



2018 Space Weather Workshop Agenda Westin Westminster Hotel

Monday, April 16

8:30-9:30 Satellite Anomaly Database – Michael Bonadonna
9:30-11:30 Air Force Meeting – by invitation – Eric Sutton/Michael Starks
11:30-1:00 Lunch
1:00 - 3:00 Space Weather Policy – Seth Jonas
3:00 - 5:00 O2R-R2O Current Activities and Future Plans – Terry Onsager/Howard Singer
3:00 - 4:30 Student Workshop – by invitation – Alfredo Cruz
5:00 - 7:00 Networking Session for Space Weather Workshop Participants

Tuesday, April 17

8:30 Conference Welcome
Bill Murtagh, NOAA/SWPC

8:45 - 10:00 **Space Weather 2018 – In the Spotlight**
Chair: Bill Murtagh, NOAA/SWPC

8:45 **SWPC – Always Moving Forward**
Brent Gordon, NOAA/SWPC

9:00 **The USAF Space Weather Operations Center**
Lt. Col William Ryerson, US Air Force

9:15 **MOSWOC – 4 years old! What have we achieved and where are we going?**
Mark Gibbs, United Kingdom Meteorological Office

9:30 **The Space Weather Enterprise (SWE) - The Time Is Now!**
Conrad C. Lautenbacher, Jr., GeoOptics Inc.

9:45 **Building Resilience against Space Weather Effects: An update from the Office of Science and Technology Policy**
Steven Clarke, Office of Science and Technology Policy

10:00 - 11:00 **Break and Poster Session (Solar and Interplanetary Research and Applications)**

11:00 - 12:15 **Panel Session: September 2017 Storm - Discussion on User Needs and Science Capabilities**
Chair: Howard Singer, NOAA/SWPC

11:00 Overview of September 2017 Space Weather Period
Rob Redmon, NOAA/NCEI
Bob Rutledge, NOAA/SWPC

11:20 The Effects of the 10 SEP 17 Solar Event on HF Voice Comms Over the Atlantic
Anthony Abate, Rockwell Collins

11:30 NOAA SWPC Operational Model Performance during the September 2017 Storms
Michele Cash, NOAA/SWPC

11:40 September 2017 Space Weather Impacts
Capt John Ross, US Air Force

11:50-12:15 Panel/Audience Discussion

12:15 - 2:00 SWPC Lunch Tour (*Please Note: Tour participants must have signed up and will miss early afternoon session talks*) *Tour bus departs the Westin Lobby at 12:30 PM and returns at 3 PM*

2:00 - 3:30 Space Weather Policy
Chair: Tamara Dickinson, Science Matters Consulting

2:00 EMP, Natural and Adversarial; A Policy Perspective
Seth Jonas, Science and Technology Policy Institute

2:15 Reducing GMD Risks to Reliability of the North American Electricity Grid
Mark Olson, North American Electric Reliability Corporation

2:30 Provision of the Space Weather Advisory for International Air Navigation
William Bauman III, Federal Aviation Administration

2:45 Space Weather Services for Australia's Critical Infrastructure
Richard Marshall, Australia Bureau of Meteorology

3:00 Asia Oceania Space Weather Alliance (AOSWA)
Yuki Kubo, Japan's National Institute of Information and Communications Technology

3:15 European Space Agency Space Situational Awareness Lagrange Mission to L5 Point
Juha-Pekka Luntama, European Space Agency

3:30 - 4:30 Break and Poster Session (Solar and Interplanetary Research and Applications)

4:30 - 5:15 Economic Impact Assessment
Chair: Chris Cannizzaro, US State Department

4:30 The Canadian Space Weather Socioeconomic Impact Study
Pierre Langlois, Canadian Space Agency

4:45 The Social and Economic Impacts of Space Weather (US Project)
Susan Taylor, Abt Associates

5:00 Testing Realistic Scenarios for Space Weather: The Economic Impacts of Electricity Transmission Infrastructure Failure in the UK
Mark Gibbs, United Kingdom Meteorological Office

5:15 **Special Presentation: Parker Solar Probe: A NASA Mission to Touch the Sun**
Nicola Fox, Johns Hopkins University Applied Physics Laboratory

5:45 - 8:00 **12th Annual NOAA - Commercial Space Weather Interest Group (CSWIG)/American Commercial Space Weather Association (ACSWA) Summit Meeting – by invitation**

Wednesday, April 18

8:30 - 8:40 **Air Force Space Weather – The Way Ahead**
Col. Jeff Jarry and Dr. Mark Pesses, US Air Force

8:40 – 10:00 **Panel Session: Space Weather Action Plan Implementation – Challenges and Opportunities**
Chair: Steven Clarke, Office of Science and Technology Policy

8:40 **NASA's Role and Current Efforts for SWAP**
Jim Spann, NASA

8:50 **NSF's Contributions to SWAP Implementation**
Michael Wiltberger, National Science Foundation

9:00 **NOAA Progress on SWAP Activities**
Bill Lapenta, NOAA

9:10 **Space Weather Action Plan – Air Force Update**
Col. Jeff Jarry, US Air Force

9:20 **Goal 6: International Activities**
Chris Cannizzaro, US State Department

9:30 **USGS Role in SWAP Implementation**
Carol Finn, USGS

9:40-10:00 **Panel/Audience Discussion**

10:00 - 11:00 **Break and Poster Session (Ionosphere Research and Applications and General Space Weather Services and Education)**

11:00 - 12:15 **Research and Services Supporting Satellite Operations**
Chair: Rob Redmon, NOAA/NCEI

11:00 **Spacecraft Anomalies and Failures Workshop 2017 Summary**
Alec Engell, NextGen Federal Systems

11:15 **Summaries for the 2017 Applied Space Environments Conference (ASEC) and the Space Environment Engineering and Science Applications Workshop (SEESAW)**
Linda Neergaard Parker, Universities Space Research Association

11:30 **Tools for Understanding On-Orbit Satellite Anomalies**
Janet Green, Space Hazards Applications, LLC

11:45 **AE9/AP9/SPM (IRENE) Commercial Deployment and Use**
Richard Quinn, Atmospheric and Environmental Research

12:00 **GPS Energetic Particle Data and their Use for Space Weather, Climatology, and Anomaly Assessment**
Steven Morley, Los Alamos National Laboratory

12:15 - 1:30 **Lunch**

1:30 - 2:45 **Building Resilience to Geomagnetic Induced Currents on the Electric Power Grid**
Chair: Christopher Balch, NOAA/SWPC

1:30 **Impacts of Extreme Space Weather Events on Power Grid Infrastructure: Physics-Based Modelling of Geomagnetically-Induced Currents (GICs) During Carrington-Class Geomagnetic Storms**
Michael G. Henderson, Los Alamos National Laboratory

1:45 **CHARGED: An NSF-Funded Initiative to Understand the Physics of Extreme GICs**
Mike Liemohn, University of Michigan

2:00 **GMD Vulnerability Assessment**
Emanuel Bernabeu, PJM Interconnection

2:15 **DOE's Recommended Monitoring Approach for GMDs and DOE's Pilot Program to Test and Evaluate Devices that can Mitigate GMD Impacts on the Grid**
John Ostrich, Department of Energy

2:30 **Magnetic-Storm Geoelectric Hazard Maps and the Induction of Voltages on Power Grids**
Jeffrey Love, USGS

2:45 - 3:45 **Break and Poster Session (Ionosphere Research and Applications and General Space Weather Services and Education)**

3:45 - 5:15 **Panel Session: Space Weather and Aviation - Making the Connection between Operations and Research**
Chair: Robert Rutledge, NOAA/SWPC

3:45 **United Airlines Space Weather Procedures and Needs**
Mike Stills, United Airlines

3:57 **Real-time Radiation Weather for Commercial Aviation on the Horizon**
W. Kent Tobiska, Space Environment Technologies

4:09 **The Effects of the 10 SEP 17 Solar Event on HF Voice Comms Over the Atlantic**
Anthony Abate, Rockwell Collins

4:21 **SWPC Challenges and Opportunities for Supporting Aviation**
Robert Rutledge, NOAA/SWPC
Bill Murtagh, NOAA/SWPC

4:33 **AFRL Next-Gen Dose Rate Specification and Prediction**
Shawn Young, Air Force Research Laboratory

4:45-5:15 **Panel/Audience Discussion**

6:00 - 9:00 **Banquet Dinner at Westin Lake House**

**Special Guest Speaker: Thomas Zurbuchen, NASA Associate Administrator
Science Mission Directorate**

Thursday, April 19

8:30 - 10:00 Space Weather Observations
Rodney Viereck, NOAA/SWPC

8:30 Status of the GOES-R Series Space Weather Observations
Juan Rodriguez, NOAA/NCEI

8:45 The GOLD Mission – Real-time Imaging of the Space Weather in Earth’s Ionosphere and Thermosphere from Geostationary Orbit
Richard Eastes, University of Colorado, Laboratory for Atmospheric and Space Physics

9:00 DSCOVR – Status Update and Comparing Data from L1
Doug Biesecker, NOAA/SWPC

9:15 Activities of Korean Space Weather Center
Jinwook Han, Korean Space Weather Center

9:30 The FORMOSAT-7/COSMIC-2 Satellite Mission: Expanding the Observational Capabilities for the Space Weather Community
John Braun, University Corporation for Atmospheric Research

9:45 Update from Spire Global, GeoOptics and PlanetIQ
Timothy Duly, Spire Global, Inc.
Rob Kursinski, PlanetIQ
Conrad Lautenbacher Jr., GeoOptics, Inc.

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

11:00 - 12:00 Space Weather Observation Cont’d
Chair: Michael Bonadonna, Office of the Federal Coordinator for Meteorological Services and Supporting Research

11:00 Implementation of Solar Irradiance Measurements on the International Space Station (ISS): The TSIS-1 Mission of Total and Spectral Solar Irradiance Observational Continuity
Erik Richard, University of Colorado, Laboratory for Atmospheric and Space Physics

11:15 Deployment of Magnetic and Electric Field Sensors for GIC Hazard Mitigation
Jennifer Gannon, Computational Physics Inc.

11:30 OWS The Industrialization and Democratization of Space
Tony Gingiss, OneWeb

11:45 Five and One-Half Years of Radiation Belt Measurements: Space Weather in Earth’s Neighborhood
Daniel Baker, University of Colorado, Laboratory for Atmospheric and Space Physics

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

2:00 – 2:15 Keynote: Alice Bunn - Director of Policy, UK Space Agency

2:15 - 3:30 **Research to Operations**
Chair: Terry Onsager, NOAA/SWPC

2:15 **University of Colorado Space Weather Technology, Research, and Education Center**
Jeffrey Thayer, University of Colorado

2:30 **Space Weather Forecasting Advancements at the University of Michigan**
Daniel Welling, University of Michigan

2:45 **Extending Terrestrial Weather R2O/O2R to Space Weather at NASA's SPoRT Center**
Brad Zavodsky, NASA

3:00 **Community Coordinated Modeling Center as a Hub for R2O and O2R: Capabilities, Challenges and Opportunities**
Maria Kuznetsova, NASA GSFC, Community Coordinated Modeling Center

3:15 **Air Force Research Laboratory Space Weather Open Standards and Data Repository Initiatives**
Michael Starks, Air Force Research Laboratory

3:30 - 4:30 **Break and Poster Session (Magnetosphere Research and Applications)**

4:30 - 5:30 **Space Weather Services for Human Space Exploration**
Chair: Scott McIntosh, National Center for Atmospheric Research, High Altitude Observatory

4:30 **NASA's Near Term Human Exploration Plans**
John Guidi, NASA

4:50 **Space Radiation Protection for NASA Exploration Class Missions**
Kerry Lee, NASA

5:10 **Update on the Worsening Particle Radiation Environment Observed by CRaTER and Implications for Future Human Deep-Space Exploration**
Nathan Schwadron, University of New Hampshire

Friday, April 20

8:30 – 10:00 **Ionosphere and Thermosphere Modeling and Prediction**
Chair: Michael Wiltberger, NSF, Geospace Section

8:30 **Why the WAM in WAM-IPE?**
Tim Fuller-Rowell, University of Colorado, Cooperative Institute for Research in Environmental Sciences

8:45 **Whole Atmosphere Community Climate Model with Thermosphere and Ionosphere Extension (WACCM-X): Model Capabilities and Validation**
Han-Li Liu, National Center for Atmospheric Research, High Altitude Observatory

9:00 **Global Modeling of Metal Ions in the Ionosphere with SAMI3**
Joseph Huba, Naval Research Laboratory

9:15 **Private Sector Contributions to Ionospheric Monitoring**
Geoff Crowley, Atmospheric and Space Technology Research Associates

9:30 **USU GAIM Data Assimilation Models for Space Weather Specifications and Forecasts**
Robert Schunk, Utah State University

9:45 **OpenGGCM Modeling of SAPS and Related Ionosphere-Thermosphere Phenomena**
Jimmy Raeder, University of New Hampshire

10:00 - 10:30 **Break**

10:30 – 12:00 **Solar and Magnetosphere Modeling and Prediction**
Chair: Michele Cash, NOAA/SWPC

10:30 **Toward a New Space Weather Model Suite**
Slava Merkin, Johns Hopkins University Applied Physics Laboratory

10:45 **NASA GSFC Heliophysics Science Division and Space Weather**
Antti Pulkkinen, NASA GSFC, Heliophysics Science Division

11:00 **CIMI - Modeling the Inner Magnetosphere**
Mei-Ching Fok, NASA GSFC, Heliophysics Science Division

11:15 **Geoelectric Field Maps: Progress on NOAA's Operational Near Real-Time Geoelectric Field Estimation Capability**
Chris Balch, NOAA/SWPC

11:30 **Forecasting the Arrival Time of Coronal Mass Ejections: Current Capabilities and Uncertainties**
Peter Riley, Predictive Science Inc.

11:45 **Will There Even Be Sunspot Cycle 25?**
Scott McIntosh, National Center for Atmospheric Research, High Altitude Observatory

12:00 **Conference Closing Remarks**
Howard Singer, NOAA/SWPC

THE WESTIN
WESTMINSTER

