NASA Technical Memorandum 85735

Scientific and Technical Information
Output of the Langley Research Center
for Calendar Year 1983

JANUARY 1984
Scientific and Technical Information
Output of the Langley Research Center
for Calendar Year 1983

Compiled by
Research Information and Applications Division
Langley Research Center
Hampton, Virginia
FOREWORD

This report contains a listing of Langley Research Center’s scientific and technical research output for calendar year 1983.

The intent of this report is to provide a greater awareness of the broad scope of results and the importance of the research and development work conducted by scientists and engineers at Langley. This current awareness is mandated by the National Aeronautics and Space Act of 1958, which provides for the widest practical dissemination of NASA research.

During the calendar year 1983, Langley’s contributions to NASA and non-NASA literature included 157 NASA Formal Reports, 121 Quick-Release Technical Memorandums, 260 Contractor Reports, 168 Journal Articles and Other Publications, 477 Meeting Presentations, 206 Technical Talks, 8 Computer Programs, 136 Tech Briefs, and 28 Patents. In addition, during the year 19 conferences, symposia, and workshops were sponsored or cosponsored by Langley and held locally.

Comments or suggestions concerning this publication should be addressed to the Research Information and Applications Division, Mail Stop 180A, NASA Langley Research Center, Hampton, Virginia 23665.

Jess G. Ross
Chief, Research Information and Applications Division
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<td>Jim J. Jones and James P. Arrington</td>
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<td>5. NASA Space Station Technology Workshop</td>
<td>Mar. 28-31</td>
<td>Robert L. Wright and Aubrey G. Price</td>
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<td>7. NASA Workshop on Tough Composite Materials</td>
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<td>8. NASA/ASTM Second United States/Japan Conference on Composite Materials</td>
<td>June 6-8</td>
<td>George L. Roderick</td>
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<td>15. 1st Annual NASA Aircraft Controls Workshop</td>
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<td>16. SIAM Conference on Parallel Processing for Scientific Computing</td>
<td>Nov. 10-11</td>
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<td>17. NASA/AHS Annual Meeting</td>
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INTRODUCTION

The NASA Langley Research Center is one of the Nation's leading laboratories for research and development in the sciences of aeronautics and space technology. Langley conducts basic and applied research in fluid and flight mechanics, structures and materials, acoustics and noise reduction, measurement and instrumentation systems, numerical methods and techniques, data systems, electronics, physics, chemistry, and Earth and space sciences.

This publication is a compilation of Langley's scientific and technical research output for 1983 which is processed through the Center's Research Information and Applications Division, an integral part of NASA's Agency-wide Scientific and Technical Information (STI) system. This document is intended as a reference summary for researchers and as a current awareness publication for the scientific, research, and academic community.

The results of Langley's research are disseminated in a variety of NASA and non-NASA scientific and technical media and information systems. Details of the availability of the research references in this document are found in the section, "Availability," on page vii.

The citations are grouped first by Langley Directorates, then by the Langley Office or Division to which the senior author or innovator belongs. Citations are listed alphabetically by author or innovator under the following headings: Formal Reports (Technical Papers, Technical Memorandums, Conference Publications, Reference Publications, and Special Publications), Quick-Release Technical Memorandums, Contractor Reports, Journal Articles and Other Publications, Meeting Presentations, Technical Talks, Computer Programs, Tech Briefs, and Patents. If a citation has more than one author, it is listed only once under the first author's name. The subject category number used to index the citation and the Research Technology Objectives and Plans (RTOP) number are noted below citations when appropriate.

Computer Programs listed are those which were submitted by Langley to COSMIC in 1983.

The NASA Tech Briefs cited have either been published or submitted in 1983 for publication in "NASA Tech Briefs," a quarterly journal for United States industry, entrepreneurs, and academia. Subscriptions to this journal are available through the NASA Technology Utilization Program by writing to the Director, Technology Transfer Division, NASA Scientific and Technical Information, P. O. Box 8757, Baltimore/Washington International Airport, Maryland 21240.

Patents listed, which are owned in whole or in part by Langley Research Center personnel, have been published in issues of "Scientific and Technical Aerospace Reports" (STAR), a NASA announcement journal for report literature. A subscription to STAR is available from the U.S. Government Printing Office (GPO) or to qualified recipients from the NASA Scientific and Technical Information Facility (STIF).
### AVAILABILITY

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<td>Formal Reports</td>
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<td>5285 Port Royal Road, Springfield, VA 22161</td>
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<td>Langley Tech Briefs</td>
<td>Computer Software Management and Information Center (COSMIC)</td>
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<td>112 Barrow Hall, University of Georgia, Athens, GA 30602</td>
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<td>Patents:</td>
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<td>Patent Application Specifications</td>
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Contractor Reports

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Journal Articles and Other Publications

No journal articles and other publications.

Meeting Presentations

No meeting presentations.

Technical Talks


Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

PUBLICATIONS FOR OFFICE OF DIRECTOR FOR PROJECTS

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Other Publications

No journal articles and other publications.

Meeting Presentations


Technical Talks


Computer Programs

No computer programs.

Tech Briefs

Formal Reports

(Avail: NTIS Subject Category 02 RTOP 505-43-43)

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Contractor Reports

(Avail: NTIS Subject Category 05 RTOP 505-43-53)

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Journal Articles and Other Publications


Meeting Presentations


Technical Talks


106. Driver, Cornelius: Progress in Supersonic Cruise Technology. Presented at the Aerodynamics Institute Seminar on Supersonic Transport Technology, October 14, 1983, Aachen, West Germany. (Subject Category 02 RTOP 505-43-43)


Computer Programs

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Patents

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Formal Reports


Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Other Publications

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Meeting Presentations

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Technical Talks

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Computer Programs

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Tech Briefs

No tech briefs.

Patents

No patents.
PUBLICATIONS FOR SCOUT PROJECT OFFICE

Formal Reports
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Quick-Release Technical Memorandums
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Contractor Reports
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Journal Articles and Other Publications
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Meeting Presentations
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Technical Talks
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Computer Programs
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Tech Briefs

Patents
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PUBLICATIONS FOR AIRCRAFT ENERGY EFFICIENCY PROJECT OFFICE

Formal Reports


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Contractor Reports


Journal Articles and Other Publications

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Meeting Presentations


Technical Talks

136. Chapman, Andrew J.; and Bohon, Herman L.: Application of Composites to Transport Aircraft Structures. Presented at the Society of Experimental Stress Analysis 1983 Fall Meeting, November 7-9, 1983, Salt Lake City, Utah. (Subject Category 39 RTOP 534-06-13)


Computer Programs

No computer programs.

Patents

No patents.
PUBLICATIONS FOR OFFICE OF DIRECTOR FOR ELECTRONICS

Formal Reports
No formal reports.

Quick-Release Technical Memorandums
No quick-release technical memorandums.

Contractor Reports
No contractor reports.

Journal Articles and Other Publications
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Meeting Presentations
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Technical Talks
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Computer Programs
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Tech Briefs
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Patents
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Contractor Reports

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Computer Programs

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Tech Briefs

No tech briefs.

Patents

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Contractor Reports

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Journal Articles and Other Publications

(Subbect Category 23 RTOP 179-80-10)

(Subject Category 35 RTOP 665-40-40)

(Subject Category 48 RTOP 506-61-73)

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Meeting Presentations


191. Cantrell, John H., Jr.: Assessment of Burn Depth With Ultrasound: A Promising Methodology in Burn Research. Presented at the Burn Conference "Where are the Frontiers in the Understanding of Burn Injuries?", September 26-28, 1983, Washington, DC. (Subject Category 71 RTOP 505-33-23)


198. Heyman, Joseph S.; and Yoder, L.: An Interferometric Measurement of the Acoustoelastic Constant of Rock Core Samples. Presented at the IEEE 1983 Ultrasonics Symposium, October 31 - November 2, 1983, Atlanta, Georgia. Proceedings Pending. (Subject Category 71 RTOP 505-33-23)
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<td>201</td>
<td>Kern, Frederick A.</td>
<td>Langley Research Center Metrology and Calibration Program. Presented at the Seventh NASA/DOE Metrology/Calibration Workshop, October 24-28, 1983, Albuquerque, New Mexico.</td>
<td>Proceedings Pending. (Subject Category 38 RTOP 992-19-00)</td>
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<td>203</td>
<td>Kern, Frederick A.; and Williams, Herbert E.</td>
<td>Automated Calibration. Presented at the Seventh NASA/DOE Metrology/Calibration Workshop, October 24-28, 1983, Albuquerque, New Mexico.</td>
<td>Proceedings Pending. (Subject Category 38 RTOP 992-19-00)</td>
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<td>204</td>
<td>Li, Peter; Winfree, William P.; Yost, W. T.; and Cantrell, John H., Jr.</td>
<td>Observation of Collinear Beam-Mixing by an Amplitude Modulated Ultrasonic Wave in a Solid. Presented at the IEEE 1983 Ultrasonics Symposium, October 31 - November 2, 1983, Atlanta, Georgia.</td>
<td>Proceedings Pending. (Subject Category 71 RTOP 505-33-23)</td>
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210. Upchurch, Billy T.; Wood, George M.; Swann, Robert T.; Allen, Gayle J.; Miller, Irvin M.; and Hoyt, Ronald F.: Mass Spectrometric Investigation of Isotope Exchange Reactions of Molecular Oxygen With Several Oxide Surfaces. Presented at the 35th Southeastern Regional Meeting of the American Chemical Society, November 9-11, 1983, Charlotte, North Carolina. (Subject Category 23 RTOP 307-03-02)


Technical Talks


219. Crouch, Roger K.; Debnam, W. J.; and Taylor, Ray: Thermal Diffusivity Measurements in PbTe and PbSnTe from Room Temperature to 1000°C. Presented at the South Dakota School of Mines and Technology, 18th International Thermal Conductivity Conference, October 3-5, 1983, Rapid City, South Dakota. (Subject Category 27 RTOP 179-80-70)


230. Rayborn, Grayson H.; Wood, George M.; Upchurch, Billy T.; and Howard, Samuel J.: Resolution of Fused Chromatography Peaks by Deconvolution With Extension of the Fourier Spectrum. Presented at the American Chemical Society Symposium, April 26, 1983, Jackson, Mississippi. (Subject Category 23 RTOP 506-54-23)


Computer Programs

No computer programs.


*Army Structures Laboratory, USARLT (AVRADCOM)
247. Singh, Jag J. (Langley Research Center); Khandelwal, G. S. (Old Dominion University); and Mall, Gerald H. (Computer Sciences Corporation): Radionuclide Counting Technique Measures Wind Velocity. NASA Tech Brief LAR-12971.


Patents


252. Fripp, Archibald L.; Robertson, James B.; and Breckenridge, Roger A.: Pyroelectric Detector Arrays. U.S. Patent 4,379,970. Issued April 12, 1983. (Subject Category 33)


PUBLICATIONS FOR FLIGHT DYNAMICS AND CONTROL DIVISION

Formal Reports


Quick-Release Technical Memorandums


Contractor Reports


Journal Articles and Other Publications


Meeting Presentations


299. Suit, William T.; Compton, Harold R.; Scallion, William I.; Schiess, James R.; and Gahan, L. Sue: Analysis of Shuttle Oscillation in the Mach Number = 1.7 to Mach Number = 1.0 Range. Presented at the Langley Conference on Shuttle Performance: Lessons Learned, March 8-10, 1983, Hampton, Virginia. In NASA CP-2283. (Subject Category 18 RTOP 505-34-03)


303. Taylor, L. W., Jr.: A Laboratory Experiment Used to Evaluate Control Laws for Flexible Spacecraft...A NASA/IEEE Design Challenge. Presented at the VPI&SU/AIAA Fourth Symposium on Dynamics and Control of Large Structures, June 6-8, 1983, Blacksburg, Virginia. Proceedings Pending. (Subject Category 18 RTOP 506-57-13)


Technical Talks


Computer Programs

No computer programs.

Tech Briefs


309. Campbell, Roy H.; Kolstad, Robert B.; Holle, Daniel F.; Miller, Thomas J.; Krause, Philip; Horton, Kurt; and Macke, Tom (University of Illinois at Urbana-Champaign): Path Pascal. NASA Tech Brief LAR-12854.


Patents

PUBLICATIONS FOR FLIGHT ELECTRONICS DIVISION

Formal Reports

(Avail: NTIS Subject Category 35 RTOP 506-61-03)

(Avail: NTIS Subject Category 48 RTOP 506-58-23)

(Avail: NTIS Subject Category 48 RTOP 146-40-06)

(Avail: NTIS Subject Category 35 RTOP 618-22-31)

(Avail: NTIS Subject Category 43 RTOP 307-01-02)

(Avail: NTIS Subject Category 48 RTOP 146-40-05)

Quick-Release Technical Memorandums

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(Avail: NTIS Subject Category 71 RTOP 505-34-13)

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(Avail: IAC Subject Category 43 RTOP 619-12-01)

(Avail: STIF Subject Category 33 RTOP 506-61-33)

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(Avail: NTIS Subject Category 43 RTOP 506-58-13)

Journal Articles and Other Publications

(Subject Category 48 RTOP 307-02-02)

(Subject Category 23 RTOP 179-80-10)


Meeting Presentations


352. Hunter, Monica Y.: Development of the Pushbroom Microwave Radiometer. Presented at the National Technical Association Student Technical Symposium, July 25-30, 1983, Kissimmee, Florida. (Subject Category 33 RTOP 506-54-23)


Computer Programs

No computer programs.

Tech Briefs


360. Crouch, Roger K.; and Debnam, W. J. (Langley Research Center); and Ryan, R. (BOMCO, Inc.): Ampoule With Integral Feedthroughs. NASA Tech Brief LAR-12899.


No patents.
(Avail: NTIS Subject Category 03 RTOP 505-35-23)

(Avail: NTIS Subject Category 06 RTOP 505-35-23)

(Avail: NTIS Subject Category 06 RTOP 505-35-23)

(Avail: NTIS Subject Category 01 RTOP 505-34-13)

(Avail: NTIS Subject Category 01 RTOP 505-35-23)

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(Avail: NTIS Subject Category 06 RTOP 505-35-23)

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*Army Structures Laboratory, USARTL (AVRADCOM)

Contractor Reports


Journal Articles and Other Publications


Meeting Presentations


447. Spady, Amos A., Jr.; Harris, Randall L., Sr.; and Comstock, Raymond: Flight Versus Simulator Scan Behavior. Presented at the Ohio State University Second Symposium on Aviation Psychology, April 26-27, 1983, Columbus, Ohio. (Subject Category 53 RTOP 534-04-13)


Technical Talks


460. Spitzer, Cary R.: Planetary Exploration. Presented at the NASA/ASEE Summer Faculty Research Program Lecture Series, June 14, 1983, Hampton, Virginia. (Subject Category 91 RTOP 505-34-23)


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PUBLICATIONS FOR OFFICE OF DIRECTOR FOR STRUCTURES

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Journal Articles and Other Publications


525. Maahs, Howard G.: Measurements of the Oxidation Rate of Sulfur (IV) by Ozone in Aqueous Solution and Their Relevance to SO₂ Conversion in Nonurban Tropospheric Clouds. Atmospheric Environment, Volume 17, 1983, p. 341-345. (Subject Category 23 RTOP 307-01-02)

*Army Structures Laboratory, USARL (AVRADCOM)
(Subject Category 24 RTOP 505-33-33)

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   (Subject Category 24 RTOP 505-33-33)

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*Army Structures Laboratory, USARTL (AVRADCOM)


547. Hergenrother, P. M.: High Temperature Polymers. Presented at the 17th ACS Middle Atlantic Regional Meeting, April 6-8, 1983, White Haven, Pennsylvania. (Subject Category 27 RTOP 505-33-33)


*Army Structures Laboratory, USARL (AVRADCOM)


*Army Structures Laboratory, USARTL (AVRADCOM)


*Army Structures Laboratory, USARLT (AVRADCOM)


572. St. Clair, Anne K.; and Stoakley, Diane M.: Chromium Ion-Containing Epoxies. Presented at the 35th Southeastern Regional Meeting of the American Chemical Society, November 9-11, 1983, Charlotte, North Carolina. (Subject Category 27 RTOP 534-03-23)


575. Stoakley, Diane M.; and St. Clair, Anne K.: Cobalt Ion Containing Epoxies. Presented at the 35th Southeastern Regional Meeting of the American Chemical Society, November 9-11, 1983, Charlotte, North Carolina. (Subject Category 27 RTOP 534-03-23)


Technical Talks

580. Bales, Thomas T.; Royster, Dick M.; and Wiant, H. Ross: Brazed Borsic®/Aluminum Structural Panels for High Speed Aircraft. Presented at the 28th National SAMPE Symposium and Exhibition, April 12-14, 1983, Anaheim, California. (Subject Category 24 RTOP 505-33-13)


588. Hergenrother, P. M.: Recent Advances in Structural Resins for Aerospace Applications. Presented at the Plastics Institute of America, 22nd Annual Meeting and Research Symposium, April 21, 1983, Hoboken, New Jersey. (Subject Category 27 RTOP 505-33-33)

589. Hergenrother, P. M.: High Performance High Temperature Polymers. Presented at the Naval Research Laboratory Chemistry Division Lecture Series, April 28, 1983, Washington, DC. (Subject Category 27 RTOP 505-33-33)


*Army Structures Laboratory, USARTL (AVRADCOM)


*Army Structures Laboratory, USARTL (AVRADCOM)
Research Center. Presented at The Technical Cooperative Program Committee
HTP-3 Meeting, September 27, 1983, Fort Eustis, Virginia.
(Subject Category 24 RTOP 506-53-23)

603. Poe, C. C., Jr.: Fracture Toughness of Composite Laminates. Presented at
the AFWAL Ninth Annual Mechanics of Composites Review, October 24-26, 1983,
Dayton, Ohio.
(Subject Category 24 RTOP 506-53-23)

604. Rummler, Donald R.: Advances in Carbon-Carbon and Current and Future
Applications. Presented at the NASA/AIAA Fibrous Ceramic Materials
(Subject Category 24 RTOP 506-53-33)

605. Shivakumar, K. N.; and Whitcomb, J. D.: Buckling of Surface Delaminations in
Quasi-Isotropic Composite Laminates. Presented at the AFWAL Ninth Annual
(Subject Category 24 RTOP 505-33-33)

Presented at the Gordon Research Conference on The Science of Adhesion,
(Subject Category 27 RTOP 505-33-33)

VPI&SU Center for Adhesion Science Workshop/Program Review, May 1-3, 1983,
Blacksburg, Virginia.
(Subject Category 27 RTOP 505-33-33)

608. St. Clair, Terry L.: Thermoplastic Polyimide Development. Presented at the
American Cyanamid Company Stamford Research Laboratory, July 12, 1983,
Stamford, Connecticut.
(Subject Category 27 RTOP 505-33-33)

in Composites and Adhesives. Presented at the California Institute of
Technology Industrial Associates Conference on Polymers and Composites, May
10-12, 1983, Pasadena, California.
(Subject Category 27 RTOP 505-33-33)

610. Stein, Bland A.: An Overview of NASA Research Programs on Metal Matrix
Composites. Presented at the U.C.L.A./Metal Matrix Composites Information
Center, Metal Matrix Composites Short Course, August 1-5, 1983,
Los Angeles, California.
(Subject Category 25 RTOP 505-33-13)

at the ASM/Oak Ridge Chapter Session, 1983 WATTec Conference, February
(Subject Category 24 RTOP 506-53-23)

*Army Structures Laboratory, USARTL (AVRADCOM)
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Computer Programs

(Subject Category 24)

Tech Briefs


*Army Structures Laboratory, USARTL (AVRADCOM)

626. St. Clair, Terry L.; St. Clair, Anne K.; and Barrick, John D. (Langley Research Center); Wolfe, James F. (Virginia Polytechnic Institute and State University); and Greenwood, Thomas D. (King College): Thermoset/Thermoplastic Aromatic Polyamides for Composites. NASA Tech Brief LAR-12723.


Patents


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Quick-Release Technical Memorandums

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Meeting Presentations


*Army Structures Laboratory, USARTL (AVRADCOM)
692. Stephens, David G.; and Powell, Clemans A.: Human Response to Aircraft and Other Noise Events. Presented at the INT 4th International Congress on Noise as a Public Health Problem, June 21-25, 1983, Turin, Italy. (Subject Category 71 RTOP 505-35-13)


Technical Talks


701. Lamkin, Stanley L.; and Hardin, Jay C.: Aeroacoustic Computation From Vortex-Pair Merging. Presented at the SIAM 1983 Fall Meeting, November 7-9, 1983, Norfolk, Virginia. (Subject Category 76 RTOP 505-31-33)


Computer Programs

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Tech Briefs


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<tr>
<td>715.</td>
<td>McCarty, John Locke; and Tanner, John A.</td>
<td>Temperature Distribution in an Aircraft Tire at Low Ground Speeds</td>
<td>NASA TP-2195, August 1983, 34 p.</td>
<td>NTIS</td>
<td>39</td>
<td>Formal Reports</td>
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Quick-Release Technical Memorandums


730. Williams, M. Susan; and Hayduk, Robert J.: Vertical Drop Test of a Transport Fuselage Center Section Including the Wheel Wells. NASA TM-85706, October 1983, 58 p. (Avail: NTIS Subject Category 39 RTOP 505-33-53)


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Journal Articles and Other Publications

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   (Subject Category 24 RTOP 506-53-43)

   (Subject Category 39 RTOP 506-53-53)

   (Subject Category 39 RTOP 534-03-23)


Technical Talks


804. Yager, Thomas J.: Results from Previous Aircraft Ground Handling Performance Studies and an Overview of On-Going Research Efforts. Presented at the 1983 SAE Aerospace Congress & Exposition, October 3-6, 1983, Long Beach, California. (Subject Category 05 RTOP 505-45-23)

Computer Programs


Tech Briefs


815. Erickson, Wayne J.; Gray, Frederic P.; Comfort, Dennis L.; and Wahlstrom, Stig O. (Boeing Commercial Airplane Company); and Von Limbach, Geoffrey (Boeing Computer Services Company); and Storaasli, Olaf O. (Langley Research Center): Relational Information Management Data Base System. NASA Tech Brief LAR-12943.


821. Skoumal, Donald E.; and Cushman, James B. (Boeing Aerospace Company): Bonded and Bolted Graphite/Polyimide Composite Joints. NASA Tech Brief LAR-13090.

822. Skoumal, Donald E.; and Cushman, James B. (Boeing Aerospace Company): Hybrid Joints for Improved Efficiency. NASA Tech Brief LAR-13091.


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FORMAL REPORTS


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*Army Structures Laboratory, USARL (AVRADCOM)
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906. Sobieszczanski-Sobieski, Jaroslaw: Large-Scale Structural Optimization. Presented at the University of Iowa 18th Midwestern Mechanics Conference, May 16-18, 1983, Iowa City, Iowa. (Subject Category 05 RTOP 505-33-53)

*Army Structures Laboratory, USARTL (AVRADCOM)

908. Sobieszczanski-Sobieski, Jaroslaw: Multi-Disciplinary Analysis and Optimization. Presented at the University of Iowa, 18th Midwestern Mechanics Conference, May 16-18, 1983, Iowa City, Iowa. (Subject Category 05 RTOP 505-33-53)


Computer Programs

No computer programs.

Tech Briefs


915. Rogers, James L., Jr.; and Sobieszczanski-Sobieski, Jaroslaw (Langley Research Center); Bhat, Rama B. (George Washington University); Dovi, A. R.; and Riley, K. M. (Kentron International, Inc.): Structural Optimization. NASA Tech Brief LAR-13010.

(Subject Category 44)

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Formal Reports
No formal reports.

Quick-Release Technical Memorandums
No quick-release technical memorandums.

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No meeting presentations.

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948. Mazur, Vladislav; Fisher, Bruce D.; and Gerlach, John C.: Conditions Conducive to Lightning Striking an Aircraft in a Thunderstorm. Presented at the NASA/FAA et al., 8th International Aerospace and Ground Conference on Lightning and Static Electricity, June 21-23, 1983, Ft. Worth, Texas. (Subject Category 03 RTOP 505-44-13)


954. Sellers, William L., III; and *Elliott, Joe N.: Recent Applications of a Laser Velocimeter in the Langley 4- by 7-Meter Wind Tunnel. Presented at the University of Missouri-Rolla 8th Biennial Symposium on Turbulence, September 26-28, 1983, Rolla, Missouri. Proceedings Pending. (Subject Category 01 RTOP 505-45-43)


956. Stickle, Joseph W.; and Hall, Albert W.: Operating Safely in Adverse Weather Environments. Presented at the 36th International Air Safety Seminar, November 7-11, 1983, Rio de Janeiro, Brazil. (Subject Category 03 RTOP 505-45-13)


*Army Structures Laboratory, USARTL (AVRADCOM)


963. Cokeley, Ralph C.; and Person, Lee H., Jr.: Relaxed Stability Flight Test in Lockheed L-1011. Presented at the Society of Experimental Test Pilots Symposium, September 29 - October 1, 1983, Los Angeles, California. (Subject Category 01 RTOP 534-02-13)


965. Holmes, Bruce J.: Laminar Flow Applications for Practical Airplanes. Presented at the 1983 Experimental Aircraft Association Annual Convention, July 30 - August 6, 1983, Oshkosh, Wisconsin. (Subject Category 02 RTOP 505-45-43)


967. Holmes, Bruce J.: Viscous Drag Reduction Research. Presented at the University of Kansas/Texas A&M University/NASA Meeting on Aeronautics Research, September 27, 1983, Lawrence, Kansas. (Subject Category 02 RTOP 505-45-43)

968. Liu, Chen-Huei; and Ting, Lu: Boundary Conditions for Navier Stokes Solutions Merging With Boundary Layer and Potential Solutions. Presented at the SIAM 1983 Fall Meeting, November 7-9, 1983, Norfolk, Virginia. (Subject Category 02 RTOP 505-31-03)


Computer Programs

No computer programs.

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No patents.
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   (Avail: NTIS Subject Category 34 RTOP 534-02-13)

   (Avail: NTIS Subject Category 02 RTOP 505-31-23)

Quick-Release Technical Memorandums


Contractor Reports


1017. Chao, Der-Chang; and Lan, C. Edward: Calculation of Wing Response to Gusts and Blast Waves With Vortex Lift Effect. (NAG1-75 The University of Kansas Center for Research, Inc.) NASA CR-172232, October 1983, 65 p. (Avail: NTIS Subject Category 02 RTOP 505-31-23)


1021. Kuhlman, John M.: Longitudinal Aerodynamic Characteristics of a Wing-Winglet Model Designed at $M = 0.8$, $C_L = 0.4$ Using Linear Aerodynamic Theory. (NSG-1357 Old Dominion University Research Foundation.) NASA CR-172186, July 1983, 232 p. (Avail: NTIS Subject Category 02 RTOP 505-31-23)


Journal Articles and Other Publications

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(Subject Category 64 RTOP 505-31-03)

(Subject Category 64 RTOP 505-31-03)

Meeting Presentations

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1045. Dagenhart, J. Ray; and Saric, William S.: An Orthogonal Coordinate Grid Following the Three-Dimensional Viscous Flow Over a Concave Surface. Presented at the ASME Fluids Engineering Conference, Mini-Symposium on Advances in Grid Generation, June 20-22, 1983, Houston, Texas. (Subject Category 64 RTOP 505-31-33)


   (Subject Category 02 RTOP 505-31-63)

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   (Subject Category 02 RTOP 505-31-03)

   (Subject Category 02 RTOP 505-31-03)

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   (Subject Category 02 RTOP 505-31-43)

   (Subject Category 02 RTOP 505-31-03)

   (Subject Category 02 RTOP 505-31-43)

   (Subject Category 09 RTOP 505-31-53)


1060. McCarthy, D. R.; and Swanson, R. C.: Embedded Mesh Multigrid Treatment of Two-Dimensional Transonic Flows. Presented at the Colorado State University, AFSOR/NASA International Multigrid Conference, April 6-8, 1983, Copper Mountain, Colorado. (Subject Category 64 RTOP 505-31-03)


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<td>1068</td>
<td>Ray, E. J.; and Ladson, C. L.</td>
<td>Review of the Advanced Technology Airfoil Test (ATAT) Program in the 0.3-M TCT.</td>
<td>Presented at the NASA Wind-Tunnel Wall-Interference Assessment/Correction Workshop, January 25-26, 1983, Hampton, Virginia. NASA CP Pending.</td>
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1075. Streett, Craig L.; Zang, Thomas A.; and Hussaini, M. Yousuff: Spectral Multigrid Methods With Applications to Transonic Potential Flow. Presented at the Colorado State University, AFOSR/NASA International Multigrid Conference, April 6-8, 1983, Copper Mountain, Colorado. (Subject Category 64 RTOP 505-31-03)


1077. Thames, Frank C.: Multigrid Applications to Three-Dimensional Elliptic Coordinate Generation. Presented at the Colorado State University, AFOSR/NASA International Multigrid Conference, April 6-8, 1983, Copper Mountain, Colorado. (Subject Category 64 RTOP 505-31-03)


1092. Melson, N. Duane: Input for the TAWFIVE Code - Control Parameters. Presented at the TAWFIVE Workshop, October 20, 1983, Hampton, Virginia. (Subject Category 64 RTOP 505-31-03)
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(Subject Category 09 RTOP 505-31-53)

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(Subject Category 64 RTOP 505-31-03)

1105. Wedan, B.; and South, J. C., Jr.: Cartesian Grid Methods for Compressible Fluids. Presented at the ICASE Workshop on Grid Methods, September 26-27, 1983, Hampton, Virginia. (Subject Category 64 RTOP 505-31-03)

Computer Programs


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*Army Structures Laboratory, USARTL (AVRADCOM)
Formal Reports

1117. Allen, Jerry M.; Hernandez, Gloria; and Lamb, Milton: Body-Surface Pressure Data on Two Monoplane-Wing Missile Configurations With Elliptical Cross Sections at Mach 2.50. NASA TM-85645, September 1983, 156 p. (Avail: NTIS Subject Category 02 RTOP 505-43-23)


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Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports


Journal Articles and Other Publications


1160. Walsh, Michael J.: Riblets as a Viscous Drag Reduction Technique. AIAA Journal, Volume 21, No. 4, April 1983, p. 485-486. (Subject Category 34 RTOP 505-31-23)

Meeting Presentations


1168. Creel, Theodore R., Jr.: Operating Experience With the Supersonic Pilot Quiet Tunnel. Presented at the 60th Semi-Annual Meeting of the Supersonic Tunnel Association, October 6-7, 1983, Williamsburg, Virginia. (Subject Category 34 RTOP 505-31-13)


1190. Rogers, R. Clayton; and Weidner, Elizabeth H.: Numerical Predictions of Residence Times Behind a Rearward Facing Step with Transverse Slot Injection. Presented at the Twentieth JANNAF Combustion Meeting, October 17-21, 1983, Monterey, California. CPIA Proceedings Pending. (Subject Category 07 RTOP 505-43-83)


1196. Zang, Thomas A.; and Hussaini, M. Y.: Recent Applications of Spectral Methods in Fluid Dynamics. Presented at the AMS 1983 Summer Seminar on Large-Scale Computations in Fluid Mechanics, June 27 - July 1, 1983, LaJolla, California. Proceedings Pending. (Subject Category 02 RTOP 505-31-03)

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Patents

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Quick-Release Technical Memorandums
No quick-release technical memorandums.

Contractor Reports
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Journal Articles and Other Publications
No journal articles and other publications.

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Technical Talks

1216. Pritchard, E. Brian: Space Station: Gateway to the Future. Presented at the Annual Meeting of the Association of Professional Engineers of the Province of Ontario, The Niagara Chapter, October 18, 1983, Ontario, Canada. (Subject Category 15 RTOP 506-64-13)

Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.
1217. Anon.: Assessment of Techniques for Measuring Tropospheric N\textsubscript{2}O\textsubscript{y}. NASA CP-2292, December 1983, 62 p. (Avail: NTIS Subject Category 46 RTOP 176-20-10)


1222. Sullivan, Edward M.; Thompson, Robert E.; Harvey, Gale A.; Park, Jae H.; and Richardson, D. J.: Halogen Occultation Experiment (HALOE) Gas Cell Life Test Program. NASA TM-84640, August 1983, 73 p. (Avail: NTIS Subject Category 35 RTOP 678-12-03)


Journal Articles and Other Publications

   (Subject Category 46 RTOP 307-02-02)

   (Subject Category 46 RTOP 146-20-10)

   (Subject Category 47 RTOP 176-40-04)

   (Subject Category 46 RTOP 146-20-10)

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(Subject Category 47 RTOP 619-12-20)

(Subject Category 45 RTOP 146-20-10)

(Subject Category 47 RTOP 146-10-06)

(Subject Category 48 RTOP 146-40-15)


1252. McNeal, Robert J.; Mugler, John P., Jr.; Harriss, Robert C.; and Hoell, James M., Jr.: The NASA Global Tropospheric Experiment. EOS, Volume 64, No. 38, September 1983, p. 561-562. (Subject Category 46 RTOP 176-20-09)


Meeting Presentations


1289. Minnis, Patrick; Gibson, Gary G.; and Denn, Frederick M.: Diurnal Cloud Variations Over South America and the Southeastern Pacific. Presented at the AMS/INPE/BMS First International Conference on Southern Hemisphere Meteorology, July 31 - August 6, 1983, Sao Jose dos Campos, Brazil. In Proceedings. (Subject Category 47 RTOP 672-22-04)


1301. Stuhlmann, Rolf; Minnis, Patrick; and Smith, G. Louis: A Comparison of Experimental and Theoretical Bidirectional Reflectance Functions. Presented at the AMS Fifth Conference on Atmospheric Radiation, October 31 - November 3, 1983, Baltimore, Maryland. In Proceedings. (Subject Category 47 RTOP 672-40-06)


Technical Talks


1316. Grose, W. L.; and Boville, B.: The Role of Radiative-Dynamical Processes in the Maintenance of the Zonal Mean Circulation in the Lower Stratosphere. Presented at the XVIII General Assembly of the IUGG, August 15-27, 1983, Hamburg, Germany. (Subject Category 47 RTOP 147-32-07)


1318. Grose, William L.; Remsberg, Ellis E.; Russell, James M., III; and Gapcynski, John P.: Derived Dynamical Quantities From Nimbus 7 LIMS Measurements and Application to the Study of a Sudden Stratospheric Warming. Presented at the XVIII General Assembly of the IUGG, August 15-27, 1983, Hamburg, Germany. (Subject Category 47 RTOP 147-32-07)

1319. Harrison, Edwin F.; and Minnis, Patrick: Diurnal Cloud Variations for Several Seasons. Presented at the XVIII General Assembly of the IUGG, August 15-27, 1983, Hamburg, Germany. (Subject Category 47 RTOP 672-22-04)


1326. McCormick, M. P.: Stratospheric Aerosol Climatology in the Polar Regions as Observed by SAM II. Presented at the XVIII General Assembly of the IUGG, August 15-27, 1983, Hamburg, Germany. (Subject Category 46 RTOP 665-10-40)


1333. Remsberg, Ellis E.; Russell, James M., III; and Gordley, Larry L.: The Occurrence and Distribution of PSC's as Determined From the Nimbus 7 LIMS Data Set. Presented at the NASA Workshop "Polar Stratospheric Clouds: Their Role in Atmospheric Processes," June 20-22, 1983, Virginia Beach, Virginia. (Subject Category 46 RTOP 147-32-07)


1335. Russell, James M., III; Gordley, Larry L.; Remsberg, Ellis E.; and Callis, Linwood B.: The Variability of NO\textsubscript{2} in the Polar Winter Night Observed by LIMS. Presented at the XVIII General Assembly of the IUGG, August 15-27, 1983, Hamburg, Germany. (Subject Category 47 RTOP 147-30-01)

1337. Shipley, S. T.; Browell, E. V.; Orndorff, B. L.; and McDougal, D. S.: Airborne Lidar Observations of Long-Range Transport in the Free Troposphere. Presented at the American Meteorological Society Sixth Symposium on Turbulence and Diffusion, March 22-25, 1983, Boston, Massachusetts. (Subject Category 47 RTOP 146-20-10)


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1356. Townsend, Lawrence W.; Wilson, John W.; and Bidasaria, Hari B.: Heavy-Ion Total and Absorption Cross Sections Above 25 MeV/Nucleon. NASA TP-2138, April 1983, 42 p. (Avail: NTIS Subject Category 73 RTOP 199-20-76)


Quick-Release Technical Memorandums


1363. Bradley, Pamela F.; Siemers, Paul M., III; Flanagan, Paul F.; and Henry, Martin W.: Pressure Distributions Obtained on a 0.04-Scale and 0.02-Scale Model of the Space Shuttle Orbiter's Forward Fuselage in the Langley 20-Inch Mach 6 Air Tunnel. NASA TM-84629, March 1983, 43 p. (Avail: NTIS Subject Category 12 RTOP 506-63-32)

1364. Bradley, Pamela F.; Siemers, Paul M., III; Flanagan, Paul F.; and Henry, Martin W.: Pressure Distributions Obtained on a 0.04-Scale and 0.02-Scale Model of the Space Shuttle Orbiter's Forward Fuselage in the Langley Continuous Flow Hypersonic Tunnel. NASA TM-84630, March 1983, 62 p. (Avail: NTIS Subject Category 12 RTOP 506-63-32)


Contractor Reports


1408. Throckmorton, D. A.: Influence of Radiant Energy Exchange on the 
Determination of Convective Heat-Transfer Rates to Orbiter Leeside Surfaces 
During Entry. Progress in Astronautics and Aeronautics, Volume 85, 1983, 
p. 78-96. 
(Subject Category 34 RTOP 506-51-33)

1409. Townsend, L. W.: Abrasion Cross Sections for $^{20}$Ne Projectiles at 2.1 
GeV/Nucleon. Canadian Journal of Physics, Volume 61, No. 1, January 1983, 
p. 93-98. 
(Subject Category 73 RTOP 199-20-76)

Journal of Spacecraft and Rockets, Volume 20, No. 6, November - December 
(Subject Category 18 RTOP 199-20-76)

1411. Townsend, L. W.; Bidasaria, H. B.; and Wilson, J. W.: Eikonal Phase Shift 
Analyses of Carbon-Carbon Scattering. Canadian Journal of Physics, Volume 
61, No. 6, June 1983, p. 867-871. 
(Subject Category 73 RTOP 199-20-76)

(Subject Category 16 RTOP 540-03-13)

1413. Zapata, L. E.; and DeYoung, R. J.: Flashlamp-Pumped Iodine Monobromide Laser 
Characteristics. Journal of Applied Physics, Volume 54, No. 4, April 1983, 
p. 1686-1692. 
(Subject Category 36 RTOP 506-55-13)

1414. Zoby, E. V.: Comparisons of STS-1 Experimental and Predicted Heating 
Rates. Journal of Spacecraft and Rockets, Volume 20, No. 3, May-June 1983, 
p. 214-218. 
(Subject Category 34 RTOP 506-51-33)

1415. Zoby, E. V.: Analysis of STS-2 Experimental Heating Rates and Transition 
Data. Journal of Spacecraft and Rockets, Volume 20, No. 3, May-June 1983, 
(Subject Category 34 RTOP 506-51-13)

Meeting Presentations

Presented at the Canaveral Council of Technical Societies, Twentieth Space 
(Subject Category 15 RTOP 506-63-23)

1417. Bidasaria, H. B.; Townsend, L. W.; and Wilson, J. W.: Complex WKB Analyses 
of Carbon-Carbon Rainbow Scattering. Presented at the 1983 Meeting of the 
American Physical Society, April 18-21, 1983, Baltimore, Maryland. 
(Subject Category 73 RTOP 199-20-76)


1462. Townsend, L. W.; Bidasaria, H. B.; and Wilson, J. W.: Complex WKB Solutions for $^{12}\text{C} + ^{14}\text{C}$ Scattering. Presented at the Lawrence Berkeley Laboratory Sixth High Energy Ion Study and Second Workshop on Anomalons, June 28 - July 1, 1983, Berkeley, California. (Subject Category 73 RTOP 199-20-76)

1463. Townsend, Lawrence W.; and Wilson, John W.: Space Radiation Protection Methods. Presented at the NASA Space Radiation Effects Workshop, November 16-18, 1983, Houston, Texas. NASA CP Pending. (Subject Category 93 RTOP 199-20-76)


1471. Wilson, John W.; and Stock, L. V.: Equivalent Electron Fluence for Solar Proton Damage in GaAs Shallow Junction Cells. Presented at the NASA Lewis Research Center Sixth Space Photovoltaic Research and Technology Meeting, October 18-20, 1983, Cleveland, Ohio. Proceedings Pending. (Subject Category 73 RTOP 506-55-43)

1472. Witcofski, Robert D.: Space-Station Crew-Safety Requirements. Presented at the NSIA/AIA/USAF/NASA 1983 Conference and Workshops on Mission Assurance, June 7-9, 1983, Los Angeles, California. (Subject Category 15 RTOP 906-54-20)


Technical Talks


1482. Townsend, L. W.; and Bidasaria, H. B.: Analytic Determinations of Single-Folding Optical Potentials. Presented at the 1983 Spring Meeting of the American Physical Society, April 18-21, 1983, Baltimore, Maryland. (Subject Category 73 RTOP 199-20-76)

1483. Townsend, Lawrence W.; and Wilson, John W.: Overview of Space Radiation Protection Methods. Presented at the NASA Space Radiation Effects Workshop, November 16-18, 1983, Houston, Texas. (Subject Category 93 RTOP 199-20-76)


Computer Programs


Tech Briefs


1492. Hohl, Frank (Langley Research Center); and Zang, Thomas A. (College of William and Mary): Two and Three-Dimensional Galaxy Simulations. NASA Tech Brief LAR-12907.


Patents

PUBLICATIONS FOR OFFICE OF DIRECTOR FOR SYSTEMS ENGINEERING AND OPERATIONS

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No formal reports.

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(Avail: STIF Subject Category 05 RTOP 513-52-01)

(Avail: NTIS Subject Category 26 RTOP 505-31-53)

Journal Articles and Other Publications

(Subject Category 37 RTOP 141-20-10)
1521. *Boen, James M.; and Bement, Laurence J.: How to Evaluate Service Life of Explosive Components. Astronautics and Aeronautics, Volume 21, No. 4, April 1983, p. 76-77. (Subject Category 03 RTOP 505-32-49)


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*Army Structures Laboratory, USARL (AVRADCOM)


Technical Talks


1533. Young, C. P., Jr.: Cryogenic Technology Model Development. Presented at the NASA/ASEE Summer Faculty Research Program Lecture Series, June 23, 1983, Hampton, Virginia. (Subject Category 09 RTOP 505-31-53)

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No computer programs.

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APPENDIX

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Durant, OK 74701
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NASA Industrial Applications Center
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University of Pittsburgh
Pittsburgh, PA 15260
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NASA Industrial Applications Center
University of Southern California
Research Annex, Room 200
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Los Angeles, CA 90007
(213) 743-6132

New England Research Applications Center
Mansfield Professional Park
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(203) 486-4533

North Carolina Science and Technology Research Center
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Research Triangle Park, NC 27709
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Technology Applications Center
University of New Mexico
Albuquerque, NM 87131
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Highlights of the major research accomplishments and applications made at the Langley Research Center during the past year are included in NASA TM-85702 entitled "Research and Technology - 1983 Annual Report of the Langley Research Center."