Space Studies Board (SSB)

Committee

France A. Córdova

Chair

France A. Córdova is president of the Science Philanthropy Alliance, is an experienced leader in science, engineering and education with more than three decades of experience at universities and national labs. Córdova is active in science policy, science administration, and science philanthropy, and has scientific expertise in observational and experimental astrophysics, multi-spectral research on x-ray and gamma ray sources and space-borne instrumentation. Córdova has served in five presidential administrations, both Democratic and Republican, and has served on both corporate and nonprofit boards, often assuming a leadership position. Previously, Córdova was the 14th Director of the National Science Foundation (NSF); president of Purdue University; chancellor emerita and distinguished professor of physics and astronomy at the University of California, Riverside; vice chancellor for research and professor of physics at the University of California, Santa Barbara; and chief scientist at NASA. Córdova has published more than 150 scientific papers and has been awarded several honorary doctorates, including ones from Purdue, Duke and Dartmouth Universities. Córdova was awarded NASA’s Distinguished Service Medal, the Kennedy-Lemass Medal from Ireland, and the Order of Bernardo O’Higgins from Chile, and is a Kilby Laureate for "significant contributions to society through science, technology, innovation, invention and education." Córdova is a fellow of the American Association for the Advancement of Science, the Association for Women in Science, and the American Academy of Arts and Sciences, a member of the National Academy of Science, and an honorary member of the Royal Irish Academy. Córdova received a Ph.D. in physics from the California Institute of Technology.

Nelson Pedreiro

Vice Chair

Nelson Pedreiro (NAE) is the senior vice president of hardware at Zoox. In this role, Pedreiro is responsible for leading a world class team that is revolutionizing urban mobility through the development of zero emission autonomous vehicles focused on safety and unparalleled customer experience. Prior to this role, Pedreiro was Chief Engineer for Lockheed Martin Space and led the Advanced Technology Center (ATC) at Lockheed Martin Space. Pedreiro has experience in developing and transitioning technology into aerospace applications, particularly with respect to optics and electro-optics; guidance, navigation, and control; artificial intelligence and data analytics; and thermal and material sciences. Pedreiro is an AIAA fellow, a senior member of the IEEE, and former founding chair of the COSPAR Committee on Industry Relations. Pedreiro earned a Ph.D. in aeronautics and astronautics and completed post-doctoral studies at Stanford University.

Tahllee Baynard

Member

Tahllee Baynard is vice president of Ignite at Lockheed Martin Space, leading research & development and technology insertion across all Space Lines of Business. Ignite is comprised of 500 scientists, technologists, and program managers across 7 technical directorates. Leading Space Ignite, Baynard focuses on next generation and generation after next technology development including quantum technologies; artificial intelligence; autonomy; advanced materials and manufacturing; photonic integrated circuits; next generation sensors; space-based nuclear power; space-based nuclear propulsion; next-generation pointing, navigation, and timing; and micro-electronics for space based applications. Baynard's distinguished career honors and awards include: Lockheed Martin Special Program Leadership Excellence Award Q4 - recognized for strategic support to mergers and acquisition and structuring future business access to critical components and merchant supplier options; Lockheed Martin Space Systems Company Extraordinary Engineering Award - recognized for shaping program capture for mission payloads under the Center of Excellence; and Being Everything You Are (BEYA) – Scientist of the Year - recognized by the Career Communications Group for scientific leadership and development of new capabilities associated with remote sensing technologies and detection of modified explosives. Baynard currently represents Industry on the Palo Alto (CA) Chamber of Commerce covering the home base of Lockheed Martin's Advance Technology Center and managing critical issues that impact companies operating in Silicon Valley; is a Board of Trustee with Cornell College in Mt Vernon, Iowa (his undergrad alma mater). More recently he chaired the Governance committee, helping the college through strategic planning, adjustments to committee structure, trustee recruiting, and financial business decisions. Baynard earned a Ph.D. in physical chemistry from the University of Chicago.

Daniela Calzetti

Member

Daniela Calzetti (NAS) is a professor and head of the Department of Astronomy at the University of Massachusetts Amherst. Calzetti's research interests include understanding star formation on the scales of galaxies, using the information provided by a variety of both space-borne (Hubble, Spitzer, Herschel, etc.) and ground-based telescopes, at wavelengths that range from the ultraviolet to the radio. Prior to joining the University of Massachusetts Amherst, Calzetti held various positions at the Space Telescope Science Institute, including—E.S.A. Fellow, postdoctoral researcher, assistant astronomer, and associate astronomer. Calzetti is a member of the American Astronomical Society and the International Astronomical Union. In addition, Calzetti is a member on the NASA's Astrophysics Advisory Committee; member of the ERC Panel; Max Planck Society (ad-hoc appointment for the Chemistry, Physics, and Technology Section); NASA STDT for the LUVOIR Surveyor Mission Concept Study; AURA Space Telescope Science Institute Council (STIC); and the EUCLID Science Consortium/Co-I of Euclid Science Program: Precision Studies of Galaxy Growth and Cosmology. Calzetti has received numerous awards including the Award for Outstanding Accomplishments in Research at the University of Massachusetts and the Clarivate-Reuters Worlds Most Cited Researchers. Calzetti received a Ph.D. in astronomy from the University of Rome.

Robin M. Canup

Member

Robin M. Canup (NAS) is vice president of the Solar System Science and Exploration Division at Southwest Research Institute. Canup is a theoretician, using numerical simulations and analytical methods to study the formation and early evolution of planets and their moons. Canup has modeled many aspects of the formation of the Moon, including hydrodynamical simulations of lunar-forming giant impacts, the accumulation of the Moon, and its initial composition and orbital evolution. Canup has developed models for an impact origin of the satellites of Pluto and Mars, and studied the origin of the systems of rings and satellites around the outer giant planets, including models of circumplanetary disk formation during gas accretion, satellite accretion and orbital migration, and the compositional and interior properties of outer rings and moons. Canup is also developing models for the origin of compact exoplanetary systems. Canup is a recipient of the American Astronomical Society’s Harold C. Urey Prize in Planetary Science, and the James B. Macelwane Medal of the American Geophysical Union. Canup is a member of the National Academy of Sciences (NAS) and the American Academy of Arts and Sciences, and is a fellow of the American Geophysical Union. Canup recently co-chaired the National Academies' 2023-2032 Decadal Survey in Planetary Science and Astrobiology. Canup received a Ph.D. in astrophysics and planetary sciences from the University of Colorado, Boulder.

Deepto Chakrabarty

Member

Deepto Chakrabarty is a professor and head of the Physics Department at MIT. Chakrabarty is an international leader in the field of astrophysical X-ray spectral timing, concentrating on the physics and astrophysics of neutron stars and the spin evolution of millisecond pulsars. Chakrabarty chairs the Burst and Accretion Physics Working Group for the NICER X-ray astronomy instrument on the International Space Station. Chakrabarty was awarded the American Astronomical Society’s Bruno Rossi Prize in High-Energy Astrophysics and was elected a fellow of the American Physical Society and a legacy fellow of the American Astronomical Society. Chakrabarty is the author of over 200 refereed papers and leads a broad research program in high-energy astrophysics, employing space-based observations in the X-ray, optical, infrared, and ultraviolet bands as well as ground-based optical observations. Chakrabarty earned a PhD in physics from Caltech. Chakrabarty served as chair of the Panel on Compact Objects and Energetic Phenomena for the National Academies Astro2020 Decadal Survey in Astronomy and Astrophysics, and as a member of the Panel on Stars and Stellar Evolution for the Astro2010 Decadal Survey.

Melinda Darby Dyar

Member

M. Darby Dyar is the Kennedy-Schelkunoff Professor of Astronomy and Chair of Astronomy at Mount Holyoke College. She is also a senior scientist at the Planetary Science Institute (PSI). Dyar is a mineralogist and spectroscopist interested in a wide range of problems relating to the evolution of the solar system. She studies the redox state of iron and the abundance of hydrogen in solar system materials using Mossbauer, x-ray absorption, and FTIR spectroscopy. Dyar has pioneered use of machine learning tools to interpret spectroscopic data. She is a participating scientist on the Mars Science Laboratory science team. Dyar is the 2025 recipient of the Roebling Medal, the highest honor awarded by the Mineralogical Society of America. With this honor she also become a Life Fellow of the Society. Dyar has also received the Outstanding Service Award and 1991 Fellow, both from Mineralogical Society of America. She earned her B.A. from Wellesley College and her Ph.D. for geochemistry from Massachusetts Institute of Technology.

Antonio L. Elias

Member

Antonio L. Elias (NAE) retired from Orbital ATK, Inc. where he served as chief technical officer and executive vice president. Prior to the merger between Orbital Sciences and ATK he served as Orbital Sciences Corporation chief technical officer, corporate senior vice president, and founder and general manager of its Advanced Programs Group. He was the lead architect of the Cygnus cargo resupply spacecraft and also led the technical team that designed and built the Pegasus air-launched booster, flying as launch vehicle operator on the carrier aircraft for the rocket’s first and fourth flights. He headed the design teams of Orbital’s APEX and Sea Star satellites and X-34 hypersonic research vehicle. Dr. Elias came to Orbital from the Massachusetts Institute of Technology, where he held various teaching and research positions, including the Boeing Chair in the Department of Aeronautics and Astronautics. Dr. Elias is on Aerospace Corporation’s Technical Advisory Research Committee; and he consults for Jet Propulsion Laboratory on various missions and independent reviews. He is the secretary-treasurer of the Virginia Academy of Science, Engineering and Medicine (VASEM). He is a fellow of the AIAA, the American Astronautical Society (AAS), and the International Academy of Astronautics. His awards include the AIAA Engineer of the Year, the AIAA Aircraft Design Award, AIAA Von Karman lectureship and the AAS Brouwer Award. He is a co-recipient of the National Medal of Technology and the National Air and Space Museum Trophy. He has a Ph.D. in flight transportation from the Massachusetts Institute of Technology.

Jed J. Hancock

Member

Jed J. Hancock is president of Utah State University (USU) Space Dynamics Laboratory (SDL). As a University Affiliated Research Center, SDL serves as a trusted Government partner, providing mission-enabling, multi-domain solutions to the Department of Defense, Intelligence Community, and civil space agencies. Hancock also serves as an adjunct faculty for optical sciences at USU and on graduate committees at both USU and University of Arizona. Hancock's expertise is in systems engineering, instrument characterization for electro-optical remote sensing payloads, development of space-based missile tracking and other sensors. He is on the board of Universities Space Research Association. His awards include distinguished alumni from USU and individual/group achievement awards from NASA. Hancock is a fellow of the International Society for Optics and Photonics, a representative for the Universities Space Research Association, and a volunteer for several local charity and community organizations. Hancock earned a doctorate in optical sciences from the University of Arizona.

Daniel M. Hart

Member

Daniel M. Hart (NAE) is president of HarTechnologies LLC. Hart's expertise is in the development of space systems and space technologies. Hart has led engineering, operations, and business organizations in the development of a myriad of spacecraft/satellites, launch systems, and missile defense systems; has served as an advisor to executive teams and investors across the space, energy, and technology sectors; and is an active volunteer in the field of wildfire intelligence. While CEO of Virgin Orbit Hart led the development and operation of a new space launch method of launching small satellites. Prior to Virgin Orbit, Hart served as vice president of Government Satellite Systems at the Boeing Company where he led Boeing's combined civil, DoD, and proprietary satellite programs portfolio. He is on the advisory boards of a small infrared satellite company in the U.K. and a small propulsion company in San Diego. He is also a senior fellow for the Atlanta Council. Hart served on the U.S. Investment Advisory Council for the Secretary of Commerce (2018- 2020); and was selected by the California Governor to serve on the COVID Task Force on Business and Jobs Recovery (2020). Hart was awarded the Aviation Week Laureate for space leadership. Hart is a committed advocate for STEM education, serving on the Board of Trustees of the California Science Center, and the Dean's Advisory Council for California State University, Long Beach's College of Engineering. Hart earned a B.S, in physics from the State University of New York at Albany and received the Distinguished Alumni Award in 2020. In 2013 Hart attended Harvard Business School's Advanced Management Program.

Péter I. Mészáros

Member

Peter I. Mészáros (NAS) is the Eberly Chair Professor Emeritus of Astronomy & Astrophysics and Physics at the Pennsylvania State University. Mészáros is also the director emeritus of the Center for Particle and Gravitational Astrophysics at Penn State. His areas of research involve high-energy astrophysics, cosmology, particle astrophysics, gamma-ray bursts, and neutron stars. Mészáros is known in cosmology for an effect bearing his name which controls large scale structure formation, and for his work in developing the fireball shock model of gamma-ray bursts. He was the science theory lead of the NASA Swift satellite, for which he shared several NASA Group Awards. For the past two decades, Mészáros has been primarily interested in theoretical aspects of high-energy neutrino astrophysics and multi-messenger astrophysics. He is on the Science Advisory Council of the IceCube Neutrino Observatory. Mészáros is a recipient of the First Prize of the Gravity Research Foundation and a recipient of the American Astronomical Society's Bruno Rossi Prize. Mészáros is a member of the National Academy of Sciences, American Academy of Arts and Sciences, Hungarian Academy of Sciences, and the Einstein Professor of the Chinese Academy of Sciences, and is currently member of the Science Advisory Committee of the IceCube Antarctic Neutrino Observatory. Mészáros has served on two National Academies study committees. Mészáros received a Ph.D. in astrophysics from the University of California, Berkeley.

Richard M. Obermann

Member

Richard M. Obermann (NAE) is a retired member of the staff of the U.S. Congress, where he last served as the chief of staff for the U.S. House Committee on Science, Space, and Technology. As such Obermann was the committee staff director, administrator, and senior policy adviser to the committee chair. Obermann was responsible for managing a team of committee scientists, engineers, attorneys, and other professional support staff as well as the majority budget. The Committee has legislative and oversight jurisdiction over many federal agencies, including NASA, the National Science Foundation, the National Institute of Standards and Technology, the National Oceanic and Atmospheric Administration, the Office of Science and Technology Policy, and relevant research, science, and technology development elements of the Environmental Protection Agency, Department of Energy, Department of Transportation, Department of Homeland Security, and Department of Commerce. Formerly, Obermann was a senior program officer on the Aeronautics and Space Engineering Board of the National Research Council (now the National Academies of Sciences, Engineering, and Medicine), and a technical staff member of the MITRE Corporation. Obermann serves on the visiting committee for the Space Telescope Science Institute, is affiliated with the Colorado Space Policy Center (CSPC), is an advisor to the COSPAR Panel on Early Careers and International Space Societies, and is a paid consultant for a climate technology startup. Obermann is a member of the National Academy of Engineering and the International Academy of Astronautics and a fellow of the American Institute of Aeronautics and Astronautics, the American Astronautical Society, and the British Interplanetary Society. Obermann has no prior National Academies experience. Obermann received a Ph.D. in aerospace and mechanical sciences from Princeton University.

Terrance G. Onsager

Member

TERRANCE G. ONSAGER is a retired physicist with the National Oceanic and Atmospheric Administration Space Weather Prediction Center. Onsager's research includes solar wind-magnetosphere coupling, modeling the signatures of magnetic reconnection at Earth's magnetopause and in the magnetotail, and the dynamics of the electron radiation belts. It also includes coordinating the capabilities and priorities of international space weather organizations to improve global space weather services and working to bridge the gap between research and operations. Onsager has served as the director of the International Space Environment Service, co-chair of the World Meteorological Organization Inter-Programme Coordination Team on Space Weather, and as a member of the Space Weather Expert Team for the United Nations Committee on the Peaceful Use of Outer Space Working Group on the Long-Term Sustainability of Outer Space. Onsager received a Ph.D. in physics from the University of Washington.

Christa D. Peters-Lidard

Member

Christa D. Peters-Lidard (NAE) is principal at WtrSense, LLC. Prior to that Peters-Lidard was the director of the Sciences and Exploration Directorate at NASA Goddard Space Flight Center; deputy director of the Sciences and Exploration Directorate; deputy director for Hydrosphere, Biosphere, and Geophysics in the Earth Sciences Division; and acting GSFC chief scientist. Peters-Lidard was a physical scientist in the Hydrological Sciences Laboratory, and lab chief. Peters-Lidard's research interests include land-atmosphere interactions, hydrologic remote sensing and modeling, and the application of high-performance computing and communications technologies in Earth system modeling, for which her Land Information System team was awarded the 2005 NASA Software of the Year Award. Peters-Lidard is a member of Phi Beta Kappa and was awarded the Committee on Space Research (COSPAR) Scientific Commission A Zeldovich Medal in 2004 and the Arthur S. Flemming Award in 2007. Peters-Lidard is an AMS Fellow, an AGU Fellow, has served as chief editor for the American Meteorological Society (AMS) Journal of Hydrometeorology, and as an elected member of the AMS Council and Executive Committee. Peters-Lidard earned a Ph.D. from the Water Resources Program in the Department of Civil Engineering and Operations Research at Princeton University. Peters-Lidard is a member of the National Academy of Engineering and served on the National Academies Committee on Hydrologic Science: Studies in Land-Surface Hydrologic Sciences.

Tara M. Ruttley

Member

Tara M. Ruttley is chief scientist for Orbital Reef, Blue Origin. Before Blue Origin, Ruttley was NASA’s associate chief scientist for the International Space Station (ISS) at the Johnson Space Center, spending a decade managing, evaluating, and communicating about ISS science activities from the period of “Assembly Complete” into the “Utilization” period. Ruttley later became NASA’s associate chief scientist for Exploration and Applied Research at NASA Headquarters (HQ) in the Office of the Chief Scientist, representing the human, biological, and physical sciences performed on the ISS and planned Artemis lunar missions. Awards include the NASA Tech Brief Award, NASA’s Center Director Commendation Award, and a United States patent. Ruttley earned a Ph.D. in neuroscience from the University of Texas Medical Branch.

Keivan G. Stassun

Member

KEIVAN G. STASSUN is the Stevenson Professor of Physics & Astronomy and a professor of computer science at Vanderbilt University. Stassun is also the founding director of Vanderbilt’s Center for Autism & Innovation, which focuses on advancing science and engineering through the engagement and workforce development of autistic individuals and those with other forms of neurocognitive difference. Stassun’s research focuses on stars and exoplanets, with an emphasis on developing new data-driven methods for making precise measurements of the fundamental physical properties of stars and planets. Stassun is a co-investigator for NASA’s Transiting Exoplanet Survey Satellite (TESS) mission and chairs the executive committee of the Sloan Digital Sky Survey. Having trained more than 50 Ph.D. students and postdoctoral scholars from diverse backgrounds, Stassun is a leader and advocate for expanding participation in STEM. Stassun is a member of the National Science Board of the National Science Foundation (NSF) and a former member of the NSF Committee for Equal Opportunity in Science and Engineering (CEOSE). Stassun is a fellow of the American Physical Society (APS), the American Astronomical Society (AAS), the American Association for the Advancement of Science (AAAS), and the American Academy of Arts and Sciences. Stassun is a recipient of the APS Nicholson Medal for Human Outreach, a Presidential Award for Excellence in Science Mathematics and Engineering Mentoring (PAESMEM), an NSF CAREER award, a Cottrell Scholar award from the Research Corporation for Science Advancement, a Howard Hughes Medical Institute Professor award, a Ford Foundation Fellowship from the National Academies, and a Mentor of the Year award from the AAAS. Stassun has been recognized as a MacArthur fellow and a National Medal of Science laureate. Stassun is a former member of the steering committee of National Academies’ Decadal Survey on Astronomy and Astrophysics 2020 (Astro2020) and serves on the Divisional Committee for Engineering and Physical Sciences. Stassun received a Ph.D in Astronomy from the University of Wisconsin- Madison.

Chris Wolverton

Member

S. Christopher Wolverton is a professor in the Department of Biological Sciences and the Albert M. Austin Professor in Natural Sciences at Ohio Wesleyan University. Wolverton is a plant scientist interested in the ways plants sense and respond to environmental inputs, especially gravity and light, and use these cues to govern the development of form. Wolverton has had experiments on the U.S. Space Shuttle and recently led a project on the International Space Station designed to test the threshold for gravity perception in plants using an on-board centrifuge facility. Wolverton's team was awarded the NASA Ames Research Center Honor Award. Wolverton is a member of the American Society of Plant Biologists, the American Society for Gravitational and Space Research, and serves in several capacities in COSPAR. Wolverton was co-chair of the Biological Sciences Panel of the National Academies of Science, Engineering, and Medicine Decadal Survey on Biological and Physical Sciences Research in Space 2023-2032. Wolverton earned a Ph.D. in plant biology from Ohio State University.

Endawoke Yizengaw

Member

Endawoke Yizengaw, is a senior scientist at The Aerospace Corporation who has done much to advance space physics exploration with a keen interest to develop infrastructure and education in space science in developing countries. Yizengaw has contributed significantly to the scientific literature on the complexities of ionospheric electrodynamics and has published scores of high-impact papers using multiple instrument techniques from ground and space. Two early papers were selected for the cover of Geophysical Research Letters. One of those papers proved a long-standing conjecture that the ionospheric trough is the signature of a boundary in the magnetosphere. More recent publications describe work using ground-based measurements to demonstrate that dayside electrodynamics display not only temporal and seasonal variations but also very strong gradients versus longitude. In addition, Yizengaw developed the African Meridian B-field Education and Research (AMBER) network of magnetometer instruments in more than 10 countries and has played a vital role in the expansion of space science education and research in developing countries. Yizengaw participates in the International Space Weather Initiative (ISWI), was active in the International Heliophysical Year (IHY) program, and has performed scientific outreach programs for young scientists in the United States and developing nations. Yizengaw has co-convened conferences and schools in Africa, including an American Geophysical Union (AGU) Chapman Conference and a number of ISWI and IHY programs. Yizengaw was awarded the AGU's Joanne Simpson Medal. Yizengaw received a Ph.D. in space science from La Trobe University, Australia.

Gary P. Zank

Member

Gary P. Zank (NAS) is the director of the Center for Space Plasma and Aeronomic Research (CSPAR), University of Alabama Board of Trustees Trustee Professor, Aerojet/Rocketdyne Chair in Space Science, an Eminent Scholar and distinguished professor, and chair of the Department of Space Science at the University of Alabama in Huntsville. Zank's research interests extend across space physics, plasma astrophysics, plasma physics, and the interaction of the solar wind with the partially ionized interstellar medium. He is a co-PI on several NASA spacecraft missions and one European Space Agency mission. Zank was named the University of Alabama Board of Trustees Trustee Professor, the first and only University of Alabama System faculty member to achieve this position. Zank is a recipient of the Axford Medal, the highest honor given by the Asia Oceania Geosciences Society (AOGS). Zank is a member of the National Academy of Sciences and a fellow of the American Geophysical Union, the American Physical Society, and the American Association for the Advancement of Science. Zank is also an AOGS honorary member and was chosen by the International Space Science Institute as a Johannes Geiss Fellow. Zank has been the chair or member of many National Academies committees. Zank received a Ph.D in applied mathematics from the University of Natal in South Africa.