

TEXAS

SPACE GRANT CONSORTIUM

Spring 2001—Annual Meeting

Life Sciences and Engineering Support for Long-Duration Space Flight

THE UNIVERSITY OF HOUSTON, THE UNIVERSITY OF Texas at Austin, and Texas A&M University are the charter members of the Texas Space Grant Consortium (TSGC). Membership consists of 23 universities and colleges, five companies, three non-profit organizations, and two agencies of the State of Texas. The extensive TSGC web site URL is: <http://www.tsgc.utexas.edu>.

TSGC holds at least two meetings for the entire membership each year. The Institute for Space Systems Operations, with excellent support by the TSGC Austin office and the program committee, led the organization of the Spring 17-18 May, 2001 meeting held in Houston at the Lunar and Planetary Institute (LPI). The LPI is housed in the USRA Center for Advanced Space Studies and was an excellent host. The theme was "Life Sciences and Engineering Support for Long Duration Space Flight."

This research meeting focused on key challenges in physiology, radiation, and psychology for long-duration space flight comprehending both the engineering problems and the implications for the life-sciences. Distinguished speakers from NASA, the national Space Biomedical Research Institute, and academia presented overviews of each major area.

In addition to primary presentations and discussions, more than ten research organizations, located at Texas Space Grant Consortium institutions, and researchers of the University of Vermont and MIT presented research and engineering projects currently underway. The program details the speakers and topics. Presentations were delivered to describe all posters. The presentations are grouped below by subject area and are not listed in the actual sequence of presentation.

Thursday May 17, 2001

9:00 a.m.—Welcome to the Workshop on "Life Sciences and Engineering Support for Long Duration Space Flight"

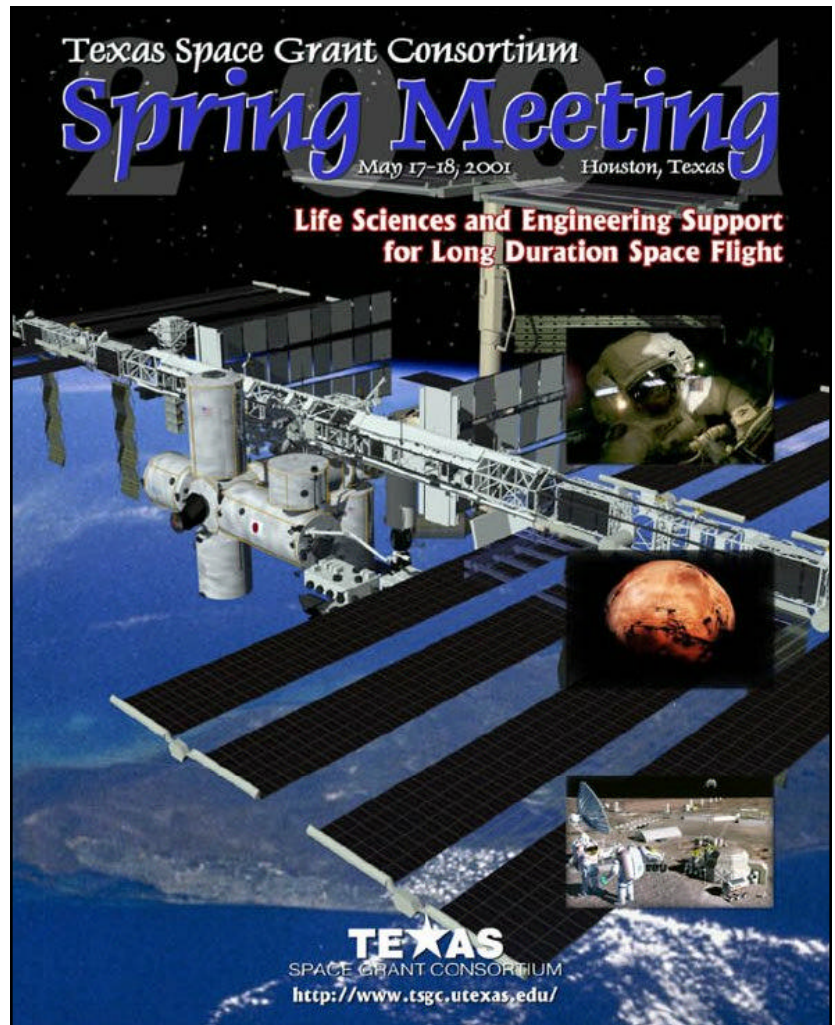
University of Houston, David Criswell

9:10 a.m.—Life Sciences and Supporting Engineering Overview
NASA/JSC, John Charles

PHYSIOLOGY Session Chair, NASA/JSC, John Charles

10:00 a.m.: Key Physiology Challenges in Human Long-Duration
Presence Beyond Earth, National
Space Biomedical Research
Institute, Ron White

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10:45 a.m.—Break—Poster Viewing

11:00 a.m.—Intelligent Systems & Human Centered Design:
Critical Issues for a Future Human Mars Mission. NASA/JSC,
Charles Stegemoeller and Alyssa Mueller

11:30 a.m.—Poster Presentations

"Musculoskeletal Modeling and Countermeasures to Space Flight," Tony S. Keller, Ph.D., and Mark S. Miller, M.S., Dept. of Mechanical Engineering, The University of Vermont, Rutland, VT 05701, and James Jordan, M.D., Killington Medical Clinic, Rutland Regional Health Service, Burlington, VT 0540

"Immune Responses And Latent Herpesvirus Reactivation In Aging And Spaceflight," Raymond P. Stowe¹, Satish K. Mehta², Arny A. Ferrando³, Daniel L. Feedback², and Duane L. Pierson². Departments of Pathology¹ and Surgery², University of Texas Medical Branch, Galveston, TX, and ²Life Sciences Research Laboratories, National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, TX.

"Otoliths of Fish Reared in Microgravity," M. L. Wiederhold, and J. L. Harrison, Dept. Otolaryngology—Head & Neck Surgery, Univ. Texas Health Science Center, San Antonio

11:45 a.m.—Poster Presentations

"Analysis and Design of a Prototype Artificial Gravity Generating Tethered Satellite System," John H. Hoffman¹, Andre Mazzoleni², and Andrew Santangelo³, ¹Department of Physics, University of Texas at Dallas, P.O. Box 830688,



SPACECRAFT, EARTH, AND SUN—NASA Artist's Concept

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 "Aerospace Projects Funded by the Texas Advanced Technology Program: 1987-1999," Linda Domelsmith, Texas Higher Education Coordinating Board
 12:15 p.m.—Lunch
 1:15 p.m.—Group Discussion of "Key Physiology Challenges" Radiation, Session Chair, Larry Pinsky, University of Houston
 2:00 p.m.— "Radiation: Key Challenges in Space Life-Science," Texas A&M University, Les Braby
 2:45 p.m.— "Engineering for Radiation Monitoring and Protection," NASA/JSC, G. Badhwar
 3:30 p.m.— Break – Poster Viewing and then presentations
 "NF- β -dependent Downstream Gene Expression in Human Monocytes Exposed to High LET Heavy-Ion Radiation," Mohan Natarajan, Natarajan Aravindan, Martin L. Meltz, and Terence S. Herman, Department of Radiation Oncology, The University of Texas Health Science Center, San Antonio, Texas 78229.
 "Effects of Ionizing Radiation on the Mutation Frequency of Male Germ Cells," Gabriel W. Intano¹, John R. McCarrey³, C. Alex McMahan² and Christi A. Walter^{1,4}, ¹Department of

Cellular and Structural Biology, ²Department of Pathology, The University of Texas Health Science Center at San Antonio, San Antonio, TX 78284, USA, ³Department of Genetics, Southwest Foundation for Biomedical Research, San Antonio, TX 78245, USA and ⁴South Texas Veterans Health Care System, Audie L. Murphy Hospital, San Antonio, TX 78284, USA

"Melatonin and Radioprotection," Vijayalaxmi, Department of Radiation Oncology, The University of Texas Health Science Center, San Antonio, TX 78284

"Development Of A Space Radiation Monte-Carlo Computer Simulation Based On The Fluka And Root Codes," Lawrence Pinsky, University of Houston
 "Center for Applied Radiation Research (CARR)", Richard Wilkins and Kelvin Kirby, Prairie View A&M University

4:15 p.m.—Group Discussion of Radiation and Related Engineering Support

5:00 p.m.—Break – Poster Viewing

6:00 p.m.—Reception, Hilton Houston Nassau Bay & Marina

6:45 p.m.—Dinner Speaker, Prof. Robert L. Helmreich, University of Texas-Austin, Psychology Department

Friday May 18, 2001

PSYCHOLOGY, Session Chair, Bob Helmreich, University of Texas

8:00 a.m.—"Key Psychological Challenges–Life Sciences," Christopher Flynn, NASA/JSC

8:45 a.m.—"Key Psychological Challenges–Engineering Support," Donald Stilwell, NASA/JSC

9:30 a.m.—Poster Presentations

"Aeronautical Orientation Research Through Haptics–A Study in Tactile Attitude Recovery," K.A. Stoke, T.P. Graves, NASA-JSC

Project NORTH-STAR: "AeroNautical Orientation Research Through Haptics–A Study in Tactile Attitude Recovery," Kristy Stoke, Timothy Graves, Dana Forti, John Thomas, Jen Law, Massachusetts Institute of Technology; Col. Peter Young (Advisor) NASA-JSC

10:15 a.m.—Group Discussion of Psychology and Related Engineering Support

11:00 p.m.—Lunch

12:30 p.m.—TSGC Business Session

2:00 p.m.—Adjourn

This Annual Meeting was the largest spring Annual Meeting of the Texas Space Grant Consortium (TSG). More than 80 researchers participated. Most of the presentations and summaries of several of the discussions will be made available on the ISSO web site: <http://www.issouh.edu>.