



40th International Conference on Environmental Systems



Call for Papers

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

SAE Space Environmental Systems Committee

11–15 July 2010

**Hotel Fira Palace
Barcelona, Spain**

Abstract Deadline:
2 November 2009





40th International Conference on Environmental Systems

General Chair

Wolfgang Supper
European Space Agency

Vice Chair

Jeffery Farmer
NASA Marshall Space Flight Center

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EADS Astrium GmbH

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Texas Tech University

David Mazyck
University of Florida

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NASA Goddard Space Flight Center

Chang H. Son
The Boeing Company

Vernon Strength
The Boeing Company (retired)

David Williams
NASA Johnson Space Center



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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Synopsis

The 40th International Conference on Environmental Systems (ICES) will be held 11–15 July 2010 at the Hotel Fira Palace, in Barcelona, Spain. The conference is organized by the American Institute of Aeronautics and Astronautics (AIAA), in co-sponsorship with the American Institute of Chemical Engineers (AIChE), the American Society of Mechanical Engineers (ASME), and the ICES International Committee (INT). 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. ICES 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.

ICES Under New Management

Pursuant to a strategic realignment within SAE International, the management and operation of ICES has transitioned to AIAA, a long-standing co-sponsor of ICES and the world's largest technical society dedicated to the global aerospace profession. SAE will continue to work with the ICES Steering Committee and AIAA professional staff during the transition to ensure the continuity of the conference.

Conference General Chair Wolfgang Supper and Vice Chair Jeff Farmer announce that the program committee will be accepting abstracts until 2 November 2009 for the following technical topics:

ICES100: SAE/INT

Environmental and Thermal Control of Launch and Space Exploration Vehicles

This session covers passive and active thermal control, thermal protection, and environmental control topics for missions and vehicles including present and future space transportation vehicles, such as the Delta, Atlas, Ariane, and Ares launch vehicles, the Orion Crew Exploration Vehicle, and transit stages, that are part of U.S. and/or international space exploration programs. Potential topics also include discussion of thermal requirements, design, analysis, verification, and testing.

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
Tom Leimkuehler, Paragon Space Development Corporation

Jon Holladay, NASA Marshall Space Flight Center

ICES101: SAE

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: SAE

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, Temeku Technologies

ICES103: SAE/INT

Thermal and Environmental Control of Crewed Lunar Exploration Vehicles

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 transport vehicle systems. Papers on related systems within the Constellation and international programs are welcome. Potential topics cover discussion of thermal and environmental control requirements, design, analysis, verification and testing, and technology development.

Organizers:

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

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

Joe Chambliss, NASA Johnson Space Center

Jose Roman, NASA Marshall Space Flight Center

Ryan Stephan, NASA Johnson Space Center
Burkhard Behrens, Astrium Space Transportation

ICES104: SAE/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@astrium.eads.net

Wes Ousley, NASA Goddard Space Flight Center

ICES105: SAE/INT

Thermal and Environmental Control for Lunar Base and Surface Systems

This session focuses on passive and active thermal control for crewed lunar base and related systems such as rovers, EVA systems, and surface utilities, such as power systems and communications. Other potential topics include considerations in transitioning from lunar exploration to lunar habitation, lunar base heat rejection, impact of dust on thermal control, impacts of long duration shadows, thermal environment characterization, and development and implementation of advanced technologies specific to extended surface operations.

Organizers:

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

Ad Delil, Advanced Aerospace Thermal Control Systems Consultant, adelil@zonnet.nl, adelil@xs4all.nl

Darius Nikanpour, Canadian Space Agency
Tom Leimkuehler, Paragon Space Development Corporation

Paul McElroy, Temeku Technologies

Ryan Stephan, NASA Johnson Space Center

ICES 106: SAE/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:

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

Gualtiero Brambati, Thales Alenia Space
Gary Adamson, Hamilton Sundstrand
Jon Holladay, NASA Marshall Space Flight Center

Tom Leimkuehler, Paragon Space Development Corporation

Dale Winton, Honeywell International

ICES107: SAE/INT

Thermal and Environmental Control Engineering Analysis and Software

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

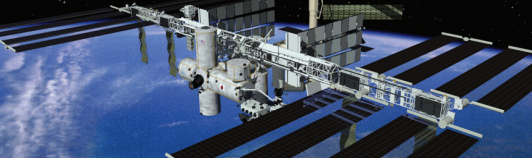
Organizers:

Olivier Pin, European Space Agency, olivier.pin@esa.int

Julian Thomas, Alstom Aerospace;

William Ducas, Orbital Sciences Corporation

Nick Teti, Hawk Institute for Space Sciences



Technical Topics

ICES108: SAE/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

Olivier Pin, European Space Agency
Jeff Farmer, NASA Marshall Space Flight Center

Ryan Stephan, NASA Johnson Space Center
Brian O'Connor, NASA Marshall Space Flight Center

ICES109: SAE

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, Temeku Technologies, pmcelroy@temekutech.com

Rick Helms, NASA Jet Propulsion Laboratory

ICES110: SAE

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:

Bill Ducas, Orbital Sciences Corporation, ducas.bill@orbital.com

Nick Teti, Hawk Institute for Space Sciences

ICES111: SAE

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

Bill Ducas, Orbital Sciences Corporation
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:

Willigert Raatschen, EADS Astrium GmbH, willigert.raatschen@astrium.eads.net

L. Bobe, Niichimash
C. Lobascio, Thales Alenia Space Italia S.p.a.

ICES201: INT

Two-Phase Thermal Control Technology

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

Organizers:

Darius Nikanpour, Canadian Space Agency, darius.nikanpour@space.gc.ca

R. Schlitt, OHB System AG
T. Kaya, Carleton University
A. Delil, AATCS

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. Hugonnot, 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@astrium.eads.net

A. Robson, EADS Astrium Ltd
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 that 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.

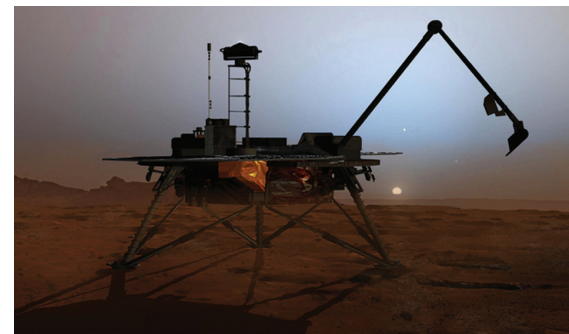
Organizers:

Timo Stuffer, Kayser-Threde GmbH, timo.stuffer@kayser-threde.com

Abhijit Shevade, NASA Jet Propulsion Laboratory, abhijit.shevade@jpl.nasa.gov

Darrell L. Jan, NASA Jet Propulsion Laboratory

Margaret Amy Ryan, NASA Jet Propulsion Laboratory



ICES300: AICHe

ECLSS (Environmental Control & Life Support Systems) Modeling and Test Correlations

This session reports on applications of and advances in modeling physio-chemical and biochemical 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.

Organizers:

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

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.,
kortenk@tracelabs.com

Chang H. Son, The Boeing Company

ICES302: AICHe

Physio-Chemical Life Support Process Development

This session will address 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:

John Fisher, NASA Ames Research Center,
john.w.fisher@nasa.gov

K. Wignarajah, NASA Ames Research Center
Mike Flynn, NASA Ames Research Center
Bernadette Luna, NASA Ames Research Center

John Hogan, NASA Ames Research Center
Lila Mulloth, SAIC, NASA Ames Research Center

ICES303: AICHe

Planetary Protection and Astrobiology

This session will address 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,
pstabekis@hq.nasa.gov

Tim Nalette, Hamilton Sundstrand

ICES304: AICHe

Development for Space Missions and Terrestrial Applications

This session will focus 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 that discuss the development of terrestrial applications that have potential for NASA applications are also being solicited.

Organizers:

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

Kristen Riley, University of Florida

ICES306: AICHe

In-Situ Resource Utilization

This session will address 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 307: AICHe

Environmental and Thermal Control for Commercial Crewed and Cargo Transport Spacecraft

Differences in driving requirements for these commercial vehicles as compared to traditional governmental spacecraft are expected to lead to reliable but cost-efficient design solutions. 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.

Organizers:

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

Chang H. Son, The Boeing Company

ICES 308: AICHe/AIAA

CEV ECLSS and Thermal Control

This session addresses Crew Exploration Vehicle current configuration and status.

Organizers:

Grant Anderson, Paragon Space Development Corporation,
ganderson@paragonsdc.com

Tim Nalette, Hamilton Sundstrand

John Lewis, NASA Johnson Space Center

ICES309: 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,
jbh5@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,
robert.c.trevino@nasa.gov

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 Sunstrand,
ed.hodgson@hs.utc.com

Bruce Webbon, NASA Ames Research Center

ICES403: ASME

Extravehicular Activity: Operations

This session will address EVA operational activities associated with the Space Shuttle, the International Space Station, 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.

Organizer:

Vince Witt, Hamilton Sunstrand,
vincent.witt@hs.utc.com

ICES404: ASME

International Space Station ECLS: Systems

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

Organizers

Richard Reysa, The Boeing Company,
richard.p.reysa@boeing.com

David Williams, NASA Johnson Space Center
Gregory Gentry, The Boeing Company

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:

Richard Reysa, The Boeing Company,
richard.p.reysa@boeing.com

David Williams, NASA Johnson Space Center
Gregory Gentry, The Boeing Company

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.

Organizers:

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

Dan King, Missile Defense Agency

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, darrell.l.jan@jpl.nasa.gov

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 Sunstrand,
loel.goldblatt@hs.utc.com

Frederick D. Smith, NASA Johnson Space
Center

ICES409: 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:

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

Rebekah Jean Bruce, Wyle Laboratories

ICES410 : ASME

Airliner Cabin Air: Monitoring, Control, Environmental Health and Comfort Issues

Aircraft passenger cabins provide the least available airspace per person of enclosed public spaces. The environmental control systems on modern commercial airliners provide for safety, health, and comfort of traveling passengers and crew by meeting interdependent requirements involving thermal design, air pressurization, and cabin air quality while also minimizing energy costs in providing these services. Future challenges include the ever rising cost of energy, emerging threats of infectious diseases, and the increasing age of the traveling public. Specific areas of interest for papers in this session include innovative concepts for future environmental control

systems, novel technologies for air purification and pollutant removal, sensors and sensor systems to monitor air quality in aircraft cabins, and advanced CFD applications in cabin ventilation. Also of interest are papers addressing environmental health effects of specific contaminants, risk assessments for disease transmission, and advanced techniques for aircraft disinfection.

Organizer:

Ruel Overfelt, Auburn University,
overfra@auburn.edu

ICES501: 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 freeflying platforms and planetary spacecraft, and terrestrial analogs will be presented.

Organizer:

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

ICES502: 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

Julie Levri, NASA Ames Research Center

ICES503: 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, T. W. Hall Company,
twhall@twhall.com

David Nixon, Altus Associates, Architects

ICES504: 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

ICES505: AIAA **Management of Air Quality in Sealed Environments**

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

Organizers:

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

Thomas Limero, Wyle Laboratories

Hilary Bollan, Defense Equipment and Support Sea System

ICES509: AIAA **Lunar Life Support**

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

Organizers:

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

Andrew Jackson, Texas Tech University

ICES510: 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 extra-terrestrial 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

ICES511: 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

ICES513: 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

ICES514: AIAA **Lunar and Martian Dust Properties and Mitigation Technologies**

This session will focus 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

ICES515: 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), reichelt@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.

ICES700 **Student Poster Competition**

Organizer:

Andrew Jackson, Texas Tech University, andrew.jackson@ttu.edu



Conference Information

Important Dates

Abstract Deadline	2 November 2009
Author Notification	10 December 2009
Draft Manuscript Deadline	15 March 2010
Final Manuscript Deadline	1 June 2010

Student Poster Competition

The ICES poster session is a program targeted to stimulate the participation of students that will 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, and 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 2010** 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(s) name(s), mailing and e-mail addresses, phone and fax numbers, and the name of the university or college. The first author and 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. For questions on the student poster competition, please contact Andrew Jackson at andrew.jackson@ttu.edu.

Abstract Submittal Guidelines

Authors who wish to contribute a paper to the conference must submit a 300-word abstract by **2 November 2009**. 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. The deadline for receipt of abstracts via electronic submittal is **2 November 2009**.

If you have questions regarding the submission criteria or questions about AIAA policy please contact Institute Administrator Ann Ames at anna@aiaa.org or 703.264.7549. If you have any difficulty with the submittal process please e-mail ScholarOne Technical Support at ts.acsupport@thomson.com or call 434.964.4100 or (toll-free, U.S. only) 888.503.1050.

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

AIAA: W. Andrew Jackson
Texas Tech University
andrew.jackson@ttu.edu

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

ASME: Dave Williams
NASA Johnson Space Center
dave.e.williams@nasa.gov

ICES International Committee:
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Authors will be notified of paper acceptance or rejection on or about **10 December 2009**. Instructions for preparation of draft manuscripts and final manuscripts will be provided for accepted abstracts. Draft manuscripts will be due on **15 March 2010**, and final manuscripts are due by **1 June 2010**.

"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.

Final Manuscript Guidelines

An Author's Kit containing detailed instructions and guidelines for submitting papers will be made available to authors of accepted papers. Authors must submit their final manuscripts via the conference Web site no later than **1 June 2010**.

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.