International Conference On Environmental Systems

Technical Session Schedule

As of 07/18/2009 07:40 pm

Monday, July 13

Space Architecture (Part 1 of 2)

Session Code: ***ICES503***

Room Ballroom D ***Session Time:*** ***1:30 p.m.***

As more nations and private enterprises prepare to send more people into space, the "right stuff" astronaut paradigm for space travelers is quickly becoming a relic of history. Space travel cannot remain a heroic test of human endurance. The architectural principles that provide for comfortable lodging, productive work, and enjoyment of life on Earth must be brought to bear in the design of facilities beyond Earth, in full recognition of the technical challenges presented by the environment.

Organizers - *Theodore W. Hall, University of Michigan; David Nixon, Astrocourier LLC*

Time	Paper No.	Title
1:30 p.m.	***2009-01-2367***	***International Space Station United States Operational Segment Crew Quarters On-orbit vs. Design Performance Comparison*** *James Lee Broyan, NASA Johnson Space Center; Melissa Borrego, MEI Technologies Inc.; Juergen Bahr, ERC Inc.*
2:00 p.m.	***2009-01-2368***	***Life Support System and Habitability Concepts for the ECLIPSE (European Cis-Lunar Interplanetary Port for Space Exploration) Orbiting Station*** *Ernesto Appella; Alessandro Quaglia; Emanuele Flesia*
2:30 p.m.	***2009-01-2366***	***Comparative Configurations for Lunar Lander Habitation Volumes: 2005-2008*** *Marc M. Cohen, Marc M. Cohen Arch.D Architect*
3:00 p.m.	***2009-01-2369***	***Minimum Functionality Lunar Habitat Element Design: Requirements and De¿nition of an Initial Human Establishment on the Moon*** *Massimiliano Di Capua, Adam Mirvis, Omar Medina, David Akin, Space Systems Laboratory at Univ. of Maryland*

Monday, July 13

Space Architecture (Part 2 of 2)

Session Code: ***ICES503***

Room Ballroom D ***Session Time:*** ***3:45 p.m.***

As more nations and private enterprises prepare to send more people into space, the "right stuff" astronaut paradigm for space travelers is quickly becoming a relic of history. Space travel cannot remain a heroic test of human endurance. The architectural principles that provide for comfortable lodging, productive work, and enjoyment of life on Earth must be brought to bear in the design of facilities beyond Earth, in full recognition of the technical challenges presented by the environment.

Organizers - *Theodore W. Hall, University of Michigan; David Nixon, Astrocourier LLC*

Time	Paper No.	Title
3:45 p.m.	***2009-01-2385***	***Mars Base 10 - A Permanent Settlement On Mars For 10 Astronauts*** *Ondrej Doule*
4:15 p.m.	***2009-01-2527***	***Human-rated Automated and Robotics Systems - HAL can work Safely with Astronauts*** *Lynn E. Baroff, David Fitts, Charles Dischinger, NASA*

Monday, July 13

Radiation Issues for Space Flight

Session Code: ***ICES504***

Room Ballroom E ***Session Time:*** ***10:15 a.m.***

This session addresses major issues in space radiation and analysis, 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*

Time	Paper No.	Title
10:15 a.m.	***ORAL ONLY***	***The Earth-Moon-Mars Radiation Environment Module - First Results*** *Nathan A. Schwadron, Kamen Kozarev, Boston Univ.; Lawrence W. Townsend, Richard Hatcher, Univ. of Tennessee; Mahmoud Pourarsalan, Univ. of Tennessee-Knoxville; Mihir Desai, Maher Al Dayeh, Southwest Research Institute*
10:45 a.m.	***2009-01-2338***	***Analyses of Several Space Radiation-Mitigating Materials: Computational and Experimental Results*** *William Atwell, Paul Boeder, Boeing Co.; Richard Wilkins, Prairie View A&M Univ. (PVAMU); Brad Gersey, Nasa Center for Applied Radiation (PVAMU); Kristina Rojdev, NASA Johnson Space Center*
11:15 a.m.	***2009-01-2339***	***Disturbance of Electronics in Low-Earth Orbits by High Energy Electron Plasmas*** *Courtney Matzkind, William Atkinson, William Seidler, Boeing*
11:45 a.m.	***2009-01-2340***	***Status of Developing a Near Real-Time Capability for Estimating Space Radiation Exposure Using EMMREM*** *Richard Hatcher, Lawrence W. Townsend, Univ. of Tennessee; Nathan Schwadron, Kamen Kozarev, Boston Univ.*

Monday, July 13

Life Science/Life Support Research Technologies (Part 1 of 2)

Session Code: ***ICES501***

Room Ballroom E ***Session Time:*** ***1:30 p.m.***

This session emphasizes research technologies to support astrobiology, habitation and life support system design. Life sciences related hardware developments, experiment designs, and flight experiment results for manned spaceflight, un-manned systems such as freeflying platforms and planetary spacecraft, and terrestrial analogs will be presented.

Organizers - *Alexander Hoehn, Univ. of Colorado-Boulder; Robert C. Morrow, Orbital Technologies Corp.*

Time	Paper No.	Title
1:30 p.m.	***2009-01-2360***	***Providing Optimal Root-Zone Fluid Fluxes: Effects of Hysteresis on Capillary-Dominated Water Distributions in Reduced Gravity*** *Robert Heinse, Univ. of Idaho; Scott Jones, Utah State Univ.; Markus Tuller, Univ. of Arizona; Gail Bingham, Space Dynamics Laboratory; Igor Podolsky, Institute of Biomedical Problems; Dani Or, Swiss Federal Institute of Technology*
2:00 p.m.	***2009-01-2359***	***A Novel Testing Protocol for Evaluating Particle Behavior in Fluid Flow under Simulated Reduced Gravity Conditions*** *Jared Leidich, Evan Thomas, David Klaus, Univ. of Colorado-Boulder*

2:30 p.m.	***2009-01-2361***	***Porous Plant Growth Media Design Considerations for Lunar and Martian Habitats***
		Scott B. Jones, Robert Heinse, Bruce Bugbee, Utah State Univ.; Dani Or, Swiss Federal Institute of Technology, Zurich (ETHZ); Gail Bingham, Space Dynamics Laboratory

Monday, July 13

Life Science/Life Support Research Technologies (Part 2 of 2)

Session Code: ***ICES501***

Room Ballroom E ***Session Time:*** ***3:45 p.m.***

This session emphasizes research technologies to support astrobiology, habitation and life support system design. Life sciences related hardware developments, experiment designs, and flight experiment results for manned spaceflight, un-manned systems such as freeflying platforms and planetary spacecraft, and terrestrial analogs will be presented.

Organizers - *Alexander Hoehn, Univ. of Colorado-Boulder; Robert C. Morrow, Orbital Technologies Corp.*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2380***	***Use of Tinted Reflectors to Eliminate False Positives in an Adaptive Lighting Control Systems***
		Christopher Bourget, Robert C. Morrow, Orbital Technologies Corp.
4:15 p.m.	***2009-01-2381***	***Sustained Salad Crop Production Requirements for Lunar Surface***
		Gary W. Stutte, Oscar Monje, Neil Yorio, Sharon Edney, Dynamac Corp.; Gerard Newsham, Lisa Connole, FAS/Limerick Institute Technology; Raymond Wheeler, NASA Kennedy Space Center
4:45 p.m.	***2009-01-2382***	***A Deployable Salad Crop Production System for Lunar Habitats***
		Robert C. Morrow, Ross Remiker, Orbital Technologies Corp.

Monday, July 13

Lunar and Martian Dust Properties and Mitigation Technologies (Part 1 of 3)

Session Code: ***ICES514***

Room Scarbrough Four ***Session Time:*** ***10:15 a.m.***

This session focuses on mitigation strategies for lunar and Martian dust inside spacecraft and habitat airlocks and cabins, and on the properties of dust in planetary surface environments. This may include cleaning and repelling approaches for the protection and nominal performance of hardware, and the capture/filtration of airborne dust. Also the measurements of lunar and Martian dust properties that provide engineering data for development of mitigation technologies.

Organizers - *Juan H. Agui, Mark J. Hyatt, NASA*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2335***	***Techniques for Characterization of Microsize Dust Particles***
		Rajiv Kohli, The Aerospace Corporation
10:45 a.m.	***2009-01-2336***	***Development of a Lunar Dust Simulant***
		Robert J. Gustafson, Brant White, Orbital Technologies Corp.
11:15 a.m.	***2009-01-2337***	***Regolith Activation on the Lunar Surface and Its Ground Test Simulation***
		James R. Gaier, NASA Glenn Research Center

Monday, July 13

Lunar and Martian Dust Properties and Mitigation Technologies (Part 2 of 3)

Session Code: ***ICES514***

Room Scarbrough Four ***Session Time:*** ***1:30 p.m.***

This session focuses on mitigation strategies for lunar and Martian dust inside spacecraft and habitat airlocks and cabins, and on the properties of dust in planetary surface environments. This may include cleaning and repelling approaches for the protection and nominal performance of hardware, and the capture/filtration of airborne dust. Also the measurements of lunar and Martian dust properties that provide engineering data for development of mitigation technologies.

Organizers - *Juan H. Agui, Mark J. Hyatt, NASA*

Time	Paper No.	Title
1:30 p.m.	***2009-01-2356***	***A Survey of Terrestrial Approaches to the Challenge of Lunar Dust Containment*** *Jay L. Perry, NASA Marshall Space Flight Center; Tatiana Aguilera, Carnegie Mellon Univ.*
2:00 p.m.	***2009-01-2357***	***Lunar Dust Cloud Characterization in a Gravitational Settling Chamber Experiencing Zero, Lunar, Earth and 1.8g Levels*** *Jeffrey Mackey, ASRC Aerospace; Juan Agui, NASA*
2:30 p.m.	***2009-01-2358***	***Development and Testing of A New NASA Lunar Dust Filtration Testing Facility*** *Juan H. Agui, NASA; Jeffrey Mackey, ASRC Aerospace*

Monday, July 13

Lunar and Martian Dust Properties and Mitigation Technologies (Part 3 of 3)

Session Code: ***ICES514***

Room Scarbrough Four ***Session Time:*** ***3:45 p.m.***

This session focuses on mitigation strategies for lunar and Martian dust inside spacecraft and habitat airlocks and cabins, and on the properties of dust in planetary surface environments. This may include cleaning and repelling approaches for the protection and nominal performance of hardware, and the capture/filtration of airborne dust. Also the measurements of lunar and Martian dust properties that provide engineering data for development of mitigation technologies.

Organizers - *Juan H. Agui, Mark J. Hyatt, NASA*

Time	Paper No.	Title
3:45 p.m.	***2009-01-2377***	***Developing Abrasion Test Standards for Evaluating Lunar Construction Materials*** *Ryan Kobrick, David Klaus, Univ. of Colorado-Boulder; Kenneth Street, NASA John Glenn Research Center*
4:15 p.m.	***2009-01-2378***	***Environmental Testing for the Reliability Effects of Lunar Dust*** *Todd Treichel, Robert Gustafson, Orbital Technologies Corp.*
4:45 p.m.	***2009-01-2379***	***Pulmonary Toxicity of Lunar Highland Dust*** *John T. James, NASA Johnson Space Center*

Monday, July 13

Physico-Chemical Life Support Process Development (Part 1 of 5)

Session Code: ***ICES302***

Room Scarbrough One ***Session Time:*** ***10:15 a.m.***

This session will address research issues and development of physico-chemical technology for Solid Waste Management System (WMS), Recovery of Resources, in particular water, from wastes for use on Space Vehicles and Planetary Habitats. Performance of technologies for processing solid wastes will be included. Discussions on crosscutting technologies demonstrating the integration of the systems together with reduction of mission costs are also encouraged.

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

Time	Paper No.	Title
10:15 a.m.	***2009-01-2342***	***Water Recovery from Wastes in Space Habitats - A Comparative Evaluation of Prototypes*** *John W. Fisher, John Hogan, Lance Delzeit, NASA Ames Research Center; Kanapathipillai Wignarajah, Ric Alba, Enterprise Advisory Services Inc.; Gregory Pace, Lockheed Martin IS&GS Defense; Thomas Fox, Foothill College*
10:45 a.m.	***2009-01-2344***	***Results and Analysis from Reduced Gravity Experiments of the Flexible Membrane Commode Apparatus*** *Zeng-Guang Yuan, Uday Hegde, NCSER; Nancy Hall, NASA Glenn Research Center; David Althausen, Jeffrey Mackey, ASRC Aerospace; Eric Litwiller, Richard Alba, Kanapathipillai Wignarajah, Enterprise Advisory Services Inc.; Travis Liggett, John Hogan, John Fisher, NASA Ames Research Center*
11:15 a.m.	***2009-01-2343***	***Fecal Simulant Delivery Systems for Parabolic Flight Testing of the Flexible Membrane Commode*** *Richard Alba, EASI; John Fisher, John Hogan, Travis Liggett, NASA Ames Research Center; Robert Devaney, ASRC Aerospace; Jon Rask, EASI; Nancy Hall, NASA; David Althausen, ASRC Aerospace; Uday Hegde, NCSER; Eric Anderson, Jeffrey Mackey, ASRC Aerospace; Rochelle May, NASA*
11:45 a.m.	***2009-01-2341***	***Investigations into Water Recovery from Solid Wastes using a Microwave Solid Waste Stabilization and Water Recovery System.*** *Kanapathipillai Wignarajah, Richard Alba, Enterprise Advisory Services Inc.; John Hogan, John Fisher, NASA Ames Research Center; Thomas G. Fox, Foothill College*

Monday, July 13

Physico-Chemical Life Support Process Development (Part 2 of 5)

Session Code: ***ICES302***

Room Scarbrough One ***Session Time:*** ***1:30 p.m.***

This session will address research issues and development of physico-chemical technology for Solid Waste Management System (WMS), Recovery of Resources, in particular water, from wastes for use on Space Vehicles and Planetary Habitats. Performance of technologies for processing solid wastes will be included. Discussions on crosscutting technologies demonstrating the integration of the systems together with reduction of mission costs are also encouraged.

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

Time	Paper No.	Title
1:30 p.m.	***2009-01-2363***	***Testing of a Plastic Melt Waste Compactor Designed for Human Space Exploration Missions*** *Gregory Pace, Lockheed Martin Mission Services*
2:00 p.m.	***2009-01-2364***	***Water Recovery Using Spray Drying*** *Nicholas V. Coppa, Kyle V Chandler, Nanomaterials Company*

2:30 p.m.	***2009-01-2365***	***A Pilot Scale System for Low Temperature Solid Waste Oxidation and Recovery of Water***
		James A. Nabity, Jeffrey Engel, Erik Andersen, TDA Research Inc.; David Wickham, Reaction Systems; John Fisher, Ames Research Center

Monday, July 13

Physico-Chemical Life Support Process Development (Part 3 of 5)

Session Code: ***ICES302***

Room Scarbrough One ***Session Time:*** ***3:45 p.m.***

This session will address research issues and development of physico-chemical technology for Solid Waste Management System (WMS), Recovery of Resources, in particular water, from wastes for use on Space Vehicles and Planetary Habitats. Performance of technologies for processing solid wastes will be included. Discussions on crosscutting technologies demonstrating the integration of the systems together with reduction of mission costs are also encouraged.

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

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2384***	***Methodology for Identification and Classification of Biomass Pyrolysis Behavior***
		Michael A. Serio, Marek A. Wójtowicz, Advanced Fuel Research, Inc.
4:15 p.m.	***2009-01-2383***	***Results of Multifunctional Condensing Heat Exchanger for Water Recovery Applications***
		Yonghui Ma, Nick Schmitt, Ross Remiker, Orbital Technologies Corp.
4:45 p.m.	***2009-01-2466***	***Starship Life Support***
		Harry W. Jones, NASA Ames Research Center

Monday, July 13

Extravehicular Activity: PLSS and Support Equipment (Part 1 of 5)

Session Code: ***ICES402***

Room Scarbrough Three ***Session Time:*** ***10:15 a.m.***

This session will include papers describing design studies and new technology development or significant experience and lessons learned with existing systems in the area of portable life support systems and associated support hardware. Papers dealing with emerging technology and concepts for use in and from Orion or other Constellation Systems are of particular interest.

Organizers - *Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2345***	***Flexible Packaging Concept for a Space Suit Portable Life Support Subsystem***
		Paul Dillon, ERC Inc.; Gretchen Thomas, NASA Johnson Space Center
10:45 a.m.	***2009-01-2373***	***Results of the Particulate Contamination Control Trade Study for Space Suit Life Support Development***
		Thomas J. Cognata, MEI Technologies, Inc.; Bruce Conger, Hamilton Sundstrand; Heather L. Paul, NASA Johnson Space Center

11:15 a.m.	***2009-01-2346***	***Development Testing of a High Differential Pressure (HDP) Water Electrolysis Cell Stack for the High Pressure Oxygen Generating Assembly (HPOGA)***
		Robert J. Roy, Hamilton Sundstrand; John Graf, NASA Johnson Space Center; Timothy Gallus, Dax Rios, MEI Technologies; Sarah Smith, NASA White Sands Test Facility; Gregory Diderich, Jacobs

Monday, July 13

Extravehicular Activity: PLSS and Support Equipment (Part 2 of 5)

Session Code: ***ICES402***

Room Scarbrough Three ***Session Time:*** ***1:30 p.m.***

This session will include papers describing design studies and new technology development or significant experience and lessons learned with existing systems in the area of portable life support systems and associated support hardware. Papers dealing with emerging technology and concepts for use in and from Orion or other Constellation Systems are of particular interest.

Organizers - *Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center*

Time	***Paper No.***	***Title***
1:30 p.m.	***2009-01-2408***	***Lunar Portable Life Support System Heat Rejection Study***
		Robert Sompayrac PE, Bruce Conger, Hamilton Sundstrand; Luis Trevino, NASA Johnson Space Center
2:00 p.m.	***2009-01-2406***	***Advanced Design Heat Pump/Radiator for EVA Suits***
		Michael Izenson, Weibo Chen, Christian Passow, Scott Phillips, Creare Inc.; Luis Trevino, NASA Johnson Space Center
2:30 p.m.	***2009-01-2405***	***Demonstration of Super Cooled Ice as a Phase Change Material Heat Sink for Portable Life Support Systems***
		Thomas O. Leimkuehler, Aaron Powers, Christopher Linrud, Chad Bower, Paragon Space Development; Grant Bue, NASA Johnson Space Center
	2009-01-2407	***Radiator Heat Pump Subsystem for the Space Suit Portable Life Support (Written Only -- No Oral Presentation)***
		Carlos Silva; Michael Schuller, Egidio Marotta, Texas A&M Univ.

Monday, July 13

Extravehicular Activity: PLSS and Support Equipment (Part 3 of 5)

Session Code: ***ICES402***

Room Scarbrough Three ***Session Time:*** ***3:45 p.m.***

This session will include papers describing design studies and new technology development or significant experience and lessons learned with existing systems in the area of portable life support systems and associated support hardware. Papers dealing with emerging technology and concepts for use in and from Orion or other Constellation Systems are of particular interest.

Organizers - *Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2427***	***Testing of Commercial Hollow Fiber Membranes for Spacesuit Water membrane Evaporator***
		Grant Bue, Luis Trevino, NASA Johnson Space Center; Anthony Hanford, Jacobs Technology

4:15 p.m.	***2009-01-2371***	***Hollow Fiber Spacesuit Water Membrane Evaporator Development for Lunar Missions***
		Grant Bue, NASA Johnson Space Center
4:45 p.m.	***2009-01-2451***	***Development of a Compact, Efficient Cooling Pump for Spacesuit Life Support Systems***
		Roger van Boeyen, Jonathan Reeh, Lynntech Inc.; Luis Trevino, NASA Johnson Space Center
5:15 p.m.	***2009-01-2450***	***Development of a Prototype Water Pump for Future Space Suit Applications***
		Edward W. Hodgson, Hamilton Sundstrand; David Hartman, Hamilton Sundstrand Space Systems Intl.; Luis Trevino, NASA Johnson Space Center; Edward Gervais, Cascon Inc.

Monday, July 13

Satellite, Payload and Instrument Thermal Control (Part 1 of 2)

Session Code: ***ICES202***

Room Scarbrough Two ***Session Time:*** ***10:15 a.m.***

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

Organizers - *Patrick Hugonnot, Thales; Marco Molina, Carlo Gavazzi Space; Hiroyuki Ogawa, Institute of Space & Astronautical Sci; Nico H. Pennings, ESA ESTEC*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2348***	***Herschel Heaters Control Modeling and Correlation***
		Savino De Palo, Thales Alenia Space Italia; Michele Cairola, Marco Compassi, Thales Alenia Space Italia SpA; Ludovic Ouchet, Satellite Aerospace Inc; Claudio Damasio, Alenia Aerospazio
10:45 a.m.	***2009-01-2349***	***Thermal Design of the Mercury Transfer Module***
		Sean Tuttle, Giovanni Cavallo, Astrium Satellites Ltd.
11:15 a.m.	***2009-01-2350***	***Development of a Mechanically Pumped Fluid Loop for 3 To 6 KW Payload Cooling***
		Roeland C. Benthem Van, National Aerospace Laboratory NLR; Tisna Tjiptahardja, European Space Agency ESA; Wubbo Grave, National Aerospace Laboratory NLR; Rudolf Bleuler, RealTechnologie AG; Johannes Es, National Aerospace Laboratory NLR; Jacques Elst, Bradford Engineering BV
11:45 a.m.	***2009-01-2351***	***Sentinel-1 SAR Antenna Thermal Design and Verification Approach***
		Markus Manns, Markus Huchler, Mathias von Alberti, EADS Astrium GmbH; Aniceto Panetti, Thales Alenia Space Italia S.p.A

Monday, July 13

Satellite, Payloadand Instrument Thermal Control (Part 2 of 2)

Session Code: ***ICES202***

Room Scarbrough Two ***Session Time:*** ***1:30 p.m.***

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

Organizers - *Patrick Hugonnot, Thales; Marco Molina, Carlo Gavazzi Space; Hiroyuki Ogawa, Institute of Space & Astronautical Sci; Nico H. Pennings, ESA ESTEC*

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

1:30 p.m.	***2009-01-2374***	***Thermal Design of the MIXS Micro-Optics for X-Raying Mercury***
		Steven Price, Astrium, Ltd.
2:00 p.m.	***2009-01-2375***	***Domex-2 Thermal Design, Testing and Commissioning in Support to the SMOS Mission***
		Sylvain Vey, Silvio Dolce, European Space Agency; Giovanni Macelloni, Institute for Applied Physics - CNR; Elena Checa, European Space Agency
2:30 p.m.	***2009-01-2376***	***Thermal Control of CM and SM Panels for Turkish Satellite***
		Nedim Sozbir, Murat Bulut, Turksat A.S.

Monday, July 13

Spacecraft and Instrument Thermal Design, Testing and Technology

Session Code: ***ICES102***

Room Scarbrough Two ***Session Time:*** ***3:45 p.m.***

This session presents thermal design, testing, and on-orbit performance of near earth and interplanetary, unmanned/robotic spacecraft, instruments and payloads, and the application of key new technologies.

Organizers - *Wes Ousley, NASA Goddard Space Flight Center; Glenn T. Tsuyuki, Jet Propulsion Laboratory; David K. Wasson, Orbital Sciences Corp.*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2389***	***Thermal Test Verification of Emission Control through Directional Baffles for the James Webb Space Telescope***
		Matthew Garrison, NASA; Timothy Switzer, David Shaw, Bryant White, Genesis Engineering Solutions; Neal Bachtell, Johns Hopkins Univ. Applied Physics Lab; Robert Rashford, Michael Lynch, Frank Huber, Genesis Engineering Solutions
4:15 p.m.	***2009-01-2390***	***On-Orbit Performance of the Moon Mineralogy Mapper Instrument***
		Jose I. Rodriguez, Howard Tseng, Padma Varanasi, Burt Zhang, Jet Propulsion Laboratory
4:45 p.m.	***2009-01-2392***	***Effective Solar Absorptance of Multi-Layer Insulation***
		Pradeep Bhandari, Jet Propulsion Laboratory
5:15 p.m.	***2009-01-2391***	***Thermal Considerations for Meeting 20ºC and Stringent Temperature Gradient Requirements of IXO SXT Mirror Modules***
		Michael K. Choi, NASA Goddard Space Flight Center

Monday, July 13

International Space Station ECLS: Air and Water Systems

Session Code: ***ICES405***

Room Verelst Peroival ***Session Time:*** ***10:15 a.m.***

Session addresses ECLS Water and Air Subsystem issues and lessons learned from the International Space Station.

Organizers - *Richard P. Reysa, MEI Technologies Inc.; David E. Williams, NASA*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2352***	***Status of the Regenerative ECLSS Water Recovery System***
		Donald Layne Carter, NASA Marshall Space Flight Center

10:45 a.m.	***2009-01-2353***	***Status of the International Space Station (ISS) Trace Contaminant Control System***
		Ariel Macatangay, Wyle Laboratories, Inc.; Jay Perry, NASA Marshall Space Flight Center; Paul Belcher, The Boeing Company; Sharon Johnson, MEI Technologies Inc.
11:15 a.m.	***2009-01-2354***	***International Space Station Environmental Control and Life Support System Acceptance Testing for Node 1 Atmosphere Control and Storage Subsystem***
		David E. Williams, NASA
11:45 a.m.	***2009-01-2355***	***Survey of Software Problems with Impacts to Campout Protocol Extravehicular Activity (EVA) Prebreathe***
		Christopher M. Matty, Gregory Diderich, Jacobs

Monday, July 13

Management of Air Quality in Sealed Environments (Part 1 of 2)

Session Code: ***ICES505***

Room Verelst Peroival ***Session Time:*** ***1:30 p.m.***

The session enables experts that manage submarine, spacecraft, and airliner air quality to share new research findings on the control of air pollutants in these sealed or semi-sealed environments to include air quality standards, hazards associated with specific compounds, and monitoring of those compounds to protect the health of crew and passengers.

Organizers - *Hilary Bollan, Defense Equipment And Support Sea System; Chris Clark, Ministry of Defence UK; John T. James, NASA Johnson Space Center; Thomas Limero, Wyle Laboratories Inc.*

Time	***Paper No.***	***Title***
1:30 p.m.	***2009-01-2591***	***A History of Space Toxicology Mishaps: Lessons Learned and Risk Management***
		John T. James, NASA Johnson Space Center
2:00 p.m.	***2009-01-2578***	***An Investigation into the Carbon Dioxide Removal Performance of a Novel Hydrophobic Absorbent***
		Gareth D. Toft, Tony Aitchison, QinetiQ
2:30 p.m.	***2009-01-2577***	***CO2 Removal in Distressed Submarines: The Validation of the CFD Reaction Model Created to Represent a Chemical Based Passive Removal System for Royal Navy Submarines***
		Neil A. Scholes, Royal Navy; George Tebbut, Frazer Nash Consultancy Ltd.

Monday, July 13

Spacecraft Water/Air Quality: Maintenance and Monitoring

Session Code: ***ICES407***

Room Verelst Peroival ***Session Time:*** ***3:45 p.m.***

This session covers recent developments in spacecraft water quality monitoring technology.

Organizers - *John R. Schultz, John E. Straub II, Wyle Integrated Science & Eng'g.; Darrell L. Jan, Jet Propulsion Laboratory*

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

5:15 p.m.	***2009-01-2393***	***Development of the Second Generation International Space Station (ISS) Total Organic Carbon Analyzer (TOCA)***
		Anna Clements, NASA Johnson Space Center; Richard G. Stinson, Lockheed Martin Mission Services; Michael Van Wie, Eric Warren, Wyle Integrated Science & Engineering

Monday, July 13

Management of Air Quality in Sealed Environments (Part 2 of 2)

Session Code: ***ICES505***

Room Verelst Peroival ***Session Time:*** ***3:45 p.m.***

The session enables experts that manage submarine, spacecraft, and airliner air quality to share new research findings on the control of air pollutants in these sealed or semi-sealed environments to include air quality standards, hazards associated with specific compounds, and monitoring of those compounds to protect the health of crew and passengers.

Organizers - *Hilary Bollan, Defense Equipment And Support Sea System; Chris Clark, Ministry of Defence UK; John T. James, NASA Johnson Space Center; Thomas Limero, Wyle Laboratories Inc.*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2590***	***An Indicative Evaluation to Determine if Selected Endocrine Disrupting Chemicals of Concern to Health are Detectable in Royal Navy Submarines at Levels Observed in Previously Published House Dust Research Papers***
		Tina Anne Goodall, MoD United Kingdom
4:15 p.m.	***2009-01-2592***	***A Design Basis for Spacecraft Cabin Trace Contaminant Control***
		Jay L. Perry, NASA Marshall Space Flight Center
4:45 p.m.	***2009-01-2576***	***Results of Manned Shelter Testing in an Underground Mine***
		Thomas J. Daley, Micropore Inc.

Tuesday, July 14

Fire Safety in Spacecraft and Enclosed Habitats (Part 1 of 3)

Session Code: ***ICES513***

Room Ballroom D ***Session Time:*** ***3:45 p.m.***

This session covers all aspects of fire safety in closed environments including EVA suits; spacecraft; extraterrestrial habitats; aircraft; ships; and submarines. Relevant subjects include material controls for fire prevention; fire detection and suppression; fire signatures and toxicity; post-fire cleanup; risk assessment; fire related combustion research; lessons learned and design status of current systems; and life support and control system designs to enable fire detection and suppression.

Organizers - *Gary A. Ruff, NASA John Glenn Research Center; James F. Russell, Lockheed Martin Space Systems Co.; David L. Urban*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2468***	***Smoke Particle Sizes in Low-Gravity and Implications for the Design of Spacecraft Smoke Detector Design***
		David Urban, NASA; Gary A. Ruff, NASA John Glenn Research Center; George Mulholland, Thomas Cleary, Jiann Yang, National Institute Standards & Tech.; Zeng-guang Yuan, Victoria Bryg, National Center for Space Exploration Research

4:15 p.m.	***2009-01-2469***	***Miniaturized Sensor Systems for Early Fire Detection in Spacecraft***
		Gary Hunter, Paul Greenberg, Jennifer Xu, NASA John H. Glenn Research Center; Darby Makel, Makel Engineering Corp.; Benjamin Ward, Makel Engineering, Inc.; Chung-Chiun Liu, Case Western Reserve Univ.; Prabir Dutta, Ohio State Univ.
4:45 p.m.	***2009-01-2470***	***Development of a Test Protocol for Spacecraft Post-Fire Atmospheric Cleanup and Monitoring***
		David Zuniga, ESCG NASA Johnson Space Center; John Graf, NASA Johnson Space Center; Steven Hornung, NASA White Sands Test Facility; Jon Haas, NASA Johnson Space Center

Tuesday, July 14

Microbial Factors Applied to Design

Session Code: ***ICES507***

Room Ballroom E ***Session Time:*** ***8:00 a.m.***

This session focuses on the dynamic effects of microorganisms on materials and systems in order to minimize hardware performance issues.

Organizers - *Rebekah Jean Bruce, Enterprise Advisory Services Inc.; Monserrate Roman, NASA Marshall Space Flight Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2421***	***Characterization of Microbial Contamination in Pretreated Urine Collected from the ISS Urine Processing Assembly During Ground Testing***
		Michele Birmele, LaShelle McCoy, Dynamac Corp.; Monserrate Roman, NASA Marshall Space Flight Center; Michael Roberts, Dynamac Corp.
8:30 a.m.	***2009-01-2398***	***Identification of Microflora on Wicks and Biofilm Associated with Wastewater***
		JMR Apollo Arquiza, Jean B. Hunter, Cornell Univ.

Tuesday, July 14

Regenerable Life Support Processes and Systems

Session Code: ***ICES408***

Room Ballroom E ***Session Time:*** ***1:30 p.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*

Time	***Paper No.***	***Title***
1:30 p.m.	***2009-01-2442***	***Oxygen Production via Carbothermal Reduction of Lunar Regolith***
		Robert J. Gustafson, Brant White, Michael Fidler, Orbital Technologies Corp.
2:00 p.m.	***2009-01-2440***	***Design of a Stand-Alone Solid Oxide Electrolysis Stack with Embedded Sabatier Reactors for 100% Oxygen Regeneration***
		Christine S. Iacomini, Aaron Powers, Tom Durrant, Paragon Space Development

2:30 p.m.	***2009-01-2441***	***Development Status of the Carbon Dioxide and Moisture Removal Amine Swing-Bed System (CAMRAS)***
		William Papale, Tim Nalette, Hamilton Sundstrand; Jeffrey Sweterlitsch, NASA

Tuesday, July 14

Advanced Life Support Systems Control

Session Code: ***ICES301***

Room Ballroom E ***Session Time:*** ***3:45 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 - *David Kortenkamp, Traclabs; Linda Moreland, NASA Johnson Space Center*

Chairpersons - *David Kortenkamp, Traclabs*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2463***	***Development of Simulation Tool for Life Support System Design Based on the Interaction Model***
		Hiroyuki Miyajima, Tokyo Jogakkan College
4:15 p.m.	***2009-01-2464***	***A Crew Life Support System Control for Interplanetary Vehicles***
		Boris Zarezkiy, PhD, Lev Gavrilov, Eduard Kurmazenko, Prof, NIICHIMMASH
4:45 p.m.	***2009-01-2465***	***Data Abstraction Architecture for Monitoring and Control of Lunar Habitats***
		Scott Bell, David Kortenkamp, TRACLabs Inc.

Tuesday, July 14

Mars and Beyond

Session Code: ***ICES511***

Room Scarbrough Four ***Session Time:*** ***8:00 a.m.***

The session is dedicated to general matters concerning Mars: the environment and surroundings encountered on the planet, vehicles and vehicles behavior, problems and solutions found to sustain this particular environment, and various mars related technologies.

Organizers - *Marie-Christine Desjean, CNES; W. Andrew Jackson, Texas Tech. Univ.*

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2394***	***Search for Life on Mars and ExoMars Planetary Protection Approach***
		Vincenzo Guarnieri, Thales Alenia Space Italia ; Cesare Lobascio, Antonio Saverino, Thales Alenia Space Italia; Ezio Amerio, Marco Giuliani, Sofiter System Engineering SpA
8:30 a.m.	***2009-01-2395***	***The Mars Climate Database (version 4.3)***
		Ehouarn Millour, Laboratoire de Morologie Dynamique
9:00 a.m.	***2009-01-2396***	***Solar Cycle and Seasonal Variability of the Martian Thermosphere-Ionosphere and the Associated Impacts upon Atmospheric Escape***
		Stephen W. Bougher, Arnaud Valeille, Michael Combi, Valeriy Tenishev, Univ. of Michigan

9:30 a.m.	***2009-01-2397***	***The CHEMCAM Instrument on Mars Science Laboratory (MSL 09): First Laser Induced Breakdown Spectroscopy Instrument in Space!***
		Muriel Saccoccio, CNES; Sylvestre Maurice, CESR; Roger Wiens, B. Barraclough, John D. Bernardin, Los Alamos National Lab.; A. Cros, CESR; S. Bender, S. Clegg, Los Alamos National Lab.; L. Pares, LATT; K. Gasc, CNES; D. Kouach, B. Dubois, M. Bouye, OMP; J. Thocaven, H. Seran, Y. Parot, R. Orttner, CESR; B. Faure, Y. Michel, CNES; P. Cais, Observatoire de Boreaux; M. Berthe, IAS; R. Perez, CNES; R. Stiglich, D. Landis, T. Hale, Los Alamos National Lab.; C. Hayes, Chris Lindensmith, T. Elliot, Jet Propulsion Laboratory

Tuesday, July 14

Thermal and Environmental Control for Lunar Base and Surface Systems

Session Code: ***ICES106***

Room Scarbrough Four ***Session Time:*** ***10:15 a.m.***

This session focuses on passive and active thermal control for crewed lunar surface systems such as rovers, EVA systems, surface utilities (power systems and communications etc.), and science equipment. Other topic ideas could include lunar habitation, lunar base heat rejection, impacts of dust on thermal control, impacts of long duration shadows, thermal environment characterization, and development and implementation of advanced technologies specific to extended surface operations.

Organizers - *Gajanana Birur, Jet Propulsion Laboratory; Adrianus A. Delil, Advanced Aerospace Thermal Control Systems; Thomas O. Leimkuehler, Paragon Space Development; Paul M. McElroy, Temeku Technologies Inc.; John Sharp, NASA; Ryan Stephan, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2417***	***Sub-Critical Liquid Oxygen (LOX) Storage for Exploration Life Support Systems***
		David W. Plachta, Mohammad Hasan, NASA John Glenn Research Center
10:45 a.m.	***2009-01-2418***	***Spacesuit Cooling on the Moon and Mars***
		Harry W. Jones, NASA Ames Research Center
11:15 a.m.	***2009-01-2419***	***Design Description and Initial Characterization Testing of an Active Heat Rejection Radiator with Digital Turn-Down Capability***
		Gani Ganapathi, Eric T. Sunada, Gajanana Birur, Jennifer Miller, Jet Propulsion Laboratory; Ryan Stephan, NASA Johnson Space Center
11:45 a.m.	***2009-01-2420***	***Effect of Illumination Angle and Particle Size on the Performance of Dusted Thermal Control Surfaces in a Simulated Lunar Environment***
		James R. Gaier, NASA Glenn Research Center

Tuesday, July 14

Thermal Control for Planetary Surface Missions and Systems (Part 1 of 2)

Session Code: ***ICES104***

Room Scarbrough Four ***Session Time:*** ***1:30 p.m.***

This session focuses on passive and active thermal control for planetary surface missions and systems such as Mars rovers, comet rendezvous systems, surface mapping and science instruments and systems, in-situ resource mapping and processing.

Organizers - *Gajanana Birur, Jet Propulsion Laboratory; Adrianus A. Delil, Advanced Aerospace Thermal Control Systems; Paul M. McElroy, Temeku Technologies Inc.*

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

1:30 p.m.	***2009-01-2435***	***Thermal Design for Mars-NEXT***
		David Gwyn Jones, Astrium, Ltd.
2:00 p.m.	***2009-01-2437***	***Mars Science Laboratory Mechanically Pumped Fluid Loop for Thermal Control, Design, Implementation and Testing***
		Pradeep Bhandari, Gajanana Birur, Paul Karlmann, David Bame, A. J. Mastropietro, Michael Pauken, Gani Ganapathi, Robert Krylo, Jet Propulsion Laboratory
2:30 p.m.	***2009-01-2438***	***Thermal Strategy for the Phoenix Robotic Arm Deployment***
		Glenn T. Tsuyuki, Jet Propulsion Laboratory; Chern-Jiin Lee, Applied Science Laboratories

Tuesday, July 14

Thermal Control for Planetary Surface Missions and Systems (Part 2 of 2)

Session Code: ***ICES104***

Room Scarbrough Four ***Session Time:*** ***3:45 p.m.***

This session focuses on passive and active thermal control for planetary surface missions and systems such as Mars rovers, comet rendezvous systems, surface mapping and science instruments and systems, in-situ resource mapping and processing.

Organizers - *Gajanana Birur, Jet Propulsion Laboratory; Adrianus A. Delil, Advanced Aerospace Thermal Control Systems; Paul M. McElroy, Temeku Technologies Inc.*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2461***	***Thermal Design for Moon-NEXT Polar Rover***
		Simon Barraclough, EADS Astrium, Ltd.
4:15 p.m.	***2009-01-2462***	***Thermal Design Trade Study for the Mars Science Laboratory ChemCam Body-Mounted Unit***
		Glenn T. Tsuyuki, Jet Propulsion Laboratory; Siuchun Lee, ASL; John Bernardin, Los Alamos National Laboratory

Tuesday, July 14

Physico-Chemical Life Support Process Development (Part 4 of 5)

Session Code: ***ICES302***

Room Scarbrough One ***Session Time:*** ***8:00 a.m.***

This session will address research issues and development of physico-chemical technologies for Water Recovery System (WRS) for use in Space Vehicles and Planetary Habitats. Performance characteristics of technologies for processing water and urine will be included. Discussions of crosscutting technologies demonstrating the integration of the systems together with reduction of mission costs are also encouraged.

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

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2402***	***Ersatz Formulations for Lunar Outpost Wastewater and Brine***
		Jean B. Hunter, Jasmin Sahbaz, Cornell Univ.
8:30 a.m.	***2009-01-2400***	***Development of an In-line Urine Monitoring System for the International Space Station***
		James Lee Broyan, Branelle Cibuzar, NASA Johnson Space Center

9:00 a.m.	***2009-01-2401***	***Cascade Distillation Subsystem Development: Progress Toward a Distillation Comparison Test*** *Michael R. Callahan, Jacobs Technology; Alex Lubman, Honeywell International; Karen Pickering, NASA Johnson Space Center*

Tuesday, July 14

Physico-Chemical Life Support Process Development (Part 5 of 5)

Session Code: ***ICES302***

Room Scarbrough One ***Session Time:*** ***10:15 a.m.***

This session will address research issues and development of physico-chemical technology for the Air Revitalization Systems (ARS) for use in Space Vehicles and Planetary Habitats. Performance of technologies for processing air will be included and studies on use of Commercial off-the Shelf adsorbents in purification of air are encouraged. Discussions on crosscutting technologies demonstrating the integration of the systems together with reduction of mission costs are also encouraged.

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

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2444***	***Engineered Structured Sorbents for the Adsorption of Carbon Dioxide and Water Vapor from Manned Spacecraft Atmospheres: Applications and Testing 2008/2009*** *Jay Perry, NASA Marshall Space Flight Center; David Howard, All Points Logistics Inc.; James C. Knox, NASA Marshall Space Flight Center; Christian Junaedi PhD, Precision Combustion Inc*
10:45 a.m.	***2009-01-2467***	***Development and Testing of a Prototype Microwave Plasma Reactor for Hydrogen Recovery from Sabatier Waste Methane*** *James E. Atwater, Richard Wheeler, Neal Hadley, Roger Dahl, Umpqua Research Co.; Robyn Carrasquillo, NASA Marshall Space Flight Center*
11:15 a.m.	***2009-01-2445***	***Development and Testing of a Sorbent-Based Atmosphere Revitalization System 2008/2009*** *Lee Miller, ECLS Technologies, LLC; James C. Knox, NASA Marshall Space Flight Center*
11:45 a.m.	***2009-01-2443***	***VOC Removal by Novel Regenerable Silica-Titania Sorbent and Photocatalytic Technology*** *Alexander F. Gruss, Univ. of Florida; Anna Casasus, Sol-gel Solutions LLC; David W. Mazyck, Univ. of Florida*

Tuesday, July 14

Extravehicular Activity: PLSS and Support Equipment (Part 4 of 5)

Session Code: ***ICES402***

Room Scarbrough Three ***Session Time:*** ***8:00 a.m.***

This session will include papers describing design studies and new technology development or significant experience and lessons learned with existing systems in the area of portable life support systems and associated support hardware. Papers dealing with emerging technology and concepts for use in and from Orion or other Constellation Systems are of particular interest.

Organizers - *Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center*

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

8:00 a.m.	***2009-01-2370***	***Results of the Trace Contaminant Control Trade Study for Space Suit Life Support Development***
		Heather L. Paul, NASA Johnson Space Center; Mallory Jennings, Lyndon B. Johnson Space Center
8:30 a.m.	***2009-01-2386***	***Heat Exchanger/Humidifier Trade Study and Conceptual Design for the Constellation Space Suit Portable Life Support System Ventilation Subsystem***
		Robert Sompayrac, Escg Jacobs; Bruce Conger, Hamilton Sundstrand; Mateo Chamberlain, Escg Jacobs; Heather L. Paul, NASA Johnson Space Center
9:00 a.m.	***2009-01-2448***	***Fan Performance Testing and Oxygen Compatibility Assessment Results for Future Space Suit Life Support Systems***
		Heather L. Paul, NASA Johnson Space Center; Mallory Jennings, Lyndon B. Johnson Space Center; Matthew Vogel, Jacobs Engineering

Tuesday, July 14

Extravehicular Activity: PLSS and Support Equipment (Part 5 of 5)

Session Code: ***ICES402***

Room Scarbrough Three ***Session Time:*** ***10:15 a.m.***

This session will include papers describing design studies and new technology development or significant experience and lessons learned with existing systems in the area of portable life support systems and associated support hardware. Papers dealing with emerging technology and concepts for use in and from Orion or other Constellation Systems are of particular interest.

Organizers - *Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2372***	***Evaluation of Carbon Dioxide Sensors for the Constellation Space Suit Life Support System for Surface Exploration***
		Daniel L. Dietrich, NASA John Glenn Research Center; Heather Paul, NASA Johnson Space Center; Bruce Conger, Hamilton Sundstrand
10:45 a.m.	***2009-01-2388***	***PLSS Scale Demonstration of MTSA Temperature Swing Adsorption Bed Concept for CO2 Removal/Rejection***
		Christine S. Iacomini, Paragon Space Development; Heather L. Paul, NASA Johnson Space Center; Aaron Powers, Paragon Space Development
11:15 a.m.	***2009-01-2387***	***Investigation of Condensing Ice Heat Exchangers for MTSA Technology Development***
		Sebastian Padilla, Aaron Powers, Christine S. Iacomini, Paragon Space Development; Heather L. Paul, NASA Johnson Space Center

Tuesday, July 14

Extravehicular Activity: Space Suits (Part 1 of 4)

Session Code: ***ICES400***

Room Scarbrough Three ***Session Time:*** ***1:30 p.m.***

This session covers topics related to space suit pressure garments. It includes advanced development work, as well as on-going efforts towards the Constellation Program flight program space suit design.

Organizers - *Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center*

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

1:30 p.m.	***2009-01-2553***	***Constellation Pressure Garment Development Activities***
		Amy J. Ross, NASA Johnson Space Center
2:00 p.m.	***2009-01-2496***	***Defining Constellation Suit Helmet Field of View Requirements Employing a Mission Segment Based Reduction Process***
		Shane M. McFarland, MEI Technologies/NASA JSC
2:30 p.m.	***2009-01-2538***	***Philosophies Applied in the Selection of Space Suit Joint Range-of-Motion Requirements***
		Lindsay Aitchison, NASA

Tuesday, July 14

Extravehicular Activity: Space Suits (Part 2 of 4)

Session Code: ***ICES400***

Room Scarbrough Three ***Session Time:*** ***3:45 p.m.***

This session covers topics related to space suit pressure garments. It includes advanced development work, as well as on-going efforts towards the Constellation Program flight program space suit design.

Organizers - *Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2497***	***Development and Testing of the First Full Pressure Suit for Non-Govermental Commercial Spaceflight***
		Pablo G. De Leon, Univ. of North Dakota; Gary Harris, De Leon Technologies LLC
4:15 p.m.	***2009-01-2537***	***A Method for and Issues Associated with the Determination of Space Suit Joint Requirements***
		Jennifer E. Matty, Jacobs Engineering; Lindsay Aitchison, NASA
4:45 p.m.	***2009-01-2535***	***Characterization of Structural, Volume and Pressure Components to Space Suit Joint Rigidity***
		Bradley T. Holschuh, James Waldie, Jeffrey Hoffman, Dava Newman, Massachusetts Institute of Technology
5:15 p.m.	***2009-01-2536***	***Investigation of Joint Torque Characteristics for a Mechanical Counterpressure Spacesuit***
		Jared Ruckman, Kettering Univ.; Edward W. Hodgson, Gregory Quinn, Hamilton Sundstrand

Tuesday, July 14

Thermal Testing (Part 1 of 2)

Session Code: ***ICES203***

Room Scarbrough Two ***Session Time:*** ***8:00 a.m.***

The thermal testing session focuses on all aspects of thermal tests, test methods, test correlation and test facilities. Tests for all kinds of spacecraft, instruments, equipments and materials are of interest. Special attention is given to sharing lessons learned from thermal test and test analysis and correlation activities, and also to innovative test methods, set-ups, and approaches to testing and verification of the hardware and of the analysis.

Organizers - *Markus Huchler, EADS Astrium GmbH; Andrew Robson, EADS France*

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

8:00 a.m.	***2009-01-2409***	***Investigation of Thermal Test Effectiveness for Spacecraft Electronic Units Using Precipitation Efficiencies of MIL-HDBK-344***
		John W. Welch, Aerospace Corporation
8:30 a.m.	***2009-01-2412***	***ESTEC Calorimeter: Thirty-Five Years of Measurements***
		Robert Mayrhofer, RUAG Aerospace Austria; Bernd Lehmann, ESA ESTEC; Ingolf Eberhart, Christian Laa, Christian Ranzenberger, Alexander Reissner, Johannes Stipsitz, RUAG Aerospace Austria
9:00 a.m.	***2009-01-2411***	***ESTEC Calorimeter: Numerical Interpretation of Measurements***
		Robert Mayrhofer, RUAG Aerospace Austria; Bernd Lehmann, ESA ESTEC; Christian Laa, Christian Ranzenberger, Alexander Reissner, Johannes Stipsitz, RUAG Aerospace Austria
9:30 a.m.	***2009-01-2410***	***Cryogenic Thermal Testing of the Verification Model Mid-Infrared Instrument (MIRI) Optics Module***
		Bryan Shaughnessy, Paul Eccleston, Rutherford Appleton Laboratory

Tuesday, July 14

Thermal Testing (Part 2 of 2)

Session Code: ***ICES203***

Room Scarbrough Two ***Session Time:*** ***10:15 a.m.***

The thermal testing session focuses on all aspects of thermal tests, test methods, test correlation and test facilities. Tests for all kinds of spacecraft, instruments, equipments and materials are of interest. Special attention is given to sharing lessons learned from thermal test and test analysis and correlation activities, and also to innovative test methods, set-ups, and approaches to testing and verification of the hardware and of the analysis.

Organizers - *Markus Huchler, EADS Astrium GmbH; Andrew Robson, EADS France*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2428***	***The AMS02 TVTB Test Design and Predictions***
		Serena Borsini, Univ. of Perugia-INFN; Marco Molina, Carlo Gavazzi Space; Yan Chen, Shandong Univ.; Christian Vettore, Ivan Corradino, Paolo Ruzza, Carlo Gavazzi Space; Roberto Battiston, Bruna Bertucci, Univ. of Perugia-INFN
10:45 a.m.	***2009-01-2429***	***AMS-02 Radiators Thermal Model Correlation with Test Data***
		Paolo Ruzza, Univ. of Perugia - Carlo Gavazzi Space SpA; Marco Molina, Marcus Groeller, Carlo Gavazzi Space SpA
11:15 a.m.	***2009-01-2430***	***Thermal Verification and Testing of Earth Observation and Navigation Platforms: Thales Alenia Space Italia Experience***
		Andrea Ferrero, Manuela Muni, Ernesto Massa, Enrico Sacchi, Thales Alenia Space Italia

Tuesday, July 14

Space Station and Manned Orbiting Infrastructures Thermal Control (Part 1 of 2)

Session Code: ***ICES107***

Room Scarbrough Two ***Session Time:*** ***1:30 p.m.***

This session addresses thermal control design, operation onboard current and future manned space stations, either institutional or commercial. Topics from system and component issues with Space Station thermal control systems to thermal aspects of payloads and experiments that utilize the station as a science platform or as a test bed for future exploration applications, including thermal control solutions/techniques, e.g. for habitats based on inflatable technologies.

Organizers - *Gary A. Adamson, Hamilton Sundstrand; Gualtiero Brambati, Thales Alenia Space Italia; Jon B. Holladay, NASA Marshall Space Flight Center; Thomas O. Leimkuehler, Paragon Space*

Development; Zoltan Szigetvari, Astrium Space Transportation; Dale Allen Winton, Honeywell Int'l Inc.

Time	Paper No.	Title
1:30 p.m.	***2009-01-2452***	***Development of a Passive Gas Trap for Internal Thermal Control System***
		Dacong Weng, Bonnie Bowman, Honeywell Int'l Inc.
2:00 p.m.	***2009-01-2453***	***A5ES-ATV: Aerothermodynamical Study of the Deorbitation of the Ariane 5 Upper Composite***
		Amauric Jarry, Dominique Fraioli, Astrium Space Transportation
2:30 p.m.	***2009-01-2454***	***NODE 3 & CUPOLA Thermal Analysis Campaign for Design Verification and Operations Definition***
		Luca Tentoni, Nicola Fortunato, Renato Martino, Giovanni Loddoni, Thales Alenia Space Italy

Tuesday, July 14

Space Station and Manned Orbiting Infrastructures Thermal Control (Part 2 of 2)

Session Code: ***ICES107***

Room Scarbrough Two ***Session Time:*** ***3:45 p.m.***

This session addresses thermal control design, operation onboard current and future manned space stations, either institutional or commercial. Topics from system and component issues with Space Station thermal control systems to thermal aspects of payloads and experiments that utilize the station as a science platform or as a test bed for future exploration applications, including thermal control solutions/techniques, e.g. for habitats based on inflatable technologies.

Organizers - *Gary A. Adamson, Hamilton Sundstrand; Gualtiero Brambati, Thales Alenia Space Italia; Jon B. Holladay, NASA Marshall Space Flight Center; Thomas O. Leimkuehler, Paragon Space Development; Zoltan Szigetvari, Astrium Space Transportation; Dale Allen Winton, Honeywell Int'l Inc.*

Time	Paper No.	Title
3:45 p.m.	***2009-01-2474***	***ATV THERMAL CONTROL: Architecture and Jules Verne First Flight Result***
		Patrick Oger, Pascal Vincent, Jean-Christophe Guyot, Astrium Space Transportation; Frank Bouckaert, European Space Agency
4:15 p.m.	***2009-01-2475***	***ATCS Operations during COLUMBUS Mission: Flight Data Evaluation and Correlation***
		Savino De Palo, Gaetana Bufano, Paolo Vaccaneo, Fabio Burzagli, Thales Alenia Space Italia; Marco Bruno, Sofiter System Engineering

Tuesday, July 14

International Space Station ECLS: Systems (Part 1 of 2)

Session Code: ***ICES404***

Room Verelst Peroival ***Session Time:*** ***8:00 a.m.***

This session addresses ECLS Systems issues and lessons learned from the International Space Station.

Organizers - *Richard P. Reysa, MEI Technologies Inc.; David E. Williams, NASA*

Time	Paper No.	Title

8:00 a.m.	***2009-01-2415***	***International Space Station Environmental Control and Life Support System Status: 2008 - 2009***
		David E. Williams, NASA
8:30 a.m.	***2009-01-2414***	***Columbus ECLSS First Year of Operations***
		Paola Parodi, Sergio Palumberi, Thales Alenia Space Italia; Roland Mueller, EADS Astrium GmbH; Zoltan Szigetvari, Astrium Space Transportation; Johannes Witt, ESA; Gaetana Bufano, Thales Alenia Space Italia
9:00 a.m.	***2009-01-2413***	***Nitrogen Oxygen Recharge System for the International Space Station***
		Brandon N. Dick, Boeing
9:30 a.m.	***2009-01-2416***	***Modification of the USOS to Support Installation and Activation of the Node 3 Element***
		Dwight E. Link, Boeing Integrated Defense Systems

Tuesday, July 14

International Space Station ECLS: Systems (Part 2 of 2)

Session Code: ***ICES404***

Room Verelst Peroival ***Session Time:*** ***10:15 a.m.***

This session addresses ECLS Systems issues and lessons learned from the International Space Station.

Organizers - *Richard P. Reysa, MEI Technologies Inc.; David E. Williams, NASA*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2432***	***Improving the Measurement Accuracy of Water Partial Pressure Using the Major Constituent Analyzer***
		Ben Gardner, Hamilton Sundstrand Space Systems Intl.; Souzan Thoresen, Hamilton Sundstrand
10:45 a.m.	***2009-01-2433***	***Root Cause Assessment of Pressure Drop Rise of a Packed Bed of Lithium Hydroxide in the International Space Station Trace Contaminant Control System***
		Tatiana Aguilera, Carnegie Mellon Univ.; Jay L. Perry, NASA Marshall Space Flight Center
11:15 a.m.	***2009-01-2431***	***Carbon Dioxide Removal Assembly Performance Comparison***
		Robert Kay, Dina El Sherif, Honeywell International

Tuesday, July 14

CEV ECLSS and Thermal Control (Part 1 of 2)

Session Code: ***ICES306***

Room Verelst Peroival ***Session Time:*** ***1:30 p.m.***

This session addresses Crew Exploration Vehicle current configuration and status.

Organizers - *Grant Allan Anderson, Barry W. Finger, Paragon Space Development; John F. Lewis, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
1:30 p.m.	***2009-01-2457***	***Crew Exploration Vehicle Environmental Control and Life Support Development Status***
		John F. Lewis, NASA Johnson Space Center

2:00 p.m.	***2009-01-2456***	***First Human Testing of the Orion Atmosphere Revitalization Technology***
		Amy Lin, Jacobs Technology; Jeffrey Sweterlitsch, NASA
2:30 p.m.	***2009-01-2460***	***Orion Emergency Mask Approach***
		George Tuan, John Graf, NASA Johnson Space Center

Tuesday, July 14

CEV ECLSS and Thermal Control (Part 2 of 2)

Session Code: ***ICES306***

Room Verelst Peroival ***Session Time:*** ***3:45 p.m.***

This session addresses Crew Exploration Vehicle current configuration and status.

Organizers - *Grant Allan Anderson, Barry W. Finger, Paragon Space Development; John F. Lewis, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2458***	***A Comparison between One- and Two-Loop ATCS Architectures Proposed for CEV***
		Dustin A. Ochoa, Walt Vonau, Jacobs Technology (ESCG); Michael Ewert, NASA Johnson Space Center
4:15 p.m.	***2009-01-2459***	***Compatibility Study of Silver Biocide in Drinking Water with Candidate Metals for Crew Exploration Vehicle Potable Water System***
		Niklas Adam, Jacobs Technology

Wednesday, July 15

Fire Safety in Spacecraft and Enclosed Habitats (Part 2 of 3)

Session Code: ***ICES513***

Room Ballroom D ***Session Time:*** ***8:00 a.m.***

This session covers all aspects of fire safety in closed environments including EVA suits; spacecraft; extraterrestrial habitats; aircraft; ships; and submarines. Relevant subjects include material controls for fire prevention; fire detection and suppression; fire signatures and toxicity; post-fire cleanup; risk assessment; fire related combustion research; lessons learned and design status of current systems; and life support and control system designs to enable fire detection and suppression.

Organizers - *Gary A. Ruff, NASA John Glenn Research Center; James F. Russell, Lockheed Martin Space Systems Co.; David L. Urban*

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2490***	***Pressure Effects on Self-Extinguishment Limits of Aerospace Materials***
		David Hirsch, NASA; Gary A. Ruff, NASA John Glenn Research Center; Michael Pedley, Jon Haas, NASA Johnson Space Center; Harold Beeson, NASA White Sands Test Facility; James Williams, NASA Johnson Space Center
8:30 a.m.	***2009-01-2489***	***Microgravity Flame Spread over Non-Charring Materials in Exploration Atmospheres: Pressure, Oxygen, and Velocity Effects on Concurrent Flame Spread***
		Sandra L. Olson, Gary A. Ruff, NASA Glenn Research Center
9:00 a.m.	***2009-01-2491***	***Ignition Delay of Combustible Materials in Normoxic Equivalent Environments***
		Sara McAllister, Carlos Fernandez-Pello, Univ. of California-Berkeley; Gary Ruff, David Urban, NASA John H. Glenn Research Center

9:30 a.m.	***2009-01-2492***	***Modeling Flame Spread and Extinction of Solids in Space Exploration Atmospheres***
		Sheng-Yen Hsu, Ya-Ting Tseng, James S. T'ien, Case Western Reserve Univ.

Wednesday, July 15

Fire Safety in Spacecraft and Enclosed Habitats (Part 3 of 3)

Session Code: ***ICES513***

Room Ballroom D ***Session Time:*** ***10:15 a.m.***

This session covers all aspects of fire safety in closed environments including EVA suits; spacecraft; extraterrestrial habitats; aircraft; ships; and submarines. Relevant subjects include material controls for fire prevention; fire detection and suppression; fire signatures and toxicity; post-fire cleanup; risk assessment; fire related combustion research; lessons learned and design status of current systems; and life support and control system designs to enable fire detection and suppression.

Organizers - *Gary A. Ruff, NASA John Glenn Research Center; James F. Russell, Lockheed Martin Space Systems Co.; David L. Urban*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2512***	***Flammability of Human Hair in Exploration Atmospheres***
		Sandra L. Olson, DeVon W. Griffin, David L. Urban, Gary A. Ruff, NASA Glenn Research Center; Elizabeth A. Smith, Cornell Univ.
10:45 a.m.	***2009-01-2511***	***A Fire Suppression Analysis for the Altair Project***
		Daniel L. Dietrich, David Urban, Gary Ruff, NASA John Glenn Research Center
11:15 a.m.	***2009-01-2510***	***Advances in Development of a Fine Water Mist Portable Fire Extinguisher***
		James R. Butz, ADA Technologies Inc.; Angel Abbud-Madrid, Colorado School of Mines

Wednesday, July 15

Human/Robotics System Integration

Session Code: ***ICES406***

Room Ballroom D ***Session Time:*** ***1:30 p.m.***

This session addresses the 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 Inc.*

Time	***Paper No.***	***Title***
1:30 p.m.	***2009-01-2527***	***Human-rated Automated and Robotics Systems - HAL can work Safely with Astronauts***
		Lynn E. Baroff, David Fitts, Charles Dischinger, NASA
2:00 p.m.	***2009-01-2528***	***In Situ Planetary Resource Exploration using Miniature Robotic Subsurface Sample Analysis***
		Roman Kruzelecky, MPB Communications Inc.; Edward Cloutis, Univ. of Winnipeg; Nadeem Ghafoor, Sean Jessen, MDA Space Missions

2:30 p.m.	***2009-01-2530***	***Proposed Standards and Tools for Risk Analysis and Allocation of Robotic Systems to Enhance Crew Safety During Planetary Surface Exploration***
		Lealem Mulugeta, USRA DSLS; David Bodkin, Orbital Sciences Corp.; Romain Chasseigne; Michael Demel; Dexter Jagula; Matthew Turnock, McMaster Univ., Centre for Simulation Based Learning
3:00 p.m.	***2009-01-2529***	***Role Definition and Task Allocation for a Cooperative EVA and Robotic Team***
		Sharon Michelle Singer, David Akin, Space Systems Laboratory, Univ. of Maryland

Wednesday, July 15

Education Outreach

Session Code: ***ICES307***

Room Ballroom D ***Session Time:*** ***3:45 p.m.***

The Education and Outreach session features papers that link human activities in space with human activities on earth. The session provides educators the opportunity to share experiences and present the most recent methodologies for linking students and the general public to human exploration of space.

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

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2547***	***Academic Principles of Human Space Habitat Design***
		David M. Klaus, Kevin Higdon, Univ. of Colorado-Boulder
4:15 p.m.	***2009-01-2546***	***Developing Education and Outreach Initiatives at the Indiana Space Grant Consortium***
		Barrett S. Caldwell, Purdue Univ.- West Lafayette

Wednesday, July 15

Lunar Life Support (Part 1 of 2)

Session Code: ***ICES509***

Room Ballroom E ***Session Time:*** ***8:00 a.m.***

This session focuses on life support systems for future human lunar missions, addressing vehicle elements such as landers, pressurized rovers and outpost habitats. It will include discussions of requirements, technology development needs, challenges and gaps, candidate system designs, interfaces to other systems, as well as technology solutions.

Organizers - *Daniel J. Barta, NASA Johnson Space Center; W. Andrew Jackson, Texas Tech. Univ.*

Chairpersons - *Daniel Barta, NASA Johnson Space Center*

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

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2481***	***Challenges with Deploying and Integrating Environmental Control and Life Support Functions in a Lunar Architecture with High Degrees of Mobility***
		Robert M. Bagdigian, NASA Marshall Space Flight Center
8:30 a.m.	***2009-01-2482***	***Lunar Base Life Support Failure Analysis and Simulation***
		Harry W. Jones, NASA Ames Research Center

9:00 a.m.	***2009-01-2505***	***Investigation of Life Support and Habitability Requirements for a Pressurized Lunar Rover***
		Syed-Ali Husain, David Akin, Univ. of Maryland School of Engineering
9:30 a.m.	***2009-01-2484***	***Prototype BLSS Lunar Greenhouse***
		Phil Sadler, Sadler Machine Company; Gene Giacomelli, Roberto Furfaro, Randy Patterson, Murat Kacira, Univ. of Arizona

Wednesday, July 15

Lunar Life Support (Part 2 of 2)

Session Code: ***ICES509***

Room Ballroom E ***Session Time:*** ***10:15 a.m.***

This session focuses on life support systems for future human lunar missions, addressing vehicle elements such as landers, pressurized rovers and outpost habitats. It will include discussions of requirements, technology development needs, challenges and gaps, candidate system designs, interfaces to other systems, as well as technology solutions.

Organizers - *Daniel J. Barta, NASA Johnson Space Center; W. Andrew Jackson, Texas Tech. Univ.*

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

Assistant Chairpersons - *Daniel Barta, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2483***	***Development of Life Support System Technologies for Human Lunar Missions***
		Daniel Barta, Michael Ewert, NASA Johnson Space Center
10:45 a.m.	***2009-01-2503***	***A Sustainable Regolith-Based Water Recovery Concept for the Lunar Outpost***
		Evan Thomas, David Klaus, Jared Leidich, Univ. of Colorado-Boulder

Wednesday, July 15

Advanced Life Support Sensor and Control Technology (Part 1 of 2)

Session Code: ***ICES205***

Room Ballroom E ***Session Time:*** ***1:30 p.m.***

This session includes 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 - *Darrell L. Jan, Margaret A. Ryan, Abhijit Shevade, Jet Propulsion Laboratory; Timo Stuffler, Kayser-Threde GmbH; Gijsbert B T Tan, ESA ESTEC*

Time	***Paper No.***	***Title***
1:30 p.m.	***2009-01-2523***	***Advanced ISS Air Monitoring - The ANITA and ANITA2 Missions***
		T. Stufler, H. Mosebach, D. Kampf, Kayser-Threde GmbH; A. Honne, H. Schumann-Olsen, K. Kaspersen, SINTEF; N. Henn, DLR; W. Supper, G. Tan, ESTEC

2:00 p.m.	***2009-01-2520***	***Evaluation of ANITA Air Monitoring on the International Space Station***
		Atle Honne, Henrik Schumann-Olsen, Kristin Kaspersen, SINTEF; Thomas Limero, Ariel Macatangay, Wyle Laboratories Inc.; Herbert Mosebach PhD, Dirk Kampf, Kayser-Threde GmbH; Paul Mudgett, John James, NASA Johnson Space Center; Gijsbert Tan, ESA ESTEC; Wolfgang Supper, European Space Agency
2:30 p.m.	***2009-01-2522***	***Operation of Third Generation JPL Electronic Nose on ISS***
		M. A. Ryan, K Manatt, M Homer, S Gluck, A Shevade, A Kisor, L Lara, Jet Propulsion Laboratory
3:00 p.m.	***2009-01-2521***	***The Orion Air Monitor Performance Model; Dynamic Simulations and Accuracy Assessments in the CEV Atmospheric Revitalization Unit Application***
		George Steiner, Hamilton Sundstrand

Wednesday, July 15

Advanced Life Support Sensor and Control Technology (Part 2 of 2)

Session Code: ***ICES205***

Room Ballroom E ***Session Time:*** ***3:45 p.m.***

This session includes 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 - *Darrell L. Jan, Margaret A. Ryan, Abhijit Shevade, Jet Propulsion Laboratory; Timo Stuffler, Kayser-Threde GmbH; Gijsbert B T Tan, ESA ESTEC*

Time	***Paper No.***	***Title***
3:45 p.m.	***2009-01-2544***	***Trade Studies of Selected Environmental Monitoring and Control Technologies***
		Craig E. Peterson, Margaret A. Ryan, Jet Propulsion Laboratory
4:15 p.m.	***2009-01-2542***	***Smoke Detection for the Orion Crew Exploration Vehicle***
		George Steiner, Hamilton Sundstrand
4:45 p.m.	***2009-01-2543***	***Monitoring Pre-Combustion Event Markers by Heating Electrical Wires***
		Abhijit Shevade, Margaret Ryan, Adam Kisor, Kenneth Manatt, Margie Homer, Liana Lara, Jet Propulsion Laboratory
5:15 p.m.	***2009-01-2545***	***Development of a Photocatalytic Oxidation based TOC Analyzer Part II: Effect of Reactor Design and Operation Parameters on Oxidation Efficiency of VOCs***
		Lanfang H. Levine, Jeffrey T. Richards, Dynamac Corp.; William Rigdon, Univ. of Central Florida; Paul E. Hintze, John C. Sager, Raymond M. Wheeler, NASA Kennedy Space Center

Wednesday, July 15

Thermal and Environmental Control of Crewed Lunar Exploration Vehicles (Part 1 of 2)

Session Code: ***ICES100***

Room Scarbrough Four ***Session Time:*** ***8:00 a.m.***

This session covers passive and active thermal control, thermal protection and environmental control topics for vehicles used to transport crew and cargo to/from the moon, with emphasis on the Altair Lunar Lander and crew transit vehicle systems. Papers on related systems within the Constellation and international programs are welcome. Potential topics cover discussion of thermal and environmental control requirements, design, analysis, verification and testing, and technology development.

Organizers - *Burkhard Behrens, Astrium Space Transportation; Gualtiero Brambati, Thales Alenia Space Italia;*

Joe Chambliss, NASA Johnson Space Center; Thomas O. Leimkuehler, Paragon Space Development; Jose Roman, NASA Marshall Space Flight Center

Time	Paper No.	Title
8:00 a.m.	***2009-01-2436***	***Overview of NASA's Thermal Control System Development for Exploration Project***
		Ryan Stephan, NASA Johnson Space Center
8:30 a.m.	***~~2009-01-2476~~ CANCELLED***	***Evaluation of Dowfrost HD as a Thermal Control Fluid for Constellation Vehicles***
		Steve Lee, MEI Technologies
9:00 a.m.	***2009-01-2479***	***Testing and Model Correlation of Sublimator Driven Coldplate Coupons***
		Rubik Sheth, Ryan Stephan, NASA Johnson Space Center; Thomas O. Leimkuehler, Paragon Space Development
9:30 a.m.	***2009-01-2480***	***Investigation of Transient Sublimator Performance***
		Thomas O. Leimkuehler, Paragon Space Development; Rubik Sheth, Ryan Stephan, NASA Johnson Space Center

Wednesday, July 15

Thermal and Environmental Control of Crewed Lunar Exploration Vehicles (Part 2 of 2)

Session Code: ***ICES100***

Room Scarbrough Four ***Session Time:*** ***10:15 a.m.***

This session covers passive and active thermal control, thermal protection and environmental control topics for vehicles used to transport crew and cargo to/from the moon, with emphasis on the Altair Lunar Lander and crew transit vehicle systems. Papers on related systems within the Constellation and international programs are welcome. Potential topics cover discussion of thermal and environmental control requirements, design, analysis, verification and testing, and technology development.

Organizers - *Burkhard Behrens, Astrium Space Transportation; Gualtiero Brambati, Thales Alenia Space Italia; Joe Chambliss, NASA Johnson Space Center; Thomas O. Leimkuehler, Paragon Space Development; Jose Roman, NASA Marshall Space Flight Center*

Time	Paper No.	Title
10:15 a.m.	***2009-01-2477***	***Altair Lander Life Support: Design Analysis Cycles 1, 2, and 3***
		Molly Anderson, Su Curley, Imelda Stambaugh, Henry Rotter, NASA
10:45 a.m.	***2009-01-2478***	***The Application of Simulation Tools to Ultra-deep Water Development Programs and its Relevance to Space Exploration***
		Frank Sager, Oceaneering Space Systems

Wednesday, July 15

Panel: Thermal Testing

Session Code: ***ICES206***

Room Scarbrough Four ***Session Time:*** ***2:00 p.m.***

The Thermal Testing Panel shall provide a forum for the open discussion and exchange of test methods, test correlation and test facilities. Lessons learned from thermal test and test related activities shall be discussed.

Organizers - *Markus Huchler, EADS Astrium GmbH; Rajeshuni Ramesham, California Institute of Technology; Andrew Robson, EADS France*

Panelists - *Chris Jewell, ESA ESTEC; Steven Price, Astrium, Ltd.; Bryan M. Shaughnessy, Rutherford Appleton Lab.; Hume Peabody, NASA; Eric W. Grob, NASA Goddard Space Flight Center; Marco Molina, Carlo Gavazzi Space; Glenn T. Tsuyuki, Jet Propulsion Laboratory; Andrea Ferrero, Thales Alenia Space Italia; Gerd*

Jahn, EADS Astrium GmbH;

Wednesday, July 15

Physico-Chemical Processes: Air and Water (Part 1 of 3)

Session Code: ***ICES200***

Room Scarbrough One ***Session Time:*** ***8:00 a.m.***

This session covers technology studies, design, development, manufacturing, integration, testing and operations experience in the areas of water regeneration and treatment, air renewal and cleaning, human waste recycling, energy storage and transformation and In-Situ Resource Utilization, which apply physico-chemical processes.

Organizers - *Cesare Lobascio, Thales Alenia Space Italia; Leonid S. Bobe, NIICHIMMASH; Willigert Raatschen, Astrium Space Transportation*

Time	Paper No.	Title
8:00 a.m.	***2009-01-2486***	***Enhanced Brine Dewatering System*** *Ross Remiker, Orbital Technologies Corp.; Jean B. Hunter, Cornell Univ.; Adam Marten, Brian Zelle, Orbital Technologies Corp.*
8:30 a.m.	***2009-01-2487***	***Heat Transfer Characteristics of the Concentric Disk inside the WFRD Evaporator for the VPCAR Water Recovery System*** *Walter M. Duval, Nancy Hall, NASA Glenn Research Center; Jeffrey Mackey, David Althausen, Alain Izadnegahdar, ASRC Aerospace; Eric Litwiller, Enterprise Advisory Services Inc.; Michael Flynn, NASA Ames Research Center*
9:00 a.m.	***2009-01-2488***	***Evaluation Of A Passive Water Treatment Device for Contingency Liquid Recovery from Urine for Spacecraft Applications*** *Michael S. Roberts, Sharon Edney, Michele Birmele, Dynamac Corp.*
9:30 a.m.	***2009-01-2485***	***Water Recovery and Urine Collection in the Russian Orbital Segment of the International Space Station (Mission 1 through Mission 17)*** *Leonid S. Bobe, Alexey Kochetkov, Mikhail Tomashpolskiy, NIICHIMMASH*

Wednesday, July 15

Physico-Chemical Processes: Air and Water (Part 2 of 3)

Session Code: ***ICES200***

Room Scarbrough One ***Session Time:*** ***10:15 a.m.***

This session covers technology studies, design, development, manufacturing, integration, testing and operations experience in the areas of water regeneration and treatment, air renewal and cleaning, human waste recycling, energy storage and transformation and In-Situ Resource Utilization, which apply physico-chemical processes.

Organizers - *Cesare Lobascio, Thales Alenia Space Italia; Leonid S. Bobe, NIICHIMMASH; Willigert Raatschen, Astrium Space Transportation*

Time	Paper No.	Title
10:15 a.m.	***2009-01-2509***	***Design and Testing of a UV-A LED Photocatalytic Oxidation Reactor for Spacecraft Potable Water Disinfection*** *Nadia Silvestry Rodriguez, ORAU/NASA; Robert Soler, Bionetics Corp.; Lawrence Koss Jr, Dynamac Corp.; Fred Maxik PhD, Lighting Science Group Corp.; Andrew C. Schuerger, Univ. of Florida; Michael Roberts, Dynamac Corp.*

10:45 a.m.	***2009-01-2508***	***Ultraviolet Light Emitting Diodes for Disinfection of Spacecraft Potable Water Systems***
		Michele Birmele, Dynamac Corp.; Robert Soler, Bionetics Corp.; LaShelle McCoy, Michael Roberts, Dynamac Corp.
11:15 a.m.	***2009-01-2506***	***Design Status of the Closed-Loop Air Revitalization System ARES for Accommodation on the ISS***
		Klaus Bockstahler, Helmut Funke, Joachim Lucas, Astrium GmbH; Johannes Witt, Scott Hovland, European Space Agency
11:45 a.m.	***2009-01-2507***	***Subscale Air Revitalization System by CO2 Reduction for Small Satellite Demonstration***
		Masato Sakurai, Japan Aerospace Exploration Agency

Wednesday, July 15

Physico-Chemical Processes: Air and Water (Part 3 of 3)

Session Code: ***ICES200***

Room Scarbrough One ***Session Time:*** ***1:30 p.m.***

This session covers technology studies, design, development, manufacturing, integration, testing and operations experience in the areas of water regeneration and treatment, air renewal and cleaning, human waste recycling, energy storage and transformation and In-Situ Resource Utilization, which apply physico-chemical processes.

Organizers - *Leonid S. Bobe, NIICHIMMASH; Cesare Lobascio, Thales Alenia Space Italia; Willigert Raatschen, Astrium Space Transportation*

Time	***Paper No.***	***Title***
1:30 p.m.	***2009-01-2524***	***Counter-Flow Silica-Titania Reactor for the Simultaneous Treatment of Air and Water Contaminated With VOCs***
		Christina Akly, Paul Chadik, David Mazyck, Univ. of Florida
2:00 p.m.	***2009-01-2525***	***Multifunctional System for Trace Gas Contaminants Removal***
		Lucia Grizzaffi, Antonio Saverino, Thales Alenia Space Italia; Daniela Perrachon, Politecnico di Torino; Cesare Lobascio, Thales Alenia Space Italia; Riccardo Rampini, ESA ESTEC; Barbara Onida, Edoardo Garrone, Politecnico di Torino; Flaviano Testa, Universita' della Calabria
2:30 p.m.	***2009-01-2526***	***Subscale-Testbed For Characterizing Dynamic Performance Of Regenerable Adsorbents For Filtering Trace Contaminants From Cabin Atmosphere***
		Oscar Monje, Dynamac Corp.; Peter Kenny, Univ. of Delaware; Nickolas Sexson, Univ. of Florida; Brid Brosnan, Limerick Institute of Technology; Raymond Wheeler, NASA Kennedy Space Center

Wednesday, July 15

Extravehicular Activity: Space Suits (Part 3 of 4)

Session Code: ***ICES400***

Room Scarbrough Three ***Session Time:*** ***8:00 a.m.***

This session covers topics related to space suit pressure garments. It includes advanced development work, as well as on-going efforts towards the Constellation Program flight program space suit design.

Organizers - *Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center*

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

8:00 a.m.	***2009-01-2516***	***Subjective Perception of Thermal and Physical Comfort in Three Liquid Cooling Garments***
		Gloria R. Leon, Victor Koscheyev, Birgit Fink, Paul Ciofani, Joe Warpeha, Univ. of Minnesota; Michael Gernhardt, Nicholas Skytland, NASA Johnson Space Center
8:30 a.m.	***2009-01-2471***	***Anthropometric and Blood Flow Characteristics Leading to EVA Hand Injury***
		Roedolph Opperman, James Waldie, Massachusetts Institute of Technology; Jason Hochstein , European Space Agency; Alan Natapoff, Massachusetts Institute of Technology; Luca Pollonini, Univ. of Houston - College of Technology; Rafat Ansari , NASA John Glenn; Jeff Jones, NASA; Dava Newman, Massachusetts Institute of Technology
9:00 a.m.	***2009-01-2517***	***The Advanced Design of a Liquid Cooling Garment Through Long-Term Research: Implications of the Test Results on Three Different Garments***
		Victor Koscheyev, Joe Warpeha, Gloria Leon, Jung-Hyun Kim, Birgit Fink, Univ. of Minnesota; Michael Gernhardt, Nicholas Skytland, NASA Johnson Space Center
9:30 a.m.	***2009-01-2498***	***Tactile Sensing Gloves for Extravehicular Activity***
		Ji Son, Richard Fan, Christopher Wottawa, Erik Dutson, Warren Grundfest, Martin Culjat, UCLA

Wednesday, July 15

Extravehicular Activity: Space Suits (Part 4 of 4)

Session Code: ***ICES400***

Room Scarbrough Three ***Session Time:*** ***10:15 a.m.***

This session covers topics related to space suit pressure garments. It includes advanced development work, as well as on-going efforts towards the Constellation Program flight program space suit design.

Organizers - *Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center*

Chairpersons - *Amy Ross, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2472***	***Incorporating Advanced Controls, Displays and other Smart Elements into Space Suit Design***
		Shane Jacobs, Massimiliano Di Capua, Syed-Ali Husain, Adam Mirvis, David Akin, Univ. of Maryland
10:45 a.m.	***2009-01-2473***	***Abrasion of Candidate Spacesuit Fabrics by Simulated Lunar Dust***
		James R. Gaier, NASA Glenn Research Center

Wednesday, July 15

Extravehicular Activity: Operations

Session Code: ***ICES403***

Room Scarbrough Three ***Session Time:*** ***1:30 p.m.***

This session addresses EVA operational activities associated with the Space Shuttle, the International Space Station (ISS), and other future human spacecraft. Lessons learned on the logistics, maintenance, and conduct of EVA operations that may apply to the future of EVA are also of interest.

Organizers - *William F. Higgins, Hamilton Sundstrand*

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

1:30 p.m.	***2009-01-2561***	***The Effect of Center of Gravity and Anthropometrics on Human Performance in Simulated Lunar Gravity***
		Lealem Mulugeta, USRA DSLS; Steven Chappell, Wyle Integrated Science & Engineering; Nicholas Skytland, NASA
2:00 p.m.	***2009-01-2562***	***An EVA Mission Planning Tool based on Metabolic Cost Optimization***
		Aaron W. Johnson, Dava Newman, James Waldie, Jeff Hoffman, Massachusetts Institute of Technology
2:30 p.m.	***2009-01-2563***	***Desert Research and Technology Studies 2008 Report***
		Barbara Romig, Joseph Kosmo, NASA Johnson Space Center; Michael Gernhardt, National Aero & Space Administration; Andrew Abercromby, Wyle
3:00 p.m.	***2009-01-2541***	***Performance of the Extravehicular Mobility Unit Airlock Coolant Loop Recovery Hardware - Phase II***
		John W. Steele, Tony Rector, Hamilton Sundstrand; Daniel B. Gazda, Wyle Integrated Science and Engineering Group; John Lewis, NASA Johnson Space Center

Wednesday, July 15

Two-Phase Thermal Control Technology (Part 1 of 2)

Session Code: ***ICES201***

Room Scarbrough Two ***Session Time:*** ***8:00 a.m.***

This session presents the latest developments & innovations of two-phase heat transport systems, modeling techniques & on-orbit performances for space applications. It covers all variants of heat pipe technologies, capillary pumped loops and loop heat pipes.

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

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2502***	***Steady-State Performance Results for a High-Capacity, Flexible Variable Conductance Heat Pipe***
		Liz Streckert, Lockheed Martin Space Systems Co.; Jay Ambrose, Lockheed Martin Missiles & Space Co.
8:30 a.m.	***2009-01-2501***	***Advance Grooved Heat Pipe for Space Satellite Thermal Control System***
		Leonid L. Vasiliev Jr., Luikov Heat & Mass Transfer Inst.; Jean Claude Legros, Univ. of Brussels; Leonard L. Vasiliev, Vladimir Romanenkov, Mikchail Rabetsky, Luikov Heat & Mass Transfer Inst.
9:00 a.m.	***2009-01-2518***	***Characteristics of Reservoir Embedded Loop Heat Pipe under Orbital Environment in the first one-year***
		Haruo Kawasaki, Atsushi Okamoto, JAXA; Hiroaki Ishikawa, Takehide Nomura, Mitsubishi Electric Corporation

Wednesday, July 15

Two-Phase Thermal Control Technology (Part 2 of 2)

Session Code: ***ICES201***

Room Scarbrough Two ***Session Time:*** ***10:15 a.m.***

This session presents the latest developments & innovations of two-phase heat transport systems, modeling techniques & on-orbit performances for space applications. It covers all variants of heat pipe technologies, capillary pumped loops and loop heat pipes.

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

Time	Paper No.	Title
10:15 a.m.	***2009-01-2519***	***Advanced Design of a Small Low Cost Loop Heat Pipe***
		Leonid L. Vasiliev, Univ. of Bergamo; Stefano Zinna PhD, Uniheat S.r.l.; Marco Marengo PhD, Claudio Ferrandi PhD, Univ. of Bergamo; Viktor Maziuk PhD, NPO "Powder metallurgy"
10:45 a.m.	***2009-01-2500***	***Transient Response of a Flexible High-Performance Variable Conductance Heat Pipe***
		Rob Leitch, Jay H. Ambrose, Lockheed Martin Space Systems Co.

Wednesday, July 15

On-orbit Operations and Logistics of Thermal and Environmental Control Subsystems (Part 1 of 2)

Session Code: ***ICES112***

Room Scarbrough Two ***Session Time:*** ***1:30 p.m.***

The session focuses on the operations and logistics aspects of thermal and environmental control subsystems for on-orbit spacecraft.

Organizers - *Wes Ousley, NASA Goddard Space Flight Center; Zoltan Szigetvari, Astrium Space Transportation*

Time	Paper No.	Title
1:30 p.m.	***2009-01-2555***	***COLUMBUS Thermal Hydraulic Operations with US Payloads***
		Savino De Palo, Roberto Passini, Albino Quaranta, Thales Alenia Space Italia; Bruce Wright, Boeing Co
2:00 p.m.	***2009-01-2556***	***ATV Thermal Operations for Jules Verne First Flight***
		Pascal Vincent, Astrium Space Transportation; Frank Bouckaert, European Space Agency; Patrick Oger, Jean-Christophe Guyot, Astrium Space Transportation
2:30 p.m.	***2009-01-2558***	***Thermal Power and Software Development and Validation on ATV Vehicle***
		Jean-Christophe Guyot, Patrick Oger, Astrium Space Transportation; Frank Bouckaert, European Space Agency; Pascal Vincent, Astrium Space Transportation

Wednesday, July 15

On-orbit Operations and Logistics of Thermal and Environmental Control Subsystems (Part 2 of 2)

Session Code: ***ICES112***

Room Scarbrough Two ***Session Time:*** ***3:45 p.m.***

The session focuses on the operations and logistics aspects of thermal and environmental control subsystems for on-orbit spacecraft.

Organizers - *Wes Ousley, NASA Goddard Space Flight Center; Zoltan Szigetvari, Astrium Space Transportation*

Time	Paper No.	Title

3:45 p.m.	***2009-01-2559***	***COLUMBUS ECLSS and TCS Joint Operations Support - Lessons Learnt***
		Zoltan Szigetvari, Astrium Space Transportation
4:15 p.m.	***2009-01-2560***	***COLUMBUS ATCS AmiA Installation Analysis and Operations***
		Paolo Vaccaneo, Thales Alenia Space Italia; Marco Bruno, Sofiter System Engineering; Albino Quaranta, Thales Alenia Space Italia; Zoltan Szigetvari, Astrium Space Transportation

Wednesday, July 15

Life Support Systems Engineering and Analysis (Part 1 of 2)

Session Code: ***ICES502***

Room Verelst Peroival ***Session Time:*** ***8:00 a.m.***

This session addresses life support for future missions, and in particular technology options and optimizing the selection, development, and integration of technologies into complete systems.

Organizers - *Harry W. Jones, Julie A. Levri, NASA Ames Research Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2493***	***Planning the Dynamic Simulation of Recycling Space Life Support***
		Harry W. Jones, NASA Ames Research Center
8:30 a.m.	***2009-01-2495***	***Redundancy Testing and Cost Assessment for Environmental Control and Life Support Systems***
		Haibei Jiang, Univ. of Illinois at Urbana-Champaign; David Kortenkamp, Scott Bell, NASA Johnson Space Center; Luis Rodriguez, Univ. of Illinois at Urbana-Champaign
9:00 a.m.	***2009-01-2494***	***Theoretical Analysis for Long-Term Space Life Support Reliability***
		Yevhen I. Holubnyak, Vadim Ye. Rygalov, Univ. of North Dakota

Wednesday, July 15

Life Support Systems Engineering and Analysis (Part 2 of 2)

Session Code: ***ICES502***

Room Verelst Peroival ***Session Time:*** ***10:15 a.m.***

This session addresses life support for future missions, and in particular technology options and optimizing the selection, development, and integration of technologies into complete systems.

Organizers - *Harry W. Jones, Julie A. Levri, NASA Ames Research Center*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2514***	***Model Confidence Level - A Systematic Metric for Development of a Virtual Space Habitat***
		Markus Czupalla, Philipp Hager, Andreas Hein, Thomas Dirlich, Anton Zhukov, Matthias Pfeiffer, Technical Univ. of Munich, Human Spaceflight Group; David Klaus, Univ. of Colorado, Aerospace Engineering Sciences Dept.
10:45 a.m.	***2009-01-2515***	***Laundry Study for a Lunar Outpost***
		Frank Jeng, Barrios Technology; Michael K. Ewert, NASA Johnson Space Center

	2009-01-2513	***Online Project Information System (OPIS) Description, Annual Reporting Outcomes, and Resulting Improvements (Written Only -- No Oral Presentation)***
		Julie A. Levri, NASA Ames Research Center; Bruce Deng, Jon Welch, Michael Ho, Lockheed Martin Space Operations Co.; John Hogan, NASA Ames Research Center

Wednesday, July 15

ECLSS Modeling and Test Correlations (Part 1 of 2)

Session Code: ***ICES300***

Room Verelst Peroival ***Session Time:*** ***1:30 p.m.***

ECLSS (Environmental Control & Life Support Systems) Modeling and Test Correlations session reports on applications of and advances in modeling physico-chemical and bio-chemical life support processes as well as in numerical modeling of atmospheric pressure, cabin ventilation, and composition distributions in closed habitats and spacecrafts, such as the Lunar habitat, the International Space Station, the Space Shuttle Orbiter, and the Crew Exploration Vehicle (CEV).

Organizers - *Brian R. Dunaway, Chang H. Son, Boeing Co.*

Time	***Paper No.***	***Title***
1:30 p.m.	***2009-01-2532***	***Unique Regeneration Steps for the Sorbent-Based Atmosphere Revitalization System Designed for CO2 and H2O Removal from Spacecraft Cabins***
		Armin D. Ebner, James A. Ritter, Univ. of South Carolina; M. Douglas LeVan, Vanderbilt Univ.; James C. Knox, NASA Marshall Space Flight Center
2:00 p.m.	***2009-01-2551***	***Hardware/Software Complex of Crew's Service of the Regeneration Life Support Systems Operation: Formation and Localization of Off-Nominal Situations***
		Eduard A. Kurmazenko, Lev Gavrilov, Mikhail Tomashpolskiy Sr, Alexsey Kochetkov Sr, Nikolay Khabarovskiy PhD, Ivan Dokunin PhD, Guzel Kamaletdinova lng, NIICHIMMASH
2:30 p.m.	***2009-01-2533***	***ALSSAT Development Status***
		Hue-Hsia Y. Yeh, Hamilton Sundstrand ; Cheryl Brown, Hamilton Sundstrand Mgmt Services Inc; Molly Anderson, Michael Ewert, NASA Johnson Space Center; Frank Jeng, Barrios Technology
3:00 p.m.	***2009-01-2534***	***High-Pressure Oxygen Generation for Lunar Outpost EVA***
		Frank F. Jeng, Barrios Technology; Bruce Conger, Hamilton Sundstrand; Molly Anderson, Michael Ewert, NASA Johnson Space Center

Wednesday, July 15

ECLSS Modeling and Test Correlations (Part 2 of 2)

Session Code: ***ICES300***

Room Verelst Peroival ***Session Time:*** ***3:45 p.m.***

ECLSS (Environmental Control & Life Support Systems) Modeling and Test Correlations session reports on applications of and advances in modeling physico-chemical and bio-chemical life support processes as well as in numerical modeling of atmospheric pressure, cabin ventilation, and composition distributions in closed habitats and spacecrafts, such as the Lunar habitat, the International Space Station, the Space Shuttle Orbiter, and the Crew Exploration Vehicle (CEV).

Organizers - *Brian R. Dunaway, Chang H. Son, Boeing Co.*

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

3:45 p.m.	***2009-01-2550***	***CFD Analysis of Convective Heat Transfer in the Orbiter Middeck for the Shuttle Rescue Mission***
		Chang H. Son, Brian R. Dunaway, The Boeing Company; Evgueni Smirnov, Nikolay Ivanov, Denis Telnov, New Technologies and Services, Russia
4:15 p.m.	***2009-01-2549***	***CFD Study of Ventilation and Carbon Dioxide Transport for ISS Node 2 and Japanese Experiment Modules***
		Chang H. Son, The Boeing Company; Evgueni Smirnov, Nikolay Ivanov, Denis Telnov, New Technologies and Services, Russia
4:45 p.m.	***2009-01-2552***	***On the Establishment of the Analysis and Verification Methods Regarding the Air Ventilation with Very Low Velocity in JEM (KIBO) as the First Manned Space Development in Japan***
		Ichiro Aoki, JAXA; Sadamu Ito, Mitsubishi Heavy Industries Ltd.; Hiroyasu Mizuno PhD, JAXA
5:15 p.m.	***2009-01-2531***	***Engineering Support for Columbus: a Hydraulic Model of the Air Loop***
		Gianpiero Audrito, Paola Parodi, Massimo Antonacci, Thales Alenia Space Italia; Nicola Di Francescantonio, Altran; Roland Mueller, EADS Astrium GmbH

Thursday, July 16

Human Factors for Space Missions: Ground and Flight Operations (Part 1 of 2)

Session Code: ***ICES510***

Room Ballroom D ***Session Time:*** ***8:00 a.m.***

This session presents Human Factors topics applicable to space missions with special emphasis on ground assembly, deployment, logistics, maintenance, and operations for both Earth-bound preflight as well as extra-terrestrial planetary missions. Topics may include procedures, tools, human-automation interaction, remote operation, team performance, design or assessment methods, training. Papers may report research as well as descriptions of design, methods, tools, policy, or experience.

Organizers - *Jennifer Linda Blume, Jacobs*

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2403***	***TAS-I Virtual Reality Tool for COLUMBUS MSP/PEI Stage Analysis Verification:Case Studies and Lesson Learned***
		Marinella Ferrino, Enrico Villata, Mario Cardano, Thales Alenia Space Italia; Valter Basso
8:30 a.m.	***2009-01-2446***	***A Methodology for Training International Space Station Crews to Respond to On-Orbit Emergencies***
		Clinton Balmain, Mark Fleming, United Space Alliance
9:00 a.m.	***2009-01-2404***	***Technology Transfer Challenges: A Case Study of User-Centered Design in NASA's Systems Engineering Culture***
		Jason C. Quick, Triumph Aerospace Systems - Newport News
	2009-01-2447	***Mentoring SFRM: A New Approach to International Space Station Flight Controller Training (Written Only -- No Oral Presentation)***
		Therese Huning, United Space Alliance, LLC; Immanuel Barshi, NASA Ames Research Center; Lacey Schmidt, Wyle

Thursday, July 16

Human Factors for Space Missions: Ground and Flight Operations (Part 2 of 2)

Session Code: ***ICES510***

Room Ballroom D ***Session Time: 10:15 a.m.***

This session presents Human Factors topics applicable to space missions with special emphasis on ground assembly, deployment, logistics, maintenance, and operations for both Earth-bound preflight as well as extra-terrestrial planetary missions. Topics may include procedures, tools, human-automation interaction, remote operation, team performance, design or assessment methods, training. Papers may report research as well as descriptions of design, methods, tools, policy, or experience.

Organizers - *Jennifer Linda Blume, Jacobs*

Time	Paper No.	Title
10:15 a.m.	***2009-01-2423***	***Behavioral Systems Management of Confined Microsocieties: An Agenda for Research and Applications*** *Henry Emurian, Kip Canfield, UMBC; Peter Roma, Eric Gasior, Zabecca Brinson, Institutes for Behavior Resources; Robert Hienz, Steven Hursh, Joseph Brady, Johns Hopkins Medical School*
10:45 a.m.	***2009-01-2424***	***Effects of Prolonged (60 days) Simulated Microgravity Condition on Cognitive and Emotional Functions*** *Chetwyn C. H. Chan, The Hong Kong Polytechnic Univ.*
11:15 a.m.	***2009-01-2426***	***Modeling Mission Operations Trade Spaces and Lunar C3I Capabilities*** *Barrett S. Caldwell, Jeffrey Onken, Purdue Univ. West Lafayette*
11:45 a.m.	***2009-01-2425***	***Assessment of Cognitive Abilities in Simulated Space Ascent Environments*** *Bettina L. Beard, NASA; Jon Holbrook, Perot Systems; Albert J. Ahumada, NASA*

Thursday, July 16

Bioregenerative Life Support (Part 1 of 2)

Session Code: ***ICES204***

Room Ballroom E ***Session Time: 8:00 a.m.***

This session focuses on the design and development of ground-based facilities and experiments, and flight hardware designs and experiments associated with integrated systems which incorporate biological, physical and chemical processors.

Organizers - *Mark Kliss, NASA Ames Research Center; Cesare Lobascio, Thales Alenia Space Italia; Yasuhiro Tako, Institute for Environmental Sciences; Yas Takashima, Ichidai Nursery Inc.*

Chairpersons - *Cesare Lobascio, Thales Alenia Space Italia*

Assistant Chairpersons - *Masato Sakurai, Japan Aerospace Exploration Agency*

Time	Paper No.	Title
8:00 a.m.	***2009-01-2564***	***An Optimum Biological Reactor Configuration for Water Recycling in Space*** *W. Andrew Jackson, Audra Morse, Nick Landes, Darryl Low, Texas Tech Univ.*
8:30 a.m.	***2009-01-2565***	***Effects of Red and Blue Light Emitting Diodes (LEDs) on the Growth and Development of Lettuce (var. Youmaicai)*** *Yongkang Tang; Shuangsheng Guo; Weidang Ai; Lifeng Qin*
9:00 a.m.	***2009-01-2566***	***Study on the Growing Characteristics of Lettuce (var. Youmaicai) Cultivated at Elevated CO2 Concentrations*** *Shuangsheng Guo; Yongkang Tang; Weidang Ai; Lifeng Qin*

Thursday, July 16

Bioregenerative Life Support (Part 2 of 2)

Session Code: ***ICES204***

Room Ballroom E ***Session Time:*** ***10:15 a.m.***

This session focuses on the design and development of ground-based facilities and experiments, and flight hardware designs and experiments associated with integrated systems which incorporate biological, physical and chemical processors.

Organizers - *Mark Kliss, NASA Ames Research Center; Cesare Lobascio, Thales Alenia Space Italia; Yasuhiro Tako, Institute for Environmental Sciences; Yas Takashima, Ichidai Nursery Inc.*

Chairpersons - *Cesare Lobascio, Thales Alenia Space Italia*

Assistant Chairpersons - *Masato Sakurai, Japan Aerospace Exploration Agency*

Time	Paper No.	Title
10:15 a.m.	***2009-01-2579***	***Theoretical Analysis of Stability for Hybrid Life Support Systems with Catalytic Incineration of Deadlock Products (Experiences with Russian BIOS-3 Project)***
		Yevhen I. Holubnyak, Vadim Ye. Rygalov, Univ. of North Dakota
10:45 a.m.	***2009-01-2580***	***Outline of Material Circulation - Closed Habitation Experiments Conducted in 2005-2007 using Closed Ecology Experiment Facilities***
		Yasuhiro Tako, Institute for Environmental Sciences; Masato Sakurai, Japan Aerospace Exploration Agency
11:15 a.m.	***2009-01-2581***	***Multidisciplinary Preliminary Sizing of Advanced Life Support Systems for Space***
		Giorgio Boscheri, Mich Lavagna, Politecnico di Milano; Matteo Lamantea, Thales Alenia Space Italia SpA
11:45 a.m.	***2009-01-2582***	***A Rack-like Facility Prototype for Ground Demonstration of a LSS Based on Plants***
		Lucia Grizzaffi, Matteo Lamantea, Cesare Lobascio, Thales Alenia Space Italia; Paolo Cergna, ALTEC S.p.A.; Daniela Perrachon, Marco Perino, Politecnico di Torino; Ambra Prelle, Universita' di Torino

Thursday, July 16

Thermal and Environmental Control Engineering Analysis and Software

Session Code: ***ICES108***

Room Scarbrough One ***Session Time:*** ***8:00 a.m.***

This session addresses thermal and environmental control engineering analysis including associated analysis methods, algorithms, modeling, software tools, integration with other engineering disciplines and data exchange.

Organizers - *William Ducas, Orbital Sciences Corp.; Olivier Pin, ESA ESTEC; Nicholas M. Teti, Hawk Institute For Space Sciences; Julian S. Thomas, Alstom Power, Ltd.*

Time	Paper No.	Title
8:00 a.m.	***2009-01-2567***	***Thermal Simulation of Asteroid Surface Temperature and Yarkowski Effect***
		Simon Barraclough, EADS Astrium, Ltd.
8:30 a.m.	***2009-01-2583***	***Control Stability Analysis Applied to Columbus ATCS***
		Savino De Palo, Thales Alenia Space Italia; Jan Persson, European Space Agency; Tor Klingberg, ESA ESTEC

9:00 a.m.	***2009-01-2584***	***Nonlinear Variable-Diffusivity Moisture Transport in Zero Gravity Porous Media Space Applications***
		Nihad Daidzic, Minnesota State Univ.
9:30 a.m.	***2009-01-2568***	***Linearized Matrix Inversion and Eigenvalue Methods for Characterization of Thermal System Performance for Control Applications Using TMG Thermal Simulation and MATLAB***
		R. Scott Miskovish, Michael Saeger, ATA Engineering Inc.

Thursday, July 16

Extravehicular Activity: Systems (Part 1 of 2)

Session Code: ***ICES401***

Room Scarbrough Three ***Session Time:*** ***8:00 a.m.***

This session includes topics describing aspects of EVA systems, technologies, and studies that envision the space suit as a system. Concepts and testing of advanced space suit systems are also included.

Organizers - *David M. Klaus, Univ. of Colorado-Boulder; Robert C. Trevino, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
8:00 a.m.	***2009-01-2569***	***Creating a Lunar EVA Work Envelope***
		Brand N. Griffin, Gray Research; Robert Howard, David Smitherman, Sudhakar Rajulu, NASA
8:30 a.m.	***2009-01-2570***	***Conceptual Analysis of Electrochromic Radiators for Space Suits***
		Jonathan Glen Metts, David Klaus, Univ. of Colorado-Boulder
9:00 a.m.	***2009-01-2571***	***Neck-Entry Suitports: A Novel Concept Utilizing Morphing Upper Torso Technology***
		Shane Jacobs, Massimiliano Di Capua, David Akin, Univ. of Maryland
9:30 a.m.	***2009-01-2572***	***1-g Suit Port Concept Evaluator 2008 Test Results***
		Barbara Romig, Charles Allton, NASA Johnson Space Center; Harry Litaker, Lockheed Martin

Thursday, July 16

Extravehicular Activity: Systems (Part 2 of 2)

Session Code: ***ICES401***

Room Scarbrough Three ***Session Time:*** ***10:15 a.m.***

This session includes topics describing aspects of EVA systems, technologies, and studies that envision the space suit as a system. Concepts and testing of advanced space suit systems are also included.

Organizers - *David M. Klaus, Univ. of Colorado-Boulder; Robert C. Trevino, NASA Johnson Space Center*

Time	***Paper No.***	***Title***
10:15 a.m.	***2009-01-2585***	***Proposed Androgynous Docking Airlock/Utility Module***
		Gary L. Harris, Pablo De Leon, Univ. of North Dakota
10:45 a.m.	***2009-01-2586***	***Preliminary Development of a Suit Port for Planetary Surface EVA Part A: Design Studies***
		James Chartres, Brian Koss, Chad Brivkalns , Bruce Webbon, NASA Ames Research Center; Barbara Romig, Charles Allton, NASA Johnson Space Center

Thursday, July 16

Advances in Thermal Control Technology (Part 1 of 2)

Session Code: ***ICES109***

Room Scarbrough Two ***Session Time:*** ***8:00 a.m.***

This session addresses novel or advanced technologies and development activities pertaining to heat acquisition, transport, rejection and storage, as well as cryogenic cooling and thermal protection systems applicable to existing or future scientific instruments, spacecraft, or planetary systems.

Organizers - *Burkhard Behrens, Astrium Space Transportation; Jeffery T. Farmer, NASA Marshall Space Flight Center; Albert J. Juhasz, NASA John Glenn Research Center; Heiko Ritter, ESA; Ryan Stephan, NASA Johnson Space Center*

Time	Paper No.	Title
8:00 a.m.	***2009-01-2589***	***Phase Change Material Heat Exchanger Life Test***
		Sean T. Lillibridge, JSC; Ryan Stephan, NASA Johnson Space Center
8:30 a.m.	***2009-01-2573***	***Thermal Testing of a Heat Switch for European Mars Rover***
		Alberto Franzoso, Marco Molina, Carlo Gavazzi Space SpA; Guido Barbagallo, ESA/ESTEC; Francisco Romera Fernandez, Iberespacio
9:00 a.m.	***2009-01-2574***	***Multi-layer Coating for Smart Radiation Device with Solar Absorptance 0.13***
		Sumitaka Tachikawa, Akira Ohnishi, Institute of Space & Astronautical Science; Yasuyuki Nakamura, NEC TOSHIBA Space Systems Ltd; Akira Okamoto, NEC Corporation
9:30 a.m.	***2009-01-2575***	***Multilayer Tuneable Emittance Coatings with Low Solar Absorptance for Improved Smart Thermal Control in Space Applications***
		Emile Haddad, MPB Technologies Inc.; Roman Kruzelecky, Brian Wong, Wes Jamroz, MPB Communications Inc.; Mohamed Soltani, Mohammed Chaker, INRS Energie et Materiaux; Philippe Poinas, European Space Agency; Moushab Benkahoul, INRS Énergie et Matériaux

Thursday, July 16

Advances in Thermal Control Technology (Part 2 of 2)

Session Code: ***ICES109***

Room Scarbrough Two ***Session Time:*** ***10:15 a.m.***

This session addresses novel or advanced technologies and development activities pertaining to heat acquisition, transport, rejection and storage, as well as cryogenic cooling and thermal protection systems applicable to existing or future scientific instruments, spacecraft, or planetary systems.

Organizers - *Burkhard Behrens, Astrium Space Transportation; Jeffery T. Farmer, NASA Marshall Space Flight Center; Albert J. Juhasz, NASA John Glenn Research Center; Heiko Ritter, ESA; Ryan Stephan, NASA Johnson Space Center*

Time	Paper No.	Title
10:15 a.m.	***2009-01-2587***	***Experimental Investigation and Modeling of Stagnation and Recovery of Dissimilar Length Tubes on a Facesheet***
		Christopher Linrud, Christine S. Iacomini, Tom Durrant, Paragon Space Development
	2009-01-2588	***Integration of Thermal Control Electronics and Monitoring Functions in a Multifunctional Structure (Written Only -- No Oral Presentation)***
		Vincenzo Cascioli, SERMS Laboratory, Univ. and Sezione INFN of Perugia; Marco Gottero, Enrico Sacchi, Thales Alenia Space Italia, Turin Plant; Roberto Battiston, SERMS Laboratory, Univ. and Sezione INFN of Perugia