International Conference On Environmental Systems

Technical Session Schedule

As of 07/23/2006 07:40 pm

Monday, July 17

Space Structures for Exploration

Session Code: ***ICES36***

Room Chesapeake I-II ***Session Time:*** ***10:00 a.m.***

This session will address the efficient use of available in-situ resources as well as the application of reduced mass stowable/deployable structures to space and planetary exploration. Environmental robustness, effective storage, and the use/transformation of native resources will be considered as integral parts of these technologies that can range from materials and components to full-scale structures.

Organizers - *Richard G. Helms, Jet Propulsion Laboratory; Paul M. McElroy, Temeku Technologies Inc.*

Chairpersons - *Richard G. Helms, Jet Propulsion Laboratory; Paul M. McElroy, Temeku Technologies, Inc.*

Time	Paper No.	Title
10:00 a.m.	***2006-01-2063***	***The Applicablility of Past Innovative Concepts to the Technology for New Extremely Large Space Antenna/Telescope Structures*** *Robert E. Freeland, Richard G. Helms, Jet Propulsion Laboratory*
10:30 a.m.	***2006-01-2064***	***Self-Deployable Foam Antenna Structures for Earth Observation Radiometer Applications*** *Paul M. McElroy, Temeku Technologies, Inc.; Andrea E. Hoyt, Peter Rand, Adherer Technologies Inc.; Paul B. Willis, Jet Propulsion Laboratory*
11:00 a.m.	***2006-01-2065***	***Intelligent Flexible Materials for Deployable Space Structures (InFlex)*** *David Cadogan, Craig Scheir, Joanne Ware, Jinny Ferl, Anshu Dixit, ILC Dover LP*
11:30 a.m.	***2006-01-2066***	***A Modest Proposal: The Use of the ISS as the Crew Exploration Vehicle*** *H. Charles Dischinger, Jr.*

Monday, July 17

Panel: Space Architecture in the Vision for Space Exploration

Session Code: ***ICES56***

Room Chesapeake I-II ***Session Time:*** ***1:30 p.m.***

Organizers - *Marc M. Cohen, NASA Ames Research Center*

Chairpersons - *Marc M. Cohen, NASA Ames Research Center*

Panelists - *Constance M. Adams, Futron Corporation; Thomas Gangale; James D. Lowe; Georgi Petrov, Laguarda.Low Arc*

Monday, July 17

Spacecraft Water/Air Quality: Maintenance and Monitoring

Session Code: ***ICES27***

Room Franklin/Shangri-La Yorktown ***Session Time:*** ***10:00 a.m.***

The session includes papers on the results of ground-based chemical water quality analyses of Shuttle potable, ISS potable, and ISS condensate water samples, plus a paper on a recent development in spacecraft water quality monitoring technology.

Organizers - *John R. Schultz, John E. Straub II, Wyle Laboratories, Inc., Life Sciences Group; Darrell L. Jan, Margaret A. Ry Propulsion Laboratory*

Chairpersons - *John R. Schultz, John E. Straub II, Wyle Laboratories, Inc., Life Sciences Group*

Time	Paper No.	Title
10:00 a.m.	2006-01-2014	**Shuttle Potable Water Quality from STS-26 to STS-114** *Marie M. Hwang, John R. Schultz, Wyle Laboratories, Inc., Life Sciences Group; Ra Sumner, Bionetics Corporation*
10:30 a.m.	2006-01-2015	**ISS Expeditions 10 & 11 Potable Water Sampling and Chemical Analysis Results** *John E. Straub II, Debrah K. Plumlee, John R. Schultz, Wyle Laboratories, Inc., Life Group*
11:00 a.m.	2006-01-2016	**Chemical Characterization of US Laboratory Humidity Condensate** *John R. Schultz, Debrah K. Plumlee, Wyle Laboratories, Inc., Life Sciences Group; Mudgett, NASA Johnson Space Center*
11:30 a.m.	2006-01-2017	**Novel Regenerative Carbon Analyzer for Water Quality Monitoring** *Jinseong Kim, Tony Ragucci, Anuncia Gonzalez-Martin, Lynntech Inc.*

Monday, July 17

Food Processing

Session Code: ***ICES42***

Room Franklin/Shangri-La Yorktown ***Session Time:*** ***1:30 p.m.***

In this session, the speakers will discuss the challenges involved in the development of a food system for future exploration missions.

Organizers - *Michele Perchonok, NASA Johnson Space Center*

Chairpersons - *Michele Perchonok, NASA Johnson Space Center*

Time	Paper No.	Title
1:30 p.m.	2006-01-2067	**Metric Evaluation of Food Packaging Scenarios Intended for a Mars Surface Mission** *Stephen J. French, Lockheed Martin Corp.*
2:00 p.m.	2006-01-2068	**Physicochemical Properties and Consumer Acceptance of Hydroponic Carrots (Daucus carota) in an Extended Screening Process** *Peter Gichuhi, Chellani Hathorn, Diantha Gladney, Desmond Mortley, Steven Moult Bromfield, C. Bovell-Benjamin, Tuskegee University, CFESH*
2:30 p.m.	2006-01-2071	**Trade Study for a Mars Surface Mission Bulk Commodity Supply Scenario: Processed Peanut Oil Versus Bulk Oil** *Stephen J. French, Lockheed Martin Corp.*
3:00 p.m.	2006-01-2072	**Identification of Volatile Organic Compounds from Model Sweetpotato Products Using Different Analytical Methods** *Chellani Hathorn, Jessica Mason, Tuskegee University; Jeffrey Greene, Montreka D North Carolina State University; Peter Gichuhi, Mohamed Abdalla, Tuskegee Univer Derrick Dean, University of Alabama-Birmingham; Adelia Bovell-Benjamin, Tuskege University*
3:30 p.m.		**BREAK**
3:45 p.m.	2006-01-2073	**Effect of Storage on the Physicochemical Properties of a Sweetpotato Beverage Processed Through Centrifugation** *Elaine Bromfield, Diantha Gladney, Peter Gichuhi, C. Bovell-Benjamin, Tuskegee U*

Monday, July 17

Education and Outreach (Panel to follow)

Session Code: ***ICES40***

Room Hampton Roads Ballroom I-II ***Session Time:*** ***10:00 a.m.***

Organizers - *Jean B. Hunter, Cornell Univ.; Dean Muirhead, Barrios Technology Inc.*

Chairpersons - *Jean B. Hunter, Cornell Univ.*

Panelists - *Jean B. Hunter, Cornell Univ.; Volodymyr L. Nazarenko, A.V. Palladin Institute of Biochemistry; Frederick D. Sm Johnson Space Center; Kanapathipillai Wignarajah, NASA Ames Research Center*

Time	Paper No.	Title
10:00 a.m.	***2006-01-2025***	***Biological Experiment in Space as the Object of the Educational Program in Ukraine*** *Volodymyr L. Nazarenko, A.V. Palladin Institute of Biochemistry*

Monday, July 17

ECLSS Modeling and Test Correlations

Session Code: ***ICES16***

Room Hampton Roads Ballroom I-II ***Session Time:*** ***1:30 p.m.***

This session reports on applications of and advances in modeling physico-chemical and bio-chemical life support processes as well as in modeling atmospheric pressure and composition distributions in closed habitats.

Organizers - *Thomas J. Slavin, Chang H. Son, Boeing Co.*

Chairpersons - *Robert W. Goalwin, Boeing Integrated Defense Systems; Ching-Fen Tsai, Boeing Co.*

Time	Paper No.	Title
1:30 p.m.	***2006-01-2048***	***Analysis to Characterize Fresh vs. Aged Shuttle Orbiter Lithium Hydroxide Performance*** *Peter McCloud, Brian Dunaway, The Boeing Company*
2:00 p.m.	***2006-01-2049***	***Impact of Shuttle Orbiter Booster Fan Bypass on Integrated Environmental Control and Life Support Systems*** *Brian R. Dunaway, Douglas M. Cudd, The Boeing Company*
2:30 p.m.	***2006-01-2050***	***The Personal Computer Transport Analysis Program*** *Brian R. Dunaway, Boeing Space Exploration*
3:00 p.m.	***2006-01-2053***	***Development of a Computer-Aided Tool for System Description, Modeling, Analysis, and Integration for Screening Planetary Habitation Alternatives*** *Eva Lovelady, Grace Nworie, Nathan Shirlberg, Texas A&M University; Jill Hill, Hes Adelia Bovell-Benjamin, Peter Gichuhi, Tuskegee University*

Monday, July 17

Planetary Protection and Astrobiology

Session Code: ***ICES20***

Room Hampton Roads Ballroom VII ***Session Time:*** ***10:00 a.m.***

The session will address Planetary Protection related planning, guidelines, and technology development for robotic and human missions to Mars. Also discussed will be issues relating to the microbial diversity on the International Space Station.

Organizers - *David W. Mazyck, Univ. of Florida; Chang H. Son, Boeing Co.; Perry Stabekis, Windermere*

Chairpersons - *Chang H. Son, Boeing Co.*

Time	Paper No.	Title
10:00 a.m.	***2006-01-2005***	***Technical Civilizations in the Galaxy***
		Harry W. Jones, NASA Ames Research Center
10:30 a.m.	***2006-01-2006***	***Rapid microbial analysis during simulated surface EVA at Meteor Crater: Implications for human exploration of the Moon and Mars***
		Jake G. Maule, Carnegie Institution of Washington
11:00 a.m.	***2006-01-2007***	***Results Summary of the Life Support & Habitation and Planetary Protection Workshop***
		John Hogan, National Space Grant Foundation; John Fisher, NASA Ames Research Margaret Race, SETI Institute; Jitendra Joshi, John Rummel, NASA Headquarters
11:30 a.m.	***2006-01-2008***	***Proof of Concept of Low Temperature Brine Microbial Habitats for Subsurface Mars and Europa Habitat Viability Scenario Testing and Astrobiology Biosignature Instrument Development***
		Sherwin Gormly, National Space Grant Foundation; Dean Adams, University of Nev Eric Marchand, Univ. of Nevada Reno; Bailey Cannon, Univ. of Nevada, Reno; Mich NASA Ames Research Center

Monday, July 17

Human and Robotics System Integration

Session Code: ***ICES38***

Room James I-III ***Session Time:*** ***10:00 a.m.***

This session covers design and development of robotics for Space Exploration and how these robotic systems will work together with humans.

Organizers - *Loel Goldblatt, Hamilton Sundstrand Space Systems Intl.; Dan King, MDA Space Missions*

Chairpersons - *Loel Goldblatt, Hamilton Sundstrand Space Systems Intl.; Dan King, MDA Space Missions*

Time	Paper No.	Title
10:00 a.m.	***2006-01-2019***	***Use of Standardization and Intelligent Subsystems for Advancing the Human-Robotic Competency in Space Exploration***
		Jeffrey Ferketic, Hamilton Sundstrand
10:30 a.m.	***2006-01-2020***	***Evolutionary Adaptive Robotic Systems to Support Lunar Exploration***
		Catherine Erkorkmaz, Howard Jones, MDA; Sean Murray, Edward W. Hodgson, Ha Sundstrand
11:00 a.m.	***2006-01-2022***	***Collaborating Human Robot Swarms to Achieve Robust Space Exploration Capabilities***
		Edward W. Hodgson, Hamilton Sundstrand

Monday, July 17

Space Robotics & Automation

Session Code: ***ICES14***

Room James I-III ***Session Time:*** ***1:30 p.m.***

This session describes how robotic and autonomous systems with high motor skills can acquire the capability to perform automatic operations without human presence in space. The stringent space operation requirements have brought new challenges that need to be considered in the development of space robotics and automation technologies. This session presents some applications of robotics and automation in space addressing automated payload & instruments, deployable antenna, reconfigurable space manipulators and robotic test bed as a spacecraft simulator.

Organizers - *Darius Nikanpour, Canadian Space Agency; Timo Stuffler, Kayser-Threde GmbH*

Chairpersons - *Darius Nikanpour, Canadian Space Agency; Timo Stuffler, Kayser-Threde GmbH*

Time	Paper No.	Title
1:30 p.m.	***2006-01-2045***	***Automated Payload and Instruments for European Exploration related Activities***
		Timo Stuffler, Kayser-Threde GmbH
2:00 p.m.	***2006-01-2046***	***On the Design and Control of a New Generation of Reconfigurable Space Manipulators with Passive Joints***
		Farhad Aghili, Canadian Space Agency
2:30 p.m.	***2006-01-2047***	***A Robotic System as an Alternative to the Air-bearing System for Spacecraft Simulator***
		Farhad Aghili, Canadian Space Agency

Monday, July 17

Satellite, Payload and Instrument Thermal Control

Session Code: ***ICES12***

Room Marriott Ballroom I-III ***Session Time:*** ***1:30 p.m.***

The session covers the development and design of thermal control systems for Satellites, Payloads, and Instruments.

Organizers - *Nico H. Pennings, ESA ESTEC; Patrick Hugonnot, Alcatel; Hiroyuki Ogawa, Isas; Marco Molina, Carlo Gavazzi*

Chairpersons - *Patrick Hugonnot, Alcatel; Hiroyuki Ogawa, Isas*

Time	Paper No.	Title
1:30 p.m.	***2006-01-2039***	***Thermal Design and On-Orbit Performance of the TopSat Camera***
		Bryan Shaughnessy, Jayne Fereday, Rutherford Appleton Laboratory
2:00 p.m.	***2006-01-2040***	***Heat Transfer In Film-Cooled Bipropellant Thruster***
		Kaori Ohminami, Sokendai Univ. / ISAS; Kuninori T. Uesugi, Hiroyuki Ogawa, ISAS
2:30 p.m.	***2006-01-2041***	***Proteus Small-Sat Family: Multi-Mission Thermal Control Design and Performances***
		Marc Valentini, Patrick Arfi, Alcatel Alenia Space France
3:00 p.m.	***2006-01-2042***	***Preliminary Thermal Design of the Extreme Ultra Violet Spectrometer (EUS) Instrument for Solar Orbiter***
		Bryan Shaughnessy, Rutherford Appleton Laboratory
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2043***	***Some Aspects of Peltier-Cooler Optimization Applied for the Glove Box Air Temperature Control***
		Evgeny Kotlyarov, Peter Crom, Raoul Voeten, Bradford Engineering
4:15 p.m.	***2006-01-2044***	***GOCE Instrument Thermal Control***
		David Valentini, Michel Vacance, Domenico Battaglia, Alcatel Alenia Space; Bernd I ESTEC; Jean-Michel Niot, Assystems France

Monday, July 17

Thermal, Environmental, and Human Factors Systems for Crew Transfer Vehicles

Session Code: ***ICES25***

Room Marriott Ballroom IV ***Session Time:*** ***10:00 a.m.***

Crew Transfer Vehicles will carry crew from the Earth to the ISS and the lunar vicinity. This session covers the technical status and development of Thermal Control Systems, ECLSS, Human Engineering, and Crew Systems for this next generation of crewed spacecraft. Presenters may discuss alternate and innovative technologies that show potential to be used to improve the systems. Topics may also include improved practices in engineering, procurement, ground and flight tests, operations, etc.

Organizers - *Barry W. Finger, Bigelow Aerospace; Leslie J. A. Rogers, Lockheed Martin Space Systems Co.*

Chairpersons - *Leslie J. A. Rogers, Lockheed Martin Space Systems Co.*

Time	Paper No.	Title
10:00 a.m.	***2006-01-2011***	***Crew Exploration Vehicle (CEV) Environmental Control and Life Support (ECLS) Development Status***
		John F. Lewis, NASA Johnson Space Center
10:30 a.m.	***2006-01-2012***	***Development of Water and Waste Treatment Systems for Use on NASA Crew Exploration Vehicle (CEV) and Lunar Surface Assent Missions (LSAM)***
		Michael T. Flynn, NASA Ames Research Center
11:00 a.m.	***2006-01-2013***	***Evolution of the CEV ECLS from ISS to Mars***
		Harry W. Jones, NASA Ames Research Center

Monday, July 17

International Space Station Systems ECLSS: Systems

Session Code: ***ICES30***

Room Marriott Ballroom IV ***Session Time:*** ***1:30 p.m.***

This session addresses ECLS systems issues and lessons learned from the ISS.

Organizers - *Patricia O'Donnell, Hamilton Sundstrand; Richard P. Reysa, MEI Technologies Inc.*

Chairpersons - *Gregory J. Gentry, Boeing Co.; David E. Williams, NASA Johnson Space Center*

Time	Paper No.	Title
1:30 p.m.	***2006-01-2055***	***International Space Station Environmental Control and Life Support System Status: 2005 - 2006***
		David E. Williams, NASA Johnson Space Center; Gregory J. Gentry, Boeing Co.
2:00 p.m.	***2006-01-2056***	***International Space Station (ISS) Environmental Control and Life Support (ECLS) System Overview of Events: February 2005 - 2006***
		Gregory J. Gentry, Boeing Co.; Richard Reysa, MEI Technologies Inc.; David Willia Johnson Space Center
2:30 p.m.	***2006-01-2057***	***Status of the Regenerative ECLSS Water Recovery and Oxygen Generation System***
		Robert M. Bagdigian, NASA Marshall Space Flight Center; Dale Cloud, John Bedar Sundstrand Space Systems International, Inc.
3:00 p.m.	***2006-01-2058***	***Integrated Status of Regenerative Environmental Control and Life Support System (ECLSS) Functions into the International Space Station (ISS) U.S. Laboratory Element***
		Richard Reysa, Steve Van Keuren, MEI Technologies; Cynthia Philistine, Boeing Co Link, Boeing Integrated Defense Systems

3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2060***	***Lessons Learned from the Crew Health Care System (CHeCS) Rack 1 Environmental Control and Life Support (ECLS) Design*** *David E. Williams, NASA Johnson Space Center*
4:15 p.m.	***2006-01-2061***	***Methodology and Assumptions of Contingency Shuttle Crew Support (CSCS) Calculations Using ISS Environmental Control and Life Support Systems*** *Kimberlee Prokhorov, Brienne Shkedi, NASA Johnson Space Center*
4:45 p.m.	***2006-01-2062***	***ISS: On-Board ECLSS Maintenance Activities and Launch Logistics*** *Clifford Dean Thompson, Boeing Integrated Defense Systems*

Monday, July 17

Biomass Production

Session Code: ***ICES41***

Room Marriott Ballroom V-VII ***Session Time:*** ***10:00 a.m.***

Biomass Production will address a variety of life-support issues including hypobaric plant growth, transpiration and energy burdens of growing crops under different lighting regimes, salad-crop yield under lunar/Mars light & temperature conditions, and temperature & pollination effects on strawberry cultivar performance.

Organizers - *Cary A. Mitchell, Purdue Univ.; Raymond M. Wheeler, NASA Kennedy Space Center*

Chairpersons - *Cary A. Mitchell, Purdue Univ.*

Time	***Paper No.***	***Title***
10:00 a.m.	***2006-01-2028***	***Water and Energy Transport of Crops Under Different Lighting Conditions*** *James F. Russell, Gioia D. Massa, Cary A. Mitchell, Purdue Univ.*
10:30 a.m.	***2006-01-2029***	***Yields of Salad Crops Grown Under Potential Lunar or Mars Habitat Environments: Effect of Temperature and Lighting Intensities*** *Jeffrey T. Richards, Sharon Edney, Neil Yorio, Gary Stutte, Dynamac Corp.; Raymo Wheeler, NASA Kennedy Space Center*
11:00 a.m.	***2006-01-2030***	***Strawberry Cultivar Analysis: Temperature and Pollination Studies*** *Gioia Donna Massa, Mercedes Mick, Cary Mitchell, Purdue Univ.*

Monday, July 17

Interplanetary Spacecraft and Lunar/Planetary Thermal Control

Session Code: ***ICES1***

Room Marriott Ballroom V-VII ***Session Time:*** ***1:30 p.m.***

This session describes advances in the thermal control for interplanetary spacecraft. Passive and active thermal control technologies are used in a variety of orbiting and surface vehicles in the exploration of the planets, the Moon and interplanetary space. New thermal control technologies such as louvers, heat pipes, thermal control paints and integrated thermal control structures are discussed for these missions.

Organizers - *Gajanana Birur, Jet Propulsion Laboratory; Paul M. McElroy, Temeku Technologies, Inc.*

Chairpersons - *Gajanana Birur, Jet Propulsion Laboratory; Paul M. McElroy, Temeku Technologies, Inc.*

Time	***Paper No.***	***Title***

1:30 p.m.	***2006-01-2032***	***Evaluation of Coatings and Materials for Future Radiators***
		George Tuan, NASA Johnson Space Center; David Westheimer, National Aero & S Administration; Gajanana Birur, Jet Propulsion Laboratory; Duane Beach, NASA Gl Research Center; Donald A. Jaworske, NASA John Glenn Research Center; Wand NASA Goddard Space Flight Center; Jack J. Triolo, Swales Aerospace
2:00 p.m.	***2006-01-2033***	***The Thermal Design Evolution of the Phoenix Robotic Arm***
		Chern-Jiin Lee, Applied Sciences Laboratory Inc.; Glenn Tsuyuki, Jet Propulsion La
2:30 p.m.	***2006-01-2038***	***Design and Fabrication of a Passive Deployable/Stowable Radiator***
		Hosei Nagano, Yuji Nagasaka, Keio Univ.; Akira Ohnishi, Institute of Space & Astro Koji Yamaguchi, Orbital Engineering Corp.; Kazuki Watanabe, Yu Oikawa, Wel Res Ltd.
3:00 p.m.	***2006-01-2037***	***A Porous Media-Based Heat Exchanger: Experimental Measurements of Moisture Condensation***
		Vedha Nayagam, NASA; Ramaswamy Balasubramaniam, Mohammad M. Hasan, N Glenn Research Center; Charles Bunnell, David Althausen, ZIN Technologies
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2035***	***Mechanically Pumped Fluid Loop Technologies for Thermal Control of Future Mars Rovers***
		Gajanana Birur, Pradeep Bhandari, Mauro Prina, David P. Bame, Andre Yavrouian, Jet Propulsion Laboratory

Tuesday, July 18

Radiation Issues for Space Flight I

Session Code: ***ICES50A***

Room Chesapeake I-II ***Session Time:*** ***8:00 a.m.***

This session addresses major issues in space radiation analyses, tools, and research that are being developed and applied to support the Space Exploration Initiative to ensure astronaut radiation protection and safety.

Organizers - *William Atwell, Boeing Co.; Lawrence W. Townsend, Univ. of Tennessee*

Chairpersons - *William Atwell, Boeing Co.; Lawrence W. Townsend, Univ. of Tennessee*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2103***	***Space Radiation Exposure Mitigation: Study of Select Materials***
		William Atwell, Boeing Co.; John Nealy, Old Dominion University; Martha Clowdsley Langley Research Center
8:30 a.m.	***2006-01-2104***	***Radiation Shielding and Mechanical Strength Evaluations of Non-parasitic, Multi-functional Microporous Carbon for Aerospace Applications***
		Eric Rubenstein, Marek Wójtowicz, Erik Kroo, Advanced Fuel Research; Lawrence Univ. of Tennessee; Richard Wilkins, Brad Gersey, NASA Center for Applied Radiat Research; William Atwell, Boeing Co.
9:00 a.m.	***2006-01-2105***	***Passive Radiation Shielding Investigations in Low Earth Orbit and in an Accelerator***
		Cesare Lobascio, Vincenzo Guarnieri, Mauro Briccarello, Alcatel Alenia Space - Ital Marco Casolino, University Tor Vergata; Marco Durante, University of Napoli Federi
9:30 a.m.	***2006-01-2106***	***21st Century Lunar Exploration: Advanced Radiation Exposure Assessment***
		Brooke M. Anderson Park, Martha Clowdsley, John Nealy, NASA Langley Research Nathan Luetke, Lockheed Martin; John Wilson, NASA Langley Research Center

10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2108***	***Risk Assessment and Shielding Design for Long-Term Exposure to Ionizing Space Radiation*** *R. K. Tripathi, NASA Langley Research Center*
10:45 a.m.	***2006-01-2109***	***Standardized Radiation Shield Design Methods: HZETRN 2005*** *John W. Wilson, NASA Langley Research Center; F. F. Badavi, Christopher Newpo Francis A. Cucinotta, NASA Johnson Space Center; R. K. Tripathi, NASA Langley R Center*
11:15 a.m.	***2006-01-2110***	***Spacesuit Radiation Shield Design Methods*** *John W. Wilson, Brooke Anderson, NASA Langley Research Center; Francis A. Cu NASA Johnson Space Center; Joanne S. Ware, ILC Dover Inc.; Cary Zeitlin, Lawre Berkeley National Laboratory*

Tuesday, July 18

Radiation Issues for Space Flight II

Session Code: ***ICES50B***

Room Chesapeake I-II ***Session Time:*** ***1:30 p.m.***

This session addresses major issues in space radiation analyses, tools, and research that are being developed and applied to support the Space Exploration Initiative to ensure astronaut radiation protection and safety.

Organizers - *William Atwell, Boeing Co.*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2144***	***Numerical Study of the Generation of Linear Energy Transfer Spectra for Space Radiation Applications*** *Francis F. Badavi, Christopher Newport University; John Wilson, NASA Langley Res Center; Briana L. Abrahms, Brandeis Univ.; Abigail Hunter, University of Utah*
2:00 p.m.	***2006-01-2145***	***LET Spectra of High Energy Proton Beam on A-150:Model Predictions For The CRaTER Detector*** *Youssef Charara, Univ. of Tennessee; Lawrence W. Townsend, Univ. of Tennessee Hanna M. Moussa, Univ. of Tennessee*
2:30 p.m.	***2006-01-2146***	***MIDN, A MIcroDosimeter iNstrument for Space Exploration*** *Vincent L. Pisacane, Quentin Dolecek, Frank Maas, Martin Nelson, Philip Taddei, Z Zhao, James Ziegler, Patrick Acox, Mark Bender, James Brown, Tristan Garritsen, C Gaughan, Amy Hough, Brendon Kolb, Justin Langlois, Jefrey Ross, Mark Sheggeby Thomas, John Dicello, US Naval Academy; Francis Cucinotta, NASA JSC; Anatoly Andrew Wroe, University of Wollongong; Marco Zaider, Memorial Sloan-Kettering C Center*
3:00 p.m.	***2006-01-2147***	***An Improved Green's Function Code for HZE Ion Transport*** *John Tweed, Old Dominion Univ.*
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2148***	***Steps Toward Developing a Multi-layer Green' s Function Code for Ion Beam Transport*** *Steven A. Walker, John Tweed, Old Dominion Univ.; John Wilson, R. Tripathi, NASA Research Center; Francis Cucinotta, NASA Johnson Space Center*

4:15 p.m.	***2006-01-2149***	***A New Method for Calculating Low Energy Neutron Flux***
		Tony Slaba, J. H. Heinbockel, Old Dominion Univ.; John W. Wilson, Steve Blattnig, Clowdsley, NASA Langley Research Center; F. F. Badavi, Christopher Newport Uni

Tuesday, July 18

Thermal and Environmental Control Simulation Software

Session Code: ***ICES8***

Room Hampton Roads Ballroom I-II ***Session Time:*** ***8:00 a.m.***

Advances in analytical modeling are presented that have been achieved as a result of enhancements in existing software, new methodologies and algorithms, software integration and improvements in data exchange.

Organizers - *Olivier Pin, European Space Agency; William Ducas, Orbital Sciences Corp.; Nicholas M. Teti, Swales Aerospa Thomas, Alstom Power, Ltd.*

Chairpersons - *William Ducas, Orbital Sciences Corp.; Olivier Pin, European Space Agency; Nicholas M. Teti, Swales Aeros S. Thomas, Alstom Power, Ltd.*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2111***	***Interfacing Structural and Thermal Tools for Thermo-elastic Distortion Analysis***
		Cosmas Heller, Markus Huchler, EADS Astrium GmbH
8:30 a.m.	***2006-01-2112***	***Thermal Model Reduction: Algorithms and Validation Techniques***
		Marco Molina, Carlo Gavazzi Space; Concetta Clemente, Politecnico di Milano
9:00 a.m.	***2006-01-2113***	***MonteCarlo Techniques in Thermal Analysis Design Margins Determination Using Reduced Models and Experimental Data***
		Marco Molina, Amalia Ercoli Finzi, Politecnico di Milano
9:30 a.m.	***2006-01-2114***	***Development of a Thermo-Electric Cooler Simulation Routine for the Wide Field Camera 3 Thermal Model***
		Hume Peabody, Swales Aerospace; Richard Stavely, NASA Goddard Space Flight David Maidt, Orbital Sciences Corp.
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2115***	***An Environment for the Post-Processing of Thermal Analysis Results***
		Julian S. Thomas, Alstom Aerospace

Tuesday, July 18

Advanced Life Support Systems Control

Session Code: ***ICES18***

Room Hampton Roads Ballroom I-II ***Session Time:*** ***1:30 p.m.***

The Advanced Life Support Systems Control session reports on advanced life support system control topics such as: controller technology; control theory and application; autonomous control; integrated system control; control software; and modeling, simulation and emulation for control development.

Organizers - *Thomas J. Slavin, Kimberly Curry, Boeing Co.*

Chairpersons - *David Kortenkamp, NASA Johnson Space Center*

Time	***Paper No.***	***Title***

1:30 p.m.	***2006-01-2122***	***Integrated Modular Concepts for Improved ECLSS Command and Data Handling***
		Randall H. Black, Honeywell
2:00 p.m.	***2006-01-2121***	***System Engineering and Integration of Controls for Advanced Life Support***
		David Overland, NASA Johnson Space Center; Karlene Hoo, Texas Tech. Univ.
2:30 p.m.	***2006-01-2124***	***Process Control for Advanced Life Support, Biological Test Bed***
		Marvin Ciskowski, Hamilton Sundstrand Management Services; David Overland, NA Johnson Space Center; Karlene Hoo, Texas Tech. Univ.
3:00 p.m.	***2006-01-2125***	***Simulation Model for the Closed Animal Breeding and Habitation Experiment Facility of CEEF***
		Koichi Abe, Institute for Environmental Sciences; Tomofumi Hirosaki, Space System Development Corporation; Hiroyuki Miyajima, Tokyo Jogakkan College; Yoshio Ishil Univ.; Masahiro Endo, Keiji Nitta, Institute for Environmental Sciences
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2123***	***Design of Intelligent Control Software for Mini-Earth***
		Hiroyuki Miyajima, Tokyo Jogakkan College; Koichi Abe, Institute for Environmental Tomofumi Hirosaki, Space Systems Development Corporation; Yoshio Ishikawa, Ni

Tuesday, July 18

Microbial Factors Applied to Design

Session Code: ***ICES57***

Room Hampton Roads Ballroom VII ***Session Time:*** ***1:30 p.m.***

It is impossible to maintain sterile conditions in environments inhabited by humans. Microorganisms will be a dynamic part of such environments, on Earth, in space and on a planetary outpost. The design of a spacecraft or space habitat has to take in consideration the effect of microorganisms on materials and systems to minimize hardware performance issues.

Organizers - *Victoria Castro, Wyle Laboratories; Monsi Roman, NASA Marshall Space Flight Center*

Chairpersons - *Victoria Castro, Wyle Laboratories; Aaron L. Mills, NASA Kennedy Space Center; Monsi Roman, NASA Mar Flight Center*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2156***	***The Influence of Microbiology on Spacecraft Design and Controls: A Historical Perspective of the Shuttle and International Space Station Programs***
		Victoria Castro, Wyle Laboratories; Rebekah Jean Bruce, Enterprise Advisory Servi Mark Ott; Duane L. Pierson, NASA Johnson Space Center
2:00 p.m.	***2006-01-2157***	***Microbial Characterization of Internal Active Thermal Control System (IATCS) Hardware Surfaces after Five Years of Operation in the International Space Station***
		Monsi Roman, NASA Marshall Space Flight Center; Natalee E. Weir, Boeing Co.; M Wilson, Boeing Aerospace Co.; Barry H. Pyle, Montana State Univ.
2:30 p.m.	***2006-01-2159***	***Microbiological Sampling of the Multi-Purpose Logistics Module from Return to Flight Mission ISS LF-1/STS-114***
		Michael S. Roberts, Dynamac Corp.; Randall Sumner, Bionetics Corp.; Aaron Mills, Virginia

3:00 p.m.	***2006-01-2160***	***Airborne Endospore Bioburden as an Indicator of Spacecraft Cleanliness***
		Donald C. Obenhuber, Elizabeth Lester, Pun To Yung, Kasthuri Venkateswaran, Ad Jet Propulsion Laboratory; Barry Pyle, Montana State University; Monserrate Roma Space Flight Center

Tuesday, July 18

EVA - Systems

Session Code: ***ICES34B***

Room James I-III ***Session Time:*** ***8:00 a.m.***

This session includes topics describing aspects of EVA technologies and studies related to space suit portable life support systems. Concepts and testing of portable life support systems are also included.

Organizers - *Robert C. Trevino, NASA Johnson Space Center*

Chairpersons - *Robert C. Trevino, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2201***	***Innovative Schematic Concept Analysis for a Space Suit Portable Life Support Subsystem***
		Michael Schuller, Texas A&M Univ.; David Klaus, Univ. of Colorado-Boulder; Thoma Texas A&M Univ.; Lauren Wiseman, Wisco Inc.; Gretchen Thomas, NASA Johnson Center; Frank Little, Olivier Godard, Texas A&M University; Ryan Kobrick, Universit Colorado; Sherif Abdel-Fattah, Texas A&M University; Michael Rouen, NASA Johns Center; Ray Askew, Texas A&M University
8:30 a.m.	***2006-01-2202***	***Advanced Space Suit Portable Life Support Subsystem Packaging Design***
		Michael Rouen, NASA, Johnson Space Center
9:00 a.m.	***2006-01-2203***	***Development of Pressure Swing Adsorption Technology for Spacesuit Carbon Dioxide and Humidity Removal***
		William G. Papale, Hamilton Sundstrand; Healther L Paul, Gretchen A. Thomas, NA Johnson Space Center
9:30 a.m.	***2006-01-2205***	***Durable Coating Technology for Lunar Dust Protection and Mitigation***
		Juan H. Agui, NASA John Glenn Research Center; Paul Hambourger, Cleveland St Jordan Wirfs-Brock, Massachusetts Institute of Technology; John M. Griffin, Jason T Ashraf G. Morgan, Cleveland State Univ.
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2206***	***Human Systems Monitoring During Extravehicular Activity (EVA)***
		Azhar Rafiq, Xiaoming Zhao, Cosmin Boanca, Esther Hughes, Ronald Merrell, Virgi Commonwealth University
10:45 a.m.	***2006-01-2208***	***Emergency Oxygen System Evaluation for Exploration PLSS Applications***
		Walt Vonau Jr., Jacobs Sverdrup; Bruce Conger, Hamilton Sundstrand; Heather Pa Johnson Space Center

Tuesday, July 18

EVA - Space Suits

Session Code: ***ICES34A***

Room James I-III ***Session Time: 1:30 p.m.***

This is an exciting time for EVA. The NASA human space exploration program, Constellation, will need new EVA systems and space suits to meet the Crew Excursion Vehicle and lunar and Martian surface operations requirements. The first of four EVA sessions begins with a broad perspective review of various approaches to EVA systems and space suit architectures. It continues with papers that discuss major design drivers for the space suit pressure garments. Topics range from field test results to creative approaches to suit sizing.

Organizers - *Edward W. Hodgson, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center*

Chairpersons - *Amy J. Ross, NASA Johnson Space Center*

Time	Paper No.	Title
1:30 p.m.	***2006-01-2135***	***A Comparison of Pressure Suit Systems Architectures for the Space Exploration Enterprise***
		Edward W. Hodgson, Steven G. Dionne, Victoria Margiott, Hamilton Sundstrand Spa Sea; Sean Murray, Kenneth Thomas, Mary Ann Valk, Hamilton Sundstrand; Jinny F Keith Splawn, ILC Dover LP
2:00 p.m.	***2006-01-2137***	***Crew Protection, Contingency EVA and the Crew Exploration Vehicle***
		Gary L. Harris, Pablo De Leon, University of North Dakota
2:30 p.m.	***2006-01-2138***	***Desert Research and Technology Studies 2005 Results***
		Amy J. Ross, Joseph J. Kosmo, Barbara Janoiko, NASA Johnson Space Center; Cr Bernard, NASA Jonson Space Center; Dean Bener Eppler, Science Applications Int Corporation; W. Keith Splawn, ILC Dover Inc.
3:00 p.m.	***2006-01-2140***	***Morphing: A Novel Approach to Suit Sizing***
		Sarah Margerum, Lockheed Martin Space Operations; Karen Young, Lockheed Mar Kurt Clowers, MEI Technologies; Sudhakar Rajulu, NASA Johnson Space Center
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2141***	***System Considerations for an Exploration Spacesuit Upper Torso Architecture***
		Jinny Ferl, Linda Hewes, David Cadogan, David Graziosi, W. Keith Splawn, ILC Dov
4:15 p.m.	***2006-01-2142***	***Morphing Upper Torso: A Novel Concept in EVA Suit Design***
		Shane Jacobs, David Akin, Jeffrey Braden, University of Maryland; David Graziosi, LP
4:45 p.m.	***2006-01-2143***	***Evaluation of the Rear Entry I-Suit during Desert RATS Testing***
		David Graziosi, ILC Dover LP; W. Keith Splawn, ILC Dover Inc.; Jinny Ferl, ILC Dov Ross, NASA Johnson Space Center

Tuesday, July 18

Physico-Chemical Life Support Process Development: Water

Session Code: ***ICES19A***

Room Marriott Ballroom I-III ***Session Time: 8:00 a.m.***

This session will be dedicated to current research activities in water recovery and water purification technologies. Use of catalytic systems as well as membrane system have proven to be effective in recovery of water from wastewater for use by astronauts.

Organizers - *John W. Fisher, John Hogan, Kanapathipillai Wignarajah, NASA Ames Research Center*

Chairpersons - *John W. Fisher, Michael T. Flynn, John Hogan, NASA Ames Research Center*

Time	Paper No.	Title

8:00 a.m.	***2006-01-2083***	***Alterative Physical and System Architectures for Membrane Based Advanced Regenerative Space Life Support System Water Processing***
		Sherwin Gormly, National Space Grant Foundation; Michael Flynn, NASA Ames Re Center
8:30 a.m.	***2006-01-2084***	***Performance of a Magnetically Agitated Photocatalytic Reactor for Oxidation of Ersatz Water***
		William Kostedt IV, David Mazyck, Univ. of Florida
9:00 a.m.	***2006-01-2085***	***Effect of Photocatalyst Type on Oxidation of Ersatz Water Using a Photocatalytic Reactor with Slurry Separation***
		William Kostedt IV, David Mazyck, Univ. of Florida; Tony Powell, Brian Butters, Puri
9:30 a.m.	***2006-01-2086***	***New Concepts and Performance of the Direct Osmotic Concentration Process for Wastewater Recovery in Advanced Life Support Systems***
		Tzahi Y. Cath, University of Nevada Reno
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2087***	***Design Validation - Via Parabolic Flight Tests - of a Condensate Buffer Equalizing a Discontinuous Gas / Water Flow Between a Condensing Heat Exchanger and a Water Separator***
		Helmut Christoph Westermann, Roland Mueller, EADS Space Transportation; Beren Houdou, Johannes Witt, ESA
10:45 a.m.	***2006-01-2088***	***Energy Efficient Closed Loop Heat Pump Dryer for Solid Waste Stabilization on Long Duration Space Missions***
		Jean B. Hunter, Cornell University; Robert Morrow, William Butrymowicz, Orbital Te Corp.; Apollo Arquiza, Cornell University
11:15 a.m.	***2006-01-2009***	***Commercialization of Silica-Titania Composites, a NASA Gray Water Post Processor Technology, for Terrestrial Applications***
		David W. Mazyck, Univ. of Florida

Tuesday, July 18

Physico-Chemical Life Support Process Development: Water and Air

Session Code: ***ICES19B***

Room Marriott Ballroom I-III ***Session Time:*** ***1:30 p.m.***

This session will emphasize research activities in the field of air revitalization and Space Station Water processing systems. It is currently contended that two of the major limitations to the number of crew members on Space Station is the availability of oxygen and water. The papers presented will emphasize technology for revitalization of air and recovery of water in Space Station and other Space habitats.

Organizers - *John W. Fisher, Michael T. Flynn, Kanapathipillai Wignarajah, NASA Ames Research Center*

Chairpersons - *John W. Fisher, Michael T. Flynn, NASA Ames Research Center*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2126***	***Performance Characterization of a Temperature-Swing Adsorption Compressor Based on Integrated Tests with Carbon Dioxide Removal and Reduction Assemblies***
		Lila M. Mulloth, Science Applications International Corp.; Mini Varghese, Enterprise Services Inc.; Micha Rosen, Science Applications International Corp.; James Knox, Marshall Space Flight Center; Bernadette Luna, Bruce Webbon, NASA Ames Resea
2:00 p.m.	***2006-01-2127***	***Trace Contaminant Removal from Air via Photocatalytic Oxidation***
		Stephen F. Yates, Tihomir Tonev, Stephen Lupton, Honeywell

2:30 p.m.	***2006-01-2128***	***Catalytic Decomposition of Gaseous Byproducts from Primary Solid Waste Treatment Technologies***
		Thomas W. Williams, Umpqua Research Company
3:00 p.m.	***2006-01-2130***	***Testing of Performance of a Scroll Pump in Support of Improved Vapor Phase Catalytic Ammonia Removal (VPCAR) Mass Reduction***
		Henry K. Nahra, Thomas Kraft, Glenda Yee, NASA Glenn Research Center; Michae NASA Ames Research Center; Amy Jankovsky, NASA Glenn Research Center
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2131***	***Fluid Dynamics Assessment of the VPCAR Water Recovery System in Partial and Microgravity***
		Charles E. Niederhaus, Henry Nahra, NASA John Glenn Research Center; Michael NASA Ames Research Center
4:15 p.m.	***2006-01-2132***	***Diffusion Limited Supercritical Water Oxidation (SCWO) in Microgravity Environments***
		Michael C. Hicks, NASA John Glenn Research Center
4:45 p.m.	***2006-01-2133***	***Modeling and Analyses of an Integrated Air Revitalization System of a 4-Bed Molecular Sieve Carbon Dioxide Removal System (CDRA), Mechanical Compressor Engineering Development Unit (EDU) and Sabatier Engineering Development Unit***
		Frank F. Jeng, Jacobs Sverdrup/Barrios Technology; Melissa Campbell, Hamilton S Mgmt. Services Inc.; Sao-Dung Lu, MEI; James Knox, NASA Marshall Space Flight Fred Smith, NASA JSC

Tuesday, July 18

International Space Station Systems ECLSS: Air

Session Code: ***ICES31***

Room Marriott Ballroom IV ***Session Time:*** ***8:00 a.m.***

This session addresses ECLS air and water subsystems and lessons learned from the ISS.

Organizers - *Patricia O'Donnell, Hamilton Sundstrand; Richard P. Reysa, MEI Technologies Inc.*

Chairpersons - *Gregory J. Gentry, Boeing Co.; David E. Williams, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2090***	***International Space Station (ISS) Metabolic Oxygen Consumption for Expeditions 12***
		Phillip Watters, Boeing Co.; Ryan Schaezler, MEI Technologies Inc.
8:30 a.m.	***2006-01-2091***	***International Space Station Nitrogen System Performance***
		Daniel James Leonard, Boeing Co.; Richard Ehmer, Boeing Space Exploration
9:00 a.m.	***2006-01-2092***	***International Space Station (ISS) Major Constituent Analyzer (MCA) On-Orbit Performance***
		George Steiner, Souzan Maleki-Thoresen, Hamilton Sundstrand; Richard P. Reysa, Technologies Inc.; John Granahan, The Boeing Company
9:30 a.m.	***2006-01-2093***	***International Space Station (ISS) Water Transfer Hardware Logistics***
		Brienne Shkedi, NASA Johnson Space Center
10:00 a.m.		***BREAK***

10:15 a.m.	***2006-01-2094***	***International Space Station Water Usage Analysis***
		Cynthia L. Philistine, Boeing Co.; Ara Kulhanjian, MEI Technologies
10:45 a.m.	***2006-01-2095***	***Recommendations for Water Systems in Future Space Applications***
		Laurie Peterson, Brienne Shkedi, Laura Shaw, John Lewis, Richard Morton, NASA Space Center

Tuesday, July 18

Management of Air Quality in Sealed Environments

Session Code: ***ICES51***

Room Marriott Ballroom IV ***Session Time:*** ***1:30 p.m.***

The papers in this session will address issues related to managing air quality in sealed environments such as submarines, aircraft, and spacecraft. Presentations will describe different aspects of air quality management including preventive steps to control contaminants, predictive activities to determine the risk of contaminant exposure, and the development of monitoring devices to measure the air quality.

Organizers - *John T. James, NASA Johnson Space Center; Thomas Limero, Wyle Laboratories*

Chairpersons - *Hilary Bollan, Defence Procurement Agency; Thomas Limero, Wyle Laboratories*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2150***	***Paecilomyces lilacinus and Fusarium Verticillioides Remove t-Butanol from Contaminated Air***
		Jane Shevtsov, UCLA; Ignacio Eraso, Gary Stutte, Dynamac Corp.
2:00 p.m.	***2006-01-2154***	***Indoor Air Comfort for Human Life Support in Living Compartments of Manned Submersibles***
		Eugeniy Trushliakov, National University of Shipbuilding
2:30 p.m.	***2006-01-2151***	***Flight Data Update on Long-Term Compound Stability in Dual Sorbent Tubes***
		Thomas Limero, Wyle Laboratories
3:00 p.m.	***2006-01-2152***	***Airborne Dust in Space Vehicles and Habitats***
		John T. James, NASA Johnson Space Center
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2153***	***Evaluation of Gas Chromatography-Differential Mobility Spectrometry for Measurement of Air Contaminants in Spacecraft***
		Thomas Limero, Wyle Laboratories
4:15 p.m.	***2006-01-2155***	***NOx emission during operation of a drying toilet system in air-circulated confinement experiment***
		Susumu Nozoe, Shouichi Tsuga, Yasuhiro Tako, Institute for Environmental Science Nakamura, Scientec Co., Ltd.

Tuesday, July 18

Bioregenerative Life Support

Session Code: ***ICES15***

Room Marriott Ballroom V-VII ***Session Time:*** ***8:00 a.m.***

This session focuses on the development of ground-based experiments, experimental facilities and flight hardware designs and experiments associated with Bioregenerative Life Support Systems.

Organizers - *Mark Kliss, NASA Ames Research Center; Yas Takashima, Ichidai Nursery Inc.; Yasuhiro Tako, Institute for En*

Sciences

Chairpersons - *Mark Kliss, NASA Ames Research Center*

Time	Paper No.	Title
8:00 a.m.	***2006-01-2082***	***Comparison of Bioregenerative and Physical/Chemical Life Support Systems***
		Harry W. Jones, NASA Ames Research Center
8:30 a.m.	***2006-01-2075***	***Carbon Flow in an Artificial Ecosystem Comprised of Crew, Goats and Crops for Three 1-Week Confined Habitation Experiments using CEEF***
		Yasuhiro Tako, Institute for Environmental Sciences
9:00 a.m.	***2006-01-2076***	***Carbon Dioxide Separation and Recovery From the Closed Animal Breeding and Habitation Module of the CEEF During Closed Habitation Experiments***
		Takashi Tani, Susumu Nozoe, Shouichi Tsuga, Yasuhiro Tako, Institute for Environ Sciences
9:30 a.m.	***2006-01-2080***	***Mushroom Cultivation in the Bed of Feces Obtained from Shiba Goats***
		Hideo Minagawa, M. Sato, K. Sano, T. Hirabayshi, Kitasato University
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2078***	***Rapid and Accurate Determination of Bacterial Abundance and Their Physiological Activity in Fresh Water Used in Closed Ecology Experiment Facilities (CEEF) "Mini-Earth", Japan***
		Takashi Baba, Nobuyasu Yamaguchi, Masao Nasu, Osaka University; Youichi Aibe Shinohara, Institute for Environmental Sciences
10:45 a.m.	***2006-01-2079***	***Rapid and Accurate Quantification of Bacterial Cells in Fresh Water Using a Simplified Microfluidic Device***
		Nobuyasu Yamaguchi, Hiroyasu Nagase, Masao Nasu, Osaka University
	2006-01-2074	***Simulation of Membrane-Photobioreactor for Carbon Dioxide Removal by Microalgal Photosynthesis***
		Lihua Cheng, Zhejiang Univ.

Tuesday, July 18

Space Station Thermal Control

Session Code: ***ICES7***

Room Marriott Ballroom V-VII ***Session Time:*** ***1:30 p.m.***

This session addresses thermal/environmental control onboard the International Space Station (ISS). Topics range from system and component issues with ISS thermal control systems to thermal aspects of other hardware. Specifically this session will address IATCS coolant anomalies and remediation, hardware design challenges associated with the coolant, proposals for innovative system and component designs, and loop performance and testing results. Thermal insulation designs based on past experiences and for specific applications are also addressed.

Organizers - *Thomas O. Leimkuehler, Honeywell; Gualtiero Brambati, Alenia Spazio SpA; Stephen E. Tongue, Hamilton Sur Systems; Jon Holladay, NASA Marshall Space Flight Center; Zoltan Szigetvari, European Aeronautic Defence a*

Chairpersons - *Gualtiero Brambati, Alcatel Alenia Space Italia SpA; Jon Holladay, NASA Marshall Space Flight Center; Mar EADS Astrium GmbH; Thomas O. Leimkuehler, Honeywell; Zoltan Szigetvari, European Aeronautic Defence Co.; Stephen E. Tongue, Hamilton Sundstrand*

Time	Paper No.	Title

1:30 p.m.	***2006-01-2161***	***ISS Internal Active Thermal Control System (IATCS) Coolant Remediation Project - 2006 Update***
		James M. Holt, NASA Marshall Space Flight Center; Russell H. Morrison, The Boeir Company
2:00 p.m.	***2006-01-2162***	***Fluid Quick Disconnects - ISS Lessons Learned***
		Timothy Bond, NASA Johnson Space Center; Russell Morrison, Boeing Co.
2:30 p.m.	***2006-01-2163***	***Heat Pipe Heat Exchanger with Two Levels of Isolation for Environmental Control of Manned Spacecraft Crew Compartment***
		David B. Sarraf, Advanced Cooling Technologies Inc.
3:00 p.m.	***2006-01-2164***	***ATCS Re-Certification Test: The Investigation of Columbus MT Loop Performances Close and Beyond Its Maximum Operative Limits***
		Paolo Vaccaneo, Savino De Palo, Alcatel Alenia Space Italia SpA
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2165***	***Thermal Design and Model Correlation of a Microgravity Vibration Isolation System for an International Space Station Facility***
		Stephan Lapensee, Darius Nikanpour, Canadian Space Agency
4:15 p.m.	***2006-01-2166***	***ISS Node 3 IECS Anti-Condensation Insulation Design***
		Giuseppe Valenzano, Alenia Aerospazio
4:45 p.m.	***2006-01-2167***	***Russian Systems Thermal Tayloring and Application on ATV Cargo Carrier***
		Maria Cristina Tosi, Luca Tentoni, ALCATEL ALENIA SPACE
5:15 p.m.	***2006-01-2117***	***ATV Jules Verne Thermal Vacuum Test Predictions***
		Maria Cristina Tosi, ALCATEL ALENIA SPACE

Wednesday, July 19

Bio Support Hardware / Plant Growth Systems Technology

Session Code: ***ICES44***

Room Chesapeake I-II ***Session Time:*** ***8:00 a.m.***

The session will cover topics in research and technology development needed for space flight systems to support planetary exploration, including habitation and life support applications. The session will also include the plant flight hardware systems needed for manned and unmanned exploration systems.

Organizers - *Cynthia M. Martin-Brennan, Bionetics Corp.; Robert C. Morrow, Orbital Technologies Corp.*

Chairpersons - *Cynthia M. Martin-Brennan, Bionetics Corp.; Robert C. Morrow, Orbital Technologies Corp.*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2210***	***Instrumental Approaches and Pecularities of Design of Stationary and Portable Analytical Devices for Determination of Bio- and Cheml-Luminescence***
		Nikolaj Starodub, National Academy Sciences of Ukraine
8:30 a.m.	***2006-01-2211***	***Integration of Heat Capacity and Electrical Conductivity Sensors for Root Module Water and Nutrient Assessment***
		Robert Heinse, Utah State University; Gerard Kluitenberg, Kansas State University; Austin, Peter J. Shouse, USDA-ARS; Kelly S. Lewis, Utah State University; Gail E. I Space Dynamics Laboratory; Scott B. Jones, Utah State University

9:00 a.m.	***2006-01-2212***	***Single Loop for Cell Culture (SLCC) - Development and Spaceflight Qualification of a Perfusion Cell Culture System***
		Alexander Hoehn, University of Colorado; Jacob Freeman, Bioserve Space Technol Koenig, Louis Stodieck, Matthew Vellone, Shea Williams, BioServe Space Technolo Wendy Feenstra, Javier DeLuis, Joe Parrish, Stephan Pretorius, Robert Renshaw, L Payload Systems Inc.; Stephen Dyble, Nancy Searby, Donald Vandendriesche, NAS Research Center
9:30 a.m.	***2006-01-2215***	***The Point-by-Point Irradiance Method Applied to Plant Systems Based on the Phytometric System***
		Gilberto J. C. da Costa, PUCRS University, Brazil; Joel L. Cuello, Univ. of Arizona
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2214***	***Plant Facilities for Inflatable Habitats***
		M. Lamantea, C. Lobascio, M.A. Perino, Alcatel Alenia Space - Italia; F. Piccolo, V. Aerosekur; L. Bertaggia, Agronomos
10:45 a.m.	***2006-01-2213***	***Optimization of Extraterrestrial Plant Biology Research Through the Use of Standardized Plant Cultivation and Analysis Technologies***
		Gerard Heyenga, University of Colorado; Cameron Blackford, Science Technology Robert N. Bowman, Lockheed Martin Engineering; Mark Kliss, NASA Ames Researc

Wednesday, July 19

Panel: Mars and Beyond

Session Code: ***ICES49***

Room Chesapeake I-II ***Session Time:*** ***1:30 p.m.***

Organizers - *Marie-Christine Desjean, Centre National D'Etudes Spatiales*

Panelists - *Pradeep Bhandari, Jet Propulsion Laboratory; Francois Forget, Université de Paris; Keith S. Novak, Jet Propulsi John Wilson, Princeton Univ.*

Wednesday, July 19

Regenerable Life Support Processes and Systems

Session Code: ***ICES33A***

Room Franklin/Shangri-La Yorktown ***Session Time:*** ***8:00 a.m.***

This session covers development of Regenerable Life Support Processes and Systems for Spacecraft.

Organizers - *Loel Goldblatt, Hamilton Sundstrand Space Systems Intl.; Frederick D. Smith, NASA Johnson Space Center*

Chairpersons - *Loel Goldblatt, Tim A. Nalette, Hamilton Sundstrand Space Systems Intl.; Frederick D. Smith, NASA Johnso Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2192***	***Development Status of Amine-based, Combined Humidity, CO2, and Trace Contaminant Control System for CEV***
		Tim A. Nalette, Hamilton Sundstrand Space Systems Intl.; William Papale, Hamilton Sundstrand; Fred Smith, NASA Johnson Space Center; Jay Perry, NASA Marshall S Center

8:30 a.m.	***2006-01-2193***	***Monolithic Sorbents for Carbon Dioxide Removal***
		Marek A. Wójtowicz, Elizabeth Florczak, Erik Kroo, Eric Rubenstein, Michael Serio, Fuel Research; Thomas Filburn, Univ. of Hartford
9:00 a.m.	***2006-01-2194***	***Modified X Zeolites as Next Generation Carbon Dioxide Adsorbents***
		Stephen F. Yates, Tihomir Tonev, Honeywell; Allen Macknight; Robert Kay, Honeyw
9:30 a.m.	***2006-01-2195***	***Nanoscale Materials for Human Spaceflight Applications: Regenerable Carbon Dioxide Removal Using Single-wall Carbon Nanotubes***
		Rama Kumar Allada, NASA Johnson Space Center; Jayanta Chattopadhyay, Rice University/CNST; Padraig Moloney, NASA Johnson Space Center; Kunal Shah, Ric University/CNST; Thomas Filburn, Univ. of Hartford; Molly Anderson, NASA Johnso Center; Fred Smith, NASA JSC; W. Edward Billups, Rice University/CNST; Sivaram NASA Johnson Space Center/ERC Inc.; Leonard Yowell, NASA Johnson Space Ce
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2196***	***Critical Factor Identification for Vacuum Regenerated Carbon Dioxide and Water Vapor Adsorption Beds***
		Robert Kay, Honeywell
10:45 a.m.	***2006-01-2197***	***Novel Photocatalytic Filter for Removal of Trace Contaminant Gases***
		Anuncia Gonzalez-Martin, Lynntech, Inc.; Brian Hennings, Koray Ozdemir, Jennifer Jinseong Kim, Lynntech Inc.

Wednesday, July 19

Regenerable Life Support Processes and Systems

Session Code: ***ICES33B***

Room Franklin/Shangri-La Yorktown ***Session Time:*** ***1:30 p.m.***

Organizers - *Loel Goldblatt, Hamilton Sundstrand Space Systems Intl.; Frederick D. Smith, NASA Johnson Space Center*

Chairpersons - *Loel Goldblatt, Tim A. Nalette, Hamilton Sundstrand Space Systems Intl.; Frederick D. Smith, NASA Johnso Center*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2198***	***Rapid Cycling CO2 and H2O Removal System for EMU***
		Gokhan O. Alptekin, Matthew L. Cates, Margarita Dubovik, Yevgenia Gershanovich Research Inc.; Heather Paul, Gretchen A. Thomas, NASA Johnson Space Center
2:00 p.m.	***2006-01-2199***	***Development of Advanced ECS***
		Hidefumi Saito, Shimadzu Corp.; Naomasa Shinoda, Japan Aircraft Development C Takao, Mitsubishi Heavy Industries, Ltd.; Susumu Ohara, Tokyo Aircraft Instrument
2:30 p.m.	***2006-01-2200***	***Development of CO2 Remover for Aircraft Advanced ECS***
		Mitsuyuki Kouzuma, Takatoshi Shouji, Kawasaki Heavy Industries Ltd.; Naomasa S Japan Aircraft Development Corp.

Wednesday, July 19

Missions, Requirements, Metrics, and Decision Tools

Session Code: ***ICES26***

Room Hampton Roads Ballroom I-II ***Session Time:*** ***8:00 a.m.***

This session includes topics such as: mission planning and requirements, the impact of mission characteristics on technology selection, and measures and tools for evaluating mission and technology options.

Organizers - *Kevin E. Lange, Jacobs Sverdrup; Julie A. Levri, NASA Ames Research Center*

Chairpersons - *Kevin E. Lange, Jacobs Sverdrup; Julie A. Levri, NASA Ames Research Center*

Time	Paper No.	Title
8:00 a.m.	***2006-01-2188***	***Application of Supply Chain Optimization and Protocol Environment Architecture to ALS Modeling and Visualization of a Mars Surface Habitat*** *Michael E. Lasinski, Seza Orcun, Raj Arangarasan, Meiqi Ren, Purdue Univ.*
8:30 a.m.	***2006-01-2189***	***A Simple Project Process Model for Estimating and Controlling Cost and Schedule*** *Harry W. Jones, NASA Ames Research Center*
9:00 a.m.	***2006-01-2190***	***NASA's On-line Project Information System (OPIS) Attributes and Implementation*** *Julie A. Levri, NASA Ames Research Center; John Hogan, National Space Grant Fo Rich Morrow, Michael Ho, Bob Kaehms, Lockheed Martin Space Operations Co.; Ji Cavazzoni, Rutgers Univ.; Jon Welch, Kim Chan, Lockheed Martin Space Operation Dawn Whitaker, Purdue Univ.*
9:30 a.m.	***2006-01-2191***	***Air and Water Recycling System Development for a Long Duration Lunar Base*** *Harry Jones, Mark Kliss, NASA Ames Research Center*

Wednesday, July 19

Integrated Advanced Water Recovery

Session Code: ***ICES59***

Room Hampton Roads Ballroom I-II ***Session Time:*** ***1:30 p.m.***

This session focuses on the development of waste recovery technologies within integrated biological and physical/chemical treatment systems. Paper topics this year include evaluation of biological processes for pre-treatment of liquid waste streams, and post processing of solid waste biologically stabilized solids.

Organizers - *Darryl Dwayne Low, W. Andrew Jackson, Texas Tech. Univ.; Kathy Banks, Cummins Inc.; Jay L. Garland, Dyna*

Chairpersons - *W. Andrew Jackson, Texas Tech. Univ.*

Time	Paper No.	Title
1:30 p.m.	***2006-01-2255***	***Anaerobic Stabilization of Early Planetary Base Ersatz Wastewater Formulation*** *Kevin R. Gilmore, Romeo Capuno, Nancy Love, Virginia Tech.; Barth Smets, Techn Denmark*
2:00 p.m.	***2006-01-2256***	***Simultaneous Biodegradation of a Two-Phase Fluid: Discolored Biofilm Issues*** *Eric Scott McLamore*
2:30 p.m.	***2006-01-2257***	***Alleviating Carbon Limitations in the Early Planetary Base Waste Stream*** *Audra Morse, Texas Tech. Univ.; Tiffany Diaz; W. Jackson, Texas Tech. Univ.*
3:00 p.m.	***2006-01-2258***	***Post-Treatment of Anaerobically Digested Solid Waste From Long Term Space Missions*** *Pratap Pullammanappallil, Wei Liu, Arthur Teixeira, Univ. of Florida*
3:30 p.m.		***BREAK***

3:45 p.m.	***2006-01-2259***	***Theoretical applications for Mechanized Vermi-composting technology as a bio-regenerative tool in CELSS***
		Ryan Salcido, Remedy Resources
4:15 p.m.	***2006-01-2260***	***Principles of Express of Instrumental Control of Total Toxicity of Environmental Objects and Their Realization in Space Conditions***
		Nikolaj Starodub, National Academy Sciences of Ukraine

Wednesday, July 19

Advanced Life Support Sensor and Control Technology

Session Code: ***ICES17***

Room Hampton Roads Ballroom VII ***Session Time:*** ***8:00 a.m.***

The sessions on Advanced Life Support, Sensor and Control Technology include papers describing approaches to monitoring water and air in enclosed habitats, thermal control of habitats, chemical sensors and sensing devices for detection of chemical constituents in water and air, and on systems and system concepts for environmental monitoring and control.

Organizers - *Margaret A. Ryan, Jet Propulsion Laboratory; Timo Stuffler, Kayser-Threde GmbH; Darrell L. Jan, Jet Propulsio*

Chairpersons - *Darrell L. Jan, Margaret A. Ryan, Jet Propulsion Laboratory; Timo Stuffler, Kayser-Threde GmbH*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2176***	***The ANITA Air Monitoring Programme and Instrumentation - ISS and other Applications***
		Timo Stuffler, Kayser-Threde GmbH
8:30 a.m.	***2006-01-2177***	***Protein-Based Sensors for Environmental Monitoring***
		Chad D. Paavola, NASA Ames Research Center
9:00 a.m.	***2006-01-2178***	***Advanced Miniature IR Spectral Processor for the Infrared Spectral Monitoring of Spacecraft Vital Life-Support Systems and Remote Astronaut Health Diagnostics***
		Roman Volodymyr Kruzelecky, Brian Wong, Jing Zou, Wes Jamroz, MPB Communi Inc.; Mohamed Soltani, Mohammed Chaker, INRS Énergie et Matériaux
9:30 a.m.	***2006-01-2179***	***Expanding the Capabilities of the JPL Electronic Nose for an International Space Station Technology Demonstration***
		Margaret A. Ryan, Jet Propulsion Laboratory

Wednesday, July 19

Advanced Life Support and Systems Analysis

Session Code: ***ICES45***

Room Hampton Roads Ballroom VII ***Session Time:*** ***1:30 p.m.***

This session addresses life support for future missions, and in particular technology options and optimizing the selection and integration of technologies into complete systems. The focus will be on optimizing system level metrics.

Organizers - *Alan E. Drysdale, Boeing Co.; Harry W. Jones, NASA Ames Research Center*

Chairpersons - *Alan E. Drysdale, Boeing Co.; Harry W. Jones, NASA Ames Research Center*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2241***	***New Direction of NASA Exploration Life Support***
		Joe Chambliss, Michael B. Lawson, Daniel J. Barta, NASA Johnson Space Center

2:00 p.m.	***2006-01-2243***	***Process for Selecting System Level Assessments for Human System Technologies***
		John Park, Jacobs Sverdrup
2:30 p.m.	***2006-01-2244***	***A Simulation Approach to Minimize Water Supply, Storage Capacity and Treatment Capacity Requirements in ALS System***
		Chit Hui Ang, Tze Chao Chiam, Yuehwern Yih, Purdue Univ-West Lafayette
3:00 p.m.	***2006-01-2245***	***Modeling the Impact of Water Systems Configuration on the Overall System Health of a Human Space Habitat***
		Tze Chao Chiam, Chit Hui Ang, Purdue Univ.; Yuehwern Yih, Purdue Univ-West La
3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2246***	***An Optimization Framework to Design an Integrated ALSS***
		Selen Aydogan, Seza Orcun, Gary Blau, Joseph Pekny, Gintaras Reklaitis, Purdue
4:15 p.m.	***2006-01-2247***	***Reduced Pressure Atmosphere Impacts on Life Support and Internal Thermal Systems***
		Molly Anderson, NASA Johnson Space Center
4:45 p.m.	***2006-01-2248***	***Recommendations for Clothing Systems for Advanced Missions***
		Alan E. Drysdale, Boeing Co.

Wednesday, July 19

EVA - PLSS & Support Equipment I

Session Code: ***ICES34C***

Room James I-III ***Session Time:*** ***8:00 a.m.***

This session presents papers dealing with the design of EVA spacesuit systems and their components with an emphasis on thermal control. Individual papers deal with a wide range of topics in this area from environmental challenges and analytical techniques to new materials and design approaches. Conceptual and experimental studies of design solutions for future exploration systems and operational experience with current systems are represented.

Organizers - *Edward W. Hodgson, Hamilton Sundstrand; Amy J. Ross, Robert C. Trevino, NASA Johnson Space Center*

Chairpersons - *Edward W. Hodgson, Hamilton Sundstrand; Amy J. Ross, Robert C. Trevino, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2231***	***Lunar EVA Thermal Environment Challenges***
		Luis A. Trevino, NASA Johnson Space Center; Dustin A. Ochoa, Bruno M. S. Miran Sverdrup (ESCG); Bruce C. Conger, Hamilton Sundstrand (ESCG)
8:30 a.m.	***2006-01-2232***	***Performance Testing of an Advanced Lightweight Freezable Radiator***
		James Nabity, Robert Copeland, Georgia Mason, Kerry Libberton, TDA Research In Paul, Luis Trevino, Ryan Stephan, NASA Johnson Space Center
9:00 a.m.	***2006-01-2233***	***The Development of a Planetary Suit Concept Demonstrator by the North Dakota Space Grant Consortium***
		Pablo G. de Leon, Department of Space Studies, University of North Dakota; Gary H of North Dakota
9:30 a.m.	***2006-01-2234***	***Advanced Airlock Concept Studies for Exploration Surface Systems***
		Luis A. Trevino, NASA Johnson Space Center
10:00 a.m.		***BREAK***

10:15 a.m.	***2006-01-2235***	***Thermal Performance of Space Suit Elements with Aerogel Insulation for Moon and Mars Exploration***
		Henry H. Tang, MEI Technologies/ESCG; Evelyne S. Orndoff, Luis A. Trevino, NAS Space Center
10:45 a.m.	***2006-01-2236***	***Flexible Fabrics with High Thermal Conductivity for Advanced Spacesuits***
		Luis A. Trevino, NASA Johnson Space Center; John Connell, NASA Langley Resea Ya-Ping Sun, Clemson University; Joseph Smith, Robin Southward, NASA Langley Center; Donavon Delozier, Kent Watson, Thomas Clancy, National Institute of Aeros Sayata Ghose, National Research Council; Yi Lin, Clemson University; Grant Bue, E Orndoff, NASA Johnson Space Center
11:15 a.m.	***2006-01-2237***	***Informativeness of Finger Temperature/Heat Flux as an Index of Human Thermal Status Under Local Cold Influences***
		Victor S. Koscheyev, Gloria R. Leon, Aitor Coca, Jung-Hyun Kim, University of Minn Robert Trevino, NASA Johnson Space Center

Wednesday, July 19

EVA - PLSS & Support Equipment II

Session Code: ***ICES34C***

Room James I-III ***Session Time:*** ***1:30 p.m.***

Organizers - *Amy J. Ross, Robert C. Trevino, NASA Johnson Space Center; Edward W. Hodgson, Hamilton Sundstrand*

Chairpersons - *Edward W. Hodgson, Hamilton Sundstrand; Amy J. Ross, Robert C. Trevino, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2238***	***Wissler Simulations of a Liquid Cooled and Ventilation Garment (LCVG) for Extravehicular Activity (EVA)***
		Matt Kesterson, Jacobs Sverdrup; Grant Bue, Luis Trevino, NASA Johnson Space C
2:00 p.m.	***2006-01-2239***	***Phase II Testing of Liquid Cooling Garments Using a Sweating Manikin, Controlled by a Human Physiological Model***
		Heather Paul, Luis Trevino, Grant Bue, NASA Johnson Space Center; John Rugh, F Farrington, Charles King, National Renewable Energy Laboratory
2:30 p.m.	***2006-01-2240***	***Extravehicular Mobility Unit (EMU) / International Space Station (ISS) Coolant Loop Failure and Recovery***
		John F. Lewis, NASA Johnson Space Center; Harold E. Cole, Boeing Co.; Daniel B. Wyle Life Sciences; Gary Cronin, John W. Steele, Hamilton Sundstrand

Wednesday, July 19

Physico-Chemical Life Support Process Development: Solid Waste

Session Code: ***ICES19C***

Room Marriott Ballroom I-III ***Session Time:*** ***8:00 a.m.***

This session will emphasize research activities in the field of waste processing focusing on solid wastes, both human excreta and food wastes. Water removal and recovery from solid wastes is important in space missions, especially for extra-terrestrial habitats which water-poor environments. In addition, it is essential that solid wastes must be treated or processed to ensure crew health and safety.

Organizers - *Michael T. Flynn, NASA Ames Research Center; Masami Nakagawa, Colorado School of Mines; John Hogan, Wignarajah, NASA Ames Research Center*

Chairpersons - *John Hogan, NASA Ames Research Center; Masami Nakagawa, Colorado School of Mines*

Time	***Paper No.***	***Title***

8:00 a.m.	***2006-01-2180***	***Simulated Human Feces for Testing of Solid Waste Management Technology***
		Kanapathipillai Wignarajah, John W. Fisher, NASA Ames Research Center
8:30 a.m.	***2006-01-2182***	***Development and Testing of a Microwave Powered Solid Waste Stabilization and Water Recovery System***
		Richard R. Wheeler, Neal Hadley, Roger Dahl, Thomas W. Williams, Frank C. Garm R. Akse, James E. Atwater, Umpqua Research Co.; John W. Fisher, NASA Ames R Center
9:00 a.m.	***2006-01-2183***	***Carbon Production in Space from Pyrolysis of Solid Waste***
		Michael A. Serio, Erik Kroo, Marek Wójtowicz, Advanced Fuel Research; Eric Suube Univ.; Kanapathipillai Wignarajah, John Fisher, NASA Ames Research Center
9:30 a.m.	***2006-01-2185***	***Modeling of Heat and Mass Transfer in a TEC-Driven Lyophilizer***
		Zeng-Guang Yuan, Uday Hegde, Ncser; Eric Litwiller, Michael Flynn, John Fisher, N Ames Research Center
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2186***	***Compaction Technologies for Near and Far Term Space Missions***
		Gregory S. Pace, Lockheed Martin Technical Operations; John W. Fisher, NASA Ar Research Center
10:45 a.m.	***2006-01-2187***	***Control of Solid Waste Using Low Temperature Oxidation***
		David T. Wickham, TDA Research Inc.

Wednesday, July 19

Advanced Thermal Control Technology

Session Code: ***ICES9***

Room Marriott Ballroom I-III ***Session Time:*** ***1:30 p.m.***

This session addresses advanced technologies and developments activities pertaining to heat acquisition, transport, rejection and storage as well as cryogenic cooling and thermal protection systems for spacecraft and space vehicles.

Organizers - *Burkhard Behrens, EADS Space Transportation; Jeffery T. Farmer, NASA Marshall Space Flight Center*

Chairpersons - *Burkhard Behrens, EADS Space Transportation; Jeffery T. Farmer, NASA Marshall Space Flight Center; He ESA; Albert J. Juhasz, NASA John Glenn Research Center*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2261***	***FLPP: An European Opportunity for the Development of Re-entry / Reuse Technologies - Materials & Structures***
		Angelo Denaro, NGL Prime S.p.A.
2:00 p.m.	***2006-01-2262***	***Hybrid Structure Concept for Winglet Design***
		Savino De Palo, Franco Fossati, Giovanni Gambacciani, Alcatel Alenia Space Italia
2:30 p.m.	***2006-01-2263***	***Multi-function Tuneable Emittance Smart Coatings for Thermal Control in Harsh Space Environment***
		Roman Volodymyr Kruzelecky, Emile Haddad, Wes Jamroz, MPB Communications Mohamed Soltani, Mohammed Chaker, INRS Énergie et Matériaux
3:00 p.m.	***2006-01-2264***	***Nanoparticle-enhanced Heat Transfer Fluids for Spacecraft Thermal Control Systems***
		Steven J. Oldenburg, nanoComposix; Stephen U. Choi, Argonne National Laborato D. Kihm, Chan H. Chon, Univ. of Tennessee

3:30 p.m.		***BREAK***
3:45 p.m.	***2006-01-2267***	***Radiator Performance Enhancement using a LiBr-H2O Absorption Cooler and Microchannel Technology: A Portable Life Support System Example*** *Kriston P. Brooks, Ward TeGrotenhuis, Pacific Northwest National Laboratory*
4:15 p.m.	***2006-01-2268***	***Thermal Conductivity Testing of Radiation Shielding Materials for Use as Thermal Insulation*** *Richard Horton, GH Systems, Inc.; Guy Smith, Mala Thompson, Tec-Masters, Inc.*

Wednesday, July 19

Environmental / Thermal Control for Future Space Vehicles

Session Code: ***ICES6***

Room Marriott Ballroom IV ***Session Time:*** ***8:00 a.m.***

This session will address all technical areas related to future space vehicles such as thermal control and ECLSS. It will also cover the development of corresponding subsystems and components.

Organizers - *Burkhard Behrens, EADS Space Transportation; Jose Roman, NASA Marshall Space Flight Center*

Chairpersons - *Burkhard Behrens, EADS Space Transportation; Jose Roman, NASA Marshall Space Flight Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2216***	***Preliminary Trade Study of Evaporative Heat Sinks*** *Molly Anderson, NASA Johnson Space Center; Thomas O. Leimkuehler, Honeywell Quinn, Hamilton Sundstrand; Eric Golliher, NASA John Glenn Research Center*
8:30 a.m.	***2006-01-2217***	***Development of a Contaminant Insensitive Sublimator*** *Thomas O. Leimkuehler, Honeywell; Molly Anderson, NASA Johnson Space Center Westheimer, National Aero & Space Administration*
9:00 a.m.	***2006-01-2218***	***An Environmental Impact Assessment of Perfluorocarbon Thermal Working Fluid Use On Board Crewed Spacecraft*** *Jay L. Perry, NASA Marshall Space Flight Center; William A. Arnold, ZIN Technolog*
9:30 a.m.	***2006-01-2219***	***Development and Testing of a Sorbent-Based Atmosphere Revitalization System for the Crew Exploration Vehicle*** *James C. Knox, Jeff Adams, Ken Kittredge, NASA Marshall Space Flight Center; Pa Qualis Corporation*
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2220***	***Mathematical Simulation of the Sorbent-Based Atmosphere Revitalization System for the Crew Exploration Vehicle*** *James A. Ritter, Univ. of South Carolina; Steven P. Reynolds, Armin D. Ebner, Univ South Carolina; James C. Knox, NASA Marshall Space Flight Center; M. Douglas L Vanderbilt University*

Wednesday, July 19

Aerospace Architecture: Theory and Principles

Session Code: ***ICES47***

Room Marriott Ballroom IV ***Session Time:*** ***1:30 p.m.***

This session covers papers presenting projects ranging from actual flight ready hardware to conceptual mockups, whether physical or virtual. The work may represent actual planned systems destined for operational regimes or design of test articles intended to expand knowledge relative to human occupied spaces in the aerospace environment.

Organizers - *Marc M. Cohen, NASA Ames Research Center*

Chairpersons - *Marc M. Cohen, NASA Ames Research Center*

Time	Paper No.	Title
1:30 p.m.	***2006-01-2100***	***How to Make an Anchor-Free, Flat-Floor Inflatable Habitat for the Moon or Mars***
		James D. Lowe
2:00 p.m.	***2006-01-2101***	***Constraint Driven Design of a Surface Inflatable Habitat Module***
		Georgi Petrov, Synthesis International; Kyle Steinfeld, TUDelft; Constance Adams, S International; Dmitri Jajich, SOM
2:30 p.m.	***2006-01-2249***	***The Architecture of Time (Part 2): The Darian System for Mars***
		Thomas Gangale

Wednesday, July 19

Two-Phase Thermal Control Technology I

Session Code: ***ICES11A***

Room Marriott Ballroom V-VII ***Session Time:*** ***8:00 a.m.***

The session describes the latest developments & innovations in space-based two-phase heat transport systems, modeling techniques & on-orbit performances. These include variants of heat pipe technologies, capillary pumped loops and miniature loop heat pipes with multiple evaporators & condensers. The numerical modeling of loop heat pipes are addressed along with ground and on-orbit (steady & transient) performances.

Organizers - *Darius Nikanpour, Canadian Space Agency; Reinhard Schlitt, OHB System GmbH; Ad Delil, Advanced Aerospa Control Systems; Wolfgang Supper, European Space Agency; Konstantin A. Goncharov, Lavochkin Association*

Chairpersons - *Ad Delil, Advanced Aerospace Thermal Control Systems; Konstantin A. Goncharov, Lavochkin Association; Carleton Univ.; Darius Nikanpour, Canadian Space Agency; Reinhard Schlitt, OHB System GmbH; Wolfgang European Space Agency*

Time	Paper No.	Title
8:00 a.m.	***2006-01-2168***	***The VARiable Effective Surface Radiator (VARES), Novel Heat Switch Technology Based on the Oscillating Heat Pipe (OHP) Principle***
		Mustapha Bsibsi, Gerrit Van Donk, A. Pauw, National Aerospace Laboratory NLR; J Pérez, European Space Agency ESA; Johannes Van Es, National Aerospace Labor
8:30 a.m.	***2006-01-2169***	***Extensive Development of the Loop Heat Pipe Technology***
		Roger R. Riehl, National Institute for Space Research
9:00 a.m.	***2006-01-2170***	***A Laboratory Setup for Observation of Loop Heat Pipe Characteristics***
		Donatas Mishkinis, Guanghan Wang, Darius Nikanpour, Canadian Space Agency
9:30 a.m.	***2006-01-2171***	***Development of Loop Heat Pipe with Pressure Regulator***
		Konstantin A. Goncharov, Lavochkin Association
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2172***	***Performance Improvement in Loop Heat Pipe Using Primary Wick with Circumferential Grooves***
		Roger R. Riehl, Nadjara dos Santos, National Institute for Space Research
10:45 a.m.	***2006-01-2173***	***Modeling of a Loop Heat Pipe with Evaporator of Circumferential Vapor Grooves in Primary Wick***
		Valeri V. Vlassov, Roger R. Riehl, National Institute for Space Research

11:15 a.m.	***2006-01-2174***	***Mathematical Modeling of Multiple Evaporator/Multiple Condenser LHPs Using EcosimPro***
		Carmen Gregori, Alejandro Torres, Ramón Pérez, Iberespacio; Tarik Kaya, Carleton
11:45 a.m.	***2006-01-2175***	***Nanofluids as Working Media for Loop Heat Pipes***
		Donatas Mishkinis, Muriel K. Corbierre, Guanghan Wang, Darius Nikanpour, Canad Agency

Wednesday, July 19

Two-Phase Thermal Control Technology II

Session Code: ***ICES11B***

Room Marriott Ballroom V-VII ***Session Time:*** ***1:30 p.m.***

The session describes the latest developments & innovations in space-based two-phase heat transport systems, modeling techniques & on-orbit performances. These include variants of heat pipe technologies, capillary pumped loops and miniature loop heat pipes with multiple evaporators & condensers. The numerical modeling of loop heat pipes are addressed along with ground and on-orbit (steady & transient) performances.

Organizers - *Tarik Kaya, Carleton Univ.; Darius Nikanpour, Canadian Space Agency; Reinhard Schlitt, OHB System GmbH; Advanced Aerospace Thermal Control Systems; Wolfgang Supper, European Space Agency; Konstantin A. Go Lavochkin Association*

Chairpersons - *Ad Delil, Advanced Aerospace Thermal Control Systems; Konstantin A. Goncharov, Lavochkin Association; Carleton Univ.; Darius Nikanpour, Canadian Space Agency; Reinhard Schlitt, OHB System GmbH; Wolfgang European Space Agency*

Time	***Paper No.***	***Title***
1:30 p.m.	***2006-01-2223***	***Development of the Low Temperature Arterial Heat Pipes***
		Konstantin A. Goncharov, Lavochkin Association
2:00 p.m.	***2006-01-2228***	***Modeling of a Real LHP and Integration in a System Level Analysis***
		Gongming Xin, Shandong University; Marco Molina, Carlo Gavazzi Space
2:30 p.m.	***2006-01-2229***	***Variable Conductance Thermal Control by Passive or Active Control of Fluid Manipulation***
		Adrianus A. Delil, Advanced Aerospace Thermal Control Sys
3:00 p.m.	***2006-01-2230***	***Reappraisal of Unrealised & Novel Thermal Control Issues for Applications in Future Spacecraft***
		Adrianus A. Delil, Advanced Aerospace Thermal Control Systems

Thursday, July 20

Human Factors

Session Code: ***ICES52***

Room Chesapeake I-II ***Session Time:*** ***8:00 a.m.***

The Space Human Factors session focuses on psychological, physical, physiological, psycho-social issues and concerns that are either addressed or affected by the advent of a change in the design or in the environment. Papers presented in this year's session will address specifically the issues and concerns related to a) confined and secluded habitation issues, b) psychological, physical, physiological, and workload and energy areas associated with space exploration, and c) the economic impacts of undertaking planetary exploration.

Organizers - *Sudhakar Rajulu, Baylor College of Medicine; Barry W. Tillman, Lockheed Martin Space Operations Co.; Donna Our Designs Inc.*

Chairpersons - *L. Javier Gonzalez, NASA Johnson Space Center; Sudhakar Rajulu, Baylor College of Medicine; Barry W. T Lockheed Martin Space Operations Co.*

Time	***Paper No.***	***Title***

8:00 a.m.	***2006-01-2293***	***Air Circulation Confinement Experiments in the CEEF: Psychological Status in Eco-nauts through Repeated Seven-day Habitations***
		Masanori Shinohara, Osamu Komatsubara, Yoichi Aibe, Susumu Nozoe, Yasuhiro T Nitta, Institute for Environmental Sciences; Tamiyasu Shimamiya, University of Yam
8:30 a.m.	***2006-01-2294***	***Air Circulation Confinement Experiments in the CEEF: Physiological Status in Econauts through Repeated Seven-day Habitations***
		Tamiyasu Shimamiya, Univ. Of Yamanashi; Toshihiro Kitama, Makoto Osada, Yukio University of Yamanashi; Masanori Shinohara, Yoichi Aibe, Osamu Komatsubara, S Nozoe, Institute for Environmental Sciences; Nobuyuki Terada, School of Engineeri University; Motohiko Mohri, Nippon Marine Enterprises Ltd.
9:00 a.m.	***2006-01-2295***	***Air Circulation Confinement Experiments in the CEEF - Workloads and Energy Expenditures of Eco-nauts in Closed Habitation Experiments***
		Osamu Komatsubara, Yoichi Aibe, Masanori Shinohara, Yasuhiro Tako, Institute for Environmental Sciences; Toshitada Yoshioka, Hirosaki Gakuin University
9:30 a.m.	***2006-01-2296***	***Air Circulation Confinement Experiments in the CEEF - Changes in Physical Conditions and Health Managements of Eco-nauts***
		Youichi Aibe, Masanori Shinohara, Osamu Komatsubara, Manami Suzuki, Yasuhiro Institute for Environmental Sciences; Tamiyasu Shimamiya, University of Yamanash Toshitada Yoshioka, Hirosaki Gakuin University; Michimasa Yoshida, Yoshida Clinic Mohri, Nippon Marine Enterprises Ltd.
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2297***	***Mission Planning and Re-planning for Planetary Extra-Vehicular Activities: Analysis of Excursions in a Mars-Analog Environment and Apollo***
		Jessica J. Marquez, Dava Newman, Massachusetts Institute of Technology
10:45 a.m.	***2006-01-2298***	***Static Postural Analysis: A Methodology to Assess Gravity Related Sensory-Motor Controls' Status for Astronauts***
		Philippe A. Souvestre, Clint K. Landrock, NeuroKinetics Health Services (BC) Inc.

Thursday, July 20

Physico-Chemical Life Support: Air and Water

Session Code: ***ICES10***

Room Franklin/Shangri-La Yorktown ***Session Time:*** ***8:00 a.m.***

This session covers technology developments in the frame of water regeneration, human waste recycling, air renewal and air cleaning applying physico-chemical processes.

Organizers - *Willigert Raatschen, EADS Space Transportation; Gijsbert B T Tan, European Space Agency*

Chairpersons - *Leonid S. Bobe, NIICHIMMASH; Gijsbert B T Tan, European Space Agency*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2269***	***The Performance of the System for Water Recovery from Humidity Condensate (SRV-K) on International Space Station ISS 1 Thru ISS-11 Mission***
		Leonid S. Bobe, Nikolaiy M. Samsonov, Victor A. Soloukhin, NIICHIMMASH; Peter Andreychuk, Nikoly Protasov, RSC Energia; Yuryi Sinjak, Vladimir Skuratov, IMBP
8:30 a.m.	***2006-01-2270***	***Design Status of ARES for Accommodation on the ISS***
		Willigert Raatschen, EADS Space Transportation; Johannes Witt, ESA; Berengere L ESA ESTEC

9:00 a.m.	***2006-01-2271***	***Integrated Test and Evaluation of a 4-Bed Molecular Sieve, Temperature Swing Adsorption Compressor, and Sabatier Engineering Development Unit***
		James C. Knox, NASA Marshall Space Flight Center; Lee A. Miller, JE Sverdrup; M Campbell, Hamilton Mgmt. Services Inc.; Lila Mulloth, Science Applications Internat Mini Varghese, Enterprise Advisory Services Inc.; Bernadette Luna, NASA Ames Re Center
9:30 a.m.	***2006-01-2272***	***Methane Pyrolysis Technology as Part of Life Support and ISRU Systems; Design Trade-Off supported by Breadboarding***
		Klaus Bockstahler, Tilman Schaefer, EADS Space Transportation; Berengere Houd ESTEC
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2273***	***Wastewater Processing Cascade Distillation Subsystem Design and Evaluation***
		Alex M. Lubman, Honeywell; Allen Macknight; Volodimir Rifert, Thermodistillation; K Pickering, NASA Johnson Space Center; Ivan Zolotukhin, Thermodistillation
10:45 a.m.	***2006-01-2274***	***A Water Recovery System Evolved for Exploration***
		Mary Jane E. O'Rourke, Donald L. Carter, Jay L. Perry, National Aeronautics and S Administration
11:15 a.m.	***2006-01-2275***	***Porous Media Based Phase Separation in Condensing Heat Exchanger for Space Systems***
		Lutful Khan, Cleveland State Univ.; Mohammad Hasan, NASA John Glenn Researc

Thursday, July 20

EVA - Operations

Session Code: ***ICES35***

Room James I-III ***Session Time:*** ***8:00 a.m.***

This session addresses EVA Operational Considerations, EMU related activities, and lessons learned from ISS.

Organizers - *Bill Higgins, Hamilton Sundstrand*

Chairpersons - *Bill Higgins, Hamilton Sundstrand; Amy J. Ross, Robert C. Trevino, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2285***	***Micrometeoroid and Orbital Debris Enhancements of Shuttle Extravehicular Mobility Unit Thermal Micrometeoroid Garment***
		Robert Joseph Jones, David Graziosi, Jinny Ferl, W. Keith Splawn, David Cadogan, Zetune, ILC Dover Inc.; Eric Christiansen, NASA Johnson Space Center
8:30 a.m.	***2006-01-2286***	***A Mathematical Model to Predict and Maintain the Neutral Buoyancy of Suited Astronauts***
		Kurt Clowers, MEI Technologies; Sarah Margerum, Daniel Nguyen, Lockheed Marti Sudhakar Rajulu, NASA; Marcos Jaramillo, Robert Sweet, MEI Technologies
9:00 a.m.	***2006-01-2287***	***System Overview and Operations of the MX-2 Neutral Buoyancy Space Suit Analogue***
		Shane Jacobs, David Akin, Jeffrey Braden, Univ. of Maryland
9:30 a.m.	***2006-01-2288***	***Development of an EVA Support Equipment System for Exploration using ISS Lessons Learned***
		Christopher A. Looper, Zane Ney, United Space Alliance

10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2290***	***Defining Space Suit Operational Requirements for Lunar and Mars Missions and Assessing Alternative Architectures*** *David Klaus, Univ. of Colorado-Boulder; Matthew Bamsey, Univ. Of Colorado-Boulo Michael Schuller, Olivier Godard, Frank Little, Ray Askew, Texas A&M University*
10:45 a.m.	***2006-01-2291***	***Access Systems for Partial Gravity Exploration & Rescue: Engineering Analysis & Design*** *Steven P. Chappell, David Klaus, Univ. of Colorado-Boulder; Scott Parazynski, NAS*
11:15 a.m.	***2006-01-2096***	***Design and Certification of the Extravehicular Activity Mobility Unit (EMU) Water Processing Jumper*** *Laurie Peterson, Derek Neumeyer, John Lewis, NASA Johnson Space Center*

Thursday, July 20

Spacecraft Thermal Design and Technology

Session Code: ***ICES2***

Room Marriott Ballroom I-III ***Session Time:*** ***8:00 a.m.***

This session presents the thermal design, testing, and on-orbit performance of spacecraft and instruments, and the development of key technologies including high-precision systems and cryogenic applications.

Organizers - *David K. Wasson, Orbital Sciences Corp.; Wes Ousley, NASA Goddard Space Flight Center*

Chairpersons - *Wes Ousley, NASA Goddard Space Flight Center; David K. Wasson, Orbital Sciences Corp.*

Time	***Paper No.***	***Title***
8:00 a.m.	***2006-01-2276***	***LISA PathFinder Thermal Design and Micro-Disturbance Considerations*** *S. Barraclough, A. Robson, Katy Smith, Astrium UK, England; J.A. Romera Perez, E ESTEC*
8:30 a.m.	***2006-01-2277***	***Development of the Temperature Control Scheme for the CALIPSO Integrated Lidar Transmitter Subsystem*** *Joseph Gasbarre, NASA Langley Research Center; Jason Thomas, Ball Aerospace Technologies Corp.; Wes Ousley, Theodore Michalek, NASA Goddard Space Flight*
9:00 a.m.	***2006-01-2278***	***Comparison of Recent Satellite Flight Temperatures with Thermal Model Predictions*** *John W. Welch, The Aerospace Corporation*
9:30 a.m.	***2006-01-2279***	***An Evaluation of the Hubble Space Telescope Thermal Design in Preparation for the Final Servicing Mission*** *Daniel H. Nguyen, NASA Goddard Space Flight Center; Teri Gregory, Swales Aeros Kim, Orbital Sciences Corp.*
10:00 a.m.		***BREAK***
10:15 a.m.	***2006-01-2280***	***Hubble Space Telescope Thermal Math Model Improvement after Fifteen Years of On-Orbit Operations*** *Daniel H. Nguyen, NASA Goddard Space Flight Center; Joshua Abel, Lockheed Ma Technical Operations; Christine E. Cottingham, Lockheed Martin Corp.; Joe Mandi, Martin Technical Operations; Jong Kadesch, Orbital Sciences Corp.*