



## 2021 Space Weather Workshop Agenda Held Virtually

### *Times in EDT*

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#### Monday Evening, April 19

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##### 6:00 - 8:00 pm **Space Weather: Student/Professional Virtual Networking Session**

Co-Chairs: Rhiannon Fleming, Millersville University  
Sara Housseal, US Air Force Space Weather Operations Center

Participating Professionals:

Janet Green, Space Hazards Applications  
Alexa Halford, NASA Goddard Space Flight Center  
Rachel Hock, USAF, Air Force Research Laboratory  
Dan Welling, University of Texas, Arlington

Participating Graduate Students:

Samantha Carlson, Catholic University of America  
Samantha Howard, Maj, USAF Air Force Institute of Technology  
Agnit Mukhopadhyay, University of Michigan  
Lengying Khoo, University of Colorado, Boulder

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#### Tuesday, April 20

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##### 10:00 am **Opening Remarks and Welcome**

Bill Murtagh, National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), Space Weather Prediction Center (SWPC)

##### 10:05 – 10:50 **Space Weather Policy**

Co-Chairs: Tammy Dickinson, Science Matters Consulting  
Bill Murtagh, NOAA/SWPC

##### 10:05 **Update from the Executive Office of the President**

Caitlin Durkovich, National Security Council

##### 10:15 **Implementation of U.S. Space Weather Policy**

Louis Uccellini, NOAA National Weather Service

- 10:25**      [UK Space Weather Strategy](#)  
Mark Prouse, Department for Business, Energy & Industrial Strategy, UK
- 10:35**      **Q&A**
- 10:45**      **Break**
- 10:50 – 12:15**    **Space Weather Programs**  
Co-Chairs: Tammy Dickinson, Science Matters Consulting  
Bill Murtagh, NOAA/NWS/SWPC
- 10:50**      **Session Introduction**
- 10:55**      [Space Weather Prediction Center \(SWPC\)](#)  
Clinton Wallace, NOAA/NWS/SWPC
- 11:05**      [National Environmental Satellite, Data, and Information Service \(NESDIS\)](#)  
Elsayed Talaat, NOAA NESDIS
- 11:15**      [National Aeronautics and Space Administration \(NASA\)](#)  
Jamie Favors, NASA Headquarters, Heliophysics Division
- 11:25**      [National Science Foundation \(NSF\)](#)  
Mangala Sharma, NSF Geospace Section
- 11:35**      [US Air Force \(USAF\)](#)  
Omar Nava, Lt Col, Headquarters USAF/A3W
- 11:45**      [American Commercial Space Weather Association \(ACSWA\)](#)  
Jennifer Gannon, Computational Physics, Inc.
- 11:55**      **Q&A**
- 12:15 – 1:00**    **Lunch**
- 1:00 – 2:30**    **Space Weather and Space Situational Awareness**  
Co-Chairs: Jimmie Meehan, NOAA, National Weather Service Headquarters  
Janet Green, Space Hazards Applications
- 1:00**      **Session Introduction**
- 1:05**      [Space Traffic Management](#)  
Moriba Jah, University of Texas, Austin, Aerospace Engineering and Engineering Mechanics
- 1:15**      [Office of Space Commerce](#)  
Mark Mulholland, NOAA Office of Space Commerce
- 1:25**      [Low Earth Orbit \(LEO\) Space Environment](#)  
Jeff Thayer, University of Colorado, Aerospace Engineering Sciences
- 1:35**      [Maxar Anomaly Analysis](#)  
Casey Keys, Maxar
- 1:45**      [Iridium's Space Operations Experience Through the Decades](#)

Walt Everetts, Iridium

**1:55**     **GEO Spacecraft Anomaly Attribution Using GOES-16 / 17 Data**  
Dave Pitchford, SES

**2:05**     **Q&A**

**2:30 – 3:00**     **Break**

**3:00 – 4:30**     **Space Weather Support for Human Exploration**  
Co-Chairs:    Bob Rutledge, Aerospace Corporation  
                  Bill Murtagh, NOAA/NWS/SWPC

**3:00**     **Session Introduction**

**3:05**     **NASA Plans for Human Exploration**  
John Allen, NASA Headquarters, Human Exploration and Operations

**3:15**     **NESC Study: Safe Human Expeditions Beyond Low Earth Orbit**  
Azita Valinia, NASA Engineering & Safety Center (NESC)

**3:25**     **NASA Space Radiation Analysis Group**  
Katie Whitman, NASA Johnson Space Center, Space Radiation Analysis Group

**3:35**     **Radiation Modeling**  
Hazel Bain, University of Colorado, Cooperative Institute for Research in Environmental Sciences (CIRES)/SWPC

**3:45**     **European Space Agency (ESA) Support for Human Spaceflight**  
Alexi Glover, ESA Space Safety Programme Office

**3:55**     **Gateway-Space Weather Observations**  
Bill Paterson, NASA Goddard Space Flight Center

**4:05 – 4:30**     **Q&A**

**4:30 – 5:00**     **Break**

**5:00 – 6:30**     **Lightning Talks (5:00-5:30) and Poster Session (5:30-6:30):**  
**Solar and Interplanetary Research and Applications**  
Chair: Leila Mays, NASA Community Coordinated Modeling Center (CCMC)  
Lightning Talk Presenters (3 min each, from 5:00-5:30 EDT; poster viewing from 5:30-6:30 EDT):  
    **Predicting the Occurrence of Solar Energetic Particles With Machine Learning Techniques**  
        Eleni Lavasa, Department of Physics, National and Kapodistrian University of Athens  
    **Space Weather Monitoring in 3D with PUNCH and QuickPUNCH: Mission Status**  
        Craig DeForest, Southwest Research Institute  
    **SMOS Mission: from Earth Explorer Satellite to Space Weather Asset**  
        Manuel Flores-Soriano, Universidad de Alcalá  
    **The Solaris Solar Polar MIDEX Mission: Improving our Understanding for Space Weather**  
        Don Hassler, Southwest Research Institute  
    **Solar Wind Simulations along the Parker Solar Probe Trajectory**  
        Dinesha Vasanta Hegde, The University of Alabama in Huntsville  
    **Advantages of Multiple Line-of-Sight Measurements of Faraday Rotation through a Coronal Mass Ejection**  
        Jason Kooi, U.S. Naval Research Laboratory

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**Wednesday, April 21**

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**10:00 – 11:30 Space Weather: Meeting the Needs of the Energy Sector**

Co-Chairs: Antti Pulkkinen, NASA Goddard Space Flight Center, Heliophysics Science Division  
Jenn Gannon, Computational Physics, Inc.

**10:00 Session Introduction**

**10:05 NESDIS Powergrid Economic Impact Study**

Lou Nadeau, Eastern Research Group, Inc.

**10:15 Geomagnetic Disturbances – British Columbia Hydro Experience**

Jorge Hollman, Powertech Labs

**10:25 Ground Electromagnetic Induction and the Geoelectric Field: Update from the United States Geological Survey (USGS)**

Anna Kelbert, USGS Geomagnetism Program

**10:35 NOAA-USGS Geoelectric Field Model**

Chris Balch, NOAA/NWS/SWPC

**10:45 Ensemble Modeling to Predict Space Weather Impacts on the North American Power Grid**

Steven Morley, Los Alamos National Laboratory

**10:55 Texas A&M Support for Texas Grid**

Komal Shetye, Texas A&M University, Engineering

**11:05 – 11:30 Q&A**

**11:30 – 1:00 Lunch Events:**

**Student Lunch with a Professional (11:40-12:50)**

Co-Chairs: Rhiannon Fleming, Millersville University  
Carina Alden, NASA Goddard Space Flight Center

Participating Professionals:

Hazel Bain, CIRES CU Boulder / NOAA SWPC  
Michele Cash, NOAA/SWPC

**15th Annual NOAA - American Commercial Space Weather Association (ACSWA) Summit Meeting – by invitation (11:40-12:50)**

**1:00 – 2:30 Space Weather: Meeting the Needs for Global Aviation Services**

Co-Chairs: Rachel Hock, USAF, Air Force Research Laboratory  
Frank Centinello, LT, NOAA/NWS/SWPC

**1:00 Session Introduction**

**1:05 Provision of ICAO Space Weather Information**

Pat Murphy, FAA Aviation Weather Division

**1:15 UN International Civil Aviation Organization (ICAO) Space Weather Services**

Kirsti Kauristi, Finnish Meteorological Institute

- 1:25 [Space Weather Services in Support of Aviation](#)  
Robyn Fiori, Natural Resources Canada (NRCAN)
- 1:35 [Space Weather and the Allied Pilots Association](#)  
Rondeau Flynn, Allied Pilots Association
- 1:45 [Space Weather and Airlines for America](#)  
Nathan Polderman, Airlines for America (A4A)
- 1:55 [Whole Atmosphere Model - Ionosphere Plasmasphere Electrodynamics \(WAM-IPE\)](#)  
Tzu-Wei Fang, CIRES/SWPC
- 2:05 – 2:30 Q&A
- 2:30 – 3:00 Break
- 3:00 – 4:30 **Observing and Modeling the Ionosphere: Supporting Communications and Navigation**  
Co-Chairs: Tzu-Wei Fang, University of Colorado, CIRES/SWPC  
Omar Nava, Lt Col, Headquarters USAF/A3W
- 3:00 **Session Introduction**
- 3:05 [Space Weather Effects on Communications Systems](#)  
Mark MacAlester, Department of Homeland Security, Cybersecurity and Infrastructure Security Agency
- 3:15 [The Ionosphere's Impact on Global Navigation Satellite System \(GNSS\)](#)  
Jade Morton, University of Colorado, Aerospace Engineering Sciences
- 3:25 [Defense Advanced Research Projects Agency \(DARPA\) Space Environment Portfolio](#)  
David Lewis, Lt Col, DARPA, USAF
- 3:35 [Space Weather Research and Operations at the German Aerospace Center \(DLR\) Institute for Solar-Terrestrial Physics](#)  
Jens Berdermann, DLR, Institute for Solar-Terrestrial Physics
- 3:45 [ASTRA Ionospheric Observations and Modeling Ionospheric Conditions](#)  
Geoff Crowley, Atmospheric & Space Technology Research Associates (ASTRA)
- 3:55 [Data Assimilation for Ionospheric and Thermospheric Prediction of Dynamics](#)  
Seebany Datta-Barua, Illinois Institute of Technology, Mechanical and Aerospace Engineering
- 4:05 – 4:30 Q&A
- 4:30 – 5:00 Break
- 5:00 – 6:30 **Lightning Talks (5:00-5:30) and Poster Session (5:30-6:30):  
Ionosphere and Thermosphere Research and Applications and General Space Weather**  
Chair: Tim Fuller-Rowell, CIRES/SWPC  
Lightning Talk Presenters (3 min each, from 5:00-5:30 EDT; poster viewing from 5:30-6:30 EDT):  
[Taking Ionospheric Measurements to the Oceans](#)  
Irfan Azeem, ASTRA LLC  
[Interactive Tool To Visualize Space Weather Scenarios](#)  
Valerie Bernstein, University of Colorado Boulder  
[Estimation of ROTI Thresholds for Ionospheric Scintillation Over the African Sector](#)

- Pierre Cilliers, South African National Space Agency  
[Ionospheric Long-Term Trends and Its Relevance to Space Weather](#)  
Ana Georgina Elias, Laboratorio de Ionosfera, Atmosfera Neutra y Magnetosfera  
[Resolving High-Latitude Ionospheric Plasma Density Structures With Novel Geospace Sensor Techniques](#)  
Lindsay Goodwin, New Jersey Institute of Technology; University Corporation for Atmospheric Research  
[SWx TREC's Space Weather Data Portal: A Tool for Accessing Diverse Space Weather Data](#)  
Jenny Knuth, SWx TREC, CU Boulder, LASP  
[An Operative Space Weather Service in Argentina](#)  
Vanina Lanabere, Universidad de Buenos Aires  
[Pushing the Frontiers of Geoelectric Hazard Modeling](#)  
Greg Lucas, Laboratory for Atmospheric and Space Physics
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**Thursday, April 22**

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- 10:00 – 12:00** [Space Weather Research to Operations to Research \(R2O2R\) Applications](#)  
Co-Chairs: Barbara Giles, NASA Heliophysics Science Division, Goddard Space Flight Center  
Jim Spann, NASA Headquarters, Heliophysics Division
- 10:00** **Session Introduction**
- 10:05** [Automated Radiation Measurements for Aerospace Safety - Dual Monitor \(ARMAS-DM\)](#)  
Kent Tobiska, Space Environment Technologies
- 10:13** [Advanced Techniques to Specify Irregularities with Ground- and Space-based Sensors](#)  
Keith Groves, Boston College
- 10:21** [A CubeSat Based System for Topside Ionospheric Sounding](#)  
Ivan Galkin, Lowell Digisonde International
- 10:29** [A Tool for Defining Solar Particle Access to the Magnetosphere \(SPAM\) for Satellite Anomaly Attribution](#)  
Janet Green, Space Hazards Applications
- 10:37** [Towards a Robust Hindcast and Forecast Framework for On-Orbit Satellite Anomaly Detection](#)  
Adam Kellerman, University of California Los Angeles
- 10:45** [Enhancing Geomagnetically Induced Current Understanding and Prediction over Continental United States](#)  
Chigomezvo Ngwira, Atmospheric & Space Technology Research Associates (ASTRA)
- 10:53** [Advanced Prediction of Upper Atmospheric Neutral Density Using Measurements from Solar Wind Sentinels](#)  
Daniel Weimer, Virginia Polytechnic Institute & State University
- 11:01** [Improving the EUVS Spectral Model Through Physics-Based Differential Emission Techniques](#)  
Courtney Peck, University of Colorado
- 11:09** [Interactive Tool for Modeling Multiple Solar Eruptions](#)  
Tibor Török, Predictive Science Inc.

- 11:17 [Extending and Improving the Wang-Sheeley-Arge Solar Wind Model](#)  
Heather Elliott, Southwest Research Institute
- 11:25 [Updates to Global Remotely-Sensed Heliospheric Modeling Using In-situ Spacecraft Measurements](#)  
Bernard Jackson, University of California, San Diego
- 11:33 Q&A
- 12:00 - 1:00 **Lunch, also**  
**Heliophysics Decadal Survey Plans-Interactive Discussion (12:10-12:50)**  
Co-Chairs: Antti Pulkkinen, NASA Goddard Space Flight Center, Heliophysics Science Division  
Jenn Gannon, Computational Physics, Inc.  
Presenters: [Jim Spann, NASA Headquarters, Heliophysics Division](#)  
[Jared Leisner, NASA Headquarters, Heliophysics Division](#)
- 1:00 - 2:30 **Space Weather: New and Future Observations To Advance Understanding and Forecasting**  
Co-Chairs: Joanne Ostroy, NOAA/NESDIS  
Terry Onsager, NOAA/NWS/SWPC
- 1:00 **Session Introduction**
- 1:05 [Radiation Belts: What We've Learned from Van Allen Probes and Future Prospects](#)  
Dan Baker, University of Colorado, Laboratory for Atmospheric and Space Physics
- 1:15 **Solar Orbiter**  
Teresa Nieves-Chinchilla, NASA Goddard Space Flight Center
- 1:25 [Space Weather Applications of the Spire Nanosatellite Constellation](#)  
Matthew Angling, Spire
- 1:35 [Radio Occultation Measurements from GeoOptics CICERO Constellation](#)  
Conrad Lautenbacher, GeoOptics
- 1:45 [Solar Cruiser](#)  
Leslie McNutt, NASA Marshall Space Flight Center
- 1:55 **CubeSat Mission to Study Solar Particles - Pathfinder for Interplanetary Space Weather Constellation Mission**  
Mihir Desai, Southwest Research Institute
- 2:05 Q&A
- 2:30 – 3:00 **Break**
- 3:00 – 4:30 **Advances in Space Weather Modeling and Services**  
Co-Chairs: Dan Welling, University of Texas, Arlington, Physics Department  
Howard Singer, NOAA/NWS/SWPC
- 3:00 **Session Introduction**
- 3:05 [Solar Storms and Terrestrial Impacts Center \(SOLSTICE\): Where Machine Learning Meets Space Weather Modeling](#)  
Tamas Gombosi, University of Michigan, Climate and Space Sciences and Engineering

- 3:15**      [Building Multiscale Atmosphere-Geospace Environment \(MAGE\): Toward a New Community Model for Understanding and Predicting Space Weather](#)  
Slava Merkin, Johns Hopkins University Applied Physics Laboratory
- 3:25**      [Harnessing Big Data to Improve Understanding and Predictions of Geomagnetically Induced Currents \(GIC\)](#)  
Hyunju Connor, University of Alaska, Physics Department
- 3:35**      [International Space Weather Action Teams \(ISWAT\)](#)  
Masha Kuznetsova, NASA Goddard Space Flight Center, Community Coordinated Modeling Center
- 3:45**      [Ground-Based Solar Astronomy Support to Space Weather R&D: DKIST and the Path Forward](#)  
Valentin M. Pillet, National Solar Observatory (NSO)
- 3:55**      [Machine Learning in Space Weather](#)  
Enrico Camporeale, University of Colorado, CIRES/SWPC
- 4:05**      **Q&A**
- 4:20**      [Workshop 'Penultimate' Remarks](#)  
Howard Singer, NOAA/NWS/SWPC
- 4:30 – 5:00**      **Break**
- 5:00 – 6:30**      **Lightning Talks (5:00-5:30) and Poster Session (5:30-6:30):  
Geospace/Magnetosphere and Aviation Radiation Research and Applications**  
Chair: Michael Wiltberger, National Center for Atmospheric Research, High Altitude Observatory (NCAR HAO)  
Lightning Talk Presenters (3 min each, from 5:00-5:30 EDT; poster viewing from 5:30-6:30 EDT):
- [A Machine Learning Based Specification and Forecast Model of the Inner Magnetospheric Radiation Environment](#)  
Jacob Bortnik, UCLA
  - [Geomagnetically Induced Currents and Space Weather Prediction in Austria](#)  
Dennis Albert, Institute of Electrical Power System, Graz University of Technology
  - [GIC Monitoring in the Mexican 400kV Power Grid](#)  
Ramón Caraballo, Universidad Nacional Autónoma de México, Laboratorio Nacional de Clima Espacial
  - [Substorm Dynamics in MHD: Statistical Validation Tests and Paths for Improvement](#)  
John Haiducek, US Naval Research Laboratory