



APPLIED SPACE ENVIRONMENTS CONFERENCE 2023

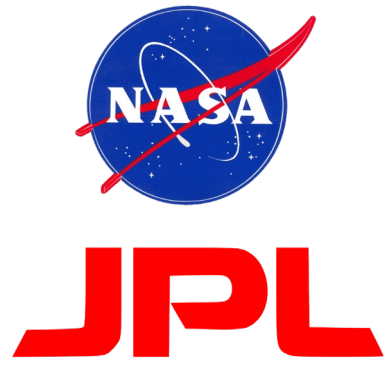
AC Hotel by Marriott
435 Williams Ave
Huntsville, AL



Space Weather Solutions



Applied Space Environments Conference 2023 Agenda



Logistics

- ASEC 2023 is fully in-person with no option for remote participation.
- Technical sessions Monday through Friday are in the AC Hotel Huntsville Downtown, 435 Williams Avenue SW, Huntsville, Alabama +1 256-836-7776.
- Conference dinner on Wednesday evening is at the Davidson Center for Space Exploration, US Space and Rocket Center, One Tranquility Base, Huntsville, Alabama +1 256-837-3400.
- A bus service will be provided (please sign up in advance) for participant without their own transportation.
- Please upload your presentation (in PowerPoint or PDF format) to the ExOrdo conference site (<https://asec2023.exordo.com>) the week before your talk. We will download presentations from this site to the conference computer for presentation each day.
- No full written ASEC paper is required to participate in the conference, your presentation slides are the only materials due before the conference.
- Additional information about the special Virtual Collection of ASEC2023 peer reviewed papers in the Journal of Spacecraft and Rockets will be provided during the conference. Submitting a paper to the journal is voluntary and not required to participate in the workshop.

Welcome to ASEC 2023!

As the conveners for this year's conference, we welcome all of you to the Applied Space Environment Conference (ASEC) 2023! The conference this year will be the first since the world emerged from the travel restrictions imposed by the Covid pandemic and we are very happy to be able to hold ASEC once again fully in person.

ASEC 2023 is the fourth event organized in the biennial ASEC conference series. The location of previous ASEC events were:

- ASEC 2017 Huntsville, Alabama
- ASEC 2019 Los Angeles, California
- ASEC 2021 Virtual

The good response from speakers for this year's event in terms of submitted abstracts demonstrates that ASEC continues to meet the communication need for our applied space environments science and engineering community. We plan to continue organizing the conference series on alternate years in the future and hope to see all of you in person for ASEC 2025!

Welcome to ASEC 2023 and enjoy the conference!

ASEC 2023 Conveners

Linda Neergaard Parker/Space Weather Solutions

Joseph Minow/NASA

Insoo Jun/JPL

Mark Matney/NASA

[Note: All times are US Central Daylight Time, UTC – 5 hours]

Monday, 9 October

08:00 – 09:00	Registration and Check-in	
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Session 1: Welcome, Opening Remarks, and Keynote Chair: Insoo Jun/JPL		
09:00 – 09:30	01-Convener Introduction and Logistics	Linda Neergaard Parker, Joseph Minow, Insoo Jun, Mark Matney
09:30 – 10:00	02-Keynote: NASA's Space Weather Program	Jamie Favors Space Weather Lead NASA SMD
10:00 – 10:20	Break	

Session 2: Lunar Environments I Chairs: Casey Keys/Maxar, Wesley Chambers/MSFC		
10:20 – 10:40	03-Lunar Gateway Charging and Effects on Low-Energy Electron Measurements	Miles Bengtson GSFC/Aurora Engineering
10:40 – 11:00	04-Lunar Electrostatics and Dust Mitigation Tool	Charles Buhler NASA/KSC
11:00 – 11:20	05-Modelling and Ground Testing of Lunar Dust Simulant Electrostatic Charging under VUV Irradiation	Rémi Pacaud ONERA
11:20 – 11:40	06-Knowledge Gaps for Human Lunar Exploration Design Environments	Robert Suggs NASA/MSFC
11:40 – 01:00	Lunch Break	

Session 3: Radiation I Chairs: Chris Mertens/LaRC, Eddie Semones/JSC		
01:00 – 01:20	07-INVITED: LRO CRaTER and the Radiation Environment Measured near the Moon	Harlan Spence Univ. of New Hampshire
01:20 – 01:40	08-Estimating Electron Dose in Geostationary Orbit from GOES Fluxes: an Accuracy Assessment	Juan Rodriguez CU Boulder, CIRES
01:40 – 02:00	09-Space Ionizing Radiation Environment and Effects Advance Climatology (SIRE2-AC) Toolkit	Zachary Robinson Fifth Gait Technologies
02:00 – 02:20	10-Radiation Monitoring from the Atmosphere to the ISS - the ARMAS Radiation Database as a Global Baseline	W. Kent Tobiska Space Environment Technologies
02:20 – 02:40	11-NAIRAS Atmospheric and Space Radiation Environment Model	Christopher Mertens NASA/LaRC
02:40 – 03:10	Break	

Session 4: Charging I**Chairs: Gian Luca Delzanno/LANL, Sebastien Hess/ONERA**

03:10 – 03:30	12-INVITED: CROCUS Mission Development Status	Pierre Sarrailh ONERA
03:30 – 03:50	13-A New Approach to IESD Arc Modeling: Test Data and Simulations	Wousik Kim NASA/JPL
03:50 – 04:10	14-The “Knowledge Check” in NASA Charging Handbook, NASA-HDBK-4002B	Wousik Kim NASA/JPL
04:10 – 04:30	15-Design of the SunRISE Spacecraft and Mission for Radiation, Charging, and Upset Mitigation in Near Geosynchronous Equatorial Orbit	Ryan Martineau SDL
04:30	Daily Wrap-up	Conveners

Tuesday, 10 October

08:00 – 09:00	Registration and Check-in	
09:00 – 09:10	Announcements	Conveners

Session 5: Welcome Comments**Chair: Joseph Minow/MSFC**

09:10 – 09:40	16-Keynote: Welcome Comments from MSFC	Mary Beth Koelbl Director of Engineering Directorate, NASA/MSFC
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Session 6: Testing and Instrumentation**Chairs: Ken Wright/USRA, Ryan Hoffmann/AFRL**

09:50 – 10:10	17-Establishment of a Ground-Based Testing Facility for Simulating Space Plasma: - Vacuum Facility Assessment	Emmanuel Wie-Addo Missouri Univ. of Science and Technology
10:10 – 10:30	18-Integrated Space Environmental Testing Facility	Matthew Beckerle Pennsylvania State University
10:30 – 10:50	19-Characterization of Electrons in the Space Environment with X-Ray Spectroscopy	Samuel Westrick AFRL/USRA
10:50 – 11:10	Break	
11:10 – 11:30	20-Considerations for Langmuir probe operations on small spacecraft	Omar Leon Univ. of Michigan
11:30 – 11:50	21-Object Relative Heading Estimation with Binary Wide Field of View X-Ray Sensing	Andrea Lopez CU Boulder
11:50 – 12:10	22-Testing of a Magnetohydrodynamic Generator System within Simulated Solar Wind/GEO and LEO Space Environments	Chris Torre Torre Space and Power Systems
12:10 – 12:30	23-Lunar Environmental Testing Facilities at Marshall Space Flight Center	Erin Hayward NASA/MSFC

12:30 – 01:50	Lunch Break	
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Session 7: Radiation II

Chairs: Zach Robinson/Fifth Gait, Juan Rodriguez/CU Boulder CIRES

01:50 – 02:10	24- INVITED : A Solar Cycle of Radiation Measurements on the Surface of Mars with RAD on the Mars Science Laboratory	Don Hassler Southwest Research Institute
02:10 – 02:30	25-GLACE (Geant4 Lunar Albedo Computed Environment): A Freely-Available Model of Lunar Energetic-Particle Secondary Radiation and Its Variation with Regolith Hydrogen	Mark Looper The Aerospace Corporation
02:30 – 02:50	26-RADISH (RAdiation Deflecting SHield): Assessment of Active Magnetic Shielding for Deep Space Exploration	Paulina Umansky Univ. of California Berkeley
02:50 – 03:10	27- INVITED : Nuclear Data for Enhancing Space Exploration	Keith Jankowski Department of Energy

03:10 – 03:30	Break	
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Session 8: Charging II

Chairs: Omar Leon/Univ. of Michigan, Wousik Kim/JPL

03:30 – 03:50	28-Dramatic Influence of Temperature upon Charging of External Cables on a Spacecraft	Michael Bodeau Consultant
03:50 – 04:10	29-Experimentally Estimating Secondary Electron Yield	James Walker CU Boulder
04:10 – 04:30	30-Impacts of Cislunar Plasma on Electrostatic Tractor Potentials	Kaylee Champion CU Boulder
04:30 – 04:50	31-Inner Magnetosphere Transport and Acceleration Model for specification of radiation environment for surface charging	Natalia Ganushkina Univ. of Michigan
04:50 – 05:10	32-Neighboring Spacecraft Charging due to Continuous Electron Beam Emission and Impact	Julian Hammerl CU Boulder
05:10 – 05:30	33-SpaceSuite, The self-consistent toolbox for space environment effects analysis	Julien Forest ARTENUM
05:30 – 05:50	34-AIAA Journal of Spacecraft and Rockets Virtual Collection of ASEC 2021 Papers	Insoo Jun NASA/JPL
05:50	Daily Wrap-up	Conveners

Wednesday, 11 October

08:30 – 09:00	Registration and Check-in	
09:00 – 09:10	Announcements	Conveners

Session 9: Keynote

Chair: Linda Neergaard Parker/Space Weather Solutions

09:10 – 09:40	35- Keynote: NOAA Space Weather Prediction Center's Operational Support for Space Missions	Howard Singer NOAA/SWPC
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Session 10: Space Weather Environments

Chairs: Kent Tobiska/SET, Matt McCollum/MSFC

09:50 – 10:10	36- INVITED: Mitigation of environments in heritage and new designs	Catherine Keys Maxar
10:10 – 10:30	37-SBIR Space Weather R2O2R Technology Development and Commercial Applications	Anthony DeStefano NASA/MSFC
10:30 – 10:50	38-Relationship Between GOES-R Series Operational Anomalies and In-situ Electron Measurements	Brian Kress CU Boulder, NOAA NCEI
10:50 – 11:10	Break	
11:10 – 11:30	39-Improving Space Weather Predictions with a New Generation Software for Modeling the Solar Atmosphere and Inner Heliosphere	Nikolai Pogorelov Univ. of Alabama Huntsville
11:30 – 11:50	40-Using SPIS connection to Virtual Observatory to model the electrostatic cleanliness of science missions	Sebastien Hess ONERA
11:50 – 12:10	41-A next step after PAGER: the Advanced Charging Risk Forecast Service	Julien Forest ARTENUM
12:10 – 12:30	42-Radiation, Interplanetary Shocks, and Coronal Sources (RISCS) toolset for situational assessment and decision making related to space operations	Vladimir Kolobov CFD Research Corporation
12:30 – 01:50	Lunch Break	

Session 11: Meteoroids and Orbital Debris

Chairs: Bill Cooke/NASA/MSFC, Mark Matney/JSC

01:50 – 02:10	43- INVITED: The four most common misconceptions concerning the meteoroid environment	Bill Cooke NASA/MSFC
02:10 – 02:30	44-Space debris tracking, mitigation and removal innovations for a safer orbital environment	John Christy Johnson Univ. of Alberta
02:30 – 02:50	45-Plasma signatures of small orbital debris in LEO	Gian Luca Delzanno LANL
02:50 – 03:10	Break	
03:10 – 03:30	46- INVITED: An Overview of Ground-based Radar and Optical Measurements Utilized by the NASA Orbital Debris Program Office	Alyssa Manis NASA/JSC
03:30 – 03:50	47-Misconceptions and Reality of Orbital Debris Risk	Mark Matney NASA/JSC
03:50	Daily Wrap-up	

Conference Banquet at the Davidson Center for Space Exploration

- 5:30 Bus Leaves for Davidson Center (sign up in advance)
 6:00 Social
 6:30 Dinner

Dinner speaker: Dr. Don Krupp, Associate Program Manager, Human Landing System, NASA/MSFC



Thursday, October 12

09:00 – 09:10	Announcements	Conveners
Session 12: Keynote Chair: Joseph Minow		
09:10 – 09:40	48- Keynote: Robotic and Crewed Mars Missions Increasing the Demand for Planetary Protection Technology Needs	Nick Bernardini NASA/HQ
Session 13: Lunar Environments II Chairs: Charles Buhler/KSC, Miles Bengtson/Aurora Engineering		
09:50 – 10:10	49-Space Environments Applied to the Gateway Program	Emily Willis NASA/MSFC
10:10 – 10:30	50-Overview of NASA Gateway Lunar Dust Mitigation and Contamination Modeling and Analysis	Ronald Lee Booz Allen Hamilton, Inc.
10:30 – 10:50	51-Plume-surface interaction testing for crewed lunar lander risk reduction	Wesley Chambers NASA/MSFC
10:50 – 11:10	Break	
11:10 – 11:30	52-Electrostatic Issues in Space	Charles Buhler NASA/KSC
11:30 – 11:50	53-Mesoscale Charged Dust Dynamics on Spacesuits	Lubos Brieda Univ. of Southern California
11:50 – 12:10	54-Environmental conditions in the vicinity of the Apollo 17 LEAM/ALSEP package	Fabrice Cipriani European Space Agency

12:10 – 12:30	55-Solar Array System Combined Environmental Effects Tests: Gateway Power and Propulsion Element	Todd Schneider NASA/MSFC
12:30 – 01:50	Lunch Break	
Session 14: Materials in Space Chairs: Miria Finckenor/MSFC, Rob Suggs/MSFC		
01:50 – 02:10	56- INVITED : Atomic Oxygen Environment, Effects and Simulation	Sharon Miller NASA/GRC
02:10 – 02:30	57-Geographical Challenges of Acquiring Atomic Oxygen: Impact on Materials and Potential Technological Innovations for Space Missions	Peter Anto Johnson Univ. of Alberta
02:30 – 02:50	58-Thermal Control Coatings Flown on MISSE and METIS	Levi Leeper AZ Technology
02:50 – 03:10	59-Space Environment Effects on Materials: Testing Capabilities for ESA's Challenging Missions	Julian Eck European Space Agency
03:10 – 03:40	Break	
03:40 – 04:00	60-Exploring the Impact of High-Energy Electron Irradiation on the Properties of Space Coverglass Materials	Elena Plis Assurance Technology Corporation
04:00 – 04:20	61-Durability of Passive Thermal Control Materials Exposed to Low Earth Orbit Environment	Miria Finckenor NASA/MSFC
04:20 – 04:40	62-FTIR Characterization of Ground and Space-Aged Spacecraft Materials	Scott Bowman AFRL/USRA
04:40 – 05:00	63-CHaMISEn Data Management System for Material Properties	Sebastien Hess ONERA
05:00	Daily Wrap-up	Conveners

Friday, October 13

09:00 – 09:10	Announcements	Conveners
Session 15: Current and Future Missions Chairs: Emily Willis/MSFC, Anthony DeStefano/MSFC		
09:10 – 09:30	64- INVITED : 24 years of Radiation Protection of the Chandra X-ray Observatory	Scott Wolk Center for Astrophysics Harvard & Smithsonian
09:30 – 09:50	65-Radiation Odyssey: Navigating Material Challenges in Earth and Mars Environments with Innovative Tech-shields	Peter Anto Johnson Univ. of Alberta
09:50 – 10:10	66-Multifunctional Shielding Polymer for Space Applications	Lembit Sihver Cosmic Shielding Corporation
10:10 – 10:30	67-IMPACT: Invisible Magnetospheric Plasma Pathfinder with Active Charging Techniques	Gian Luca Delzanno LANL

10:30 – 11:00	Break	
11:00 – 11:20	68-Artemis IV Docking in Radiation Belt Charging Environment	Matt McCollum NASA/MSFC
11:20 – 11:40	69-Space Environment Data at NOAA NCEI: Status, Recent Advances and Upcoming Events	Juan Rodriguez Univ. of Colorado CIRES
11:40 – 12:00	70-Space Weather Launch Constraints for JWST	Joseph Minow NASA/MSFC
12:00	ASEC 2023 Wrap-up	Conveners