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

JANUARY 1984
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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
## Conferences Sponsored or Cosponsored by Langley and Held Locally in 1983

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<th>Langley contacts</th>
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<td>Jan. 3-6</td>
<td>Milton E. Rose</td>
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<tr>
<td>4. Langley Conference on Shuttle Performance: Lessons Learned</td>
<td>Mar. 8-10</td>
<td>Jim J. Jones and James P. Arrington</td>
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<td>5. NASA Space Station Technology Workshop</td>
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<td>Robert L. Wright and Aubrey G. Price</td>
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<tr>
<td>7. NASA Workshop on Tough Composite Materials</td>
<td>May 24-26</td>
<td>Louis F. Vosteen</td>
<td>6</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>9. NASA Workshop on Transonic Unsteady Aerodynamics and Aeroelasticity</td>
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<td>10. NASA/MSFC Applications of Tethers in Space Workshop</td>
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<td>Paul M. Siemens III</td>
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<td>11. STEP Experiment Requirements Workshop</td>
<td>June 29 - July 1</td>
<td>Marcus L. Brumfield</td>
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<td>12. Workshop on Advanced Materials/Structures Technology for Rotorcraft</td>
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<tr>
<td>13. NASA/LaRC/OAST Optical Information Processing Conference II</td>
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<tr>
<td>15. 1st Annual NASA Aircraft Controls Workshop</td>
<td>Oct. 25-27</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>
<td>Nov. 29 - Dec. 1</td>
<td>Otis S. Childress, Jr.</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).
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<td>5285 Port Royal Road</td>
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NASA LANGLEY RESEARCH CENTER
Hampton, Virginia

CALENDAR YEAR 1983

PUBLICATIONS FOR OFFICE OF THE DIRECTOR

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

   (Avail: NTIS Subject Category 99)

   (Avail: NTIS Subject Category 99)

Contractor Reports

   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

   (Avail: NTIS Subject Category 64 RTOP 505-31-83)

   (Avail: NTIS Subject Category 62 RTOP 505-31-83)

   (Avail: NTIS Subject Category 62 RTOP 505-31-83)

   (Avail: NTIS Subject Category 59 RTOP 505-31-83)


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
(Subject Category 05 RTOP 534-02-13)

Technical Talks
(Subject Category 05 RTOP 534-02-13)

Computer Programs
No computer programs.

Tech Briefs
Formal Reports

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

(Avail: NTIS Subject Category 05 RTOP 533-01-43)

Quick-Release Technical Memorandums

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

(Avail: STIF Subject Category 05 RTOP 505-43-43)

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

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

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

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

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


Contractor Reports


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 505-43-33)


Computer Programs

No computer programs.

Tech Briefs


Patents

No patents.
Formal Reports

(Avail: NTIS Subject Category 15 RTOP 506-62-23)

(Avail: NTIS Subject Category 15 RTOP 506-62-23)

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

No meeting presentations.

Technical Talks

No technical talks.

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
PUBLICATIONS FOR SCOUT PROJECT OFFICE

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
No meeting presentations.

Technical Talks
No technical talks.

Computer Programs
No computer programs.

Tech Briefs

Patents
No patents.
Formal Reports


Quick-Release Technical Memorandums


Contractor Reports


Journal Articles and Other Publications

No journal articles and other publications.

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
No journal articles and other publications.

Meeting Presentations
No meeting presentations.

Technical Talks
No technical talks.

Computer Programs
No computer programs.

Tech Briefs
No tech briefs.

Patents
No patents.
PUBLICATIONS FOR ANALYSIS AND COMPUTATION DIVISION

Formal Reports

(Avail: NTIS Subject Category 61 RTOP 505-31-83)

(Avail: NTIS Subject Category 04 RTOP 534-04-13)

Quick-Release Technical Memorandums

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(Avail: IAC Subject Category 05 RTOP 505-45-23)

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Meeting Presentations


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Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.
PUBLICATIONS FOR INSTRUMENT RESEARCH DIVISION

Formal Reports

(Avail: NTIS Subject Category 35 RTOP 505-31-53)

(Avail: NTIS Subject Category 48 RTOP 506-61-73)

(Avail: NTIS Subject Category 35 RTOP 505-33-53)

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Quick-Release Technical Memorandums

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(Subject Category 35 RTOP 505-31-53)

(Subject Category 35 RTOP 505-31-53)

(Subject Category 71 RTOP 505-33-23)

(Subject Category 71 RTOP 505-33-23)
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)


204. Li, Peter; Winfree, William P.; Yost, W. T.; and Cantrell, John H., Jr.: 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. Proceedings Pending. (Subject Category 71 RTOP 505-33-23)


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, USARTL (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)


Formal Reports


Quick-Release Technical Memorandums


Contractor Reports


Journal Articles and Other Publications


Meeting Presentations

(Subject Category 08 RTOP 505-34-03)

(Subject Category 05 RTOP 505-34-03)

(Subject Category 63 RTOP 506-57-13)

(Subject Category 08 RTOP 505-34-03)

(Subject Category 08 RTOP 505-34-03)

(Subject Category 18 RTOP 506-57-13)

(Subject Category 08 RTOP 505-34-03)

(Subject Category 08 RTOP 505-34-03)

(Subject Category 20 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

FORMAL REPORTS


QUICK-RELEASE TECHNICAL MEMORANDUMS


Contractor Reports


Journal Articles and Other Publications


(Subject Category 45 RTOP 176-30-34)

(Subject Category 35 RTOP 506-58-13)

(Subject Category 60 RTOP 506-61-03)

Meeting Presentations

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(Subject Category 43 RTOP 506-53-13)

(Subject Category 02 RTOP 534-01-13)

(Subject Category 35 RTOP 506-54-23)

(Subject Category 35 RTOP 506-54-23)


Technical Talks


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.


378. Parrish, Russell V.; McKissick, Burnell T.; and Ashworth, Billy R.: Comparison of Simulator Fidelity Model Predictions With In-Simulator Evaluation Data. NASA TP-2106, February 1983, 37 p. (Avail: NTIS Subject Category 05 RTOP 505-35-33)


Quick-Release Technical Memorandums


*Army Structures Laboratory, USARTL (AVRADCOM)

Contractor Reports


(Avail: IAC Subject Category 62 RTOP 505-34-13)

(Avail: NTIS Subject Category 05 RTOP 534-04-13)

(Avail: STIF Subject Category 08 RTOP 505-43-13)

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(Avail: NTIS Subject Category 08 RTOP 505-45-33)

(Avail: NTIS Subject Category 03 RTOP 505-35-23)
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)


Computer Programs

No computer programs.

Tech Briefs


Patents

Formal Reports

No formal reports.

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No quick-release technical memorandums.

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No contractor reports.

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No journal articles and other publications.

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No meeting presentations.

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No computer programs.

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No tech briefs.

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No patents.
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(Avail: NTIS Subject Category 27 RTOP 505-33-33)

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*Army Structures Laboratory, USARTL (AVRADCOM)


*Army Structures Laboratory, USARLT (AVRADCOM)
(Avail: NTIS Subject Category 24 RTOP 505-33-23)

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(Avail: NTIS Subject Category 27 RTOP 505-33-33)

(Avail: NTIS Subject Category 39 RTOP 505-33-23)

(Avail: NTIS Subject Category 52 RTOP 141-20-20)

(Avail: NTIS Subject Category 27 RTOP 505-33-33)


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, USARTL (AVRADCOM)


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<th>No.</th>
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Quick-Release Technical Memorandums
No quick-release technical memorandums.

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No meeting presentations.

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Patents
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Patents

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Tech Briefs

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Patents

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Pittsburgh, PA 15260
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Albuquerque, NM 87131
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### Abstract

This document is a compilation of the scientific and technical information that the Langley Research Center has produced during the calendar year 1983. Included are citations for Formal Reports, Quick-Release Technical Memorandums, Contractor Reports, Journal Articles and Other Publications, Meeting Presentations, Technical Talks, Computer Programs, Tech Briefs, and Patents.

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