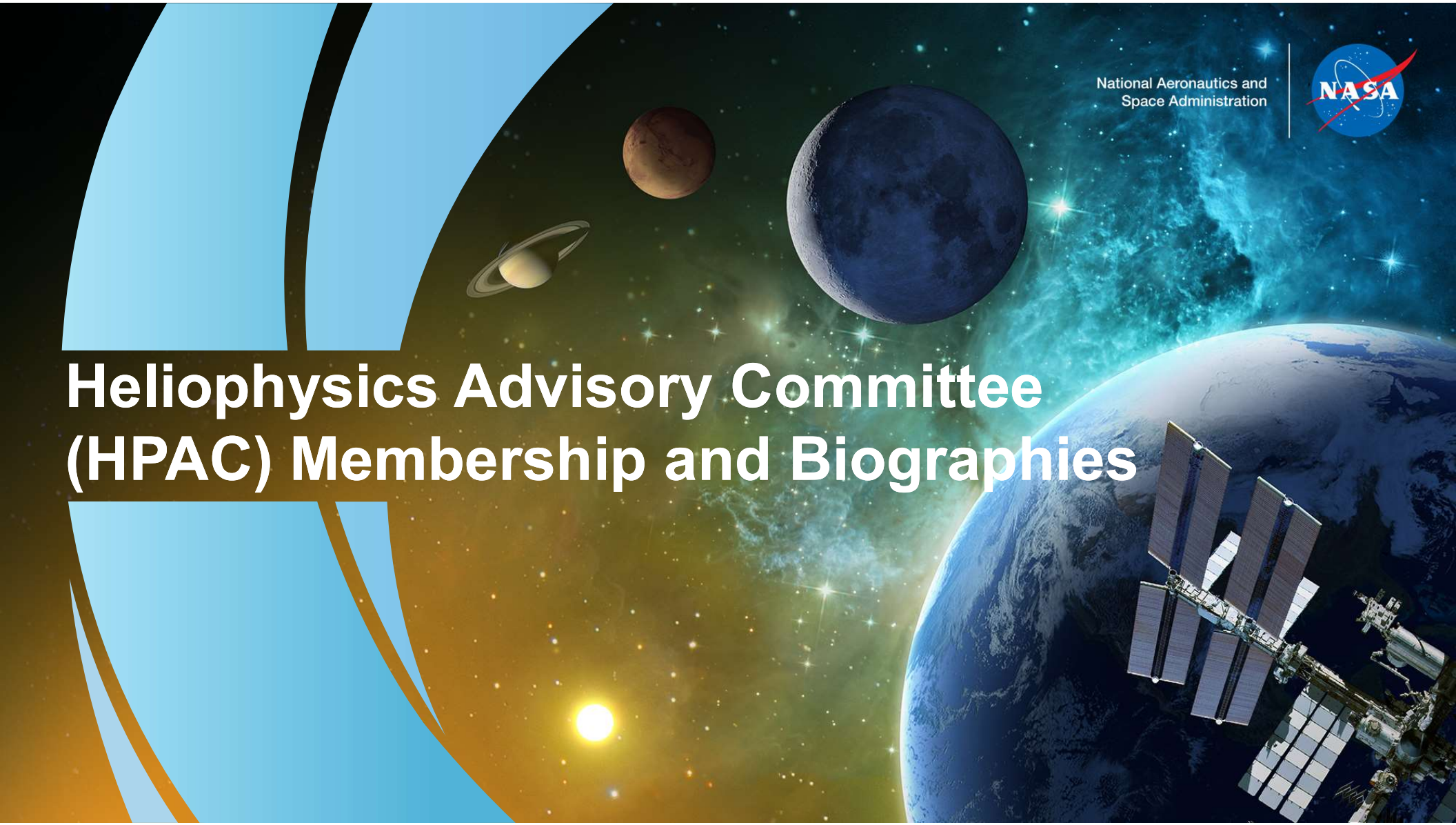


Heliophysics Advisory Committee (HPAC) Membership and Biographies

Heliophysics Division (HPD) Leadership

HPD Division Director | Joe Westlake

Dr. Joseph (Joe) H. Westlake is the Director of the Heliophysics Division in the Science Mission Directorate at NASA Headquarters. He leads a world-class team in understanding Earth's most important and life-sustaining star.

Before his NASA career, Dr. Westlake was the Space Physics Chief Scientist at Johns Hopkins University Applied Physics Laboratory (JHUAPL). He was the Principal Investigator for the Plasma Instrument for Magnetic Sounding (PIMS) an instrument to be flown on the Europa Clipper spacecraft which will be responsible for determining the plasma influence on the induced magnetic field at Jupiter's moon Europa to determine its ice shell thickness, ocean depth, and ocean salinity. He was the Project Scientist for the Interstellar Mapping and Acceleration Probe (IMAP) mission that will discover the processes responsible for the structure and dynamics of the heliosphere. He was a member of NASA's Planetary Advisory Committee (PAC). He has made significant contributions to several missions including the Magnetospheric Multiscale (MMS), ESA's JUICE mission to Ganymede, and Cassini.

Dr. Westlake has authored or co-authored more than 40 peer-reviewed manuscripts including 4 publications in high-impact scientific journals.

Dr. Westlake earned a doctorate in Space Physics from the University of Texas at San Antonio.

HPD Deputy Division Director | Peg Luce

Margaret (Peg) Luce is the Deputy Division Director of the Heliophysics Division in the Science Mission Directorate at NASA Headquarters. The Heliophysics Division manages a portfolio of space systems and scientific research dedicated to studying the Sun, heliosphere, and planetary environments as elements of a single interconnected system. Before joining Heliophysics in 2015, she had served for seven years as the Deputy Director of NASA's Earth Science Division.

Luce joined NASA's Goddard Space Flight Center in 1987 following six years of engineering experience in the private sector. Throughout her career, Luce has been involved in the development of spaceflight systems to support NASA's science programs. At Goddard, she served in numerous leadership roles in the Flight Projects Directorate, including Project Manager for the Earth Observing System Aura Mission, Associate Director of Flight Projects for Project Formulation, and Chief of the Advanced Concepts and Formulation Office.

Luce received a B.S. in Engineering Mechanics from the University of Wisconsin, Madison.

HPD Transition Advisor | Therese Jorgensen

Therese Jorgensen currently serves as the Transition Advisor for the Heliophysics Division at NASA HQ. She does so on a detail from NASA Ames Research Center, where she is Director of the New Opportunities Center. Therese's prior experiences include more than 13 years as Program Director and Section Head for Geospace Sciences at the National Science Foundation. Her accomplishments include conceiving and implementing the National Science Foundation's CubeSat program, for which she won the NSF Director's Award for Excellence in Program Management. That program has since been modeled at NASA and other agencies around the world as a standard of an effective management approach to scientific CubeSat programs. It also has firmly established the scientific value of CubeSats by developing highly successful, creative, and innovative missions that carry out important science experiments. In recognition of extraordinary leadership and community service in the field of space science, particularly for her support of CubeSat technology, Therese was honored with AGU's 2020 Waldo E. Smith Award.

Therese has a M.Sc. degree from Aarhus University, Denmark, and a Ph.D. degree in theoretical physics from the University of Oxford, U.K. She is a recognized space physics scientist and worked in various senior research positions in Denmark and in the US, before joining the National Science Foundation in 2004. In 2017 Therese joined the University of Bergen, Norway, as a Senior Scientist and Advisor in the Department of Physics and Technology. During 2019-2020, she was the co-lead and proposal manager for the phase-0 science study for the Daedalus satellite project, a candidate of ESA's Earth Explorers program.

HPD Associate Director for Flight Programs | Nicki Rayl

Nicole (Nicki) Rayl is the Associate Director for Flight in the Heliophysics Division of the Science Mission Directorate at NASA Headquarters. In this role, she leads the flight portfolio for 12 spaceflight missions in development and 20 operating missions.

Nicki joined NASA at the Ames Research Center in 2004 as a Payload Manager for life science payloads on the Space Shuttle and International Space Station. From 2004-2013, Nicki was a payload and project manager, responsible for numerous flight payloads, hardware developments, ground facilities and technology demonstrations, ranging from cell biology, microbiology, plant biology to invertebrate and vertebrate biology and human research. Nicki led the development of the GeneLab initiative, as well as the U.S./Russian collaborative project for Bion-M1 and enabled numerous international cooperations through the U.S./Russian Joint Working Group and the International Space Life Sciences Working Group.

Prior to her current role, Nicki was the Acting Chief Technology for SMD and the Space Biology Program Manager, a position she has held from 2013-2021. In that capacity, she developed and implemented research and engineering developments for NASA's non-human biological research, to further understand the basic mechanisms of adaptation or acclimation to spaceflight.

Before joining NASA, Nicki worked as a field marine ecologist and scientific diver, focusing on invertebrate biology and invasive species models. She has a bachelor's degree from UC Davis in Environmental Biology/Marine Ecology.

HPAC Leadership

Designated Federal Officer (DFO) | Janet Kozyra

Program Scientist | NASA's Heliophysics Division

Janet Kozyra is a Program Scientist of the Heliophysics Division in the Science Mission Directorate at NASA Headquarters. Kozyra's work as a heliophysicist involves researching solar superstorms and using data from Imager for Magnetopause to Aurora Global Exploration (IMAGE), to show that Earth interacts with solar energy during solar storms. She serves as the Designated Federal Officer (DFO) on the Heliophysics Advisory Committee (HPAC). Prior to joining Heliophysics in 2017, she had served for nine years as an Assistant Research Scientist at the University of Michigan.

In 2005, Kozyra was named the George Carignan Collegiate Research Professor.

Kozyra received a B.S. in Astronomy and Physics in 1979, a M.S. in Aeronomy & Space Physics in 1981, and a Ph.D. in Aeronomy and Space Physics in 1986 all from the University of Michigan.

HPAC Chair | Dr. Paul Cassak

Professor & Associate Director | West Virginia University/KINETIC Plasma Physics

Dr. Paul Cassak is a Professor at West Virginia University. He became Associate Director of the Center for KINETIC Plasma Physics in 2020, and a WVU ECAS Woodburn Fellow from 2020-2022. His research focuses on magnetic reconnection and its applications using analytical techniques, large-scale numerical simulations, and observational data as appropriate. Applications of reconnection are many; solar eruptions (flares and CMEs) and similar eruptions on other sun-like stars, substorms and solar wind-magnetospheric coupling in the geomagnetic magnetic field (relevant to the field of space weather), disruptive events in fusion plasmas, and various astrophysical settings.

His work focuses on reconnection through laboratory experiments (PHASMA Experiment), kinetic and fluid models incorporating the effects of flow shear, turbulence, asymmetries and nonlinear dynamics, three-dimensional magnetic reconnection models, and through his participation on the Theory and Modeling Team of NASA's Magnetosphere Multiscale Mission.

He holds a graduate degree in Physics from the University of Wisconsin and a doctorate degree in Physics from the University of Maryland.

HPAC Vice Chair | Dr. Chris Englert

Superintendent | U.S. Naval Research Laboratory Space Science Division

Dr. Chris Englert is Superintendent of the U.S. Naval Research Laboratory's Space Science Division. He directs the conception, planning, and execution of space science research and development programs in two major areas: theoretical, experimental, and numerical research of geospace science and technology, solar and heliospheric physics, and the high-energy space environment; and conception, design, fabrication, integration, test, operation and experimentation with forefront space instrumentation flown on space and near-space platforms.

Dr. Englert joined the federal service at NRL's Space Science Division in 2001 as staff research physicist, became Head of the Planetary Atmospheres Section in 2009, and Head of the Geospace Science and Technology Branch in 2012. During this time, he predominantly worked on high spectral resolution, remote sensing instrumentation and observations, covering the electromagnetic spectrum from the ultraviolet to the thermal infrared. He served as the Instrument Scientist of a Space Shuttle payload flown in 2002, the Principal Investigator (PI) of the first long duration, satellite borne Spatial Heterodyne Spectrometer, and the PI of a satellite payload to observe thermospheric wind and temperature. His roles included a broad range of responsibilities ranging from instrument conception to the analysis, interpretation and publication of the scientific results.

He holds a graduate degree in Physics from the Technical University of Munich and a doctorate degree (summa cum laude) in Physics from the University of Bremen.

HPAC Members

Dr. Aroh Barjatya

Professor of Engineering Physics & Director of the Space and Atmospheric Instrumentation Lab | Embry-Riddle University

Dr. Aroh Barjatya is a Professor of Engineering Physics and Director of the Space and Atmospheric Instrumentation Lab at Embry-Riddle Aeronautical University. He is a space systems expert with research interests and active projects spanning small satellites, sounding rockets, high-altitude balloons, spacecraft charging, embedded electronics, space situational awareness, and space systems engineering.

Dr. Barjatya has written or co-written fifteen successful proposals over the last decade and has overseen seven space flight projects from the proposal stage to commissioning. He is currently part of 6 additional missions, including as the PI of APEP- Eclipse Sounding Rocket campaign and a Co-I on NASA ESCAPADE mission to Mars.

Dr. Barjatya holds masters and doctoral degrees in Electrical Engineering from Utah State University. He is a member of the American Geophysical Union, the American Institute of Aeronautics and Astronautics, the American Association for the Advancement of Science, and a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE).

Dr. David Brain

Associate Professor in the Laboratory for Atmospheric and Space Physics & Chair of the Department of Astrophysical and Planetary Sciences | University of Colorado

Dr. David Brain is an Associate Professor in the Laboratory for Atmospheric and Space Physics, and the Chair of the Department of Astrophysical and Planetary Sciences at the University of Colorado. Dr. Brain uses observations and models to study the atmospheres and plasma environments of rocky planets, including Mars, Venus, and exoplanets. Interaction between these planets and their host stars alters their atmospheres over time. By studying atmospheric processes that occur today we can unravel how planetary atmospheres evolve and why their atmospheres can be different from our own. A goal of this research is to determine which combination of characteristics of planets and stars leads to habitable atmospheres.

Dr. Brain is the Principal Investigator of a NASA ICAR grant to determine the influence of atmospheric escape on planetary habitability. He chairs the Science Advisory Board for the NASA MAVEN mission and is a science team member the UAE EMM, NASA ESCAPADE, and JAXA MMX missions.

He holds a B.A. in Physics and in Math from Rice University, and a Ph.D. in Astrophysical, Planetary, and Atmospheric Sciences from the University of Colorado at Boulder.

Dr. Nicole Duncan

Strategic Planning Manager | Civil Space, Ball Aerospace

Dr. Nicole Duncan serves as the Strategic Planning Manager for Ball Aerospace's for Civil Space division. Dr. Duncan oversees the division's annual Strategic Plan, spearheads special projects across the space mission lifecycle and drives development of advanced technologies. Previously, Dr. Duncan managed Ball Aerospace's Mission Formulation and technology development activities for Heliophysics, Astrophysics, and Planetary Science. In this role, Dr. Duncan developed innovative mission concepts for both scientific and operational purposes across the Solar System.

Dr. Duncan established the company's Heliophysics and Space Weather Program and continues to act as a company subject matter expert for these disciplines. In this capacity she regularly advises Ball's Heliophysics and Space Weather activities for multiple Civil and Defense agencies and participates in community-driven forums where she connects between science, national policy, and industrial communities.

Dr. Duncan holds a Ph.D. in Physics from the University of California, Berkeley. Her graduate research focused on particle energization and transport in solar flares.

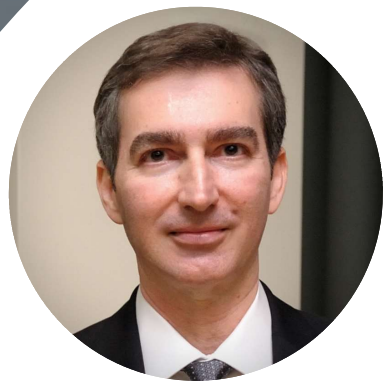
Dr. Matina Gkioulidou

Senior Staff Scientist | Johns Hopkins Applied Physics Laboratory

Dr. Matina Gkioulidou is a Senior Staff Scientist at the Johns Hopkins Applied Physics Laboratory. Her background is in data analysis and instrumentation of energetic ions in the Earth's magnetosphere, focusing on plasma acceleration processes in Earth's magnetosphere during geomagnetic storms, to the heliosphere's interactions with the interstellar medium. As Co-I of the RBSPICE instrument on the Van Allen Probes mission, she investigated physical processes that lead to the development of geomagnetic storm-time ring current, as well as ionospheric outflow.

Dr. Gkioulidou is the Co-I of the Interstellar Mapping and Acceleration Probe (IMAP) mission, and the Lead of the IMAP-Ultra instrument, which will measure Energetic Neutral Atoms (ENAs) coming all the way from our heliospheric boundary, revealing how that boundary is shaped by interactions with the interstellar medium. She is also the Deputy Instrument Scientist for the JENI instrument on ESA's JUpiter ICy moons Explorer (JUICE) mission, which will provide ENA images of Jupiter's magnetosphere for the very first time.

Dr. Gkioulidou graduated from the Physics Department of Aristotle University in 2006 and obtained her Ph.D. from the Department of Atmospheric Sciences of the University of California, Los Angeles (UCLA) in 2012.



Dr. Farzad Kamalabadi

Kung Chie and Margaret Yeh Endowed Professor in Electrical and Computer Engineering | University of Illinois Urbana-Champaign

Dr. Farzad Kamalabadi is the Kung Chie and Margaret Yeh Endowed Professor in Electrical and Computer Engineering and Professor of Statistics at the University of Illinois Urbana-Champaign, where he has been a faculty member since 2000. From 2010 to 2012, he was a Program Director at the National Science Foundation Division of Atmospheric and Geospace Sciences. He was a Visiting Professor with the French National Research Institute for Computer Science and Automation in 2008-2009, a NASA Faculty Fellow with the Jet Propulsion Laboratory, California Institute of Technology in 2003, and a Visiting Fellow with SRI International in 2002.

Dr. Kamalabadi directs a research program spanning space physics, sensing and imaging technologies, data science, and theoretical foundations of machine learning and its applications to scientific inference. His work on computational spectral imaging with diffractive optical systems integrates recent advances in signal processing with emerging small satellite technologies to investigate the solar corona at unprecedented resolution. His scholarly contributions in solar tomography have enabled multi-dimensional characterization of coronal plasma dynamics. His work on ionospheric sensing and imaging with UV and radio techniques focuses on the investigation of plasma processes and their interactions with neutral dynamics.

Dr. Kamalabadi received a B.S. degree in Computer Systems Engineering from the University of Massachusetts, Amherst, and M.S. and Ph.D. degrees in Electrical Engineering from Boston University.

Dr. Laura Peticolas

Associate Director | EdEon STEM Learning

Dr. Laura Peticolas is Associate Director of EdEon STEM Learning at Sonoma State University. She works to engage teachers and students in Earth and Space Physics participatory experiences using coding, hardware, and experimental design. Dr. Peticolas has over 15 years of experience in the education and outreach fields, leading or co-leading NSF-, NASA- and Department of Education-funded national science education programs. She continues to create Science, Technology, Engineering, and Math (STEM) activities and curriculum, and to provide professional development for educators on topics in physics, computing, engineering, earth science, and space science, all while leading large-scale programs.

Dr. Peticolas received her B.A. in Mathematics and Physics at the University of Oregon Honors College in 1993 and her Ph.D. in Physics studying the aurora at the University of Alaska, Fairbanks in 2000. She spent 3 years as a post-doctoral fellow at the University of California Berkeley's Space Sciences Laboratory (SSL) continuing her study of Earth's aurora using NASA's Fast Auroral SnapshoT satellite data and computational models. During this time, she expanded her research to include developing computer models of the Martian aurora, which continued for several years. Ultimately, she forewent science research to lead the education group at SSL. After 17 years at SSL, Dr. Peticolas joined Sonoma State University to continue her passion for mentoring under-represented, economically disadvantaged, and historically marginalized students in STEM+Computing careers.

Dr. Chadi Salem

Scientist, Space Physicist (and former Associate Director of the Solar & Heliospheric Physics Group) | University of California Berkeley

Dr. Chadi Salem is a Scientist/Physicist at the Space Sciences Laboratory (SSL) of the University of California Berkeley (UC Berkeley). He served as Associate Director of the Solar Heliospheric Group from February 2021 to June 2023. Dr. Salem focuses on problems of plasma astrophysics, from the experimental/observational point of view, with a particular focus on the solar wind and solar coronal plasma. The solar wind, emanating from the hot solar corona, is a weakly collisional, strongly turbulent plasma undergoing supersonic and super-Alfvenic spherical expansion, inside which space experiments have furnished the scientific community with a wealth of data (electromagnetic fields, particle distribution functions and associated moments) at a resolution which is not available in any terrestrial laboratory. This makes the solar wind a unique environment in which to study MHD and kinetic turbulence as well as fundamental plasma processes in astrophysical plasmas. These processes include solar wind turbulence at both MHD and kinetic levels and kinetic, dissipative plasma processes such as structures, waves, wave-particle interactions, instabilities, and ion/electron thermal noise. A significant part of his work is dedicated to solar wind electron microphysics, to understand electron energy and heat transport phenomena in the heliosphere.

Dr. Salem earned a M.S. in Physics in 1996 from the University of Paris VII Denis Diderot and a Ph.D. in Astrophysics and Space Techniques from the University of Paris VII Denis Diderot in December 2000.

Dr. Lisa Upton

Solar Physicist | Southwest Research Institute

Dr. Lisa Upton is a Solar Physicist based in Colorado at the Southwest Research Institute. She was Co-Chair of the Solar Cycle 25 Prediction Panel, a panel of experts, sponsored by NASA and NOAA, that met in 2019. She is a member of the COFFIES: Consequences of Fields and Flows in the Interior and Exterior of the Sun Science Center, one of the three NASA-funded Heliophysics Phase II DRIVE Science Centers. This center is working to establish a multi-institution collaboration to develop the most reliable data-driven physical model of solar activity possible.

Together with David Hathaway, she is one of the original authors of the Advective Flux Transport (AFT) SFT model used to investigate SFT processes and make solar cycle predictions. She continues to play a leading role in its further development. She has also championed its use in coronal modeling and as a resource for testing data analysis techniques.

Dr. Upton received a Ph.D. in Physics from Vanderbilt University in 2014. She serves on the Solar Physics Division's Student Organizing Committee. Upton is the lead developer and maintainer of a website Solar Cycle Science, that is intended to share solar knowledge and data with the general-public and scientists alike.

Dr. Marco Velli

Professor & Joint Appointee | NASA/Jet Propulsion Laboratory

Dr. Marco Velli is a Professor at the University of California in Los Angeles (UCLA) and holds a joint appointment the NASA/Jet Propulsion Laboratory. His research focuses on space plasma physics and solar magnetic activity with particular emphasis on the stability of magnetic structures anchored in the photosphere such as coronal loops; wave propagation and shock formation in inhomogeneous and stratified plasmas; nonlinear evolution of current sheets and magnetic reconnection; the properties of turbulence in dynamically forced, open systems; and wave particle interactions in the solar corona and heliosphere.

He is principal investigator of Heliospheric Origins on the Solar Probe Plus (SPP) mission, the first spacecraft to fly within 9 solar radii of the Sun's surface, directly studying the outer solar corona and acceleration region of the solar wind. As the mission's observatory scientist, he will provide an independent assessment of scientific performance and act as a community advocate for the mission.

Dr. Velli received his Ph.D. in Physics, and Scuola Normale Superiore (combined degree), from the University of Pisa, in Italy in 1985.

Dr. Jia Yue

Research Scientist | Catholic University of America & NASA Goddard Space Flight Center

Dr. Yue is the ionosphere thermosphere Lead Scientist at the NASA GSFC Community Coordinated Modeling Center. His research focuses on the theoretical, numerical, and experimental investigations of the dynamical, electrodynamical, and energetic coupling processes between Earth's lower and upper atmosphere and long-term changes in the terrestrial upper atmosphere. He specializes in fluid dynamics, thermodynamics, and electrodynamics applied to the upper atmosphere. He also specializes in optical remote sensing techniques (lidars and airglow imagers) to design, develop, deploy, and apply the instruments to upper atmosphere researches. He has worked with several global circulation models, such as TIME-GCM and WACCM, to characterize the impacts of gravity waves, planetary waves, and tides in the upper atmosphere. He is a Co-I and science team member of NASA TIMED/SABER and AIM missions, PI of the NSF CCMC project and Co-I of Citizen Science. He is now serving as the Associate Editor for JGR Atmospheres and a steering committee member for NSF CEDAR community.

Dr. Yue received his M.S. in ECE at University of Alaska Fairbanks in 2004 and Ph.D. in ECE at Colorado State University in 2009, specializing in Upper Atmosphere Dynamics and lidar remote sensing.

Dr. Eric Zirnstein

Research Scholar | Princeton University

Dr. Eric Zirnstein is a Research Scholar at Princeton University. He specializes in the simulation and analysis of pickup ion (PUI) dynamics and hydrogen energetic neutral atom (ENA) emission from the solar wind-very local interstellar medium interaction. He developed a parallelized numerical code that computes hydrogen ENA fluxes at 1 AU to simulate ENA measurements for NASA's Interstellar Boundary Explorer (IBEX) mission by post-processing 3D magnetohydrodynamic-plasma/kinetic-neutral simulation results of the heliosphere.

He also analyzes New Horizon's Solar Wind Around Pluto (SWAP) measurements of PUIs in the solar wind and at shocks. He is lead data analyst for the Solar Wind And Pickup Ion (SWAPI) instrument, and science team member for the IMAP-Lo, IMAP-Hi, and IMAP-Ultra ENA imagers, all in development for the upcoming Interstellar Mapping and Acceleration Probe (IMAP) mission.

His current research continues the simulation and analysis of observations made by the IBEX mission, New Horizons' SWAP measurements of PUIs, Voyager measurements of the outer heliosphere and interstellar medium, the properties of non-thermal PUIs at shocks and turbulence, ENAs' evolution with the solar cycle, as well as the interstellar magnetic field draped around the heliosphere.

Dr. Zirnstein received his M.S. in 2012, and Ph.D. in 2014, both in Physics, at the University of Alabama in Huntsville, specializing in Space Science.