

Space Weather Roundtable

Committee

Geoffrey Crowley

Co-Chair

GEOFFREY CROWLEY, Co-Chair, is the Chief Scientist for Arcfield. Prior to it being acquired by Arcfield, Crowley was the Founder, CEO, and former chief scientist of Orion Space Solutions (aka Atmospheric & Space Technology Research Associates LLC), a commercial provider of space weather data, models, and instruments, both ground- and space-based. Crowley previously worked at the National Center for Atmospheric Research, the Air Force Research Laboratory (as a contractor via Univ. of Lowell), the Johns Hopkins University Applied Physics Laboratory, and the Southwest Research Institute, performing fundamental research on various areas of space physics and space weather. Crowley was principal investigator on the National Science Foundation (NSF)-funded, DICE (Dynamic Ionosphere Cubesat Experiment) mission, and on the NASA-funded SORTIE cubesat mission. Dr. Crowley is also a co-founder of the American Commercial Space Weather Association (ACSWA), which is comprised of over 20 companies with the common goal of developing, delivering, and sustaining key space weather products and services to mitigate threats to societal infrastructure. Crowley earned a Ph.D. in ionospheric physics from the University of Leicester, UK.

Janet C. Green

Co-Chair

JANET C. GREEN, Co-Chair, is a physicist at Space Hazards Applications, LLC. Green previously worked at NOAA's Space Weather Prediction Center as the instrument scientist for the particle detectors on NOAA Geostationary Operational Environmental Satellites (GOES) and Polar Operational Environmental Satellites (POES). Green's principal area of expertise is the physics of Earth's radiation belts and their effects on satellite electronics and performance. Green has also worked on the design and implementation of new particle instruments and transitioning new algorithms and products that rely on the data into operations. Green earned a Ph.D. in space science from the University of California, Los Angeles.

Anthea J. Coster

Member

ANTHEA J. COSTER is a principal research scientist, at the Massachusetts Institute of Technology's Haystack Observatory. Coster's expertise includes physics of the ionosphere, magnetosphere, and thermosphere; space weather and geomagnetic storm time effects; coupling between the lower and upper atmosphere; GPS positioning and measurement accuracy; radio wave propagation effects; and meteor detection and analysis. Coster is a principal investigator/co-principal investigator on numerous projects involving the use of the Global Positioning System to probe the atmosphere, including investigations of the plasmaspheric boundary layer, stratospheric warming, and space weather effects in the Arctic/Antarctic and in the equatorial region. Coster earned a Ph.D. in space physics and astronomy from Rice University.

Seebany Datta-Barua

Member

SEEBANY DATTA-BARUA is a professor of mechanical and aerospace engineering at Illinois Institute of Technology in Chicago. Before joining Illinois Tech, Datta-Barua was a research engineer at ASTRA, LLC, and then an assistant professor of aviation at San Jose State University. Datta-Barua's research interests include upper atmospheric effects on GNSS-based navigation systems, GNSS data assimilation, and the use of GNSS for remote sensing. Datta-Barua was on the NEMISIS science team for the Geospace Dynamics Constellation. Datta-Barua has received the NSF CAREER award and the Institute of Navigation (ION) 2018 Per Enge Early Achievement Award for "outstanding contributions to the understanding of the dynamics of the ionosphere and its impacts on satellite-based navigation integrity." Datta-Barua served as associate editor of Radio Science from 2013-2019 and has been recognized as an Outstanding Reviewer for Space Weather and Navigation. Datta-Barua earned a Ph.D. in aeronautics and astronautics from Stanford University and served on the Decadal Survey for Solar and Space Physics (Heliophysics) 2024-2033 Panel on the Physics of Ionospheres, Thermospheres, and Mesospheres.

Alexander J. Engell

Member

ALEXANDER J. ENGELL is an experienced technical lead for the R&D division at NextGen Federal Systems developing machine-learning (ML) models to predict solar energetic particles, contrail formation, aircraft turbulence, and cloud nowcasting for the DoD. These efforts focus on the development and operationalization of capabilities and involve creating continuous development/ continuous deployment (CI/CD) pipelines, and applying DevSecOps and software development to streamline and scale cloud-based data analysis for heliophysics and Earth science data. Engell has developed two currently operating space weather capabilities: (1) Space Radiation Intelligence System (SPRINTS) and (2) Spacecraft Anomaly Resolution Knowledgebase (SPARK). The capabilities have users from NASA CCMC, NASA Moon-to-Mars, AFRL, NRO, Space ISAC, and ESA. Engell has been on the American Commercial Space Weather Association's (ACSWA) Executive Board since 2015 and served as the American Meteorological Society's Space Weather Conference chair from 2021-2024. Engell is leading ACSWA's development of the Space Weather Commercial Marketplace. Engell began work in solar physics in 2006 at the Harvard-Smithsonian Center for Astrophysics and continues to be active in the space weather community. Engell completed all Ph.D. required coursework for Physics at Montana State University in 2013 prior to entering the workforce in the commercial space and terrestrial weather industry.

Bruce A. Fritz

Member

BRUCE FRITZ is a research physicist in the Geospace Science and Technology Branch at the U.S. Naval Research Laboratory in Washington, DC. Fritz is also a program officer on assignment to the Office of Naval Research Marine Meteorology and Space Science Division. Fritz's primary research expertise lies in understanding ionosphere-thermosphere dynamics with a specialty in ultraviolet remote sensing instrumentation. Fritz also serves as a space weather subject matter expert to bridge the gap between space weather data providers, ionosphere prediction model developers and the operational user community. Fritz is a member of the American Geophysical Union (AGU) and serves as an International Union of Radio Scientists (URSI) Commission G Early Career representative. Fritz served as an Air Force commissioned officer, first with the Air Force Research Laboratory at Hanscom Air Force Base, MA and then as a program officer at the Space and Missile Systems Command at LA Air Force Base, CA. Fritz earned a Ph.D. in physics from the University of New Hampshire.

Sarah Gibson

Member

SARAH E. GIBSON is a senior scientist of the High Altitude Observatory (HAO) at the National Center for Atmospheric Research. Gibson's research centers on solar drivers of the terrestrial environment, from short-term space weather drivers such as coronal mass ejections (CMEs), to long-term solar cycle variation. Gibson is a former co-chair of the Committee on Solar and Space Physics and a former member of the steering committee for the 2013 decadal survey in solar and space physics (heliophysics) and had a key role in the creation of the DRIVE (Diversify, Realize, Integrate, Venture, Educate) initiative to develop more fully and employ more effectively the many experimental and theoretical assets at NASA, NSF, and other agencies. Gibson provided testimony, "Surveying the Space Weather Landscape," in 2018 before the Joint Subcommittees on Space and Environment, Committee on Science, Space, and Technology, U.S. House of Representatives, in support of what became the landmark 2020 "Promoting Research and Observations of Space Weather to Improve the Forecasting of Tomorrow Act" (or the "PROSWIFT" Act)—the act that established the Space Weather Roundtable at the National Academies. Gibson is currently the project scientist for the NASA-Southwest Research Institute mission, "PUNCH" (Polarimeter to Unify the Corona and Heliosphere), a landmark Small Explorers Program mission that will image beyond the Sun's outer corona. Gibson earned a Ph.D. in astrophysics from the University of Colorado Boulder.

Justin C. Kasper

Member

JUSTIN C. KASPER is deputy chief technology officer at BWX Technologies, Inc. and a professor in the Department of Climate and Space Sciences and Engineering at the University of Michigan, Ann Arbor. Kasper's research interests include the solar corona, the solar wind, the societal impacts of space weather events, and the potential to use small satellite platforms in future space weather observing architectures that would be affordable and sustainable. Kasper is the principal investigator for the Solar Wind Electrons Alphas and Protons (SWEAP) suite of instruments on the Parker Solar Probe. Additionally, Kasper has worked on development of the CRaTER (Cosmic Ray Telescope for the Effects of Radiation) instrument on the Lunar Reconnaissance Orbiter, the Solar Wind Experiment Faraday Cup on the Wind spacecraft, and the Faraday Cup instrument on the Deep Space Climate Observatory (DSCOVR). Kasper has spoken at recent workshops on the potential to use small satellite platforms in future space weather observing architectures that would be affordable and sustainable, which is of great interest to government and private users of space weather data. Kasper earned a Ph.D. in physics from the Massachusetts Institute of Technology.

Mark H. MacAlester

Member

MARK H. MACALESTER is a telecommunications specialist with the Cybersecurity and Infrastructure Security Agency (CISA) in the U.S. Department of Homeland Security. Macalester serves as CISA's Liaison Officer at the North American Aerospace Defense (NORAD) Command and United States Northern Command (USNORTHCOM) at Peterson Space Force Base in Colorado Springs. Macalester started working with the NOAA Space Weather Prediction Center in 2010 while serving at the Federal Emergency Management Agency (FEMA) to investigate space weather effects on communications with a focus on operations, and has expanded collaboration with researchers, engineers, and systems operators to refine and update both effects and operational impacts to communications from space weather. Macalester regularly briefs space weather operational impacts to government officials, private sector, and academic audiences with responsibilities in the Emergency Management field. Previous to FEMA, Macalester served as an IT Systems Engineer with the Department of the Navy and in the U.S. Army Signal Corp. Macalester received a M.S. in Management/Emergency Management Specialization from the University of Maryland.

Julie J. Moses

Member

JULIE MOSES is a program officer, Space Physics, at the Air Force Office of Scientific Research (AFOSR). Previously, Moses served at AFOSR as a program officer in remote sensing and imaging and as a program coordinator in external programs. Moses' research interests lie in polar ionosphere and magnetosphere-ionosphere coupling. Before joining the AFOSR, Moses was a staff specialist of space and sensors systems in the Office of the Undersecretary of Defense (AT&L). Moses' background includes working on Capitol Hill, in science diplomacy, and science administration. Moses has a deep knowledge of programs and programmatic investments for DoD investments in solar and space physics. Moses earned a Ph.D. in atmospheric science from UCLA.

John Paul “JP” Parker

Member

JOHN PAUL (JP) PARKER is CEO and founder of Escape Velocity, a boutique national security advisory firm working at the intersection of government, technology, and national security. Parker is also a subject matter expert for the Defense Science Board; an affiliate research scientist at the University of Maryland; a senior fellow at the Potomac Institute for Policy Studies; a member of the National Security Space Association Board of Advisors; and a member of the Board of Directors of Silverthread, a Boston-based technology firm. Before founding Escape Velocity, Parker served as the first ever Intelligence Community (IC) Space Executive. The IC Space Executive is the principal space policy advisor to the Director of National Intelligence and also serves as the National Intelligence Manager (NIM) for space related threats to national security. Previously, Parker was appointed Special Advisor to the Vice President of the United States for Space, Cyber, and Intelligence. Parker was the founding technical director of the Intelligence Community’s cybersecurity center. While in industry, Parker spent 14 years managing research and development projects for DARPA. Parker has also served as a professional staff member on the House Armed Services Committee. Parker received an MA in International Relations in 1990 from Claremont Graduate University.

Tuija Pulkkinen

Member

TUIJA PULKKINEN is currently the George R. Carignan Professor of the Department of Climate and Space Sciences and Engineering at the University of Michigan. Pulkkinen’s research interests focus on plasma physics of the Sun-Earth system, especially to quantification of the energy transfer from the solar wind into the space environment and upper atmosphere. Pulkkinen’s research methodologies include analysis of ground-based and space mission data together with numerical space plasma simulations. Pulkkinen currently acts as the research director and team lead in NASA’s SWORD Space Weather Center of Excellence that targets to specify the low-Earth orbit space environment through coupled atmosphere-space models in order to improve forecasts of especially the neutral density variations. Pulkkinen’s previous positions include dean and vice president for research and innovation at Aalto University, and unit head and research professor at the Finnish Meteorological Institute. Pulkkinen has held numerous positions in international and national scientific organizations including presidency of the European Geosciences Union. Pulkkinen earned a Ph.D. degree in theoretical physics from the University of Helsinki in Finland. Pulkkinen has served on several committees, including as a member of the Decadal Survey for Solar and Space Physics (Heliophysics) 2024-2033.

Geoffrey D. Reeves

Member

GEOFFREY D. REEVES is chief scientist for Intelligence and Space Research at Los Alamos National Laboratory (LANL). Since arriving at LANL in 1989, Reeves has studied the near-Earth space environment, space weather effects on commercial and military satellite systems, and radiation hazards from nuclear explosions in space. Reeves has been active on a number of NASA, DoE, and European satellite systems including GPS, Polar, Cluster, MMS, and the Van Allen Probes. Reeves has published papers on geomagnetic storms and substorms, radiation belt dynamics, energetic neutral atom imaging, the effects of nuclear explosions in space, and the use of space-based electron beams to study wave-particle interactions. Reeves chaired the 2019 Institute for Defense Analysis-NASA study that resulted in the report, Next Step Space Weather Benchmarks that inform engineering standards, vulnerability assessments, risk estimates, decision points and thresholds for action, more effective mitigation procedures and practices, and response and recovery planning. Reeves is a fellow of Los Alamos National Laboratory and the American Geophysical Union (AGU), as well as president of AGU's Space Physics and Aeronomy section. Reeves earned a Ph.D. in applied physics from Stanford University.

Howard J. Singer

Member

HOWARD J. SINGER is chief scientist at the NOAA Space Weather Prediction Center and an adjunct professor in the Department of Aerospace Engineering Sciences at the University of Colorado, Boulder. Previously, Singer served as the chief of the research and development division of the Space Environment Center (SEC). Singer has been the project leader for the current and future NOAA Space Environment Monitor instruments on the GOES spacecraft and the magnetometer responsible scientist on numerous GOES satellites and the joint USAF-NASA Combined Release and Radiation Effects satellite. Singer's research is in the area of solar-terrestrial interactions, ultra-low frequency waves, Earth's radiation belts, geomagnetic disturbances, storms, and substorms. Singer has had leadership roles in the transition of research to operations. Singer has authored or co-authored over 300 publications and was co-editor of the 2001 AGU Geophysical Monograph, Space Weather. Singer has received awards from the Air Force, NASA, and NOAA and is the recipient of the Antarctica Service Medal for spending more than one year at South Pole Station, Antarctica, where a geographic feature is named after Singer. Singer has served as editor and Editor's Choice Editor of the Space Weather Journal. Singer received a Ph.D. in space physics and geophysics from UCLA. Singer has served on multiple committees including the Space Studies Board, Committee on Solar and Space Physics, and the 2013 Heliophysics Decadal Survey Steering Committee.

Elsayed Talaat

Member

ELSAIED R. TALAAT serves as president and chief executive officer at Universities Space Research Association (USRA). Before joining USRA, Talaat was director of the Office of Space Weather Observations at NESDIS, providing leadership and oversight in the development, acquisition, integration, installation, and acceptance of major system elements for NOAA's operational and environmental satellite systems. Prior to joining NOAA, Talaat was the chief scientist of the Heliophysics Division at NASA Headquarters. In this role, Talaat directed overall development efforts for the Heliophysics space science program in Solar, Heliospheric, Magnetospheric, and Ionospheric, Thermospheric, and Mesospheric physics. Previously, Talaat was a program scientist at NASA Headquarters serving as program scientist for the Living with a Star mission and science line, grant research lines, and Heliophysics and Planetary missions. Talaat was supervisor of the Earth and Planetary Atmospheres Section at Johns Hopkins University, Applied Physics Laboratory (APL), conducting research focused on developing remote sensing techniques and data analysis and modeling of geophysical and planetary phenomena. Talaat earned a Ph.D. from the University of Michigan in atmospheric and space sciences.

William K. Tobiska

Member

WILLIAM KENT TOBISKA is the president and chief scientist of Space Environment Technologies (SET). Tobiska has a four-decade long history in space sciences and space weather and has led work to develop operational systems at NOAA's Space Environment Laboratory (now known as NOAA SWPC), UC Berkeley, the Jet Propulsion Laboratory, Northrop Grumman, and Utah State University. At SET, Tobiska developed commercial operational space weather systems that were first of their kind worldwide. Tobiska has been a USAF/USSF, NASA, and NOAA principal investigator and authored over 200 peer-review scientific papers as well as 10 books. Tobiska's service includes the COSPAR C1 sub-commission chair (Thermosphere & Ionosphere), the COSPAR International Reference Atmosphere (CIRA) Task Force chair, and COSPAR scientific session organizer for 2002–2024. Tobiska is the lead U.S. delegate to ISO for the space environment and developed the ISO solar irradiance, Earth atmosphere density, and space weather information for use in space systems operations standards documents. Tobiska served as the chair of the AIAA Atmospheric and Space Environment Technical Committee (ASETC) Committee on Standards (CoS), is an associate fellow of the AIAA as well as a member of AGU, COSPAR, AMS, American Commercial Space Weather Association (ACSWA) Executive Committee, and ISO TC20/SC14 US Technical Advisory Group. Tobiska also serves as an industry representative on the PROSWIFT Space Weather Advisory Group (SWAG). Tobiska earned a Ph.D. in aerospace engineering from the University of Colorado, Boulder.

Drew L. Turner

Member

DREW L. TURNER is a researcher at the Johns Hopkins Applied Physics Laboratory. Research interests include energetic charged particles in Earth's magnetosphere and the lunar environment; particle acceleration processes in collisionless plasmas; the coupling of energy from the Sun and space environments ranging from the Van Allen radiation belts to the boundaries of the magnetosphere and solar wind; and space-based measurements needed to improve space weather forecasting, nowcasting, and hindcasting. Turner is a 2016 COSPAR Zeldovich Medalist and a 2018 James B. Macelwane Medalist and Fellow of the American Geophysical Union. Turner earned a Ph.D. in aerospace engineering from the University of Colorado Boulder.

Louis W. Uccellini

Member

LOUIS W. UCCELLINI is a retired NOAA assistant administrator for weather services and director, National Weather Service, which oversees NOAA's Space Weather Prediction Center. Uccellini's experience includes the development and management of both the terrestrial weather enterprise and the space weather enterprise. Uccellini has been involved in developing numerous partnerships between NOAA and other government entities and the commercial sector. At the direction of Congress, Uccellini also managed NOAA's commercial data buys in support of numerical weather prediction and for inputs to space weather models. Uccellini is an expert on issues related to space weather operations and the transition from research to operations. Uccellini earned a Ph.D. in meteorology from the University of Wisconsin-Madison.

James E. Favors

Ex Officio Member

Jamie Favors is the director of NASA's Space Weather Program in the Heliophysics Division at NASA Headquarters in Washington. In this role, Favors leads NASA's efforts to advance space weather science, measurements, and applications to protect life and infrastructure on Earth and across the solar system. During 18 years with NASA, Favors has managed large, complex satellite missions, overseen the development of commercial space launch capabilities, led hundreds of applied Earth science projects benefiting society, and developed global commercial partnerships that extended the reach and impact of NASA science data. Favors has worked at multiple NASA Centers including Langley Research Center in Hampton, Virginia; Goddard Space Flight Center in Greenbelt, Maryland; Stennis Space Center in Bay St. Louis, Mississippi; and Ames Research Center in Silicon Valley, California. Favors also performed a work detail in the Virginia Governor's Office to foster the use of Earth observations in state-level decision making and planning and later served as advisor to a member of the Board of Directors for the Virginia Commercial Space Flight Authority for the Mid-Atlantic Regional Spaceport. Favors' academic background is in Meteorology (M.Sc., San Jose State University) with research focused on atmospheric dynamics and drivers of monsoonal systems in North America and Africa.

Mangala Sharma

Ex Officio Member

MANGALA SHARMA is the program director for space weather at the U.S. National Science Foundation (NSF), where Sharma was previously the agency lead for spectrum management (ensuring the availability of radio spectrum for scientific purposes) and the lead for NSF partnerships with Nordic, Asian and African countries. Before joining the NSF, Sharma was the point of contact for space weather matters at the U.S. Department of State and organized the first-ever global ministerial meeting on cooperation in space exploration. Sharma previously taught astronomy at Ohio University and Pennsylvania State University, coordinated astronomy education and outreach nationwide as part of the NASA Astrophysics Education and Public Outreach Forum, and has long been engaged in STEM diversity issues. Sharma earned a Ph.D. in physics, and astronomy from performing doctoral research work at the Indian Institute of Astrophysics.

James Spann, Jr.

Ex Officio Member

JAMES F. (JIM) SPANN, JR. is senior scientist in Office of Space Weather Observations, NOAA NESDIS. Spann joined NOAA in October 2023 after a long career at NASA, most recently as the Heliophysics Division space weather lead at NASA Headquarters. At NASA, Spann was engaged in defining science that exploration enables; establishing a NASA Space Weather Research Program; and coordinating space weather activities with national and international partners. Spann also headed up the first Lunar Gateway science payload called HERMES, which will study the solar wind and enable better space weather forecasting that enhances astronaut radiation protection for deep space human exploration. Spann developed several auroral UV remote sensing instruments that flew in space; managed the Marshall Space Flight Center's (MSFC) science research organization, which includes the disciplines of astrophysics, planetary science, heliophysics and earth science; and served as the MSFC chief scientist. Spann was the principal investigator of SPORT, an international 6U CubeSat mission with the Brazilian Space Agency, which will investigate the conditions in Earth's ionosphere, just above its upper atmosphere, that lead to disruptions in communication and GPS signals. Spann earned a Ph.D. in physics from the University of Arkansas.