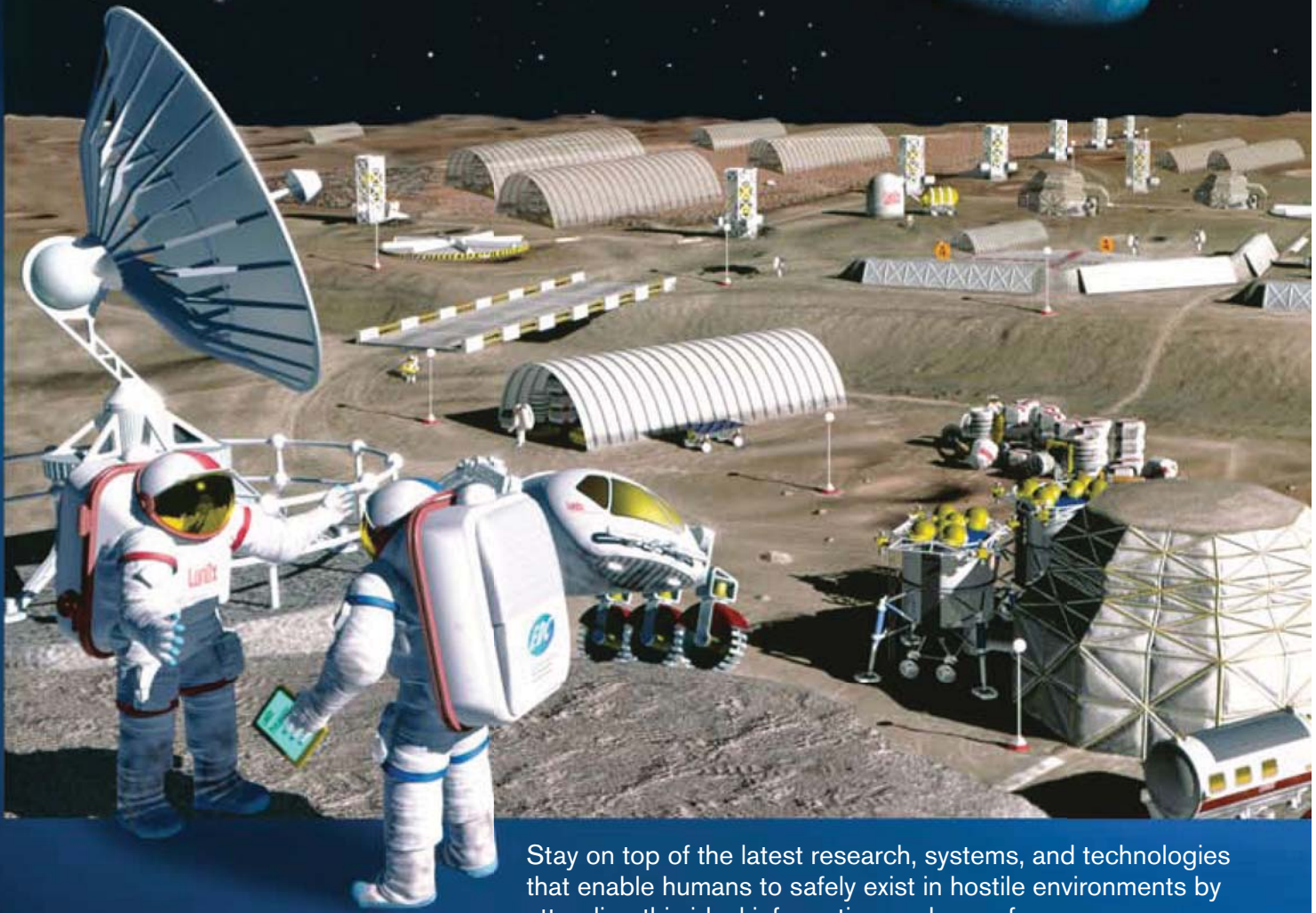


39th International Conference on Environmental Systems

July 12-16, 2009 • Hyatt Regency Savannah • Savannah, Georgia, USA

*“Towards Permanent Lunar Habitation:
The Journey Continues”*



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39th International Conference on Environmental Systems

July 12-16, 2009 ▪ Hyatt Regency Savannah ▪ Savannah, Georgia, USA

Leading technical authorities from industry, government, and academia will delve into the technical issues of humans living and working in hostile environments, present achievements and late-breaking results, and share technological solutions that impact the future...all in four days of focused technical presentations at the 39th International Conference on Environmental Systems (ICES).

Technical Session Highlights

ICES technical sessions address a comprehensive range of environmental systems subjects, including:

- Advanced Life Support
- Architecture and Human Factors
- ECLS Technology Development
- Extravehicular Activity
- Exploration Missions
- Life Sciences
- Spacecraft / Vehicle ECLSS
- Simulation Software / Analysis & Modeling
- Spacecraft and Aircraft Thermal Control

Who Should Attend

Year after year, industry and government engineers, scientists, designers, educators, researchers, students and technical specialists rely on the ICES to learn about the latest technology advancements on space station and spacecraft environmental control systems.

Steering Committee

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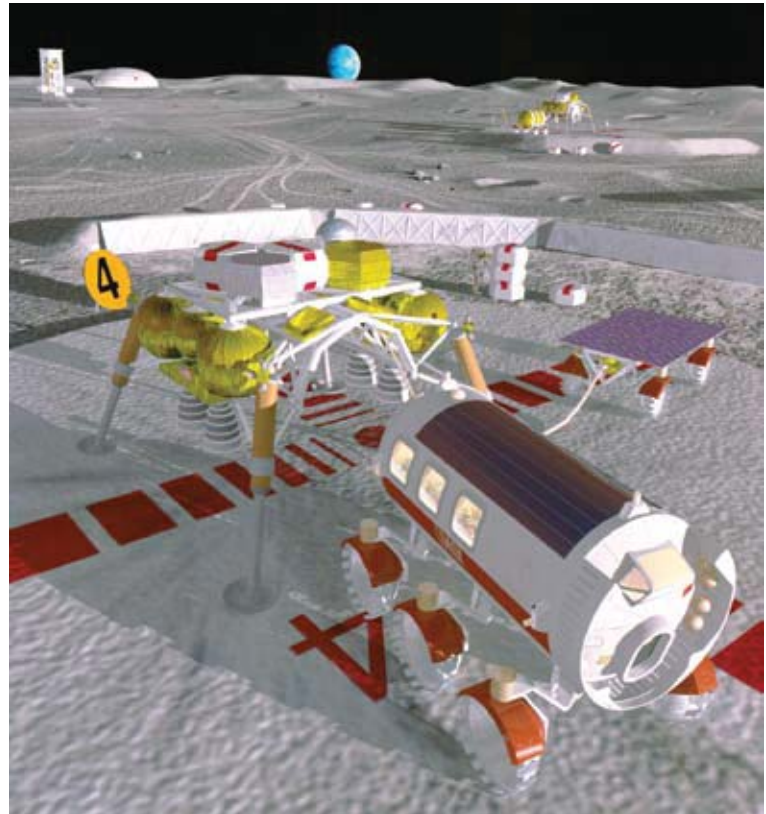
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Dave Williams, NASA Johnson Space Center (ASME Chair)



Andrew Jackson, Texas Tech University (AIAA Chair)

Chang H. Son, The Boeing Company (AIChE Chair)

Melissa Jena, SAE staff (ICES Secretary)



EVENT AT A GLANCE

Sunday July 12	Monday July 13	Tuesday July 14	Wednesday July 15	Thursday July 16
Early Bird Registration 3:00 – 6:00 p.m.	Registration 7:00 a.m. – 5:30 p.m.	Registration 7:00 a.m. – 5:00 p.m.	Registration 7:00 a.m. – 5:00 p.m.	Registration 7:00 – 10:00 a.m.
	Speakers' Breakfast 7:00 a.m.	Speakers' Breakfast 7:00 a.m.	Speakers' Breakfast 7:00 a.m.	Speakers' Breakfast 7:00 a.m.
	Continental Breakfast for attendees 7:30 a.m.	Continental Breakfast for attendees 7:30 a.m.	Continental Breakfast for attendees 7:30 a.m.	Continental Breakfast for attendees 7:30 a.m.
	Plenary Session 9:15 - 10:00 a.m.	Sessions 8:00 a.m.	Sessions 8:00 a.m.	Sessions 8:00 a.m.
	Break 10:00 a.m.	Break 10:00 a.m.	Break 10:00 a.m.	Break 10:00 a.m.
	Sessions 10:15 a.m.	Sessions 10:15 a.m.	Sessions 10:15 a.m.	Sessions 10:15 a.m.
		Committee Meetings AICHe SAE	Committee Meetings AIAA ASME International	Conference Concludes
AIAA Committee Meeting 1:00 - 5:00 p.m.	Sessions 1:30 p.m.	Sessions 1:30 p.m.	Sessions 1:30 p.m.	
	Break 3:30 p.m.	Break 3:30 p.m.	Break 3:30 p.m.	
	Sessions 3:45 p.m.	Sessions 3:45 p.m.	Sessions 3:45 p.m.	
Hamilton Reception 5:30 – 7:30 p.m. 	Networking Reception and Student Poster Competition (Cash Bar) 5:30 – 6:30 p.m.	ORBITEC River Boat Cruise 6:00 – 8:00 p.m. 	Banquet Reception (Cash Bar) 6:30 p.m. Banquet 7:30 p.m. Paragon Dessert Reception 	



SPECIAL EVENTS

Plenary Session

Monday, July 13
9:15 - 10:00 a.m.



Eugene Tattini, Deputy Director,
Jet Propulsion Laboratory

Student Poster Competition

Monday, July 13
5:30 - 6:30 p.m.

The ICES poster session is a program targeted to stimulate the participation of students and will provide an excellent forum for students to present their work in an informal and interactive setting. Posters are ideal for presenting speculative, late-breaking results or for giving an introduction to interesting, innovative work. Posters are intended to provide students and participants with the ability to connect with each other and to engage in discussions about the work. Each poster will be judged, and each participating student will receive a ticket to Wednesday night's banquet.

Abstracts should be submitted to Joan Hudson via email at jhudson@sae.org no later than June 1, 2009. Please include the topic area to which you would like your submission considered along with a poster title, complete contact information including email address and a 300 word abstract.

No formal guest program is being planned. A guest hospitality suite will be available each morning to meet with other spouses. Coordination for special events and/or tours maybe coordinated through the concierge desk at the hotel.

Networking Receptions

Sunday, July 12
5:30 - 7:30 p.m.
Sponsored by



Monday, July 13
5:30 - 6:30 p.m.
In conjunction with Student Poster Competition

ORBITEC River Boat Cruise

Tuesday, July 14
6:00 - 8:00 p.m.



Banquet

Wednesday, July 15

Banquet Reception 6:30 p.m.

Banquet 7:30 p.m.

Dessert Reception immediately following banquet
Sponsored by



Speaker: Carl E. Walz
(Colonel, USAF, Ret.)
NASA Astronaut (Former)

Visit www.sae.org/ices for the latest event, sponsorship and travel information.

Week At A Glance

	Mon		Tues		Wed		Thurs		Page No.
	AM	PM	AM	PM	AM	PM	AM	PM	
Advanced Life Support Sensor and Control Technology (Part 1 of 2) (ICES205)	-	-	-	-	-	✓	-	-	22
Advanced Life Support Sensor and Control Technology (Part 2 of 2) (ICES205)	-	-	-	-	-	✓	-	-	24
Advanced Life Support Systems Control (ICES301)	-	-	-	✓	-	-	-	-	16
Advances in Thermal Control Technology (Part 1 of 2) (ICES109)	-	-	-	-	-	-	✓	-	26
Advances in Thermal Control Technology (Part 2 of 2) (ICES109)	-	-	-	-	-	-	✓	-	27
Bioregenerative Life Support (Part 1 of 2) (ICES204)	-	-	-	-	-	-	✓	-	26
Bioregenerative Life Support (Part 2 of 2) (ICES204)	-	-	-	-	-	-	✓	-	27
CEV ECLSS and Thermal Control (ICES306)	-	-	-	✓	-	-	-	-	15
ECLSS Modeling and Test Correlations (Part 1 of 2) (ICES300)	-	-	-	-	-	✓	-	-	22
ECLSS Modeling and Test Correlations (Part 2 of 2) (ICES300)	-	-	-	-	-	✓	-	-	24
Education Outreach (ICES307)	-	-	-	-	-	✓	-	-	24
Extravehicular Activity: Operations (Part 1 of 2) (ICES403)	-	-	-	-	-	✓	-	-	22
Extravehicular Activity: Operations (Part 2 of 2) (ICES403)	-	-	-	-	-	✓	-	-	24
Extravehicular Activity: PLSS and Support Equipment (Part 1 of 6) (ICES402)	✓	-	-	-	-	-	-	-	5
Extravehicular Activity: PLSS and Support Equipment (Part 2 of 6) (ICES402)	-	✓	-	-	-	-	-	-	7
Extravehicular Activity: PLSS and Support Equipment (Part 3 of 6) (ICES402)	-	✓	-	-	-	-	-	-	8
Extravehicular Activity: PLSS and Support Equipment (Part 4 of 6) (ICES402)	-	-	✓	-	-	-	-	-	11
Extravehicular Activity: PLSS and Support Equipment (Part 5 of 6) (ICES402)	-	-	✓	-	-	-	-	-	12
Extravehicular Activity: PLSS and Support Equipment (Part 6 of 6) (ICES402)	-	-	-	✓	-	-	-	-	15
Extravehicular Activity: Space Suits (Part 1 of 5) (ICES400)	-	-	-	✓	-	-	-	-	17
Extravehicular Activity: Space Suits (Part 2 of 5) (ICES400)	-	-	-	-	✓	-	-	-	18
Extravehicular Activity: Space Suits (Part 3 of 5) (ICES400)	-	-	-	-	✓	-	-	-	19
Extravehicular Activity: Space Suits (Part 4 of 5) (ICES400)	-	-	-	-	-	✓	-	-	22
Extravehicular Activity: Space Suits (Part 5 of 5) (ICES400)	-	-	-	-	-	✓	-	-	25
Extravehicular Activity: Systems (Part 1 of 2) (ICES401)	-	-	-	-	-	-	✓	-	26
Extravehicular Activity: Systems (Part 2 of 2) (ICES401)	-	-	-	-	-	-	✓	-	27
Fire Safety in Spacecraft and Enclosed Habitats (Part 1 of 3) (ICES513)	-	-	-	✓	-	-	-	-	17
Fire Safety in Spacecraft and Enclosed Habitats (Part 2 of 3) (ICES513)	-	-	-	-	✓	-	-	-	18
Fire Safety in Spacecraft and Enclosed Habitats (Part 3 of 3) (ICES513)	-	-	-	-	✓	-	-	-	20
Human Factors for Space Missions: Ground and Flight Operations (Part 1 of 3) (ICES510)	-	-	✓	-	-	-	-	-	11
Human Factors for Space Missions: Ground and Flight Operations (Part 2 of 3) (ICES510)	-	-	✓	-	-	-	-	-	13
Human Factors for Space Missions: Ground and Flight Operations (Part 3 of 3) (ICES510)	-	-	-	✓	-	-	-	-	15
Human/Robotics System Integration (ICES406)	-	-	-	-	-	✓	-	-	23
International Space Station ECLS: Air and Water Systems (ICES405)	✓	-	-	-	-	-	-	-	5
International Space Station ECLS: Systems (Part 1 of 2) (ICES404)	-	-	✓	-	-	-	-	-	11
International Space Station ECLS: Systems (Part 2 of 2) (ICES404)	-	-	✓	-	-	-	-	-	13
Life Science/Life Support Research Technologies (Part 1 of 2) (ICES501)	-	✓	-	-	-	-	-	-	7
Life Science/Life Support Research Technologies (Part 2 of 2) (ICES501)	-	✓	-	-	-	-	-	-	8
Life Support Systems Engineering and Analysis (Part 1 of 2) (ICES502)	-	-	-	-	✓	-	-	-	18
Life Support Systems Engineering and Analysis (Part 2 of 2) (ICES502)	-	-	-	-	✓	-	-	-	20
Lunar Life Support (Part 1 of 2) (ICES509)	-	-	-	-	✓	-	-	-	18
Lunar Life Support (Part 2 of 2) (ICES509)	-	-	-	-	✓	-	-	-	20

Week At A Glance continued on page 4.

Week At A Glance

	Mon		Tues		Wed		Thurs		Page No.
	AM	PM	AM	PM	AM	PM	AM	PM	
Lunar and Martian Dust Properties and Mitigation Technologies (Part 1 of 3) (ICES514)	✓	-	-	-	-	-	-	-	5
Lunar and Martian Dust Properties and Mitigation Technologies (Part 2 of 3) (ICES514)	-	✓	-	-	-	-	-	-	7
Lunar and Martian Dust Properties and Mitigation Technologies (Part 3 of 3) (ICES514)	-	✓	-	-	-	-	-	-	9
Management of Air Quality in Sealed Environments (Part 1 of 2) (ICES505)	-	-	-	-	-	-	✓	-	26
Management of Air Quality in Sealed Environments (Part 2 of 2) (ICES505)	-	-	-	-	-	-	✓	-	28
Mars and Beyond (ICES511)	-	-	✓	-	-	-	-	-	11
Microbial Factors Applied to Design (Part 1 of 2) (ICES507)	-	-	✓	-	-	-	-	-	12
Microbial Factors Applied to Design (Part 2 of 2) (ICES507)	-	-	✓	-	-	-	-	-	13
On-orbit Operations and Logistics of Thermal and Environmental Control Subsystems (ICES112)	-	-	-	-	-	✓	-	-	25
Panel: Thermal Testing (ICES206)	-	-	-	-	-	✓	-	-	23
Physico-Chemical Life Support Process Development (Part 1 of 6) (ICES302)	✓	-	-	-	-	-	-	-	5
Physico-Chemical Life Support Process Development (Part 2 of 6) (ICES302)	-	✓	-	-	-	-	-	-	7
Physico-Chemical Life Support Process Development (Part 3 of 6) (ICES302)	-	✓	-	-	-	-	-	-	9
Physico-Chemical Life Support Process Development (Part 4 of 6) (ICES302)	-	-	✓	-	-	-	-	-	12
Physico-Chemical Life Support Process Development (Part 5 of 6) (ICES302)	-	-	-	✓	-	-	-	-	15
Physico-Chemical Life Support Process Development (Part 6 of 6) (ICES302)	-	-	-	✓	-	-	-	-	17
Physico-Chemical Processes: Air and Water (Part 1 of 3) (ICES200)	-	-	-	-	✓	-	-	-	19
Physico-Chemical Processes: Air and Water (Part 2 of 3) (ICES200)	-	-	-	-	✓	-	-	-	20
Physico-Chemical Processes: Air and Water (Part 3 of 3) (ICES200)	-	-	-	-	-	✓	-	-	23
Radiation Issues for Space Flight (ICES504)	✓	-	-	-	-	-	-	-	6
Regenerable Life Support Processes and Systems (ICES408)	-	-	-	✓	-	-	-	-	16
Satellite, Payload and Instrument Thermal Control (Part 1 of 2) (ICES202)	✓	-	-	-	-	-	-	-	6
Satellite, Payload and Instrument Thermal Control (Part 2 of 2) (ICES202)	-	✓	-	-	-	-	-	-	8
Space Architecture (Part 1 of 3) (ICES503)	-	✓	-	-	-	-	-	-	10
Space Architecture (Part 2 of 3) (ICES503)	-	✓	-	-	-	-	-	-	8
Space Architecture (Part 3 of 3) (ICES503)	-	✓	-	-	-	-	-	-	9
Space Station and Manned Orbiting Infrastructures Thermal Control (Part 1 of 2) (ICES107)	-	-	-	✓	-	-	-	-	16
Space Station and Manned Orbiting Infrastructures Thermal Control (Part 2 of 2) (ICES107)	-	-	-	✓	-	-	-	-	17
Spacecraft Water/Air Quality: Maintenance and Monitoring (ICES407)	-	✓	-	-	-	-	-	-	9
Spacecraft and Instrument Thermal Design, Testing and Technology (ICES102)	-	✓	-	-	-	-	-	-	10
Thermal Control for Planetary Surface Missions and Systems (Part 1 of 2) (ICES104)	-	-	-	✓	-	-	-	-	16
Thermal Control for Planetary Surface Missions and Systems (Part 2 of 2) (ICES104)	-	-	-	✓	-	-	-	-	17
Thermal Testing (Part 1 of 2) (ICES203)	-	-	✓	-	-	-	-	-	12
Thermal Testing (Part 2 of 2) (ICES203)	-	-	✓	-	-	-	-	-	13
Thermal and Environmental Control Engineering Analysis and Software (Part 1 of 2) (ICES108)	-	-	-	-	-	-	✓	-	27
Thermal and Environmental Control Engineering Analysis and Software (Part 2 of 2) (ICES108)	-	-	-	-	-	-	✓	-	28
Thermal and Environmental Control for Lunar Base and Surface Systems (ICES106)	-	-	✓	-	-	-	-	-	14
Thermal and Environmental Control of Crewed Lunar Exploration Vehicles (ICES100)	-	-	-	-	✓	-	-	-	19
Two-Phase Thermal Control Technology (Part 1 of 3) (ICES201)	-	-	-	-	✓	-	-	-	19
Two-Phase Thermal Control Technology (Part 2 of 3) (ICES201)	-	-	-	-	✓	-	-	-	21
Two-Phase Thermal Control Technology (Part 3 of 3) (ICES201)	-	-	-	-	-	✓	-	-	23

MONDAY, JULY 13 - MORNING
Technical Sessions

<p>Extravehicular Activity: PLSS and Support Equipment (Part 1 of 6) (ICES402)</p> <p>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.</p> <p>Organizers: Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center</p>	<p>International Space Station ECLS: Air and Water Systems (ICES405)</p> <p>Session addresses ECLS Water and Air Subsystem issues and lessons learned from the International Space Station.</p> <p>Organizers: Richard P. Reysa, MEI Technologies Inc.; David E. Williams, NASA</p>	<p>Lunar and Martian Dust Properties and Mitigation Technologies (Part 1 of 3) (ICES514)</p> <p>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.</p> <p>Organizers: Juan H. Agui, Mark J. Hyatt, NASA</p>	<p>Physico-Chemical Life Support Process Development (Part 1 of 6) (ICES302)</p> <p>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.</p> <p>Organizers: John W. Fisher, Ames Research Center; Michael T. Flynn, John Hogan, Kanapathipillai Wignarajah, NASA Ames Research Center</p>
<p>Flexible Packaging Concept for a Space Suit Portable Life Support Subsystem</p> <p>Paul Dillon, ERC Inc.; Gretchen Thomas, NASA Johnson Space Center</p>	<p>Status of the Regenerative ECLSS Water Recovery System</p> <p>Donald Layne Carter, NASA Marshall Space Flight Center</p>	<p>Techniques for Characterization of Microsize Dust Particles</p> <p>Rajiv Kohli, The Aerospace Corporation</p>	<p>Investigations into Water Recovery from Solid Wastes using a Microwave Solid Waste Stabilization and Water Recovery System.</p> <p>Kanapathipillai Wignarajah, NASA Ames Research Center</p>
<p>Development Testing of a High Differential Pressure (HDP) Water Electrolysis Cell Stack for the High Pressure Oxygen Generating Assembly (HPOGA)</p> <p>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</p>	<p>International Space Station Environmental Control and Life Support System Acceptance Testing for Node 1 Atmosphere Control and Storage Subsystem</p> <p>David E. Williams, NASA</p>	<p>Development of a Lunar Dust Simulant</p> <p>Robert J. Gustafson, Brant White, Orbital Technologies Corp.</p>	<p>Results and Analysis from Reduced Gravity Experiments of the Flexible Membrane Commode Apparatus</p> <p>Zeng-Guang Yuan, Uday Hegde, NCSER; Nancy Hall, NASA Glenn Research Center; David Althausen, Jeffrey Mackey, ASRC Aerospace; Eric Litwiller, Richard Alba, Enterprise Advisory Services Inc.; Travis Liggett, John Hogan, John Fisher, NASA Ames Research Center</p>
<p>Design and Testing of a Variable Pressure Regulator for the Constellation Space Suit</p> <p>Lawrence Gill, Carleton Technologies Inc.; Colin Campbell, NASA</p>	<p>Survey of Software Problems with Impacts to Campout Protocol Extravehicular Activity (EVA) Prebreathe</p> <p>Christopher M. Matty, Gregory Diderich, Jacobs</p>	<p>Regolith Activation on the Lunar Surface and Its Ground Test Simulation</p> <p>James R. Gaier, NASA Glenn Research Center</p>	<p>Water Recovery from Wastes in Space Habitats - A Comparative Evaluation of Prototypes</p> <p>John W. Fisher, Ames Research Center; Kanapathipillai Wignarajah, John Hogan, NASA Ames Research Center</p>
			<p>Fecal Simulant Delivery Systems for Parabolic Flight Testing of the Flexible Membrane Commode</p> <p>Kanapathipillai Wignarajah, NASA Ames Research Center</p>

Preliminary papers/presentations under consideration.
For up-to-date event information, visit www.sae.org/ices.

Dates/times subject to change.

MONDAY, JULY 13 - MORNING
Technical Sessions

<p>Radiation Issues for Space Flight (ICES504)</p> <p>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.</p> <p>Organizers: William Atwell, Boeing Co.; Lawrence W. Townsend, Univ. of Tennessee</p>	<p>Satellite, Payload and Instrument Thermal Control (Part 1 of 2) (ICES202)</p> <p>The session covers the development and design of thermal control systems for Satellites, Payloads, and Instruments.</p> <p>Organizers: Patrick Hugonnot, Thales; Marco Molina, Carlo Gavazzi Space; Hiroyuki Ogawa, Institute of Space & Astronautical Sci; Nico H. Pennings, ESA ESTEC</p>			
<p>Analyses of Several Space Radiation-Mitigating Materials: Computational and Experimental Results</p> <p>William Atwell, Boeing Co.; Paul Boeder, The Boeing Company; Richard Wilkins, Prairie View A&M Univ. (PVAMU); Brad Gersey, Nasa Center for Applied Radiation (PVAMU); Kristina Rojdev, NASA Johnson Space Center</p>	<p>Herschel and Planck Heaters Control Modeling and Correlation</p> <p>Savino De Palo, Thales Alenia Space Italia; Michele Cairoia, Marco Compassi, Thales Alenia Space Italia SpA; Ludovic Ouchet, Satellite Aerospace Inc; Claudio Damasio, Alenia Aerospazio</p>			
<p>Status of Developing a Near Real-Time Capability for Estimating Space Radiation Exposure Using EMMREM</p> <p>Richard Hatcher, Lawrence W. Townsend, Univ. of Tennessee; Nathan Schwadron, Kamen Kozarev, Boston Univ.</p>	<p>Thermal Design of the Mercury Transfer Module</p> <p>Sean Tuttle, Astrium Satellites Ltd.; Giovanni Cavallo, Astrium Satellites</p>			
<p>Disturbance of Electronics in Low-Earth Orbits by High Energy Electron Plasmas</p> <p>Courtney Matzkind, William Atkinson, William Seidler, Boeing</p>	<p>Sentinel-1 SAR Antenna Thermal Design and Verification Approach</p> <p>Markus Manns, Markus Huchler, Mathias von Alberti, EADS Astrium GmbH; Aniceto Panetti, Thales Alenia Space Italia S.p.A</p>			
<p>The Earth-Moon-Mars Radiation Environment Module - First Results</p> <p>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</p>	<p>Development of a Mechanically Pumped Fluid Loop for 3 To 6 KW Payload Cooling</p> <p>Roeland C. Benthem van, National Aerospace Laboratory NLR; Jacques Elst, Bradford Engineering BV; Rudolf Bleuler, RealTechnologie AG; Tisna Tijptahardja, European Space Agency ESA; Wubbo Grave, National Aerospace Laboratory NLR</p>			

Preliminary papers/presentations under consideration.
For up-to-date event information, visit www.sae.org/ices.

Dates/times subject to change.

MONDAY, JULY 13 - AFTERNOON
Technical Sessions

<p>Extravehicular Activity: PLSS and Support Equipment (Part 2 of 6) (ICES402)</p> <p>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.</p> <p>Organizers: Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center</p>	<p>Life Science/Life Support Research Technologies (Part 1 of 2) (ICES501)</p> <p>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.</p> <p>Organizers: Alexander Hoehn, Univ. of Colorado-Boulder; Robert C. Morrow, Orbital Technologies Corp.</p>	<p>Lunar and Martian Dust Properties and Mitigation Technologies (Part 2 of 3) (ICES514)</p> <p>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.</p> <p>Organizers: Juan H. Agui, Mark J. Hyatt, NASA</p>	<p>Physico-Chemical Life Support Process Development (Part 2 of 6) (ICES302)</p> <p>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.</p> <p>Organizers: John W. Fisher, Ames Research Center; Michael T. Flynn, John Hogan, Kanapathipillai Wignarajah, NASA Ames Research Center</p>
<p>Results of the Trace Contaminant Control Trade Study for Space Suit Life Support Development</p> <p>Heather L. Paul, NASA Johnson Space Center; Mallory Jennings, Lyndon B. Johnson Space Center</p>	<p>Porous Plant Growth Media Design Considerations for Lunar and Martian Habitats</p> <p>Scott B. Jones, Robert Heinse, Bruce Bugbee, Utah State Univ.; Dani Or, Swiss Federal Institute of Technology, Zurich (ETHZ); Gail Bingham, Space Dynamics Laboratory</p>	<p>A Survey of Terrestrial Approaches to the Challenge of Lunar Dust Containment</p> <p>Jay L. Perry, NASA Marshall Space Flight Center; Tatiana Aguilera, Carnegie Mellon University</p>	<p>Testing and Evaluation of the UMPQUA Prototype Catalytic Oxidation System (COS)</p> <p>Lance Delzeit, NASA; Gregory Pace, Lockheed Martin Mission Services; John Fisher, Ames Research Center</p>
<p>Results of the Particulate Contamination Control Trade Study for Space Suit Life Support Development</p> <p>Thomas Cognata, Escg Jacobs; Bruce Conger, Hamilton Sundstrand; Heather L. Paul, NASA Johnson Space Center</p>	<p>Providing Optimal Root-Zone Fluid Fluxes: Effects of Hysteresis on Capillary-Dominated Water Distributions in Microgravity</p> <p>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</p>	<p>Lunar Dust Cloud Characterization in a Gravitational Settling Chamber Experiencing Zero, Lunar, Earth and 1.8g Levels</p> <p>Jeffrey Mackey, ASRC Aerospace; Juan Agui, NASA</p>	<p>A Pilot Scale System for Low Temperature Solid Waste Oxidation and Recovery of Water</p> <p>James A. Nabity, Jeffrey Engel, Erik Andersen, TDA Research Inc.; David Wickham, Reaction Systems; John Fisher, Ames Research Center</p>
<p>Evaluation of Carbon Dioxide Sensors for the Constellation Space Suit Life Support System for Surface Exploration</p> <p>Daniel L. Dietrich, NASA John Glenn Research Center; Heather Paul, NASA Johnson Space Center; Bruce Conger, Hamilton Sundstrand</p>	<p>A Novel Testing Protocol for Evaluating Particle Behavior in Fluid Flow under Simulated Reduced Gravity Conditions</p> <p>Jared Leidich, Evan Thomas, David Klaus, Univ. of Colorado-Boulder</p>	<p>Development and Testing of A New NASA Lunar Dust Filtration Testing Facility</p> <p>Juan H. Agui, NASA; Jeffrey Mackey, ASRC Aerospace</p>	<p>Water Recovery Using Spray Drying</p> <p>Nicholas V. Coppa, Nanomaterials Company</p>
<p>Hollow Fiber Spacesuit Water Membrane Evaporator Development for Lunar Missions</p> <p>Grant Bue, NASA Johnson Space Center</p>			<p>Testing of a Plastic Melt Waste Compactor Designed for Human Space Exploration Missions</p> <p>Gregory Pace, Lockheed Martin Mission Services</p>

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Dates/times subject to change.

MONDAY, JULY 13 - AFTERNOON
Technical Sessions

	<p>Satellite, Payload and Instrument Thermal Control (Part 2 of 2) (ICES202)</p> <p>The session covers the development and design of thermal control systems for Satellites, Payloads, and Instruments.</p> <p>Organizers: Patrick Hugonnot, Thales; Marco Molina, Carlo Gavazzi Space; Hiroyuki Ogawa, Institute of Space & Astronautical Sci; Nico H. Pennings, ESA ESTEC</p>	<p>Space Architecture (Part 2 of 3) (ICES503)</p> <p>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.</p> <p>Organizers: Theodore W. Hall, University of Michigan; David Nixon, Astrocourier LLC</p>	<p>Extravehicular Activity: PLSS and Support Equipment (Part 3 of 6) (ICES402)</p> <p>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.</p> <p>Organizers: Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center</p>	<p>Life Science/Life Support Research Technologies (Part 2 of 2) (ICES501)</p> <p>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.</p> <p>Organizers: Alexander Hoehn, Univ. of Colorado-Boulder; Robert C. Morrow, Orbital Technologies Corp.</p>
	<p>Thermal Design of the MIXS Micro-Optics for X-Raying Mercury</p> <p>Steven Price, Astrium, Ltd.</p>	<p>Human-rated Automation & Robotics Laboratory and Testbed</p> <p>Lynn E. Baroff, Jet Propulsion Laboratory; David Fitts, Charles Dischinger, NASA</p>	<p>Heat Exchanger/Humidifier Trade Study and Conceptual Design for the Constellation Space Suit Portable Life Support System Ventilation Subsystem</p> <p>Robert Sompayrac, Escg Jacobs; Bruce Conger, Hamilton Sundstrand; Mateo Chamberlain, Escg Jacobs; Heather L. Paul, NASA Johnson Space Center</p>	<p>Use of Tinted Reflectors to Eliminate False Positives in an Adaptive Lighting Control System.</p> <p>Robert C. Morrow, Christopher Bourget, Orbital Technologies Corp.</p>
	<p>Domex-2 Thermal Design, Testing and Commissioning in Support to the SMOS Mission</p> <p>Sylvain Vey, ESA; Silvio Dolce, Elena Checa, European Space Agency</p>	<p>Comparative Habitation Volumes for Lunar Lander: 2005-2008</p> <p>Marc M. Cohen, Marc M. Cohen Arch.D Architect</p>	<p>PLSS Scale Demonstration of MTSA Temperature Swing Adsorption Bed Concept for CO2 Removal/Rejection</p> <p>Christine S. Iacomini, Aaron Powers, Paragon Space Development; Heather Paul, NASA Johnson Space Center</p>	<p>A Deployable Salad Crop Production System for Lunar Habitats</p> <p>Robert C. Morrow, Ross Remiker, Orbital Technologies Corp.</p>
	<p>Thermal Control of CM and SM Panels for Turkish Satellite</p> <p>Nedim Sozbir, Murat Bulut, Turksat A.S.</p>	<p>Architecture Of Habitats For Space Tourism - Investigation Of Design Principles</p> <p>Ondrej Doule, International Space Univ.</p>	<p>Investigation of Condensing Ice Heat Exchangers for MTSA Technology Development</p> <p>Sebastian Padilla, Aaron Powers, Christine S. Iacomini, Paragon Space Development; Heather Paul, NASA Johnson Space Center</p>	<p>Sustained Salad Crop Production Requirements for Lunar Surface</p> <p>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</p>
		<p>Synergetic Principles in Membrane Structure Design for Space Architecture</p> <p>Valentin Stavrev, Aeromedia; Raffi Tomassian, Miami Univ.</p>		

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MONDAY, JULY 13 - AFTERNOON
Technical Sessions

<p>Lunar and Martian Dust Properties and Mitigation Technologies (Part 3 of 3) (ICES514)</p> <p>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.</p> <p>Organizers: Juan H. Agui, Mark J. Hyatt, NASA</p>	<p>Physico-Chemical Life Support Process Development (Part 3 of 6) (ICES302)</p> <p>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.</p> <p>Organizers: John W. Fisher, Ames Research Center; Michael T. Flynn, John Hogan, Kanapathipillai Wignarajah, NASA Ames Research Center</p>	<p>Space Architecture (Part 3 of 3) (ICES503)</p> <p>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.</p> <p>Organizers: Theodore W. Hall, University of Michigan; David Nixon, Astrocourier LLC</p>	<p>Spacecraft Water/Air Quality: Maintenance and Monitoring (ICES407)</p> <p>This session includes papers on the results of ground-based chemical water quality analyses of ISS potable water samples and on recent developments in spacecraft water quality monitoring technology.</p> <p>Organizers: John R. Schultz, John E. Straub II, Wyle Integrated Science & Eng'g.; Darrell L. Jan, Jet Propulsion Laboratory</p>
<p>Developing Abrasion Test Standards for Evaluating Lunar Construction Materials</p> <p>Ryan Kobrick, David Klaus, Univ. of Colorado-Boulder; Kenneth Street, NASA John Glenn Research Center</p>	<p>Results of Multifunctional Condensing Heat Exchanger for Water Recovery Applications</p> <p>Yonghui Ma, Nick Schmitt, Ross Remiker, Orbital Technologies Corp.</p>	<p>Mars Base 10 - A Permanent Settlement On Mars For 10 Astronauts</p> <p>Ondrej Doule</p>	<p>Development of the Second Generation International Space Station (ISS) Total Organic Carbon Analyzer (TOCA)</p> <p>Anna Clements, NASA Johnson Space Center; Richard G. Stinson, Lockheed Martin Mission Services; Michael Van Wie, Wyle Integrated Science & Engineering; Eric Warren, Wyle Integrated Science & Eng'G</p>
<p>Environmental Testing for the Reliability Effects of Lunar Dust</p> <p>Todd Treichel, Robert Gustafson, Orbital Technologies Corp.</p>	<p>Optimization of Air Drying of Cabin Solid Waste for Long-Term Space Missions</p> <p>Apollo Arquiza, Jean B. Hunter, Cornell Univ.; Ross Remiker, Robert Morrow, Orbital Technologies Corp.</p>	<p>Minimum Functionality Lunar Habitat Design: Defining the Essential Functions of an Initial Human Establishment on the Moon</p> <p>Massimiliano Di Capua, Adam Mirvis, Space Systems Laboratory at Univ. of Maryland; Omar Medina, Space Systems Laboratory at Univ of Maryland; David Akin, Space Systems Laboratory at Univ. of Maryland</p>	
<p>Respiratory Toxicity of Highland Lunar Dust</p> <p>John T. James, NASA Johnson Space Center</p>	<p>Methodology for Identification and Classification of Biomass Pyrolysis Behavior</p> <p>Michael A. Serio, Marek A. Wójtowicz, Advanced Fuel Research, Inc.</p>	<p>Mars Homestead Design for an Early Mars Scientific Settlement</p> <p>Bruce Mackenzie, Mars Foundation</p>	

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MONDAY, JULY 13 - AFTERNOON
Technical Sessions

	<p>Spacecraft and Instrument Thermal Design, Testing and Technology (ICES102)</p> <p>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.</p> <p>Organizers: Wes Ousley, NASA Goddard Space Flight Center; Glenn T. Tsuyuki, Jet Propulsion Laboratory; David K. Wasson, Orbital Sciences Corp.</p>	<p>Space Architecture (Part 1 of 3) (ICES503)</p> <p>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.</p> <p>Organizers: Theodore W. Hall, University of Michigan; David Anthony Nixon, Astrocourier (Ireland), Ltd.</p>		
	<p>Thermal Test Verification of Emission Control through Directional Baffles for the James Webb Space Telescope</p> <p>Matthew Garrison, NASA; Timothy Switzer, David Shaw, Bryant White, Genesis Engineering Solutions; Neal Bachtell, Johns Hopkins University Applied Physics Lab; Robert Rashford, Michael Lynch, Frank Huber, Genesis Engineering Solutions</p>	<p>Membrane Based Habitat Wall Architectures for Life Support and Evolving Structures</p> <p>Sherwin Gormly, National Space Grant Foundation</p>		
	<p>On-Orbit Performance of the Moon Mineralogy Mapper Instrument</p> <p>Jose I. Rodriguez, Howard Tseng, Padma Varanasi, Burt Zhang, Jet Propulsion Laboratory</p>	<p>Architecture of an Inflatable Translucent Membrane Structure for a Space-based Micro-gravity Photo-bioreactor</p> <p>Valentin Stavrev, Aeromedica ; Raffi Tomassian, Miami Univ.; Sherwin Gormly, National Space Grant Foundation</p>		
	<p>Thermal Considerations for Meeting 20°C and Stringent Temperature Gradient Requirements of IXO FMA Mirror Segments</p> <p>Michael K. Choi, NASA Goddard Space Flight Center</p>	<p>Environmental Control and Life Support System for ECLIPSE (European Cis-Lunar Interplanetary Port for Space Exploration) Orbiting Station</p> <p>Ernesto Appella; Emanuele Flesia; Alessandro Quaglia</p>		
	<p>Effective Solar Absorptance of Multi-Layer Insulation</p> <p>Pradeep Bhandari, Jet Propulsion Laboratory</p>	<p>International Space Station USOS Crew Quarters On-orbit vs Design Performance Comparison</p> <p>James Lee Broyan, NASA Johnson Space Center; Melissa Borrego, MEI Technologies Inc; Juergen Bahr, ERC Inc</p>		

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Dates/times subject to change.

TUESDAY, JULY 14 - MORNING
Technical Sessions

	<p>Extravehicular Activity: PLSS and Support Equipment (Part 4 of 6) (ICES402)</p> <p>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.</p> <p>Organizers: Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center</p>	<p>Human Factors for Space Missions: Ground and Flight Operations (Part 1 of 3) (ICES510)</p> <p>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.</p> <p>Organizers: Jennifer Linda Blume, Jacobs</p>	<p>International Space Station ECLS: Systems (Part 1 of 2) (ICES404)</p> <p>This session addresses ECLS Systems issues and lessons learned from the International Space Station.</p> <p>Organizers: Richard P. Reysa, MEI Technologies Inc.; David E. Williams, NASA</p>	<p>Mars and Beyond (ICES511)</p> <p>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.</p> <p>Organizers: Marie-Christine Desjean, CNES; W. Andrew Jackson, Texas Tech. Univ.</p>
	<p>Demonstration of Super Cooled Ice as a Phase Change Material Heat Sink for Portable Life Support Systems</p> <p>Thomas O. Leimkuehler, Aaron Powers, Christopher Linrud, Chad Bowers, Paragon Space Development; Grant Bue, NASA Johnson Space Center</p>	<p>TAS-I Virtual Reality Tool for COLUMBUS MSP/PEI Stage Analysis Verification: Case Studies and Lesson Learned</p> <p>Marinella Ferrino, Enrico Villata, Mario Cardano, Thales Alenia Space Italia; Valter Basso</p>	<p>Nitrogen Oxygen Recharge System for the International Space Station</p> <p>Brandon N. Dick, Boeing</p>	<p>The Mars Climate Database (version 4.3)</p> <p>Ehouarn Millour, Laboratoire de Météorologie Dynamique</p>
	<p>Lunar Portable Life Support System Heat Rejection Study</p> <p>Robert Sompayrac PE, ESCG Jacobs (Engr. Prof. Staffing); Bruce Conger, Hamilton Sundstrand; Luis Trevino, NASA Johnson Space Center</p>	<p>Technology Transfer Challenges: A Case Study of User-Centered Design in NASA's Systems Engineering Culture</p> <p>Jason C. Quick, Triumph Aerospace Systems - Newport News</p>	<p>Modification of the International Space Station USOS to Support Installation and Activation of the Node 3 Element</p> <p>Dwight E. Link, Boeing Integrated Defense Systems</p>	<p>Solar Cycle and Seasonal Variability of the Martian Thermosphere-Ionosphere and the Associated Impacts upon Atmospheric Escape</p> <p>Stephen W. Bougher, Arnaud Valeille, Michael Combi, Valeriy Tenishev, Univ. of Michigan</p>
	<p>Radiator Heat Pump Subsystem for the Space Suit Portable Life Support</p> <p>Carlos Silva; Michael Schuller, Egidio Marotta, Texas A&M Univ.</p>	<p>Application of Modeling and Simulation in Large Manned Systems for HFE and Manning/Crewing Design</p> <p>Ron Merryman, Raytheon Integrated Defense Systems</p>	<p>International Space Station Environmental Control and Life Support System Status: 2008 - 2009</p> <p>David E. Williams, NASA</p>	<p>The CHEMCAM Instrument on Mars Science Laboratory (MSL 09): First Laser Induced Breakdown Spectroscopy Instrument in space!</p> <p>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. Ortner, 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</p>
	<p>Advanced Design Heat Pump/Radiator for EVA Suits</p> <p>Michael Izenon, Weibo Chen, Creare Inc.; Christian Passow, Scott Phillips, Creare Inc; Luis Trevino, NASA Johnson Space Center</p>		<p>Columbus ECLSS First Year of Operations</p> <p>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</p>	<p>Search for Life on Mars and ExoMars Planetary Protection Approach</p> <p>Vincenzo Guarneri, Thales Alenia Space Italia</p>

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Dates/times subject to change.

TUESDAY, JULY 14 - MORNING
Technical Sessions

	<p>Microbial Factors Applied to Design (Part 1 of 2) (ICES507)</p> <p>This session focuses on the dynamic effects of microorganisms on materials and systems in order to minimize hardware performance issues.</p> <p>Organizers: Rebekah Jean Bruce, Enterprise Advisory Services Inc.; Monserrate Roman, NASA Marshall Space Flight Center</p>	<p>Physico-Chemical Life Support Process Development (Part 4 of 6) (ICES302)</p> <p>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.</p> <p>Organizers: John W. Fisher, Ames Research Center; Michael T. Flynn, John Hogan, Kanapathipillai Wignarajah, NASA Ames Research Center</p>	<p>Thermal Testing (Part 1 of 2) (ICES203)</p> <p>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.</p> <p>Organizers: Markus Huchler, EADS Astrium GmbH; Andrew Robson, EADS France</p>	<p>Extravehicular Activity: PLSS and Support Equipment (Part 5 of 6) (ICES402)</p> <p>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.</p> <p>Organizers: Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center</p>
	<p>Comparison of Alternative Biocide Pretreatment Chemicals for Urine</p> <p>Dean Muirhead, NASA</p>	<p>Current status of WFRD</p> <p>Lance Delzeit, NASA; Michael Flynn, NASA Ames Research Center</p>	<p>Investigation of Thermal Test Effectiveness for Spacecraft Electronic Units Using Precipitation Efficiencies of MIL-HDBK-344</p> <p>John W. Welch, Aerospace Corporation</p>	<p>Research and Development on a Membrane Water Evaporator for Future Exploration Missions</p> <p>Edward W. Hodgson, James Fort, Hamilton Sundstrand</p>
	<p>Identification of Microflora on Wicks and Biofilm Associated with Wastewater</p> <p>JMR Apollo Arquiza, Jean B. Hunter, Cornell Univ.</p>	<p>Ersatz Formulations for Lunar Outpost Wastewater and Brine</p> <p>Jean B. Hunter, Jasmin Sahbaz, Cornell Univ.</p>	<p>ESTEC Calorimeter: Thirty-Five Years of Measurements</p> <p>Robert Mayrhofer, RUAG Aerospace Austria; Bernard Lehmann, ESA ESTEC; Ingolf Eberhart, Christian Laa, Christian Ranzenberger, Alexander Reissner, Johannes Stipsitz, RUAG Aerospace Austria</p>	<p>Hollow Fiber Space Suit Water Membrane Evaporator Test</p> <p>Grant Bue, Luis Trevino, NASA Johnson Space Center; Anthony Hanford, Jacobs Technology</p>
		<p>Cascade Distillation Subsystem Development: Progress Toward A Distillation Comparison Test</p> <p>Michael R. Callahan, Jacobs Technology; Alex Lubman, Honeywell International; Karen Pickering, NASA Johnson Space Center</p>	<p>ESTEC Calorimeter: Numerical Interpretation of Measurements</p> <p>Robert Mayrhofer, RUAG Aerospace Austria; Bernard Lehmann, ESA ESTEC; Christian Laa, Christian Ranzenberger, Alexander Reissner, Johannes Stipsitz, RUAG Aerospace Austria</p>	
		<p>Development of an In-line Urine Monitoring System for the International Space Station</p> <p>James Lee Broyan, Branelle Cibuzar, NASA Johnson Space Center</p>		

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Dates/times subject to change.

TUESDAY, JULY 14 - MORNING
Technical Sessions

<p>Human Factors for Space Missions: Ground and Flight Operations (Part 2 of 3) (ICES510)</p> <p>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.</p> <p>Organizers: Jennifer Linda Blume, Jacobs</p>	<p>International Space Station ECLS: Systems (Part 2 of 2) (ICES404)</p> <p>This session addresses ECLS Systems issues and lessons learned from the International Space Station.</p> <p>Organizers: Richard P. Reysa, MEI Technologies Inc.; David E. Williams, NASA</p>	<p>Microbial Factors Applied to Design (Part 2 of 2) (ICES507)</p> <p>This session focuses on the dynamic effects of microorganisms on materials and systems in order to minimize hardware performance issues.</p> <p>Organizers: Rebekah Jean Bruce, Enterprise Advisory Services Inc.; Monserrate Roman, NASA Marshall Space Flight Center</p>	<p>Thermal Testing (Part 2 of 2) (ICES203)</p> <p>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.</p> <p>Organizers: Markus Huchler, EADS Astrium GmbH; Andrew Robson, EADS France</p>
<p>Behavioral Systems Management of Confined Microsocieties: An Agenda for Research and Applications</p> <p>Henry Emurian, UMBC; Joseph Brady, Robert Hienz, Johns Hopkins Medical School; Kip Canfield, UMBC; Peter Roma, Institutes for Behavior Resources; Steven Hursh, Johns Hopkins Medical School; Zabecca Brinson, Eric Gasior, Institutes for Behavior Resources</p>	<p>Carbon Dioxide Removal Assembly Performance Comparison</p> <p>Robert J. Kay, Honeywell Int'l. Inc.</p>	<p>Characterization of Microbial Contamination in Pretreated Urine Collected from the ISS Urine Processing Assembly During Ground Testing</p> <p>Michele Birmele, Dynamac Corp.; LaShelle McCoy, Dynamac Corp.; Monserrate Roman, NASA Marshall Space Flight Center; Michael Roberts, Dynamac Corp.</p>	<p>The AMS02 TVTB Test Design and Predictions</p> <p>Serena Borsini, University of Perugia-INFN; Marco Molina, Carlo Gavazzi Space; Yan Chen, Shandong University; Christian Vettore, Ivan Corradino, Paolo Ruzza, Carlo Gavazzi Space; Roberto Battiston, Bruna Bertucci, University of Perugia-INFN</p>
<p>Effects of Prolonged (60 days) Simulated Microgravity Condition on Cognitive and Emotional Functions</p> <p>Chetwyn C. H. Chan, The Hong Kong Polytechnic Univ.</p>	<p>Improving the Measurement Accuracy of Water Partial Pressure Using the Major Constituent Analyzer</p> <p>Ben D. Gardner, Hamilton Sundstrand Space Systems Intl.; John Granahan, Boeing Co.; John Cover, NASA</p>	<p>Water Activity and Microbial Stability of Dried Food Residues in Cabin Solid Waste</p> <p>Jean B. Hunter, Carissa A. Jones, Apollo Arquiza, Trudy Chu, Cornell Univ.</p>	<p>AMS-02 Radiators Thermal Model Correlation with Test Data</p> <p>Paolo Ruzza, University of Perugia - Carlo Gavazzi Space SpA; Marco Molina, Marcus Groeller, Carlo Gavazzi Space SpA</p>
<p>Modeling Mission Operations Trade Spaces and Lunar C3I Capabilities</p> <p>Barrett S. Caldwell, Jeffrey Onken, Purdue Univ. West Lafayette</p>	<p>Root Cause Assessment of Pressure Drop Rise of a Packed Bed of Lithium Hydroxide in the International Space Station Trace Contaminant Control System</p> <p>Jay L. Perry, NASA Marshall Space Flight Center; Tatiana Aguilera, Carnegie Mellon University</p>		<p>Cryogenic Thermal Testing of the Verification Model Mid-Infrared Instrument (MIRI) Optics Module</p> <p>Bryan Shaughnessy, Paul Eccleston, Rutherford Appleton Laboratory</p>
<p>Assessment of Cognitive Abilities in Simulated Space Ascent Environments</p> <p>Bettina L. Beard, NASA; Jon Holbrook, Perot Systems; Albert J. Ahumada, NASA</p>	<p>International Space Station Major Constituent Analyzer On-orbit Performance</p> <p>Ben Gardner, Hamilton Sundstrand Space Systems Intl.; John Granahan, Boeing Co.; John Cover, NASA</p>		<p>Thermal Verification and Testing of Earth Observation Satellites: Thales Alenia Space Italia Experience</p> <p>Andrea Ferrero, Manuela Muni, Ernesto Massa, Enrico Sacchi, Thales Alenia Space Italia</p>

Preliminary papers/presentations under consideration.
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TUESDAY, JULY 14 - MORNING
Technical Sessions

<p>Thermal and Environmental Control for Lunar Base and Surface Systems (ICES106)</p> <p>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.</p> <p>Organizers: Gajanana Birur, Jet Propulsion Laboratory; Adrianus A. Delll, 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</p>	<p>Sub-Critical Liquid Oxygen (LOX) Storage for Exploration Life Support Systems</p> <p>David W. Plachta, Mohammad Hasan, NASA John Glenn Research Center</p>
<p>Spacesuit Thermal Control Needs on the Moon and Mars</p> <p>Harry W. Jones, NASA Ames Research Center</p>	<p>Effect of Illumination Angle and Particle Size on the Performance of Dusted Thermal Control Surfaces in a Simulated Lunar Environment</p> <p>James R. Gaier, NASA Glenn Research Center</p>
<p>Design Description and Initial Characterization Testing of an Active Heat Rejection Radiator with Digital Turn-Down Capability</p> <p>Gani Ganapathi, Eric T. Sunada, Gajanana Birur, Jennifer Miller, Jet Propulsion Laboratory; Ryan Stephan, NASA Johnson Space Center</p>	

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TUESDAY, JULY 14 - AFTERNOON
Technical Sessions

<p>CEV ECLSS and Thermal Control (ICES306)</p> <p>This session addresses Crew Exploration Vehicle current configuration and status.</p> <p>Organizers: Grant Allan Anderson, Barry W. Finger, Paragon Space Development; John F. Lewis, NASA Johnson Space Center</p>	<p>Extravehicular Activity: PLSS and Support Equipment (Part 6 of 6) (ICES402)</p> <p>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.</p> <p>Organizers: William F. Higgins, Edward W. Hodgson, Hamilton Sundstrand; Bruce Webbon, NASA Ames Research Center</p>	<p>Human Factors for Space Missions: Ground and Flight Operations (Part 3 of 3) (ICES510)</p> <p>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.</p> <p>Organizers: Jennifer Linda Blume, Jacobs</p>	<p>Physico-Chemical Life Support Process Development (Part 5 of 6) (ICES302)</p> <p>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.</p> <p>Organizers: John W. Fisher, Ames Research Center; Michael T. Flynn, John Hogan, Kanapathipillai Wignarajah, NASA Ames Research Center</p>
<p>First Human Testing of the Orion Atmosphere Revitalization Technology</p> <p>Amy Lin, Jacobs Technology; Jeffrey Sweterlitsch, NASA</p>	<p>Fan Performance Testing and Oxygen Compatibility Assessment Results for Future Space Suit Life Support Systems</p> <p>Heather L. Paul, NASA Johnson Space Center; Mallory jennings, Lyndon B. Johnson Space Center; Matthew Vogel, Jacobs Engineering</p>	<p>A Methodology for Training International Space Station Crews to Respond to On-Orbit Emergencies</p> <p>Clinton Balmain, Mark Fleming, United Space Alliance</p>	<p>VOC Removal by Novel Regenerable Silica-Titania Sorbent and Photocatalytic Technology</p> <p>Alexander F. Gruss, Univ. of Florida; Anna Casaus, Sol-gel Solutions LLC; David W. Mazyck, Univ of Florida</p>
<p>Crew Exploration Vehicle Environmental Control and Life Support Development Status</p> <p>John F. Lewis, NASA Johnson Space Center</p>	<p>Development of a Compact, Efficient Cooling Pump for Space Suit Life Support Systems</p> <p>Roger Van Boeyen, Jonathan Reeh, Lynntech Inc.; Luis Trevino, NASA Johnson Space Center</p>	<p>Mentoring SFRM: A New Approach to International Space Station Flight Controller Training</p> <p>Therese Huning, United Space Alliance, LLC; Immanuel Barshi, NASA Ames Research Center; Lacey Schmidt, Wyle</p>	<p>Development and Testing of a Sorbent-Based Atmosphere Revitalization System 2008/2009</p> <p>Lee Miller, ECLS Technologies, LLC; James C. Knox, NASA Marshall Space Flight Center</p>
<p>Orion Emergency Mask Approach</p> <p>George Tuan, NASA Johnson Space Center</p>	<p>Development of a Prototype Water Pump for Future Space Suit Applications</p> <p>Edward W. Hodgson, Hamilton Sundstrand; David Hartman, Hamilton Sundstrand Space Systems Intl.; Luis Trevino, NASA Johnson Space Center; Edward Gervais, Cascon Inc.</p>		<p>Engineered Structured Sorbents for the Adsorption of Carbon Dioxide and Water Vapor from Manned Spacecraft Atmospheres: Applications and Testing 2008/2009</p> <p>David Howard, All Points Logistics Inc.; James C. Knox, Jay Perry, NASA Marshall Space Flight Center</p>
<p>Compatibility Study of Silver Biocide in Drinking Water with Candidate Metals for Crew Exploration Vehicle Potable Water System</p> <p>Niklas Adam, Jacobs Technology</p>	<p>Water Pump Development for the EVA PLSS</p> <p>Michael Schuller, Cable Kurwitz, Texas A&M Univ.; Jeffrey Goldman, Honeywell International; Luis Trevino, NASA Johnson Space Center</p>		

Preliminary papers/presentations under consideration.
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TUESDAY, JULY 14 - AFTERNOON
Technical Sessions

	<p>Regenerable Life Support Processes and Systems (ICES408)</p> <p>This session covers development of Regenerable Life Support Processes and Systems for Spacecraft.</p> <p>Organizers: Loel Goldblatt, Hamilton Sundstrand Space Systems Intl.; Frederick D. Smith, NASA Johnson Space Center</p>	<p>Space Station and Manned Orbiting Infrastructures Thermal Control (Part 1 of 2) (ICES107)</p> <p>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.</p> <p>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.</p>	<p>Thermal Control for Planetary Surface Missions and Systems (Part 1 of 2) (ICES104)</p> <p>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.</p> <p>Organizers: Gajanana Birur, Jet Propulsion Laboratory; Adrianus A. Delll, Advanced Aerospace Thermal Control Systems; Paul M. McElroy, Temeku Technologies Inc.</p>	<p>Advanced Life Support Systems Control (ICES301)</p> <p>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.</p> <p>Organizers: David Kortenkamp, Traclabs; Linda Moreland, NASA Johnson Space Center</p> <p>Chairpersons: David Kortenkamp, Traclabs</p>
	<p>Achieving Ultra Reliable Space Life Support Systems</p> <p>Harry W. Jones, NASA Ames Research Center</p>	<p>Development of a Passive Gas Trap for Internal Thermal Control System</p> <p>Dacong Weng, Bonnie Bowman, Honeywell Int'l Inc.</p>	<p>Thermal Design for Mars-NEXT</p> <p>David Gwyn Jones, Astrium, Ltd.</p>	<p>Development of Simulation Tool for Life Support System Design Based on the Interaction Model</p> <p>Hiroyuki Miyajima, Tokyo Jogakkan College</p>
	<p>Demonstration of Self Contained Solid Oxide Electrolysis Stack with Embedded Sabatier Reactors for 100% Oxygen Regeneration</p> <p>Christine S. Iacomini, Aaron Powers, Paragon Space Development</p>	<p>NODE 3 & CUPOLA Thermal Analysis Campaign for Design Verification and Operations Definition</p> <p>Luca Tentoni, Nicola Fortunato, Renato Martino, Giovanni Loddoni, Thales Alenia Space Italy</p>	<p>Thermal Strategy for the Phoenix Robotic Arm Deployment</p> <p>Glenn T. Tsuyuki, Jet Propulsion Laboratory; Chern-Jiin Lee, Applied Science Laboratories</p>	<p>Data Abstraction Architecture for Monitoring and Control of Lunar Habitats</p> <p>Scott Bell, David Kortenkamp, TRACLabs Inc.</p>
	<p>Development Status of the Carbon Dioxide and Moisture Removal Amine Swing-Bed System (CAMRAS)</p> <p>William Papale, Tim Nalette, Hamilton Sundstrand; Jeffrey Sweterlitsch, NASA</p>	<p>Managing Space Craft Aqueous Thermal Coolant pH when affected by a High Carbon Dioxide Environment</p> <p>Thomas Stegman, MEI Technologies Inc.; Harold Cole, Mark E. Wilson, The Boeing Company</p>	<p>Mars Science Laboratory Mechanically Pumped Fluid Loop for Thermal Control, Design, Implementation and Testing</p> <p>Pradeep Bhandari, Jet Propulsion Laboratory</p>	<p>A Crew Life Support System Control for Interplanetary Vehicles</p> <p>Boris Zarezkiy, PhD, Lev Gavrilov, Eduard Kurmazenko, Prof, NIICHIMMASH</p>
	<p>Oxygen Production via Carbothermal Reduction of Lunar Regolith</p> <p>Robert J. Gustafson, Brant White, Michael Fidler, Orbital Technologies Corp.</p>	<p>A5ES-ATV: Aerothermodynamical Study of the Deorbitation of the Ariane 5 Upper Composite</p> <p>Amauric Jarry, Dominique Fraioli, Astrium Space Transportation</p>	<p>Overview of NASA's Thermal Control System Development for Exploration Project</p> <p>Ryan Stephan, NASA Johnson Space Center</p>	

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TUESDAY, JULY 14 - AFTERNOON
Technical Sessions

<p>Extravehicular Activity: Space Suits (Part 1 of 5) (ICES400)</p> <p>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.</p> <p>Organizers: Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center</p>	<p>Fire Safety in Spacecraft and Enclosed Habitats (Part 1 of 3) (ICES513)</p> <p>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.</p> <p>Organizers: Gary A. Ruff, NASA John Glenn Research Center; James F. Russell, Lockheed Martin Space Systems Co.; David L. Urban</p>	<p>Physico-Chemical Life Support Process Development (Part 6 of 6) (ICES302)</p> <p>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.</p> <p>Organizers: John W. Fisher, Ames Research Center; Michael T. Flynn, John Hogan, Kanapathipillai Wignarajah, NASA Ames Research Center</p>	<p>Space Station and Manned Orbiting Infrastructures Thermal Control (Part 2 of 2) (ICES107)</p> <p>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.</p> <p>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.</p>
<p>Anthropometric and Blood Flow Characteristics Leading to EVA Hand Injury</p> <p>Roedolph Opperman, Massachusetts Institute of Technology ; 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</p>	<p>Smoke Particle Sizes in Low-Gravity and Implications for the Design of Spacecraft Smoke Detectors</p> <p>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</p>	<p>Starship Life Support</p> <p>Harry W. Jones, NASA Ames Research Center</p>	<p>ATV THERMAL CONTROL: Architecture and Jules Verne First Flight Result</p> <p>Patrick Oger, Astrium Space Transportation; Frank Bouckaert, European Space Agency; Pascal Vincent, Jean-Christophe Guyot, Astrium Space Transportation</p>
<p>Incorporating Advanced Controls, Displays and other Smart Elements into Space Suit Design</p> <p>Shane Jacobs, Massimiliano Di Capua, Syed-Ali Husain, Adam Mirvis, David Akin, Univ. of Maryland</p>	<p>Miniaturized Sensor Systems for Early Fire Detection in Spacecraft</p> <p>Gary Hunter, Paul Greenberg, NASA John H. Glenn Research Center; Jennifer Xu, NASA John 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.</p>	<p>Development and Testing of a Prototype Microwave Plasma Reactor for Hydrogen Recovery from Sabatier Waste Methane</p> <p>James E. Atwater, Richard Wheeler, Umpqua Research Co.; Robyn Carrasquillo, NASA Marshall Space Flight Center; Neal Hadley, Roger Dahl, Umpqua Research Co.</p>	<p>ATCS Operations during COLUMBUS Mission: Flight Data Evaluation and Correlation</p> <p>Savino De Palo, Gaetana Bufano, Paolo Vaccaneo, Fabio Burzagli, Thales Alenia Space Italia; Marco Bruno, Sofiter System Engineering</p>
<p>Abrasion of Candidate Spacesuit Fabrics by Simulated Lunar Dust</p> <p>James R. Gaier, NASA Glenn Research Center</p>	<p>Spacecraft Fire Detection and Post-Fire Atmospheric Monitoring</p> <p>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</p>	<p>The Development of Constellation System Water Recycle Options from Commercially Available Products</p> <p>Sherwin Gormly, National Space Grant Foundation</p>	<p>Heater Power Consumption during Columbus Stages: Flight Data Evaluation and Correlation</p> <p>Gaetana Bufano, Thales Alenia Space</p>
<p>Thermal Control for Planetary Surface Missions and Systems (Part 2 of 2) (ICES104)</p> <p>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.</p> <p>Organizers: Gajanana Birur, Jet Propulsion Laboratory; Adrianus A. Delli, Advanced Aerospace Thermal Control Systems; Paul M. McElroy, Temeku Technologies Inc.</p>			
<p>Thermal Design for Moon-NEXT Polar Rover</p> <p>Simon Barraclough, EADS Astrium, Ltd.</p>			
<p>Thermal Design Trade Study for the Mars Science Laboratory ChemCam Body-Mounted Unit</p> <p>Glenn T. Tsuyuki, Jet Propulsion Laboratory; Siuchun Lee, ASL; John Bernardin, Los Alamos National Laboratory</p>			

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WEDNESDAY, JULY 15 - MORNING
Technical Sessions

	<p>Extravehicular Activity: Space Suits (Part 2 of 5) (ICES400)</p> <p>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.</p> <p>Organizers: Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center</p>	<p>Fire Safety in Spacecraft and Enclosed Habitats (Part 2 of 3) (ICES513)</p> <p>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.</p> <p>Organizers: Gary A. Ruff, NASA John Glenn Research Center; James F. Russell, Lockheed Martin Space Systems Co.; David L. Urban</p>	<p>Life Support Systems Engineering and Analysis (Part 1 of 2) (ICES502)</p> <p>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.</p> <p>Organizers: Harry W. Jones, Julie A. Levri, NASA Ames Research Center</p>	<p>Lunar Life Support (Part 1 of 2) (ICES509)</p> <p>This session focuses on innovative life support technologies for the proposed Lunar base. The session will highlight the technical challenges and assets available on the Lunar surface.</p> <p>Organizers: Daniel J. Barta, NASA Johnson Space Center; W. Andrew Jackson, Texas Tech. Univ.</p>
	<p>Defining Constellation Suit Helmet Field of View Requirements Employing a Mission Segment Based Reduction Process</p> <p>Shane M. McFarland, MEI Technologies/ NASA JSC</p>	<p>Microgravity Flame Spread over Non-Charring Materials in Exploration Atmospheres: Pressure, Oxygen, and Velocity Effects on Concurrent Flame Spread</p> <p>Sandra L. Olson, Gary A. Ruff, NASA Glenn Research Center</p>	<p>Planning the Dynamic Simulation of Recycling Space Life Support</p> <p>Harry W. Jones, NASA Ames Research Center</p>	<p>Challenges with Deploying and Integrating Environmental Control and Life Support Functions in a Lunar Architecture with High Degrees of Mobility</p> <p>Robert M. Bagdigian, NASA Marshall Space Flight Center; Chel Stromgren, SAIC</p>
	<p>Development and Testing of the First Full Pressure Suit for Non-Governmental Commercial Spaceflight</p> <p>Pablo G. De Leon, Univ. of North Dakota; Gary Harris, De Leon Technologies LLC</p>	<p>Pressure Effects on Self-Extinguishment Limits of Aerospace Materials</p> <p>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</p>	<p>Theoretical Analysis for Long-Term Space Life Support Reliability</p> <p>Yevhen I. Holubnyak, Vadim Ye. Rygalov, Univ. of North Dakota</p>	<p>A Dynamic Simulation of Lunar Surface Habitat Life Support</p> <p>Harry W. Jones, NASA Ames Research Center</p>
	<p>Tactile Sensing Gloves for Extravehicular Activity</p> <p>Ji Son, Richard Fan, Christopher Wottawa, Erik Dutson, Warren Grundfest, Martin Culjat, UCLA</p>	<p>Ignition Delay of Combustible Materials in Normoxic Equivalent Environments</p> <p>Sara McAllister, Carlos Fernandez-Pello, Univ. of California-Berkeley; Gary Ruff, David Urban, NASA John H. Glenn Research Center</p>	<p>Redundancy Testing and Cost Assessment for Environmental Control and Life Support Systems</p> <p>Haibei Jiang, Univ. of Illinois at Urbana-Champaign; David Kortenkamp, Scott Bell, NASA Johnson Space Center; Luis Rodriguez, Univ. of Illinois at Urbana-Champaign</p>	<p>Development of Life Support System Technologies for Human Lunar Missions</p> <p>Daniel Barta, Michael Ewert, NASA Johnson Space Center</p>
		<p>Modeling Flame Spread and Extinction of Solids in Space Exploration Atmospheres</p> <p>Sheng-Yen Hsu, Ya-Ting Tseng, James S. T'ien, Case Western Reserve Univ.</p>		

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WEDNESDAY, JULY 15 - MORNING
Technical Sessions

	<p>Physico-Chemical Processes: Air and Water (Part 1 of 3) (ICES200)</p> <p>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.</p> <p>Organizers: Leonid S. Bobe, NIICHIMMASH; Cesare Lobascio, Thales Alenia Space Italia; Willigert Raatschen, Astrium Space Transportation</p>	<p>Thermal and Environmental Control of Crewed Lunar Exploration Vehicles (ICES100)</p> <p>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.</p> <p>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</p>	<p>Two-Phase Thermal Control Technology (Part 1 of 3) (ICES201)</p> <p>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.</p> <p>Organizers: Adrianus A. Dellij, Advanced Aerospace Thermal Control Systems; Konstantin A. Goncharov, Lavochkin Association; Darius Nikanpour, Canadian Space Agency; Reinhard Schilt, OHB System GmbH</p>	<p>Extravehicular Activity: Space Suits (Part 3 of 5) (ICES400)</p> <p>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.</p> <p>Organizers: Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center</p>
	<p>Water Recovery and Urine Collection in the Russian Orbital Segment of the International Space Station (Mission 1 through Mission 17)</p> <p>Leonid S. Bobe, Alexey Kochetkov, Mikhail Tomashpolskiy, NIICHIMMASH</p>	<p>Evaluation of Dowfrost HD as a Thermal Control Fluid for Constellation Vehicles</p> <p>Steve Lee, MEI Technologies</p>	<p>Thermal Performance of an Oscillating Heat Pipe for Spacecraft Thermal Control System</p> <p>Atsushi Okamoto, JAXA</p>	<p>Subjective Perception of Thermal and Physical Comfort in Three Liquid Cooling Garments</p> <p>Gloria R. Leon, Victor Koscheyev, Birgit Fink, Paul Ciofani, Joe Warpeha, University of Minnesota; Michael Gernhardt, Nicholas Skytland, NASA Johnson Space Center</p>
	<p>Enhanced Brine Dewatering System</p> <p>Ross Remiker, Orbital Technologies Corp.; Jean B. Hunter, Cornell Univ.; Adam Marten, Brian Zelle, Orbital Technologies Corp.</p>	<p>Investigation of Transient Sublimator Performance</p> <p>Thomas O. Leimkuehler, Paragon Space Development; Rubik Sheth, Ryan Stephan, NASA Johnson Space Center</p>	<p>Steady-State Performance Results for a High-Capacity, Flexible Variable Conductance Heat Pipe</p> <p>Jay Ambrose, Lockheed Martin Missiles & Space Co.</p>	<p>The Advanced Design of a Liquid Cooling Garment Through Long-Term Research: Implications of the Test Results on Three Different Garments</p> <p>Victor Koscheyev, Joe Warpeha, Gloria Leon, Jung-Hyun Kim, Birgit Fink, University of Minnesota; Michael Gernhardt, Nicholas Skytland, NASA Johnson Space Center</p>
	<p>Heat Transfer Characteristics of the Concentric Disk inside the WFRD Evaporator for the VPCAR Water Recovery System</p> <p>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</p>	<p>Altair Lander Life Support: Design Analysis Cycles 1, 2, and 3</p> <p>Molly Anderson, Su Curley, Imelda Stambaugh, Henry Rotter, NASA</p>	<p>Transient Response of a Flexible High-Performance Variable Conductance Heat Pipe</p> <p>Rob Leitch, Jay H. Ambrose, Lockheed Martin Space Systems Co.</p>	
	<p>Evaluation Of A Passive Water Treatment Device for Contingency Liquid Recovery from Urine for Spacecraft Applications</p> <p>Michael S. Roberts, Sharon Edney, Michele Birmele, Dynamac Corp.</p>	<p>Testing and Model Correlation of Sublimator Driven Coldplate Coupons</p> <p>Rubik Sheth, Ryan Stephan, NASA Johnson Space Center; Thomas O. Leimkuehler, Paragon Space Development</p>	<p>Advance Grooved Heat Pipe for Space Satellite Thermal Control System</p> <p>Leonid L. Vasiliev Jr., Luikov Heat & Mass Transfer Inst.; Jean Claude Legros, Univ. of Brussels; Leonard L. Vasiliev, Vladimir Romanenkov, Luikov Heat & Mass Transfer Inst.</p>	
		<p>The Application of Simulation Tools to Ultra-deep Water Development Programs and its Relevance to Space Exploration</p> <p>Frank Sager, Oceaneering Space Systems</p>		

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WEDNESDAY, JULY 15 - MORNING
Technical Sessions

	<p>Fire Safety in Spacecraft and Enclosed Habitats (Part 3 of 3) (ICES513)</p> <p>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.</p> <p>Organizers: Gary A. Ruff, NASA John Glenn Research Center; James F. Russell, Lockheed Martin Space Systems Co.; David L. Urban</p>	<p>Life Support Systems Engineering and Analysis (Part 2 of 2) (ICES502)</p> <p>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.</p> <p>Organizers: Harry W. Jones, Julie A. Levri, NASA Ames Research Center</p>	<p>Lunar Life Support (Part 2 of 2) (ICES509)</p> <p>This session focuses on innovative life support technologies for the proposed Lunar base. The session will highlight the technical challenges and assets available on the Lunar surface.</p> <p>Organizers: Daniel J. Barta, NASA Johnson Space Center; W. Andrew Jackson, Texas Tech. Univ.</p>	<p>Physico-Chemical Processes: Air and Water (Part 2 of 3) (ICES200)</p> <p>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.</p> <p>Organizers: Leonid S. Bobe, NIICHIMMASH; Cesare Lobascio, Thales Alenia Space Italia; Willigert Raatschen, Astrium Space Transportation</p>
	<p>Advances in Development of a Fine Water Mist Portable Fire Extinguisher</p> <p>James R. Butz, ADA Technologies Inc.; Angel Abbud-Madrid, Colorado School of Mines</p>	<p>Online Project Information System (OPIS) Description, Annual Reporting Outcomes, and Resulting Improvements</p> <p>Julie A. Levri, NASA Ames Research Center; Bruce Deng, Jon Welch, Michael Ho, Lockheed Martin Space Operations Co.; John Hogan, NASA Ames Research Center</p>	<p>A Sustainable Regolith-Based Water Recovery Concept for the Lunar Outpost</p> <p>Evan Thomas, David Klaus, Jared Leidich, Univ. of Colorado-Boulder</p>	<p>Design Status of the Closed-Loop Air Revitalization System ARES for Accommodation on the ISS</p> <p>Klaus Bockstahler, Helmut Funke, Joachim Lucas, Astrium GmbH; Johannes Witt, Scott Howland, European Space Agency</p>
	<p>Flammability of Human Hair in Exploration Atmospheres</p> <p>Sandra L. Olson, DeVon W. Griffin, David L. Urban, Gary A. Ruff, NASA Glenn Research Center; Elizabeth A. Smith, Cornell Univ.</p>	<p>Laundry Study for a Lunar Outpost</p> <p>Frank Jeng, Jacobs Technology; Michael K. Ewert, NASA Johnson Space Center</p>	<p>Investigation of Life Support Requirements for Pressurized Lunar Rover</p> <p>Syed-Ali Husain, David Akin, Univ. of Maryland School of Engineering</p>	<p>Design and Testing of a UV-A LED Photocatalytic Oxidation Reactor for Spacecraft Potable Water Disinfection</p> <p>Nadia Silvestry Rodriguez, ORAU/NASA; Robert Soler, Bionetics Corp.; Lawrence Koss Jr, Dynamac Corp.; Fred Maxik PhD, Lighting Science Group Corporation; Andrew C. Schuerger, University of Florida; Michael Roberts, Dynamac Corp.</p>
	<p>A Fire Suppression Analysis for the Altair Project</p> <p>Daniel L. Dietrich, David Urban, Gary Ruff, NASA John Glenn Research Center</p>	<p>Model Confidence Level - A Systematic Metric for Development of a Virtual Space Habitat</p> <p>Markus Czupalla, Thomas Dirlich, Matthias Pfeiffer, Jan Harder, Philipp Hager, Technical Univ. of Munich, Human Spaceflight Group; David Klaus, Univ. of Colorado, Aerospace Engineering Sciences Dept.</p>	<p>Prototype BLSS Lunar Greenhouse</p> <p>Phil Sadler, Sadler Machine Company; Gene Giacomelli, Roberto Furfaro, R. Patterson, Murat Kacira, Univ. of Arizona</p>	<p>Ultraviolet Light Emitting Diodes for Disinfection of Spacecraft Potable Water Systems</p> <p>Michele Birmele, Dynamac Corp.; Robert Soler, Bionetics Corp.; LaShelle McCoy, Michael Roberts, Dynamac Corp.</p>
			<p>Prototype Lunar Surface Vehicle</p> <p>Phil Sadler, Sadler Machine Company; Roberto Furfaro, Univ. of Arizona</p>	<p>Subscale Air Revitalization System by CO2 Reduction for Small Satellite Demonstration</p> <p>Masato Sakurai, Japan Aerospace Exploration Agency</p>

Preliminary papers/presentations under consideration.
For up-to-date event information, visit www.sae.org/ices.

Dates/times subject to change.

Two-Phase Thermal Control Technology (Part 2 of 3) (ICES201)

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. Dellil, Advanced Aerospace Thermal Control Systems; Konstantin A. Goncharov, Lavochkin Association; Darius Nikanpour, Canadian Space Agency; Reinhard Schlitt, OHB System GmbH

Effect of Orientation Angle on the Thermal Performance of Plate Evaporator and Condenser

Mohammad M. Hasan, NASA John Glenn Research Center; David Althausen, ASRC Aerospace

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

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"

Preliminary papers/presentations under consideration.
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Dates/times subject to change.

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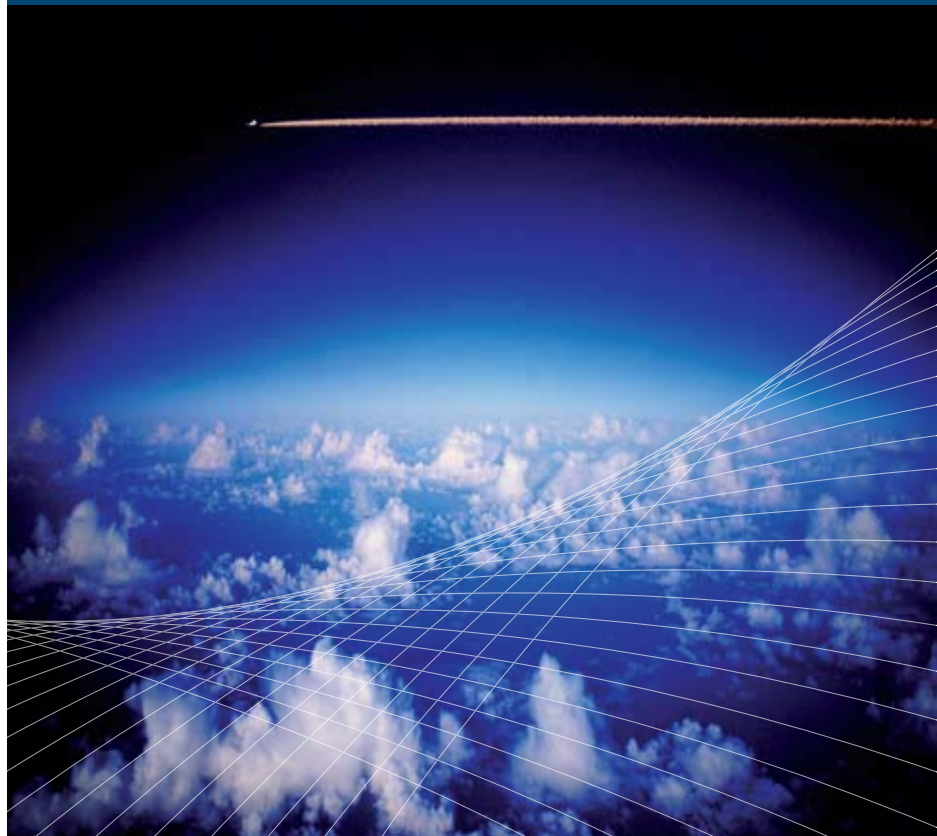
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**WEDNESDAY, JULY 15 - AFTERNOON
Technical Sessions**

<p>Advanced Life Support Sensor and Control Technology (Part 1 of 2) (ICES205)</p> <p>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.</p> <p>Organizers: Darrell L. Jan, Margaret A. Ryan, Abhijit Shevade, Jet Propulsion Laboratory; Timo Stuffer, Kayser-Threde GmbH; Gijbert B T Tan, ESA ESTEC</p>	<p>ECLSS Modeling and Test Correlations (Part 1 of 2) (ICES300)</p> <p>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).</p> <p>Organizers: Brian R. Dunaway, Chang H. Son, Boeing Co.</p>	<p>Extravehicular Activity: Operations (Part 1 of 2) (ICES403)</p> <p>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.</p> <p>Organizers: William F. Higgins, Hamilton Sundstrand</p>	<p>Extravehicular Activity: Space Suits (Part 4 of 5) (ICES400)</p> <p>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.</p> <p>Organizers: Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center</p> <p>Chairpersons: Amy Ross, NASA Johnson Space Center</p>
<p>ANITA Air Monitoring on the International Space Station: Results Compared to Other Measurements</p> <p>Atle Honne, SINTEF; Thomas Limerio, Wyle Laboratories Inc.; Kristin Kaspersen, SINTEF; Ariel Macatangay, Wyle Laboratories Inc.; Paul Mudgett, John James, NASA Johnson Space Center; Gijbert Tan, ESA ESTEC; Wolfgang Supper, European Space Agency</p>	<p>Engineering Support for Columbus: a Hydraulic Model of the Air Loop</p> <p>Gianpiero Audrito, Paola Parodi, Massimo Antonacci, Thales Alenia Space Italia; Nicola Di Francescantonio, Altran; Roland Mueller, EADS Astrium GmbH</p>	<p>Extravehicular Mobility Unit Sublimator Performance with Water from the International Space Station Water Processor Assembly</p> <p>John W. Steele, David Etter, Jesse Morenz, Hamilton Sundstrand</p>	<p>Characterization of Structural, Volume and Pressure Components to Space Suit Joint Rigidity</p> <p>Bradley T. Holschuh, James Waldie, Jeffrey Hoffman, Dava Newman, Massachusetts Institute of Technology</p>
<p>The Orion Air Monitor Performance Model; Dynamic Simulations and Accuracy Assessments in the CEV Atmospheric Revitalization Unit Application</p> <p>George Steiner, Hamilton Sundstrand</p>	<p>ALSSAT Development Status</p> <p>Hue-Hsia Y. Yeh, Cheryl Brown, Hamilton Sundstrand Mgmt Services Inc.; Molly Anderson, Michael Ewert, NASA Johnson Space Center; Frank Jeng, Barrios Technology</p>	<p>Performance of the Extravehicular Mobility Unit Airlack Coolant Loop Recovery Hardware - Phase II</p> <p>John W. Steele, Tony Rector, Hamilton Sundstrand; Daniel B. Gazda, Wyle Integrated Science and Engineering Group; John Lewis, NASA Johnson Space Center</p>	<p>Philosophies Applied in the Selection of Space Suit Joint Range of Motion Requirements</p> <p>Lindsay Aitchison, NASA</p>
<p>Operation of Third Generation JPL Electronic Nose on ISS</p> <p>Margaret A. Ryan, K Manatt, M Homer, S Gluck, A Shevade, A Kisor, L Lara, Jet Propulsion Laboratory</p>	<p>Design and Performance of the Sorbent-Based Atmosphere Revitalization System for Orion and Altair</p> <p>Armin D. Ebner, James A. Ritter, Univ. of South Carolina; M. Douglas LeVan, Vanderbilt Univ.; James C. Knox, NASA Marshall Space Flight Center</p>	<p>Comparing Apollo and ISS EVA Task Efficiency</p> <p>Christopher Arthur Looper, National Aeronautics and Space Administration</p>	<p>A Method for and Issues Associated with the Determination of Space Suit Joint Requirements</p> <p>Jennifer E. Matty, Jacobs Engineering; Lindsay Aitchison, NASA</p>
<p>Advanced ISS Air Monitoring - The ANITA and ANITA2 Missions</p> <p>Timo Stuffer, Kayser-Threde GmbH</p>	<p>High-Pressure Oxygen Generation for Lunar Outpost EVA</p> <p>Frank F. Jeng, Barrios Technology; Bruce Conger, Hamilton Sundstrand; Molly Anderson, Michael Ewert, NASA Johnson Space Center</p>		<p>Investigation of Joint Torque Characteristics for a Mechanical Counterpressure Spacesuit</p> <p>Jared Ruckman, Kettering Univ.; Edward W. Hodgson, Gregory Quinn, Hamilton Sundstrand</p>

Preliminary papers/presentations under consideration.
For up-to-date event information, visit www.sae.org/ices.

Dates/times subject to change.

WEDNESDAY, JULY 15 - AFTERNOON
Technical Sessions

	<p>Human/Robotics System Integration (ICES406)</p> <p>This session addresses the design and development of robotics for Space Exploration and how these robotic systems will work together with humans.</p> <p>Organizers: Loel Goldblatt, Hamilton Sundstrand Space Systems Intl.; Dan King, MDA Inc.</p>	<p>Panel: Thermal Testing (ICES206)</p> <p>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.</p> <p>Organizers: Rajeshuni Ramesham, California Institute of Technology; Andrew Robson, EADS France</p> <p>Panelists: Andrea Ferrero, Thales Alenia Space Italia Eric W. Grob, NASA Goddard Space Flight Center Chris Jewell, ESA ESTEC Marco Molina, Carlo Gavazzi Space Hume Peabody, NASA Steven Price, Astrium, Ltd. Bryan M. Shaughnessy, Rutherford Appleton Lab. Glenn T. Tsuyuki, Jet Propulsion Laboratory</p>	<p>Physico-Chemical Processes: Air and Water (Part 3 of 3) (ICES200)</p> <p>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.</p> <p>Organizers: Leonid S. Bobe, NIICHIMMASH; Cesare Lobascio, Thales Alenia Space Italia; Willigert Raatschen, Astrium Space Transportation</p>	<p>Two-Phase Thermal Control Technology (Part 3 of 3) (ICES201)</p> <p>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.</p> <p>Organizers: Adrianus A. Delll, Advanced Aerospace Thermal Control Systems; Konstantin A. Goncharov, Lavochkin Association; Darius Nikanpour, Canadian Space Agency; Reinhard Schlitt, OHB System GmbH</p>
	<p>Human-rated Automation and Robotics: Integrating Human and Robotic Systems Design Needs and Standards</p> <p>Lynn E. Baroff, David Fitts, Charles Dischinger, NASA</p>		<p>Counter-Flow Silica-Titania Reactor for the Simultaneous Treatment of Air and Water Contaminated With VOCs</p> <p>Christina Akly, Univ. of Florida; Paul Chadik, David Mazzyck, Univ of Florida</p>	<p>First LHP in European Satellite</p> <p>Konstantin Goncharov, Tais, Ltd.</p>
	<p>Proposed Standards and Tools for Risk Analysis and Allocation of Robotic Systems to Enhance Crew Safety During Planetary Surface Exploration</p> <p>Lealem Mulugeta; David Bodkin, Orbital Sciences Corp.; Romain Chasseigne; Michael Demel; Dexter Jagula; Matthew Turnock, McMaster University, Centre for Simulation Based Learning</p>		<p>Multifunctional System for Trace Gas Contaminants Removal</p> <p>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</p>	<p>Carbon Honeycomb Panels with Embedded Heat Pipes</p> <p>Konstantin Goncharov, Tais, Ltd.</p>
	<p>Role Definition and Task Allocation for a Cooperative EVA and Robotic Team</p> <p>Sharon Michelle Singer, David Akin, Space Systems Laboratory, Univ. of Maryland</p>		<p>Subscale-Testbed For Characterizing Dynamic Performance Of Regenerable Adsorbents For Filtering Trace Contaminants From Cabin Atmospheres</p> <p>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</p>	<p>Arterial Variable Conductive Heat Pipe</p> <p>Konstantin Goncharov, Tais, Ltd.</p>
	<p>In Situ Planetary Resource Exploration using Miniature Robotic Subsurface Sample Analysis</p> <p>Roman Kruzelecky, MPB Communications Inc.; Edward Cloutis, Univ. of Winnipeg; Nadeem Ghafoor, Sean Jessen, MDA Space Missions</p>			

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**WEDNESDAY, JULY 15 - AFTERNOON
Technical Sessions**

	<p>Advanced Life Support Sensor and Control Technology (Part 2 of 2) (ICES205)</p> <p>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.</p> <p>Organizers: Darrell L. Jan, Margaret A. Ryan, Abhijit Shevade, Jet Propulsion Laboratory; Timo Stuffer, Kayser-Threde GmbH; Gijbert B T Tan, ESA ESTEC</p>	<p>ECLSS Modeling and Test Correlations (Part 2 of 2) (ICES300)</p> <p>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).</p> <p>Organizers: Brian R. Dunaway, Chang H. Son, Boeing Co.</p>	<p>Education Outreach (ICES307)</p> <p>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.</p> <p>Organizers: Jean B. Hunter, Cornell Univ.; Dean Muirhead, Barrios Technology Inc.</p>	<p>Extravehicular Activity: Operations (Part 2 of 2) (ICES403)</p> <p>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.</p> <p>Organizers: William F. Higgins, Hamilton Sundstrand</p>
	<p>Smoke Detection for the Orion Crew Exploration Vehicle</p> <p>George Steiner, Hamilton Sundstrand</p>	<p>CFD Modeling for Plenum Ventilation Optimization of Node 1 Smoke Detectors</p> <p>Chang H. Son, Boeing Co.</p>	<p>Developing Education and Outreach Initiatives at the Indiana Space Grant Consortium</p> <p>Barrett S. Caldwell, Purdue Univ.- West Lafayette</p>	<p>The Effect of Center of Gravity and Anthropometrics on Human Performance in Simulated Lunar Gravity</p> <p>Lealem Mulugeta; Steven Chappell, Wyle Integrated Science & Engineering; Nicholas Skytland, NASA</p>
	<p>Monitoring Pre-Combustion Event Markers by Heating Electrical Wires</p> <p>Abhijit Shevade, Margaret Ryan, Adam Kisor, Kenneth Manatt, Margie Homer, Liana Lara, Jet Propulsion Laboratory</p>	<p>CFD Study of Ventilation and Carbon Dioxide Transport for ISS Node 2 and Japanese Experiment Module (JEM)</p> <p>Chang H. Son, Boeing Co.</p>	<p>Academic Principles of Human Space Habitat Design</p> <p>David M. Klaus, Kevin Higdon, Univ. of Colorado-Boulder</p>	<p>An EVA Mission Planning Tool based on Metabolic Cost Optimization</p> <p>Aaron W. Johnson, Dava Newman, James Waldie, Jeff Hoffman, Massachusetts Institute of Technology</p>
	<p>Development of a Photocatalytic Oxidation based TOC Analyzer Part II: Effect of Reactor Design and Operation Parameters on Oxidation Efficiency of VOCs</p> <p>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</p>	<p>CFD Analysis of Convective Heat Transfer in the Orbiter Middeck for the Shuttle Rescue Mission</p> <p>Chang H. Son, Boeing Co.</p>		<p>Desert Research and Technology Studies 2008 Report</p> <p>Barbara Romig, Joseph Kosmo, NASA Johnson Space Center; Michael Gernhardt, National Aero & Space Administration; Andrew Abercromby, Wyle Laboratories</p>
	<p>Trade Studies of Selected Environmental Monitoring and Control Technologies</p> <p>Darrell Jan, Margaret A. Ryan, Craig Peterson, Jet Propulsion Laboratory</p>	<p>Hardware/Software Complex of Crew's Service of the Regeneration Life Support Systems Operation: Formation and Localization of Off-Nominal Situations</p> <p>Eduard A. Kurmazenko, Lev Gavrilov, Mikhail Tomashpolskiy Sr, Alexsey Kochetkov Sr, Nikolay Khabarovskiy PhD, Ivan Dokunin PhD, NIICHIMMASH; Guzel Kamaletdinova Ing, NIICYIMMASH</p>		
		<p>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</p> <p>Ichiro Aoki, JAXA; Sadamu Ito, Mitsubishi Heavy Industries Ltd.; Hiroyasu Mizuno PhD, JAXA</p>		

Preliminary papers/presentations under consideration.
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Dates/times subject to change.

WEDNESDAY, JULY 15 - AFTERNOON
Technical Sessions

<p>Extravehicular Activity: Space Suits (Paart 5 of 5) (ICES400)</p> <p>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.</p> <p>Organizers: Lindsay T. Aitchison, NASA; William F. Higgins, Hamilton Sundstrand; Amy J. Ross, NASA Johnson Space Center</p> <p>Chairpersons: Amy Ross, NASA Johnson Space Center</p>		<p>On-orbit Operations and Logistics of Thermal and Environmental Control Subsystems (ICES112)</p> <p>The session focuses on the operations and logistics aspects of thermal and environmental control subsystems for on-orbit spacecraft.</p> <p>Organizers: Wes Ousley, NASA Goddard Space Flight Center; Zoltan Szigetvari, Astrium Space Transportation</p>
<p>Constellation Pressure Garment Development Activities</p> <p>Amy J. Ross, NASA Johnson Space Center</p>		<p>COLUMBUS Thermal Hydraulic Operations with US Payloads</p> <p>Savino De Palo, Roberto Passini, Albino Quaranta, Thales Alenia Space Italia; Bruce Wright, Boeing Co</p>
<p>Constellation Space Suit Element Impacts of the SPR Suit Port Architecture</p> <p>Justin Ryan Thompson, California Institute of Technology</p>		<p>COLUMBUS ECLSS and TCS Joint Operations Support - Lessons Learnt</p> <p>Zoltan Szigetvari, Astrium Space Transportation</p>
		<p>ATV Thermal Operations for Jules Verne First Flight</p> <p>Pascal Vincent, Astrium Space Transportation; Frank Bouckaert, European Space Agency; Patrick Oger, Jean-Christophe Guyot, Astrium Space Transportation</p>
		<p>COLUMBUS ATCS AmiA Installation Analysis and Operations (Written Only -- No Oral Presentation)</p> <p>Paolo Vaccaneo, Thales Alenia Space Italia</p>
		<p>International Space Station (ISS) Internal Active Thermal Control System (IATCS) New Biocide Selection, Qualification and Implementation</p> <p>Mark E. Wilson, The Boeing Company; Tony Rector, John Steele, Jerry Varsik, Hamilton Sundstrand Space Systems Intl.</p>
		<p>Thermal Power and Software Development and Validation on ATV Vehicle</p> <p>Jean-Christophe Guyot, Astrium Space Transportation; Frank Bouckaert, European Space Agency; Pascal Vincent, Patrick Oger, Astrium Space Transportation</p>

Preliminary papers/presentations under consideration.
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Dates/times subject to change.

THURSDAY, JULY 16 - MORNING
Technical Sessions

	<p>Advances in Thermal Control Technology (Part 1 of 2) (ICES109)</p> <p>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.</p> <p>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</p>	<p>Bioregenerative Life Support (Part 1 of 2) (ICES204)</p> <p>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.</p> <p>Organizers: Mark Kliss, NASA Ames Research Center; Cesare Lobascio, Thales Alenia Space Italia; Yas Takashima, Ichidai Nursery Inc.; Yasuhiro Tako, Institute for Environmental Sciences</p>	<p>Extravehicular Activity: Systems (Part 1 of 2) (ICES401)</p> <p>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.</p> <p>Organizers: David M. Klaus, Univ. of Colorado-Boulder; Robert C. Trevino, NASA Johnson Space Center</p>	<p>Management of Air Quality in Sealed Environments (Part 1 of 2) (ICES505)</p> <p>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.</p> <p>Organizers: Hilary Bolland, Defense Equipment And Support Sea System; John T. James, NASA Johnson Space Center; Thomas Limero, Wyle Laboratories Inc.</p>
	<p>Thermal Testing of a Heat Switch for European Mars Rover</p> <p>Alberto Franzoso, Marco Molina, Carlo Gavazzi Space SpA; Guido Barbagallo, ESA/ESTEC; Francisco Romera Fernandez, Iberespacio</p>	<p>An Optimum Biological Reactor Configuration for Water Recycling in Space</p> <p>W. Andrew Jackson, Texas Tech. Univ.; Audra Morse, Nick Landes, Darryl Low, Texas Tech Univ.</p>	<p>Creating a Lunar EVA Work Envelope</p> <p>Brand N. Griffin, Gray Research; Robert Howard, David Smitherman, Sudhakar Rajulu, NASA</p>	<p>Results of Manned Shelter Testing in an Underground Mine</p> <p>Thomas J. Daley, Micropore Inc.</p>
	<p>Multi-layer Coating for Smart Radiation Device with Solar Absorptance 0.13</p> <p>Sumitaka Tachikawa, Akira Ohnishi, Institute of Space & Astronautical Science</p>	<p>Study on the Growing Characteristics of Lettuce (var. Youmaica) Cultivated at Elevated CO2 Concentrations</p> <p>Shuangsheng Guo; Yongkang Tang; Weidang Ai; Lifeng Qin</p>	<p>Preliminary Bench-Top Testing of Electrochromic Material as an Alternative Space Suit Thermal Control Concept</p> <p>Jonathan Glen Metts, David Klaus, Univ. of Colorado-Boulder</p>	<p>An Investigation into the Carbon Dioxide Removal Performance of a Novel Hydrophobic Absorbent</p> <p>Gareth D. Toft, Tony Aitchison, QinetiQ</p>
	<p>Multilayer Tuneable Emittance Coatings with Low Solar Absorptance for Improved Smart Thermal Control in Space Applications</p> <p>Emile Haddad, MPB Technologies Inc.; Roman Kruzelecky, Brian Wong, Wes Jamroz, MPB Communications Inc.; Mohamed Soltani, Mohammed Chaker, INRS Énergie et Matériaux; Philippe Poinas, European Space Agency</p>	<p>Effects of Red and Blue Light Emitting Diodes (LEDs) on the Growth and Development of Lettuce (var. Youmaica)</p> <p>Yongkang Tang; Shuangsheng Guo; Weidang Ai; Lifeng Qin</p>	<p>1-g Suit Port Concept Evaluator 2008 Test Results</p> <p>Barbara Romig, Charles Allton, NASA Johnson Space Center; Harry Litaker, Lockheed Martin</p>	<p>Advances in Submarine Atmosphere Control for a Common US/UK Advanced Atmosphere Control System (AACS)</p> <p>Benjamin Bishop, Vernon Swartley, Hamilton Sundstrand</p>
			<p>Neck-Entry Suitports: A Novel Concept Utilizing Morphing Upper Torso Technology</p> <p>Shane Jacobs, Massimiliano Di Capua, David Akin, Univ. of Maryland</p>	<p>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</p> <p>Neil A. Scholes, Royal Navy; George Tebbut, Frazer Nash Consultancy Ltd</p>

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THURSDAY, JULY 16 - MORNING
Technical Sessions

<p>Thermal and Environmental Control Engineering Analysis and Software (Part 1 of 2) (ICES108)</p> <p>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.</p> <p>Organizers: William Ducas, Orbital Sciences Corp.; Olivier Pin, ESA ESTEC; Nicholas M. Teti, Hawk Institute For Space Sciences; Julian S. Thomas, Alstom Power, Ltd.</p>	<p>Advances in Thermal Control Technology (Part 2 of 2) (ICES109)</p> <p>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.</p> <p>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</p>	<p>Bioregenerative Life Support (Part 2 of 2) (ICES204)</p> <p>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.</p> <p>Organizers: Mark Kliss, NASA Ames Research Center; Yasuhiro Tako, Institute for Environmental Sciences; Cesare Lobascio, Thales Alenia Space Italia; Yas Takashima, Ichidai Nursery Inc.</p>	<p>Extravehicular Activity: Systems (Part 2 of 2) (ICES401)</p> <p>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.</p> <p>Organizers: David M. Klaus, Univ. of Colorado-Boulder; Robert C. Trevino, NASA Johnson Space Center</p>
<p>Matrix Methods for Characterization and Verification of Thermal System Performance for Control Applications Using TMG Finite Element Simulation and MATLAB</p> <p>R. Scott Miskovich, Michael Saeger, ATA Engineering Inc.</p>	<p>Experimental Investigation of Facesheet Influence on Tube Stagnation and Recovery</p> <p>Christopher Linrud, Christine S. Iacomini, Paragon Space Development; Tom Durrant, Paragon Space Development</p>	<p>Theoretical Analysis of Stability for Hybrid Life Support Systems with Catalytic Incineration of Deadlock Products (Experiences with Russian BIOS-3 Project)</p> <p>Yevhen I. Holubnyak, Vadim Ye. Rygalov, Univ. of North Dakota</p>	<p>Proposed Androgynous Docking Airlock/Utility Module</p> <p>Gary L. Harris, Pablo De Leon, Univ. of North Dakota</p>
<p>Thermal Simulation of Asteroid Surface Temperature and Yarkowski Effect</p> <p>Simon Barraclough, EADS Astrium, Ltd.</p>	<p>Integration of Thermal Control Electronics and Monitoring Functions in a Multifunctional Structure</p> <p>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</p>	<p>Outline of Material Circulation - Closed Habitation Experiments Conducted in 2005-2007 using Closed Ecology Experiment Facilities</p> <p>Masato Sakurai, Japan Aerospace Exploration Agency</p>	<p>Preliminary Development of a Suit Port for Planetary Surface EVA Part A: Design Studies</p> <p>James Chartres, Bruce Webbon, NASA Ames Research Center</p>
<p>Phase Change Material Heat Exchanger Life Test</p> <p>Sean T. Lillibridge, JSC; Ryan Stephan, NASA Johnson Space Center</p>	<p>Phase Change Material Heat Exchanger Life Test</p> <p>Sean T. Lillibridge, JSC; Ryan Stephan, NASA Johnson Space Center</p>	<p>Multidisciplinary Preliminary Sizing of Advanced Life Support Systems for Space</p> <p>Giorgio Boscheri, Michele Lavagna, Politecnico di Milano; Matteo Lamantea, Thales Alenia Space Italia SpA</p>	<p>Extravehicular Mobility Unit Sublimator Performance With Water from the International Space Station Water Processor Assembly</p> <p>Jeffrey James Ferketic, Hamilton Sundstrand</p>
<p></p>	<p></p>	<p>A Rack-like Facility Prototype for Ground Demonstration of a LSS Based on Plants</p> <p>Lucia Grizzaffi, Thales Alenia Space Italia; Matteo Lamantea, Thales Alenia Space Italia; Cesare Lobascio, Thales Alenia Space Italia; Paolo Cergna, ALTEC S.p.A.; Daniela Perrachon, Marco Perino, Politecnico di Torino; Ambra Prella, Universita' di Torino</p>	<p></p>

Preliminary papers/presentations under consideration.
For up-to-date event information, visit www.sae.org/ices.

Dates/times subject to change.

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<p>Management of Air Quality in Sealed Environments (Part 2 of 2) (ICES505)</p> <p>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.</p> <p>Organizers: Hilary Bolland, Defense Equipment And Support Sea System; John T. James, NASA Johnson Space Center; Thomas Limerio, Wyle Laboratories Inc.</p>	<p>Thermal and Environmental Control Engineering Analysis and Software (Part 2 of 2) (ICES108)</p> <p>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.</p> <p>Organizers: William Ducas, Orbital Sciences Corp.; Olivier Pin, ESA ESTEC; Nicholas M. Teti, Hawk Institute For Space Sciences; Julian S. Thomas, Alstom Power, Ltd.</p>
<p>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</p> <p>Tina Anne Goodall, MoD United Kingdom</p>	<p>Control Stability Analysis Applied to Columbus ATCS</p> <p>Savino De Palo, Thales Alenia Space Italia; Jan Persson, European Space Agency; Tor Klingberg, ESA ESTEC</p>
<p>A Design Basis for Spacecraft Cabin Trace Contaminant Control</p> <p>Jay L. Perry, NASA Marshall Space Flight Center</p>	<p>Nonlinear Variable-Diffusivity Moisture Transport in Zero Gravity Porous Media Space Applications</p> <p>Nihad Esad Daidzic, Minnesota State Univ.</p>
<p>A History of Space Toxicology Mishaps: Lessons Learned and Risk Management</p> <p>John T. James, NASA Johnson Space Center</p>	

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Mon., July 13	7:00 a.m. - 5:30 p.m.
Tues., July 14	7:00 a.m. - 5:00 p.m.
Wed., July 15	7:00 a.m. - 5:00 p.m.
Thurs., July 16	7:00 - 10:00 a.m.

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All attendees are responsible for their own lodging and travel arrangements. Please note that there are a limited number of reserved rooms at the government rate, so plan to book early! A block of sleeping rooms has been reserved at the Hyatt Regency Savannah at the SAE group rate of \$169 single/double for non-government attendees, plus applicable taxes. Reservations must be made through the Housing Connection by Monday, June 22, 2009, by calling 1-800-847-5810 (toll-free), 1-801-521-9025 (international) or through our on-line connection and hotel reservation form at www.sae.org/ices.

Conference Location and Headquarters Hotel Hyatt Regency Savannah (Map)

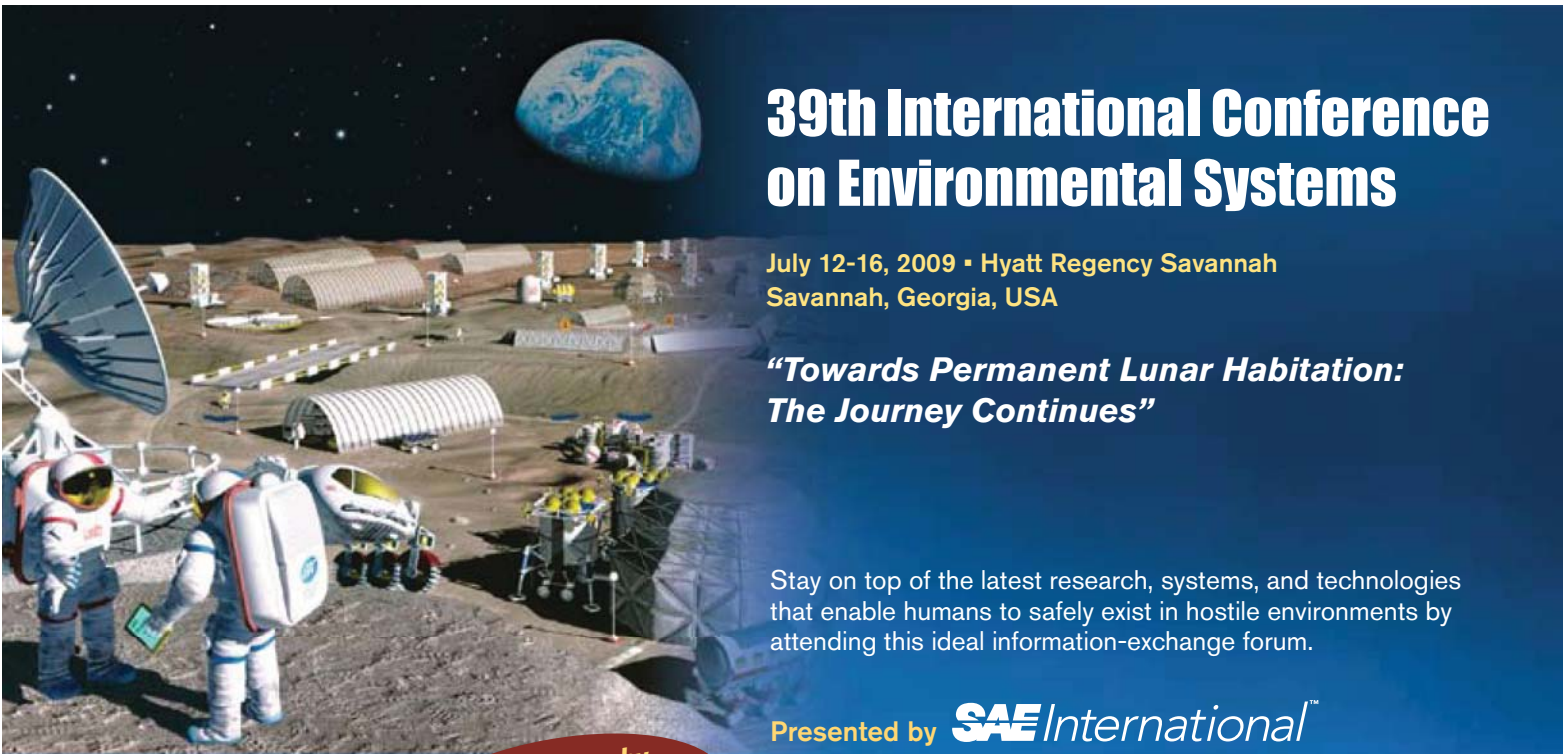
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