

45TH INTERNATIONAL CONFERENCE ON ENVIRONMENTAL SYSTEMS (ICES 2015)



JULY 12-16TH • BELLEVUE HILTON • BELLEVUE, WA



Sponsored by

PARAGON
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UTC Aerospace Systems



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FIRST ANNOUNCEMENT/CALL FOR PAPERS
ABSTRACT DEADLINE: 3 NOVEMBER 2014
[HTTP://WWW.DEPTS.TTU.EDU/CEWEB/ICES/](http://www.depts.ttu.edu/ceweb/ices/)

SYNOPSIS

ORGANIZING COMMITTEE

Conference Chair

Wes Ousley

*Genesis Engineering
Solutions LLC*

Conference Vice Chair

Olivier Pin

European Space Agency-ESTEC

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*AIAA SES Program Chair
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Chang Hyun Son

*Past Conference Chair 2014
The Boeing Company*

W. Andrew Jackson

*Past Conference Chair 2013
Texas Tech University*

The 45th International Conference on Environmental Systems (ICES) will cover all topics related to humans living and working in hostile environments with applications inside or outside of terrestrial or outer space habitats or vehicles, including 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. The conference is organized by the ICES Steering Committee and Texas Tech University, and supported by the American Institute of Aeronautics and Astronautics (AIAA), the American Institute of Chemical Engineers (AIChE), the American Society of Mechanical Engineers (ASME), and the ICES International Committee (INT).

TRAVEL AND ACCOMMODATIONS

Hotel Information

ICES has made arrangements for a block of rooms at the Hilton Bellevue located just outside of Seattle: 300 112th Avenue SE, Bellevue, WA, 98004. Room rates are \$189.⁰⁰ plus applicable taxes, for single and double occupancy. Please note there is NOT a separate block for government employees. The prevailing U.S. government per diem rate at the time of the conference is greater than the negotiated conference rate. To make a reservation, contact the Group Rooms Coordinator, Alex Niezgodka at the hotel directly by dialing (425) 450-4173 and refer to the 45th International Conference on Environmental Systems (ICES). [Reservations can also be booked online.](#) Rooms at the conference rate will be held until 11 June 2015 while availability lasts. After this date, any unused rooms will be released to the general public. The hotel has a 24 hour cancellation policy, so you are encouraged to book your hotel room EARLY, and you are able to cancel without penalty up to 24 hours in advance of your arrival.

Help Keep Our Expenses Down (and yours too!)

ICES group rates for hotel accommodations are negotiated as part of an overall contract that also includes meeting rooms and other conference needs. Our total event costs are based in part on meeting or exceeding our guaranteed minimum of group-rate hotel rooms booked by conference participants. If we fall short, our other event costs go up. **Please help us keep the costs of presenting this conference as low as possible – reserve your room at the designated hotel listed in this Call for Papers and on our website, and be sure to mention that you're with the ICES conference.** Meeting our guaranteed minimum helps us hold the line on costs, and that helps us keep registration fees as low as possible. **All of us at ICES thank you for your help!**

Organized by: ICES Steering Committee/ Texas Tech University

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

TECHNICAL TOPICS

ICES101: AIAA SES

Spacecraft and Instrument Thermal Systems

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.

Jose Rodriguez, NASA Jet Propulsion Laboratory

jose.i.rodriguez@jpl.nasa.gov

Joe Gasbarre, NASA Langley Research Center
Wes Ousley, Genesis Engineering Solutions LLC
Dave Wasson, Orbital Sciences Corporation

ICES102: AIAA SES

Thermal Control for Planetary Surface Missions and Small-Body Rendezvous Systems

This session focuses on active and passive thermal control for planetary surface missions such as rovers and landers as well as small-body rendezvous systems such as those for comet and asteroid sampling. Included is the thermal control of instruments and systems for in-situ resource utilization, surface mapping, and science. Also covered is surface environment characterization work used in support of thermal control designs such as surface and atmospheric modeling and data analysis.

Eric Sunada, NASA Jet Propulsion Laboratory

Eric.T.Sunada@jpl.nasa.gov

Jennifer Miller, NASA Jet Propulsion Laboratory
Gaj Birur, NASA Jet Propulsion Laboratory

ICES103: AIAA SES/INT

Thermal and Environmental Control of Exploration Vehicles and Surface Habitats

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, including landers, surface habitats, and crew transport vehicle systems. Papers on related systems within the U.S. and international programs are welcome. Potential topics include encountered space environment, base heat rejection, dust mitigation, thermal and environmental control and life support requirements, design, analysis, verification, and testing.

Jose Roman, NASA Marshall Space Flight Center

jose.roman@nasa.gov

Andrea Ferrero, Thales Alenia Space

andrea.ferrero@thalesaleniaspace.com

Joe Chambliss, NASA Johnson Space Center
Tom Leimkuehler, Paragon Space Development Corporation
Ryan Stephan, NASA Glenn Research Center

ICES104: AIAA 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.

Jeff Farmer, NASA Marshall Space Flight Center

jeffery.t.farmer@nasa.gov

Matthias Holzwarth, Airbus Defence and Space

matthias.holzwarth@astrium.eads.net

Richard Briet, CNES
Brian O'Connor, NASA Marshall Space Flight Center
Wolfgang Supper, European Space Agency
Ryan Stephan, NASA Glenn Research Center

ICES105: AIAA 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 programs, space centers, or agencies.

Eric Grob, NASA Goddard Space Flight Center

eric.w.grob@nasa.gov

Art Avila, NASA Jet Propulsion Laboratory
Joe Gasbarre, NASA Langley Research Center

ICES106: AIAA SES

Thermal Control for Space Launch Vehicles, Propulsion, and Nuclear Power Systems

This session features papers on thermal control design, analysis, testing, and flight performance. Three aspects are addressed in this session: (1) Launch vehicles, both commercial and government, including NASA's Space Launch System

STUDENT POSTER COMPETITION

The ICES student poster competition 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. University/college students are invited to submit abstracts on their proposed poster by **1 June 2015** 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 emailed as an attachment to Amy Ross by **1 June 2015**. Authors will be notified of poster presentation acceptance by 10 June 2015. Each participating student will receive a ticket to Wednesday night's banquet. For questions on the student poster competition, please contact Amy Ross at amy.j.ross@nasa.gov

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(SLS); (2) Propulsion systems for rockets, spacecraft, orbiting platforms, space vehicles, and landers, including advanced propulsion techniques; (3) Nuclear power systems for spacecraft, orbiting platforms, space vehicles, landers, and rovers, including systems for power generation, propulsion, and heating.

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

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

ICES107: AIAA SES

Thermal Design of Microsatellites, Nanosatellites, and Picosatellites

Satellites that are smaller than smallsats run into issues with limited radiative surface area and increased power density that make their thermal environment in some ways more challenging than larger satellites. This session presents and discusses the unique thermal concerns pertaining to very small satellites (nanosatellites, cubesats, microsats, etc.). Potential topics include the thermal design, analysis, testing, and on-orbit performance of very small satellites, and the application of relevant key new technologies.

Robert Coker, NASA Marshall Space Flight Center
robert.f.coker@nasa.gov

ICES108: AIAA SES/INT

James Webb Space Telescope Thermal Control

This session focuses on the thermal design, analysis, and testing of spacecraft, instrument, optical, and thermal protection systems for the international James Webb Space Telescope mission.

Wes Ousley, Genesis Engineering Solutions LLC
wes.ousley@nasa.gov

Gerd Jahn, Airbus Defence and Space

Jose Rodriguez, NASA Jet Propulsion Laboratory

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.

Frank Bodendieck, OHB System AG
frank.bodendieck@ohb-system.de

Darius Nikanpour, Canadian Space Agency

Wolfgang Supper, European Space Agency

Tarik Kaya, Carleton University

Alejandro Torres, IberEspacio S.A.

Alain Chaix, Thales Alenia Space

ICES202: INT

Satellite, Payload, and Instrument Thermal Control

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

Patrick Hugonnot, Thales Alenia Space
patrick.hugonnot@thalesaleniaspace.com

Marco Molina, Selex Galileo

Hiroyuki Ogawa, Japan Institute of Space and

Astronautical Science

Johannes van Es, NLR

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.

Gerd Jahn, Airbus Defence and Space
gerd.jahn@astrium.eads.net

Steve Price, Airbus Defence and Space

Hiroyasu Mizuno, JAXA

Andrea Ferrero, Thales Alenia Space

ICES204: INT/AIAA LS&S

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.

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

Masato Sakurai, JAXA

Cesare Lobascio, Thales Alenia Space

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.

Abhijit V. Shevade, NASA Jet Propulsion Laboratory

abhijit.v.shevade@jpl.nasa.gov

Darrell L. Jan, NASA Ames Research Center

Timo Stuffer, Kayser-Threde GmbH

ICES206: INT/AIAA SES

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.

Zoltan Szigetvari, Airbus Defence and Space
zoltan.szigetvari@astrium.eads.net

Matteo Lamantea, Thales Alenia Space

Gary Adamson, UTC Aerospace Systems

Dale Winton, Honeywell International

ICES207: INT/AIAA SES

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.

Henri Brouquet, ITP Engines UK
henri.brouquet@itp-engines.co.uk

Brian Briggs, Orbital Sciences Corporation

Olivier Pin, European Space Agency

Hume Peabody, NASA Goddard Space Flight Center

ICES300: AICHe

ECLSS Modeling and Test Correlations

This session reports on applications 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, exploration spacecraft,

the habitats, and commercial crewed and cargo space transport vehicles.

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

Nikolay Ivanov, Saint Petersburg State Polytechnic University, Russia

ICES301: AICHe

Advanced Life Support Systems Control

The Advanced Life Support Systems Control session reports on advanced life support system control topics, such as controller technology; control theory and application; autonomous control; integrated system control; control software; and modeling, simulation, and emulation for control development.

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

Nikolay Ivanov, Saint Petersburg State Polytechnic University, Russia

ICES302: AICHe/ASME/INT

Physio-chemical Life Support-Air Revitalization Systems-Technology and Process Development

This session addresses research, development, and enhancement of physio-chemical technologies and systems associated with Air Revitalization Systems (ARS). Integration of these systems in closed loop life support applications such as space vehicles and habitats, recent findings and performance of on orbit systems, cross cutting applications of ARS technologies, in addition to approaches to reducing mission costs and improving overall mission logistics, associated with ARS technologies are also presented.

Tim Nalette, UTC Aerospace Systems
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Willigert Raatschen, Airbus Defence and Space
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Morgan Abney, NASA Marshall Space Flight Center
morgan.b.abney@nasa.gov

Darrell Jan, NASA Ames Research Center

ICES303: AICHe/INT

Physio-Chemical Life Support - Water Recovery & Management Systems - Technology and Process Development

This session addresses research, development, and enhancement of physio-chemical technologies and systems associated with Water Recovery & Management (WRM) Systems, including water/waste-water regeneration, water quality management and water storage. Integration of these systems in closed loop life support applications such as space vehicles and habitats, recent findings and perfor-

mance of on orbit systems, cross cutting applications of WRS technologies, in addition to approaches to reducing mission costs and improving overall mission logistics, associated with WRS technologies are also presented.

Justine Richardson, NASA Ames Research Center
tra-my.j.richardson@nasa.gov

Cesare Lobascio, Thales Alenia Space
cesare.lobascio@thalesaleniaspace.com

*John Fisher, NASA Ames Research Center
 Mike Flynn, NASA Ames Research Center
 Leonid Bobe, Niichimmash*

ICES304: AICHe/INT

Physio-Chemical Life Support - Waste Management Systems - Technology and Process Development

This session addresses research, development, and enhancement of physio-chemical technologies and systems associated with Waste Management Systems (WMS). Integration of these systems in closed loop life support applications such as space vehicles and habitats, recent findings and performance of on orbit systems, cross cutting applications of WMS technologies, in addition to approaches to reducing mission costs and improving overall mission logistics, associated with WWS technologies are also presented.

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

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

Matteo Lamantea, Thales Alenia Space
Matteo.Lamantea@thalesaleniaspace.com

*Jeff Lee, NASA Ames Research Center
 Linden Harris, NASA Ames Research Center*

ICES305: AICHe/ASME/AIAA SES

Environmental and Thermal Control of Commercial Spacecraft

This session seeks papers that describe the design, operation, and performance of reliable and cost-efficient thermal and environmental control systems and subsystems for commercial crew and cargo transport, space stations, deep space habitats, and other commercially developed space vehicles.

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

*Chang Hyun Son, The Boeing Company
 David Williams, NASA Johnson Space Center
 Brian Briggs, Orbital Sciences Corporation
 Nick Teti, Vertex Aerospace, LLC*

ICES306: AICHe/AIAA LS&S

Orion Multi-Purpose Crew Vehicle Environmental Control and Life Support System

This session addresses Crew Exploration Vehicle current configuration and status.

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

Tim Nalette, UTC Aerospace Systems
t.nalette@utas.utc.com

ICES307: 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.

Jean Hunter, Cornell University
jbh5@cornell.edu
Dean Muirhead, Barrios Technology

ICES400: ASME

Extravehicular Activity: Space Suits

This session covers topics related to space suit pressure garments. It includes advanced development work for the spectrum of missions from record deep space micro-gravity EVA to long-duration Mars surface stays, as well as sustaining engineering and lessons learned being performed for the ISS Extravehicular Mobility Unit (EMU).

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

*Shane McFarland, Wyle Laboratories
 Jinny Feri, ILC Dover*

ICES401: ASME/AIAA LS&S

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.

Robert Trevino, NASA Johnson Space Center
robert.c.trevino@nasa.gov

Shawn Macleod, David Clark Company
smacleod@davidclark.com

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

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and associated support hardware. Also, this session will deal with emerging technology and concepts for use in and from Orion or other exploration platforms.

Gregory Quinn, UTC Aerospace Systems

gregory.quinn@utas.utc.com

Bruce Conger, Jacobs Technology

ICES403: ASME

Extravehicular Activity: Operations

This session will address EVA operational activities and EVA simulations associated with the International Space Station (ISS), analog or field studies, and other future human spacecraft. Lessons learned on logistics, maintenance, and EVA preparation are also of interest.

Daryl Schuck, Honeywell

daryl.schuck@honeywell.com

Cinda Chullen, NASA Johnson Space Center

cinda.chullen-1@nasa.gov

ICES404: ASME

International Space Station ECLS: Systems

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

Gregory Gentry, The Boeing Company

gregory.j.gentry2@boeing.com

David Williams, NASA Johnson Space Center

dave.e.williams@nasa.gov

Zoltan Szigetvari, Airbus Defence and Space

Zoltan.Szigetvari@astrium.eads.net

ICES405: 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.

Darren Samplatsky, UTC Aerospace Systems

darren.samplatsky@utas.utc.com

ICES406: ASME/AICHe

Spacecraft Water/Air Quality: Maintenance and Monitoring

This session focuses on recent results from flight- and ground-based chemical analyses of spacecraft water and air samples along with recent developments in spacecraft water and air quality monitoring technology.

John Straub, Wyle Laboratories

john.straub-1@nasa.gov

ICES500: AIAA LS&S

Life Science/Life Support Research Technologies

This session emphasizes research technologies to support space biology, 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.

Bob Morrow, Orbital Technologies Corporation (ORBITEC)

morrowr@orbitec.com

Jonathan Metts, Sierra Nevada Corporation (SNC)

Jonathan.Metts@sncorp.com

ICES501: AIAA LS&S

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.

John Hogan, NASA Ames Research Center

john.a.hogan@nasa.gov

Harry Jones, NASA Ames Research Center

harry.jones@nasa.gov

Jeffrey Lee, NASA Ames Research

jeffrey.m.lee@nasa.gov

ICES502: AIAA LS&S

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.

Sandra Haeuplik-Meusburger, Vienna University of Technology

haeuplik@hb2.tuwien.ac.at

A. Scott Howe, Jet Propulsion Laboratory

a.scott.howe@jpl.nasa.gov

ICES503: AIAA LS&S

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 and avionics radiation protection and safety.

Bill Atwell, The Boeing Company (retired)

bigshot.ba@gmail.com

Lawrence Townsend, University of Tennessee

ltownsen@tennessee.edu

ICES504: AIAA LS&S

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.

Thomas Limerio, Wyle Laboratories

thomas.f.limerio@nasa.gov

ICES505: AIAA LS&S/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.

Monserate Roman, NASA Marshall Space Flight Center

monsi.roman@nasa.gov

Rebekah Jean Bruce, Wyle Laboratories

rebekah.j.bruce@nasa.gov

ICES506: AIAA LS&S

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.

Dan Barta, NASA Johnson Space Center

daniel.j.barta@nasa.gov

James Chartres, Carnegie Mellon

james.t.chartres@nasa.gov

ICES507: AIAA LS&S/SES

Debris and Meteoroid Problems and Mitigation for ECLS and TCS

This session deals with space debris and meteoroid impact mitigation and also techniques for reduction of debris. Focus includes the impact of debris and meteoroid presence on the design of manned and unmanned vehicles, including reinforcement, special structural concepts,

other design requirements, and operational mitigation.

Marie-Christine Desjean, CNES

Marie-Christine.Desjean@cnes.fr

Eric Grob, NASA Goddard Space Flight Center

eric.w.grob@nasa.gov

ICES508: AIAA LS&S

Cost Considerations for Space Life Support Systems

This session addresses estimating, allocating, and controlling the costs of space Environmental Control and Life Support Systems (ECLSS). Life Cycle Cost (LCC) includes design and development, launch, and operations.

Harry Jones, NASA Ames Research Center

harry.jones@nasa.gov

ICES509: AIAA LS&S

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.

Gary A. Ruff, NASA Glenn Research Center

gary.a.ruff@nasa.gov

James Russell, Lockheed Martin Corporation

james.f.russell@lmco.com

David Urban, NASA Glenn Research Center

david.urban@nasa.gov

ICES510: AIAA LS&S

Planetary and Spacecraft Dust Properties and Mitigation Technologies

This session focuses on the properties and mitigation technologies for internally generated dust and planetary and asteroid surface dust within and external to spacecraft. 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 dust that may enter the pressurized volumes of spacecraft and habitats. Characterization and measurements of lunar, Martian, asteroid or internally generated dust properties that provide engineering data for the development of mitigation technologies are also of interest.

Juan H. Agui, NASA Glenn Research Center

juan.H.Agui@nasa.gov

ICES511: AIAA LS&S

Reliability for Space Based 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, acceptance testing, and qualification testing. Special attention is given to failure modes and mechanisms associated with electronic devices, mechanical assemblies, chemical processing, and life sciences.

Greg Davis, NASA Jet Propulsion Laboratory

gregory.l.davis@jpl.nasa.gov

Todd H. Treichel, Orbital Technologies

Corporation (ORBITEC)

treichel@orbitec.com

ICES513: AIAA LS&S

Computational Modeling for Human Health and Performance Analysis

This session covers practical application of computational modeling (deterministic and probabilistic) for analysis of human health and performance risks, and countermeasure development. Discussion areas include modeling and simulation of physiologic, biomechanical and behavioral responses to reduced gravity, radiation, spacecraft environment, planetary environment, extravehicular activity, crew dynamics, ergonomics, work-load, and countermeasure prescriptions (exercise and non-exercise).

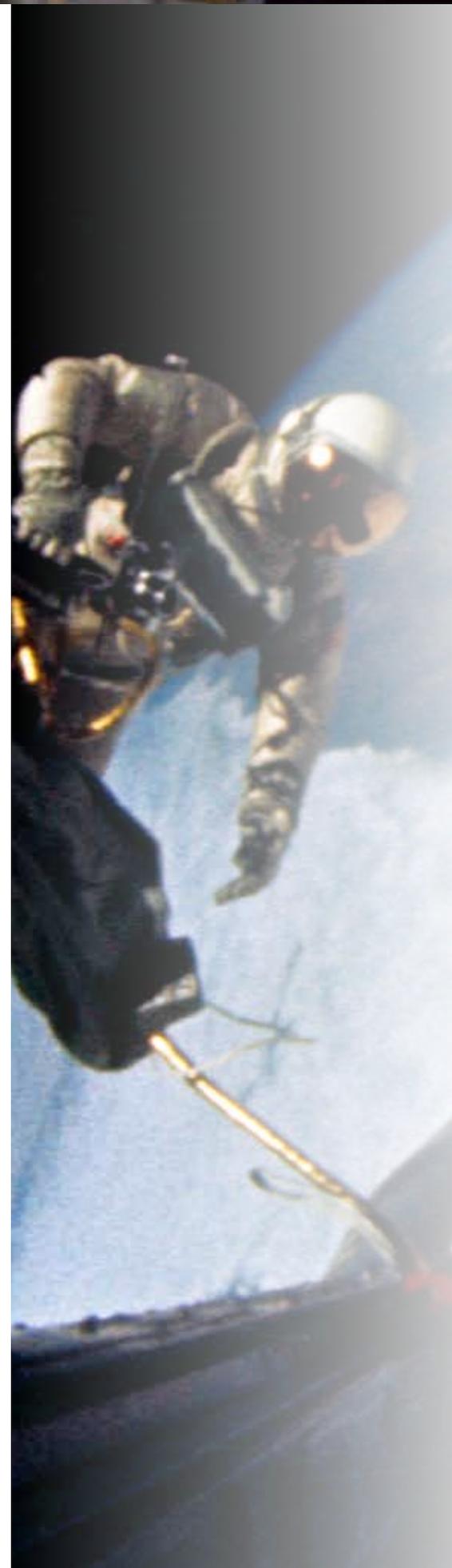
Lealem Mulugeta, Universities Space Research Association

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ICES600

Other

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



ABSTRACT SUBMISSION GUIDELINES AND PROCEDURES

ABSTRACT SUBMISSION GUIDELINES AND PROCEDURES

Authors who wish to contribute a paper to the conference must submit a 300-word abstract. 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.

The deadline for receipt of abstracts via electronic submittal is 3 November 2014, midnight Eastern Standard Time, USA.

The electronic submission process is as follows:

1. Access [EasyChair for ICES 2015](#)
2. Log in or create account.
3. Click on "New Submission" in the top menu and follow the instructions.

Authors having trouble submitting abstracts electronically should send an email to ices.ce@ttu.edu. Questions pertaining to the abstract or technical topics, or general inquiries concerning the program format or policies of the conference, should be referred to the corresponding Program Chair:

AIAA SES	Tom Leimkuehler, Paragon Space Development Corporation, t.leimkuehler@paragonsdc.com
INT	Matthias Holzwarth, Airbus Defence and Space, matthias.holzwarth@astrium.eads.net
AICHe	Tim Nalette, UTC Aerospace Systems, t.nalette@utas.utc.com
ASME	Amy Ross, NASA Johnson Space Center, amy.i.ross@nasa.gov
AIAA LS&S	Grant Anderson, Paragon Space Development Corporation, ganderson@paragonsdc.com

Authors will be notified of paper acceptance or rejection on or about 19 December 2014. An Author's Kit, containing detailed instructions and guidelines for submitting papers to ICES, will be made available to authors of accepted abstracts. Authors of accepted abstracts must provide a draft manuscript by 2 March 2015. Authors of accepted draft manuscripts must then provide a complete final manuscript to ICES by 30 April 2015 for inclusion in the conference 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.

"No Paper, No Podium" and "No Podium, No Paper" Policies

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. If a paper is not presented at the conference, it will be withdrawn from the conference proceedings. These policies are intended to eliminate no-shows and to improve the quality of the conference for attendees.

Publication Policy

ICES 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.

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)

ICES 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.

Important Dates

Abstract Deadline	3 November 2014
Author Notification	19 December 2014
Draft Manuscript Deadline	2 March 2015
Final Manuscript Deadline	30 April 2015

Wes Ousley,
ICES General Chair