

Paper Reference List for ICES 2020*

* These manuscripts were PUBLISHED but not presented due to the postponement of the 50th International Conference on Environmental Systems as a result of the COVID-19 Pandemic

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94	101	Europa Clipper Passive Thermal Control Valve Test and Analysis	Razmig Kandilian, Pradeep Bhandari, Arthur Mastropietro and Paul Woodmansee
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563	101	Psyche Magnetometer Engineering Model Test and Thermal Model Correlation to Validate Operational Thermal Requirement	Elham Maghsoudi, Maria De Soria-Santacruz Pich, David Leneman and Ryan Caron

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71	308	Analysis of a Cold Trap as a Purification Step for Lunar Water Processing	Jordan Holquist, Patrick Pasadilla, Chad Bower, Philipp Tewes, Laura Kelsey and Thomas Cognata
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148	308	A parametric study on the effect of acidity and pressure on electrochemical stripping of ammonia from wastewaters	Matthew Liu and William Tarpeh
151	308	Demonstration of Advanced Mars ISRU CO2 Recovery System	Gokhan Alptekin, Ambalavanan Jayaraman, Michael Bonnema, Sarah Devoss and Andrew Hagen
204	308	Chemical Lidar Science Payload for the Lunar Volatile and Mineralogy Mapping Orbiter	Roman Kruzelecky, Piotr Murzionak, Ian Sinclair, Yang Gao, Chris Bridges, Andrea Luccafabris, Edward Cloutis and Amelie St-Amour
498	308	Design of Anaerobic Digestion Systems for Closed Loop Space Biomanufacturing	Alexander Benvenuti, Saige Drecksler, Sourmyajit Sen Gupta and Amor Menezes
499	308	Effects of Space Biomanufacturing on Fuel Production Alternatives for Mars Exploration	Saige Drecksler, Sourmyajit Sen Gupta, Alexander Benvenuti and Amor Menezes
ICES400: Extravehicular Activity: Space Suits			
69	400	xEMU Lower Torso Assembly (LTA) Brief Fleet Sizing Study	Kristine Davis, Richard Rhodes, Han Kim, Elizabeth Benson, Yaritza Hernandez, Linh Vu and Sudhakar Rajulu
175	400	Development and Evaluation of the Active Response Gravity Offload System as a Lunar and Martian EVA Simulation Environment	Omar Bekdash, Paul Valle, Kyoung Jae Kim, Sarah Jarvis, Jocelyn Dunn, Jason Norcross and Andrew Abercromby
182	400	Towards Large-area On-body Force Sensing Using Soft, Flexible Materials: Challenges of Textile-Based Array Sensing	Crystal Compton, Alireza Golgouneh, Brad Holschuh and Lucy Dunne
187	400	Evaluating the Effect of Spacesuit Glove Fit on Dexterity and Cognitive Task Performance	Seamus Lombardo, Shane Jacobs, Kevin Duda and Leia Stirling
196	400	Development and Optimization of EVA Space Suit Ball Bearing Ferrofluid Pressure Seals and Hybrid A/X Race Geometry	Milo Hughes, Andrew Redd and Nikolay Moiseev
234	400	Thermal Modeling of Mechanical Counterpressure Spacesuit EVA	Jeremy Stroming and Dava Newman
327	400	Advanced Thermal, Radiation, and Dust Protection for Spacesuits and Space Systems	Cody Paige, Dava Newman and Jonah Peter
349	400	Preliminary Investigation of the Design of a Mechanically Antagonistic, Actuating Countermeasure Garment	Rachael Granberry, Julianna Abel and Brad Holschuh
389	400	A Biomechanical Design Framework to Improve Spacesuit Boot Fit	Abhishektha Boppana and Allison Anderson
430	400	Range of Motion (ROM) Analysis for Pressure Garments (EVA and LES) using 3D Photogrammetric Motion Capture	Dillon Hall, Bonnie Dunbar, Paul Burke and Callen Hajda
480	400	Reassessing the Purge Valve Architecture in the Exploration Extravehicular Mobility Unit	Margot Steely
ICES401: Extravehicular Activity: Systems			
336	401	Continued Development and Validation of the Virtual Spacesuit Using Apollo 17 Data	Claas Olthoff
ICES402: Extravehicular Activity: PLSS Systems			
83	402	High-Accuracy Oxygen Flow Meter for the Exploration Portable Life Support System	Michael Izenson, Amelia Servi, Sheldon Stokes, Theodore Beach, Carl Kirkconnell, Leon Huynh, Tessa Rundle and Steven Lee
84	402	Compact Oxygen Heat Exchanger for the Exploration Portable Life Support System	Michael Izenson, Amelia Servi, Sheldon Stokes and Tessa Rundle
456	402	The Effect of Carbonization Conditions on the Performance of Ammonia Sorbents Derived from Polyether Ether Ketone (PEEK)	Marek A. Wójciewicz, Joseph E. Cosgrove, Michael A. Serio, Andrew E. Carlson, Nicolas J. Espinosa, John M. Hostetler and Cinda Chullen
519	402	Exploration Portable Life Support System Hatch Component Design Challenges and Progress	Kristina Todd, John Hostetler, Nicolas Espinosa and Cinda Chullen
573	402	Gas Bubble Dissolution Within the Thermal Control Loop of the Exploration Portable Life Support Subsystem	Torie Miller
574	402	Flowrate Reduction Analysis of the Ventilation Loop in the Exploration Portable Life Support Subsystem	Torie Miller
ICES403: Extravehicular Activity: Operations			
163	403	Methodology for the Scientific Physical and Operations Characterization (SPOC) of Terrestrial Fieldwork	Rachel Vitali, Matthew Miller and Leia Stirling
ICES404: International Space Station ECLS: Systems			
35	404	Developing Methods for Biofilm Control in Microgravity for a Water Recovery System	Yo-Ann Velez, Donald Carter, Mononita Nur and Geoffrey Angle
391	404	Upgrades to the International Space Station Urine Processor Assembly	Jill Williamson, Layne Carter, Danielle Morris, Jimmy Hill and Colton Caviglia
ICES405: Human/Robotics System Integration			
181	405	Autonomous framework protocols for Space Missions	Vittorio Netti and Tara Bisharat
428	405	Astronaut Smart Glove: A Human-Machine Interface For the Exploration of the Moon, Mars, and Beyond	Pascal Lee, Christopher McKay, Gregory Quinn, Tom Chase, Moira Tamuly, Sondre Tagestad, Haakon Pettersen, Magnus Arveng, Frank Oygard, Brandon Dotson, John Schutt and Jake Rohrig
538	405	Investigation of Augmented Reality in Enabling Telerobotic On-Orbit Inspection of Spacecraft	Jessica Todd, Andrew Liu and Leia Stirling
ICES406: Spacecraft Water/Air Quality: Maintenance and Monitoring			
67	406	Photocatalytic Oxidation Using TiO2 and UV for Total Organic Carbon Analysis of Water	Marianne Gonzalez, Valeria Lopez, Richard Kidd, Margie Homer, Aaron Noell, Chad Morrison, April Jewell, Samad Firdosy, Murray Darrach, Mike Callahan, Lance Christensen and Fred Winberg
398	406	Selection of a Total Organic Carbon Analyzer System for Exploration Missions	Chad Morrison, Jonathan To, Aaron Noell and Michael Callahan
399	406	Miniature TOC Analyzer using Tunable Laser Spectroscopy and Combustion	Frank Winberg, Lance Christensen, Matthew Kale, Andrew Jones and Chad Morrison
ICES500: Life Science/Life Support Research Technologies			
28	500	Plant Water Management in Microgravity	Tyler Hatch, Mark Weislogel, Rihana Mungin and Maria Hernandez
77	500	Development of a photosynthesis measurement chamber under different airspeeds for applications in future space crop-production facilities	Lucie Poulet, Michael Gildersleeve, Lawrence Koss, Gioia D. Massa and Raymond M. Wheeler
ICES501: Life Support Systems Engineering and Analysis			
85	501	Life Support System Design for Habitation in Lunar Lava Tubes	Hiroyuki Miyajima
220	501	A New Vision and More Rational Process Will Advance Space Life Support Through Better Projects	Harry Jones
223	501	The System Complexity Metric (SCM) Predicts System Costs and Failure Rates	Harry Jones
473	501	Analysis of Candidate Technologies for a Partial Gravity Water Recovery System	Tsvetelina Baryakova and Kevin Lange

ICES502: Space Architecture

11	502	Lunar Daytime: Behavioral Experiments in a Space Analog Living and Working Environment	Marc M. Cohen, Donald C. Barker, Suzana De Oliveira Bianco, Sheryl Bishop, Ronald Gentile, Sandra Haeuplik-Meusburger, Pablo de Leon and James Wise
13	502	Antaeus: Concept for a Sample Receiving Lab/Planetary Quarantine Facility at the Gateway	Marc M. Cohen, Donald Barker, N. Robert Bennett, Suzana De Oliveira Bianco, Shen Ge, Rocco Mancinelli and Kris A. Zacny
150	502	Kansei Engineering Methodology to Define the Interior Design of Habitats in Extreme Environments	Paolo Caratelli and Maria Alessandra Misuri
300	502	The Bionomic Design and Mixed Reality as Passive Countermeasures in Terrestrial Analogs and Extraterrestrial Habitats	Sheryl Bishop, Sandra Haeuplik-Meusburger, Olga Bannova, Jorge Camba and Marc Jurblum
385	502	Solar Array Configurations for the Moon Village	Eric Halbach, Daniel Inocente, Max Haney, Neil Katz and Georgi I. Petrov
550	502	3D-Printing Lunar and Martian Habitats and the Potential Applications for Additive Construction	Monserrate Roman, Melodie Yashar, Michael Fiske, Shadi Nazarian, Amanda Adams, Platt Boyd, Michael Bentley and Jason Ballard

ICES504: Management of Air Quality in Sealed Environments

156	504	Impact of different ventilation strategies on aircraft cabin air quality and passengers' comfort and well-being – the ComAir study	Britta Herbig, Victor Norrefeldt, Pawel Wargocki, Florian Mayer, Ria Ströhlein, Lei Fang and Ivana Ivandic
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ICES506: Human Exploration Beyond Low Earth Orbit: Missions and Technologies

138	506	Human Adaptation: Rationale for the Sub-Atmospheric Spacecraft Environment	Hussein El-Lessy, Kevin Braman, Robert Perkins, Matthew Ziglar, Anthony Cook and Mitchell Bland
200	506	NASA Environmental Control and Life Support Technology Development and Maturation for Exploration: 2019 to 2020 Overview	Walter Schneider, Jay Perry, James Broyan, Ariel Macatangay, Melissa McKinley, Caitlin Meyer, Andrew Owens, Nikzad Toomarian and Robyn Gatens
299	506	International Space Station as a Testbed for Exploration Environmental Control and Life Support Systems - 2020 Status	Laura Shaw, John Garr, Lynda Gavin, Christopher Matty, Alesha Ridley, Michael Salopek and Katherine Toon
364	506	Planetary Protection Requirements for Crewed Missions - An update to the COSPAR Workshop Series	J Andy Spry, Bette Siegel, Margaret Race, Gerhard Kminek, Lisa Pratt and Athena Coustenis
419	506	Establishing Assessment Criteria for Intelligent Infusion of "Smart Systems" into a Space Habitat	David Klaus, Sophie Zaccarine, Patrick Pischulti and Annika Rollock
432	506	Integrating Orion and Initial Lunar Gateway Environmental Control and Life Support Systems	Joel Kirkland, Heather Mera, Timothy Cichan and Ryan Wall
485	506	Contingency operations on the Deep Space Gateway: Approaches, and Considerations to Orbiting Platforms for Deep Space Exploration	David Zuniga, Rachel Sturtz, Miriam Sargusingh, Stephanie Casper and Chad Tressler

ICES509: Fire Safety in Spacecraft and Enclosed Habitats

125	509	A Smoke Detector to Prevent False Alarms in Lunar Missions by Smoke-Dust Discrimination	Thorsten Schultze, Lea Sichma and Marit Meyer
173	509	Spacecraft Fire Safety Technology Development Plan For Exploration Missions	David Urban, Gary Ruff and Daniel Dietrich
340	509	Spacecraft Smoke Detector Characterization with Reference and Smoke Aerosols	Xiaoliang Wang, Judith Chow, John Watson, Marit Meyer, Gary Ruff, John Easton, Gordon Berger and Paul Mudgett
341	509	Effect of Humidity on Surface Interactions of Gaseous HCl and Aluminum for Spacecraft Fire Safety Applications	Justin Niehaus, Suleyman Gokoglu, Sandip Mazumder, Gordon Berger and John Easton
407	509	Effects of Confinement on Flame Spread in Microgravity	Yanjun Li, Ya-Ting Liao, Paul Ferkul, Michael Johnston and Charles Bunnell
433	509	Hazardous Effects of Li-Ion Battery Based Fires	Rosa Padilla, Ise Alcantara, Marit Meyer, Alfredo Juarez, Daniel Dietrich, David Urban, Gary Ruff and Christopher R. Nagel

ICES510: Planetary and Spacecraft Dust Properties and Mitigation Technologies

65	510	Airborne Particulate Monitor: A Real-time Reference Quality Aerosol Instrument Payload for ISS Air Pollution Quantification	Marit Meyer
147	510	Spacesuit Dust Mitigation-Study in Vacuum Settings Using Carbon Nanotube Fibers with Electric Fields	Kavya Manyapu, Leora Peltz, Pablo De Leon and Dr Carlos Calle

ICES511: Reliability for Space Based Systems

221	511	Verified Cost-Effective High Reliability for New Deep Space Systems	Harry Jones
222	511	Minimum Risk Deep Space Habitat and Life Support	Harry Jones
488	511	Failure Mode and Effects Analysis for Environmental Control and Life Support System Self-Awareness	Samuel Eshima and James Nabity

ICES513: Computational Modeling for Human Health and Performance Analysis

87	513	Age-Specific Organ and Tissue Mass Estimates and Their Distribution in Adult Women	Jan Weber
315	513	Countermeasure Suits for Spaceflight	Rachel Bellisle and Dava Newman
541	513	Estimating Compressive Spinal Loads Due to Planetary Space Suits	Katelyn Burkhart, Dennis Anderson and Leia Stirling