SPACE TECHNOLOGY & APPLICATIONS INTERNATIONAL FORUM (STAIF-2007)

February 11 - 15, 2007

"Space Renaissance: Inspiring the Next Generation"

11th CONFERENCE ON THERMOPHYSICS APPLICATIONS IN MICROGRAVITY

24th SYMPOSIUM ON SPACE NUCLEAR POWER AND PROPULSION

5th CONFERENCE ON HUMAN/ROBOTIC TECHNOLOGY AND THE VISION FOR SPACE EXPLORATION

5th SYMPOSIUM ON SPACE COLONIZATION

4th SYMPOSIUM ON NEW FRONTIERS AND FUTURE CONCEPTS

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19th Space Design Competition

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EXHIBITS

Hotel Albuquerque, Exhibit Area

Exhibit Hours:	Monday, February 12	7:45am – 12:30pm	1:30pm – 5:00pm	
	Tuesday, February 13	7:45am – 12:30pm	1:30pm – 5:00pm	6:30pm – 7:30pm
	Wednesday, February 14	7:45am – 12:30pm	1:30pm – 4:30pm	

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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-2006 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.

2007 AWARD COMMITTEE:

Robert L. Wiley (chair), U.S. Department of Energy; **Stanley K. Borowski**, NASA Glenn Research Center; **Lawrence DeFillipo**, Science Applications International Corporation; **Stanley Gunn**, Rocketdyne (Retired); **Kenneth R. Johnson**, Jet Propulsion Laboratory; **Eric Rice,** Orbital Technologies Corporation (ORBITEC); **Harrison Schmitt**, Consultant; and **Ted Swanson,** NASA Goddard Space Flight Center.

Recipients of the Schreiber-Spence Space Achievement Award:

1988 Raemer E. Schreiber
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
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2005 Ronald J. Sovie
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2006 Milton Klein
2007 Chauncey Starr

About the Schreiber-Spence Achievement Award Momento

Each Schreiber-Spence Acheivement momento is handcrafted following this 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, with which STAIF began 24 years ago. Because the scientific contributions each awardee has made to the field are unique, Hoover believes, "the mementos should be unique in the world," as well. Hoover makes the bases himself of solid walnut, while the logo-etched glass component is created 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, she must have done the majority of the research.

2007 AWARD COMMITTEE:

Stephen Gaddis, NASA Marshall Space Flight Center; **Mike Pauken,** Jet Propulsion Laboratory; **Robert S. Reid,** Los Alamos National Laboratory; **Jonathan Stabb**, Jet Propulsion Laboratory; and **Jim Woodward,** California State University, Fullerton.

Recipients of the Manuel Lujan, Jr. Student Paper Award:

1988-Vladimir Valentakovich, University of California at LA
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1993-Jonathan Witter, Massachusetts Institute of Technology
1994-David I. Poston, University of Michigan
1995-Jun Liu, Auburn University
1996-James R. Luke, ISNPS, University of New Mexico
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1998-Jeffrey S. Allen, University of Dayton
1999-Gerrit Wölk, University of Bremen, Germany
1999-Thomas L. Mahood, California State University
2000-Jeffrey C. King, ISNPS, University of New Mexico
2001-Eric Choiniere, University of Michigan
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

OUTSTANDING PAPER AWARD

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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Conference on Thermophysics Applications in Microgravity: **Tung L. Lam,** (Chair) The Aerospace Corporation; **R. Panneer Selvam,** University of Arkansas; **Eric Silk,** NASA Goddard Space Flight Center; **Kirk Yerkes**, U.S. Air Force Research Laboratory.

Symposium on Space Nuclear Power and Propulsion: **Michael Houts,** (Chair) NASA Marshall Space Flight Center; **Robert Abelson,** Jet Propulsion Laboratory; **Patrick Frye,** Pratt & Whitney Rocketdyne; **Thomas Marcille,** Los Alamos National Laboratory; **Melissa Van Dyke,** NASA Marshall Space Flight Center; **Robert Wegeng,** NASA Headquarters; **Abraham Weitzburg**, Massachusetts Institute of Technology (retired); **James Werner,** Idaho National Laboratory.

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Symposium on New Frontiers and Future Concepts: **Glen A. Robertson,** (Chair) NASA Marshall Space Flight Center; **Michael LaPointe,** NASA Marshall Space Flight Center; **Raymond A. Lewis,** NASA Marshall Space Flight Center; **Clive Woods**, Louisiana State University.

RECIPIENTS OF 2006 AWARD

10th Conference on Thermophysics in Microgravity: Ryoji Oinuma, David Bean, Charles Neill, Kevin Supak and Frederick Best, Texas A & M University, College Station, TX, USA, for their paper, "Two-Phase Pressure Drop in a Twisted Tape Boiler for a Microgravity Rankine Cycle Power System."

23rd Symposium on Space Nuclear Power and Propulsion: Shannon M. Bragg-Sitton, NASA Marshall Space Flight Center, Nuclear & Advanced Propulsion Branch, AL, USA; T.J. Morton, Department of Chemical and Nuclear Engineering, University of New Mexico, Albuquerque, NM, USA, for their paper, "Dynamic Response Testing in an Electrically Heated Reactor Test Facility."

3rd Symposium on New Frontiers and Future Concepts: E. W. Davis, H. E. Puthoff, Inst. for Advanced Studies at Austin, Austin, TX, USA; V. L. Teofilo, Lockheed Martin Space Systems, Sunnyvale, CA, USA; B. Haisch, ManyOne Networks, Scotts Valley, CA, USA; L. J. Nickisch, NorthWest Research Associates, Bellevue, WA, USA; A. Rueda, Dept. of Electrical Engineering, Cal. State Univ.-Long Beach, Long Beach, CA, USA; D. C. Cole, Dept. of Manufacturing Engineering, Boston University, Boston, MA, USA for their paper, "Review of Experimental Concepts for Studying the Quantum Vacuum Field."

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 freshmen and undergraduate students. In addition, awards consist of a certificate of recognition and a monetary sum of $500 per year, for up to four years. The graduate student award has a monetary value of $14,000-$16,000 per year, plus tuition waivers and health insurance for up to three years.

This year's recipient of a $500 scholarship is **Ben Maestas**, a senior in The University of New Mexico's Nuclear Engineering Program.

SECONDARY SCHOOL SPECIAL SESSION

19th Secondary School Special Session

This session is sponsored by the University of New Mexico's Institute for Space and Nuclear Power Studies. Activities are coordinated by **Jon Webb**, UNM-ISNPS, and **Susan Ostlie**, Madison Middle School. New Mexico secondary school students and teachers participating in the Space Design Competition are invited to attend this session. Space related topics will be presented to the attendees by members of the science and engineering committees.

19th Annual Space Design Competition

This event is sponsored by the University of New Mexico's Institute for Space and Nuclear Power Studies. Activities are coordinated by **Jon Webb, Timothy Schriener,** and **Jack Parker,** UNM-ISNPS. This year's design objective is entitled, "Lunar Resort." 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 12, 2007.

PUBLICATIONS

Available from the American Institute of Physics, c/o Springer New York, Customer Service, 1-800-777-4643, or e-mailorders-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.)

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AIP Conf. Proceedings 880, (1-vol. hardcover book), ISBN 978-0-7354-0386-4...$286.00
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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

AIP Conf. Proceedings Volume 301 (Space Nuclear Power and Propulsion-**1994**), Volume 361 (**STAIF-1996**), and Volume 387 (**STAIF-1997**) . . .**out of print.**

HOTEL ACCOMMODATIONS

Hotel Albuquerque, 800 Rio Grande Blvd. NW, Albuquerque, NM 87104
(505) 843-6300, Fax (505) 842-9863, Toll Free Reservations: 1-800-237-2133

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-2007. The rates are:

ROOM RATES

Single Occupancy $70.00
Double Occupancy $70.00
Triple Occupancy $70.00
Quadruple Occupancy $70.00

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 26, 2007. Attendees must identify themselves as participants of STAIF-2007, 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 p.m. and Check-out is 12:00 noon. Contact the hotel for more information on reservation requirements and cancellation policies.

REGISTRATION AND FEES

Hotel Albuquerque, Fireplace Room

Sunday, February 11,	4:30 pm - 7:30 pm
Monday, February 12,	7:00 am - 5:30 pm
Tuesday, February 13,	7:00 am - 7:00 pm
Wednesday, February 14	7:00 am - 4:30 pm
Thursday, February 15	7:30 am - 10:30 am

ALL ATTENDEES AND EXHIBITORS MUST REGISTER & PAY A REGISTRATION FEE

(a) Open Technical Meeting Full Registration Fee: Includes 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 2007 Spring Semester. Pre-registrants should enclose a copy of their 2007 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-2007 Conferences, MSC01-1120, FEC Room 239, 1 University of New Mexico, Albuquerque, NM 87131-0001, (505) 277-2813 or (505) 277-0446.

	Early	**Late** (after 12/18/2006)
OPEN TECHNICAL MEETING(a)	$550.00	$595.00
ONE DAY REGISTRATION (b)	$370.00	$395.00
STUDENT (C)	$185.00	$195.00
ADDITIONAL LUNCHEON TICKET(D)	$40.00	$55.00

CANCELLATIONS AND REFUNDS

Those unable to attend the conferences may receive a refund of their registration fee (less a 20% processing charge) by calling the Institute office at (505) 277-0446 or by email at: isnps@unm.edu no later than January 16, 2007. All refunds will be made promptly by mail. NO REFUNDS WILL BE ISSUED after JANUARY 16, 2007.

AWARDS BANQUET

Tuesday, February 13, 7:30 pm - 9:30 pm, Alvarado Ballroom, 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: Donald Cobb, Los Alamos National Laboratory (retired), Los Alamos, NM

Guest Speaker: Roger D. Launius, Chair, Division of Space History, National Air and Space Museum, Smithsonian Institution, Washington, DC

CHAIRS' AND SPEAKERS' BREAKFAST

All STAIF-2007 speakers and session chairs are requested to attend the hosted Speakers' Breakfast on the day of their session or presentation to discuss the session arrangements and guidelines. A Speakers' Preparation Room will be available Monday through Wednesday.

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

Steering and Executive Committees

Monday, February 12, 6:30 pm – 8:30 pm, **Alvarado A**

Technical Program Committees

Tuesday, February 13, 12:30 pm – 1:45 pm
(All Session Chairs and Co-Chairs are committee members. Lunch is available for purchase)
11th Conf. on Thermophysics Applications in Microgravity, **Alvarado A**
24th Symp. on Space Nuclear Power and Propulsion, **Alvarado D**
5th Conf. on Human/Robotic Tech. and the Vision for Space Exploration, **Alvarado B/C**
5th Symp. on Space Colonization, **Alvarado G/H**
4th Symp. on New Frontiers and Future Concepts, **Alvarado F**

Executive Committee

Wednesday, February 14, 12:30 pm – 2:00 pm, **Franciscan Room**

PROGRAM ACTIVITIES

SUNDAY, February 11, 2007

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

MONDAY, February 12, 2007

7:00 am - 7:45 a.m. **Speakers' Breakfast,** Franciscan Room
7:00 am - 5:30 pm **Registration,** Fireplace Room
7:30 am - 12:30 pm **Space Design Competition,** West/North Atrium
8:00 am - 8:45 am **Opening Remarks and Keynote Speech,** Alvarado Ballroom
8:45 am - 10:25 am **Plenary Session I,** Alvarado Ballroom
10:25 am - 10:45 am **Coffee Break,** East/North Atrium
10:45 am - 12:45 pm **Plenary Session II,** Alvarado Ballroom
10:05 am - 12:30 pm **Secondary School Special Session,** Alvarado B/C
12:30 pm - 12:45 pm **Space Design Competition Awards Ceremony,** Alvarado Ballroom
12:45 pm - 1:45 pm **Lunch Break**
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
4:00 pm - 6:00 pm **Technical Sessions** (see table of contents or centerfold for time and room)
6:30 pm - 8:30 pm **Joint Steering and Executive Committee Meeting,** Alvarado A

TUESDAY, February 13, 2007

7:00 am - 7:45 am **Speakers' Breakfast,** Franciscan Room
7:00 am - 7:00 pm **Registration,** Fireplace Room
8:00 am - 10:00 am **Technical Sessions** (see table of contents or centerfold for time and room)
10:00 am - 10:30 am **Coffee Break,** East/North Atrium
10:30 am - 12:30 pm **Technical Sessions** (see table of contents or centerfold for time and room)
12:30 pm - 1:30 pm **Lunch Break**
12:30 pm - 1:45 pm **STAIF Technical Program Committee Meetings**
11th Conf. on Thermophysics Applications in Microgravity, Alvarado A
24th Symp. on Space Nuclear Power and Propulsion, Alvarado D
5th Conf. on Human/Robotic Technology and the Vision for Space Exploration, Alvarado B/C
5th Symp. on Space Colonization, Alvarado G/H
4th Symp. on New Frontiers and Future Concepts, Alvarado F
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
4:00 pm - 6:00 pm **Technical Sessions** (see table of contents or centerfold for time and room)
7:00 pm - 7:30 pm **No-Host Cocktail Reception,** East Atrium
7:30 pm - 9:30 pm **STAIF-2007 Awards Banquet,** Alvarado Ballroom

WEDNESDAY, February 14, 2007

7:00 am - 7:45 am **Speakers' Breakfast,** Franciscan Room
7:00 am - 4:30 pm **Registration,** Fireplace Room
8:00 am - 10:00 am **Technical Sessions** (see table of contents or centerfold for time and room)
10:00 am - 10:30 am **Coffee Break,** East/North Atrium
10:30 am - 12:30 pm **Technical Sessions** (see table of contents or centerfold for time and room)
12:30 pm - 2:00 pm **Lunch Break**
12:30 pm - 2:00 pm **Executive Program Committee Meeting,** Franciscan Room
2:00 pm - 4:00 pm **Technical Sessions** (see table of contents or centerfold for time and room)
4:00 pm - 4:15 pm **Coffee Break,** East/North Atrium
4:15 pm - 6:15 pm **Technical Sessions** (see table of contents or centerfold for time and room)
6:30 pm - 7:30 pm **Special Plenary,** Alvarado Ballroom

THURSDAY, February 15, 2007

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

OPENING REMARKS AND KEYNOTE SPEAKER

Monday, February 12, 8:00 am – 8:45 am, Alvarado Ballroom

Donald D. Cobb, STAIF-2007 General Chair, Los Alamos National Laboratory (retired)
Joseph L. Cecchi, Dean, School of Engineering, University of New Mexico (invited)
Terry Yates, Vice President for Research and Economic Development, University of New Mexico (invited)
Thomas J. Bowles, Science Advisor to NM Governor Bill Richardson, NM State Capitol

PLENARY SESSION I: INSPIRING THE NEXT GENERATION

Monday, February 12, 8:45 am – 10:25 am, Alvarado Ballroom

Donald D. Cobb, Chair
Acting Deputy Director (retired)
Los Alamos National Laboratory
Los Alamos, NM

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

Introduction
Mike Anastasio, Director, Los Alamos National Laboratory
Thomas Hunter, President and Laboratories Director, Sandia National Laboratories
Joyce L. Winterton, Associate Administrator for Education, NASA
Rachel Zimmerman Brachman, Solar System and Technology Outreach Specialist, Jet Propulsion Laboratory

PLENARY SESSION II: ENABLING THE SPACE RENAISSANCE

Monday, February 12, 10:45 am - 12:45 pm, Alvarado Ballroom

Bonnie Dunbar, Chair
President & CEO
Seattle Museum of Flight
Seattle, WA

Harold F. McFarlane, Co-Chair
Director, Space Nuclear Systems & Technology Division
Idaho National Laboratory
Idaho Falls, ID

Introduction
Douglas Cooke, Deputy Associate Administrator, Exploration Systems Mission Directorate, NASA Headquarters
Patrick McKenzie, Project Orion Business Development Manager, Lockheed Martin Space Systems Company
Robert Lange, Director, Office of Space & Defense, U.S. Department of Energy
Bernd Sommer, Space Management - General Technologies and Robotics, German Aerospace Center
12:30 pm – Presentation of Space Design Competition Student Awards, Jon Webb, Jack Parker, and Timothy Schriener, UNM-ISNPS

SECONDARY SCHOOL SPECIAL SESSION: HUMAN EXPLORATION – FUTURE SPACE MISSIONS AND EARTH APPLICATIONS

Monday, February 12, 10:05 am - 12:30 pm – Alvarado B/C

Jon Webb, Chair
UNM-ISNPS, Albuquerque, NM

Susan Ostlie, Co-Chair
Madison Middle School, Albuquerque, NM

Dava Newman, Director, Technology and Policy Program, Massachusetts Institute of Technology

SPECIAL EVENING PLENARY: REFLECTIONS ON EXPLORATION ACROSS THE AGES

Wednesday, February 14, 6:30-7:30 pm – Alvarado Ballroom

Ted Swanson, Chair
Goddard Senior Fellow
Assistant Chief for Technology,
NASA Goddard Space Flight Center
Greenbelt, MD

Roger D. Launius, Co-Chair
Chair, Division of Space History
Air and Space Museum
Smithsonian Institution
Washington, DC

Stephen J. Pyne, Regents Professor, Human Dimensions Faculty, School of Life Sciences, Arizona State University

James Horn, Director of Research, and Abby and George O'Neill Director, John D. Rockefeller Jr. Library, Colonial Williamsburg Foundation.

TECHNICAL SESSIONS

MONDAY, FEBRUARY 12, 2007

[A01] Current Topics in Thermal Control

Monday, February 12, 2007, 1:45 - 3:45 p.m. - Alvarado Salon A

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

1:45 pm - Trends in Thermal Control Technology Development
Ted Swanson, NASA Goddard Space Flight Center, Greenbelt, MD, USA

2:15 pm - Orion Crew Exploration Vehicle Thermal Control System Architecture
Gary Adamson and Mark Caron, Hamilton Sundstrand, Windsor Locks, CT, USA

[E01] Space Colonization - Opening Session I

Monday, February 12, 2007, 1:45 - 3:45 p.m. - Alvarado Salon B/C

Chairs: Edward McCullough, The Boeing Company, Huntington Beach, CA, USA
Klaus Heiss, High Frontier and The Jamestown Group, Alexandria, VA, USA

1:45 pm - The Space Colonization Technical Committee Policy Statement for a Robust Implementation of the President's Space Exploration Initiative
Edward McCullough, Boeing Phantom Works, Huntington Beach, CA, USA; Klaus P. Heiss, High Frontier and The Jamestown Group, Alexandria, VA, USA; Eric Rice, Orbital Technologies Corporation (ORBITEC), Madison, WI, USA

2:15 pm - LPRP: A Robotic Focus to the Vision
T. Lavoie, R. French and M. Nall, NASA Marshall Space Flight Center, AL, USA

2:45 pm - Issues and Problems Related to Lunar Dust
Narayanan Ramachandran, Jacobs Engineering, NASA Marshall Space Flight Center, AL, USA

3:15 pm - Current Knowledge on the Existence and Distribution of H2O on Mars
Greg Mungas, Jet Propulsion Laboratory, Pasadena, CA, USA

[C01] Space Nuclear Power and Propulsion Opening Session

Monday, February 12, 2007, 1:45 - 3:45 p.m. - Alvarado Ballroom D

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

1:45 pm - Opening Session Welcome
Garry Burdick, Jet Propulsion Laboratory, Pasadena, CA, USA

2:00 pm - The NASA Radioisotope Power Systems Development Program
B. Alan Harmon, Science Mission Directorate, NASA Headquarters, from Radioisotope Power Systems Office, U. S. Department of Energy, Washington, DC, USA; David B. Lavery, Science Mission Directorate, NASA Headquarters, Washington, DC, USA

2:30 pm - NASA Prometheus Power and Propulsion
John Warren, NASA Headquarters, Washington, DC, USA

2:50 pm - DOE Space Nuclear Program
Robert Lange, Department of Energy Headquarters, Germantown, MD, USA

3:00 pm - Q & A Panel

[D01] Human & Robotic Opening Session

Monday, February 12, 2007, 1:45 - 3:45 p.m. - Alvarado Ballroom E

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

1:45 pm - Technology for the Lunar Architecture
Christopher Moore, NASA Headquarters, Washington, DC, USA

2:15 pm - Precursor Robotic Exploration of the Moon
Benjamin Neumann, NASA Headquarters, Washington, DC, USA

3:15 pm - ETDP Program
Frank Peri, NASA Langley Research Center, Hampton, VA, USA

3:45 pm - Robots and Humans in Spaceflight: Technology, Evolution, and Interplanetary Travel
Roger Launius, National Air and Space Museum, Smithsonian Institution, Washington, DC, USA; Howard E. McCurdy, School of Public Affairs, The American University, Washington, DC, USA

[F01] Potential Frontiers

Monday, February 12, 2007, 1:45 - 3:45 p.m. - Alvarado Salon G/H

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

1:45 pm - Exploring Gravity and Gravitational Wave Dynamics Part I: Gravitational Anomalies
Paul Murad, Department of Defense, Vienna, VA, USA

2:15 pm - Revolutionary Design for Astronaut Exploration - Beyond the Bio-Suit System
Dava J. Newman, and Marita Canina, Massachusetts Institute of Technology, Cambridge, MA, USA; Guillermo L. Trotti, Trotti and Associates, Inc., Marblehead, MA, USA

2:45 pm - Inertial Mass Dependency on Local Vacuum Fluctuation Mean Free Path
Harold G. White, League City, TX, USA

3:15 pm - Progress in Quantum Vacuum Engineering Propulsion
Fabrizio Pinto, InterStellar Technologies Corporation, Monrovia, CA, USA

[C03] Propulsion Systems Concepts

Monday, February 12, 2007, 4:00 - 6:00 p.m. - Franciscan Room

Chairs: James Polk, Jet Propulsion Laboratory, Pasadena, CA, USA
Ivana Hrbud, Purdue University, West Lafayette, IN, USA

4:00 pm - Application of Solar-Electric Propulsion to Robotic Missions in Near-Earth Space
Gordon R. Woodcock and John Dankanich, Gray Research Inc., Huntsville, AL, USA

4:30 pm - Paris to Hektor: A Concept for a Mission to the Jovian Trojan Asteroids
Robert E. Gold, R. L. McNutt Jr., D. H. Napolillo, E. D. Schaefer, J. R. Tanzman, T. J. Hartka, D. S. Mehoke, P. H. Ostdiek, D. F. Persons, L. M. Prockter, and S. R. Vernon, Johns Hopkins University, Applied Physics Laboratory, Laurel, MD, USA; D. I Fielher, QSS Group, Inc., NASA Glenn Research Center, Cleveland, OH, USA

5:00 pm - A New Capability for Nuclear Thermal Rocket Propulsion Design
Benjamin W. Amiri, Richard J. Kapernick, and Bryan T. Sims, Los Alamos National Laboratory, Los Alamos, NM, USA; Steven P. Simpson, NASA Marshall Space Flight Center, Huntsville, AL, USA

[E02] Space Colonization - Opening Session II

Monday, February 12, 2007, 4:00 - 6:00 p.m. - Alvarado Salon B/C

Chairs: Edward McCullough, The Boeing Company, Huntington Beach, CA, USA
Klaus Heiss, High Frontier and The Jamestown Group, Alexandria, VA, USA

4:00 pm - Atlas V Experience Boosts Your Adventure: Launching Space Tourism

Jeff A. Patton, Lockheed Martin Space Systems Company, Denver, CO, USA

4:30 pm - Space Colonization-System Health Monitoring, Failure Detection, Diagnosis and Response
David Buchanan-United Launch Alliance, Huntington Beach, CA, USA

5:00 pm - NASA In-Situ Resource Utilization (ISRU) Implementation and Deployment Strategy
Gerald B. Sanders, Thomas M. Simon, and Landon Moore, NASA Johnson Space Center, Houston, TX, USA; William E. Larson, NASA Kennedy Space Center, FL, USA; Kurt R. Sacksteder and John J. Caruso, NASA Glenn Research Center, Cleveland, OH, USA; Carole McLemore, NASA Marshall Space Flight Center, AL, USA; Kenneth Johnson, Jet Propulsion Laboratory, Pasadena, CA, USA

5:30 pm - Moon Base: Gateway to Economic Expansion into Space
Klaus Heiss, High Frontier and The Jamestown Group, Alexandria, VA, USA

[D02] Architecture Studies

Monday, February 12, 2007, 4:00 - 6:00 p.m. - Alvarado Ballroom E

Chairs: Douglas Craig, NASA Headquarters, Washington, DC, USA
Robert Wegeng, NASA Headquarters, Washington, DC, USA

4:00 pm - The Making of a Lunar Outpost - Exploring a Future Case Study
Ruthan Lewis, National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, MD, USA; Kurt Micheels, Nexterra, Inc., Pensacola, FL, USA; Cathy Dankewicz, Swales Aerospace, Inc., Beltsville, MD, USA

4:30 pm - Alternative Applications for Exploration System Elements
Patrick A. Troutman, NASA Langley Research Center, Hampton, VA, USA

5:00 pm - Space Solar Power – An Update
John C. Mankins, Artemis Innovation Management Solutions LLC, Ashburn, VA, USA

5:30 pm - Technology Assessment in Support of Lunar Exploration
Charles R. Weisbin, William Lincoln, Joe Mrozinski, Hook Hua, Sofia Merida, Kacie Shelton, Virgil Adumitroaie, and Jason Derleth, Jet Propulsion Laboratory, Pasadena, CA, USA; Robert Silberg, Raytheon Corporation, Pasadena, CA, USA

[C02] Thermal Energy Transport and Heat Rejection Technology

Monday, February 12, 2007, 4:00 - 6:00 p.m. - Alvarado Salon F

Chairs: Donald M. Ernst, Advanced Cooling Technologies, Inc., Lancaster, PA, USA
Garry Burdick, Jet Propulsion Laboratory, Pasadena, CA, USA

4:00 pm - High Performance Lightweight Compact Thermal Radiator for Space Vehicles
Ching-fen Tsai, Julian Prabhu, and Frank Shen, The Boeing Company, Huntington Beach, CA, USA

4:30 pm - Thermal Energy Storage Technology Developments
Michael Pauken, Nick Emis, and Brenda Watkins, Jet Propulsion Laboratory, Pasadena, CA, USA

5:00 pm - An Ultra-Lightweight, High Performance Carbon-Carbon Space Radiator
W.O. Miller, Mike Wang, Wei Shih, Rogelio Ramirez, Duane Beach, Dennis Youchison, Roger Lenard, Justin Liguori, and Ed Liguor, Allcomp, City of Industry, CA, USA

5:30 pm - Thermal Energy Reservoirs Derived from Processed Lunar Regolith
Robert S Wegeng, National Aeronautics and Space Administration, Washington, DC, USA; John C. Mankins, Artemis Innovation Management Solutions LLC, Ashburn, VA, USA; Lawrence A Taylor, Planetary Geosciences Institute, University of Tennessee, TN, USA

[F02] Advanced Technologies for Terrestrial (Earth, Lunar, and Mars) and Relativistic Environments Based on Propulsion and Power

Monday, February 12, 2007, 4:00 - 6:00 p.m. - Alvarado Salon G/H

Chairs: John W. Cole, NASA Marshall Space Flight Center, Huntsville, AL, USA
David Goodwin, U.S. Department of Energy, Washington, DC, USA

4:00 pm - Local and System Level Considerations for Plasma-Based Techniques in Hypersonic Flight
Charles Suchomel and Datta Gaitonde, Aeronautical Sciences Division, Air Force Research Laboratory, Wright Patterson AFB, Dayton, OH, USA

4:30 pm - Space Exploration and Conversion of Sunlight to Coherent Light
Richard L. Fork, and Spencer T. Cole, University of Alabama, Huntsville, AL, USA

5:00 pm - An Overview of the Development of a Capillary Discharge Based Pulsed Plasma Thruster
Jean-Luc Cambier, M. Young, L. Pekker, and A. Pancotti, United Stated Air Force Research Laboratory, Edwards AFB, CA, USA

5:30 pm - The Influence of High-Frequency Gravitational Waves Upon Muscles
Lawrence S. Moy, Manhattan Beach, CA, USA; and Robert M. L. Baker , Jr., GRAVWAVE, LLC, Playa del Rey, CA, USA

TUESDAY, FEBRUARY 13, 2007

[A02] Two-Phase Thermal Control Systems

Tuesday, February 13, 2007, 8:00 - 10:00 a.m. - Alvarado Salon A

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

8:00 am - Gravity Effect on Capillary Limit in a Miniature Loop Heat Pipe with Multiple Evaporators and Multiple Condensers
Hosei Nagano, JAXA, Yoshinodai, JAPAN; Jentung Ku, NASA Goddard Space Flight Center, Greenbelt, MD, USA

8:30 am - Spacecraft Thermal Management using Advanced Hybrid Two-Phase Loop Technology
Chanwoo Park, Aparna Vallury, Jon Zuo, Advanced Cooling Technologies, Inc. Lancaster, PA, USA; Jeffrey Perez, Paul Rogers, U.S. Army TACOM, Warren, MI, USA

9:00 am - Advanced Thermal Control for Future Space Science Missions or Mars/Lunar Base Household and Research Part I: TC Issues That Deserve More Attention, and and II: Restarted Developments and Novel Research Issues
A.A.M. Delil, Advanced Aerospace Thermal Control Systems Consultant, AATCS, Emmeloord, Netherlands

9:30 am - JWST ISIM Harness Thermal Evaluation
Mark Kobel, Stuart Glazer, Jim Tuttle, NASA/Goddard Space Flight Center, Greenbelt, MD, USA; Mario Martins, Lun Xi, Warren Tolson, Swales Aerospace, Beltsville, MD, USA; Walter Ancarrow, WCA Inc., Jarrettsville, MD, USA

[E03] Space Exploration

Tuesday, February 13, 2007, 8:00 - 10:00 a.m. - Alvarado Salon B/C

Chairs: Mark Benton, The Boeing Company Space and Intelligence Systems, Los Angeles, CA, USA
Ronald Turner, ANSER, Arlington, VA, USA

8:00 am - Nanoparticle Electric Propulsion for Space Exploration

Thomas M. Liu, Louis D. Musinski, Prashant R. Patel, Alec D. Gallimore, Brian E. Gilchrist, and Michael Keidar, University of Michigan, Ann Arbor, MI, USA

8:30 am - Centaur Application to Robotic and Crewed Lunar Lander Evolution
Bonnie Birckenstaedt, Bernard F. Kuttler, and Frank Zegler, United Launch Alliance, Denver, CO, USA

9:00 am - Propellant Selection for CEV and Mars Exploration Vehicles
Timothy Chen and Edward McCullough, The Boeing Company, Huntington Beach, CA, USA

9:30 am - A Quantitative Method For Evaluating Regolith Simulants
Doug Rickman, National Space Science and Technology Center, NASA Marshall Space Flight Center, Huntsville, AL, USA; Hans Hoelzer, Rick Howard, and Charles Owens, Teledyne Brown Engineering, Huntsville, AL, USA; Paul Carpenter, BAE Systems Analytical and Ordnance Solutions, NASA Marshall Space Flight Center, AL, USA; Laurent Sibille, ASRC Aerospace Corp., NASA Kennedy Space Center, FL, USA

[C04] Materials for Space Nuclear Power and Propulsion Systems

Tuesday, February 13, 2007, 8:00 - 10:00 a.m. - Alvarado Ballroom D

Chairs: Wayne Ohlinger, Bechtel Bettis, Inc., Upper St. Clair, PA, USA
Robert Hickman, NASA Marshall Space Flight Center, Hunsville, AL, USA

8:00 am - Thermodynamic Prediction of Compositional Phases Confirmed by Transmission Electron Microscopy on Tantalum-Based Alloy Weldments
Daniel P. Kramer, and Chadwick D. Barklay, University of Dayton, Dayton, OH, USA; William E. Moddeman, and Janine C. Birkbeck, Pantex Plant, Amarillo, TX, USA; Roger G. Miller, and Lawrence F. Allard, Oak Ridge National Laboratory, Oak Ridge, TN, USA

8:30 am - Investigation of Effects of Neutron Radiation on Tantalum Alloys for Radioisotope Power System Applications
Chadwick D. Barklay, and Daniel Kramer, University of Dayton Research Institute, Dayton, OH, USA; Roger Miller, Oak Ridge National Laboratory, Oak Ridge, TN, USA; Joseph Talnagi, The Ohio State University, Columbus, OH, USA

9:00 am - The Effects Of Neutron Radiation on the Electrical Properties of Si and SiC Schottky Power Diodes
Jonathan A. Kulisek, and Thomas E. Blue, The Ohio State University, Springfield, OH, USA

9:30 am - Powder Processing of High Temperature Cermets and Carbides at Marshall Space Flight Center
Pat Salvail, Binayak Panda, and Robert R. Hickman, Marsahll Space Flight Center, Huntsville, AL, USA

[D03] Advanced Operations and In-Situ Resource Utilization

Tuesday, February 13, 2007, 8:00 - 10:00 a.m. - Alvarado Ballroom E

Chairs: Laura O'Connor, NASA Langley Research Center, Hampton, VA, USA
Robert Wegeng, NASA Headquarters, Washington, DC, USA

8:00 am - Extreme Mobility: Next Generation Tetrahedral Rovers
P.E. Clark, S.A. Curtis, M.L. Rilee, C.Y. Cheung, R. Wesenberg, G. Brown, C. Cooperrider, NASA Goddard Space Flight Center, Greenbelt, MD, USA

8:30 am - Exploration Challenges: Transferring Ground Repair Techniques to Space Flight Application
Carole A. McLemore, NASA Marshall Space Flight Center, Huntsville, AL, USA; James P. Kennedy, and Brian W. Evans, Teledyne Brown Engineering, Huntsville, AL, USA; Frederick A. Rose, bd Systems Inc., Hunstville, AL, USA

9:00 am - Surface Operations: Two Case Studies of Simulated Lunar Operations

William Bluethmann, Chris Culbert, NASA Johnson Space Center, Houston, TX, USA

9:30 am - NASA In-Situ Resource Utilization (ISRU) Technology and Development Project Overview
Gerald B. Sanders, NASA Johnson Space Center, Houston, TX, USA; William E. Larson, NASA Kennedy Space Center, FL, USA; Kurt R. Sacksteder, NASA Glenn Research Center, Cleveland, OH, USA; Carole McLemore, NASA Marshall Space Flight Center, AL, USA; Kenneth Johnson, Jet Propulsion Laboratory, Pasadena, CA, USA

[C05] Space Reactors and Shield Design Methods and Technologies

Tuesday, February 13, 2007, 8:00 - 10:00 a.m. - Alvarado Salon F

Chairs: J. Boise Pearson, NASA Marshall Space Flight Center, Marshall Space Flight Center, AL, USA
Shannon Bragg-Sitton, NASA Marshall Space Flight Center, Huntsville, AL, USA

8:00 am - Integral, Shaped Shielding for Fission Reactors on the Lunar/Martian Surface
David I. Poston, Robert B. Foresman, David D. Dixon, Los Alamos National Laboratory, Los Alamos, NM

8:30 am - Experimental Evaluation of the Thermal Performance of a Water Shield for a Surface Power Reactor
J. Boise Pearson, and E. Stewart, NASA Marshall Space Flight Center, Nuclear & Advanced Propulsion Branch, Hunstville, AL, USA; R. Reid, Los Alamos National Laboratory, Nuclear Design and Risk Analysis, Los Alamos, NM, USA

9:00 am - FRINK - A Code to Evaluate Space Reactor Transients
David I. Poston, David D. Dixon, Thomas F. Marcille, Benjamin Amiri, Los Alamos National Laboratory, Los Alamos, NM, USA

[F03] Propulsion and Power Concepts for Taming the Solar System

Tuesday, February 13, 2007, 8:00 - 10:00 a.m. - Alvarado Salon G/H

Chairs: Eric W. Davis, Institute for Advanced Studies at Austin, Austin, TX, USA
Robert M.L. Baker, Jr., GRAVWAVE, LLC, Playa Del Rey, CA, USA

8:00 am - Modified Design of Novel Variable-Focus Lens for VHFGW
R. Clive Woods, Louisiana State University, Baton Rouge, LA, USA

8:30 am - Surveillance Applications of High-Frequency Gravitational Waves
Robert M. L. Baker, Jr., Gravewave LLC and Transportation Sciences Corp., Playa del Rey, CA, USA

9:00 am - Compact Reactor
Pharis E. Williams, Williams Research, Los Alamos, NM, USA

9:30 am - Extraction of Thrust from Quantum Vacuum Using Squeezed Light
Yoshinari Minami, Space Technology Research Office, Yokohama, Japan

[E04] Space Bases on the Moon

Tuesday, February 13, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon B/C

Chairs: Klaus Heiss, High Frontier and The Jamestown Group, Alexandria, VA, USA
Paul van Susante, Colorado School of Mines, Golden, CO, USA

10:30 am - MIC: Magnetically Deployable Structures for Power, Propulsion, Processing, Habitats, and Energy Storage at Manned Lunar Basas
James Powell, George Maise, John Paniagua, and John Rather, Plus Ultra Technologies, Inc., Stony Brook, NY, USA

11:00 am - The TPS Advanced Development Project for CEV
James J. Reuther, NASA Ames Research Center, Moffett Field, CA, USA; and the Orion Thermal Protection Advanced Development Project Staff, NASA Langley Research Center, Langley, VA, USA, and NASA Johnson Space Center, Houston, TX, USA

11:30 am - Moon Bases as Initial "Space Society" Trials: Utilizing Astrosociology to Make Space

Settlements Livable
Jim Pass, Astrosociology.com, Huntington Beach, CA, USA

12:00 pm - What Will We Actually Do On the Moon?
Brent Sherwood, Jet Propulsion Laboratory, Pasadena, CA, USA

[C06] Terrestrial Programs and Technologies with Space Application

Tuesday, February 13, 2007, 10:30 a.m.-12:30 p.m. - Alvarado Ballroom D

Chairs: James E. Werner, Idaho National Laboratory, Idaho Falls, ID, USA
Lloyd Jollay, BWX T Y-12, Oak Ridge, TN, USA

10:30 am - A Wide Range Neutron Detector for Space Nuclear Reactor Applications
Eduardo Nassif and Miguel Sismonda, IVAP S.E., Bariloche, Rio Negro, Argentina; Emilio Matatagui, Solydes, Argentina; Stephan Pretorius, Payload Systems Inc, Cambridge, MA, USA

11:00 am - Space Propulsion Activities in Brazil
Lamartine Guimarães, Institute for Advanced Studies, Sao Jose dos Campos, SP, Brazil

11:30 am - Particle-Particle Interaction in Electromagnetic Fields for Force-Field Tailoring
Sameh S. Wanis, Thilini Rangedera, Cedric Justin, Narayanan M. Komerath, Georgia Institute of Technology, Atlanta, GA, USA

[D04] Advanced Materials, Structures, and Mechanisms

Tuesday, February 13, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Ballroom E

Chairs: Laura O'Connor, NASA Langley Research Center, Hampton, VA, USA
Robert Wegeng, NASA Headquarters, Washington, DC, USA

10:30 am - Status of the Space-Rated Lithium-Ion Battery Advanced Development Project in Support of the Exploration Vision
Tom Miller, NASA Glenn Research Center, Cleveland, OH, USA

11:00 am - Layered Metals Fabrication Technology Development for Support of Lunar Exploration at NASA/MSFC
Kenneth G. Cooper, NASA/ Marshall Space Flight Center, Huntsville, AL, USA; James E. Good, MEI Technologies, Inc., Houston, TX, USA; Scott D. Gilley, Tec-Masters, Inc., Huntsville, AL, USA

11:30 am - Friction Stir Welded Thin Wall Cryogenic Tank Skins
David Potter and Mike Holguin, Lockheed Martin Space Systems, Denver, CO, USA; Jennifer Takeshita, Lockheed Martin Michoud, New Orleans, LA, USA

12:00 pm - Overview and Highlights of the NASA Exploration Technology Program for Structures, Materials, and Mechanisms
Judith J. Watson, NASA Langley Research Center, Hampton, VA, USA

[C07] Nuclear Thermal Rockets: Past, Present and Future

Tuesday, February 13, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon F

Chairs: Stanley K. Borowski, NASA Glenn Research Center, Cleveland, OH, USA
Russell Joyner, Pratt and Whitney Rocketdyne, West Palm Beach, FL, USA

10:30 am - Tie Tube Heat Transfer Modeling for Bimodal Nuclear Thermal Rockets
Joshua Clough, Ryan Starkey, and Mark Lewis, University of Maryland, College Park, MD, USA; Tom Lavelle, NASA Glenn Research Center, Cleveland, OH, USA

11:00 am - Returning Humans to the Moon: Comparison of Chemical Engine and Nuclear Rocket Performance as an Earth Departure Stage
Steven D. Howe, Center for Space Nuclear Research, Idaho Falls, ID, USA; Natasha Barra, University of California – Los Angeles, Los Angeles, CA, USA; John Bess, University of Utah, Salt Lake City, UT, USA; Emily Colvin, Nuclear and Roadiological Engineering/Medical Physics Program, Georgia Institute of Technology, Atlanta, GA,

USA; Paul Cummings, Department of Physics, Embry Riddle Aeronautical University, Prescott, AZ, USA; Brandon Cunningham, Department of Nuclear Engineering, University of Florida, Gainesville, FL, USA; Melissa Ghrist and Kevin Supak, Department of Nuclear Engineering, Texas A&M University, College Station, TX, USA; Ryan Johnson, College of Engineering, Boise State University, Boise, ID, USA; Rob O'Brien, Space Research Centre, University of Leicester, Leicester, United Kingdom; Jeff Perkins, Colorado School of Mines, Golden, CO, USA; Masayuki Yano, School of Aerospace Engineering, Georgia Institute of Technology, Atlanta, GA, USA

11:30 am - Mars Mission Analysis Trades Based on Legacy and Future Nuclear Propulsion Options

Russell Joyner, Pratt & Whitney Rocketdyne, West Palm Beach, FL, USA; Andrea Lentati, Georgia Institute of Technology, Atlanta, GA, USA; Jaclyn Cichon, University of Florida, Gainesville, FL, USA

12:00 pm - Reactivity Effects and Depletion Analysis of a NERVA-Derived Nuclear Thermal Rocket

Benjamin W. Amiri, Michael L. Fensin and Thomas F. Marcille, Los Alamos National Laboratory, Los Alamos, NM, USA

[F04] Experimental Results and New Concepts within Current Physical Models I

Tuesday, February 13, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon G/H

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

10:30 am - Mach's Principle and Propulsion: Experimental Results

James F. Woodward, Departments of History and Physics, California State University, Fullerton, CA, USA

11:00 am - Propulsion from ElectroMagnetic Nonlinear Materials

Glen A. Robertson, Gravi Atomic Reseach, Madison, Al, USA

11:30 am - Measurement of Gravitomagnetic and Acceleration Fields around Rotating Superconductors

Martin Tajmar, Florin Plesescu, B. Seifert, K. Marhold, Space Propulsion, ARC Seibersdorf research, A-2444 Seibersdorf, Austria

12:00 pm - Mach-Lorentz Thruster Spacecraft Applications

Paul March, Barrios Technology, Friendswood, TX, USA

[E05] Lunar Analog Test Site Capabilities I

Tuesday, February 13, 2007, 10:30 a.m. - 12:30 p.m. – Franciscan Room

Chairs: Diane Linne, NASA Glenn Research Center, Cleveland, OH, USA
Mark Henley, The Boeing Company, Canoga Park, CA, USA

10:30 am - The Simulated Lunar OPErations (SLOPE) and Soils Design Laboratory at Glenn Research Center

Phillip B. Abel, James J. Zakrajsek, John J. Caruso, NASA Glenn Research Center, Cleveland, OH, USA

11:00 am - Analog Test Sites Used by JPL

Brian H. Wilcox, Jet Propulsion Laboratory, Pasadena, CA, USA

11:30 am - PISCES: A Lunar Outpost for ISRU Partnerships

F.D. Schowengerdt, University of Hawaii at Hilo, Alexandria, VA, USA; M.B. Duke, Dripping Springs, TX, USA; R.A. Fox, Dept. of Physics and Astronomy, University of Hawaii at Hilo, HI, USA; M. Henley, The Boeing Company, Rocketdyne, Canoga Park, CA, USA; N.I. Marzwell, Jet Propulsion Laboratory, Pasadena, CA, USA; J. Crisafulli, Dept. of Business and Economic Development, State of Hawaii, HI, USA; S.M.D. Day, International Ventures Associates, USA

12:00 pm - The Nevada Test Site as a Lunar Analog Test Area

Sheldon H. Freid, National Security Technologies, LLC, Homeland Security Technologies, Las Vegas, NV, USA

[E06] Space Resource Utilization on the Moon

Tuesday, February 13, 2007, 1:45 - 3:45 p.m. - Alvarado Salon B/C

Chairs: William E. Larson, NASA Kennedy Space Center, Kennedy Space Center, FL, USA
Gerald B. Sanders, NASA Johnson Space Center, Houston, TX, USA

1:45 pm - Vacuum Pyrolysis and Related ISRU Techniques
Eric Cardiff, Brian R. Pomeroy, and Ian S. Banks, NASA Goddard Space Flight Center, Greenbelt, MD, USA

2:15 pm - Development of an integrated RVC – LWRD system for RESOLVE
Janine Captain and Dale Lueck, NASA-KSC, Kennedy Space Center, FL, USA; Kurt Sacksteder NASA-Glenn Research Center, Cleveland, OH, USA

2:25 pm - Microwave Extraction of Water from Lunar Regolith Simulant
Edwin C. Ethridge, NASA - Marshall Space Flight Center, Huntsville, AL, USA; William Kaukler, University of Alabama, Huntsville, AL,

3:15 pm - Drilling Results in Ice-Bound Simulated Lunar Regolith
Kris Zacny, David Glaser, Paul Bartlett, Kiel Davis, and Steven Gorevan, Honeybee Robotics Ltd., Moffett Field, CA, USA

[C08] Dynamic Power I: < Kilowatt Class

Tuesday, February 13, 2007, 1:45 - 3:45 p.m. - Alvarado Ballroom D

Chairs: Richard K. Shaltens, NASA Glenn Research Center, Cleveland, OH, USA
Jeffrey G. Schreiber, NASA Glenn Research Center, Cleveland, OH, USA

1:45 pm - Final Results for the GRC Supporting Technology Development Project for the 110-Watt Stirling Radioisotope Generator (SRG110)
Lanny G. Thieme and Jeffrey G. Schreiber NASA Glenn Research Center, Cleveland, OH, USA

2:15 pm - Advanced Stirling Convertor (ASC) Phase III Progress Update
J. Gary Wood, Kyle Wilson, and Andrew Buffalino, Sunpower Inc., Athens, OH, USA; Patrick Frye, and Dan Matejczyk, Pratt & Whitney Rocketdyne, Canoga Park, CA, USA; L. B. Penswick, Consultant, Stevenson, WA, USA

2:45 pm - Palm Power Free Piston Stirling Engine Control Electronics
Douglas E. Keiter and Ezekiel Holiday, Sunpower Inc., Athens, OH, USA

3:15 pm - Structural Benchmark Testing for Stirling Convertor Heater Heads
David L. Krause, and Randy R. Bowman, NASA Glenn Research Center, Cleveland, OH, USA; Sreeramesh Kalluri, Ohio Aerospace Institute, NASA Glenn Research Center, Cleveland, OH, USA

[D05] Novel Concepts

Tuesday, February 13, 2007, 1:45 - 3:45 p.m. - Alvarado Ballroom E

Chairs: Christopher Moore, NASA Headquarters, Washington, DC, USA
Robert Wegeng, NASA Headquarters, Washington, DC, USA

1:45 pm - Micro-Inspector Spacecraft Testbed: Breadboard Subsystem Demonstrations
Juergen Mueller, Leon Alkalai, and Hannah Goldberg, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

2:15 pm - Modular, Multifunctional, and Reconfigurable SuperBot for Space Technology
W.-M. Shen, Mark Moll, and Behnam Salemi, USC Information Sciences Institute, Marina del Rey, CA USA

2:45 pm - ATHLETE Rover
Brian Wilcox, Jet Propulsion Laboratory, Pasadena, CA, USA

3:15 pm - Innovative Concepts for Sustained Exploration of Space

Ron Turner, ANSER, Arlington, VA, USA; Diana Jennings and Robert Cassanova, NASA Institute for Advanced Concepts, Atlanta, GA, USA

[C09] Lunar Regolith Excavation for Reactor Shielding

Tuesday, February 13, 2007, 1:45 - 3:45 p.m. - Alvarado Salon F

Chairs: John H. Scott, NASA Johnson Space Center, Houston, TX, USA
Michael Houts, NASA Marshall Space Flight Center, AL, USA

1:45 pm - Using ISRU Excavation Assets to Emplace a Surface Reactor on the Moon
Kurt R. Sacksteder, Diane L. Linne, Christopher A. Gallo, Juan H. Agui, NASA Glenn Research Center, Cleveland, OH, USA; David Zheng, Case Western Reserve University, Cleveland, OH, USA; Robert P. Mueller, Gregory M. Galloway, NASA Kennedy Space Center, Kennedy Space Center, FL, USA

2:15 pm - Application of Artificial-Neural-Tissue Controller to Multirobot Lunar ISRU Operations
G.M.T. D'Eleuterio, Jekanthan Thangavelautham, and Alexander Smith, Institute for Aerospace Studies, University of Toronto, Toronto, ON, Canada; Dale Boucher, Northern Centre for Advanced Technology, Sudbury, ON, Canada; Jim Richard, Electric Vehicle Controllers Ltd., Val Caron, ON, Canada

2:45 pm - Electrostatic Dust Control on Planetary Surfaces
Pamela Clark, Catholic University of America, Washington, DC, USA; C.I. Calle, and J.G. Mantovani, NASA/KSC, Cape Kennedy, FL, USA; S.A. Curtis, J.W. Keller, and F.A. Minetto, NASA/GSFC, Greenbelt, MD, USA

[F05] Innovative Theories and Concepts for Communication

Tuesday, February 13, 2007, 1:45 - 3:45 p.m. - Alvarado Salon G/H

Chairs: Gary Stephenson, Seculine Consulting, Bellevue, WA, USA
Greg Meholic, The Aerospace Corporation, El Segundo, CA, USA

1:15 pm - The Value Estimation of an HFGW Frequency Time Standard for Telecommunications Network Optimization
Colby Harper, Seattle, WA, USA and Gary Stephenson, Seculine Consulting, Seattle, WA, USA

1:45 pm - Alternate Communications for Space Travel
Pharis E. Williams, Williams Research, Los Alamos, NM, USA

2:15 pm - FTL Quantum Models of the Photon and the Electron
Richard Gauthier, Engineering Department, Santa Rosa Junior College, Santa Rosa, CA, USA

2:45 pm - A Test of De Aquino's 2005 Kinetic Quantum Theory of Gravity
Gary Stephenson, Seculine Consulting, Bellevue, WA, USA

[C10] Space Nuclear Electric Power Generation Technology: Reflection and Update

Tuesday, February 13, 2007, 1:45 - 3:45 p.m. – Franciscan Room

Chairs: Stanley V. Gunn, Rocketdyne (Retired), Chatsworth, CA, USA
Michael Houts, NASA Marshall Space Flight Center, AL, USA

1:45 pm - Mission Interplanetary: Using Radioisotope Power to Explore the Solar System
Gary L. Bennett, Metaspace Enterprises, Emmett, ID, USA

2:15 pm - Technology Status for Space Nuclear Power Systems
Sterling Bailey, Consultant, Grass Valley, CA, USA

2:45 pm - Systems for Nuclear Auxiliary Power (SNAP) Program: A Review of Space Reactor Power Systems SNAP 2/10A, SNAP 8, and the Adv. UZrH Reactor Program
William R. Determan, Hamilton Sundstrand Rocketdyne, Space Land and Sea, Canoga Park, CA, USA

3:15 pm - Space Nuclear Electric Power Systems: 44 Years of Russian and American Developments
Joseph Wetch, USA-Russian Joint Venture (INERTEK), Reno, NV, USA

[A03] High-Capacity Heat Rejection Systems

Tuesday, February 13, 2007, 4:00 - 6:00 p.m. - Alvarado Salon A

Chairs: Michael N. Nikitkin, Swales Aerospace, Beltsville, MD, USA
Eric Silk, NASA Goddard Space Flight Center, Greenbelt, MD, USA

4:00 pm - Advances in High Temperature Titanium-Water Heat Pipe Technology
John H. Rosenfeld and Nelson J. Gernert, Thermacore, Inc., Lancaster, PA, USA

4:30 pm - Optimized Design and Testing of a Graphite Reinforced-Fiber Reinforced Composite Heat Pipe Radiator with Tapered Fins
R.J. Naumann, University of Alabama, Huntsville, AL, USA: Jim Barth, ATK Space Systems, San Diego, CA, USA: James Marris, Marshall Space Flight Center, AL, USA

5:00 pm - Optimization of Phase-Change Material Thermal Control Devices
T. Kelvin Cheung, The Aerospace Corporation, Los Angeles, CA, USA; Benjamin A. Blake, Nifty Analysis and Design, San Francisco, CA, USA

5:30 pm - High Performance Titanium-Water Heat Pipes for High Temperature Applications
David Wolf, Michael Nikitkin, Terry Miller, Swales Aerospace, Beltsville, MD, USA

[E07] Space Resource Utilization on Mars

Tuesday, February 13, 2007, 4:00 - 6:00 p.m. - Alvarado Salon B/C

Chairs: Larry D. Clark, Lockheed Martin, Denver, CO, USA
Adam P. Bruckner, University of Washington, Seattle, WA, USA

4:00 pm - Multi-MICE: Nuclear Powered Mobile Probes to Explore Deep Interiors of the Ice Sheets on Mars and the Jovian Moons
George Maise, James Powell, and John Paniagua, Plus Ultra Technologies, Stony Brook, NY, USA; Jesse Powell, Scripps Institution of Oceanography, San Diego, CA, USA

4:30 pm - Lunar In Situ Materials-Based Surface Structure Technology Development Efforts at NASA/MSFC
M. R. Fiske, Jacobs Sverdrup, Marshall Space Flight Center, Huntsville, AL, USA; W. McGregor, R. Pope, Qualis Corporation, Marshall Space Flight Center, Huntsville, AL, USA; C. A. McLemore, R. Kaul, G. Smithers, E. Ethridge, NASA Marshall Space Flight Center, Huntsville, AL, USA; H. Toutanji, Civil Engineering Department, University of Alabama in Huntsville, Huntsville, AL, USA

5:00 pm - Martian Liquid CO2 and Metabolic Heat Regenerated Temperature Swing Adsorption for Portable Life Support Systems
Christine S. Iacomini, Tom Morin, and Taber MacCallum, Kathrine Straub-LopezParagon Space Development Corporation, Tucson, AZ, USA; Heather Paul, National Aeronautics and Space Administration, Houston, TX, USA

5:30 pm - Percussive Penetration of Unconsolidated Granular Media in a Laboratory Setting
Leslie Gertsch, University of Missouri-Rolla, Rolla, MO, USA

[C11] Radioisotope Power Systems Applications

Tuesday, February 13, 2007, 4:00 - 6:00 p.m. - Alvarado Salon F

Chairs: Robert Abelson, Jet Propulsion Laboratory, Pasadena, CA, USA
Robert L. Wiley, U.S. Department of Energy, Washington, DC, USA

4:00 pm - Curie-Montgolfiere Planetary Explorers
Chris Taylor, Jupiter Research and Development, Houston, TX, USA; Jeremiah Hansen, Spotsylvania, VA, USA

4:30 pm - Titan Exploration Using a Radioisotopically-Heated Montgolfier Balloon
John O. Elliott, Kim Reh, and Tom Spilker, Jet Propulsion Laboratory, Pasadena, CA,

USA

5:00 pm - The Europa Explorer - A Fresh Look at Exploring Europa with an RPS-Powered Spacecraft
Robert Abelson and Karla Clark, Jet Propulsion Laboratory, Pasadena, CA, USA

[F06] Theoretical Considerations - Warp Drives, FTL Speed Travel and Others I

Tuesday, February 13, 2007, 4:00 - 6:00 p.m. - Alvarado Salon G/H

Chairs: John Brandenburg, Florida Space Institute, Orlando, FL, USA
David Goodwin, U.S. Department of Energy, Washington, DC, USA

4:00 pm - Progress on the GEMS (Gravity Electro-Magnetism-Strong) Theory of Field Unification and Its Application to Space Problems
J.E. Brandenburg, Florida Space Institute-University of Central Florida, Kennedy Space Center, FL, USA

4:30 pm - Hyperspace for Space Travel
Giorgio Fontana, University of Trento, Trento, Italy; Paul Murad, Department of Defense, Vienna, VA, USA; and Robert M. L. Baker, Jr., GRAVWAVE®LLC, Playa del Rey, CA, USA

5:00 pm - Fluid Dynamic Simulations of Warp Drive Flight Through Negative Pressure Zero-Point Vacuum
H. David Froning Jr, Flight Unlimited, Gumeracha, SA, Australia, and Robert L. Roach, Ramat Hashron, Israel

5:30 pm - Can the Present Technology Create Gross Amounts of Negative Energy Density?
Mohammad Mansouryar, Karaj, Tehran, Iran

[C12] Space Nuclear Reactor Power Systems and Concepts

Tuesday, February 13, 2007, 4:00 - 6:00 p.m. - Franciscan Room

Chairs: David I. Poston, Los Alamos National Laboratory, Los Alamos, NM, USA
Bill J. Nesmith, Jet Propulsion Laboratory, Pasadena, CA, USA

4:00 pm - Thermal-Hydraulic Analysis of the Submersion-Subcritical, Safe Space (S^4) Reactor
Jeffrey C. King, University of New Mexico, Albuquerque, NM, and University of Missouri, Rolla, MO, USA; Mohamed S. El-Genk, University of New Mexico, Albuquerque, NM, USA

4:30 pm - Low Mass SCoRe-S Designs for Affordable Planetary Exploration
Steven A. Hatton and Mohamed S. El-Genk, UNM-ISNPS, Albuquerque, NM, USA

5:00 pm - Methods for Determining Operation Lifetime of Space Reactors
Timothy M. Schriener and Mohamed S. El-Genk, Institute for Space and Nuclear Power Studies and Chemical and Nuclear Engineering Dept., The University of New Mexico, Albuquerque, NM, USA

5:30 pm - PID Control Effectiveness for Surface Reactor Concepts
David D. Dixon, North Carolina State University, NC, USA; Christopher P. Marsh, United States Naval Academy, MD, USA; David I. Poston, Christopher L. Marsh, Los Alamos National Laboratory, Los Alamos, NM, USA

WEDNESDAY, FEBRUARY 14, 2007

[A04] Thermal Control Technologies for Future Spacecraft

Wednesday, February 14, 2007, 8:00 - 10:00 a.m. - Alvarado Salon A

Chairs: Jeffrey R. Didion, NASA Goddard Space Flight Center, Greenbelt, MD, USA
Kirk L. Yerkes, USAF Air Force Research Laboratory, Wright-Patterson AFB, OH,

USA

8:00 am - Hybrid Two-Phase Mechanical/Capillary Pumped Loop for High-Capacity Heat Transport
Triem T. Hoang, Dmitriy A. Suhkov, TTH Research, Inc., Laurel, MD, USA; Robert W. Baldauff, Kwok H. Cheung, U.S. Naval Research Laboratory, Washington, DC, USA

8:30 am - Cryogenic Loop Heat Pipes and Applications
Triem T. Hoang, TTH Research, Inc., Laurel, MD, USA; Jentung Ku, NASA Goddard Space Flight Center, Greenbelt, MD, USA

9:00 am - Thermal Isothermalization of a Large Panel with an Embedded Loop Heat Pipe
Triem T. Hoang, TTH Research, Inc., Laurel, MD, USA

9:30 am - Mathematical Modeling of Loop Heat Pipes and Test Data Verification
Triem T. Hoang, TTH Research, Inc., Laurel, MD, USA; Jentung Ku, NASA Goddard Space Flight Center, Greenbelt, MD, USA

[E08] Lunar Analog Test Site Capabilities II

Wednesday, February 14, 2007, 8:00 - 10:00 a.m. - Alvarado Salon B/C

Chairs: Diane Linne, NASA Glenn Research Center, Cleveland, OH, USA
Mark Henley, The Boeing Company, Canoga Park, CA, USA

8:00 am - Desert Research and Technology Studies (RATS) Local and Remote Test Sites
Barbara Janoiko, Joseph Kosmo, Crew and Thermal Systems Division, NASA Johnson Space Center, Houston, TX, USA; Dean Eppler, Constellation Advanced Projects Office, NASA Johnson Space Center, Houston, TX, USA

8:30 am - The Canadian Analogue Research Network (CARN): Applicability to the Global Exploration Strategy
Alain Berinstain, Canadian Space Agency, St-Hubert, QC, Canada

9:00 am - Haughton-Mars Project Site, Devon Island, Arctic: Relevance to Lunar ISRU Analog Studies
Pascal Lee, NASA Ames Research Center, Moffett Field, CA, USA

9:30 am - Analog Missions Supporting the Vision for Space Exploration
Stephen J. Hoffman, Science Applications International Corporation, Houston, TX, USA

[C13] Nuclear Thermal Rocket Technology and Integration

Wednesday, February 14, 2007, 8:00 - 10:00 a.m. - Alvarado Ballroom D

Chairs: Stanley V. Gunn, Rocketdyne (Retired), Chatsworth, CA, USA
Harold Finger, Consultant, Chevy Chase, MD, USA

8:00 am - Nuclear Thermal Rocket Reactors and Engine Systems--An Established Propulsion Technology Developed in the Rover and NERVA Programs
Richard E. Malenfant, Los Alamos National Laboratory (retired), Albuquerque, NM, USA; Frank P. Durham, Los Alamos National Laboratory (retired), Los Alamos, NM, USA; Milton Klein, NASA/AEC Space Nuclear Systems Office (retired), Menlo Park, CA, USA

8:30 am - Issues Concerning the Redevelopment of a Nuclear Thermal Rocket for Application to Lunar, Mars and Deep Space Missions
Steven D. Howe, Center for Space Nuclear Research, Idaho Falls, ID, USA

9:00 am - Human Missions to Mars: NASA's Planning for the Future
Jeff Volosin, NASA Exploration Systems Mission Directorate, NASA Headquarters, Washington D.C. USA

9:30 am - NTP Development Activities at the NASA Marshall Space Flight Center - 2006 Accomplishments
Richard O. Ballard, Nuclear Systems Engineering Branch, NASA Marshall Space Flight Center, AL, USA

[D06] Advanced Avionics and Software

Wednesday, February 14, 2007, 8:00 - 10:00 a.m. – Alvarado Ballroom E

Chairs: Dana Gould, NASA Langley Research Center, Hampton, VA, USA
Christopher Moore, NASA Headquarters, Washington, DC, USA

8:00 am - Radiation-Hardened Electronics for Space Exploration (RHESE)
Michael Watson, Don Frazier, James Adams, Todd MacLeod, Clint Patrick, Andrew Keys, NASA Marshall Space Flight Center, Huntsville, AL, USA; John Cressler, Georgia Institute of Technology, Atlanta, GA, USA; Matt Hancher, NASA Ames Research Center, Moffett Field, CA, USA; Michael Johnson, NASA Goddard Space Flight Center, Greenbelt, MD, USA; Elizabeth Kolawa, Jet Propulsion Laboratory, Pasadena, CA, USA

8:30 am - Spacecraft Autonomy Technology: From Mission Operations to Lunar Outposts
Ari Jonsson, NASA Ames Research Center, Moffett Field, CA, USA

9:00 am - The Autonomous Precision Landing and Hazard Detection and Avoidance Technology (ALHAT)
Chirold D. Epp, NASA Johnson Space Center, Houston, TX, USA; Thomas B. Smith, NASA Johnson Space Center, Houston, TX, USA

9:30 am - Automated Rendezvous and Docking System Developments
Richard T. Howard, NASA Marshall Space Flight Center, AL, USA

[C14] Advanced Energy Storage Technologies

Wednesday, February 14, 2007, 8:00 - 10:00 a.m. - Alvarado Salon G/H

Chairs: Subbarao (Rao) Surampudi, Jet Propulsion Laboratory, Pasadena, CA, USA
Garry Burdick, Jet Propulsion Laboratory, Pasadena, CA, USA

8:00 am - LI-Ion Batteries for Aerospace Applications
Frank Puglia, Vincent Yevoli, Yardney Technical Products, Inc./Lithion, Inc., Pawcatuck, CT, USA

8:30 am - Direct Methanol Fuel Cells
S. R. Narayanan, T. Valdez, Jet Propulsion Laboratory, Pasadera, CA, USA

9:00 am - Low Temperature Li-ion Batteries for Planetary Missions
Marshall Smart, Larry Whitcanack and Ratnakumar Bugga, Jet Propulsion Laboratory, California Institute of Technology ,Pasadena, CA, USA

9:30 am - Q & A

[E09] Biotechnology and Medicine for Space Colonization

Wednesday, February 14, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon B/C

Chairs: Diana Jennings, NASA Institute for Advanced Concepts, Kingston, MA, USA
Ronald Turner, ANSER, Arlington, VA, USA

10:30 am - Biotechnology Support for Space Colonization
Edward D. McCullough, The Boeing Company, Huntington Beach, CA, USA

11:00 am - A Minimized Technological Approach towards Human Self Sufficiency off Earth
Peter A. Curreri, NASA Marshall Space Flight Center, Huntsville, AL, 35812 USA

11:30 am - The All Terrain Bio nano Gear for Space Radiation Detection System
Ajay Ummat and Constantinos Mavroidis, Northeastern University, Boston, MA, USA

12:00 pm - Revolutionary Architectures and Concepts for Biotechnology, Life Support and Space Settlement
Diana E. Jennings, and Robert Cassanova, NASA Institute for Advanced Concepts, Atlanta, GA, USA; Ronald Turner, ANSER Analytic Services, Inc., Arlington, VA, USA

[C15] Dynamic Power II: > Kilowatt Class

Wednesday, February 14, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Ballroom D

Chairs: Lee S. Mason, NASA Glenn Research Center, Cleveland, OH, USA
Tim Bauch, Hamilton Sundstrand, Rockford, IL, USA

10:30 am - New 5 Kilowatt Free-Piston Stirling Space Convertor Developments
Henry W. Brandhorst, Jr., Space Research Institute, Auburn University, Auburn, AL, USA

11:00 am - Comparison of Analytical Predictions and Experimental Results for a Dual Brayton Power System
Paul Johnson, Analex Corp., NASA Glenn Research Center, Cleveland, OH, USA

11:30 am - Recent Developments in the Recovery of SNAPDYN Technical Data Base
Greg Johnson, Bill Determan, Hamilton Sundstrand, Canoga Park, CA, USA

12:00 pm - Compressor and Turbine Models of Brayton Units for Space Nuclear Power Systems
Bruno M. Gallo, Mohamed S. El-Genk, and Jean-Michel Tournier, University of New Mexico, Albuquerque, NM, USA

[D07] Advanced Thermal Technologies and Systems

Wednesday, February 14, 2007, 10:30 a.m. – 12:30 p.m. - Alvarado Ballroom E

Chairs: Dana Gould, NASA Langley Research Center, Hampton, VA, USA
Carlos S. Campos, NASA Headquarters, Washington, DC, USA

10:30 am - Cryo Fluids Management
Susan Motil, NASA Glenn Research Center, Cleveland, OH, USA

11:00 am - The Potential Impact of a LEO Propellant Depot on the NASA ESAS Architecture
Dallas Bienhoff, The Boeing Company, Arlington, VA, USA

11:30 am - Active Thermal Control System Development for Exploration
David Westheimer, NASA Johnson Space Center, Houston, TX, USA

12:30 pm - Cryogenic Propellant Depot Experiments, Demonstrations and Applications
Joe T. Howell, John Fikes, NASA, Marshall Space Flight Center, Huntsville, AL, USA; Mark Henley, The Boeing Company, Phantom Works, Huntington Beach, CA, USA

[C16] Safety and Reliability

Wednesday, February 14, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon F

Chairs: Joseph A. Sholtis, Sholtis Engineering & Safety Consulting, Tijeras, NM, USA
Lawrence E. DeFillipo, SAIC, Reston, VA, USA

10:30 am - Probabilities of Ground Impact Conditions of the New Horizons Spacecraft and RTG for Near Launch Pad Accidents
Brian E. McGrath, Dave A. Frostbutter, and Yale Chang, The Johns Hopkins University, Applied Physics Laboratory, Laurel, MD, USA

11:00 am - JHU/APL Breakup Analysis Tool (APLbat) for the New Horizons Radiological Contingency
Matthew Lear, Brian McGrath, Naruhisa Takashima, and and Gene Heyler, The Johns Hopkins University Applied Physics Laboratory, Laurel, MD, USA

11:30 pm - New Horizons Launch Contingency Effort
Yale Chang, Matthew H. Lear, Brian E. McGrath, Gene A. Heyler, Naruhisa Takashima, and W. Donald Owings, The Johns Hopkins University, Applied Physics Laboratory, Laurel, MD, USA

12:00 am - LEO Spacecraft Charging - A New NASA Design Standard
Dale C. Ferguson, NASA Marshall Space Flight Center, Huntsville, AL, USA; G. Barry Hillard, NASA GRC, USA

[F07] Experimental Results and New Concepts within Current Physical Models II

Wednesday, February 14, 2007, 10:30 a.m.- 12:30 p.m. - Alvarado Salon G/H

Chairs: Bernd Binder, Quanics, Salem, BW, Germany
Richard Obousy, Baylor University, Waco, TX, USA

8:00 am - Supersymmetry Breaking Casmir Warp Drive

Richard K. Obousy, and Gerald Cleaver, Baylor University, Waco, TX, USA

8:30 am - How a Randall-Sundrum Brane World Effective Potential Influences Inflation Physics
Andrew Walcott Beckwith, APS/Fermi Laboratory Research Contractor, Menlo Park, California, USA

9:00 am - Towards a Self-Consistent and Controllable Graviton Flux
Bernd Binder, Quanics, Salem, BW, Germany

9:30 am - The Connection between Inertial Forces and the Vector Potential
Mario J. Pinheiro, Instituto Superior Tecnico, Lisboa, Portugal; Alexandre A. Martins, Condensed Matter Physics Center, University of Lisbon, Lisbon, Portugal; Gama Pinto, Lisboa, Portugal

[A05] Thermal Control for Lunar and Deep Space Missions

Wednesday, February 14, 2007, 2:00 – 4:00 p.m. - Alvarado Salon A

Chairs: Charles Dan Butler, NASA Goddard Space Flight Center, Greenbelt, MD, USA
Gani B. Ganapathi, Jet Propulsion Laboratory, Pasadena, CA, USA

2:00 pm - Thermal Control Architecture for Planetary and Lunar Surface Exploration Micro-Robots
Brian R. Burg and Dimos Poulikakos, Laboratory for Thermodynamics in Emerging Technologies, ETH, Zurich, Switzerland; Steven Dubowsky, Field and Space Robotics Laboratory, Massachusetts Institute of Technology, Cambridge, MA, USA, and John H. Lienhard V, W. M. Rohsenow Heat and Mass Transfer Laboratory, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA;

2:30 pm - Thermal Design Considerations for Designing the Next Lunar Lander
Mathew B. Garrison, Daniel H. Nguyen, Thermal Engineering Branch, NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA

3:00 pm - Lunar Dust on Heat Rejection System Surfaces: Problems and Prospects
James R. Gaier, and Donald A. Jaworske NASA Glenn Research Center, Cleveland, OH, USA

3:30 pm - Advanced Cryogenic Propellant Storage Options Applied to Lunar Architecture Studies
David Plachta, NASA Glenn Research Center, Cleveland, OH, USA

[E10] Large Scale Processes and Technologies for Colonization

Wednesday, February 14, 2007, 2:00 – 4:00 p.m. - Alvarado Salon B/C

Chairs: Roger X. Lenard, Sandia National Laboratories, Albuquerque, NM, USA
John Brandenburg, Florida Space Institute, Orlando, FL, USA

2:00 pm - The CI Carbonaceous Chondrites as the Missing Old Meteorites of Mars
John Brandenburg, Florida Space Institute-University of Central Florida, Kennedy Space Center, FL, USA

2:30 pm - Establishing Large Scale Colony Infrastructure On The Moon And Mars
Edward McCullough, The Boeing Company, Huntington Beach, CA, USA

3:00 pm - A Discrete Event Simulation of Crewed Lunar Surface Operations
Dean Davis, Analysis, Modeling, Simulation, & Experimentation (AMSE), Los Angeles, CA, USA; Martin Bayer, Advanced Space Exploration, Huntington Beach, CA, USA; Ashok Iyer, Strategic Development & Analysis (SD&A), Huntington Beach, CA, USA; Andrew Born, Strategic Development & Analysis (SD&A), Huntington Beach, CA, USA

3:30 pm - On the Possibility of a Persistent Mars Greenhouse, or, Mars and Venus Find Something in Common
John Brandenburg, Florida Space Institute-University of Central Florida, Kennedy Space Center, FL, USA

[C17] Fission Surface Power Component Technology Development I

Wednesday, February 14, 2007, 2:00 – 4:00 p.m. - Alvarado Ballroom D

Chairs: Lee S. Mason, NASA Glenn Research Center, Cleveland, OH, USA
Joseph Nainiger, NASA Glenn Research Center, Cleveland, OH, USA

2:00 pm - ***Heat Rejection Radiator Technology Development for High Power Space Applications***
Duane E. Beach, Cheryl L. Bowman, NASA Glenn Research Center at Lewis Field, Cleveland, OH, USA; John Siamidis, Analex Corporation, Brook Park, OH, USA; E. Eugene Shin, Mrityunjay Singh , Ohio Aerospace Institute, Brook Park, OH, USA; James L. Sanzi, Sest, Inc., Middleburg Heights, OH, USA

2:30 pm - ***Creep Property Characterization of Potential Brayton Cycle Impeller and Duct Materials***
Timothy P. Gabb, John Gayda, NASA Glenn Research Center, Cleveland, OH USA; Anita Garg, University of Toledo, Cleveland, OH

3:00 pm - ***Variable Conductance Liquid Metal Heat Pipes for Use with Isotope Power Systems - Past & Present***
Donald M. Ernst, Advanced Cooling Technologies, Inc., Lancaster, PA, USA

3:30 pm - ***Post Irradiation Evaluation of Thermal Control Coatings and Solid Lubricants to Support Fission Surface Power Systems***
Cheryl Bowman, Donald Jaworske, and Malcolm Stanford, NASA Glenn Research Center, Cleveland, OH, USA; Justin Persinger, and Thomas Blue, Ohio State University, Columbus, OH, USA

[D08] Environmental Control and Life Support Technologies and Systems

Wednesday, February 14, 2007, 2:00 – 4:00 p.m. - Alvarado Ballroom E

Chairs: Jitendra Joshi, NASA Headquarters, Washington, DC, USA
Steve Davison, NASA Headquarters, Washington, DC, USA

2:00 pm - ***Exploration Life Support***
B. M. Lawson, NASA Johnson Space Center, Houston, TX, USA

2:30 pm - ***Water Recovery Systems for Exploration Missions***
Karen Pickering, NASA Johnson Space Center, Houston, TX, USA

3:00 pm - ***Key Technologies for Environmental Monitoring for CEV and LSAM***
Gregory Bearman, Jet Propulsion Laboratory, Pasadena, CA, USA

3:30 pm - ***Atmosphere Revitalization Process Technology Maturation for NASA's Constellation Projects***
Jay L. Perry, NASA George C. Marshall Space Flight Center, Marshall Space Flight Center, AL, USA

[C18] Ongoing Radioisotope-Enabled Missions

Wednesday, February 14, 2007, 2:00 – 4:00 p.m. - Alvarado Salon F

Chairs: Ralph McNutt, The Johns Hopkins University, Laurel, MD, USA
Jacklyn R. Green, Jet Propulsion Laboratory, Pasadena, CA, USA

2:00 pm - ***Jupiter, Saturn and the Sun: Investigations Enabled by Nuclear Power***
Karla B. Clark and Richard Terrile, Jet Propulsion Laboratory, Pasadena, CA, USA

2:30 pm - ***RTG's on Transit***
John Dassoulas and Ralph L. McNutt, Jr., Johns Hopkins University Applied Physics Laboratory, Laurel, MD, USA

3:00 pm - ***Voyagers to the Edge of the Solar System and Beyond: Contributions from the MHW-RTGs***
Jacklyn R. Green, Jet Propulsion Laboratory, Pasadena, CA, USA

3:30 pm - ***The New Horizons Mission to Pluto and the Kuiper-Bel***
David Y. Kusnierkiewicz, Yanping Guo, Chris Hersman, Glen Fountain, and Steve

[CE01] Education and Public Outreach

Wednesday, February 14, 2007, 2:00 – 4:00 p.m. – Alvarado Salon G/H

Chairs: Alice Wessen, Jet Propulsion Laboratory, Pasadena, CA, USA
Amber Trounce, Boeing-Huntington Beach, Huntington Beach, CA, USA

2:00 pm - ***Successful Education Workforce Development Programs and Lessons Learned***
Barbara Hammond and Jessica Cejka, USRA, Houston, TX, USA

2:30 pm - ***Share the Adventure of Mars Exploration***
Michelle A. Viotti, Jet Propulsion Laboratory, Pasadena, CA, USA

3:00 pm - ***Virtual Presence for Mission Simulation: Serious Games Provide a New Approach***
Kevin Hussey, Jet Propulsion Laboratory, Pasadena, CA, USA

3:30 pm - ***Q & A***

[A06] Advances in Spray Cooling

Wednesday, February 14, 2007, 4:15 – 6:15 p.m. - Alvarado Salon A

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

4:15 pm - ***Influence of the Coulomb Force on Spray Cooling***
John M. Kuhlman, Paul J. Kreitzer, Deepak Mehra, and Donald D. Gray, West Virginia Universtiy, Morgantown, WV, USA; Kirk L. Yerkes, U.S. Air Force Research Laboratory, Wright-Patterson Air Force Base, OH, USA

4:45 pm - ***Energy Model Based Spray Cooling Heat Flux Correlation with Emphasis on Spray Characteristics***
Eric A. Silk, NASA Goddard Space Flight Center, Greenbelt, MD, USA

5:15 pm - ***Mathematical Model of Two-Phase Flow in Advanced Micro Cooling Modules Incorporating Flow Pattern Phenomena***
Jerry K. Keska and William E. Simon, University of Louisiana, Lafayette, LA, USA

5:45 pm - ***Spray Cooling Modeling: Liquid Film Thickness Effect on Heat Transfer***
R. Paneer Selvam, and Matthew Hamilton, University of Arkansas, Fayetteville, AR, USA; Eric A. Silk, NASA Goddard Space Flight Center, Greenbelt, MD, USA

[E11] Terraforming, Domed Ecosystems and Planetary

Wednesday, February 14, 2007, 4:15 – 6:15 p.m. - Alvarado Salon B/C

Chairs: Eric Rice, Orbital Technologies Corporation (ORBITEC), Madison, WI, USA
Edward McCullough, The Boeing Company, Huntington Beach, CA, USA

4:15 pm - ***Life on Mars and Relationship to Terraforming Mars***
David S. McKay, NASA Johnson Space Flight Center, Houston, TX, USA

4:45 pm - ***Lunar Atmosphere Development***
Richard R. Vondrak, NASA Goddard Space Flight Center, Greenbelt, MD, USA; Dana H. Crider, CatholicUniversity, Gibsonville, NC, USA

5:15 pm - ***Domes: The Moon and Mars***
John C. Mankins, Artemis Innovation Management Solutions LLC, Ashburn, VA, USA

5:45 pm - ***Constructing an Observatory Condominium on the Moon for Climate Change Data Measurements***
Klaus P. Heiss, High Frontier and The Jamestown Group, Alexandria, VA, USA

[C19] Non-Nuclear Testing and Evaluation II

Wednesday, February 14, 2007, 4:15 – 6:15 p.m. - Alvarado Ballroom D

Chairs: Bernard Wernsman, Bechtel Bettis, Inc., West Mifflin, PA, USA
Patrick McDaniel, Sandia National Laboratories, Albuquerque, NM, USA

4:15 pm - Supercritical Brayton Cycle Nuclear Power System Concepts
Steven A. Wright, Sandia National Laboratories, Albuquerque, NM, USA

4:45 pm - Testing in Support of Fission Surface Power System Qualification
Michael Houts, Shannon Bragg-Sitton, Tom Godfroy, Jim Martin, J. Boise Pearson, Melissa Van Dyke, NASA Marshall Space Flight Center, AL, USA

5:15 pm - Initial Testing of the Stainless Steel NaK-Cooled Circuit (SNaKC)
Anne Garber, NASA Marshall Space Flight Center, Nuclear & Advanced Propulsion Branch, Huntsville, AL, USA; Thomas J. Godfroy, Los Alamos National Laboratory, Los Alamos, NM, USA

5:45 pm - Development of High Fidelity, Fuel-Like Thermal Simulators for Non-Nuclear Testing
Shannon M. Bragg-Sitton, J. Farmer, R. Dickens, M. Adams, and J. Davis, NASA Marshall Space Flight Center, Nuclear and Advanced Propulsion Branch, Huntsville, AL, USA; D. Dixon, and R. Kapernick, Los Alamos National Laboratory, Nuclear Design and Risk Analysis, Los Alamos, NM, USA

[D09] Advanced Power and Propulsion Technologies and Systems

Wednesday, February 14, 2007, 4:15 – 6:15 p.m. - Alvarado Ballroom E

Chairs: Diane Hope, NASA Langley Research Center, Hampton, VA,
Nantel Suzuki, NASA Headquarters, Washington, DC, USA

4:15 pm - Novel Rock Detection Intelligence for Space Exploration Based on Non-Symbolic Algorithms and Concepts
Sule Yildirim, and Ronald L. Beachell, Computer Science Department, Hedmark University College, Norway, Henning Veflingstad, Computer Science Department, Norwegian University of Science and Technology, Trondheim, Norway

4:45 pm - Fuel Cells
Mark A. Hoberecht, NASA Glenn Research Center, Cleveland, OH, USA

5:15 pm - Propulsion and Cryogenics Advanced Development
Mark Klem, NASA Glenn Research Center, Cleveland, OH, USA

5:45 pm - Where Space Comes Down to Earth: Test Facilities for Exploration Systems
Jeffrey Woytach, Jeffrey Chambers, Brian Willis, Gerald Carek, NASA Glenn Research Center, Plum Brook Station, Cleveland, OH, USA; Diane Linne, NASA Glen Research Center, Cleveland, OH USA

[C20] Radioisotope Power Systems Technology and Development

Wednesday, February 14, 2007, 4:15 – 6:15 p.m. - Alvarado Salon G/H

Chairs: Patrick E. Frye, Pratt & Whitney Rocketdyne, Canoga Park, CA, USA
Jaime Reyes, Lockheed Martin, Phoenixville, PA, USA

4:15 pm - Development of Advanced Stirling Radioisotope Generator for Space Exploration
Jack Chan, Lockheed Martin Space Systems Company, Philadelphia, PA, USA; J. Gary Wood, Sunpower Inc., Athens, OH, USA; Jeffrey G. Schreiber, NASA Glenn Research Center, Cleveland, OH, USA

4:45 pm - Multi-Watt Small Radioisotope Thermoelectric Generator Conceptual Design Study
Patrick Frye, William Otting, and William R. Determan, Pratt & Whitney Rocketdyne Inc., Canoga Park, CA, USA

5:15 pm - Modeling of the Thermal Performance of an Advanced Stirling Converter Concept
Brian G. Woods, Jiani Wang, John T. DeNoma, Oregon State University, Department of Nuclear Engineering and Radiation Health Physics, Corvallis, OR, USA

5:45 pm - NASA'S RPS Design Reference Mission Set for Solar System Exploration
Tibor Balint, Jet Propulsion Laboratory, California Institute of technology, Pasadena, CA, USA

THURSDAY, FEBRUARY 15, 2007

[A07] Advanced Heat Pipes and Other Emerging Technologies

Thursday, February 15, 2007, 8:00 - 10:00 a.m. - Alvarado Salon A

Chairs: Robert S. Reid, Los Alamos National Laboratory, Los Alamos, NM, USA
D. Angirasa, Goodrich Corporation, Power Systems Division, Twinsburg, OH, USA

8:00 am - Intermediate Temperature Fluids Life Tests – Theory
Calin Tarau, David B. Sarraf, and William G. Anderson, Advanced Cooling Technologies, Inc., Lancaster, PA, USA; Ivan E. Locci, NASA Glenn Research Center, Cleveland, OH, USA

8:30 am - Reversible Electrochemical Mirror (REM) Device for Satellite Thermal Control
Michael A. Cunningham, D. Morgan Tench and Leslie F. Warren, Jr., Teledyne Scientific Company, Thousand Oaks, CA, USA

9:00 am - Fabrication and Testing of a Passive Re-Deployable Radiator for Autonomous Thermal Control
Hosei Nagano, Akira Ohnishi, and Ken Higuchi, Japan Aerospace Exploration Agency/ Institute of Space and Astronautical Science, Sagamihara, Kanagawa, Japan; Kan Matsumoto, Tokai University, Hiratsuka, Kanagawa, Japan; Yuji Nagasaka, Keio University, Kanagawa, Japan

9:30 am - Compatibility Studies of Inconel 625 with Lunar Regolith Simulant
Donald Gillies, Sandor Lehoczky, NASA, Marshall Spaceflight Center, Huntsville, AL, USA; Witold Palosz, Paul Carpenter, BAE Systems, MSFC, Huntsville, AL, USA; Pat Salvail, STS, MSFC, Huntsville, AL, USA

[E12] Space Resource Utilization on the Moon II

Thursday, February 15, 2007, 8:00 - 10:00 a.m. - Alvarado Salon B/C

Chairs: Kevin Payne, Lockheed Martin Space Systems Company, Denver, CO, USA
Timothy Chen, The Boeing Company, Huntington Beach, CA, USA

8:0 0 am - Oxygen Production System Models for Lunar ISRU
Edgardo Santiago-Maldonado, NASA Kennedy Space Center, FL, USA; Jim Kennedy, Teledyne Brown Engineering, NASA Marshall Space Flight Center, AL, USA

8:30 am - High-Efficiency Extraction and Utilization of Lunar Solar Wind Volatiles
David E. Petrick, and Steven J. Nieczkoski, Technology Applications Inc., Boulder, CO, USA; Tracy Q. Gardner, Colorado School of Mines, Golden, CO, USA

9:00 am - Development of a Reactor Model for Chemical Conversion of Lunar Regolith
Uday Hegde, Suleyman Gokoglu, and R. Balasubramaniam, National Center for Space Exploration Research, NASA Glenn Research Center, Cleveland, OH, USA

9:30 am - Tribocharging Lunar Simulant in Vacuum for Electrostatic Beneficiation
James Captain, University of Central Florida, FL, USA; Steve Trigwell, ASRC Aerospace, FL, USA; Ellen Arens, Janine Captain, Carlos Calle, Jacqueline Quinn, NASA Kennedy Space Flight Center, FL, USA; Alex Biris, University of Arkansaa at Little Rock, Little Rock, AR, USA

[C21] Fission Surface Power Component Technology Development II

Thursday, February 15, 2007, 8:00 - 10:00 a.m. - Alvarado Ballroom D

Chairs: Lee S. Mason, NASA Glenn Research Center, Cleveland, OH, USA
Joseph Nainiger, NASA Glenn Research Center, Cleveland, OH, USA

8:00 am - ***High Temperature Stability of Dissimilar Metal Joints in Fission Surface Power Systems***
Ivan Locci, University of Toledo, Toledo, OH, USA; Cheryl Bowman, James Nesbitt, and Frank Ritzert, NASA Glenn Research Center, Cleveland, OH, USA

8:30 am - ***Thermal Performance of High Temperature Titanium - Water Heat Pipes by Multiple Heat Pipe Manufacturers***
James Sanzi, SEST Inc., NASA Glenn Research Center, Cleveland, OH, USA

9:00 am - ***Gas Foil Bearing Technology Advancements for Closed Brayton Cycle Turbines***
Samuel A Howard, Christopher DellaCorte, Robert J. Bruckner, and Malcolm Stanford, NASA Glenn Research Center, Cleveland, OH, USA; Kevin Radil, US Army Research Laboratory, Adelfi, MD, USA

9:30 am - ***Operational Results from a High Power Alternator Test Bed***
Arthur Birchenough, and David Hervol, NASA Glenn Research Center, Cleveland, OH, USA

[C22] Thermoelectric Power Conversion Technology and Applications

Thursday, February 15, 2007, 8:00 - 10:00 a.m. - Alvarado Salon F

Chairs: Bahman Heshmatpour, Teledyne Energy Systems, Inc., Hunt Valley, MD, USA
Jean-Pierre Fleurial, Jet Propulsion Laboratory, Pasadena, CA, USA

8:00 am - ***Special Application Thermoelectric Micro Isotope Power Sources***
B. Heshmatpour, A. Lieberman, M. Khayat, A. Leanna, T. Dobry, Teledyne Energy Systems, Inc., Hunt Valley, MD, USA

8:30 am - ***A Look Back at Assembly and Test of the New Horizons Radioisotope Power System***
B. Alan Harmon, and William A. Bohne, Space and Defense Power Systems, U.S. Department of Energy, Washington, DC, USA

9:00 am - ***Small Thermoelectric Radioisotope Power Sources***
A. Lieberman, A. Leanna, M. McAlonan, B. Heshmatpour, Teledyne Energy Systems, Inc., Hunt Valley, MD, USA

[F08] Theoretical Considerations - Warp Drives, FTL Speed Travel and Others II

Thursday, February 15, 2007, 8:00 - 10:00 a.m. - Alvarado Salon G/H

Chairs: David Maker, Photon Research Associates, Huntsville, AL, USA
Glen A. (Tony) Robertson, Gravi Atomic Reseach, Madison, Al, USA

8:00 am - ***Exploring Gravity and Gravitational Wave Dynamics Part II: Gravity Models***
Paul A. Murad, Vienna, VA, USA

8:30 am - ***The Schwarzschild Metric Violates the Weak Principle of Equivalence***
Raymond Jensen, University of Notre Dame, Notre Dame, IN, USA

9:00 am - ***Electrostatic 512kV Rotator/Oscillator Propulsion System***
David Maker, Huntsville, AL, USA

9:30 am - ***Why Should a Superconductor Generate Large Gravitomagnetic Fields***
Martin Tajmar, Space Propulsion, ARC Seibersdorf research, A-2444 Seibersdorf, Austria

[A08] Smart Materials and Coatings for Thermal Control

Thursday, February 15, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon A

Chairs: Donya M. Douglas, NASA Goddard Space Flight Center, Greenbelt, MD, USA
William J. Biter, Sensortex, Inc., Kennett Square, PA, USA

10:30 am - Variable Emittance Electrochromic Devices for Satellite Thermal Control
Hulya Demiryont, Kenneth C. Shannon III, Eclipse Energy Systems, Inc., St. Petersberg, FL, USA

11:00 am - Performance Results of the ESR from the Space Technology 5 Satellites
William J. Biter, and Sung Oh, Sensortex Inc., Kennett Square, PA, USA

11:30 am - MEMS Shutters for Thermal Control – Flight Validation and Lessons Learned
Dawnielle Farrar, Ann Darrin, and Robert Osiander, The John Hopkins University Applied Physics Laboratory, Laurel, MD, USA; Donya M. Douglas, Ted D. Swanson, and Christine Collins, NASA Goddard Space Flight Center, Greenbelt, MD, USA

12:00 pm - A Space-Based Experiment to Evaluate Performance of Electrostatic Switched Radiator (ESR)
Saeed Moghaddam, John Lawler, and Joseph Currano, ATEC, Inc., College Park, MD, USA; Jungho Kim, University of Maryland, College Park, MD, USA

[E13] Space Settlements/Colonies

Thursday, February 15, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon B/C

Chairs: Anita Gale, Space Settlement Design Competitions, Nassau Bay, TX, USA
Richard Edwards, Space Settlement Design Competitions, Nassau Bay, TX, USA

10:30 am - Atlas V: Reliable Human Space Transportation for Space Colonization
Michael Holguin, Lockheed Martin, Denver, CO, USA

11:00 am - Symbiotic Relationship of Man and Machine in Space Colonization
Roy Nielsen, r-bok tech, Los Alamos, NM, USA

11:30 pm - Large-Scale Nuclear Power Generation
Roger X. Lenard, Sandia National Laboratories, Albuquerque, NM, USA

12:00 am - Optimal Architecture for an Asteroid Mining Mission: System Components and Project Execution
Ken R. Erickson, Good Samaritan Hospital and Medical Center, Corvallis, OR, USA

[CE02] Lunar Environmental Effects & Mitigation

Thursday, February 15, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Ballroom D

Chairs: Insoo Jun, Jet Propulsion Laboratory, Pasadena, CA, USA
Narayanan Ramachandran, Jacobs Engineering, NASA Marshall Space Flight Center, AL, USA

10:30 am - Radiation Environments for Lunar Programs
Joseph I. Minow, NASA Marshall Space Flight Center, AL, USA; Richard L. Altstatt, William C. Blackwell, Jr., Jacobs Engineering, MSFC Group, NASA Marshall Space Flight Center, AL, USA; and Katherine J. Harine, Raytheon ITS, NASA Marshall Space Flight Center, AL, USA

11:00 am - Plasma Environments for Lunar Programs
Joseph I. Minow, NASA Marshall Space Flight Center, AL, USA; Richard L. Altstatt, William C. Blackwell, Jr., Jacobs Engineering, MSFC Group, NASA Marshall Space Flight Center, AL, USA

11:30 am - Modeling Charged Dust Particle Interactions with Spacecraft on Lunar Surface
Joseph Wang, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

12:00 pm - The Lunar Meteoroid Environment for the Constellation Program
Rob Suggs and William J. Cooke, NASA Marshall Space Flight Center, AL, USA

[C23] Reactor Systems Concepts for Surface Power

Thursday, February 15, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Ballroom E

Chairs: Robert L. Cataldo, NASA Glenn Research Center, Cleveland, OH, USA
Steven B. Dron, Sandia National Laboratories, Albuquerque, NM, USA

10:30 am - Non-Nuclear Validation Test Results of a Closed Brayton Cycle Test-Loop
Steven Wright, Sandia National Laboratories, Albuquerque, NM, USA

11:00 am - Benefit of Lunar Regolith on Reflector Mass Savings
Steven A. Hatton and Mohamed S. El-Genk, University of New Mexico, Albuquerque, NM, USA

11:30 pm - Hot Hydrogen Test Facility
W. David Swank, Jon Carmack, James E. Werner, Robert J. Pink, DeLon C. Haggard, and Ryan Johnson, Idaho National Laboratory, Idaho Falls, ID, USA

12:0 0 pm - Evaluation of Metal-Fueled Surface Reactor Concepts
David I. Poston, Thomas F. Marcille, Richard J. Kapernick, and Matthew T. Hiatt, and Benjamin Amiri, Los Alamos National Laboratory, Los Alamos, NM, USA

[E14] Panel Discussion: Requirements for Lunar Analog Test Sites for ISRU

Thursday, February 15, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon F

Chairs: Diane Linne, NASA Glenn Research Center, Cleveland, OH, USA
Edward McCullough, The Boeing Company, Huntington Beach, CA, USA

10:30 am - Panel Discussion: Requirements For Lunar Analog Test Sites For ISRU
Alain Berinstain, Canadian Space Agency, St-Hubert, QC, Canada; John Caruso, NASA Johnson Space Center, Houston, TX, USA; Leslie Gertsch, University of Missouri-Rolla, Rolla, MO, USA; Brian Glass, NASA Ames Research Center, Moffett Field, CA, USA; Edward McCullough, The Boeing Company, Huntington Beach, CA, USA; Jeff Plescia, The Johns Hopkins University Applied Physics Laboratory, Laurel, MD, USA

[F09] An International Outlook on Far Term Propulsion and Power

Thursday, February 15, 2007, 10:30 a.m. - 12:30 p.m. - Alvarado Salon G/H

Chairs: Martin Tajmar, ARC Seibersdorf Research GmbH, Seibersdorf, , Austria
Charles Suchomel, Air Force Research Laboratory, Wright-Patterson AFB, OH, USA

10:30 am - Coupling of an Open Cavity to Microwave Beam: A Possible New Scheme of Detecting High-Frequency Gravitational Waves
Fangyu Li, Zhenyun Fang, University of Chongqing, Peoples Republic of China; R.M.L. Baker, Jr., GRAVWAVE LLC and Transportation Sciences Corporation, Playa Del Rey, CA, USA

11:00 am - CasimirSim - A Tool to Compute Casimir Polder Forces for Nontrivial 3D Geometries
René Sedmik, Martin Tajmar, ARC Seibersdorf research Gmbh., Seibersdorf, A-2444, Austria

11:30 am - High-Frequency Gravitational Wave Induced Nuclear Fusion
Giorgio Fontana, University of Trento, Trento, Italy; and Robert M. L. Baker, Jr., GRAVWAVE, LLC, Playa del Rey, CA, USA

12:00 pm - Chinese High-Frequency Gravitational Wave Program
Robert M. L. Baker, GRAVWAVE, LLC, Playa del Rey, CA, USA

INDEX OF AUTHORS AND SESSION CHAIRS

A page number in **BOLD** indicates that the presenter is the lead on the paper and/or presentation.