

SPACE WEATHER

AS A GLOBAL CHALLENGE

May 18, 2017

Italian Embassy, Washington, DC

SPEAKER BIOGRAPHIES (by alphabetical order)

Roberto Battiston is the current President of the Italian Space Agency. A physicist of the National Institute of Nuclear Physics (INFN), Battiston was appointed by the Minister for Education, University and Research, Stefania Giannini. He succeeds Prof. Aldo Sandulli, Special Commissioner to the ASI following judiciary investigations that led to the resignation of the previous President of the Agency Enrico Saggese. Full Professor of Experimental Physics at the University of Trento, where he was born in 1956 and still lives, Battiston has had a long and distinguished academic and scientific career, full of international awards, which began immediately after graduating with honours in Physics from the Scuola Normale of Pisa in 1979. He is Chairman of Commission II of the INFN for Astroparticle Physics, and a member of TIFPA (Trento Institute for Fundamental Physics and Application) - The new National Center of the INFN.

Daniele Biron, M.Sc. in Physics at the University of Pisa in 1999, and soon after he won the Ministry of Defense selection for physicist, as Officer of Italian Air Force - Corps of Engineers. In 2002 he successfully completed the Specialization Course in Atmospheric Physics, becoming also Fully Qualified Weather Forecaster accordingly WMO rules. From 2003 up to 2015, since 2011 as Head, he has worked at Satellite Section of Italian Air Force Meteorological Service. From 2015, after the reconfiguration of Italian Air Force Meteorological Service, Head of Section for Space Weather Predictions, with the Centro Operativo per la Meteorologia (Operational Centre for Meteorology), Pratica di Mare. International duties related to Space Weather topic: Italian delegate with United Nations World Meteorological Organization - Inter-Programme Team on Space Weather Information, Systems and Services, Geneva, CH; and Italian delegate and Vice-chair with European Organisation for the Exploitation of Meteorological Satellites – Science Working Group, Darmstadt, DE.

Marco Brancati is the Head of Innovation and Technological Governance at Telespazio. He joined Telespazio in 1990, after three years of experience in Selenia Industrie where he dealt with System Analysis activities for Electronic Defence division. After some experiences as subsystem project manager in the frame of Italsat F1 and SAX satellite missions, he has been Program Manager up to 2001 for the Operations Engineering and O&M activities relevant to Iridium and Astrolink programs. Key Account Manager for UE and Eumetsat in 2002 and 2003, he has managed Telespazio Studies Unit in 2004 and 2005. Responsible for Telespazio Institutional Programs up to beginning of 2007, he has been Head of Marketing & Commercial Planning in the

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frame of Telespazio Commercial Directorate up to summer 2008. In autumn 2008 he was appointed as Vice President of Telespazio Networks & Connectivity Business Line, being responsible for the development of all TLC and TV programs and products in the company. At the beginning of 2011 he became Senior Vice President of Networks & Connectivity transnational Business Units. In October 2016 he was appointed as CTO of Telespazio group, being in charge of Innovation and Technological Governance for the whole company at transnational level.

Maria Fabrizia Buongiorno was born in Italy in 1962. She graduated in Geology in 1988 at the University of Rome “La sapienza”, with a thesis on remote sensing techniques for structural geology interpretation by means of LANSAT TM images. After the university she worked four years (1988-1992) at Telespazio S.p.A in the Environmental Remote Sensing Division, where she had the opportunity to acquire expertise in both technical and management areas. In particular she acquired a large experience in remote sensing sensors as responsible for airborne instruments for TELAER project (a consortium between TELESPAZIO and ALENIA companies, to create an airborne system to monitor the environment). In 1991 She has spent months at Jet Propulsion Laboratory Pasadena, CA. working in the Earth Observation Division, Volcanological group, where she focused her research on airborne data analysis in the TIR region and on the detection of SO₂ in volcanic plumes by means of thermal infrared image data. In 1992 She left Telespazio Company to join the Istituto Nazionale di Geofisica (ING). At ING after reorganized as INGV (Istituto Nazionale di Geofisica and Vulcanologia) in 2001, she devoted her career to the development of the Remote Sensing applications in Geophysics. She developed researches activities based on remote sensing techniques and in particular by organizing international field campaigns with airborne sensors to test new technologies and validate satellite data. She also organized receiving systems for satellite data (NOAA, NASA, EUMETSAT) to acquire rapid information on the evolution of volcanic phenomena. She proposed and coordinated a large number of projects funded by ASI, ESA, EC and Italian Ministry of Research (MIUR). She has been member of the Italian GMES Committee from 2003 to 2010. She also collaborated in many NASA funded projects developed by Jet Propulsion Laboratory. She is an associate member of the ASTER Volcanology Group and member of the international science team of the NASA-HYSPIRI mission, member of the Italian science team of the ASI-PRISMA mission. She collaborates with ASI and CONAE in a training program in remote sensing techniques for South American students by hosting at INGV stages of 6 months, every year since 2002. In March 2017 She has been nominated by the Italian Government member of the Operational Committee of the Italian Civil Protection which operates during National Emergencies.

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Alberto Buzzoni is a Senior Associate Astronomer at the Italian National Institute for Astrophysics. He is actively involved in SSA/SW activities working on optical observation and spectrophotometric characterization of space debris and dead orbiting payloads (Kessler Syndrome), and on survey coordination of meteor activity, as a member of the Project Office of the Italian network PRISMA, led by INAF. He is currently collaborating on SSA/SW issues with the astrodynamics group of the Politecnico di Milano, and with other international research groups in USA (Purdue University, West Lafayette IN), Spain (DEIMOS Space, Madrid), and with ESA/ESRIN, among others.

Luigi Del Bene serves as a Brigadier General in the Italian Air Force. He graduated from the Air Force Academy on 1990 and completed the pilot training at the Sheppard AFB (Air Force Base) Texas (USA) in 1991. He has been assigned to several Italian fighter squadrons and fighter training squadrons serving as instructor, evaluator pilot and squadron commander achieving more than 3,300 hours of flying time, mostly on fast jet aircrafts. He had various staff assignments at Italian MOD and Air General Staff and commanded the 6th Wing in Ghedi AB from 2011 to 2013. Since September 2016 He is the Chief of Air Staff Aerospace Planning Division, which formulates the vision for the use of Aerospace Forces, contributes to the definition of the national and defense policy and is responsible for supervising the aspects related to the technical-military cooperation of the Armed Forces in the International Fields. He attended several courses, as Joint and Combined Warfighting School at Joint Forces Staff College, Norfolk Virginia (USA) and Defence Resources Management Course in Monterey (California - USA).

Stefano Cesare is the Product Line Manager for Scientific Spacecraft and Payloads at Thales Alenia Space. He received a Degree in Physics at University of Torino (1985). He started working in 1987 as mission analysis and system engineer in the Advanced Studies Department of Aeritalia Space Systems Group (now Thales Alenia Space Italia). He managed several definition studies of scientific missions and technology development programs. He has been the head of the Optical Systems Unit and of the Advanced Projects. Since 2013 he is the Product Line Manager for Scientific Spacecraft and Payloads of Thales Alenia Space Italia. He is the program manager of the Metis coronagraph for the Solar Orbiter mission.

Steven W. Clarke is the Director of the Heliophysics Division in the Science Mission Directorate at NASA Headquarters. He is responsible for leading the formulation and implementation of a national research program, through scientific flight investigations and research grants, to understand the Sun, its interactions with the Earth and the solar system, and how the observed phenomena impact life and society. Previously, he was the Director of the Joint Agency Satellite

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Division, responsible for managing reimbursable spacecraft and instrument development activities performed by NASA for partner agencies. Mr. Clarke supported the Deputy Associate Administrator of the Exploration Systems Development Division at NASA Headquarters where he was responsible for developing the exploration architecture for human exploration beyond Earth orbit. He joined the Constellation Ground Operations Project Office at the Kennedy Space Center, FL when it was established in 2005, assigned as the Chief of the Launch Vehicle Division. In 2009, he was selected as the Deputy Director of the Ground Operations Project Office. After several years as a systems and project engineer in the aerospace industry, Mr. Clarke joined NASA in 2000 as an integration engineer responsible for NASA's scientific robotic missions. Mr. Clarke has received numerous awards during his career including NASA's Exceptional Achievement Medal for outstanding leadership. He has a BS degree in engineering and a MS degree in engineering management from the University of Central Florida.

Patricia H. Doherty is the Director and a Senior Scientist of the Institute for Scientific Research (ISR) at Boston College (BC). As director of the Institute, she oversees the activities of staff members working on a variety of innovative research projects. These projects include studies of space physics, space weather, ionospheric and atmospheric effects on space-based systems, ionospheric measurement techniques, chemical reactions in space and magnetospheric physics. As a scientist, Patricia's own research interests are centered on space weather and ionospheric effects on Global Navigation Satellite Systems (GNSS) and its relevant applications. Patricia has also been very active in promoting research and education in the science of navigation in developing countries. She is an Associate Editor of the Radio Science Journal, a member of the American Geophysical Union (AGU), Past-president of the Institute of Navigation (ION), a commission chair of the International Union of Radio Scientists (URSI), and a member of the Board of Trustees of the Universities Space Research Association. She is a Fellow of the Institute of Navigation and a Fellow of the African Geospace Society.

Juergen Drescher has been the Head of the DLR Washington, DC Office for the German Aerospace Center since 2004. He is a specialist in Medical Biophysics with specialization in Pathological Physiology. The DLR Washington Office is a MFGO and works as an interface between NASA HQ and the NASA Centers, NOAA, USGS, AFRL, DARPA, AIAA, US institutions and other Federal Agencies. The Head of the DLR Washington Office reports to the Chairman of the DLR Executive Board and represents the German Space Agency and the R&D branch of DLR with its 39 institutes for Space, Aeronautics, Energy-, Transportation and Security research in the framework of a German FFRDC - Federal Funded Research and Development Center. Prior to this position, Dr. Drescher has been working extensively on Neuropathophysiology at the Medical School of the

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Humboldt University Berlin - Charite' Hospital and in Aerospace Medicine and Space Physiology at the Institute of Aviation and Space Medicine at DLR Cologne in an international framework. He was actively involved in joint studies with NASA, the French space agency CNES and the Russian Cosmonaut Training Center "Juri Gagarin" as part of an international space research program. Dr. Drescher was the Principle Investigator on several biomedical experiments carried out on German and ESA long term spaceflight mission including the NASA Space Shuttle and Russian MIR space station experiments. As a Co-Investigator in DLR's Life Sciences research program he is involved in autonomous function testing and cardiovascular regulation research onboard the International Space Station ISS. Dr. Drescher has both a Medical Diploma, as well as a Doctoral degree in medicine. He is a member of the International Academy of Astronautics IAA and Academician of the Tsiolkovsky Space Academy, Russia. Together with the US Space Foundation he founded the US German Aerospace Roundtable UGART to foster the transatlantic bilateral scientific-industrial cooperation between aerospace research partner institutions and the industry. Since 2014 he is the official Representative of the DLR Executive Board for Commercial Space Flight.

Ignazio Droghini serves as the Managing Director of Loccioni US. In Loccioni since 2008 he started the business development activities that led the group to open its first foreign subsidiary. He has served Loccioni USA in different roles from Business Development to Sales and Marketing. Since 2008 he has successfully helped the group in establishing an extensive portfolio of North American customers in the automotive, home appliances and biomedical industries. Before joining the Loccioni Group he gained PR and Marketing experience both in the public and private sector. Born in 1981 he holds a bachelor degree in Communication and a master degree in Marketing and Advertising.

Alexander E. Ermolaev is the Counselor for Science & Technology at the Embassy of the Russian Federation with responsibilities for all S&T cooperation topics, including space, for the organization. Joined the Foreign Service in 2000 and since that time was on different assignments within the Ministry of Foreign Affairs and Department for International Cooperation of Ministry of Education and Science of Russia. Before come to Washington, DC, he served at the Russian Embassies in Colombia and Argentina as a science attaché. Mr. Ermolaev holds a Master of Science in Chemistry from the Moscow State University.

Vincenzo Giorgio is the Chief Executive Officer at ALTEC. Graduated in Electronics at Naples University Federico II, has started his space activity designing communication systems and on board computers. He has been responsible within former AERITALIA of science projects like Hipparcos and Integral, working as well for the International Space Station. He has been VP for

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Science and Exploration of Thales Alenia Space Italia participating to important European in flight projects like GOCE, Herschel & Plank and of ongoing projects like: BepiColombo targeting Mercury, Solar Orbiter and Exomars mission for the Robotic Exploration of the red planet. Since 2004 he is member (since 2016 co-chair) of ISEC “International Space Exploration Committee”. He is now Vice President for Institutional Marketing & Sales at Thales Alenia Space at JV level and CEO of ALTEC S.p.A. service company controlled by TAS.

Ken Hodgkins serves as the Director for the Office of Space and Advanced Technology in the Bureau of Oceans, Environment and Science at the U.S. Department of State. The office is responsible for bilateral and multilateral cooperation in civil and commercial space and high technology activities, including the International Space Station, collaboration in global navigation satellite systems, the International Thermonuclear Experimental Reactor (ITER), and nanotechnology, and represents the Department in national space policy review and development. Mr. Hodgkins serves as the U.S. Representative to the UN Committee on the Peaceful Uses of Outer Space (COPUOS). He has been the State representative for major Presidential policy reviews on remote sensing, the Global Positioning Satellite (GPS) system, orbital debris, and the use of space nuclear power sources in space. Before coming to the State Department, he was the Director for International Affairs at the National Environmental Satellite Data and Information Service (NESDIS) of the Department of Commerce. Mr. Hodgkins holds a BA in Political Science (1978) and an MPA (1980) from the University of Maine at Orono. He joined the Federal government in 1980 as a Presidential Management Fellow.

Mamoru Ishii serves as the Director of Japan’s Space Weather and Environment Informatics Laboratory, National Institute of Information and Communications Technology (NICT), Japan. He has been leading Japanese operational space weather forecast as a member of International Space Environment Service (ISES). He manages research projects with South-Asian countries for measuring equatorial ionospheric phenomena for more than ten years, and acts as a secretary of Asia-Oceania Space Weather Alliance (AOSWA). Dr. Ishii holds a Dr. of Sci. from Kyoto University (1993).

Robert (Bob) Jackson has been involved with Global Navigation Satellite Systems for over 20 years, in a range of capacities. He currently leads Lockheed Martin Space Systems Company’s campaign to develop and deploy a 2nd generation satellite based augmentation system. He has assembled a multinational industrial team that is engaged in implementing a collaborative testbed with Australia and New Zealand. Earlier in his career, Bob supported the FAA’s Wide Area Augmentation System, India’s GAGAN system, and Japan’s MSAS program. He is a graduate of the Fletcher School of Law and Diplomacy, Tufts University.

Seth Jonas has experience in policy analysis, strategy and metric development, program evaluation, and quantitative analysis across a broad range of topics and agencies. Select areas of study include space weather, hazard preparedness, infrastructure security and resilience, federal government continuity

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programs, national security, and emergency preparedness communications. Dr. Jonas has held fellowships at Los Alamos National Laboratory, Brookhaven National Laboratory, and with the JASON scientific advisory group for U.S. national security. He holds an MA and a PhD in physics from Johns Hopkins University, and two BS degrees from the University of Central Florida in physics and liberal science studies (math and chemistry).

Frank Koza serves as Executive Director of Infrastructure Planning support at PJM Interconnection, where he has worked for over 15 years. He also serves as the Chair of the Geomagnetic Disturbance Standard Drafting Team and former Chair of the Operating Reliability Subcommittee of the North American Electric Reliability Corporation (NERC). Previously, Mr. Koza worked for 29 years at PECO Energy in a variety of assignments, including construction of fossil and nuclear generation facilities, construction and maintenance of transmission, system planning, and system operations. Mr. Koza earned his Bachelor of Science in mechanical engineering from the University of Pennsylvania in 1972 and his Master of Engineering from Widener University in 1979. He is a registered professional engineer in the state of Pennsylvania.

William (Bill) Lapenta is the Director of the National Weather Service's National Centers for Environmental Prediction (NCEP). In this position, he oversees the planning, operations and science and technology integration of NCEP's Central Operations and Environmental Modeling Center. He is also responsible for oversight of NCEP's seven national service centers that deliver warning, forecast and guidance services for specific weather, ocean, climate, coastal and space weather phenomena. These centers include the Aviation Weather Center (Kansas City, MO), National Hurricane Center (Miami, FL), Space Weather Prediction Center (Boulder, CO), and the Storm Prediction Center (Norman, OK), as well as the Climate Prediction Center, Ocean Prediction Center, and Weather Prediction Center in College Park, MD. Dr. Lapenta was the Acting Director of NCEP's Environmental Modeling Center (EMC) from 2010 - 2013.

Jonathan Margolis serves as Acting Deputy Assistant Secretary for Science, Space, and Health in the Department of State's Bureau of Oceans and International Environmental and Scientific Affairs. In this position, he is responsible for policies and programs in the areas of International Science & Technology Cooperation, Space, & Advanced Technologies, and International Health and Biodefense. From 2007-2011, Mr. Margolis served as Deputy Assistant Secretary for Global Communications in the Bureau of International Information Programs. From 2006-2007, Mr. Margolis served as the Senior Coordinator for Global and Functional Issues in the Office of the Director of Foreign Assistance. From 1997-2006, Mr. Margolis served as the Department's Special Representative for Sustainable Development and headed the U.S. Delegation to the UN Commission on Sustainable Development. He also served as a member of international science and technology boards and sustainability partnerships. Mr. Margolis has a Ph.D. from Harvard University in psychology, focusing on negotiation and conflict resolution. He holds a master's degree from the Fletcher School of International Law and Diplomacy, and his undergraduate degree is in fine arts from Harvard College. He has also served as an Adjunct Professor at American University, and the

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Foreign Service Institute, where he has conducted courses on environmental policy, negotiations, and international organizations.

Mauro Messerotti, born in 1954, Mauro Messerotti has been researcher, permanent staff, at the Italian National Institute for Astrophysics (INAF)-Astronomical Observatory of Trieste, since 1987, and adj. prof. at the Dept. of Physics, Trieste University, since 2001, where he teaches meteorology and Climatology of Space. Specialised in solar radio physics, he has been acting as Senior Advisor for Space Weather at INAF HQ, member of the ESA Space Weather Working Team Steering Board, member of the ESF/ESSC Space Weather Assessment and Consolidation Working Group, and SSA expert for the NATO Science and Technology Organisation.

Terrance Onsager is a physicist at the National Oceanic Atmospheric Administration (NOAA) Space Weather Prediction Center (SWPC). Dr. Onsager is the liaison and coordinator for international space weather activities at SWPC and a Working Group Co-coordinator of Goal 6 of the Space Weather Operations, Research and Mitigation effort. He currently serves as the Director of the International Space Environment Service, which consists of 18 centers around the globe providing a range of services including forecasts, warnings, and alerts of space weather activity. His research has focused on fundamental topics of solar-terrestrial physics and more recently on directing our scientific knowledge toward the growing need for space weather services.

Christina Plainaki, Physicist in the field of circum-Terrestrial and Planetary Space Weather, is currently a Researcher of the Italian Space Agency. She got her PhD in Solar Cosmic Ray Physics from the National and Kapodistrian University of Athens (Greece) and continued her career as a PostDoc at the Italian National Institute of Astrophysics, until January 2017. Developer of a series of theoretical and numerical space weather models for the determination of the response of the near-Earth heliophysical environment to solar particle events, she has been the winner of two important international awards: the International Alexander Chizhevsky Medal for space weather and space climate (2014), for "outstanding results as a young scientist in space weather", awarded by the Belgian, the Norwegian and the Russian academies of science, in the context of the 11th European Space Weather Week; and the European Geophysical Union Outstanding Young Scientist Award (2014) "for fundamental studies on cosmic ray physics and on the interaction of icy moons surfaces with planetary magnetospheres". As an ASI-Scientist, she participates in different space projects such as JUNO/JIRAM, JUICE, and BepiColombo/SERENA. She currently coordinates an International Team of Researchers working on the comparison among different atmospheric models for Jupiter's icy satellite Europa (ISSI Bern project).

Vincenzo Romano is a research scientist at Italy's National Institute of Geophysics and Volcanology (INGV). Dr. Romano is researcher at INGV with more than 15 years of experience in Upper Atmosphere Physics, Radio Science, GNSS and Space Weather. He has been coordinator of several research projects as: "Upper Atmosphere Monitoring and Space Weather" by the Italian Antarctic Program (PNRA), still active; "IDIPOS - Italian Database Infrastructure for Polar Observation Sciences" by PNRA, concluded in 2013; "Warning and

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forecasting methodology in ionospheric scintillation for communication systems”, by Italian Ministry of Foreign Affairs, concluded in 2007. He has been involved in several international projects, often with Working Package leadership as: TRANSMIT (FP7, ITN Marie Curie, www.transmit-ionosphere.net), SCAR (Scientific Committee on Antarctic Research) GRAPE expert group (<http://grape.scar.org/>), “TREASURE-Training, REsearch and Applications network to Support the Ultimate Real time high accuracy EGNSS solution” (Innovative Training Networks at H2020 MARIE SKŁODOWSKA-CURIE ACTIONS), “MIERS – Mitigation of Ionospheric Effects on Radio systems” (COST 296 action) and, from the others, IPS, CIGALA, CALIBRA, ESPAS and MISW. In 2014 he has been the main-founder of the first INGV spin-off “SpacEarth Technology”, and now Managing Director. He is appointed as Space Weather expert in the Italian delegation at United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) in the years 2014-2017 and he is national co-coordinator in ISWI (International Space Weather Initiative). He published as first or co-author more than 50 papers in international scientific journals. He received his PhD in Engineering Surveying and Space Geodesy at University of Nottingham (UK); and MSc in Engineering, Electromagnetism, at University of Roma Tre (Italy).

Leonardo Sagnotti is Director of Research ("Dirigente di ricerca") at the "Istituto Nazionale di Geofisica e Vulcanologia" (INGV) in Rome (Italy) and Director of the "Environment" Department since 2016. For over 25 years he was the scientist-in-charge of the INGV paleomagnetic laboratory, that he founded in 1990. His scientific expertise is in the fields of paleomagnetism, rock magnetism and environmental magnetism. His research activity addressed the application of paleomagnetic and rock magnetic techniques to a broad variety of topics in the Earth Sciences. In particular, he developed researches on a wide range of topics ranging from integrated stratigraphy to geodynamics, geomagnetic field behavior in the geological past, paleoclimatic reconstructions as well as present-day air pollution. His main research areas are the Mediterranean and both Polar Regions. At present (May 2017) he co-authored 156 scientific papers. He was born and still lives in Rome.

Victoria Samson is the Washington Office Director for Secure World Foundation and has more than eighteen years of experience in military space and security issues. Before joining SWF, Ms. Samson served as a Senior Analyst for the Center for Defense Information (CDI), where she leveraged her expertise in missile defense, nuclear reductions, and space security issues to conduct in-depth analysis and media commentary. Previously, Ms. Samson was the Senior Policy Associate at the Coalition to Reduce Nuclear Dangers, and a researcher at Riverside Research Institute. Known throughout the space and security arena as a thought leader on policy and budgetary issues, Ms. Samson is often interviewed by multinational media outlets, including the New York Times, Space News, and NPR. She is also a prolific author of numerous op-eds, analytical pieces, journal articles, and electronic updates on missile defense and space security matters. Ms. Samson holds a Bachelor of Arts in political science with a specialization in international relations from UCLA and a Masters of Arts in international relations from the Johns Hopkins School of Advanced International Studies.

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Paul Shepson is an atmospheric chemist, and is currently serving as Director of the Division of Atmospheric and Geospace Sciences at the National Science Foundation, as a "rotator", on leave from Purdue University. He obtained a B.S. in Chemistry from State University of New York College at Cortland, and a Ph.D. in analytical/atmospheric chemistry from Penn State. He worked for Mobil Oil Corp. (Paulsboro refinery) in 1982, before moving to a research position in the Atmospheric Sciences Research Laboratory at the U.S. EPA in Research Triangle Park, N.C., from 1983-1987. From 1987 – 1994 he was a Professor in the Chemistry Department at York University in Toronto, where he was also Director of the York Centre for Atmospheric Chemistry. He has been a member of the Faculty at Purdue University since 1994, where he holds an appointment as Distinguished Professor of Chemistry, and Earth, Atmospheric, and Planetary Sciences. From 2008 - 2013 he was Head of the Department of Chemistry, and was also the founding Director of the Purdue Climate Change Research Center (PCCRC) in 2004. He is an avid pilot with instrument, commercial, and multi-engine ratings. Professor Shepson is keenly interested in understanding and communicating about the impacts of anthropogenic activities on the composition of the atmosphere, and how that relates to climate change and ecological impacts. He is a Fellow of the American Geophysical Union, and has ~210 peer-reviewed publications on various issues related to atmospheric and analytical chemistry. As AGS Division Director, Dr. Shepson has become an advocate for Space Weather.

Ralph Stoffler is the Director of Weather, Deputy Chief of Staff for Operations, Headquarters, U.S. Air Force, Washington, D.C. In this capacity, he is responsible for the development of weather and space environmental doctrine, policies, plans, programs, and standards in support of Army and Air Force operations. He is further responsible for overseeing and advocating for Air Force weather resources and monitors the execution of the \$320 million per year weather program. He is the functional manager for 4,300 total-force weather personnel and interfaces with Air Force major commands and the U.S. Army regarding full exploitation of Air Force weather resources and technology. He also represents the Air Force for interagency weather activities with the Department of Commerce, the National Aeronautics and Space Administration, and the Federal Aviation Administration. Mr. Stoffler advises the Secretary of the Air Force and Chief of Staff of the Air Force on atmospheric and space weather and climate matters and is the Department of Defense executive agent for modeling and simulation of the Air and Space Natural Environment. Mr. Stoffler is a retired Air Force colonel with 30 years of service and experience in Army operations, pilot instruction, planning, programming, resources, budget, and requirements. He served as a squadron commander as well as weather division chief and major command functional in Europe. He retired in 2011 as the Deputy Director of Weather at Headquarters, U.S. Air Force, Washington, D.C.