42nd International Conference on Environmental Systems (ICES)

15–19 July 2012
Hilton San Diego Resort and Spa
San Diego, California

Abstract Deadline: 15 November 2011

Synopsis

The 42nd International Conference on Environmental Systems (ICES) will be held 15–19 July 2012 at the Hilton San Diego Resort and Spa, in San Diego, CA. The conference is organized by AIAA, and supported by 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. 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.

Abstract Submittal Guidelines

Authors who wish to contribute a paper to the conference must submit a 300-word abstract by **15 November 2011**. 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 cosponsoring 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 August 2011**. The deadline for receipt of draft manuscripts and abstracts via electronic submission is **15 November 2011**. Authors will be notified of paper acceptance via e-mail by **5 January 2012**.

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 **22 March 2012**. Authors of accepted draft manuscripts must then provide a complete manuscript online to AIAA by **27 June 2012** 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) 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.
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 the presenting author's biography (if requested by the conference) into the Presenter Biography field. Upload your abstract file. Accepted file types are .pdf (preferred), .doc, and .docx. 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.

STEP 2: Select your Presentation Type, and the Topic Area, of your abstract. Click "Save & Continue" to proceed to the next step.

STEP 3: In this system, affiliations are added before author information. The information will be filled in for the person logged in to the site. Add additional author affiliations, if necessary, by clicking the "Add" button after each new affiliation. Click "Save & Continue" to proceed to the next step.

STEP 4: To create a list of co-authors for this submission, click the "Add Author" button and enter the required information. Click "Save" after entering each one and then associate each author with their respective affiliation by entering the appropriate reference number from the drop-down boxes to the right of each name. When you have finished entering all authors ***YOU MUST*** put them in the order they should appear on the abstract and program. Use the drop-down boxes in the far left column of the list to do this. Failure to order the authors properly will result in them being incorrectly listed when the submission is published. After you have reordered the authors, click the "Save" button at the bottom of the list. Click "Save & Continue" to proceed to the next step.

STEP 5: Select at least one technical area that best represents your work. While only one selection is required, you may list up to six for your submission. Click "Save & Continue" to proceed to the next step.

STEP 6: If you have no errors or omissions in your abstract, a "Submit" button will appear at the end of the proof. If the Error Box appears, you must correct all errors before the abstract can be submitted. Once the errors have been resolved the "Submit" button will appear at the bottom. If you exit the system without submitting the abstract, it will be logged in the system as a draft and will appear in the "Draft" section of your "View Submissions" page when you reenter the system. After you submit the abstract, you will receive a confirmation e-mail.

Special Notes
1) If authors wish to revise an abstract that has already been submitted, they must go to "View Submissions" and select

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"Return to Draft" to make any corrections. This removes the abstract from the organizers' view. Authors then need to submit the abstract again 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.

Authors having trouble submitting abstracts electronically should contact ScholarOne Technical Support at **ts.acsupport@thomson.com**, or at 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 SES: Wes Ousley, NASA Goddard Space Flight Center, wes.ousley@nasa.gov
ASME: Amy Ross, NASA Johnson Space Center, amy.j.ross@nasa.gov
AIAA LS&S: Grant Anderson, Paragon Space Development Corporation, ganderson@paragonsdc.com
AIChE: Chang H. Son, The Boeing Company, chang.h.son@boeing.com
INT: Markus Huchler, EADS Astrium GmbH, markus.huchler@astrium.eads.net

"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 **27 June 2012**.

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

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Technical Topics

Conference General Chair Dave Williams and Vice Chair Andrew Jackson announce that the program committee will be accepting abstracts until **15 November 2011** for the following technical topics:

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; Joe Gasbarre, NASA Langley Research Center; Jose Rodriguez, NASA Jet Propulsion Laboratory; Dave Wasson, Orbital Sciences Corporation)

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; Paul McElroy, Touchstone Research Laboratory)

ICES103:SES/INT—Thermal and Environmental Control of Exploration Vehicles and Surface Transport Systems

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 include 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@astrium.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, including the system engineering that integrates those functions with rovers, EVA systems, and surface utilities. Other potential topics 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)

ICES106: 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, modeling, software tools, integration with other engineering disciplines, and data exchange.

(Organizers: Olivier Pin, European Space Agency, olivier.pin@esa.int; Brian Briggs, Orbital Sciences Corporation; 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, which 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: Cesare Lobascio, Thales Alenia Space Italia S.p.a., cesare.lobascio@thalesaleniaspace.com; L. Bobe, Niichimmash; W. Raatschen, EADS Atrium GmbH)

Calls for **Papers**

ICES201: INT—Two-Phase Thermal Control Technology

This session presents the latest developments and innovations of two-phase heat transport systems, modelling 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@asc-csa.gc.ca; R. Schlitt, OHB System AG; T. Kaya, Carleton University; 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. Hugonnot, Thales Alenia Space; M. Molina, Carlo Gavazzi Space; H. Ogawa, Institute of Space and Astronautical Science)

ICES203: INT—Thermal Testing

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, equipment, 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; 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 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 systems and system concepts for environmental monitoring and control.

(Organizers: Timo Stuffler, Kayser-Threde GmbH, timo.stuffler@kayser-threde.com; Abhijit V. Shevade, NASA Jet Propulsion Laboratory; Darrell L. Jan, NASA Jet Propulsion Laboratory; Margaret Amy Ryan, NASA Jet Propulsion Laboratory)

ICES300: AIChE—ECLSS and Thermal Modeling and Test

This session reports on applications of and advances in modeling physiochemical and biochemical life support processes, as well as in numerical modeling of atmospheric pressure, cabin ventilation, and composition distributions in closed space habitats, such as the International Space Station, the deep exploration spacecraft, the lunar habitat, and commercial crewed and cargo space transport vehicles.

(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)

ICES301: AIChE—Advanced Life Support Systems Control

The Advanced Life Support Systems Control session reports on advanced life support system control topics, such as control-ler 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 physiochemical technology for the Air Revitalization System (ARS), Water Recovery System (WRS), 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 wastes, on cross-cutting technologies demonstrating the integration of the systems together with reduction of mission costs, and 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; Mark Kliss, 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, Genex Systems, perry.stabekis-1@nasa.gov; Tim Nalette, Hamilton Sunstrand)

ICES304: AIChE—Development for Space Missions and Terrestrial Applications

This session focuses on NASA-derived technologies that have terrestrial applications toward 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 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 Sunstrand, t.nalette@hs.utc.com; Jean Hunter, Cornell University)

ICES306: 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)

ICES307: AIChE/AIAA—CEV ECLSS and Thermal Control
This session addresses Crew Exploration Vehicle current configuration and status.

(John Lewis, NASA Johnson Space Center, john.f.lewis@nasa.gov; Grant Anderson, Paragon Space Development Corporation; Tim Nalette, Hamilton Sunstrand)

ICES308: AIChE—Education and Outreach
The Education and Outreach session features papers that link human activities in space with human activities on Earth. The session provides educators the opportunity to share experiences and present the most recent methodologies for linking students and the general public to human exploration of space.

(Organizers: Jean 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 toward the Constellation Program flight 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 Systems
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 relating to 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 addresses EVA operational activities associated with the Space Shuttle, the International Space Station, 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 Laboratories, 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.

(Organizer: Jackelynne Silva, Lockheed Martin Corporation, jackelynne.p.silva@lmco.com)

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)

Calls for Papers

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 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 and 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 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, Raytheon, jennifer.l.blume@raytheon.com)

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), treichelt@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 **20 June 2012** 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, focusing 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 **20 June 2012**. For questions on the student poster competition, please contact Andrew Jackson at andrew.jackson@ttu.edu.

48th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit
Future Propulsion: Innovative, Affordable, Sustainable
and
10th International Energy Conversion Engineering Conference (IECEC)

30 July–1 August 2012
Hyatt Regency Atlanta Convention Center
Atlanta, Georgia

Abstract Deadline: 21 November 2011

Abstract and Manuscript Submission Guidelines

Procedures for Abstract and Manuscript Submittal
Abstract submissions for the JPC or IECEC conferences will be accepted electronically through AIAA's Web site at **www. aiaa.org/events/jpc** or **www.aiaa.org/events/iecec**, respectively. Abstracts must be submitted no later than **21 November 2011**. Authors will be notified of paper acceptance via e-mail by **23 February 2012**. 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 complete manuscript online to AIAA by **16 July 2012** 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. 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/jpc** or **www.aiaa.org/events/iecec**, respectively.