

SPACE WEATHER

AS A GLOBAL CHALLENGE

SPEAKER BIOGRAPHIES (by agenda order)

WELCOME REMARKS

Ambassador Kazutoshi Aikawa, is the Deputy Chief of Mission at the Embassy of Japan in Washington, a post he assumed in October 2017. He is also the current Permanent Observer of Organization of American States (OAS). Prior to his present position, he served as Director General of Disarmament, Non Proliferation and Science, Ambassador at the Ministry of Foreign Affairs of Japan. In 2014, Ambassador Aikawa was Councilor at Japan's Cabinet Secretariat after serving as the Deputy Director General (ASEAN/APEC SOM, G7 Sous Sherpa) at the Ministry of Foreign Affairs of Japan. His diplomatic experience include, serving in various outposts such as Japan's Permanent Mission to the United Nations in New York and the Embassy of Japan in Tehran. Ambassador Aikawa joined the Ministry of Foreign Affairs in 1983 and holds BL from the University of Tokyo and LLM from Colombia Law School.

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

JAPAN'S SPACE WEATHER EFFORTS AND OUTLOOK

Hideyuki Tokuda is President of the National Institute of Information and Communications Technology (NICT) and a professor emeritus of Keio University, Japan. He obtained his B.S. (1975), M.S. (1977) from Keio University and Ph.D. (Computer Science) (1983) from University of Waterloo, Canada. After he completed Ph.D. in 1983, he joined School of Computer Science, Carnegie Mellon University and worked on distributed real-time operating systems such as Real-Time Mach, the ARTS Kernel. In 1990, he came back to Keio University. His research and teaching interests include Ubiquitous Computing Systems, OS, Distributed Real-Time Systems, IoT, Cyber-Physical Systems. He is vice-chairman of the 3rd group of Science Council of Japan, IPSJ (Information Processing Society of Japan) Fellow, JSSST Fellow, a chairman of Smart IoT Acceleration Forum and a President of Connected Consumer Device Security Council and a member of ACM, IEEE IEICE and JSSST.

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Toshihiko Iyemori is professor emeritus of the Kyoto University, and former director of the Data Analysis Center for Geomagnetism and Space Magnetism (DACGSM) which belongs to the Graduate School of Science, Kyoto University. Since 1981, he has been serving geomagnetic data collected by the World Data Center for Geomagnetism, Kyoto, which the DACGSM operates. He was a president of the Society of Geomagnetism and Earth, Planetary and Space Sciences for 2011–2013 and a member of the Executive Committee of IAGA for 2009–2015. His major research field is the Solar–Terrestrial Physics and he is also investigating the electromagnetic effects of lower atmospheric disturbance to geospace. He is one of the members who created the IUGONET (Inter-university Upper atmosphere Global Observation NETWORK) which is a network of distributed databases based on a common metadata database. He serves the ICSU World Data System as a member of the Scientific Committee since 2015 until 2021.

Ayako Matsuoka is an Associate Professor in Japan Aerospace Exploration Agency. She has studied the electric and magnetic fields measured by satellites in space and the physics of the magneto-hydrodynamic waves. She has participated in the Japanese spacecraft missions exploring the terrestrial magnetosphere: AKEBONO (EXOS-D, launched in 1989) and GEOTAIL (1992), as a Co-Investigator of the electric field experiment. After she received the PhD at University of Tokyo in 1994, she started to work on the development of the magnetometer hardware to contribute to planetary and lunar exploration projects. She was Principal Investigator on the magnetic-field experiment (MGF) team of NOZOMI (Planet-B, 1998), and a Co-Investigator of the KAGUYA (SELENE, 2007) magnetometer (LMAG) team. She has been the Operation Manager of the AKEBONO mission since 1997, and the Project Manager from 2008 to 2015. Currently she is working on the magnetic field experiment as the Principal Investigator of ARASE (ERG, 2016) and Co-Principal Investigator of BepiColombo MIO (MMO, 2018).

PERSPECTIVES FROM AROUND THE GLOBE

Eric Laliberté is Director General, Space Utilization for the Canadian Space Agency (CSA). In this position, he is accountable for the overall planning, direction and general management of the Space Utilization Branch of the CSA, whose mandate is the end-to-end implementation of the Earth Observation, Satellite Communications and Space environment elements of the Canadian Space Program. Mr. Laliberté joined the CSA in 2001 where he held various positions the most recent being Director of Space Exploration Projects and Director General of Space Science and Technology. Eric holds a Masters in Engineering Management from the University of Sherbrooke and a Bachelor's degree in Mechanical Engineering with an automation specialty from McGill University. He served 12 years as an Aerospace Engineering Officer in the Royal Canadian Air Force before joining the Canadian Space Agency. He was part of the Air Reserve for 10 years where he assumed the responsibilities of Quality Manager and of 438 Squadron's Aircraft Maintenance Flight Commander.

Jean-Luc Bald is the First Secretary in charge of Space at the European Union Delegation to the United States of America. In his role, he works on cooperation between the European Union and the U.S., in particular for space-based navigation, Earth observation, space surveillance and tracking and space research. In his previous role, from 2008 to 2014, he worked on Galileo, Copernicus, European space policy, and defence and security industries within the European Commission's Directorate-General for Enterprise and Industry. Previously, he was at the European GNSS (Galileo) Agency in 2007. Jean-Luc Bald has 25 years of professional experience in both the private and public sector, including a 3-year period as an entrepreneur. His career includes roles in financial management and in management consulting with a focus on the

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telecommunications, broadcasting and banking sectors. It took him to France, Germany, Belgium and now the U.S. In 1992, adding to a Bachelor in Finance degree obtained in Strasbourg (France), he completed a Master's degree in Business Administration at the University of Kansas School of Business, USA, after having been selected for an exchange scholarship with the University of Strasbourg.

Micheline Tabache is the Head of the European Space Agency office in Washington since March 2013. She represents the Agency in the United States and Canada, and supports the implementation of the Agency's cooperation with these two States, and the identification of new areas of potential collaboration. Micheline was Administrator in the International Relations Department of the European Space Agency for 12 years, and was responsible for the US, Africa, Mediterranean and Middle East desks. Before re-joining ESA, she was an Associate with Booz Allen & Hamilton, performing and managing technical contracts principally for the European Space Agency, but also for the European Commission or the World Bank. Micheline is a graduate of the University of California, Berkeley and holds a Master of Science in electronic materials. Micheline also holds a Chemical Engineering master degree, from the Ecole Nationale Supérieure de Chimie de Paris.

Roberto Vittori serves as the Space Attache at the Italian Embassy. He was born on 15 October 1964 in Viterbo, Italy, and graduated from the Italian Air Force Academy in 1989 with a degree in Aeronautical Science. He completed basic training with the US Air Force at Reese Air Force Base in Texas in 1990, and he graduated from the US Navy Test Pilot School in 1995, completing also a master's degree in physics in December 2007. From 1991 to 1998 he has logged nearly 2000 hours in over 40 different aircraft, including F-104, EF200, Tornado GR1, F-18, AMX, M-2000, G-222 and P-180, serving at the 155th Squadron, 50th Wing, Piacenza, and at the Italian Test Centre, Pratica di Mare. In July 1998, he was selected as an astronaut by Italian Space Agency in cooperation with European Space Agency and he joined ESA's Astronaut Corps. In August 1998 he entered the 1998 Astronaut Class, at NASA's Johnson Space Center in Houston, for assignments on the Space Shuttle and International Space Station. As astronaut he flew three times in space: from 25 April to 5 May 2002 (a taxi-flight to the ISS); from 15 to 25 April 2005 (to the ISS, also having an active role in piloting and docking the Soyuz spacecraft); from 16 May to 1 June 2011 (joining the Shuttle STS-134 mission to the ISS). This was also the final flight of Space Shuttle Endeavour.

Bill Murtagh is the Program Coordinator for the National Oceanic and Atmospheric Administration (NOAA), Space Weather Prediction Center (SWPC) in Boulder, Colorado. Bill is NOAA's space weather lead in coordinating preparedness and response efforts with industry, emergency managers, and government officials around the world. He regularly briefs the White House, Congress, and federal agencies on vulnerabilities of critical infrastructure to space weather storms. Bill is also a key contributor in U.S. government efforts to advance international cooperation in space weather-related activities. Before joining NOAA, Bill was a meteorologist and space weather forecaster in the United States Air Force. He coordinated and provided meteorological support for national security interests around the world. Bill transferred to the SWPC in 1997 as a space weather forecaster and liaison between NOAA and the U.S. Air Force. He joined NOAA in 2003 after retiring from the Air Force with 23 years of military service.

Krystal Wilson is a Director of Space Applications Programs at Secure World Foundation and has over 10 years of international and domestic space, public policy, and management experience. Prior to joining SWF, Ms. Wilson was a consultant at Access Partnership, where she worked with international satellite service providers and other leading technology companies on policy issues related to spectrum management, emergency communications, telecommunications standards, orbital debris, and multilateral processes including representing industry at the Inter-American Telecommunication Commission. She has also served

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as a project manager at the Tauri Group, a leading aerospace analytics firm, providing research, analysis, strategic planning, and regulatory assessment to government and commercial clients. She led and supported production of NASA's strategic plans, audits, performance plans, budgets, and annual reports. Her work exposed to the full range of NASA's Earth observation, human exploration, and aviation programs. In that role, she was also recognized as a key member of a data management team that received the NASA Group Achievement Award. Previously, Ms. Wilson was in the field of international development as a Monitoring and Evaluation Manager at Development Alternatives, Inc in Afghanistan working on US military and local government initiatives and as Senior Program Assistant at the National Democratic Institute in Africa and Washington, DC working on sustainable governance projects. In those roles, she worked closely with the United Nations, the World Bank, the Department of State, the Department of Defense, US and international nonprofits, and others. Ms. Wilson holds a BSFS in International Politics from Georgetown University's School of Foreign Service in Washington, DC and completed the Programme Internationale at Sciences-Po in Paris, France.

TOWARD IMPROVED SPACE WEATHER SERVICES

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).

Terrance Onsager currently serves as a Program Scientist in the NASA Heliophysics Division and as a physicist at the National Oceanic and Atmospheric Administration (NOAA) Space Weather Prediction Center (SWPC). Dr. Onsager a Working Group Co-coordinator for the U.S. National Space Weather Operations, Research and Mitigation effort and a coordinator for international space weather activities at SWPC. He also 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.

Elsayed R. Talaat is the Director of the Office of Projects, Planning, and Analysis for NOAA's Satellite and Information Service. In this role, he provides leadership and oversight of the development, acquisition, integration, installation, and acceptance of major system elements (spacecraft, instruments, launch services, and ground systems) for NOAA's operational environmental satellite systems. Before joining NOAA, he was Chief Scientist of the Heliophysics Division at NASA Headquarters. In this role, he directed overall development efforts for the Heliophysics space science program. Previously, he was a Program Scientist at NASA Headquarters where he served as Program Scientist for the Living With a Star mission and science line, grant research lines and Heliophysics and Planetary missions. Before joining NASA, he was Supervisor of the Earth and Planetary Atmospheres Section at the Johns Hopkins University Applied Physics Laboratory where he lead projects developing remote sensing techniques and data analysis and modeling of geophysical and planetary phenomena. Dr. Talaat received his B.S. in Aeronautics and Astronautics Engineering from the University of Washington, and an M.S. and Ph.D. from the University of Michigan in Atmospheric and Space Sciences.

Ian Mann currently serves as the Rapporteur of the UN COPUOS Space Weather Expert Group. Dr. Mann is a Professor and Canada Research Chair in Space Physics Science at the University of Alberta. His group

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focuses on experimental and theoretical research in space physics. His CARSIMA group are experts in magnetometry operating one of the foremost ground-based arrays in the world. He has research partnerships with Canadian Space Agency and NASA satellite missions, and conducts public outreach through AuroraWatch real time aurora alert forecast service.

Nat Gopalswamy is an Astrophysicist with the Solar Physics Laboratory, Heliophysics Division of NASA's Goddard Space Flight Center. He is an internationally recognized expert in coronal mass ejections and their space weather consequences, with a deep interest in understanding how solar variability impacts Earth. He has over 30 years of experience in solar-terrestrial research, working on projects such as SOHO, Wind, STEREO, and SDO. He is also a solar radio astronomer working on thermal and nonthermal radio emission from the Sun using data the Clark Lake Radioheliograph, the Very Large Array, and the Nobeyama Radioheliograph. He has authored or co-authored more than 400 scientific articles and has edited nine books. He has received numerous awards and honors including the 2013 NASA Leadership Medal and 2017 John C. Lindsay Memorial award for space science. He is currently the President of ICSU's Scientific Committee on Solar Terrestrial Physics (SCOSTEP) and the Executive Director of the International Space Weather Initiative (ISWI). He is a Fellow of the American Geophysical Union.

Mike Wiltberger is the new head of the Geospace Section within the Atmospheric and Geospace Science Division. Dr. Wiltberger comes to NSF from NCAR/HAO, where he works as a senior research scientist and Head of the AIM Section. His main area of research is the modeling of the magnetosphere and its interaction with the solar wind and coupled thermosphere-ionosphere system. Dr. Wiltberger earned his bachelor's degree in physics from Clarkson University, Potsdam, NY, in 1993, and his PhD. in space plasma physics in 1998 from the University of Maryland, College Park. Amongst his many scientific accomplishments are pioneering work on the inclusion of ionospheric outflow and the application of advanced statistical analysis in global models and ground-breaking results proving the connection between localized reconnection and, so-called, Bursty Bulk Flows in high-resolution simulations of the magnetotail. During his career, Dr. Wiltberger also has served in many important community functions, including as chair of the GEM Steering Committee, vice-chair of the AMS Science and Technology Committee on Space Weather, and as Vice Chair of the Solar Wind-Magnetosphere Interactions Panel of the 2010 NRC Decadal Survey for Solar and Space Physics. Furthermore, he holds Adjunct Professor positions at Rice University and the University of Colorado at Boulder, through which he has supervised several graduate students.

PERSPECTIVES FROM THE PRIVATE SECTOR

Ryoichiro Yasumitsu is the general manager of GNSS technical development and utilization at Mitsubishi Electric Corporation, Kamakura works. He is in charge of Quasi-Zenith Satellite System application expansion to the various field. Dr. Yasumitsu has a Ph.D. from the University of Tokyo in Aeronautics and Astronautics Engineering.

Hideaki "Max" Matsumoto is a pilot for All Nippon Airways (ANA). He is currently a captain on the Boeing 777 based in Tokyo. He joined ANA in 1999 and began his career as First Officer on the Boeing 767. He also serves as IFALPA Director for ALPA-Japan, representing more than 4000 pilots in Japan.

Susan Taylor, is a Senior Associate in the Division of Health and Environment at Abt Associates, a global leader in research and program implementation in health, social and environmental policy and international development. Dr. Taylor supported the National Oceanic and Atmospheric Administration's (NOAA) Space

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Weather Prediction Center (SWPC) with analysis of the socioeconomic impacts of space weather events, and continues to support SWPC with the assessment of user needs and requirements for products and services. Much of her work consists of engaging stakeholders across sectors vulnerable to space weather to develop tractable and quantitative estimates of physical effects and economic impacts. Her professional experience spans leadership across disaster resilience, Federal and State regulations and requirements expertise, and conducting programmatic and impact of investment evaluations. Specifically, her expertise spans communicating disaster forecasts, extreme value theory modeling and mapping in support of mitigation planning, and the development of new engineering build-design practices. Dr. Taylor has a Ph.D. from Vanderbilt University in Civil and Environmental Engineering.

Conrad C. Lautenbacher, Jr. is a retired U.S. Navy Vice Admiral, is the CEO of GeoOptics Inc., and serves on several boards including AccuWeather, and the Southeastern Coastal Ocean Observing Regional Association (SECOORA). Formerly he was Vice President of Scientific Support for CSC Corporation. As Undersecretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanic and Atmospheric Administration (NOAA) (2001-2008), Lautenbacher spearheaded the first international Earth Observation Summit in Washington in July 2003 and the subsequent activity to establish the Group on Earth Observations (GEO) and a sustained Global Earth Observation System of Systems (GEOSS). Before joining NOAA, he served as President and CEO of the Consortium for Oceanographic Research and Education (CORE) now known as the Consortium for Ocean Leadership (COL). As a Navy Flag Officer (Vice Admiral) he served as Commander, U.S. Third Fleet, Director of Force Structure, Resources, and Assessments (J-8) on the Joint Staff, Commander of U.S. Naval Forces, Riyadh during Operations Desert Shield and Desert Storm. and Deputy Chief of Naval Operations (N-8) responsible for developing the Navy Future (five) Years Program and annual budget. He is a graduate of the U.S. Naval Academy (B.S. '64) and holds M.S. and Ph.D. degrees from Harvard University in applied mathematics.

David Roop is Director for Electric Transmission at Dominion Electric Power. David W. Roop is currently Director of Electric Transmission Operations & Reliability in the Power Delivery Group. He is responsible for the operation of Dominion Energy's transmission assets, including substations in three states. This includes over 6600 miles of transmission lines, 390 substations and 42,000 relays. Presently manages an organization that provides technical support and engineering resources for electrical equipment, protective relays and operations including research activities to support Transmission System development. His organization also provides technical support for Dominion Generation substations, including protective relaying, for both regulated and merchant plants. Mr. Roop has a 42-year career in the electric utility industry focused on electric transmission and substation operations and management. During his career he has developed innovative approaches to improving operating procedures, resulting in cost savings to the Company. He serves as chair of Dominion Energy Virginia's resiliency strategy team resulting in industry leading initiatives. He is an active member of CIGRE presently serving as the President of the CIGRE U.S. National Committee. He was elected to the National Academy of Engineering in 2018 and the Virginia Academy of Science, Engineering, and Medicine. Mr. Roop is currently a Senior Member of the IEEE and is a recipient of the IEEE Power Engineering Society, 2014 Leadership in Power Award for industry-wide leadership in: changing the landscape of utility human performance and safety; reliability driven asset strategy development; novel catastrophe recovery planning; and the renaissance of the power engineering research and education. His other professional activities include membership on various advisory committees for EPRI and the North American Transmission Forum (NATF) that support resiliency and nuclear power. He is past Chair of the NATF Nuclear Power Plant Practices committee. He also actively supports Virginia Tech, University of Pittsburgh and the University of Tennessee Electrical Engineering

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departments to further develop future engineers for the electric industry. He earned his Bachelors of Science Degree in Electrical Engineering from Virginia Tech in 1976 and is a registered Professional Engineer in the Commonwealth of Virginia. He currently resides with his family in Henrico, VA.

CONCLUDING REMARKS

Tomohiko (Tom) Arai serves as Science Counselor, Chief of Science Section at the Embassy of Japan in the United States of America. He graduated from Waseda University in 1997, majoring in Natural Resources Studies and earned a master's degree in International Science and Technology Policy from the George Washington University Elliott School of International Affairs in 2004. He entered the Science and Technology Agency in Japan in 1997 and has served in various positions related to Science and Technology policy, including Deputy Director for Life Sciences at the Directorate of Council for Science and Technology Policy in the Cabinet Office; First Secretary at the Embassy of Japan in the United Kingdom and Principal Deputy Director for the Planning Section at the Ministry of Education, Culture, Sports, Science and Technology(MEXT) Research Promotion Bureau. He also previously served as Secretary to the Vice Minister of MEXT and as a Director for Planning and General Affairs at Tohoku University's Tohoku Medical Megabank Organization in Japan.

Chris Cannizzaro is a physical science / foreign affairs officer in the State Department's Office of Space and Advanced Technology. In this capacity he develops policy and technical analysis on a wide range of issues pertaining to space, science and emerging/enabling technologies. He regularly speaks on behalf of the United States in a variety of international venues including our bilateral space policy dialogues and as a Vice-Chair to the OECD's Committee for Scientific and Technological Policy. Mr. Cannizzaro joined the Department of State in 2008 as a AAAS Science and Technology Policy Fellow. Prior to that, he was a research Assistant Professor in the Department of Biomedical Engineering at Tufts University and a Research Affiliate in the Harvard-MIT Division of Health Sciences and Technology. He received a B.S. from the University of Massachusetts, Amherst and a Ph.D. from the Swiss Federal Institute of Technology, both in Chemical Engineering. In addition he was a Fulbright Scholar at the University of Milan, a Visiting Scholar at the Hawaii Natural Energy Institute, and a Postdoctoral Associate at the Massachusetts Institute of Technology.