SPACE TECHNOLOGY & APPLICATIONS INTERNATIONAL FORUM (STAIF-2008)

February 10 - 14, 2008

"Enabling Space Exploration"

FINAL PROGRAM

12th CONFERENCE ON THERMOPHYSICS APPLICATIONS IN MICROGRAVITY

1st SYMPOSIUM ON SPACE RESOURCE UTILIZATION

25th SYMPOSIUM ON SPACE NUCLEAR POWER AND PROPULSION

6th CONFERENCE ON HUMAN/ROBOTIC TECHNOLOGY AND THE VISION FOR SPACE EXPLORATION

6th SYMPOSIUM ON SPACE COLONIZATION

5th SYMPOSIUM ON NEW FRONTIERS AND FUTURE CONCEPTS

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School of Engineering, University of New Mexico
MSC01-1120
1 University of New Mexico
Albuquerque, New Mexico 87131-0001
(505) 277-0446, http://www.unm.edu/~isnps

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EXHIBITS

Hotel Albuquerque, Exhibit Area, *North/East Atrium and Alvarado E*

Sunday, February 10, 2008	Exhibitor Move-in, Noon - 6:00 p.m.
Monday, February 11, 2008	Exhibit Hours, 8:30 a.m. - 12:00 p.m., 2:00 p.m. - 7:00 p.m.
Tuesday, February 12, 2008	Exhibit Hours, 8:30 a.m. - 12:00 p.m., 2:00 p.m. - 5:00 p.m., 6:00 p.m. – 7:00 p.m.
Wednesday, February 13, 2008	Exhibit Hours, 8:30 a.m. - 12:00 p.m., 2:00 p.m. - 4:30 p.m. Exhibitor Move-Out, 4:30 p.m. - 8:30 p.m.

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Advanced Cooling Technologies, Inc.
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AWARDS AND OUTREACH

SCHREIBER-SPENCE ACHIEVEMENT AWARD

The Schreiber-Spence Space Achievement Award was established by The University of New Mexico's Institute for Space and Nuclear Power Studies to recognize contributions that have advanced capabilities in space technologies and applications through excellence in pioneering applications, technical contributions, public service, or leadership. The award consists of a memento and a monetary award of $2,500 (shared equally if there are multiple awardees who have contributed jointly). Presented by the Institute, the award is given when a worthy person (or persons contributing jointly) is identified by the Awards Committee. The award is not given more frequently than, nor necessarily, annually. The Award(s) will be presented at the STAIF-2008 Banquet. The awardee(s) is expected to attend the STAIF Conference, at which the award is given, and to address the attendees on a relevant topic. The award honors Raemer E. Schreiber and Roderick W. Spence for their pioneering and technical contributions to concepts and designs for nuclear propulsion in space during their tenure at Los Alamos National Laboratory.

NOMINATION: Nominations for the award can be submitted at any time to The University of New Mexico's Institute for Space and Nuclear Power Studies, c/o Schreiber-Spence Space Achievement Award, on the special nomination form. The final selection for the award will be made based on the criteria described in the award bylaws. A copy of the award bylaws and the nomination form can be obtained by writing to the Institute or by calling (505) 277-0446. Nominations will be retained for consideration for a three-year period.

SELECTION CRITERIA: Strict selection criteria have not been adopted, nor judged to be appropriate, except as they are implicit in the purposes for which the Award has been established and as noted in the first paragraph of these "Guidelines." Additionally, contributions are, or have been, substantial and specific, and contributions acknowledged to be worthy of unusual recognition for excellence by those actively engaged in the field of space technologies and applications.

NOMINATION FORM: To be considered by the Award Committee, all sections of the Nomination Form must be completed in compliance with the requirements. The Award Committee will place particular emphasis in its review of the nominations on evidence substantiating the excellence of the contributions noted in the citation and as contained in the basis for the nomination. Nominations can be submitted at any time on the Nomination Form to ISNPS.

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1988 Roderick W. Spence
1990 Jerome Mullein
1990 William E. Wright
1991 Stanley V. Gunn
1992 Harold B. Finger
1993 Robert T. Carpenter
1993 James J. Lombardo
1994 George Gryaznov, Russia
1994 Victor Ya. Poupko, Russia
1995 Martin Marietta Astro Space RTG Team
1996 SNAP-10A Team
1996 Gary L. Bennett
1997 Wesley T. Huntress
1998 The Cassini Mission Power Source Team
1999 NSTAR Team and SCARLET Team
2002 Robert L. Wiley
2003 Robert L. Forward
2003 Teledyne Transit/ Nimbus/ Pioneer/Viking/ RTG Team

2004 Robert W. Bussard
2005 Ronald J. Sovie,
Franklin P. Durham, and Keith Boyer Team
2006 Milton Klein
2007 Chauncey Starr

About the Schreiber-Spence Achievement Award Memento

Each Schreiber-Spence Achievement memento is handcrafted following the original design for the award by Mark D. Hoover, a former STAIF publications co-chair, and one of the co-founders of the Symposium Series. Because the scientific contributions each Schreiber-Spence awardee has made to the field are unique, Hoover believes "the mementos should be unique in the world," as well. Hoover creates the bases himself of solid walnut, while the logo-etched glass component is made by a local Albuquerque artisan.

MANUEL LUJAN, JR. STUDENT PAPER AWARD

The Manuel Lujan, Jr. Student Paper Award was established in 1987 by The University of New Mexico's Institute for Space and Nuclear Power Studies to recognize outstanding contributions by students in the field addressed at all conferences and symposia of the Space Technology & Applications International Forum. Up to two awards could be granted at the forum, with each consisting of a certificate and $500.00, shared equally if more than one awardee. The award is given by the Institute when worthy contributions are identified by the award committee.

NOMINATION CRITERIA: Nominations for the award will be based on the quality of the paper published in the STAIF proceedings, as well as on the technical quality and originality of the oral presentation at the annual meeting. For a paper to be considered for the award, it must have the student as the lead author and he or she must have done the majority of the research.

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1990-John Metzger, ISNPS, University of New Mexico
1991-Theodore Tessner, Oregon Graduate Institute of Science
1992-Christopher S. Murray, ISNPS, University of New Mexico
1992-Ronald A. Pawlowski, Oregon State University
1992-Bernard R. Wernsman, ISNPS, University of New Mexico
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1995-Jun Liu, Auburn University
1996-James R. Luke, ISNPS, University of New Mexico
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1999-Gerrit Wölk, University of Bremen, Germany
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2002-David P. Morris, University of Michigan
2004-Shannon Bragg-Sitton, University of Michigan
2005-Jeffrey C. King, ISNPS, University of New Mexico
2006-Steven A. Hatton, ISNPS, University of New Mexico
2006-Benjamin Amiri, University of Florida
2007-Thomas Liu, University of Michigan

OUTSTANDING PAPER AWARDS

The Space Nuclear Power and Propulsion Outstanding Paper Award was established in 1992 by The University of New Mexico's Institute for Space and Nuclear Power Studies (ISNPS) to recognize outstanding technical contributions to the fields of all hosted conferences and symposia of the Space Technology and Applications International Forum (STAIF). The recognition of an outstanding contribution is based upon the written paper published in the STAIF Proceedings and the content of the presentation at the meeting. The award is presented by ISNPS upon the recommendation of the STAIF Award Committees.

NOMINATION AND EVALUATION PROCEDURE: Contributions from STAIF conferences could be nominated by the session chair and co-chair, or any member of that conference or symposia Outstanding Paper Award Subcommittee. Nomination forms will be given to the session chairs and co-chairs at the speakers' breakfast. Individuals who wish to have their contribution or a colleague's contribution considered may request that a member of the Outstanding Paper Award Committee attend the session in which the presentation will be made. The request must be made in writing to the ISNPS office or to the STAIF Outstanding Paper Award Committee Chair. For consideration, nominations must be received by the ISNPS office or Outstanding Paper Award Committee Chair by the 2nd Friday in February following the STAIF Conference.

NOMINATION AND EVALUATION CRITERIA: The paper and the content of the presentation represents a technical contribution that (1) has an influential impact on the field of the topic of the conference or symposia in which it was presented, (2) has lasting technical value, and (3) is likely to be built upon and referenced by their peers. The primary emphasis in the selection of the award will be based on the written paper. In the case of a close decision, input from subcommittee members who heard the oral presentation and the session chair and co-chair may be used to render a final decision. The paper must be well written, well organized, and have appropriate references and acknowledgments. The paper must also present a complete and scientifically sound analysis. The STAIF Outstanding Paper Award is presented for technical contributions. While overview and historical papers are important for the historical archives, they will not be considered for the award. The author(s) must be a major technical contributor to the work. The paper should also acknowledge all major technical contributors to the work who are not co-authors.

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Symposium on New Frontiers and Future Concepts: **Glen A. Robertson,** (Chair) Gravi Atomic Research; **Michael LaPointe,** NASA Marshall Space Flight Center; **Raymond A. Lewis,** NASA Marshall Space Flight Center; **Clive Woods**, Louisiana State University; **Eric Davis**, Institute for Advanced Studies at Austin.

RECIPIENTS OF 2007 AWARDS

11th Conference on Thermophysics in Microgravity: James R. Gaier and Donald A. Jaworske, NASA Glenn Research Center, Cleveland, OH, USA, for their paper, "Lunar Dust on Heat Rejection System Surfaces: Problems and Prospects."

24th Symposium on Space Nuclear Power and Propulsion: David I. Poston, **David D. Dixon**, **Thomas Marcille**, and **Benjamin W. Amiri**, Los Alamos National Laboratory, Nuclear Systems Design Group, NM, USA, for their paper, "FRINK – A Code to Evaluate Space Reactor Transients."

4th Symposium on New Frontiers and Future Concepts: Martin Tajmar, **Florin Plesescu**, **Bernhard Seifert**, and **Klaus Marhold**, Space Propulsion, ARC Seibersdorf Research GmbH, Seibersdorf, Austria, for their paper, "Measurement of Gravitomagnetic and Acceleration Fields around Rotating Superconductors."

5th Conference on Space Colonization: Eric H. Cardiff, Brian R. Pomeroy, Ian S. Banks, NASA Goddard Space Flight Center, Greenbelt, MD, USA; and **Alexis Benz**, University of Michigan, Ann Arbor, MI, USA, for their paper, "Vacuum Pyrolysis and Related ISRU Techniques."

GENERAL ERNEST C. HARDIN SCHOLARSHIP AWARD

This scholarship fund was established in 1986 by The University of New Mexico's Institute for Space and Nuclear Power Studies to recognize outstanding undergraduate and graduate students in engineering and science disciplines with emphasis on space science and technology and related fields. Several awards are offered annually to deserving students. This year's awards consist of a certificate of recognition and a $1000 monetary sum.

This year's recipients are **Bruno Gallo, Tai Pham,** and **Timothy Schriener**, Ph.D., candidates in the University of New Mexico's Department of Chemical and Nuclear Engineering and Research Assistants in the Institute for Space and Nuclear Power Studies.

20th SECONDARY SCHOOL SPECIAL SESSION AND SPACE DESIGN COMPETITION

The 20th Secondary School Special Session and the 20th Annual Space Design Competition are events sponsored by the University of New Mexico's Institute for Space and Nuclear Power Studies, and cosponsored by the American Nuclear Society Trinity Section, and are organized by **Susan Ostlie**, Madison Middle School, **Jack Parker**, **Tim Schriener**, **Bruno Gallo**, and **Tai Pham**, UNM-ISNPS. New Mexico secondary school students and teachers participating in the Space Design Competition are invited to attend the Secondary School Special Session where space related topics will be presented by members of the science and engineering committees. This year's design objective for the Space Design Competition is entitled, "Orbital Colony" Judging of the event will take place during the Secondary School Special Session, and the results of the competition will be presented during Plenary Session – II, Monday, February 11, 2008.

PUBLICATIONS

Available from the American Institute of Physics, c/o Springer New York, Customer Service, 1-800-777-4643, or e-mail: orders-ny@springer.com, or mail to Springer New York, P. O. Box 2485, Secaucus, NJ 07094-2485, USA (For North America, add $5.00 for shipping and handling for the first volume, plus $1.00 for each additional volume. For orders outside of North America, add $10.00 for first volume and $5.00 for each additional volume.)

Proc. Space Technology and Applications International Forum **(STAIF-2008)**:

AIP Conf. Proceedings 969, (1-vol.hardcover book), ISBN 978-0-7354-0486-1…. $299.00
CD-ROM Version, ISBN 978-0-7354-0487-8…….. ..... $145.00

Proc. Space Technology and Applications International Forum **(STAIF-2007)**:
AIP Conf. Proceedings 880, (1-vol. hardcover book), ISBN 978-0-7354-0386-4..... $286.00
CD-ROM Version, ISBN 978-0-7354-0387-1 ..... $145.00

Proc. Space Technology and Applications International Forum **(STAIF-2006)**:
AIP Conf. Proceedings 813, (1-vol. hardcover book), ISBN 0-7354-0305-8..... $320.00
CD-ROM Version, ISBN 0-7354-0306-6..... $145.00

Proc. Space Technology and Applications International Forum **(STAIF-2005)**:
AIP Conf. Proceedings 746, (1-vol. hardcover book), ISBN 0-7354-0231-0..... $320.00
CD-ROM Version, ISBN 0-7354-0230-0……. $145.00

Proc. Space Technology and Applications International Forum **(STAIF-2004)**:
AIP Conf. Proceedings 699, (1-vol. hardcover book), ISBN 0-7354-0171-3..... $290.00
CD-ROM Version, ISBN 0-7354-0172-0……. $145.00

Proc. Space Technology and Applications International Forum **(STAIF-2003)**:
AIP Conf. Proceedings 654, (1-vol. hardcover book), ISBN 0-7354-0114-4..... $280.00
CD-ROM Version, ISBN 0-7354-0115-2..... $140.00

Proc. Space Technology and Applications International Forum **(STAIF-2002)**:
AIP Conf. Proceedings 608, (1-vol. hardcover book), ISBN 0-7354-0052-0..... $295.00
CD-ROM Version, ISBN 0-7354-0053-9..... $150.00

Proc. Space Technology and Applications International Forum **(STAIF-2001)**:
AIP Conf. Proceedings 552, (1-vol. hardcover book), ISBN 1-56396-980-7..... $280.00
CD-ROM Version, ISBN 1-56396-981-5..... $150.00

Proc. Space Technology and Applications International Forum **(STAIF-2000)**:
AIP Conf. Proceedings 504, (2-vol. hardcover set), ISBN 1-56396-919-X..... $300.00
CD-ROM Version, ISBN 1-56396-920-3..... $200.00

Proc. Space Technology and Applications International Forum **(STAIF-99)**:
AIP Conf. Proceedings 458, (2-vol. hardcover set), ISBN 1-56396-846-0 ..... $300.00
CD-ROM Version, ISBN 1-56396-879-7..... $200.00

Proc. Space Technology and Applications International Forum **(STAIF-98)**:
AIP Conf. Proceedings 420 (3-vol. hardcover set), ISBN 1-56396-747-2..... $320.00

Proc. 12th Symposium on Space Nuclear Power & Propulsion, Conf. on Alternative Power from Space, and Conf. on Accelerator-Driven Transmutation Technologies and Applications **(1995),** AIP Conf. Proceedings 324 (2-vol. hardcover set), ISBN 1-56396-427-9..... $225.00

Proc. 1st Conf. on NASA Centers for Commercial Development of Space (1-vol. hardcover book), ISBN 1-56396-431-7, AIP Conf. Proceedings 325..... $125.00

A Critical Review of Space Nuclear Power & Propulsion **(1984-1993)** (Anniversary Issue), AIP Press, ISBN 1-56396-317-5..... $ 75.00

Proceedings of the 10th Symposium **(1993)** (3-vol. hardcover set), ISBN 1-56396-137-7, AIP Conf. Proceedings 271..... $275.00

Proceedings of the 9th Symposium **(1992)** (3-vol. hardcover set), ISBN 1-56396-027-3, AIP Conf. Proceedings 246..... $225.00

Proceedings of the 8th Symposium **(1991)** (3-vol. hardcover set), ISBN 0-88318-838-4, AIP Conf. Proceedings 217..... $175.00

HOTEL ACCOMMODATIONS

Hotel Albuquerque, 800 Rio Grande Blvd. NW, Albuquerque, NM 87104
(505) 843-6300, Fax (505) 842-8426, Toll Free Reservations: 1-866-505-7829

Guest rooms have been reserved at the Hotel Albuquerque, located in Albuquerque's Old Town District, for those who identify themselves as participants of STAIF-2008. The rates are:

ROOM RATES

Single Occupancy	$75.00	Triple Occupancy	$75.00
Double Occupancy	$75.00	Quadruple Occupancy	$75.00

ALL ATTENDEES ARE RESPONSIBLE FOR MAKING THEIR OWN RESERVATIONS DIRECTLY WITH THE HOTEL.

All group-rate reservation requests must be received by the hotel no later than January 25, 2008. Attendees must identify themselves as participants of STAIF-2008, the hotel will not be able to ensure the quoted group rate or guest room availability. Rates will not be changed at check-in or check-out for attendees who fail to identify their affiliation with this meeting. All reservations must be guaranteed with a one night's deposit in the form of credit card, check, or money order. Check-in time is 3:00 pm and Check-out is 12:00 pm. Contact the hotel for more information on reservation requirements and cancellation policies.

REGISTRATION AND FEES

Hotel Albuquerque, Fireplace Room

Sunday, February 10	4:30 pm - 7:30 pm
Monday, February 11	7:00 am - 12:00 pm, 1:00 pm - 4:30 pm
Tuesday, February 12	7:30 am - 11:30 am, 1:00 pm - 4:30 pm
Wednesday, February 13	7:30 am - 11:30 am, 1:00 pm - 4:30 pm
Thursday, February 14	7:30 am - 10:30 am

ALL ATTENDEES, GUESTS, AND EXHIBITORS MUST REGISTER & PAY A REGISTRATION FEE

FULL REGISTRATION (a)	$665.00
ONE DAY REGISTRATION (b)	$435.00
STUDENT (c)	$235.00
ADDITIONAL BANQUET TICKET (d)	$50.00

(a) Full Registration Fee: Includes Technical Sessions, Tuesday banquet, daily coffee breaks, and a set of Proceedings on CD-ROM.

(b) One-Day Registration: Includes Technical Sessions, coffee breaks and a set of Proceedings on CD ROM. (Banquet tickets are not included, but are available for purchase).

(c) Student Registration: **TO QUALIFY, INDIVIDUALS MUST SHOW PROOF OF FULL TIME ENROLLMENT** for the 2008 Spring Semester. Pre-registrants should enclose a copy of their 2008 spring schedules. Registration fee includes a set of Proceedings on CD ROM, banquet ticket, and coffee breaks.

(d) Additional luncheon tickets can be purchased on-site if available, although pre-purchasing luncheon tickets is encouraged to help provide accurate numbers to the caterer.

Cash, corporate or personal checks, Visa and MasterCard will be accepted. Payment by a personal or corporate check should be made payable to: INSTITUTE FOR SPACE & NUCLEAR POWER STUDIES, STAIF-2008 Conferences, MSC01-1120, FEC Room 239, 1 University of New Mexico, Albuquerque, NM 87131-0001, (505) 277-2813 or (505) 277-0446.

AWARDS BANQUET

Tuesday, February 12, 6:45 pm – 9:00 pm, **Alvarado Ballroom A, B, C,** and **D**, Hotel Albuquerque.

One banquet ticket will be included with each full registration. Additional tickets must be purchased in advance. Please be certain that you and each of your guests have registered. *All guests must check in at registration to receive their name badge and banquet tickets*. Guest banquet tickets will ***not*** be included in the host's registration packet.

Master of Ceremonies: Harold McFarlane, Idaho National Laboratory, Idaho Falls, ID
Guest Speaker: Harrison Schmitt, University of Wisconsin, Madison, WI

CHAIRS' AND SPEAKERS' BREAKFAST

All STAIF-2008 speakers and session chairs are requested to attend the hosted Speakers' Breakfast from 7:00 am to 7:45 am in the Franciscan Room on the day of their session or presentation to discuss the session arrangements and guidelines.

AUDIO / VISUAL EQUIPMENT

One (1) LCD Data Projector, and one (1) screen will be provided at all sessions. A slide or overhead projector will also be provided on request without charge. Additional A/V equipment must be ordered through Institute personnel, in advance, and paid for by the author. Please call (505) 277-0446 with special requests. Attendees must provide their own laptop computers.

COMMITTEE MEETINGS

Schreiber-Spence Award

Monday, February 11, 12:30 pm -1:45 pm, **Weavers Room**

Steering and Executive Committees

Monday, February 11, 7:00 pm – 8:30 pm, **Alvarado A**

Technical Program Committees

Wednesday, February 13, 12:15 pm – 1:30 pm
(All Session Chairs and Co-Chairs are committee members. Lunch is available for purchase)

12th Conference on Thermophysics Applications in Microgravity, **Alvarado B/C**
1st Symposium on Space Resource Utilization, **Turquoise Room**
25th Symposium on Space Nuclear Power and Propulsion, **Alvarado D**
6th Conference on Human/Robotic Technology and the Vision for Space Exploration, **Potters Room**
6th Symposium on Space Colonization, **Alvarado F**
5th Symposium on New Frontiers and Future Concepts, **Alvarado A**

PROGRAM ACTIVITIES

SUNDAY, February 10, 2008

4:30 pm - 7:30 pm **Registration**, Fireplace Room

MONDAY, February 11, 2008

7:00 am - 7:45 am **Speakers' Breakfast,** Franciscan Room
7:00 am - 12:00 pm **Registration,** Fireplace Room
8:00 am - 12:30 pm **Space Design Competition,** North/East Atrium
8:00 am - 8:20 am **Welcoming and Opening Remarks,** Alvarado Ballroom A/B/C/D
8:25 am - 10:15 am **Plenary Session I,** Alvarado Ballroom A/B/C/D
10:00 am - 10:30 am **Coffee Break,** East/North Atrium, and Alvarado E
10:30 am - 12:00 pm **Plenary Session II,** Alvarado Ballroom A/B/C/D
10:00 am - 12:00 pm **20th Secondary School Special Session,** Alvarado G/H
12:00 pm - 12:20 pm **20th Space Design Competition Awards Ceremony,** Alvarado Ballroom A/B/C/D
12:30 pm - 1:45 pm **Lunch Break**
12:30 pm – 1:45 pm **Schreiber-Spence Award Committee Meeting,** Weavers Room
1:00 pm - 4:30 pm **Registration,** Fireplace Room
1:45 pm - 3:45 pm **Technical Sessions** (see table of contents or centerfold for time and room)
3:45 pm - 4:00 pm **Coffee Break,** East/North Atrium and Alvarado E
4:00 pm - 6:00 pm **Technical Sessions** (see table of contents or centerfold for time and room)
6:00 pm - 7:00 pm **STAIF-08 Reception,** North/East Atrium and Alvarado E
7:00 pm - 8:30 pm **STAIF Steering & Executive Committees Meeting**, Alvarado A
7:00 pm - 9:30 pm **Free Admission and Tour to The National Atomic Museum Courtesy of NASA Marshall Space Flight Center**

TUESDAY, February 12, 2008

7:00 am - 7:45 am **Speakers' Breakfast,** Franciscan Room
7:30 am - 11:30 am **Registration,** Fireplace Room
8:00 am - 10:00 am **Technical Sessions** (see table of contents or centerfold for time and room)
10:00 am - 10:15 am **Coffee Break,** East/North Atrium and Alvarado E
10:15 am - 12:15 pm **Technical Sessions** (see table of contents or centerfold for time and room)
12:15 pm - 1:30 pm **Lunch Break**
1:00 pm - 4:30 pm **Registration,** Fireplace Room
1:30 pm - 3:30 pm **Technical Sessions** (see table of contents or centerfold for time and room)
3:30 pm - 3:45 pm **Coffee Break,** East/North Atrium and Alvarado E
3:45 pm - 5:45 pm **Technical Sessions** (see table of contents or centerfold for time and room)
6:15 pm - 6:45 pm **No-Host Cocktail Reception,** North/East Atrium and Alvarado E
6:45 pm - 9:00 pm **STAIF-2008 Awards Banquet,** Alvarado A/B/C/D

WEDNESDAY, February 13, 2008

7:00 am - 7:45 am **Speakers' Breakfast,** Franciscan Room
7:30 am - 11:30 am **Registration,** Fireplace Room
8:00 am - 10:00 am **Technical Sessions** (see table of contents or centerfold for time and room)
10:00 am - 10:15 am **Coffee Break,** East/North Atrium and Alvarado E
10:15 am - 12:15 pm **Technical Sessions** (see table of contents or centerfold for time and room)
12:15 pm - 1:30 pm **Lunch Break**
12:15 pm - 1:30 pm **STAIF Technical Program Committee Meetings**
12th Conference on Thermophysics Applications in Microgravity, Alvarado B/C
1st Symposium on Space Resource Utilization, Turquoise Room
25th Symposium on Space Nuclear Power and Propulsion, Alvarado D
6th Conference on Human/Robotic Technology and the Vision for Space Exploration, Potters Room
6th Symposium on Space Colonization, Alvarado F
5th Symposium on New Frontiers and Future Concepts, Alvarado A
1:00 pm - 4:30 pm **Registration,** Fireplace Room
1:30 pm - 3:30 pm **Technical Sessions** (see table of contents or centerfold for time and room)
3:30 pm - 3:45 pm **Coffee Break,** East/North Atrium and Alvarado E
3:45 pm - 5:45 pm **Technical Sessions** (see table of contents or centerfold for time and room)
6:00 pm - 8:00 pm **Special Plenary-25th Anniversary of Symposium on Space Nuclear Power and Propulsion**, Alvarado D

THURSDAY, February 14, 2008

7:00 am - 7:45 am **Speakers' Breakfast,** Franciscan Room
7:30 am - 10:30 am **Registration,** Fireplace Room
8:00 am - 10:00 am **Technical Sessions** (see table of contents or centerfold for time and room)
10:00 am - 10:15 am **Coffee Break,** East/North Atrium
10:15 am - 12:15 pm **Technical Sessions** (see table of contents or centerfold for time and room)

OPENING REMARKS

Monday, February 11, 8:00 am – 8:20 am, Alvarado Ballroom A,B,C,D

Brewster Shaw, STAIF-2008 General Chair, The Boeing Company, TX

Harold McFarlane, STAIF-2008 General Co-Chair, Idaho National Laboratory, ID

Mohamed El-Genk, STAIF-2008 Technical and Publication Chair, University of New Mexico, NM

PLENARY SESSION I: WHY SPACE EXPLORATION?

Monday, February 11, 8:25 am – 10:00 am, Alvarado Ballroom A, B, C, D

Brewster Shaw, Chair
VP & General Manager, Space Exploration
The Boeing Company
Houston, TX

Harold McFarlane, Co-Chair
Associate Director
Idaho National Laboratory

Representative Heather Wilson (R-NM), 1st District of New Mexico, **(Invited)**
Geoffrey Yoder, Director of Constellation Systems Division, Exploration Systems Mission Director, NASA Headquarters, Washington, D. C.
Pete Worden, Director, NASA Ames Research Center, Moffett Field, CA
Paul Eckert, The Boeing Company, Houston, TX

PLENARY SESSION II: MAKING EXPLORATION AFFORDABLE

Monday, February 11, 10:30 am - 12:00 pm, Alvarado Ballroom A, B, C, D

Wade Carroll, Chair
Deputy Director
Office of Radioisotope Power Systems,
U. S. Department of Nuclear Energy
Washington, D. C.

Sterling Bailey, Co-Chair
Consultant
Bailey Engineering and Management
Grass Valley, CA

Owen Lowe, Director, Office of Radioisotope Power Systems, U.S. Department of Energy, Germantown, MD
Benjamin Neumann, Deputy Director, Advanced Capabilities Division, NASA Headquarters, Washington, DC
David R. Criswell, Director, Institute for Space Systems Operations, University of Houston, Houston, TX

12:00 pm - Space Design Competition Awards Ceremony

Brewster Shaw, The Boeing Company, STAIF-08, General Chair
Harold McFarlane, Idaho National Laboratory, STAIF-08, General Co-Chair
Mohamed El-Genk, University of New Mexico, STAIF-08, Technical Publications Chair

SPECIAL PLENARY AND LIGHT FAIR: 25th ANNIVERSARY OF SYMPOSIUM ON SPACE NUCLEAR POWER AND PROPULSION (Page 43)

Wednesday, February 13, 6:00 pm - 8:00 pm – Alvarado D

20th SECONDARY SCHOOL SPECIAL SESSION

Monday, February 11, 10:00 am - 12:00 pm – Alvarado G/H

Tai T. Pham, Chair
UNM-ISNPS

Tim Schriener, Co-Chair
UNM-ISNPS

Kevin Hussey, Jet Propulsion Laboratory, Pasadena, CA

20th SPACE DESIGN COMPETITION: ORBITAL COLONY

Monday, February 11, 8:00 am – 12:30 pm – North/East Atrium

Tim Schriener, Chair
UNM-ISNPS

Bruno Gallo, Co-Chair
UNM-ISNPS

SPACE DESIGN COMPETITION JUDGES

Andrew Beckwith
APS/Fermi National Laboratory

Neville Marzwell
Jet Propulsion Laboratory

Mark Benton
The Boeing Company

Jeffrey King
University of Missouri-Rolla

Eric Silk
NASA Goddard Space Flight Center

Edwin Sayre
Engineering Consultant

Mario Pinheiro
Instituto Superior Técnico

STAIF-08 RECEPTION CELEBRATING THE 50th ANNIVERSARY OF NASA

Monday, February 11, 6:00 pm - 7:00 pm – North/East Atrium and Alvarado E

TECHNICAL SESSIONS

MONDAY, FEBRUARY 11, 2008

[A01] Opening Session: Round Table Discussion on Current Issues in Thermal Technology

Monday, February 11, 2008, 1:45 pm - 3:45 pm - Potters Room

Chairs: Ted Swanson, NASA Goddard Space Flight Center, Greenbelt, MD, USA
Tung T. Lam, The Aerospace Corporation, Los Angeles, CA, USA

1:45 pm ***Introduction***
T. Swanson, NASA Goddard Space Flight Center, Greenbelt, MD, USA
T. T. Lam, The Aerospace Corporation, Los Angeles, CA, USA

2:15 pm ***Enhanced Boiling of Dielectric Liquids on Extended and Plane Surfaces of SmoothCopper, Copper with Nano-Dendritic Micro-porous Structures, and Micro-porous Graphite***
M. S. El-Genk, J. Parker, and A. Faris, University of New Mexico, Albuquerque, NM, USA

2:45 pm ***Panel Discussion***

Jeff Didion, Goddard Space Flight Center, Greenbelt, MD, USA
A. Williams, Air Force Research Laboratory, Kirtland AFB, Albuquerque, NM, USA
E. Ungar, NASA Johnson Space Flight Center, Houston, TX, USA
M. S. El-Genk, University of New Mexico, Albuquerque, NM, USA

[B08] Opportunities and Challenges in ISRU

Monday, February 11, 2008, 1:45 pm - 3:45 pm – Turquoise Room

Chairs: Chuck Weisbin, Jet Propulsion Laboratory, Pasadena, CA, USA
Gerald Sanders, NASA Johnson Space Center, Houston, TX, USA

1:45 pm ***Introduction***
Chuck Weisbin, Jet Propulsion Laboratory, Pasadena, CA, USA
Gerald Sanders, NASA Johnson Space Center, Houston, TX, USA

2:00 pm ***Panel Discussion***
Gary Spexarth, Johnson Space Center, Houston, USA
Doug Craig, NASA HQ, Washington, D. C. USA
Diane Linne, Glenn Research Center, Cleveland, OH, USA
Larry Clark, Lockheed Martin Space Systems, Denver, CO, USA
Robert Easter, Jet Propulsion Laboratory, Pasadena, CA, USA

[CT01] Space Nuclear Symposium Opening Session - I

Monday, February 11, 2008, 1:45 pm - 3:45 pm - Franciscan Room

Chairs: Michael G. Houts, NASA Marshall Space Flight Center, Huntsville, AL
Garry Burdick, Jet Propulsion Laboratory, Pasadena, CA

1:45 pm - ***AFSPS Study Results***
J. Nainiger, NASA Glenn Research Center, Cleveland, OH, USA

2:15 pm - ***NASA Fission Surface Power Systems***
J. Warren, NASA Headquarters, Washington, DC, USA

2:45 pm - ***Radioisotope Power for Solar System Exploration***
B. A. Harmon, NASA Headquarters, Washington, DC, USA

3:15 pm - ***Panel Discussion (all)***

[D01] Exploration Technology Opening Session

Monday, February 11, 2008, 1:45 pm - 3:45 pm - Alvarado F

Chairs: John Mankins, Artemis Innovation Management Solutions, Ashburn, VA, USA
Robert Wegeng, Pacific Northwest National Laboratory, Richland, WA, USA
Christopher Moore, NASA Headquarters, Washington, D.C., USA

1:45 pm - Advanced Capabilities for Exploration
Christopher Moore, NASA Headquarters, Washington, D.C., USA

2:15 pm - Constellation Program's Technology Development Needs
L. Ham, NASA Johnson Space Center, Houston, TX, USA

2:45 pm - Lunar Robotic Precursor Missions in Support of Lunar Science and Human Lunar Exploration
D. N. Jacobson, A. R. Lavoie, J. Bassler, L. Hill, M. Nall, S. Noneman, NASA Marshall Space Flight Center, Huntsville, AL, USA

3:15 pm - NASA's Exploration Technology Development Program
Frank Peri, NASA Langley Research Center, Hampton, VA, USA

[E01] Space Colonization - Opening Session I

*Monday, February 11, 2008, 1:45 pm - 3:45 pm - Weaver*s Room

Chairs: Klaus Heiss, The Jamestown Group/High Frontier, Alexandria, VA, USA
Narayanan Ramachandran, Jacobs Technology, Huntsville, AL, USA

1:45 pm - Introduction and Overview of Space Colonization
K. Heiss, The Jamestown Group/High Frontier, Alexandria, VA, USA

2:15 pm - Lunar Solar Power Industries to Seed Human Habitation of the Solar System
D. R. Criswell, Institute For Space Systems Operations, University of Houston, Houston, TX, USA

2:45 pm - Evolving Enterprise from Exploration
G. Woodcock, Gray Research Inc., Huntsville, AL, USA

3:15 pm - Panel Discussion (all)

[F01] Opening Session

Monday, February 11, 2008, 1:45 – 3:45 pm - Alvarado G/H

Chairs: Paul A. Murad, New Frontiers and Future Concepts, Vienna, VA, USA
Glen A. Robertson, Gravi Atomic Research. LLC, Madison, AL, USA

1:45pm - Opening Session Introduction
P. A. Murad, New Frontiers and Future Concepts, Vienna, VA, USA

2:15 pm - Guerilla Financing for Paper Napkin Plans, Garage Shop Technologies, and Ongoing Relationships
D. Mathes, Space Lines LLC, Rocklin, CA, USA

2:45 pm - The Economics of van der Waals Force Engineering
F. Pinto, InterStellar Technologies Corporation, Monrovia, CA, USA

3:15 pm - Panel Discussion (all)

[A02] Thermal Control Technologies - I

Monday, February 11, 2008, 4:00 pm - 6:00 pm - Potters Room

Chairs: Michael Pauken, Jet Propulsion Laboratory, Pasadena, CA, USA
Scott Garner, Advanced Cooling Technologies, Inc., Lancaster, PA, USA

4:00 pm - Demonstration of a Plug-And-Play Approach to Spacecraft Thermal Control System Design
E. B. Maxwell, G. S. Cole, R. P. Scaringe, Mainstream Engineering Corporation, Rockledge, FL, USA; and J. Didion, NASA Goddard Spaceflight Center, Greenbelt, MD, USA

4:30 pm - Effect of Non-Uniform Inlet Temperature on Flow Stagnation in a Pumped Fluid Tube Radiator
G. Reavis, Paragon Space Development Corporation, Tucson, AZ, USA

5:00 pm - ***Loop Heat Pipe Development Overview***
R. R. Riehl, N. dos Santos, National Institute for Space Research - INPE - Space Mechanics and Control Division-DMC, São José dos Campos, SP, Brazil

5:30 pm - ***Pressure Controlled Heat Pipe for Precise Temperature Control***
D. B. Sarraf, S. Tamanna, and P. M. Dussinger, Advanced Cooling Technologies, Inc. Lancaster, PA, USA

[B01] Lunar Resource Utilization - I

Monday, February 11, 2008, 4:00 pm – 6:00 pm - Turquoise Room

Chairs: Edgardo Santiago-Maldonado, NASA Kennedy Space Center, Uninc Brevard County, FL, USA
Takashi Nakamura, Physical Sciences, Inc., San Ramon, CA, USA

4:00 pm - ***Selection, Development and Results for The RESOLVE Regolith Volatiles Characterization Analytical System***
D. E. Lueck, J. E. Captain, Sciences Division, Applied Technology Directorate, John F. Kennedy Space Center, National Aeronautics and Space Administration, Kennedy Space Center, FL, USA; T. L. Gibson, B. V. Peterson, and C. M. Berger, Applied Sciences & Technology, Artic Slope Research Corporation Aerospace, Kennedy Space Center, FL

4:30 pm - ***Oxygen Production on the Moon: Hydrogen Reduction for the PILOT Program***
D. L. Clark, T. Muff, Lockheed Martin Space Systems Company, Denver, CO, USA; and T. Simon, NASA Johnson Space Center, Houston, TX, USA

5:00 pm - ***Oxygen Production via Carbothermal Reduction of Lunar Regolith***
R. Gustafson and B.C. White, Orbital Technologies Corporation (ORBITEC^{TM}), Madison, WI, USA

5:30 pm - ***Carbothermal Processing of Lunar Regolith Using Methane***
R. Balasubramaniam, U. Hegde, National Center for Space Exploration Research (NCSER), NASA Glenn Research Center, Cleveland, Ohio, USA; and S. Gokoglu, NASA Glenn Research Center, Cleveland, Ohio, USA

[CT02] Space Nuclear Symposium Opening Session - II

Monday, February 11, 2008, 4:00 pm - 6:00 pm - Franciscan Room

Chairs: Michael G. Houts, NASA Marshall Space Flight Center, MSFC, AL, USA
Garry Burdick, Jet Propulsion Laboratory, Pasadena, CA, USA

4:00 pm - ***AFSPS Reference Power System Concept - I***
L. S. Mason, NASA Glenn Research Center, Cleveland, OH, USA

4:30 pm - ***AFSPS Safety Approach***
S. A. Wright, Sandia National Laboratories, Albuquerque, NM, USA

5:00 pm - ***AFSPS Technology Program***
D. Palac, NASA Glenn Research Center, Cleveland, OH, USA

5:30 pm - ***Reference Reactor Module for the Affordable Fission Surface Power System***
D.I. Poston, R.J. Kapernick, D.D. Dixon, B. W. Amiri, and T. Marcille, Nuclear Systems Design Group, Los Alamos National Laboratory, Los Alamos, New Mexico, USA

[D02] Lunar and Mars Exploration Architecture Studies

Monday, February 11, 2008, 4:00 pm - 6:00 pm - Alvarado F

Chairs: Richard T. Howard, NASA Marshall Space Flight Center, Huntsville, AL, USA
Jennifer D. Mitchell, NASA Johnson Space Center, Houston, TX, USA

4:00 pm - ***Lunar Architecture Team***
Doug Craig, NASA Headquarters, Washington, D. C., USA

4:30 pm - ***Lunar Surface Power Architecture***
J. Nainiger, NASA Glenn Research Center, Cleveland, OH, USA

5:00 pm - ***Major Scientific Goals in Space and the Architecture to Return Humans to the***

Moon
H. Thronson, and R. Moe, NASA Goddard Space Flight Center, Greenbelt, MD, USA; D. Lester, University of Texas, TX, USA; M. Postman, Space Telescope Science Institute, Baltimore, MD, USA; A. Schweitzer, ADC, USA; H. P. Stahl, NASA Marshall Space Flight Center, Huntsville, AL, USA; and G. Varsi, Jet Propulsion Laboratory, [RETIRED] Pasadena, CA, USA

5:30 pm - ***Lunar Surface Systems and Operations for an Early Human Outpost***
G. Woodcock, Gray Research, Huntsville, AL, USA; D. B. Smith, NASA Systems, The Boeing Company, Arlington, VA, USA

[E02] Space Colonization - Opening Session II

Monday, February 11, 2008, 4:00 pm - 6:00 pm - Weavers Room

Chairs: Klaus Heiss, The Jamestown Group/High Frontier, Alexandria, VA, USA
Narayanan Ramachandran, Jacobs Technology, Huntsville, AL, USA

4:00 pm - ***Toxicological Risks in Space Flight***
J. T. James, NASA Johnson Space Center, Houston, TX, USA

4:30 pm - ***NESC Overview and Mechanical Systems Lunar Dust Assessment***
M. J. Dube, NASA Goddard Space Flight Center, Greenbelt, MD, USA

5:00 pm - ***Lunar Dust Mitigation Technology Development***
M. J. Hyatt, NASA Glenn Research Center, Cleveland, OH, USA; J. Feighery, NASA Johnson Space Center, Houston, TX, USA

5:30 pm - ***Development of Multifunctional Radiation Shielding Materials for Long Duration Human Exploration Beyond the Low Earth Orbit***
S. Sen, BAE Systems, NASA Marshall Space Flight Center, AL, USA; E. Schofield and S. O'Dell, Plasma Processes Inc., Huntsville, AL, USA; S. Carranza, Makel Engineering Inc., Chico, CA, USA

[F03] Other Concepts and Theories - I

Monday, February 11, 2008, 4:00 pm - 6:00 pm - Alvarado G/H

Chairs: John W. Cole, NASA Marshall Space Flight Center, Huntsville, AL, USA
Gary Stephenson, Seculine Consulting, Los Angeles, CA, USA

4:00 pm - ***An Ansatz Regarding Relativistic Space Travel Part I- The Environment***
P. A. Murad, New Frontiers and Future Concepts, Vienna, VA, USA

4:30 pm - ***The Theory of FTL (Faster Than Light) Space Travel in the Context of the GEM (Gravity-Electro-Magnetism) Theory of Field Unification***
J. Brandenburg, Orbital Technologies Inc., Madison, WI, USA

5:00 pm - ***Engineering Dynamics of the Universe***
G. A. Robertson, Atomic Research, Madison, AL, USA

5:30 pm- ***Panel Discussion***

TUESDAY, FEBRUARY 12, 2008

[A03] Thermal Control Technologies - II

Tuesday, February 12, 2008, 8:00 am - 10:00 am - Turquoise Room

Chairs: Jeffrey Didion, NASA Goddard Space Flight Center, Greenbelt, MD, USA
Glenn Tsuyuki, Jet Propulsion Laboratory, CA, Pasadena, USA

8:00 am - ***Design and Development of a Two-Phase Flow Splitter***
C. Kurwitz, B.A. Larson and F. R. Best, Texas A&M University, College Station, TX, USA; B. R. Oinuma, Center for Space Power, Texas A&M University, College Station, TX, USA

8:30 am - ***Mars Science Laboratory Launch Pad Thermal Control***
P. Bhandari, B. Dudik, T. Paris, K. Novak, G. Birur, D. Bame, Jet Propulsion

Laboratory, Pasadena, CA, USA

9:00 am - ***Titanium Loop Heat Pipes for Space Nuclear Power Systems***
J. R. Hartenstine, W. G. Anderson, and R. Bonner, III, Advanced Cooling Technologies, Inc., Lancaster, PA, USA

9:30 am - ***Vapor Compression Hybrid Two-Phase Loop Technology for Lunar Surface Applications***
C. Park, Advanced Cooling Technologies, Inc., Lancaster, PA, USA; and E. Sunada, Jet Propulsion Laboratory, Pasadena, CA, USA

[CT03] Space Nuclear Symposium Opening Session - III

Tuesday, February 12, 2008, 8:00 am - 10:00 am - Alvarado G/H

Chairs: Michael G. Houts, NASA Marshall Space Flight Center, MSFC, AL, USA
Garry Burdick, Jet Propulsion Laboratory, Pasadena, CA, USA

8:00 am - ***AFSPS Development and ATLO Approach***
J. E. Werner, Idaho National Laboratory, Idaho Falls, ID, USA

8:30 am - ***AFSPS Reactor Instrumentation and Control Approach***
A.L. Qualls, D. A. Clayton, and R.F.Lind, Oak Ridge National Laboratory, Oak Ridge, TN, USA

9:00 am - ***Visualizing a Mission Concept Using Video Game Technology – Capture Public Interest and Support***
K. Hussey, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

9:30 am - ***Panel Discussion (all)***

[D03] Technologies for Orion and Ares

Tuesday, February 12, 2008, 8:00 am - 10:00 am - Alvarado F

Chairs: Christopher Moore, NASA Headquarters, Washington, D.C., USA
John Mankins, Artemis Innovation Management Solutions, Ashburn, VA, USA

8:00 am - ***Integrated Docking Simulation and Testing with the Johnson Space Center Six-Degree-of-Freedom Dynamic Test System***
J. D. Mitchell, S. P. Cryan, K. Baker, T. Martin, R. Goode, NASA Johnson Space Center, Houston, TX, USA; K. W. Key, T. Manning, L3 Communications - Titan Group, Houston, TX, USA; and C. Chien, GeoControl Systems Inc., Houston, TX, USA

8:30 am - ***Multi-Sensor Testing for Automated Rendezvous and Docking***
R. T. Howard and C. K. Carrington, NASA Marshall Space Flight Center, Huntsville, AL, USA

9:00 am - ***Technology Infusion of Intelligent Software Engineering Tools for Orion***
M. Lowry, NASA Ames Research Center, Palo Alto, CA, USA

9:30 am - ***Technology Maturation of Integrated System Health Management***
S. Uckun, NASA Ames Research Center, Moffett Field, CA, USA; M. S. Feather, and K.A. Hicks, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

[E03] Space Exploration: Strategies

Tuesday, February 12, 2008, 8:00 am - 10:00 am - Potters Room

Chairs: Mark Benton, The Boeing Company, Los Angeles, CA, USA
Peter A. Curreri, NASA Marshall Space Flight Center, Huntsville, AL, USA

8:00 am - ***How the Sputnik 50th Anniversary Tells Us to Bridge the Proposed American Human Space Flight Gap***
J. Brandenburg, Orbital Technologies Inc., Madison, WI, USA

8:30 am - ***In-Situ Propellant Supplied Lunar Lander Concept***
B. Donahue and C. Maulsby, Boeing Advanced Systems, Huntsville, AL, USA

9:00 am - ***Lunar Surface Architecture Utilization and Logistics Support Assessment***
D. Bienhoff, The Boeing Company, Arlington, VA, USA; W. Findiesen, M. Bayer, A. Born, and D. McCormick, The Boeing Company, Huntington Beach, CA, USA

9:30 am - ***Space Colony from a Commercial Asteroid Mining Company Town***
T. C. Taylor, GLOBAL OUTPOST, Inc., Las Cruces, NM, USA; W. Grandl, Architect, Dr. Billroth, Tulln, Austria; M. Pinni, Space Habitation Architect, University IUAV of Venice, Tolentini, Italy; and H. Benaroya, Department of Mechanical & Aerospace Engineering, Rutgers University, Director, Center for Structures in Extreme Environments, Rutgers University, Piscataway, NJ, USA

[F02] Taming the Solar System

Tuesday, February 12, 2008, 8:00 am - 10:00 am - Weavers Room

Chairs: Charles Suchomel, Air Force Research Laboratory, Wright-Patterson AFB, OH, USA
Franklin B. Mead, Air Force Research Laboratory, Edwards AFB, CA, USA

8:00 am - ***Conceptual Launch Vehicles Using Metallic Hydrogen Propellant***
J. W. Cole, NASA Marshall Space Flight Center, AL, USA; I. F. Silvera, Harvard University, Cambridge, MA, USA; and J. P. Foote, Jacobs ESTS, Huntsville, AL, USA

8:30 am - ***Progress in Analysis of Two-Phase Flow***
J. K. Keska, University of Louisiana at Lafayette, Youngsville, LA, USA

9:00 am - ***Recent Progress in the Development of a Multi-Layer Green's Function Code for Ion Beam Transport***
J. Tweed, S. A. Walker, Department of Mathematics & Statistics, Old Dominion University, Norfolk, VA, USA; J. W. Wilson, and R. K. Tripathi, NASA Langley Research Center, Hampton, VA, USA

9:30 am - ***Techniques for Microfabricating Coils for Microelectromechanical Systems Applications***
R.C. Woods, Louisiana State University, Department of Electrical and Computer Engineering, Baton Rouge, LA, USA; and A.L. Powell, University of Sheffield, Sheffield, UK

[B02] Lunar Resource Utilization - II

Tuesday, February 12, 2008, 10:15 am – 12:15 pm - Turquoise Room

Chairs: Laurent Sibille, ASRC Aerospace Corporation, NASA Kennedy Space Flight Center, FL, USA
Kevin Payne, Lockheed Martin Space Systems Company, Denver, CO, USA

10:15 am - ***Advances in Molten Oxide Electrolysis for the Production of Oxygen and Metals from Lunar Regolith***
D. R. Sadoway, Massachusetts Institute of Technology, Cambridge, MA, USA; L. Sibille, A. Sirk, O. Melendez, D. Lueck, NASA Kennedy Space Center, FL, USA; P. Curreri, NASA Marshall Space Flight Center, Huntsville, AL, USA

10:45 am - ***Molten Materials Transfer and Handling on the Lunar Surface***
P. A. Curreri, NASA Marshall Space Flight Center, Huntsville, AL, USA; D. M. Stefanescu, Dept. of Materials Science and Engineering, Ohio State University, Columbus OH, USA; and S. Sen, BAE Systems, Huntsville, AL, USA

11:15 am - ***Plasma Processing of Lunar Regolith Simulant for Diverse Applications***
E. C. Schofield, J. S. O'Dell, Plasma Processes, Huntsville, AL, USA; and S. Sen, BAE Systems, Inc., NASA Marshall Space Flight Center, Huntsville, AL, USA

11:45 am - ***Production of Methane from Plastic Waste from Human Lunar Presence***
J. Captain, and E. Santiago, NASA Kennedy Space Center, Orlando, FL, USA; C. Parrish, CParrish Consulting, USA

[CT106] Non-Nuclear Testing - I

Tuesday, February 12, 2008, 10:15 am – 12:15 pm - Weavers Room

Chairs: James J. Martin, NASA Marshall Space Flight Center, Huntsville, AL, USA
David Hervol, Analex Corporation, Cleveland, OH, USA

10:15 am - ***Advanced Thermal Simulator Testing: Thermal Analysis and Test Results***
S. M. Bragg-Sitton, R. Dickens, D. Dixon, R. S. Reid, M. Adams, and J. Davis, NASA Marshall

Space Flight Center, MSFC, AL, USA

10:45 am - Demonstration of a Martian Surface Power System Sodium Boiler Heat Exchanger
C. Kurwitz, Department of Nuclear Engineering, Texas A&M University, College Station, TX, USA; M. Schuller, F. Best, Center for Space Power, Texas A&M University, College Station, TX, USA; and R. Williams, JET Learning Laboratory, Houston, TX, USA

11:15 am - Flow Components in a NaK Test Loop Designed to Simulate Conditions in a Nuclear Surface Power Reactor
K. A. Polzin and T. Godfroy, NASA Marshall Space Flight Center, AL, USA

11:45 am - Operational Results of a 30 kWe Dual Brayton Power Conversion System
K, Owen, US Army Research Laboratory,NASA Glenn Research Center, Cleveland, OH, USA
D. Hervol, Analex Corporation, Cleveland, OH, USA;

[CT406] Thermal Energy Transport and Heat Rejection

Tuesday, February 12, 2008, 10:15 am – 12:15 pm - Alvarado G/H

Chairs: Donald A. Jaworske, NASA Glenn Research Center, Cleveland, OH, USA
Robert S. Reid, Los Alamos National Laboratory, Los Alamos, NM, USA

10:15 am - High Performance Lightweight Compact Radiator Thermal Analysis and Performance Evaluation
C.-F. Tsai, J. Tran, and J. Prabhu,The Boeing Company, Huntington Beach, CA, USA; and F. Shen, The Boeing Company, Seal Beach, CA, USA

10:45 am - Oxygen Behavior in Liquid Sodium-Potassium Systems
J. Zhang, R. Kapernick, Los Alamos National Laboratory, Los Alamos, NM, USA

11:15 am - Variable Conductance Heat Pipes for Radioisotope Stirling Systems
W. G. Anderson and C. Tarau, Advanced Cooling Technologies, Inc., Lancaster, PA, USA

11:45 am - Panel Discussion (all)

[D09] International Partnerships for Exploration Technology Development

Tuesday, February 12, 2008, 10:15 am – 12:15 pm - Alvarado F

Chairs: Gerald Sanders, NASA Johnson Space Center, Houston, TX, USA
Jaret Matthews, Jet Propulsion Laboratory, Pasadena, CA, USA

10:15 am - Canada as a Key Partner in Space Exploration
J. Piedboeuf , A. Berinstain, G. Gibbs, D. Kendall, L. Grenier and G. Leclerc, Canadian Space Agency, St-Hubert, QC, Canada

10:45 am - NASA In-Situ Resource Utilization (ISRU) Technology and Development Project Overview
G. B. Sanders, NASA Johnson Space Center, Houston, TX, USA; W. E. Larson, NASA Kennedy Space Center, Orlando, FL, USA; K. R. Sacksteder, NASA Glenn Research Center, Cleveland, OH, USA; C. Mclemore, NASA Marshall Space Flight Center, Huntsville, AL, USA; K. Johnson, Jet Propulsion Laboratory, Pasadena, CA, USA

11:15 am - Lunar Team Projects at the International Space University
B. Thakore, International Space University, Illkirch-Graffenstaden, France; and J. D. Burke, The Planetary Society, Pasadena, CA, USA

11:45 am - Novelty Detection in and Between Different Modalities
S. Yildirim, Hedmark University College, Rena, Norway; and H. Veflingstad, Norwegian University of Science and Technology, Trondheim, Norway

[E08] Lunar Dust: Fundamentals and Simulations

Tuesday, February 12, 2008, 10:15 am – 12:15 pm - Potters Room

Chairs: Carlos I. Calle, NASA Kennedy Space Center, Orlando, FL, USA
Robert C. Richmond, NASA Marshall Space Flight Center, Huntsville, AL, USA

10:15 am - Measurements of Charging of Apollo 17 Lunar Dust Grains by Electron Impact
M. M. Abbas, J. F. Spann, J.A. Gaskin, NASA Marshall Space Flight Center, Huntsville, AL,

USA; D. Tankosic, University of Alabama, Huntsville, AL, USA; and M. J. Dube, NASA Goddard Space Flight Center, Greenbelt, MD, USA

10:45 am - ***Electrostatic Characterization of Apollo 14 Lunar Dust Samples***
C. I. Calle, C.R. Buhler, S. Trigwell, E.E. Arens, and M.L. Ritz, NASA Kennedy Space Center, Orlando, FL, USA

11:15 am - ***Some Expected Mechanical Characteristics of Lunar Dust: A Geological View***
D. Rickman, National Space Science and Technology Center, NASA Marshall Space Flight Center, Huntsville, AL, USA; and K.W. Street, Tribology and Surface Science, NASA Glenn Research Center, Cleveland, OH, USA

11:45 am - ***Development of the Lunar Environments Test System (LETS)***
J. Vaughn and T. A. Schneider, NASA Marshall Space Flight Center, AL, USA

[A04] High Capacity Heat Rejection Systems

Tuesday, February 12, 2008, 1:30 pm - 3:30 pm – Turquoise Room

Chairs: Michael N. Nikitkin, Swales Aerospace, Beltsville, MD, USA
Gary Adamson, Hamilton Sundstrand, Windsor Locks, CT, USA

1:30 pm - ***A Low Specific Mass Inflatable Radiator for a 100kW Solar Powered GEO Satellite***
J. Thayer and W. Cho, Thermacore International, Lancaster, PA, USA; D. Cavanaugh, and S. Palm, Surface Optics Corporation, San Diego, CA, USA

2:00 pm - ***Test Results for a High Power Thermal Management System***
K. R. Wrenn and D. A. Wolf, ATK Space Division, Beltsville, MD, USA

2:30 pm - ***Thermal Vacuum Testing of Crescent Structural Integral Radiators for Spacecraft Heat Rejection***
C. S. Iacomini, J. Dang, C. Bower, and G. Anderson, Paragon Space Development Corporation, Tucson, AZ, USA

3:00 pm - ***Assessment of the Multi-Fluid Evaporator Technology***
G. Quinn and E. O'Connor, Hamilton Sundstrand, Windsor Locks, CT, USA

[CT103] Fission Surface Power System Components - II

Tuesday, February 12, 2008, 1:30 pm - 3:30 pm - Potters Room

Chairs: Samit Bhattacharyya, RenMar Enterprises Inc., Naperville, IL, USA
Shannon Bragg-Sitton, NASA Marshall Space Flight Center, Huntsville, AL, USA

1:30 pm - ***Comparison of Reactivity Control Systems for the Submersion Subcritical Safe Space (S^4) Reactor***
T. M. Schriener and M. S. El-Genk, Institute for Space and Nuclear Power Studies, University of New Mexico, Albuquerque, NM, USA

2:00 pm - ***Radiolysis Concerns for Water Shielding in Fission Surface Power Applications***
M.P. Schoenfeld, NASA Marshall Space Flight Center, Huntsville, AL, USA; and S. Anghaie, Innovative Space Power and Propulsion Institute, University of Florida, Gainesville, FL, USA

2:30 pm - ***Reactivity Control Schemes for Fast Spectrum Space Nuclear Reactors***
A. E. Craft and J. C. King, Mining and Nuclear Engineering Department, Missouri University of Science and Technology, Rolla, MO, USA

3:00 pm - ***Wide Range Neutron Flux Measuring Channel for Aerospace Application***
R. M. Cibils, A. Busto, J. L. Gonella, A. J. Chielens, J. M. Otero, M. Nuñez, INVAP, Rio Negro, Argentina; and S. E. Tropea, INTI, Buenos Aires, Argentina

[CT110] Space Radiation and Environmental Effects

Tuesday, February 12, 2008, 1:30 pm - 3:30 pm - Alvarado G/H

Chairs: Abdulnasser F. Barghouty, NASA Marshall Space Flight Center, Huntsville, AL, USA
Ronald Lipinski, Sandia National Laboratories, Albuquerque, NM, USA

1:30 pm - ***Modeling the Uncertainty in the Radiation Quality Factor as an Ito Process***
A. F. Barghouty, NASA Marshall Space Flight Center, Huntsville, AL, USA

2:00 pm - ***Polyethylene/Boron Composites for Radiation Shielding Applications***
C. Harrison, E. Grulke, Department of Chemical & Materials Engineering, University of Kentucky, Lexington, KY, USA; E. Burgett, and N. Hertel, Neely Nuclear Research Center, Georgia Institute of Technology, Atlanta, GA, USA

2:30 pm - ***Regolith Biological Shield for a Lunar Outpost from High Energy Solar Protons***
T. Pham and M. S. El-Genk, Institute for Space and Nuclear Power Studies, University of New Mexico, Albuquerque, NM, USA

3:00 pm - ***Mechanical Characterization of Proton Radiation Induced Damage on Magnetically Annealed Epoxy***
M. S. Al-Haik, S. Trinkle, University of New Mexico, Albuquerque, NM, O. Momotyuk, B. T. Roeder, K. Kemper, and M. Y. Hussaini, Florida State University, Tallahassee, FL , and M. S El-Genk, University of New Mexico, Albuquerque, NM, USA

[D04] Technologies for the Lunar Lander

Tuesday, February 12, 2008, 1:30 pm - 3:30 pm - Alvarado F

Chairs: Andrew Keys, NASA Marshall Space Flight Center, Huntsville, AL, USA
David Kortenkamp, TRACLabs Inc., Houston, TX, USA

1:30 pm - ***Active Costorage of Cryogenic Propellants for Exploration***
E. R. Canavan, R. F. Boyle, and S. Mustafi, Cryogenics and Fluids Branch, NASA Goddard Space Flight Center, Greenbelt, MD

2:00 pm - ***Cryogenic Fluid Technologies for Long Duration In-Space Operations***
S. Motil, NASA Glenn Research Center , Cleveland, OH, USA; and T. L. Tramel, NASA Marshall Space Flight Center, Huntsville, AL, USA

2:30 pm - ***Propulsion and Cryogenics Advanced Development (PCAD) Project***
M. Klem, T. D. Smith, NASA Glenn Research Center, Cleveland, OH, USA

3:00 pm - ***Autonomous Landing and Hazard Avoidance Technology (ALHAT)***
C. Epp, NASA Johnson Space Center, Houston, TX, USA

[F06] High-Frequency Gravitational Wave

Tuesday, February 12, 2008, 1:30 pm - 3:30 pm – Weavers Room

Chairs: Robert M.L. Baker, Gravwave, LLC, Playa Del Rey, CA, USA
Giorgio Fontana, University of Trento, Trento, Italy

1:30 pm - ***Analyses of the Frequency and Intensity of Laboratory Generated HFGWs***
R. M. L. Baker, Jr., GRAVWAVE® LLC and Transportation Sciences Corp., Playa del Rey, CA, USA; G. V. Stephenson, Seculine Consulting, Redondo Beach, CA, USA; and F. Li, Department of Physics, Chongqing University, Chongqing, China

2:00 pm - ***Gravitational Waves in the Hyperspace***
G. Fontana, University of Trento, Trento, Italy

2:30 pm - ***Proposed Ultra-High Sensitivity High-Frequency Gravitational Wave Detector***
R. M. L. Baker, Jr., GRAVWAVE® LLC and Transportation Sciences Corp., Playa del Rey, CA, USA; G. V. Stephenson, Seculine Consulting, Redondo Beach, CA, USA; and F. Li, Department of Physics, Chongqing University, Chongqing, China

3:00 pm - ***Very-High-Frequency Gravitational Waves and Superconductors***
R.C. Woods, Louisiana State University, Baton Rouge, LA, USA

[B04] Lunar Soils and Simulants

Tuesday, February 12, 2008, 3:45 pm – 5:45 pm - Turquoise Room

Chairs: Allen Wilkinson, NASA Glenn Research Center, Cleveland, OH, USA
Masami Nakagawa, Colorado School of Mines, Golden, CO, USA

3:45 pm - ***A Comparison of Discrete Element Modeling, Finite Element Analysis, and Physical Experiment of Granular Material Systems in a Direct Shear Cell***
R. Bharadwaj, P. Weitzman, DEM Solutions (USA) Inc, Lebanon, NH, USA; J. Khambekar, T. A.

Royal, Jenike & Johanson Inc, Tyngsboro, MA, USA; A. Orlando, Z. Gao, H. Shen, and B. Helenbrook, Clarkson University, Potsdam, NY, USA

4:15 pm - ***Development of a High Fidelity Lunar Soil Simulant***
R. Gustafson, B. C. White, Orbital Technologies Corporation (ORBITEC™), Madison, WI, USA; and M. A. Gustafson, PLANET, Madison, WI, USA

4:45 pm - ***Electrostatic Transport and Manipulation of Lunar Soil and Dust***
H. Kawamoto, Waseda University, Tokyo, Japan

5:15 pm - ***Numerical Investigation of Mechanical Behavior of Agglutinates***
M. Nakagawa, T. Garza-Cruz, C. Somrit, Colorado School of Mines, Golden, CO, USA

[CT104] Integration and Utilization of Surface Fission Energy Sources

Tuesday, February 12, 2008, 3:45 pm – 5:45 pm - Alvarado G/H

Chairs: J. Boise Pearson, NASA Marshall Space Flight Center, Huntsville, AL, USA
Robert L. Cataldo, NASA Glenn Research Center, Cleveland, OH, USA

3:45 pm - ***Enabling Space Mission Concepts with Small Radioisotope Power Systems***
B. Heshmatpour, J. Hart, and Teledyne Energy Systems, Inc., Hunt Valley, MD, USA; J. D. Weinberg, Ball Aerospace & Technologies Corporation, Boulder, CO, USA

4:15 pm - ***Radar Men on the Moon: A Brief Survey of Fission Surface Power Studies***
G. L. Bennett, Metaspace Enterprises, Emmett, ID, USA

5:00 pm - ***The Development a Control System for a 5 Kilowatt Free Piston Stirling Space Converter***
R.L. Kirby, Space Research Institute, Auburn University, AL, USA; and N. Vitale, Foster-Miller, Inc., Albany, NY, USA

5:15 pm - ***Panel Discussion (all)***

[CT203] Non-nuclear Testing - II

Tuesday, February 12, 2008, 3:45 pm – 5:45 pm - Alvarado F

Chairs: William J. Emrich, Jr., NASA Marshall Space Flight Center, Huntsville, AL, USA
Steven B. Dron, Sandia National Laboratories, Albuquerque, NM, USA

3:45 pm - ***Feasibility Test Loop 1 Design and Test***
T. Godfroy, NASA Marshall Space Flight Center, Huntsville, AL, USA

4:15 pm - ***Large-Scale Testing and High-Fidelity Simulation Capabilities at Sandia National Laboratories to Support Space Power and Propulsion***
D. Dobranich and T. K. Blanchat, Sandia National Laboratories, Albuquerque, NM, USA

5:00 pm - ***Nuclear Thermal Rocket Element Environmental Simulator (NTREES)***
W. J. Emrich, Jr., NASA Marshall Space Flight Center, Huntsville, AL, USA

5:15 pm - ***Recent Updates to the Fission Surface Power Primary Test Circuit (FSP-PTC)***
A. Garber, NASA Marshall Space Flight Center, Huntsville, AL, USA

[D10] Novel Concepts

Tuesday, February 12, 2008, 3:45 pm – 5:45 pm - Potters Room

Chairs: Harley Thronson, NASA Goddard Space Flight Center, Greenbelt, MD, USA
Joe Howell, NASA Marshall Space Flight Center, Huntsville, AL, USA

3:45 pm - ***Astrotech Research & Conventional Technology Utilization Spacecraft (ARCTUS)***
B. Kutler, United Launch Alliance, Denver, CO, USA; M. D. Johnson, R. Fitts, B, Howe, B, Hall, SPACEHAB/Astrotech, Inc., Webster, TX, USA

4:15 pm - ***ATHLETE: A Cargo Handling and Manipulation Robot for the Moon***
J. Matthews, Jet Propulsion Laboratory, Pasadena, CA, USA

5:00 pm - ***Rolling and Climbing by the Multifunctional SuperBot Reconfigurable Robotic System***
W. Shen, H. C.H. Chiu, M. Rubenstein, and B. Salemi , Polymorphic Robotics Lab, Information Sciences Institute, University of Southern California, Marina del Rey, CA, USA

5:15 pm - ***Solving Autonomy Technology Gaps through Wireless Technology and Orion Avionics***

Architectural Principles
R. Black, H. Bai, A. Michalicek, B. Shelton, and M. Villela, Honeywell International, Inc., Glendale, AZ, USA

[F07] Experimental Results and New Concepts

Tuesday, February 12, 2008, 3:45 pm – 5:45 pm - Weavers Room

Chairs: R. Clive Woods, Louisiana State University, Baton Rouge, LA, USA
James F. Woodward, California State University, Fullerton, CA, USA

3:45 pm - ***Mach Effects and Rapid Spacetime Transport***
J. F. Woodward, California State University, Fullerton, CA, USA

4:30 pm - ***GO4IT: Gravitational Defying Methods of Propulsion From Asymmetrical Capacitors***
D. Mathes, Space Lines LLC, Rocklin, CA, USA

4:15 pm - ***Investigation of Frame-Dragging-Like Signals from Spinning Superconductors using Laser Gyroscopes***
M. Tajmar, F. Plesescu, B. Seifert, R. Schnitzer, and I. Vasiljevich, Space Propulsion & Advanced Concepts, Austrian Research Center, GmbH - ARC, Seibersdorf, Austria

5:15 pm - ***Application of the Chameleon Model to EM Field Momentum***
G. A. Robertson, Gravi Atomic Research, LLC, Madison, AL, USA

WEDNESDAY, FEBRUARY 13, 2008

[A05] Advances in Spray Cooling

Wednesday, February 13, 2008, 8:00 am - 10:00 am - Turquoise Room

Chairs: Eric Silk, NASA Goddard Space Flight Center, Greenbelt, MD, USA
Kirk L. Yerkes, USAF / Air Force Research Laboratory, OH, USA

8:00 am - ***Investigation of Pore Size Effect On Spray Cooling Heat Transfer With Porous Tunnels***
E. A. Silk, NASA Goddard Space Flight Center, MD, USA

8:30 am - ***Spray Cooling Modeling: Droplet Sub-Cooling Effect on Heat Transfer***
R. P. Selvam, University of Arkansas, Fayetteville, AR, USA; J. E. Johnston, Power Electronics Leveling Solutions LLC Fayetteville, AR, USA; and E. A. Silk, NASA Goddard Space Flight Center, Greenbelt, MD, USA

9:00 am - ***Visualization of Electrohydrodynamic Effects and Time Scale Analysis for Impinging Spray Droplets of HFE-7000***
P. J. Kreitzer and J. M. Kuhlman, Department of Mechanical and Aerospace Engineering, West Virginia University, Morgantown, WV, USA

9:30 am - ***Experimental Studies on CHF of Pool Boiling on Horizontal Conductive Micro Porous Coated Surfaces***
C. Li and G. P. Peterson, Department of Mechanical Engineering, University of Colorado, Boulder, CO, USA

[CT102] Fission Surface Power System Components - I

Wednesday, February 13, 2008, 8:00 am - 10:00 am - Alvarado D

Chairs: A.L. Qualls, Oak Ridge National Laboratory, Oak Ridge, TN, USA
Dan Wachs, Idaho National Laboratory, Idaho Falls, ID, USA

8:00 am - ***An Affordable Test Approach for Lunar Fission Surface Power Systems***
J. E. Werner, Idaho National Laboratory, Idaho Falls, ID, USA; and L. S. Mason, NASA Glenn Research Center, Cleveland, OH, USA

8:30 am - ***Gravity Scaling of a Power Reactor Water Shield***
R. S. Reid and J. B. Pearson, NASA Marshall Space Flight Center, Huntsville, AL, USA

9:00 am - ***Life-Cycle Radiation Dose Issues for a Fission Surface Power System***
D. I. Poston, N. Devine, and S. Mullet, Nuclear Systems Design Group, Los Alamos

National Laboratory, NM, USA

9:30 am - Panel Discussion (all)

[CT105] Near-Term Radioisotope Power Systems

Wednesday, February 13, 2008, 8:00 am - 10:00 am - Alvarado B/C

Chairs: Bruce Alan Harmon, NASA/HQ, Washington, D.C., USA
Robert Abelson, Jet Propulsion Laboratory, Pasadena, CA, USA

8:00 am - Mission Concepts for Studying Enceladus
A. I. Razzaghi, D. A. Di Pietro, D. A. Quinn, A. A. Simon-Miller, and S. D. Tompkins, NASA Goddard Space Flight Center, Greenbelt, MD, USA

8:30 am - NASA Radioisotope Power Systems Program Update
B. A. Harmon, U. S. Department of Energy, Washington, D. C., USA and D. B. Lavery, Science Mission Directorate, NASA Headquarters, Washington, D. C., USA

9:00 am - Results of the Europa Explorer NASA Flagship Study
R. Abelson, and K. B. Clark, Jet Propulsion Laboratory, Pasadena, CA, USA

9:30 am - Titan Explorer: A NASA Flagship Mission Concept
R. D. Lorenz, J. C. Leary, and M. K. Lockwood, Space Department, Johns Hopkins University Applied Physics Laboratory, Laurel, MD, USA, and J. H. Waite, Southwest Research Institute, San Antonio, TX, USA

[D05] Technologies for the Lunar Outpost

Wednesday, February 13, 2008, 8:00 am - 10:00 am – Alvarado F

Chairs: Barbara Romig, NASA Johnson Space Center, Houston, TX, USA
Christopher Moore, NASA Headquarters, Washington, D. C., USA

8:00 am - A Testbed for Evaluating Lunar Habitat Autonomy Architectures
D. Kortenkamp, D. Schreckenghost and R. P. Bonasso, TRACLabs Inc., Houston, TX, USA; M. Izygon, Tietronix Inc., Houston TX, USA; D. Lawler and L. Wang, NASA Johnson Space Center/ER2 Houston, TX, USA; and K. Kennedy, NASA Johnson Space Center/EA3 Houston, TX, USA

8:30 am - Remote Task-level Commanding of Centaur Over Time Delay
D. Schreckenghost, and R. Burridge, TRACLabs, Houston, TX, USA; T. Ngo and L. Wang, NASA Johnson Space Center, Houston, TX, USA; and M. Izygon, Tietronix, Houston, TX, USA

9:00 am - High-Performance, Radiation-Hardened Electronics for Space and Lunar Environments
A. Keys, J. H. Adams, R. C. Darty, and M. C. Patrick, NASA Marshall Space Flight Center, Huntsville, AL, USA; J. D. Cressler, School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, USA; and M. A. Johnson, NASA Langley Research Center, Hampton, VA, USA

9:30 am - Life Support System Technology Development for Exploration Missions
D. J. Barta and M. K. Ewert, Crew and Thermal Systems Division, NASA Johnson Space Center, Houston, TX, USA

[E05] Space Bases on Moon/Mars: How and Why?

Wednesday, February 13, 2008, 8:00 am - 10:00 am - Potters Room

Chairs: Andrew Gonzales, NASA Ames Research Center, Moffett Field, CA, USA
Subhayu Sen, BAE Systems, NASA MSFC, Huntsville, AL, USA

8:00 am - Spaceship Discovery's Crew and Cargo Lander Module Designs for Human Exploration of Mars
M. G. Benton, Sr., Boeing Space and Intelligence Systems, Los Angeles, CA, USA

8:30 am - Simulation and Analysis of Architectures for a Lunar Surface Outpost
W. Findiesen, M. Bayer, A. Born, D. McCormick, The Boeing Company, Huntington Beach, CA, USA; and D. Bienhoff, The Boeing Company, Arlington, VA, USA

9:00 am - Characterization and Glass Formation of JSC-1 Lunar and Martian Soil Simulants

C. S. Ray and S. T. Reis, Graduate Center for Materials Research, University of Missouri-Rolla, Rolla, MO, USA; and S. Sen, BAE Systems, NASA Marshall Space Flight Center, Huntsville, AL, USA

9:30 am - Development of a Lunar Water Astroparticle Observatory
A. Ignatiev, Texas Center for Advanced Materials, Houston, TX, USA; K. Heiss, High Frontier, Alexandria, VA, USA; and P. van Susante, Division of Engineering, Colorado School of Mines, Golden, CO, USA

[F04] Other Concepts and Theories - II

Wednesday, February 13, 2008, 8:00 am - 10:00 am – Alvarado A

Chairs: Andrew W. Beckwith, APS/Fermi National Laboratory, Menlo Park, CA, USA
Paul A. Murad, New Frontiers and Future Concepts, Vienna, VA, USA

8:00 am - An Ansatz Regarding Relativistic Space Travel Part II- Propulsion Realities
P. A. Murad, New Frontiers and Future Concepts, Vienna, VA, USA

8:30 am - Using Quantum Computing Models for Graviton Communication/Information Processing in Cosmological Evolution
A. W. Beckwith, APS / Contractor, Fermi National Laboratory, Menlo Park, CA, USA

9:00 am - Revisiting Anomalous Human-Generated Mass/Gravity Displacement Experimental Data with Discussion of Possible Theoretical Models
D. Graham, NW Frontier Research Institute, Yelm, WA, USA

9:30 am - Symmetries in Evolving Space-Time and their Connection to High-Frequency Gravity Wave Production
A.W. Beckwith, APS / Contractor, Fermi National Laboratory, Menlo Park, CA, USA

[B03] Thermal Challenges in ISRU Reactors

Wednesday, February 13, 2008, 10:15 am – 12:15 pm - Turquoise Room

Chairs: Adam P. Bruckner, University of Washington, Seattle, WA, USA
Uday Hegde, NCSER (National Center for Space Exploration Research), Cleveland, OH, USA

10:15 am - Analysis of Thermal and Reaction Times for Hydrogen Reduction of Lunar Regolith
U. Hegde, R. Balasubramaniam, National Center for Space Exploration Research, Cleveland, OH, USA; and S. Gokoglu, NASA Glenn Research Center, Cleveland, OH, USA

10:45 am - Resonant Heat Transfer in a Vibrofluidized Reactor with Lunar Regolith Simulant
V. Nayagam and K. R. Sacksteder, NASA Glenn Research Center, Cleveland, OH, USA

11:15 am - Sintering of Lunar and Simulant Glass
B. L. Cooper, Oceaneering Space Systems, Houston, TX, USA

11:45 am - Solar Thermal Power System for Oxygen Production from Lunar Regolith
T. Nakamura, A. D. Van Pelt, Physical Sciences Inc., San Ramon, CA, USA; R. Gustafson, Orbital Technologies Corporation, Madison, WI, USA; and L. Clark, Lockheed Martin Space Systems Company, Denver, CO, USA

[CT202] Nuclear Thermal Rockets: Past, Present, and Future

Wednesday, February 13, 2008, 10:15 am – 12:15 pm – Alvarado B/C

Chairs: Stanley K. Borowski, NASA Glenn Research Center, Cleveland, OH, USA
Stanley V. Gunn, Rocketdyne (Retired), Chatsworth, CA, USA

10:15 am - Economic Public Private Partnerships for Development
T. C. Taylor, Lunar Transportation Systems, Las Cruces, NM, USA; W. P. Kistler, and B. Citron, Lunar Transportation Systems, Inc. Bellevue, WA, USA

10:45 am - Future NTP Development Synergy Leveraged from Current J-2X Engine Development
R. O. Ballard, Liquid Engine and Main Propulsion Systems Branch, NASA Marshall Space Flight Center, AL, USA

11:15 am - The Center for Space Nuclear Research: a Paradigm for Advancing Space Nuclear

Education
J. Bess, Center for Space Nuclear Research, Idaho Falls, ID, USA

11:45 am - Panel Discussion (all)

[CT403] Dynamic Power: Multi-Kilowatt - II

Wednesday, February 13, 2008, 10:15 am – 12:15 pm – Alvarado D

Chairs: Steven Howe, Center for Space Nuclear Research, Idaho Falls, ID, USA
George Schmidt, NASA Glenn Research Center, Cleveland, OH, USA

10:15 am - Transport Properties of He-N_2 Binary Gas Mixtures for CBC Space Applications
J-M. Tournier and M.S. El-Genk, Institute for Space and Nuclear Power Studies and Chemical and Nuclear Engineering Department, The University of New Mexico, Albuquerque, NM, USA

10:45 am - Overview of Multi-Kilowatt Free-Piston Stirling Power Conversion Research at GRC
S.M. Geng, L. S. Mason, and R. W. Dyson, Thermal Energy Conversion Branch, NASA Glenn Research Center, Cleveland, OH, USA; L. B. Penswick, SEST Inc., Middleburg Hts, OH, USA

11:15 am - Performance Analyses of 38 kWe Turbo-Machine Unit for Space Reactor Power Systems
B. M. Gallo and M. S. El-Genk, Institute for Space and Nuclear Power Studies and Chemical and Nuclear Engineering Department, The University of New Mexico, Albuquerque, NM, USA

11:45 am - A Preliminary and Simplified Closed Brayton Cycle Modeling for a Space Reactor Application
L.N.F. Guimarães, Institute for Advanced Studies, São José dos Campos, SP, Brazil; and G.P. Camillo, Instituto Tecnológico de Aeronáutica – ITA, São José dos Campos, SP, Brazil

[CT404] Thermoelectric Power Conversion - I

Wednesday, February 13, 2008, 10:15 am – 12:15 pm – Alvarado F

Chairs: Bill J. Nesmith, Jet Propulsion Laboratory, Pasadena, CA, USA
Jean-Michel Tournier, University of New Mexico, Albuquerque, NM, USA

10:15 am - Development Status and Plans of the Advanced Thermoelectric Converter (ATEC) Project
R. C. Ewell, and T. Caillat, Jet Propulsion Laboratory / California Institute of Technology, Pasadena, CA, USA

10:45 am - Mechanical Properties of Thermoelectric Skutterudites
V. Ravi, California State Polytechnic University, Pomona, CA, USA and Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA; S. Firdosy, and T. Caillat, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA; B. Lerch, A. Calamino, R. Pawlik, and M. Nathal, NASA Glenn Research Center, Cleveland, OH, USA; A. Sechrist, J. Buchhalter, and S. Nutt, University of Southern California, University Park Campus, Los Angeles, CA, USA

11:15 am - MilliWatt Generator Design
J. C. Bass, V. Jovanovic, N. B. Elsner, and N. Hiller, Hi-Z Technology, Inc, San Diego, CA, USA

11:45 am - Silicon-Germanium (SiGe) Technology for Cryo Temperature Environments for Europa and Enceladus Missions
L. Peltz, R.Frampton, W. Atwell, The Boeing Company, Huntington Beach, CA, USA; J. Cressler, Georgia Institute of Technology, Atlanta, GA, USA; M. Mojarradi, Jet Propulsion Laboratory, Pasadena, CA, USA; B. Blalock, University of Tennessee, TN, USA; W. Johnson, G. Niu, F. Dai, Auburn University, Auburn, AL, USA; A. Mantooth, University of Arkansas, Fayetteville, AR, USA; M. Alles, Vanderbilt University, Nashville, TN, USA; J. Holmes, Lynguent Corporation; R. Berger, BAE Systems,

Manassas, VA, USA; R. Garbos, Aura Instrumentation, Mont Vernon, NH, USA; P. McClusky, University of Maryland, College Park, MD, USA

[D08] Technology Demonstrations and Analogs

Wednesday, February 13, 2008, 10:15 am – 12:15 pm – Potters Room

Chairs: Joseph Nainiger, NASA Glenn Research Center, Cleveland, OH, USA
Neville Marzwell, Jet Propulsion Laboratory, Pasadena, CA, USA

10:15 am - A Procedure Integrated Development Environment for future Spacecraft and Habitat
M. Izygon, Tietronix Software, Houston, TX, USA; D. Kortenkamp, TRACLabs Inc., Houston, TX, USA; and A. Molin, S&K Aerospace, Houston, TX, USA

10:45 am - Centennial Challenges Status
K. Davidian, NASA Headquarters, Washington, D.C., USA

11:15 am - Desert Research and Technology Studies (RATS) 2007 Field Campaign Objectives & Results
J. J. Kosmo, and B. Romig, NASA Johnson Space Center, Houston, TX, USA

11:45 am - The Advanced Video Guidance Sensor: Orbital Express and the Next Generation
R.T. Howard, A. F. Heaton, R. M. Pinson, C. K. Carrington, J. E. Lee, T. C. Bryan, B. A. Robertson, S. H. Spencer, and J. E. Johnson, NASA Marshall Space Flight Center, Huntsville, AL, USA

[F09] Future Propulsion Models and Concepts

Wednesday, February 13, 2008, 10:15 am – 12:15 pm – Alvarado A

Chairs: Greg V. Meholic, The Aerospace Corporation, El Segundo, CA, USA
Glen Robertson, Gravi Atomic Research, Madison, AL, USA

10:15 am - Hyperspace and Other Phenomena as Defined by the Tri-Space Model of the Universe
G. V. Meholic, The Aerospace Corporation, El Segundo, CA, USA

10:45 am - Unlabored Ship Transitions Between Subluminal and Superluminal Speeds in a Higher Dimensional Trispace
H. D. Froning, Jr. and G. V. Meholic, The Aerospace Corporation, El Segundo, CA, USA

11:15 am - Propulsion in the Chameleon Model
G. A. Robertson, Gravi Atomic Research, Madison, AL, USA

11:45 am – Panel Discussion (all)

[A06] Advanced Heat Pipe Technologies

Wednesday, February 13, 2008, 1:30 pm – 3:30 pm – Turquoise Room

Chairs: Robert S. Reid, Los Alamos National Laboratory, Los Alamos, NM, USA
Angirasa Devarakonda, NASA Ames Research Center, Moffett Field, CA, USA

1:30 pm - Design Optimization of Loop Heat Pipes with Cylindrical Evaporator and Integral Reservoir for Space Application
V. V. Vlassov, F. L. de Sousa, and R. R. Riehl, Division of Space Mechanics and Control, National Institute for Space Research, SP, Brazil

2:00 pm - Life Test Results for Water Heat Pipes Operating at 200 ºC to 300 ºC
J. H. Rosenfeld and N. J. Gernert, Thermacore, Inc., Lancaster, PA, USA

2:30 pm - Titanium Heat Pipe Thermal Plane
S. Y. Semenov, Aerospace Engineering, Thermacore International Inc., Lancaster, PA, USA; and K. A. Burke, Electrochemistry Branch, Power and Propulsion Technology Division, NASA Glenn Research Center, Cleveland, OH, USA

3:00 pm - Visual Observation of Oscillating Heat Pipes Using Neutron Radiography
H. Ma, Department of Mechanical & Aerospace Engineering, University of Missouri, Columbia, MO, USA

[CT107] Space Nuclear Power Systems: Simulation and Modeling

Wednesday, February 13, 2008, 1:30 pm – 3:30 pm – Alvarado B/C

Chairs: Thomas Marcille, Los Alamos National Laboratory, Los Alamos, NM, USA
Jeffrey C. King, University of Missouri – Rolla, MO, USA

1:30 pm - ***Comparison of Methods for Evaluating Nuclear Thermal Propulsion Tie-Tube Designs***
R. J. Kapernick, Nuclear Systems Design Group, Los Alamos National Laboratory, Los Alamos, NM, USA; and D. D. Dixon, Department of Nuclear Engineering, University of Tennessee, Knoxville, TN, USA

2:00 pm - ***MCNP Cross Section Validation Technique***
T. Marcille, Los Alamos National Laboratory, Los Alamos, NM, USA

2:30 pm - ***Monte Carlo Fission Source Convergence Assessment***
T. Marcille, Los Alamos National Laboratory, Los Alamos, NM, USA

3:00 pm - ***TXSAMC: A New Tool for Generating Shielded Multigroup Cross-Sections***
M. Hiatt, M. Adams, Texas A&M University, Pearland, TX, USA; T. F. Marcille, Los Alamos National Laboratory, Los Alamos, NM, USA

[CT401] Dynamic Power: 100 W Class

Wednesday, February 13, 2008, 1:30 pm – 3:30 pm – Alvarado D

Chairs: Richard K. Shaltens, NASA Glenn Research Center, Cleveland, OH, USA
Anne Garber, NASA Marshall Space Flight Center, Huntsville, AL, USA

1:30 pm - ***Advanced Stirling Convertor (ASC) - From Technology Development to Future Flight Product***
W. A. Wong, Power and On-Board Propulsion Technology Division, NASA Glenn Research Center, Cleveland, OH, USA; J. G. Wood, K. Wilson, Sunpower Inc., Athens, OH, USA

2:00 pm - ***GRC Supporting Technology for NASA's Advanced Stirling Radioisotope Generator (ASRG)***
J. G. Schreiber and L. G. Thieme, NASA Glenn Research Center at Lewis Field, Cleveland, OH, USA

2:30 pm - ***Validation of Organics for Advanced Stirling Convertor (ASC)***
E.E. Shin, and L. Inghram, Ohio Aerospace Institute, Cleveland, OH, USA; D. Quade, NASA Glenn Research Center, Cleveland, OH, USA; D. Scheiman, and C. Burke, ASRC, Cleveland, OH, USA; and M. Cybulski, University of Dayton, Dayton, OH

3:00 pm - ***Radioisotope Heated Jet Propulsion for Flight Applications on Titan***
J. Webb, S. Howe, M. Dhanasar, B. Gross, J. Katalenich, M. Keller, C. Miller, D. Osterberg, J. Perkins, P. Ramu, T. Riess, J. Sasser, B. Schrieb, H. Szumilla, R. Obrien, J. Joyce, L. Sailer, and C. Robinson, Center for Space Nuclear Research, Idaho Falls, ID, USA

[D06] Technologies for Lunar Surface Operations

Wednesday, February 13, 2008, 1:30 pm – 3:30 pm – Alvarado F

Chairs: Michelle Manzo, NASA Glenn Research Center, Cleveland, OH, USA
David Kortenkamp, TRACLabs Inc., Houston, TX, USA

1:30 pm - ***A Versatile Lifting Device for Lunar Surface Payload Handling, Inspection & Regolith Transport Operations***
W. Doggett, J. Dorsey, T. Collins, NASA Langley Research Center, Hampton, VA, USA; B. King, Lockheed Martin, USA; and M. Mikulas, National Institute of Aeronautics, USA

2:00 pm - ***Human Supervision of Robotic Site Surveys***
D. Schreckenghost, TRACLabs, Houston, TX, USA; T. Fong, NASA Ames Research Center, Moffett Field, CA, USA; and T. Milam, S&K Aerospace, Houston, TX, USA

2:30 pm - ***Mobility Characterization of Planetary Rover in Reduced Gravity Environment***
T. Kobayashi, and H. Ochiai, Department of Civil Engineering, Kyushu University, Fukuoka, Japan; J. Yamakawa, Department of Mechanical Engineering, National Defense Academy, Yokosuka, Japan; S. Aoki, Space and Robot System Group, Institute of Technology, Shimizu Corporation, Tokyo, Japan; K. Matsui, and A. Miyahara, SELENE Ground Systems and Exploration Research Group, Tsukuba Space Center, and Japan Aerospace Exploration Agency, Ibaraki, Japan

3:00 pm - ***Video Guidance Sensor for Surface Mobility Operation***
K. Fernandez, R. Fischer, and T. Bryan, NASA Marshall Space Flight Center, Huntsville, AL, USA; B. Peters, Schafer Corporation, Chelmsford, MA, USA

[E04] Space Bases on the Moon: Concepts and Challenges

Wednesday, February 13, 2008, 1:30 pm – 3:30 pm – Potters Room

Chairs: Paul van Susante, Colorado School of Mines, Lakewood, CO, USA
Robert P. Mueller, NASA Kennedy Space Center, Orlando, FL, USA

1:30 pm - ***Risk-Assessment for Equipment Operating on the Lunar Surface***
R.C. Richmond and N. Ramachandran, NASA Marshall Space Flight Center, Huntsville, AL, USA; and A. Kusiak, University of Iowa, Department of Mechanical and Industrial Engineering, Iowa City, IA, USA

2:00 pm - ***Conducting a Risk Management Software Enterprise-Wide Rollout***
S. Cass, Jr., Ball Aerospace & Technologies Corporation, Boulder, CO, USA

2:30 pm - ***Astrosociology and Space Exploration: Taking Advantage of the Other Branch of Science***
J. Pass, Astrosociology.com, Huntington Beach, CA, USA

3:00 pm - ***Commercial Space Tourism and Human Survival***
D. C. Gibson, C. Fletcher, and A. Garcia, University of New Mexico, Albuquerque, NM, USA; C. Candelario, Development Division, Ultra Mira, Albuquerque, NM, USA; R. Burnet, Cordova Public Relations, Albuquerque, NM, USA; M. Olivas, PRNewswire, Albuquerque, NM, USA

[F05] Other Concepts and Theories - III

Wednesday, February 13, 2008, 1:30 pm – 3:30 pm – Alvarado A

Chairs: Andrew Ketsdever, Air Force Research Laboratory, Edwards AFB, CA, USA
John Cole, NASA Marshall Space Flight Center, Huntsville, AL, USA

1:30 pm - ***An Exploration Perspective of Beamed Energy Propulsion***
J. W. Cole, NASA Marshall Space Flight Center, Huntsville, AL, USA

2:00 pm - ***Barium and Barium Oxide Transport in Hollow Cathodes***
J. Polk, Jet Propulsion Laboratory, Pasadena, CA, USA; A. M. Capece, I. G. Mikellides, I. Katz and J. Shepherd, California Institute of Technology, CA, USA

2:30 pm - ***Experiments with the Casimir Force and Concepts for New Propulsion Systems with Zero Point Energy (ZPE)***
T. Ludwig, New Energy Technologies, Berlin, Germany

3:00 pm - ***Panel Discussion (all)***

[B06] In Situ Resource Utilization Precursors, Outpost, and Beyond

Wednesday, February 13, 2008, 3:45 pm – 5:45 pm – Turquoise Room

Chairs: Kurt Sacksteder, NASA Glenn Research Center, Cleveland, OH, USA
Diane Linne, NASA Glenn Research Center, Cleveland, OH, USA

3:45 pm - ***Commonality of Electrolysis Sub-Systems for ISRU, Power, and Life Support for a Lunar Outpost***
D. Linne, J.E. Freeh, NASA Glenn Research Center, Cleveland, OH, USA; and A.F. Abercromby, Wyle, Houston, TX, USA

4:15 pm - ***In-Situ Resource Utilization (ISRU) to Support the Lunar Outpost and the Rationale for Precursor Missions***
T. Simon, NASA Johnson Space Center, Houston, TX, USA

4:45 pm - ***SELENE Mission Status Associated with ISRU***
K. Matsui, A. Miyahara, Y. Takizawa, SELENE project, Tsukuba Space Center, Japan Aerospace Exploration Agency, Tsukuba, Ibaraki, Japan; and S. Aoki, Space and Robot System Group, Institute of Technology, Shimizu Corporation, Tokyo, Japan

5:15 pm - ***Transportation and Power Requirements for He^3 Mining of the Jovian Planets***
T. Kammash, Department of Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI, USA; and R. Tang, Department of Aerospace Engineering, University of Michigan, Ann Arbor, MI, USA

[CT108] Safety and Reliability

Wednesday, February 13, 2008, 3:45 pm – 5:45 pm – Alvarado B/C

Chairs: Steven A. Wright, Sandia National Laboratories, Albuquerque, NM, USA
Martin B. Sattison, Idaho National Laboratory, Idaho Falls, ID, USA

3:45 pm - ***Advanced Stirling Radioisotope Generator: Design Processes, Reliability Analyses Impacts, and Extended Operation Tests***
C. T. Ha, Lockheed Martin Space Systems, Sunnyvale, CA, USA; R. Fernandez, NASA Glenn Research Center, Cleveland, OH, USA; S. L. Cornford, and M. S. Feather, NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

4:15 pm - ***Criticality Calculations for Step-2 GPHS Modules***
R. Lipinski, and D. L. Hensen, Advanced Nuclear Concepts Department, Sandia National Laboratories, Albuquerque, NM, USA

4:45 pm - ***Investigation of Stress Rupture Test Results on Neutron Irradiated Tantalum Alloys***
C. D. Barklay and D. P. Kramer, University of Dayton Research Institute, Dayton OH, USA; J. Y. Howe, Oak Ridge National Laboratory, Oak Ridge, TN, USA

5:15 pm - ***Space Reactor Launch Safety - An Acceptably Low Risk***
A. Weitzberg, Independent Consultant, Woodland Hills, CA, USA; and S. A. Wright, Sandia National Laboratories, Albuquerque, NM, USA

[CT402] Dynamic Power: Multi-Kilowatt - I

Wednesday, February 13, 2008, 3:45 pm – 5:45 pm – Alvarado D

Chairs: Lee S. Mason, NASA Glenn Research Center, Cleveland, OH, USA
Dennis Pelaccio, The Aerospace Corporation, Los Angeles, CA, USA

3:45 pm - ***Irradiation Damage Effects Review of Permanent Magnetic Materials for Space Power Applications***
C. Bowman, A. S. Cheryl, L. Bowman, S. M.Geng, NASA Glenn Research Center, Cleveland, OH, USA; K. J. Leonard, J. T. Busby, ASRC Aerospace Corp./NASA Glenn Research Center, Cleveland, OH, USA; and J. M. Niedra, Oak Ridge National Laboratory, Oak Ridge, TN, USA

4:15 pm - ***Progress in Developing a New 5 Kilowatt Free-Piston Stirling Space Convertor***
H. W. Brandhorst, Jr., and R. L. Kirby, Space Research Institute, Auburn University, AL, USA; and P. A. Chapman, Foster-Miller, Inc., Albany, NY, USA

4:45 pm - ***Test Results from a Simulated High Voltage Lunar Power Transmission Line***
D. Hervol, Mechanical Systems Branch, Glenn Engineering and Scientific Support Organization, Analex Corporation, NASA Glenn Research Center, Cleveland, OH, USA; A. Birchenough, Power Systems Development Branch, Power and Avionics Division, NASA Glenn Research Center, Cleveland, OH, USA

5:15 pm - ***5-kWe Free-Piston Stirling Engine Convertor***
P. A. Chapman, N. A. Vitale, and T. J. Walter, Foster-Miller, Inc., Albany, NY, USA

[CT405] Thermoelectric Power Conversion - II

Wednesday, February 13, 2008, 3:45 pm – 5:45 pm – Alvarado F

Chairs: G. Jeffrey Snyder, California Institute of Technology, Pasadena, CA, USA
Bahman Heshmatpour, Teledyne Energy Systems, Inc., Hunt Valley, Hunt Valley, MD

3:45 pm - ***Complex Zintl Phases for Thermoelectric Applications***
G. J. Snyder, California Institute of Technology, Pasadena CA, USA

4:15 pm - ***Lanthanum Telluride: Mechanochemical Synthesis of a Refractory Thermoelectric Material***
A. May, J. Snyder, California Institute of Technology, Pasadena CA, USA; and J. Fleurial, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

4:45 pm - ***Nanostructured Bulk Composite and Alloyed Semiconductors as Efficient High Temperature Thermoelectric Materials***
J. Fleurial, P. Gogna, and C. Huang, Power and Sensor Systems Group, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA; , G. Chen, M. S. Dresselhaus, H. Lee, and M. Y. Tang, Dept. of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA; Z. F. Ren, D. Wang, Physics Dept., Boston College, Chestnut Hill, MA, USA; S. Bux, R. Kaner, Dept. of Chemistry and Biochemistry and California NanoSystems Institute, University of California Los Angeles, Los Angeles, CA, USA; and R. Blair, Dept. of Chemistry, University of Central Florida, Orlando, FL, USA

5:15 pm - ***The General-Purpose Heat Source Radioisotope Thermoelectric Generator: A Truly General-Purpose Space RTG***
G. L. Bennett, Formerly of the U.S. Department of Energy and NASA, Emmett, ID, USA; J. J. Lombardo, Formerly of the U.S. Department of Energy and NASA, Damascus, MD, USA; R. J. Hemler, Formerly of Lockheed-Martin Space Systems Company, Audubon, PA, USA; G. Silverman, Formerly of Lockheed-Martin Space Systems Company, Lansdale, PA, USA; C. W. Whitmore, Formerly of General Electric Company, Broomall, PA, USA; W. R. Amos, Formerly of Mound Laboratory, Vandalia, OH, USA; E. W. Johnson, Formerly of Mound Laboratory, Centerville, OH, USA; R. W. Zocher, Formerly of Los Alamos National Laboratory, Kingston, WA, USA; J. C. Hagan, Formerly of Johns Hopkins University Applied Physics Laboratory, Ellicott City, MD, USA; and R. W. Englehart, Formerly of NUS Corporation now with the U.S. Department of Energy, Gaithersburg, MD, USA

[E07] Planetary Terraforming Domed Ecosystems

Wednesday, February 13, 2008, 3:45 pm – 5:45 pm – Alvarado A

Chairs: Eric Rice, Orbital Technologies Corporation (ORBITEC), Madison, WI, USA
John Brandenburg, Orbital Technologies Inc., Madison, WI, USA

3:45 pm - ***Early Domed Agriculture on Mars***
J. Brandenburg, Orbital Technologies Inc., Madison, WI, USA

4:15 pm - ***A Greenhouse for Mars and Beyond***
C. P. Rahaim, HyperTech Concepts LLC, Huntsville, AL, USA, and P. A. Czysz, HyperTech Concepts LLC, St. Louis, MO, USA

4:45 pm - ***The Space Homestead and Creation of Real Estate and Industry beyond Earth***
P. A. Curreri, NASA Marshall Space Flight Center, AL, USA; and M. K. Detweiler, Lewiston, ME, USA

5:15 pm - ***Terraforming Mars with Super-Greenhouse Gases***
M. Marinova, California Institute of Technology, Pasadena, CA, USA

[E09] Lunar Dust: Testing and Mitigation

Wednesday, February 13, 2008, 3:45 pm – 5:45 pm – Potters Room

Chairs: Michael J. Dube, NASA Goddard Space Flight Center, Greenbelt, MD, USA
Mark J. Hyatt, NASA Glenn Research Center, Cleveland, OH, USA

3:45 pm - Lunar Dust Simulant in Mechanical Component Testing - Paradigm and Practicality
R. Richmond, and T. Jett, NASA Marshall Space Flight Center, Huntsville, AL, USA; K.Street, P.Abel, Tribology & Surface Science, NASA Glenn Research Center, Cleveland, OH, USA

4:15 pm - Nanotube Doped Conductive "First Contact Polymers" for Surface Protection, Cleaning and Dust Mitigation
J. P. Hamilton, Department of Chemistry and Engineering Physics, University of Wisconsin-Platteville, Platteville, WI, USA

4:45 pm - Dust Mitigation Efforts at NASA Goddard Space Flight Center
S. Straka, NASA/Goddard Space Flight Center, Greenbelt, MD, USA

5:15 pm - Mitigation of Lunar Dust in Mechanical Systems
C. I. Calle, Electrostatics and Surface Physics Laboratory, NASA Kennedy Space Center, FL, USA; J.S. Clements, Physics Department, Appalachian State University, Boone, NC, USA; C.R. Buhler, ASRC Aerospace, Kennedy Space Center, FL, USA; J.G. Mantovani, NASA Electrostatics and Surface Physics Laboratory, Kennedy Space Center, FL, USA; A. Chen, Physics Department, Oklahoma Baptist University, Shawnee, OK, USA; E.E. Arens, NASA Electrostatics and Surface Physics Laboratory, Kennedy Space Center, FL, USA; J.M. McFall and M.L. Ritz, ASRC Aerospace, Kennedy Space Center, FL, USA

[CT] Special Evening Plenary – 25th Anniversary of the Symposium on Space Nuclear Power and Propulsion

Wednesday, February 13, 2008, 6:00 pm – 8:00 pm –Avarado D

Chairs: Michael G. Houts, NASA Marshall Space Flight Center, Huntsville, AL, USA
Mohamed El-Genk, University of New Mexico, Albuquerque, NM, USA.

6:00 pm How did it all start?
Mohamed El-Genk, University of New Mexico, Albuquerque, NM, USA

6:30 pm Irreverent Reminiscences of an Old Space Nuke- the People, the Humor and the Interesting Stories of the Last 25 Years!
James H. Lee, Sandia National Laboratories, Albuquerque, NM, USA

6:50 pm Take Me Out of the Ballgame
Alan Newhouse, Newhouse Consulting, Hollywood, MD, USA

7:10 pm The Future of RPS – Building on the Past
George Schmidt, NASA Glenn Research Center, Cleveland, OH, USA

7:30 pm Trials and Triumphs of SNTP
Roger Lenard, Sandia National Laboratories, Albuquerque, NM, USA

7:50 pm Questions and Closing Remarks

THURSDAY, FEBRUARY 14, 2008

[A07] Smart Materials

Thursday, February 14, 2008, 8:00 am - 10:00 am – Turquoise Room

Chairs: Kenneth Shannon, Eclipse Energy Systems, Inc., St. Petersburg, FL, USA
Angirasa Devarakonda, NASA Ames Research Center, Moffett Field, CA, USA

8:00 am - Composite Material Initiative at GSFC - Thermal Aspects
J. Didion, Senior Thermal Engineer, NASA Goddard Space Flight Center, Greenbelt, MD, USA

8:30 am - Emissivity Modulating Electrochromic Device
H. Demiryont, Eclipse Energy Systems, Inc., St. Petersburg, FL, USA

9:00 am - Heat Flux-Based Emissivity Sensor: Transient Behavior of Active Thermal Control Devices
J. Lawler, and J. Currano, ATEC, Inc., College Park, MD, USA; S. Moghaddam, Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, IL, USA and J. Kim, Department of Mechanical Engineering, University of

Maryland, College Park, MD, USA

9:30 am - Panel Discussion (all)

[B05] Excavation

Thursday, February 14, 2008, 8:00am – 10:00 am – Potters Room

Chairs: Dale S. Boucher, Northern Centre for Advanced Technology, Sudbury, Ontario, Canada
John Caruso, NASA Glenn Research Center, Cleveland, OH, USA

8:00 am - Cutterhead Development for the Low-Energy Planetary Excavator
R. Gustafson, Orbital Technologies Corporation, Madison, WI, USA; and L, Gertsch, University of Missouri-Rolla, Rock Mechanics & Explosives Research Center, and Geological Sciences & Engineering Dept., Rolla, MO, USA

8:30 am - Multirobot Lunar Excavation and ISRU Using Artificial-Neural-Tissue Controllers
J. Thangavelautham, A. Smith, N. A. El Samid, A. Ho, and G. M. T. D'Eleuterio Institute for Aerospace Studies, University of Toronto, Toronto, ON, Canada; D. Boucher, Northern Centre for Advanced Technology, Sudbury, ON, Canada; and J. Richard, Electric Vehicle Controllers Ltd, Val Caron, ON, Canada

9:00 am - Pneumatic Excavator for Extraterrestrial Applications
K. Zacny and M. Hedlund, Honeybee Robotics, New York, NY, USA; G. Mungas, C. Mungas, and D. Fisher, Firestar Engineering, Broomfield, CO, USA

9:30 am - Trade Study of Excavation Tools and Equipment for Lunar Outpost Development and ISRU
R. H. King, Engineering Division, Colorado School of Mines, Golden, CO, USA; and R. P. Mueller, Advanced Systems Division, NASA, Kennedy Space Center, Florida, USA

[CT109] Power Requirements for Lunar and Mars Missions

Thursday, February 14, 2008, 8:00 am - 10:00 am – Alvarado B/C

Chairs: Joseph Nainiger, NASA Glenn Research Center, Cleveland, OH, USA
John H. Scott, NASA Johnson Space Center, Houston, TX, USA

8:00 am - A Fission Surface Power System for a Human Lunar Outpost
J. Nainiger, NASA Glenn Research Center, Cleveland, OH, USA

8:30 am - A Photovoltaic and Regenerative Fuel Cell System Design for a Human Lunar Outpost
J. E. Freeh, T. W. Kerslake, and J. J. Nainiger, NASA Glenn Research Center, Cleveland, OH, USA

9:00 am - Expected Power Requirements for a Human Mars Mission
R. L. Cataldo, NASA Glenn Research Center, Cleveland, OH, USA

9:30 am - Lunar Surface-to-Surface Power Transfer
T. W. Kerslake, Mission and Systems Analysis Division, NASA Glenn Research Center, Cleveland, OH, USA

[CT301] Fuel and Materials

Thursday, February 14, 2008, 8:00 am - 10:00 am – Alvarado D

Chairs: A.L. Qualls, Oak Ridge National Laboratory, Oak Ridge, TN, USA
Cheryl Bowman, NASA Glenn Research Center, Cleveland, OH, USA

8:00 am - Honeycomb Betavoltaic Battery for Space Applications
G.H. Miley, J.R. Lee, and B. Ulmen, Department of Nuclear, Plasma and Radiological Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA

8:30 am - Radiation Sensitivity, Dose and Temperature Limitations of Polymeric Materials for Application in a Fission Surface Power Convertor
K. J. Leonard, C. J. Janke and J. T. Busby, Oak Ridge National Laboratory, Oak Ridge, TN, USA; E. E. Shin, Ohio Aerospace Institute, NASA Glenn Research Center, Cleveland, OH, USA;

and C. L. Bowman, NASA Glenn Research Center, Materials & Structures Division, Cleveland, OH, USA

9:00 am - ***Structural Material Choices for Space Fission Reactor Systems***
J. Busby, and K. J. Leonard, Oak Ridge National Laboratory, Oak Ridge, TN, USA

9:30 am - ***Multiscale Simulations of the Effects of Irradiation-induced Voids and Helium Bubbles on the Mechanical Properties of Metals***
T. Khraishi, P. Jing, Mechanical Engineering Department, University of New Mexico, Albuquerque, NM, USA; J. A. Young, Chemistry and Materials Science Directorate, Lawrence Livermore National Laboratory, Livermore, CA, USA; B. D. Wirth, Nuclear Engineering Department, University of California at Berkeley, Berkeley, CA, USA

[CT407] Radioisotope Power Systems Technology

Thursday, February 14, 2008, 8:00 am - 10:00 am – Alvarado F

Chairs: Patrick E. Frye, Pratt & Whitney Rocketdyne, Canoga Park, CA, USA
Joseph Nainiger, NASA Glenn Research Center, Cleveland, OH, USA

8:00 am - ***Development Status of Advanced High-Temperature Thermoelectric Materials for Integration into Advanced Radioisotope Thermoelectric Generators***
T. Caillat, C. K. Huang, S. Chi, J. Cheng, W. Okraku, P. Gogna, J. Paik, and R. Ewell, Jet Propulsion Laboratory, Pasadena, CA, USA

8:30 am - ***Special Application Thermoelectric Micro Isotope Power Sources***
B. Heshmatpour, A. Lieberman, M. Khayat, A. Leanna, and T. Dobry, Teledyne Energy Systems, Incorporated, Hunt Valley, MD, USA

9:00 am - ***Safe Alternative Radioisotope Power Sources for Space and Planetary Applications***
R. O'Brien, and R. M. Ambrosi, N. P. Bannister, Space Research Centre, Department of Physics & Astronomy, University of Leicester, Leicester, U.K; S. D. Howe, Center for Space Nuclear Research, Idaho Falls, ID, USA; H. V. Atkinson, Department of Engineering, University of Leicester, Leicester, U.K; and D. P. Butt, Department of Materials Science and Engineering, Boise State University, Boise, ID, USA

9:30 am - ***The Importance of Pu-238 in Long-Term Scientific Missions to the Outer Solar System and Beyond***
J. B. Perkins, J. A Katalenich, and L. M Sailer, Center for Space Nuclear Research, Idaho National Laboratory, Idaho Falls, ID, USA

[F08] Theoretical Considerations

Thursday, February 14, 2008, 8:00 am - 10:00 am – Alvarado A

Chairs: Eric W. Davis, Institute for Advanced Studies at Austin, Austin, TX, USA
Raymond Lewis, Pennsylvania State University, Boalsburg, PA, USA

8:00 am - ***Magic Angle Precession***
B. Binder, Quanics.com, Germany

8:30 am - ***Membrane Nano-Actuation by Light-Driven Manipulation of van der Waals Forces: A Progress Report***
F. Pinto, InterStellar Technologies Corporation, Monrovia, CA, USA

9:00 am - ***Progress on The GEMS (Gravity Electro-Magnetism-Strong) Theory of Field Unification and Its Application to Space Problems***
J. Brandenburg, Orbital Technologies Incorporated, Madison, WI, USA

9:30 am - ***Implications for the Cosmological Landscape: Can Thermal Inputs from a Prior Universe Account for Relic Graviton Production?***
A.W. Beckwith, APS/Fermi National Laboratory, Mento Park, CA, USA

[B07] Analog Test Site Experience

Thursday, February 14, 2008, 10:15 am – 12:15 pm – Turquoise Room

Chairs: Mark Henley, The Boeing Company, Topanga, CA, USA
Alain Berinstain, Canadian Space Agency, St-Hubert, Quebec, Canada

10:15 am - ***Exploration System Mission Directorate and Constellation Program Support for Analogue Missions***
S. Hoffman, and S. A. Voels, SAIC, Houston, TX, USA; C. E. Gerty, NASA Johnson Space Center, Houston, TX, USA

10:45 am - ***Lunar Commercial Mining Logistics***
T. C. Taylor, Lunar Transportation Systems, Inc., Las Cruces, NM, USA; and W. P. Kistler, B. Citron, Lunar Transportation Systems, Inc., Bellevue, WA, USA

11:15 am - ***Planetary Analogs: An Evaluation Standard***
P. Lee and C. P. McKay, NASA Ames Research Center, Moffett Field, CA, USA

11:45 am - ***Preparation and Handling Large Quantities of JSC-1A Lunar Regolith Simulant for the 2007 Regolith Excavation Challenge***
M. R. Everingham, and N. Pelster, California Space Authority, Santa Maria, CA, USA and California Space Education and Workforce Institute, Pasadena, CA, USA; R. P. Mueller, National Aeronautics and Space Administration, Kennedy Space Center, FL, USA; and K. Davidian, National Aeronautics and Space Administration, Headquarters, DC, USA

[CT101] Space Nuclear Fission Power Systems and Concepts

Thursday, February 14, 2008, 10:15 am – 12:15 pm – Alvarado B/C

Chairs: David I. Poston, Los Alamos National Laboratory, Los Alamos, NM, USA
Patrick J. McDaniel, Sandia National Laboratories, Albuquerque, NM, USA

10:15 am - ***Comparison of KENO-VI and MCNP5 Criticality Analyses for a Lunar Regolith Clustered-Reactor System***
J. D. Bess, Center for Space Nuclear Research, Idaho Falls, ID, USA

10:45 am - ***Lunar Nuclear Power Plant with Solid Core Reactor, Heatpipes and Thermoelectric Conversion***
E. D. Sayre, Engineering Consultant, Los Gatos, CA, USA; P. J. Ring, Advanced Methods & Materials, Sunnyvale, CA, USA; N. Brown, Engineering Consultant, San Jose, CA, USA; N. B. Elsner, and J. C. Bass, Hi-Z Technology, Inc., San Diego, CA, USA

11:15 am - ***Near Infrared Beam Reactor***
J. E. Werner, Idaho National Laboratory, Idaho Falls, ID, USA

11:45 am - ***System Concepts for Affordable Fission Surface Power***
L. S. Mason, NASA Glenn Research Center, Cleveland, OH, USA

[CT201] Advanced Concepts and Technologies

Thursday, February 14, 2008, 10:15 am – 12:15 pm – Alvarado F

Chairs: James R. Powell, Plus Ultra Technologies, Inc., Stony Brook, NY, USA
Terry Kammash, University of Michigan, Ann Arbor, MI, USA

10:15 am - ***Breakthrough Technologies for Ultra Large Telescopes***
J.D.G. Rather, RCIG, Inc., Oak Ridge, TN, USA; G.W. Zeiders, The Sirius Group, Huntsville, AL, USA; and J.R. Powell, Plus Ultra Technologies, Shorham, NY, USA

10:45 am - ***Converting the ISS to an Earth-Moon Transport System Using Nuclear Thermal Propulsion***
J. Paniagua, G. Maise, and J. Powell, Plus Ultra Technologies, Inc., Stony Brook, NY, USA

11:15 am - ***Engineering Challenges in Antiproton Triggered Fusion Propulsion***
B. Cassenti, Department of Engineering & Science, Rensselaer Polytechnic Institute, Hattford, CT, USA; and T. Kammash, Nuclear Engineering Department, University of Michigan, Ann Arbor, MI, USA

11:45 am - ***MOA - The Magnetic Field Amplified Thruster, a Novel Concept for a Pulsed Plasma Accelerator***
N. Frischauf, M. Hettmer, A. Grassauer, and T. Bartusch, QASAR Technologie(s), Vienna, Austria; O. Koudelka Institute of Communication Networks and Satellite Communication, Graz University of Technology, Graz, Austria

[D07] Technologies for Lunar Surface Power Systems

Thursday, February 14, 2008, 10:15 am – 12:15 pm – Alvarado D

Chairs: Joe Howell, NASA Marshall Space Flight Center, Huntsville, AL, USA
Randy Black, Honeywell, Glendale, AZ, USA

10:15 am - ***Cryogenic Storage and Processing for Regenerative Fuel Cells***
R. F. Boyle, E. Canavan, S. Mustafi, NASA Goddard Space Flight Center, Greenbelt, MD, USA

10:45 am - ***Fission Surface Power Technology Development***
D. Palac, L. S. Mason, NASA Glenn Research Center, Cleveland, OH, USA

11:15 am - ***Fuel Cell and Battery Development for Lunar Surface Power Systems***
M. A. Manzo, M. A. Hoberecht, C. M. Reid, T. B. Miller, and C. R. Mercer, NASA Glenn Research Center, Cleveland, OH, USA

11:45 am - ***Technologies for Lunar Surface Power Systems Power Beaming and Transfer***
N. Marzwell, and R. J Pogorzelski, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA; K. Chang, and F. Little, Texas A&M University, College Station, TX, USA

[F10] An International Outlook on Far Term Propulsion and Power

Thursday, February 14, 2008, 10:15 am – 12:15 pm – Alvarado A

Chairs: Bernd Binder, Quanics.com, Germany
Martin Tajmar, Austrian Research Center, GmbH – ARC, Austria

10:15 am - ***Friedmann Propulsion in a Flat Holographic Universe***
B. Binder, Quanics.com, Germany

10:45 am - ***Inertia, Electromagnetism and Fluid Dynamics***
A. A. Martins, Center for Plasma Physics, Instituto Superior Técnico, Lisboa, Portugal and M. J. Pinheiro, Department of Physics and Center for Plasma Physics, Instituto Superior Técnico, Lisboa, Portugal

11:15 am - ***Measurements of the Influence of Acceleration and Temperature of Bodies on Their Weight***
A. L. Dmitriev, St-Petersburg State University of Information Technologies, Mechanics and Optics, St-Petersburg, Russia

11:45 am - ***Long Distance Teleportation of Macroscopic Objects by Vacuum Holes***
C. Leshan, Kiev University, Department of Nuclear Physics, Ukraine

INDEX OF AUTHORS AND SESSION CHAIRS

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