



**2019 Space Weather Workshop Draft Agenda, Some Titles are Preliminary**  
**Embassy Suites Hotel**  
**Boulder, Colorado**

**Monday, April 1 – Pre-Workshop Meetings**

- 8:00-10:00**    **UN International Civil Aviation Organization (ICAO) Coordination Discussion – by invitation –**  
 Brent Gordon – Foothills Meeting Room
- 8:30-10:00**    **US Air Force and US Federal Agency Collaboration – by invitation –** Major Janelle Jenniges,  
 Michael Starks & James McCollough – Royal Arch Meeting Room
- 10:00-12:00**    **UN International Civil Aviation Organization (ICAO) Coordination Discussion – by invitation –**  
 Brent Gordon/Bill Murtagh – Royal Arch Meeting Room
- 12:00-1:30**    Lunch
- 1:30 – 4:30**    **UN International Civil Aviation Organization (ICAO) Discussion – Open -** Brent Gordon/Bill  
 Murtagh – Royal Arch Meeting Room
- 3:00 - 4:30**    **Student Networking Session – by invitation –** Carina Alden – Foothills Meeting Room
- 5:00 - 7:00**    **Networking Session for Space Weather Workshop Participants –** NCAR Mesa Lab – Busses  
 Provided from/to Hotel

**Tuesday, April 2**

- 8:30**            **Workshop Opening Remarks**  
 Bill Murtagh, NOAA/SWPC
- 8:45 – 9:00**    **Special Presentation: Update from the Executive Office of the President**  
 Aaron Miles, Office of Science and Technology Policy
- 9:00 – 9:45**    **Operational Space Weather Services – Latest Developments**  
 Chair: Bill Murtagh, NOAA/SWPC
- 9:00**            **SWPC Update to the 2019 SWW**  
 Brent Gordon, NOAA/SWPC
- 9:15**            **Current Mission and Future plans for the USAF Space Weather Operations Center**  
 Major Eric Cercone, US Air Force/557<sup>th</sup> Weather Wing
- 9:30**            **Contributions to Space Weather Services from the Commercial Sector**  
 Conrad Lautenbacher, American Commercial Space Weather Association
- 9:45 – 10:45**    **Break and Poster Session (Solar and Interplanetary Research and Applications)**

- 10:45 - 12:15** **Panel Session: Space Weather and ICAO: Meeting Needs for Global Aviation Services**  
Chair: Brent Gordon, NOAA/SWPC
- 10:45** **Regulatory Group/Policy Perspective**  
Bill Bauman, Federal Aviation Administration
- 11:00** **Space Weather: An Airline Perspective**  
Mike Stills, United Airlines
- 11:10** **A Practitioner's Perspective on Integrating ICAO Requirements into Operations**  
Rob Steenburgh, NOAA/SWPC
- 11:20** **Service Center – Pan-European Consortium for Aviation Space Weather User Services**  
Ari-Matti Harri, Finnish Meteorological Institute
- 11:30** **Service Center – Australia-Canada-France Japan Consortium**  
David Boteler, Natural Resources Canada
- 11:40** **Commercial Sector Space Weather Support for ICAO**  
W. Kent Tobiska, Space Environment Technologies, LLC
- 11:50-12:15** **Panel/Audience Discussion**
- 12:15 – 1:45** **Lunch & SWPC Tour** (*Please Note: Tour participants must have signed up and will miss early afternoon session talks, Tour bus departs the Embassy Suites Lobby at 12:30 PM and returns at 3 PM*)
- 1:45 – 2:00** **Keynote: Satellite Anomalies and the Radiation Belts**  
Daniel Baker, University of Colorado Boulder
- 2:00 - 3:15** **Satellite Impacts and Anomaly Support**  
Chair: Janet Green, Space Hazards Applications
- 2:00** **The Wave of Sensitive Systems**  
Jonny Dyer, Lyft
- 2:15** **A 60-satellite Space Weather Constellation with Real-time 24/7 Globalstar Coverage**  
Hank Voss, Nearspace Launch, Inc.
- 2:30** **SpaceWx and UK SKYNET Operations and Exercises**  
Ewan Haggerty, Airbus Defense and Space
- 2:45** **Spwx Correlations to Abnormal Satellite State of Health**  
Chris Bowman, Data Fusion and Neural Networks
- 3:00** **Roadmaps from the Space Environment Engineering and Science Applications Workshop**  
Paul O'Brien, The Aerospace Corporation
- 3:15 - 4:15** **Break and Poster Session (Solar and Interplanetary Research and Applications)**
- 4:15 - 5:30** **Space Weather Support for the Arctic Region**  
Chair: Rodney Viereck, NOAA/SWPC
- 4:15** **Policy Perspective**

- 4:30 Arctic Marine Navigation and Communication Support**  
Captain David Zezula, NOAA
- 4:45 Arctic Research at the Geophysical Institute**  
Bob McCoy, University of Alaska Geophysical Institute
- 5:00 Analytic and Experimentation Capabilities for Arctic Communications and Operations**  
Jennifer Forsyth, The MITRE Corporation
- 5:15 Space Weather in the NWS Alaska Region**  
David Kochevar, NOAA/NWS Alaska Region
- 5:45 - 8:00 13<sup>th</sup> Annual NOAA - Commercial Space Weather Interest Group (CSWIG)/American Commercial Space Weather Association (ACSWA) Summit Meeting – by invitation**

**Wednesday, April 3**

- 8:30 - 8:45 Keynote: Overview of NASA's Exploration Campaign**  
Steve Clarke, National Aeronautics and Space Administration
- 8:45 – 10:00 Panel Session: Space Weather Support for Human Expansion Across the Universe**  
Chair: Linda Parker, Universities Space Research Association
- 8:45 Operational Space Weather Forecasting Needs for Manned Exo-LEO Missions**  
Eddie Semones, NASA Johnson Space Center
- 8:55 Air Force Research Laboratory's Solar Energetic Particle Forecasting Needs**  
Rachel Hock-Myśliwiec, Air Force Research Laboratory
- 9:05 ESA Space Weather Activities in Space Safety Programme**  
Juha-Pekka Luntama, European Space Agency
- 9:15 Solar Energetic Particle Forecasting: Current Capabilities and Future Directions**  
Hazel Bain, NOAA/SWPC
- 9:25 Active Dosimeter-Based Estimate of Astronaut Acute Radiation Risk from Solar Energetic Protons**  
Chris Mertens, National Aeronautics and Space Administration at Langley
- 9:35-10:00 Panel/Audience Discussion**
- 10:00 - 11:00 Break and Poster Session (Ionosphere and Thermosphere Research and Applications and General Space Weather Services)**
- 11:00 - 12:00 Agency Vision on Implementation of Space Weather O2R2O**  
Chair: Tamara Dickinson, Office of Science and Technology Policy
- 11:00 NOAA O2R2O**  
Mary Erickson, Deputy Director of the National Weather Service
- 11:15 Heliophysics at NASA and the Science of Space Weather**  
Nicola Fox, National Aeronautics and Space Administration

- 11:30**      **NSF Space Weather Activities**  
Michael Wiltberger, National Science Foundation
- 11:45**      **USAF Space Weather O2R2O Efforts**  
Michael Farrar, US Air Force Directorate of Weather
- 12:00**      **UK R2O Activities**  
Mark Gibbs, United Kingdom Met Office
- 12:15 - 1:35**      **Lunch**
- 1:35 - 2:50**      **Extreme Space Weather Benchmarks**  
Chair: Geoffrey Reeves, Los Alamos National Laboratory
- 1:35**      **Benchmarks for Induced Geo-Electric Fields**  
Pete Riley, Predictive Sciences, Inc.
- 1:50**      **Space Weather Impacts of Solar Radio Bursts**  
Dale Gary, New Jersey Institute of Technology
- 2:05**      **Next Steps in Determining Space Weather Benchmarks for Ionizing Radiation Hazards**  
Christina Cohen, California Institute of Technology
- 2:20**      **National Benchmarks for Ionospheric Disturbances**  
Susan Skone, University of Calgary
- 2:35**      **Upper Atmosphere Expansion**  
Eric Sutton, University of Colorado, Boulder
- 2:50 - 3:45**      **Break and Poster Session (Ionosphere and Thermosphere Research and Applications and General Space Weather Services)**
- 3:45 – 4:00**      **Modernizing the Power Grids and Understanding Potential Impacts from Solar Weather**  
Ben Kroposki, National Renewable Energy Laboratory
- 4:00 – 5:15**      **Panel Session: Space Weather Services for the Electric Power Grid**  
Chair: Seth Jonas, Science and Technology Policy Institute
- 4:00**      **Integrating Space Weather and Ground-based Magnetotelluric Data with Powerflow Solutions for Real-time Assessment of Risk to the Power Grid**  
Adam Schultz, Oregon State University
- 4:15**      **NOAA’s Development of Regional Geoelectric Field Modeling Capability: New Nowcast and Forecast Products to Improve Operational Decision Making of the U.S. Electrical Power Grid in Response to Geomagnetic Storms**  
Christopher Balch, NOAA/SWPC
- 4:30**      **Magnetic-storm Geoelectric Hazard Maps and the Induction of Voltages on Power-grids**  
Jeffrey Love, US Geological Survey
- 4:45**      **Using MT Data to Improve Regional Ground Response Models**  
Jennifer Gannon, CPI Computational Physics, Inc.
- 5:00-5:15**      **Panel/Audience Discussion**

**6:30 - 9:00**     **Banquet Dinner at Pearl Street Ballroom**  
**Special Guest Speaker: Nicola Fox, Heliophysics Division Director, NASA**

**Thursday, April 4**

**8:30 - 10:00**     **International Coordination on Space Weather Research**  
Chris Cannizarro, US Department of State

**8:30**             **International Coordination**  
Jean-Luc Bald, European Commission Delegation to the US

**8:45**             **Ensemble Flare Forecasting: Using Terrestrial Weather Prediction Techniques to Improve Space Weather Operations**  
Sophie Murray, Trinity College of Dublin

**9:00**             **UN COPUOS – Long Term Sustainability Guidelines**  
Peter Martinez, Secure World Foundation

**9:15**             **Space Weather initiatives in Latin America**  
Joaquim E.R. Costa, National Institute for Space Research

**9:30**             **Modelling GICs in Australian Power and Pipeline Networks**  
Jeanne Young, Australia Bureau of Meteorology

**9:45**             **ESA Space Weather Activities in Space Safety Programme**  
Juha-Pekka Luntama

**10:00 - 11:00**   **Break and Poster Session (Geospace/Magnetosphere Research and Applications)**

**11:00 - 12:00**   **Advances in Ground and Space-based Observations**  
Chair: Douglas Biesecker, NOAA/SWPC

**11:00**             **Commercial Weather Data Pilot: Update from Spire Global, GeoOptics and PlanetIQ**  
Duly, Spire Global, Inc.  
Conrad Lautenbacher Jr., GeoOptics, Inc.  
Rob Kursinski, PlanetIQ

**11:15**             **Polarized Imaging for CME Tracking and 3D Structure**  
Craig Deforest, Southwest Research Institute

**11:30**             **NOAA's Current and Future Space Weather Architecture**  
Elsayed Taalat, NOAA/NESDIS

**11:45**             **Space Weather Monitoring with the NOAA GOES-R Series Spacecraft: Instruments, Observations and Products**  
Rob Redmon, NOAA/NCEI

**12:00 - 2:00**     **Lunch & SWPC Tour** (*Please Note: Tour participants must have signed up and will miss early afternoon session talks, Tour bus departs the Embassy Suites Lobby at 12:30 PM and returns at 3 PM*)

**2:00 – 2:15**     **Keynote: NASA's Parker Solar Probe – First Results**  
Stuart Bale, University of California, Berkeley

- 2:15 - 3:30**     **Research – Advances in Ground and Space-based Observations**  
 Chair: Tim Fuller-Rowell, University of Colorado Boulder
- 2:15**     **New Observations from NASA's Global-scale Observations of the Limb and Disk (GOLD) Mission**  
 Richard Eastes, University of Colorado Boulder
- 2:30**     **Space Weather Measurements from MACAWS: Monitors for Alaskan and Canadian Auroral Weather in Space (MACAWS)**  
 Anthea Coster, Massachusetts Institute of Technology
- 2:45**     **GTOSat: A Pathfinder for a SmallSat-based Operational Space Weather Program**  
 Larry Kepko, National Aeronautics and Space Administration
- 3:00**     **GOES-R Solar UltraViolet Imager Extended Coronal Imaging**  
 Gustave Comeyne, NOAA/NESDIS
- 3:15**     **Seismic Monitoring of the Sun's Far Hemisphere**  
 Joe Werne, NorthWest Research Associates
- 3:30 - 4:30**     **Break and Poster Session (Geospace/Magnetosphere Research and Applications)**
- 4:30 - 5:40**     **Advances in Space Weather Research and Modeling**  
 Chair: Michele Cash, NOAA/SWPC
- 4:30**     **Research and Modeling at the Air Force Research Laboratory**  
 James McCollough, Air Force Research Laboratory
- 4:45**     **CCMC-SWPC Partnership Aiming to Improve Operational Space Weather Products and Services**  
 Maria Kuznetsova, National Aeronautics and Space Administration
- 5:00**     **Machine Learning in Space Weather**  
 Enrico Camporeale, NOAA/SWPC
- 5:10**     **The Performance Characteristics of Operational Flare Forecasting Systems**  
 KD Leka, NorthWest Research Associates
- 5:20**     **NASA's SPoRT Center: Progress in Extending Terrestrial Weather R2O/O2R to Space Weather**  
 Ghee Fry, National Aeronautics and Space Administration
- 5:30**     **Applied Artificial Intelligence for Science and Exploration**  
 Madhulika Guhathakurta, National Aeronautics and Space Administration

**Friday, April 5**

- 8:30 – 10:00**     **Advances in Space Weather Research and Modeling: Solar Wind and CMEs**  
 Chair: James Spann, National Aeronautics and Space Administration
- 8:30**     **Session Introduction**  
 James Spann, National Aeronautics and Space Administration
- 8:35**     **Global Boundary Magnetic Field Optimization for Coronal and Solar Wind Models**  
 Graham Barnes, NorthWest Research Associates

- 8:41**      **Improving Magnetic Field Boundary Conditions for Solar Wind Models**  
Thomas Berger, University of Colorado, Boulder
- 8:47**      **A Higher-Accuracy Model of the Heliosphere with Improved Background Solar Wind and Coronal Mass Ejections**  
Tae Kim, University of Alabama, Huntsville
- 8:53**      **Using Machine Learning to Validate Heliophysical Models**  
Michael Kirk, Catholic University of America
- 8:59**      **Inner Heliosphere Modeling With the GAMERA MHD Model**  
Sasha Ukhorskiy, Johns Hopkins University
- 9:05**      **Improving the Prediction Accuracy of CME Arrivals in the WSA-ENLIL-Cone Model**  
Dusan Odstrcil, George Mason University
- 9:11**      **Using Magnetograms and Coronal Imaging to Improve Solar Wind Predictions**  
Yi-Ming Wang, Naval Research Laboratory
- 9:17**      **Reliably Inferring the Sun's Far-Side Magnetic Flux for Operations Using Time-Distance Helioseismic Imaging**  
Shea Hess Webber, Stanford University
- 9:23**      **Metric-Based Assessment of New Solar Wind Forecast Models incorporating Data Assimilation**  
Pete Riley, Predictive Sciences, Inc.
- 9:29**      **Space Weather O2R: Physics-Based Extension of the WSA Model Capabilities**  
Igor Sokolov, University of Michigan
- 9:35**      **Interactive Tool for Modeling Multiple Solar Eruptions**  
Jon Linker, Predictive Sciences, Inc.
- 9:41 – 10:00**      **Discussion**
- 10:00 - 10:30**      **Break**
- 10:30 – 11:45**      **Advances in Space Weather Research and Modeling: Magnetospheric Energetic Particles and Plasma**  
Chair: Howard Singer, NOAA/SWPC
- 10:30**      **Quantitative Forecasts and Specifications of Outer Radiation Belt Electrons Based on Solar Wind Conditions**  
Xinlin Li, University of Colorado Boulder
- 10:36**      **Specifying High-altitude Electrons using Low-altitude LEO Systems (SHELLS)**  
Janet Green, Space Hazards Applications, LLC
- 10:42**      **PreMevE: A Neural Network Based Predictive Model for MeV Electrons inside Earth's Outer Radiation Belt**  
Yue Chen, Los Alamos National Security, LLC
- 10:48**      **A Machine Learning Based Specification and Forecast Model of the Inner Magnetospheric Radiation Environment**  
Jacob Bortnik, University of California Los Angeles

- 10:54**      **An ARIMAX Model of ULF Wave Power and Radial Diffusion for Space Weather Forecasting**  
Kyle Murphy, University of Maryland, College Park
- 11:00**      **Data-Augmented Forecasting Model for near-Earth Relativistic Electron Intensities**  
Sasha Ukhorskiy, Johns Hopkins University
- 11:06**      **Advanced Particle and Plasma Environment Specification Model for Spacecraft Impacts**  
Mei-Ching Fok, National Aeronautics and Space Administration
- 11:12**      **Development of a Predictive Inner Magnetosphere Model for Space Weather**  
Stanislav Sazykin, William Marsh Rice University
- 11:18**      **ARMAS Dual Monitor: Demonstrating an Operational Aviation Radiation Monitoring System**  
W. Kent Tobiska, Space Environment Technologies, LLC
- 11:24 – 11:45**      **Discussion**
- 11:45 – 12:00**      **Solar Cycle 25 Predications**  
Lisa Upton, High Altitude Observatory
- 12:00**      **Workshop Closing Remarks**  
Howard Singer, NOAA/SWPC