NASA Technical Memorandum 108487

The Spacelab Scientific Missions: A Comprehensive Bibliography of Scientific Publications

Compiled by
Dr. Marsha Torr

April 1995

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FOREWORD

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

The Spacelab program represents one of the longest in duration, the most multi-disciplinary, and the most international of the space science programs conducted to date. Furthermore, eight more missions will be flown over the next few years. We have conducted an initial survey of the scientific products of the Spacelab missions already flown. In that survey, information was gathered from Principal Investigators on the scientific highlights of their investigations and on statistical measures of the overall success--such as papers published, students obtaining graduate degrees, technology spin-offs, etc.

This document is a compilation of the papers that have been published to date in refereed literature. As of November 1994, the number of papers by broad scientific discipline is as follows:

Astronomy/Astrophysics	145
Atmospheric Science	119
Earth Observations	67
Life Sciences	521
Microgravity Science	227
Space Plasma Physics	117
TOTAL	1196

We expect these numbers to grow significantly as several major missions have flown recently, and the scientists have not yet had time to analyze and publish their results. This document will be updated as appropriate to incorporate additional publications.

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Organizational Note

The bibliographic entries in this publication are first sorted according to date of publication, then alphabetically by first author's last name and title of work. The entry template order is as follows: author name(s), title of work, journal source, date of publication, and associated mission(s).

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APPENDIX A:
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Adv. Biochem. Eng.

Adv. Ceramics

Adv. Colloid Interface Sci.

Adv. Cryog. Eng.

Adv. in Space Biol. and Med.

Adv. Otolaryngol.

Adv. Physiol. Sci.

Adv. Space Res.

Aerosp. Med. Assoc.

AGU Monograph

AIAA J.

AIAA J. Aero. and Astro.

Akad. NAUK SSSR

Alta Frequenza

Aluminium

Alumni Leuven

Am. Assoc. Petrol. Geol. Bull.

Am. Heart J.

Am. J. Anat.

Am. J. Bot.

Am. J. Cardiac Imaging

Am. J. Cardiol.

Am. J. Clin. Nutr.

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Antiquity

Appl. Environ. Microbiol.

Appl. Microgravity Tech.

Appl. Optics

Arch. Otorhinolaryngol.

ASGSB Bulletin

Astro. Lett. and Comm.

Astron. and Astrophys.

Astron. J.

Astrophys. and Space Sci.

Astrophysical J.

Astrophysical J. Lett.

Astrophysical J. Lett. and Comm.

Austral. J. Phys.

Aviat. Space Environ. Med.

Bild der Wissenschaft

Biochem.

Biol. Cell.

Biol. Space Sci.

Biol. Sci. Space

Bioscience

Biotech. & Bioeng.

Blood

Br. J. Pharmacol.

Brain Res.

Bull. Mater. Sci.

Can. Aeron. and Space J.

Cell Tissue Res.

Chest

Chimica Oggi

Ciel et Terre

Circulation

Clin. Invest.

Clin. Physiol.

Comp. Biochem. Physiol.

Comput. Cardiol.

Computers in Biol. Med.

Corriere della Scienze

Crystal Res. and Technol.

Defect and Diffusion Forum

Defense Sci. J.

Dev. Brain Res.

Drugs Exp. Clin. Res.

Earth-Orient. Appl. Space Technol.

Endocrinology

Endocrnol. Japan

Environ. Med.

Environ. Res.

EOS Trans. Am. Geophys. Union

ESA J.

Eur. J. Pharmacol.

Eur. J. Physiol.

Exp. Brain Res.

Exp. Hematology

Exp. Mycology

Experientia

FASEB J.

FEBS Letters

Ferroelectrics

Fluid Phase Equilibria

GAMM-Mitteilungen

Geoarcheology

Geocarta Intl.

Geol. Soc. America Bulletin

Geophys. Res. Lett.

Glastechn. Ber.

Heat and Mass Trans. Mater. Process.

Heat Trans. in High Technol. and Power Eng.

Hydrobiologia

Hypertension

IEEE ElectroTech. Rev.

IEEE Trans. Geosci. Remote Sens.

IEEE Trans. Nuc. Sci.

Il Nuovo Cimento

Immunology Today

Indian J. Phys.

Infrared Solar Physics

Innovation Technol. Biol. Med.

Int. Arch. Photogrammetry and Remote Sensing

Int. J. Heat and Mass Transfer

Int. J. Thermophysics

Int. J. Radiat. Appl. Instrum.

Int. J. Radiat. Biol.

Int. J. Remote Sens.

J. Acoust. Soc. Am.

J. Aero. Soc. Ind.

J. Am. Ceram. Soc.

J. Am. Coll. Cardiol.

J. Am. Soc. Nephrol.

J. Am. Vac. Soc.

J. Appl. Phys.

J. Appl. Physiol.

J. Astrophys. Astron.

J. Atm. Chem.

J. Autonom. Nerv. Syst.

J. Biomechan.

J. Biotechnol.

J. Bone Miner. Res.

J. Br. Interplanetary Soc.

J. Clin. Pharmacol.

J. Colloid and Interface Sci.

J. Crystal Growth

J. Field Arch.

J. Fluid Mech.

J. Geomag. Geoelectr.

J. Geophys. Res.

J. Geophys. Res. Letters

J. Grav. Physiol.

J. Heat Transfer

J. Histochem. Cytochem.

J. Japan. Soc. Microgravity Appl.

J. Leukocyte Biol.

J. Mater. Sci.

J. Mater. Sci. Lett.

J. Med. Syst.

J. Mol. Spectrosc.

J. Neurobiol.

J. Non-Cryst. Solids

J. Nutr.

J. Photochem. Photobiol.

J. Phys.

J. Physics Condens. Matter

J. Physiol. Lond.

J. Quant. Spectrosc. and Rad. Trans.

J. Res. Natl. Inst. Stand. Technol.

J. Spaceer.

J. Spacecraft and Rockets

J. Thermophys. Heat Transfer

J. Trauma

J. Vac. Sci. Technol.

J. Vestibular Res.

Japan J. Physiol.

Japan. J. Appl. Phys.

Kagakukougaku

Kerntechnik

L'Areotecnica Missili e Spazio

Lab. Anim. Sci.

Life Sci. and Space Res.

Low G

Mar. J.

Mater. Sci. Forum

Med. Sci. Sports Exerc.

Medical Instrumentation

Met. Trans.

Metall

Microcomputing

Microgravity Q.

Microgravity Sci. and Technol.

Mikrochim. Acta

Min. Aerosp.

Mon. Not. R. Astr. Soc.

Mon. Weather Rev.

Muscle Nerve

NATO ASI Series

Nature

Naturwissenschaften

Neurochem. Int.

Neuroreport

New Engl. J. Med.

New Scientist

News Physiol. Sci.

Nucl. Inst. and Meth. in Phys. Res.

Nucl. Tracks and Radiat. Meas.

Optical Eng.

Origins of Life

Perception and Psychophysics

Phil. Trans. R. Soc. Lond.

Photogram. Eng. Remote Sensing

Photogrammetrica

Phys. Chem. Glasses

Phys. Blätter

Phys. Fluids

Phys. Rev.

Phys. Rev. Lett.

Phys. Stat. Sol.

Physicalia

Physiol. Plantarum

The Physiologist

Planet. Space Sci.

Plant and Cell Physiol.

Plant Cell and Environ.

Plant Physiol.

Planta

PNAS

Pramana - J. Phys.

Proc. Ind. National Sci. Acad.

Proc. Soc. Exp. Biol. Med.

Prog. Aeronautics Astronautics

QST

Quarterly J. Exp. Psychol.

Radiat. Res.

Radio Sci.

Radiology

Remote Sens. Environ.
Remote Sensing

Respir. Physiol.

Rev. Geophys.

Scan. Electron Microsc.

Science

Science News

Scientific American

Scienza & Tecnica

Seikagaku

Soc. Adv. Mater. and Proc. Eng. J.

Soc. Math. Fr.

Solar Physics

Space Safety and Rescue

Space Sci. Rev.

Space Technol.

Spectrum

Spektrum der Wissenschaft

SPINE

Springer Ser.Chem. Phys.

Technivisie

Tectonics

Therm. Sci. and Eng.

Trans. Tech. Pub.

Trans. Kansas Acad. Sci.

Trends Pharmacol. Sci.

Undersea Biomed. Res.

Vaccine

Yale J. Biol. Med.

Z. Metallkde.

Zeit. Anal. Anwend.

APPENDIX B:
MISSION INFORMATION

Acronym	Payload	Flight	Launch Date
OSTA-1	Office of Space & Terrestrial Applications-1	STS-2	November 12, 1981
OSS-1	Office of Space Science-1	STS-3	March 22, 1982
OSTA-2	Office of Space & Terrestrial Applications-2	STS-7	June 18, 1983
Spacelab 1	Spacelab 1	STS-9	November 28, 1983
OAST-1	Office of Aeronautics & Space Technology-1	41-D	August 30, 1984
OSTA-3	Office of Space & Terrestrial Applications-3	41-G	October 5, 1984
Spacelab 3	Spacelab 3	51-B	April 29, 1985
Spacelab 2	Spacelab 2	51-F	July 29, 1985
D1	First German Spacelab Mission	61-A	October 30, 1985
Astro-1	UV and X-ray Astronomy Mission	STS-38	December 2, 1990
SLS-1	Spacelab Life Sciences-1	STS-40	June 5, 1991
IML-1	First International Microgravity Laboratory	STS-44	January 22, 1992
ATLAS 1	First Atmospheric Laboratory for Applications and Science	STS-45	March 24, 1992
USML-1	First United States Microgravity Laboratory	STS-50	June 25, 1992
TSS-1	First Tethered Satellite System	STS-46	July 31, 1992
Spacelab J	Spacelab Japan	STS-47	September 12, 1992
ATLAS 2	Second Atmospheric Laboratory for Applications and Science	STS-56	April 8, 1993
D2	Second German Spacelab Mission	STS-55	April 26, 1993

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13. ABSTRACT *(Maximum 200 words)*

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 has 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.

14. SUBJECT TERMS
Spacelab, bibliography, scientific publications, astronomy, astrophysics, atmospheric science, Earth observation, life sciences, microgravity, space plasma physics

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