	LEHOCZKY, S.L. ES75
STONE, N.H.	ES83	LIU, H.-C. ES75
WRIGHT, K.H., JR.	UAH	FANG, R. ES75
WINNINGHAM, J.D.	Southwest Research Inst.	BREBRICK, R.F. ES75
GURGIOLO, C.	Southwest Research inst.	Mass Flux of ZnSe, ZnSeTe, and ZnCdSe and Crystal Growth of ZnSe by PVT. For presentation at the 11th International Conference on Crystal Growth, The Hague, The Netherlands, June 18–23, 1995.
SAMIR, U.	Tel Aviv University	SU, C-H. ES75
BONIFAZI, B.	Italian Space Agency	SHA, Y-G. USRA
GILCHRIST, B.	University of Michigan	LEHOCZKY, S.L. ES75
DOBROWOLNY, M.		SZOFRAN, F.R. ES75
		GILLIES, D.C. ES75

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COBB, S.D.	ES75	TELESCO, C.M.	ES84
SCRIPPA, R.N.	UAB	DAVIDSON, J.A.	ES84
Crystal Growth of HgZnTe by Directional Solidification in Microgravity. For presentation at the 34th AIAA Aerospace Sciences Meeting, Reno, NV, January 15–18, 1996.		WERNER, M.W.	ES84
SUESS, S.T.	ES82	10–30 $\mu\text{m}$ Maps of the Central 5 Parsecs of the Galaxy: Heating of the Cavity and Neutral-Gas Disk. For publication in <i>Astrophysical Journal</i> , Tucson, AZ.	
The Latitude Dependence of the Interplanetary Magnetic Field Radial Component. For presentation at the American Geophysical Union Fall 1995 Annual Meeting, San Francisco, CA, December 11–15, 1995.		TINKER, M.L.	ED26
SUGGS, R.J.		Modal Vibration Test Facilities and Methods for Space Station Modules. For presentation at the AIAA 36th Structures, Structural Dynamics and Materials Conference, New Orleans, LA, April 10–12, 1995.	
JEDLOVEC, G.J.	ES43	TOMLIN, D.D.	ED13
A Comparison of Total Integrated Water Content Retrieved From GOES-7 and GOES-8. For presentation at the AMS, Eighth Conference on Satellite Meteorology and Oceanography, Atlanta, GA., Jan. 28–Feb. 2, 1996.		MOWERY, D.K.	ED13
SUITS, M.	EH13	MUSETTI, B.	ED13
LANSAW, J.	Aerojet	CIBRARIO, B.	ED13
Use of Ultrasonic Inspection Techniques for the Advanced Main Combustion Chamber. For presentation at the JANNAF Conference on NDE in Aerospace, Hill AFB, UT, October 24–28, 1994.		Tethered Satellite Mission 1 Flight Dynamics Anomalies. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.	
SULKANEN, M.E.	ES84	TRINH, H.P.	EH32
KOLODZIEJCZAK, J.J.		Prediction of the Engine Performance and Wall Erosion Due to Film Cooling for the “Fast Track” Thrust Chamber. For presentation at the Propulsion Engineering Research Center—Sixth Annual Symposium, Cleveland, OH, September 13–14, 1994.	
CHARTAS, G.		UBERTINI, P.	
Numerical Simulation of Electron-Impact X-Ray Sources. For presentation at the SPIE’s International Symposium, San Diego, CA, July 9–14, 1995.		Istituto di Astrofisica Spaziale, Italy	
SULLIVAN, R.M.	ED28	BASSANI, L.	Isitituto TESRE, Italy
The Effect of Water on the Thermal Expansion Behavior of FM5055 Carbon Phenolic. For presentation at the ASME Summer Applied Mechanics and Materials Conference, Los Angeles, CA, June 28–30, 1995.		BAZZANO, A.	Istituto di Astrofisica Spaziale, Italy
SWARTZ, D.A.	ES84	COLE, R.	Leicester University
SUTHERLAND, P.G.	ES84	LAPINGTON, J.	MSSL, UK
HARKNESS, R.P.	ES84	MAS, M.	LAEFF, Spain
Gamma-Ray Transfer and Energy Deposition in Supernovae. For publication in <i>Astrophysical Journal</i> , Chicago, IL.		NATALUCCI	Istituto di Astrofisica Spaziale, Italy
SZOFTRAN, F.R.	ES75	RAMSEY, B.	ES84
Growth of Semiconductor Alloys in Magnetic Fields. For presentation at the 1995 Gordon Research Conference, Henniker, NH, July 9–14, 1995.		SOGGIU, E.	Istituto di Astrofisica Spaziale, Italy
VAN DER HOOFT, F.		ET AL.	
KOUVELIOTOU, C.		Integral X-Ray Monitor: A Proposal for the Hard X-Ray Imager On-Board Integral. For presentation at the Imaging in High Energy Astronomy, Frascati, Italy, September 26–30, 1994.	
VAN PARADIJS, J.			
RUBIN, B.			
FINGER, M.			
HARMON, A.			
		VAN DER HOOFT, F.	University of Amsterdam
		KOUVELIOTOU, C.	University of Amsterdam
		VAN PARADIJS, J.	University of Amsterdam
		RUBIN, B.	University of Amsterdam
		FINGER, M.	University of Amsterdam
		HARMON, A.	ES84
		Low-Frequency QPO in GRO J1719-24. For presentation at the American Astronomical Society, Tucson, AZ, January 1995.	

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VANHOOSER, T.B.	JA21	
MCCLENDON, R.K.	JA21	For publication in Journal of Modern Optics, England.
Microgravity Science Laboratory (MSL-1), A Pathfinder to the Space Station. For presentation at the AIAA 1995 Space Programs and Technologies Conference, Huntsville, AL, September 26–28, 1995.		
VANLANDINGHAM, F.	Computer Sciences Corp.	
LUCHETTI, K.	Computer Sciences Corp.	ES75
ROBINSON, J.	Orbital Sciences Corp.	ES75
SULLIVAN, D.	EL44	Flow Transitions in a Rotating Magnetic Field. For publication in Experiments in Fluids, Berlin, Germany.
Operations Support for the Monitoring and Analysis of Spacecraft Subsystems Onboard the Advanced X-Ray Astrophysics Facility (AXAF). For presentation at the 1995 AIAA Space Technologies Conference and Exhibit, Huntsville, AL, September 26–28, 1995.		
VAUGHAN, O.H.	ES44	
Lightning: A View from Space. For presentation at the National Radio Science Meeting, Boulder, CO, January 3–7, 1995.		
VENKATAKRISHNAN, P.	ES82	
HAGYARD, M.J.	ES82	
WEST, E.A.	ES82	
SMITH, J.E.	ES82	
A Search for Vector Magnetic Field Variations Associated with the M-Class Flares of 1991 June 10 in AR 6659. For publication in Solar Physics, Dordrecht, The Netherlands.		
VENKATAKRISHNAN, P.	ES82	
Observable Signals from Coronal Heating Processes. For publication in Proceedings of the International Astronomical Union Colloquium No. 165, The Netherlands.		
VERDERAIME, V.S.	ED01	
VAUGHAN, R.E.	ED01	
Multipass Weld Strength Improvement. For presentation at the Society of Engineering Science, 32nd Annual Technical Meeting, New Orleans, LA, Oct. 29–Nov. 1, 1995.		
VERDERAIME, V.S.	ED01	
VAUGHAN, R.E.	ED01	
Combined Loads Determination From Surface Measured Inelastic Strains. For presentation at the Society of Engineering Science, 32nd Annual Technical Meeting, New Orleans, LA, Oct. 29–Nov. 1, 1995.		
VIKRAM, C.S.	UAH	
WITHEROW, W.K.	ES76	
TROLINGER, J.D.	MetoLaser	
Fringe Contrast in Two-Color Holography in the Presence of a Transparent Test Medium.		
VOLZ, M.P.	ES75	
MAZURUK, K.	ES75	
Flow Transitions in a Rotating Magnetic Field. For publication in Experiments in Fluids, Berlin, Germany.		
VU, B.	ED32	
WANG, T.-S.	ED32	
SHIH, M.-H.	ED32	
SONI, B.	ED32	
Navier-Stokes Flow Field Analysis of Compressible Flow in a High Pressure Safety Relief Valve. For publication in Journal of Applied Mathematics and Computation, New York, NY.		
WALKER, J.L.	UAH	
HILL, E.V.K.	Embry-Riddle Aero U	
WORKMAN, G.L.	UAH	
RUSSELL, S.S.	EH13	
A Neural Network/Acoustic Emission Analysis of Impact Damaged Graphite/Epoxy Pressure Vessels. For publication in Proceedings of ASNT 1995 Spring Conference, Las Vegas, NV, March 22, 1995.		
WALLACE, B.K.	EL64	
SEDS Tether Deployment Ground Tests. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.		
WANG, F.C.	ES75	
RAMACHANDRAN, N.	ES75	
BAUGHER, C.	ES75	
Vibration Convection of Fluids in a Crystal Growth Cavity. For presentation at the 34th AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 15–18, 1996.		
WANG, J.-C.	Alabama A&M University	
WATRING, D.A.	ES75	
GILLIES, D.C.	ES75	
LEHOCZKY, S.L.	ES75	
Interface Morphology Effects on Lateral Compositional Distribution for Magnetically Stabilized Growth of HgCdTe. For presentation at the Ninth Alabama Materials Research Conference, Birmingham, AL, September 26–27, 1995.		
WANG, T.-S.	ED32	
Base Flowfield Grid-Resolved Analysis for a Four-Engine Clustered Nozzle Configuration. For publication in Journal of Spacecraft and Rockets, Washington, DC.		

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WANG, T.-S.	ED32	Smithsonian Astrophysical Observatory Advanced X-ray Astrophysics Facility AXAF—An Overview. For presentation at the SPIE's 1995 International Symposium, San Diego, CA, July 9–14, 1995.
WANG, T.-S.	ED32	Numerical Analysis of Base Flowfield for a Four-Engine Clustered Nozzle Configuration. For publication in Journal of Propulsion and Power, Washington, DC, 1995.
WANG, T.-S.	ED32	A Grid-Resolved Analysis of Base Flowfield for a Four-Engine Clustered Nozzle Con- figuration. For presentation at the 36th Aeronautics and Astronautics Society Symposium, Hsin Chu, Taiwan, December 4–6, 1994.
WANG, T.-S.	ED32	
MCCONNAUGHEY, P.	ED32	
WARSI, S.	Sverdrup	
CHEN, Y.-S.	Engineering Sciences, Inc.	
		CFD Assessment of the Carbon Monoxide and Nitric Oxide Formation from RD-170 Hot-Fire Testing at MSFC. For presentation at the Sixth Propulsion Engineering Research Center Symposium, Cleveland, OH, September 12–15, 1994.
WATRING, D.A.	ES75	
		The Effects of Vertical Magnetic Fields on Segregation in HgCdTe. For presentation at the Second International Conference on Solidification and Gravity, Miskolc, Hungary, April 25–28, 1995.
WATRING, D.A.	ES75	
LEHOCZKY, S.L.	ES75	
BABCsan, N.	University of Miskolc	
BARCZY, P.	University of Miskolc	
		Thermal Characterization of the Universal Multizone Crystallizer. For presentation at the Second International Conference on Solidification and Gravity, Miskolc, Hungary, April 25–28, 1995.
WATSON, M.D.	EO36	
ABUSHAGUR, M.	UAH	
ASHLEY, P.R.	Army Missile Command	
JOHNSON-COLE, H.	EO36	
		Polymer Waveguide Output Coupler. For pre- sentation at SPIE 1995 International Sym- posium on Optical Science Engineering and Instruction, San Diego, CA, July 1995.
WEDDENDORF, B.	ED55	
		The Automatic Locking Orthotic Knee Brace Joint. For presentation at NASA Technology 2004, Washington, DC, November 8–10, 1994.
WEISSKOPF, M.C.	ES84	
O'DELL, S.L.	ES84	
ELSNER, R.F.	ES84	
VAN SPEYBROECK, L.P.		
		WELLS, B.E. UAH
		RICKS, K.G. EB64
		WEIR, J.M. EB64
		Parallel Simulation of a Large Scale Aerospace System in a Multicomputer Environment. For presentation at the IEEE Transactions on Aerospace and Electronic Systems, Rockville, MD, September 1995.
		WELZYN, K.J. ED13
		ROBINSON, J.H. ED13
		Severed Tether Dynamics and Probability. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.
		WEST, E.A. ES82
		SMITH, M.H. ES82
		Polarization Errors Associated with Birefrin- gent Waveplates. For publication in Optical Engineering, Tucson, AZ.
		WEST, E.A. ES82
		SMITH, M.H. ES82
		Polarization Characteristics of the MSFC Experimental Vector Magnetograph. For pub- lication in Optical Engineering, Tucson, AZ.
		WEST, E.A. ES82
		Status of the Marshall Space Flight Center EXperimental Vector Magnetograph (EXVM). For presentation at the 26th SPD/AAS Meeting, Memphis, TN, June 4–8, 1995.
		WHITESIDES, R.H. ERC, Inc.
		PURINTON, D.C. ERC, Inc.
		HENGEL, J.E. ED34
		SKELLEY, S.E. ED34
		Effects of Slag Ejection on Solid Rocket Motor Performance. For presentation at the 31st AIAA Joint Propulsion Conference, San Diego, CA, July 10–12, 1995.
		WHORTON, M. ED12
		CALISE, A.J. ED12
		Experimental Investigation of Robust Control of Flexible Space Structures. For presentation at SPIE 1995 Aerosense, Orlando, FL, April 17–21, 1995.
		WHORTON, M.S. ED12
		CALISE, A.J. Georgia Inst. of Tech.
		BUSCHEK, H. Bodenseewerk

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**FOCUS:** Fixed Order Compensation for Uncertain Systems. For presentation at the 1995 Matlab Conference, Cambridge, MA, October 16–18, 1995.

WIEDERHOLD, M.L. University of Texas  
 SMITHERS, G.A. EH32  
 STEYGER, P.S.

Developmental Changes in Newt Otoconia Crystallography Determined with Microscopic FTIR Spectroscopy. For presentation at the Scanning Electron Microscopy Meeting, Houston, TX, May 8, 1995.

WILLIAMSEN, J. ED52  
 HOUGH, G.E. ED52  
 SERRANO, J. ED52

Atmospheric Effects in Spacecraft Interiors Following Orbital Debris Penetration. For presentation at the Space, Environment, and Safety Conference, SPIE, Orlando, FL, April 17–21, 1995.

WILSON, C.A. ES84  
 FINGER, M.H. USRA  
 HARMON, B.A. ES84  
 SCOTT, D.M. USRA  
 WILSON, R.B. ES84  
 ET AL.

BATSE Observations and Orbital Determination of the X-Ray Pulsar GS 0834-430. For publication in The Astrophysical Journal, Tucson, AZ.

WILSON, C.A. ES84  
 HARMON, B.A. ES84  
 ZHANG, S.N. ES84  
 PACIESAS, W.S. ES84  
 FISHMAN, G.J. ES81  
 ET AL.

X-Ray NOVA in Scorpius. For publication in IAU Circular No. 6056, Cambridge, MA, August 17, 1994.

WILSON, C.A. ES84  
 WILSON, R.B. ES84  
 2S 1417-624. For publication in IAU Circular No. 6075, Cambridge, MA, September 9, 1994.

WILSON, C.A. ES84  
 HARMON, B.A. ES84  
 FISHMAN, G.J. ES81  
 ZHANG, S.N. USRA  
 RUBIN, B.C. USRA  
 SCOTT, D.M. USRA  
 PACIESAS, W.S. UAH

BATSE Discovery of X-Ray Nova Scorpii 1994 (GRO J1655-40). For presentation at the

185th Meeting of the American Astronomical Society, Tucson, AZ, January 8–12, 1995.

WILSON, R.B.	ES84
FINGER, M.H.	USRA
HARMON, B.A.	ES84
PREECE, R.D.	UAH
PENDLETON, G.N.	UAH

Spectral Analyses of a Giant Outburst From A 0535+26. For presentation at the HEAD Meeting, Napa Valley, CA, November 2–5, 1994.

WILSON, R.M.	ES82
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On the Use of "First Spotless Day" as a Predictor for Sunspot Minimum. For publication in Solar Physics, The Netherlands.

WILSON, R.M.	ES82
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On the Relationship Between Transit Velocity of Interplanetary Shocks and Solar Active Processes. For publication in Planetary Space Science, Oxford, United Kingdom, March 1995.

WINGARD, C.D.	EH33
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Use of Thermal Analysis for Investigation of Anomalies With Polymeric Materials in the Space Shuttle Program. For presentation at the North American Thermal Analysis Society (NATAS) '95 Conference, San Francisco, CA, Sept. 10–13, 1995.

WINGO, D.R.	UAH
BANKSTON, C.D.	EB53

SEDSAT 1 Tether Dynamics Research. For presentation at the Fourth International Conference on Tethers in Space, Washington, DC, April 10–14, 1995.

WITHEROW, W.K.	ES76
ROGERS, J.R.	ES76
FACEMIRE, B.R.	ES76
ARMSTRONG, S.D.	ES76

Using Holography to Measure Temperature and Concentration Gradients in Chemistry and Materials Science Research. For presentation at PITTCON 95, New Orleans, LA, March 8–10, 1995.

WITTELES, E.M.	
	World-Wide Innovative Tech Corp.
NELSON, R.D.	World-Wide Innovative Tech Corp.
DASARATHY, H.	World-Wide Innovative Tech Corp.
RAMSEY, B.D.	ES84
KOLODZIEJCZAK, J.J.	USRA

Multilayer Structures for High Performance Hard X-Ray Optics. For publication in EUV,

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