



41st International Conference on Environmental Systems

17–21 July 2011

Marriott Portland
Downtown Waterfront
Portland, Oregon

Organized by
American Institute of Aeronautics and Astronautics (AIAA)



Supported by
AIAA Life Sciences and Systems Technical Committee
American Institute of Chemical Engineers (AIChE)
Environmental Systems Committee
American Society of Mechanical Engineers (ASME)
Crew Systems Technical Committee
ICES International Committee (INT)
Space Environmental Systems Committee (SES)

Abstract Deadline:
15 November 2010



10-0499

www.aiaa.org/events/ices

Call for Papers



41st International Conference on Environmental Systems

Organizing Committee

General Chair

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NASA Marshall Space Flight Center

Vice Chair

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NASA Johnson Space Center

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University of Florida

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NASA Goddard Space Flight Center

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Chang H. Son

The Boeing Company

Wolfgang Supper

European Space Agency

Synopsis

The 41st International Conference on Environmental Systems (ICES) will be held 17–21 July 2011 at the Marriott Portland Downtown Waterfront, in Portland, Oregon. The conference is organized by the American Institute of Aeronautics and Astronautics (AIAA), and supported by the American Institute of Chemical Engineers (AIChE), the American Society of Mechanical Engineers (ASME), the ICES International Committee (INT), and the Space Environmental Systems Committee (SES). The conference will cover the following topics related to humans living and working in hostile environments with applications inside or outside of terrestrial or outer space habitats or vehicles: aerospace human factors; environmental control and life-support system technology; environmental monitoring and controls; planetary protection; EVA system technology; life sciences; planetary habitats and systems; and thermal control systems technology for both manned and unmanned vehicles. The conference is open to participants from any nation, from academic, government, or industry organizations. There will be four days of technical presentations, with approximately 50 sessions.

Important Dates

Abstract Deadline 15 November 2010

Author Notification 3 February 2011

Draft Manuscript Deadline 31 March 2011

Final Manuscript Deadline 27 June 2011



The World's Forum for Aerospace Leadership

AIAA is the world's largest technical society dedicated to the global aerospace profession. With more than 35,000 individual members worldwide, and 90 corporate members, AIAA brings together industry, academia, and government to advance engineering and science in aviation, space, and defense.

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■ Technical Topics ■



Conference General Chair Jeff Farmer and Vice Chair David Williams announce that the program committee will be accepting abstracts until 15 November 2010 for the following technical topics:

■ ICES100: SES/INT

Environmental and Thermal Control of Launch and Space Exploration Vehicles

This session covers environmental control, thermal control (passive and active) and thermal protection topics for missions and space transportation vehicles (present and future) including launchers, transit stages, crewed exploration vehicles and entry descent & landing systems (including atmosphere reentry) that are part of US and/or international space exploration programs. Potential topics can include discussion of encountered space environment, environmental and thermal requirements, design, analysis, verification, testing, and flight experience.

Organizers:

Jose Roman, NASA Marshall Space Flight Center, jose.roman@nasa.gov

Gualtiero Brambati, Thales Alenia Space, gualtiero.brambati@thalesaleniaspace.com

Burhard Behrens, Astrium Space Transportation

Joe Chambliss, NASA Johnson Space Center

Jon Holladay, NASA Marshall Space Flight Center

Tom Leimkuehler, Paragon Space Development Corporation

■ ICES101: SES

Spacecraft and Instrument Thermal Design, Testing, and Technology

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

Organizers:

Wes Ousley, NASA Goddard Space Flight Center, wes.ousley@nasa.gov

Dave Wasson, Orbital Sciences Corporation

Joe Gasbarre, NASA Langley Research Center

Jose Rodriguez, NASA Jet Propulsion Laboratory

■ ICES102: SES

Thermal Control for Planetary Surface Missions and Systems

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, and in-situ resource mapping and processing.

Organizers:

Gaj Birur, NASA Jet Propulsion Laboratory, gbirur@jpl.nasa.gov

Ad Delil, AATCS Consultant

Paul McElroy, Touchstone Research Laboratory

■ ICES103: SES/INT

Thermal and Environmental Control of Crewed Lunar Exploration Vehicles

This session covers environmental control, thermal control (passive and active), and thermal protection topics for vehicles used to transport crew and cargo to/from the Moon, Mars, and asteroids, with emphasis on landers and surface crew transport vehicle systems. Papers on related systems within the U.S. and international programs are welcome. Potential topics cover discussion of encountered space environment, thermal and environmental control and life support requirements, design, analysis, verification, and testing.

Organizers:

Gualtiero Brambati, Thales Alenia Space, gualtiero.brambati@thalesaleniaspace.com

Tom Leimkuehler, Paragon Space Development Corporation, thomas.o.leimkuehler@nasa.gov

Burkhard Behrens, Astrium Space Transportation

Joe Chambliss, NASA Johnson Space Center

Jose Roman, NASA Marshall Space Flight Center

Ryan Stephan, NASA Johnson Space Center

■ ICES104: SES/INT

On-Orbit Operations and Logistics of Thermal and Environmental Control Subsystems

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

Organizers:

Zoltan Szigetvari, Astrium Space Transportation, zoltan.szigetvari@astrum.eads.net

Andrea Ferrero, Thales Alenia Space

■ ICES105: SES/INT

Thermal and Environmental Control and System Integration for Surface Habitats

This session focuses on passive and active thermal control and life support for surface habitats. Included is the system engineering that integrates those functions with rovers, EVA systems, and surface utilities. Other potential topics could include the transition from exploration to habitation, base heat rejection, dust mitigation, extreme long duration environment characterization, and advanced technologies to address habitat functionality.

Organizers:

Darius Nikanpour, Canadian Space Agency, darius.nikanpour@asc-csa.gc.ca

Joe Chambliss, NASA Johnson Space Center, joe.p.chambliss@nasa.gov

Ad Delil, AATCS Consultant

■ ICES 106: SES/INT

Space Station and Manned Orbiting Infrastructures Thermal Control

This session addresses thermal control on board the current Space Station and future long term, manned (or man-tended) orbiting habitats, platforms, laboratories, and small scale prototypes. Topics range from system and component issues with the 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 advanced thermal control solutions and/or techniques.

Organizers:

Andrea Ferrero, Thales Alenia Space, andrea.ferrero@thalesaleniaspace.com

Gary Adamson, Hamilton Sundstrand

Gualtiero Brambati, Thales Alenia Space

Jon Holladay, NASA Marshall Space Flight Center

Zoltan Szigetvari, Astrium Space Transportation

Dale Winton, Honeywell International

■ ICES107: SES/INT

Thermal and Environmental Control Engineering Analysis and Software

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

Organizers:

Oliver Pin, European Space Agency, oliver.pin@esa.int

Brian Briggs, Orbital Sciences Corp

Nick Teti, Hawk Institute for Space Sciences

Julian Thomas, ITP Engines UK

■ ICES108: SES/INT

Advances in Thermal Control Technology

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 not specific to any existing or future scientific instruments, spacecraft, or planetary systems. Some examples include advanced insulation,

"smart" optical coatings, nano-particle based heat transfer enhancements, and multifunction thermal materials.

Organizers:

Burkhard Behrens, Astrium Space Transportation,
burkhard.behrens@astrium.eads.net

Richard Briet, CNES

Jeff Farmer, NASA Marshall Space Flight Center

Brian O'Connor, NASA Marshall Space Flight Center

Olivier Pin, European Space Agency

Ryan Stephan, NASA Johnson Space Center

■ ICES109: SES

Space Structures for Exploration

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

Organizers:

Paul McElroy, Touchstone Research Laboratory,
pmm@trl.com

Rick Helms, NASA Jet Propulsion Laboratory

■ ICES110: SES

Thermal and Environmental Control of Commercial Spacecraft

This session focuses on the thermal and environmental control aspects of commercial venture, crewed, or robotic spacecraft and systems.

Organizers:

Nick Teti, Hawk Institute for Space Sciences,
nicholas.m.teti@nasa.gov

Brian Briggs, Orbital Sciences Corporation

■ ICES111: SES

Thermal Standards and Design/Development Practices

This session focuses on current and future efforts and needs for development of spacecraft thermal control standards and reference documents dealing with such areas as design, analysis, testing, equipment, specifications, and processes. These standards might be dedicated to a specific company or applicable to entire programs like Constellation or agencies like NASA.

Organizers:

Eric Grob, NASA Goddard Space Flight Center,
eric.w.grob@nasa.gov

Joe Gasbarre, NASA Langley Research Center

■ ICES200: INT

Physico-Chemical Processes: Air and Water

This session covers technology studies, design, development, manufacturing, integration,

testing, and operations experience in the areas of water regeneration and treatment, air renewal and cleaning, human waste recycling, energy storage and transformation, and in-situ resource utilization, which apply physico-chemical processes.

Organizers:

W. Raatschen, EADS Atrium GmbH,
willigert.raatschen@astrum.eads.net

Cesare Lobascio, Thales Alenia Space Italia S.p.a., cesare.

L. Bobe, Niichimmash

■ ICES201: INT

Two-Phase Thermal Control Technology

This session presents the latest developments and innovations in two-phase heat transport systems, their mathematical modelling, and ground/on-orbit performance. It covers all variants of two-phase thermal control technologies, including different types of heat pipes, capillary and mechanically pumped two-phase loops, and loop heat pipes.

Organizers:

Darius Nikanpour, Canadian Space Agency,
darius.nikanpour@asc-csa.gc.ca

R. Schlitt, OHB System AG

T. Kaya, Carleton University

A. Delil, AATCS

A. Torres, IberEspacio S.A.

■ ICES202: INT

Satellite, Payload, and Instrument Thermal Control

This session covers the development and design of thermal control systems for satellites, payloads, and instruments.

Organizers:

Nico Pennings, European Space Agency,
nico@thermal.esa.int

P. Hugonot, Thales Alenia Space

M. Molina, Carlo Gavazzi Space

H. Ogawa, Institute of Space and Astronautical Science

■ ICES203: INT

Thermal Testing

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

Organizers:

Gerd Jahn, EADS Astrium GmbH,
gerd.jahn@astrum.eads.net

S. Price, EADS Astrium GmbH

H. Mizuno, JAXA

■ ICES204: INT/AIAA

Bioregenerative Life Support

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

Organizers:

Mark Kliss, NASA Ames Research Center,
mark.h.kliss@nasa.gov

M. Sakurai, JAXA

C. Lobascio, Thales Alenia Space Italia S.p.a.

■ ICES205: INT/AICHE

Advanced Life Support Sensor and Control Technology

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.

Organizer:

Timo Stufler, Kayser-Threde GmbH,
timo.stufler@kayser-threde.com

■ ICES300: AICHE

ECLSS Modeling and Test Correlations

The 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 space crafts, such as the lunar habitat, the International Space Station, the Space Shuttle Orbiter, and the Crew Exploration Vehicle (CEV).

Organizers:

Chang H. Son, The Boeing Company,
chang.h.son@boeing.com

Nikolay Ivanov, Saint Petersburg State Polytechnic University, Russia

Brian Dunaway, The Boeing Company

■ ICES 301: AICHE

Advanced Life Support Systems Control

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

Organizers:

David Kortenkamp, TRACLabs Inc.,
korten@traclabs.com

Chang H. Son, The Boeing Company

■ ICES302: AIChE Physio-Chemical Life Support Process Development

This session addresses research issues and development of physio-chemical technology for the Air Revitalization System (ARS), Water Recovery System (WRS), and Waste Management System (WMS), and integration of these systems for space vehicles and planetary habitats. Reports on performance of technologies for processing air, water, and solid waste will be included. Cross-cutting technologies demonstrating the integration of the systems together with reduction of mission costs are also encouraged. Reports on performance of hardware in microgravity conditions are also presented.

Organizers:

K. Wignarajah, NASA Ames Research Center,
Wiggy.Wignarajah@nasa.gov

John Fisher, NASA Ames Research Center
Mike Flynn, NASA Ames Research Center
John Hogan, NASA Ames Research Center
Bernadette Luna, NASA Ames Research Center
Lila Mulloth, SAIC, NASA Ames Research Center

■ ICES303: AIChE Planetary Protection and Astrobiology

This session addresses advances in technology development designed to enable more effective implementation of planetary protection requirements by outbound and sample return interplanetary missions; and efforts relating to the development of small astrobiology payloads for space flights of opportunity.

Organizers:

Perry Stabekis, NASA Headquarters,
pstabeki@hq.nasa.gov

Tim Nalette, Hamilton Sundstrand

■ ICES304: AIChE Development for Space Missions and Terrestrial Applications

This session focuses on NASA-derived technologies that have terrestrial applications towards air purification, water treatment, and solid waste management. Papers should clearly demonstrate the original NASA application and conclude with the modifications taken to transform the original technology for terrestrial applications. In addition, papers should cover the terrestrial market, bench-scale, and pilot/full-scale data if available. Papers on the development of terrestrial applications that have potential for NASA applications are also solicited.

Organizers:

David Mazyck, University of Florida,
dmazyck@ufl.edu

Kristen Riley, University of Florida

■ ICES305: AIChE In-Situ Resource Utilization

This session addresses research and development issues in utilization of in-situ lunar, planetary, and asteroidal resources to produce consumables and propellants for future human or robotic space missions. Presentations will include, but are not limited to, hardware development and testing, system integration, trade studies, process simulations, and ISRU reliability and safety.

Organizers:

Tim Nalette, Hamilton Sundstrand,
t.nalette@hs.utc.com

Jean Hunter, Cornell University

■ ICES 306: AIChE/ASME Environmental and Thermal Control for Commercial Crewed and Cargo Transport Spacecraft

This session seeks papers that describe the environmental control and thermal control systems and subsystems being developed for commercial suborbital and orbital crewed spacecraft and commercial cargo transport vehicles, the differences in driving requirements for these commercial vehicles as compared to traditional governmental spacecraft, and reliable but cost-efficient design solutions.

Organizers:

Barry Finger, Paragon Space Development
Corporation, bfinger@paragonsdc.com

Chang H. Son, The Boeing Company

David Williams, NASA Johnson Space Center

■ ICES 307: AIChE/AIAA CEV ECLSS and Thermal Control

This session addresses Crew Exploration Vehicle current configuration and status.

Organizers:

John Lewis, NASA Johnson Space Center,
john.f.lewis@nasa.gov

Grant Anderson, Paragon Space Development
Corporation

Tim Nalette, Hamilton Sundstrand

■ ICES308: AIChE Education Outreach

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

Organizers:

Jean Hunter, Cornell University,
jhb5@cornell.edu

Dean Muirhead, Barrios Technology

Richard Alba, Enterprise Advisory Services, Inc.

■ ICES400: ASME Extravehicular Activity: Space Suits

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

Organizers:

Lindsay T. Aitchison, NASA Johnson Space
Center, lindsay.t.aitchison@nasa.gov

Amy Ross, NASA Johnson Space Center

■ ICES401: ASME/AIAA Extravehicular Activity: Systems

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

Organizers:

David Klaus, University of Colorado at Boulder,
klaus@colorado.edu

Robert Trevino, NASA Johnson Space Center

■ ICES402: ASME Extravehicular Activity: PLSS and Support Equipment

This session covers topics 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. Also, this session will deal with emerging technology and concepts for use in and from Orion or other Constellation systems.

Organizers:

Edward W. Hodgson, Hamilton Sundstrand,
ed.hodgson@hs.utc.com

Bruce Webbon, NASA Ames Research Center

■ ICES403: ASME Extravehicular Activity: Operations

This session addresses EVA operational activities associated with the Space Shuttle, the International Space Station (ISS), and 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.

Organizer:

Bill West, Hamilton Sundstrand,
william.w.west@nasa.gov

■ ICES404: ASME International Space Station ECLS: Systems

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

Organizers:

Gregory Gentry, The Boeing Company,
gregory.j.gentry2@boeing.com

David Williams, NASA Johnson Space Center
Richard Reysa, GeoLogics Corporation

■ ICES405: ASME International Space Station ECLS: Air and Water Systems

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

Organizers:

Gregory Gentry, The Boeing Company,
gregory.j.gentry2@boeing.com

David Williams, NASA Johnson Space Center
Richard Reysa, GeoLogics Corporation

■ ICES406: ASME Human/Robotics System Integration

This session addresses the design and development of robotics for space exploration and how these robotic systems will work together with humans.

Organizer:

Loel Goldblatt, Hamilton Sundstrand,
loel.goldblatt@hs.utc.com

■ ICES407: ASME/AIChe Spacecraft Water/Air Quality: Maintenance and Monitoring

This session addresses recent developments in spacecraft air and water quality monitoring technology.

Organizers:

John Schultz, Wyle Labs,
john.r.schultz@nasa.gov

Darrell Jan, NASA Jet Propulsion Laboratory
John Straub, Wyle Laboratories

■ ICES408: ASME Regenerable Life Support Processes and Systems

This session addresses recent developments of regenerable life support processes and systems for spacecraft.

Organizers:

Loel Goldblatt, Hamilton Sundstrand,
loel.goldblatt@hs.utc.com

Frederick D. Smith, NASA Johnson Space Center
Tim Nalette, Hamilton Sundstrand
Morgan Abney, NASA Marshall Space Flight Center

■ ICES409: ASME Airliner Cabin Air: Monitoring, Control, and Environmental Health Issues

This session addresses recent developments in airliner cabin air monitoring, control, and environmental health issues.

Organizers:

Ruel Overfelt, Auburn University,
overfra@auburn.edu

David R. Space, The Boeing Company

■ ICES500: AIAA Life Science/Life Support Research Technologies

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, unmanned systems such as free flying platforms and planetary spacecraft, and terrestrial analogs will be presented.

Organizer:

**Bob Morrow, Orbital Technologies Corporation
(ORBITEC),** morrow@orbitec.com

■ ICES501: AIAA Life Support Systems Engineering and Analysis

This session addresses life support for future crewed space missions, including defining systems architecture and selecting technology options. Life support systems engineering and analysis should help guide overall design and selection, development, and integration of technologies to produce complete systems.

Organizers:

Harry Jones, NASA Ames Research Center,
hjones@mail.arc.nasa.gov

John Hogan, NASA Ames Research Center

■ ICES502: AIAA Space Architecture

This session focuses on the application of architectural principles to the design of facilities beyond Earth, to provide for comfortable lodging, productive work, and enjoyment of life, in full recognition of the technical challenges presented by the environment.

Organizers:

Ted Hall, University of Michigan,
twhall@twhall.com

David Nixon, Altus Associates, Architects

■ ICES503: AIAA Radiation Issues for Space Flight

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 insure astronaut radiation protection and safety.

Organizers:

Bill Atwell, The Boeing Company,
william.atwell@boeing.com

Lawrence Townsend, University of Tennessee

■ ICES504: AIAA Management of Air Quality in Sealed Environments

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

Organizers:

John James, NASA Johnson Space Center,
John.t.james@nasa.gov

Thomas Limero, Wyle Laboratories

■ ICES505: AIAA/ASME Microbial Factors Applied to Design

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

Organizers:

Monserrate Roman, NASA Marshall Space Flight Center,
monsi.roman@nasa.gov

Rebekah Jean Bruce, Wyle Laboratories

Letty Vega, Jacobs Technology

■ ICES506: AIAA Human Exploration Beyond Low Earth Orbit: Missions and Technologies

There are many potential destinations for human exploration beyond Low Earth Orbit (LEO), each with specific mission requirements, capabilities and other attributes that may be common or unique. This session addresses mission designs, technology needs, vehicle systems and analyses for sending humans to destinations beyond LEO including geosynchronous orbit, libration points, the Moon, Near Earth Objects (Comets & Asteroids), Mars, and its moons. Relevant subjects include mission requirements, concepts and architectures, technology development needs, challenges and gaps, and candidate system designs. Special attention will be

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given to Environmental Control and Life Support Systems (ECLSS), habitability, unique environmental considerations, and architectures.

Organizers:

Dan Barta, NASA Johnson Space Center,
daniel.j.barta@nasa.gov

James Chartres, Carnegie Mellon

■ ICES507: AIAA

Human Factors for Space Missions Ground and Flight Operations

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 extraterrestrial planetary missions. Topics may include (but are not limited to) procedures, tools, human-automation interaction, remote operation, team performance, design assessment techniques, translating test results into design, temporary structures for preflight ground assembly, and training. The session will include papers reporting research as well as descriptions of design, methods, tools, and lessons learned or past successes.

Organizer:

Jennifer Blume, Jacobs ESTS Group,
Jennifer.l.blume@nasa.gov

■ ICES508: AIAA

Mars and Beyond

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

Organizers:

Marie-Christine Desjean, CNES,
marie-christine.desjean@cnes.fr

Andrew Jackson, Texas Tech University

■ ICES509: AIAA

Fire Safety in Spacecraft and Enclosed Habitats

This session covers all aspects of fire safety in closed environments including prevention, detection, and suppression. Relevant subjects include material controls for fire prevention; fire suppression; fire detection; fire signatures and toxicity; post-fire cleanup; risk assessment; material selection; 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. Applicable environments include: EVA suits; past, present, and future space transportation vehicles; different gravitational levels; extraterrestrial habitats; aircraft; ships; and submarines.

Organizers:

David Urban, NASA Glenn Research Center,
david.l.urban@nasa.gov

James Russell, Lockheed Martin Corporation
Gary A. Ruff, NASA Glenn Research Center

■ ICES510: AIAA

Lunar and Martian Dust Properties and Mitigation Technologies

This session focuses on the properties and mitigation technologies for lunar and Martian dust. The effects of dust will pose significant challenges to space operations for crewed and robotic missions. Papers are solicited on mitigation strategies for life support systems and dust encountered in planetary surface environments. Mitigation strategies may involve cleaning and repelling approaches for the protection and nominal performance of susceptible hardware, and the capture and filtration of airborne lunar dust that may enter the pressurized volumes of spacecrafts and habitats. Measurements of lunar and/or Martian dust properties that provide engineering data for the development of mitigation technologies are also of interest. This session will bring together government, industrial, and academic participants in the space research and technology development community to present their ideas and concepts on this focused topic.

Organizers:

Juan H. Agui, NASA Glenn Research Center,
juan.H.Agui@nasa.gov

Mark Hyatt, NASA Glenn Research Center

■ ICES511: AIAA

Mission Assurance and Reliability Techniques for Environmental Systems

This session covers testing and analysis for system reliability and maintainability. Relevant subjects include verification and validation, risk assessment, accelerated life testing and aging, environmental screening, and qualification testing. Special attention is given to failure modes and mechanisms associated with electronic devices, mechanical assemblies, chemical processing, and biological systems.

Organizers:

Todd H. Treichel, Orbital Technologies Corporation (ORBITEC),
treichel@orbitec.com

Greg Davis, NASA Jet Propulsion Laboratory

■ ICES600: Other

If you are not sure of the best placement for your abstract, please submit to ICES600.

Student Poster Competition

The ICES poster session is a program targeted to stimulate the participation of students and provide an excellent forum for students to present their work in an informal and interactive setting. Posters are ideal for presenting speculative or late-breaking results, or for giving an introduction to interesting, innovative work. Posters are intended to provide students and ICES participants with the ability to connect with one another and discuss the work presented. Each poster will be judged on both the format of the poster and the student's ability to convey the poster content to the judges. Each participating student will receive a ticket to Wednesday night's banquet. University/college students are invited to submit abstracts on their proposed poster by **1 June 2011** per the abstract submittal procedures described below. The student's abstract and poster should be pertinent to ICES; that is, they should follow the same theme of the general conference that focuses on humans living and working in hostile environments with applications inside or outside of terrestrial or outer space habitats or vehicles. *Abstracts of approximately 300 words must include poster title, author name(s), mailing and e-mail addresses, phone and fax numbers, and university or college. The first author and the presenting author of the poster must be students.*

Abstracts must not be more than one page in length and must be double-spaced. **Adherence to this format is required.** Abstracts that do not adhere to this format will be rejected. Poster abstracts should be e-mailed as an attachment to Andrew Jackson by **1 June 2011**. For questions on the student poster competition, please contact Andrew Jackson at andrew.jackson@ttu.edu.

WARNING—Technology Transfer Considerations

Prospective authors are reminded that technology transfer guidelines have considerably extended the time required for review of abstracts and completed papers by U.S. government agencies. Internal (company) plus external (government) reviews can consume 16 weeks or more. Government review if required is the responsibility of the author. Authors should determine the extent of approval necessary early in the paper preparation process to preclude paper withdrawals and late submissions. The conference technical committee will assume that all abstracts papers and presentations are appropriately cleared.

International Traffic in Arms Regulations (ITAR)

Speakers and attendees are reminded that some topics discussed in the conference could be controlled by the International Traffic in Arms Regulations (ITAR). U.S. nationals (U.S. citizens and permanent residents) are responsible for ensuring that technical data they present in open sessions to non-U.S. nationals in attendance or in conference proceedings are not export restricted by the ITAR. U.S. nationals are likewise responsible for ensuring that they do not discuss ITAR export-restricted information with non-U.S. nationals in attendance.

Conference Information

"No Paper No Podium" Policy

If a written paper is not submitted by the final manuscript deadline, authors will not be permitted to present the paper at the conference. It is the responsibility of those authors whose papers or presentations are accepted to ensure that a representative attends the conference to present the paper. This policy is intended to improve the quality of the conference for attendees.

Publication Policy

AIAA will not consider for presentation or publication any paper that has been or will be presented or published elsewhere. Authors will be required to sign a statement to this effect.

Abstract Submittal Guidelines

Authors who wish to contribute a paper to the conference must submit a 300-word abstract by **15 November 2010**. Papers should present technical developments and progress in any of the fields of environmental systems listed in this Call for Papers and should make a new and original contribution to the state of the art, or be a constructive review of the technical field. Authors need not be affiliated with any of the co-sponsoring societies. Papers proposed will be evaluated solely on the basis of their suitability for inclusion in the program. Please note that only written papers will be accepted, except for sessions indicated as panels.

Abstract Submittal Procedures

Abstract submissions will be accepted electronically through the AIAA Web site at www.aiaa.org/events/ices. Once you have entered the conference Web site, on the right-hand side, click "Submit a Paper" and follow the instructions listed on the screen to follow. This Web site will be open for abstract submittal starting **1 September 2010**. The deadline for receipt of draft manuscripts and abstracts via electronic submission is **15 November 2010**. Authors will be notified of paper acceptance via e-mail by **3 February 2011**. An Author's Kit, containing detailed instructions and guidelines for submitting papers to AIAA, will be made available to authors of accepted papers. Authors of accepted papers must provide a draft manuscript by **31 March 2011**. Authors of accepted draft manuscripts must then provide a complete manuscript online to AIAA by **27 June 2011** for inclusion in the online proceedings and for the right to present at the conference. It is the responsibility of those authors whose papers or presentations are accepted to ensure that a representative attends the conference to present the paper. Sponsor and/or employer approval of each paper is the responsibility of the author(s). Government review, if required, is the responsibility of the author(s). Authors should determine the extent of approval necessary early in the paper presentation process to preclude paper withdrawals or late submissions.

The electronic submission process is as follows:

1. Access the AIAA Web site at www.aiaa.org/events/ices.
 2. On the right-hand side click the 'Submit Paper' button.
 3. In order to access the submission site, you must be logged in to the AIAA Web site.
 - a. If you already have an account with AIAA, enter your User Name and Password in the 'Login' box on the left-hand side and hit the arrow button.
 - b. If you do not have an account with AIAA, complete the steps for 'Create Account'.
 4. Once logged in, you will be provided an active link for 'Begin a New Submission or View a Previous Draft/Submission'. Click the link to be directed to the Welcome page of the submission site.
 5. Click the Submission tab at the top of the page to begin your submission. Select the appropriate conference to submit to on the following page.
 6. Once selected, you will be provided with general information on the conference's abstract submission requirements and policies. To begin the submission, click the 'Create a New Submission' link on the left-hand side. PLEASE NOTE: If you have previously visited the site and begun a draft submission, click the 'View Submissions' link on the left-hand side to resume your submission.
- STEP 1: Type or paste the title of your abstract into the Title field and upload your abstract/draft manuscript file. Accepted file types are .pdf (preferred), .doc, and .docx. Add the presenting author's biography (if requested by the conference) into the Presenter Biography field. Scroll down to read through the Rules and Reminders section and check the box noting you agree. Click "Save & Continue" to proceed to the next step.
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Special Notes:

1. If authors wish to revise an abstract which has already been submitted, they must go to 'View Submissions' and select 'Return to Draft' in order to make any corrections. This removes the abstract from the organizers' view. Authors then need to submit the abstract again in order for it to be considered. An abstract cannot be returned to draft if it has been reviewed.
2. Once the abstract submission deadline passes, authors will no longer be able to submit new submissions or return previous submissions to draft for revisions. **Be sure that all of your submission data—authors, keywords, title, and abstract file—are accurate before finalizing your submission as no modifications can be made to this data after the submission site closes.**

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Questions pertaining to the abstract or technical topics should be referred to the corresponding Program Chair:

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Authors will be notified of paper acceptance or rejection on or about **3 February 2011**. Instructions for preparation of draft manuscripts and final manuscripts will be provided for accepted abstracts. Draft manuscripts will be due on **31 March 2011**, and final manuscripts are due by **27 June 2011**.