Committee on Astrobiology and Planetary Sciences (CAPS)

Committee

Martha S. Gilmore

Co-Chair

MARTHA S. GILMORE is the Joshua Boger University Professor of Science and Mathematics, Dean of Natural Sciences and Mathematics, and a professor of Earth and environmental sciences at Wesleyan University (WU). Gilmore is a geologist who specializes in the study of planetary surfaces using geomorphic mapping, visible to near-infrared (VNIR) spectroscopy and laboratory experiments to simulate environments on Venus, Mars, and Earth. Gilmore is a member of the science teams for the DAVINCI and VERITAS missions to Venus. Gilmore is the past-chair of the WU Department of Earth and Environmental Sciences and was previously the WU Director of Graduate Programs and the WU Campus Director of the NASA Connecticut Space Grant College Consortium. Gilmore is the recipient of the WU Faculty Prize for Excellence in Research, the Women of Innovation Research Innovation and Leadership Category Award from the Connecticut Technology Council and Connecticut Center for Advanced Technology, and the 2022 Claudia J. Alexander Prize from the Division of Planetary Sciences of the American Astronomical Society. Gilmore earned a Ph.D. in geological sciences from Brown University.

Karyn L. Rogers

Co-Chair

KARYN ROGERS is an associate professor in Earth and Environmental Sciences at Rensselaer Polytechnic Institute (RPI) and directs the Rensselaer Astrobiology Research and Education Center. Rogers' research interests focus largely on habitability in extreme environments and uses both terrestrial analog environments and novel laboratory experimental systems to explore the synthesis of prebiotic molecules on the early Earth, as well as the environmental limits of life. Before joining the faculty of RPI, Rogers was a research scientist at the Carnegie Institution of Washington, an assistant professor at the University of Missouri, and a Deep Ocean Exploration Institute postdoctoral scholar at Woods Hole Oceanographic Institution. Rogers is a co-lead of the Prebiotic Chemistry and Early Earth Environments consortium and was recently a resident Global Visitors Fellow at the Earth and Planets Laboratory at the Carnegie Institution for Science. Additionally, at RPI Rogers serves as vice president of the Faculty Senate and is appointed in the Institute for Data Exploration and Applications. Rogers, whose Ph.D. in Earth and Planetary Sciences is from Washington University in St. Louis, was a member of the National Academies' Committee on Astrobiology Science Strategy for the Search for Life in the Universe.

Edward Beau Bierhaus

Member

EDWARD ‘BEAU’ BIERHAUS is principal research scientist for Commercial Civil Space at the Lockheed Martin Corporation. Bierhaus was a scientist co-investigator on the OSIRIS-REx mission, and lead scientist for that mission’s Touch and Go Sample Acquisition Mechanism. Bierhaus’ prima-ry role is in working with scientists to transform science goals into specific instrument measure-ments and mission requirements, including for the MAVEN, Lucy, and Juno missions. Bierhaus re-ceived a Ph.D. in aerospace engineering from the University of Colorado, Boulder.

William F. Bottke

Member

WILLIAM F. BOTTKE is the director of the Science Directorate of the Solar System Science and Exploration Division at the Southwest Research Institute (SwRI). Bottke is a group leader of NASA’s OSIRIS-Rex mission and is a science team member of NASA’s Lucy, Psyche, and NEO Surveyor missions. Bottke’s research is broadly focused on the formation and bombardment history of planetesimals, planets, and satellites; the origin and evolution of small body populations throughout the solar system; and the evolution of near-Earth objects from their source regions in various asteroid and cometary populations to their observed orbits. Bottke was also the director of the Institute for the Science of Exploration Targets of NASA’s Solar System Exploration Research Virtual Institute and the director of the Center for Lunar Origin and Evolution of the NASA Lunar Science Institute. Bottke was the first recipient of the Paolo Farinella Prize. Botke delivered the 2015 Shoemaker Lecture for the American Geophysical Union and the 2017 Kavli Lecture at the 229th American Astronomical Society meeting. Bottke has also been named a fellow of both the Meteoritical Society and the American Geophysical Union. Bottke earned a Ph.D. in planetary science from the University of Arizona. Bottke was a member of the National Academies’ Committee on Planetary Science and Astrobiology Decadal 2023-2032: Panel on Small Solar System Bodies.

Carolyn A. Crow

Member

CAROLYN A. CROW is an assistant professor in the Department of Geological Sciences at the University of Colorado, Boulder. Prior to moving to Boulder, Crow was a postdoctoral researcher at Lawrence Livermore National Laboratory. Crow’s research focuses on understanding the evolution of planetary crusts through geochemical analyses of samples. Crow has worked with samples ranging from lunar rocks returned by Apollo astronauts, martian meteorites, and samples from the Vredefort impact basin in South Africa. Crow’s research also supports nuclear forensics projects that aim to understand the signatures of underground nuclear explosions in support of the Comprehensive Test Ban Treaty. Crow earned a Ph.D. from the University of California, Los Angeles.

Orlando Figueroa

Member

ORLANDO FIGUEROA is the president of Orlando Leadership Enterprise, LLC, which focuses on providing expert advice in space mission systems and technology, organization and enterprise/program management, strategic planning, and team and leadership development. Figueroa retired from NASA after serving as the director of applied engineering and technology at the Goddard Space Flight Center (GSFC), the deputy center director of science and technology at GSFC, and the NASA deputy associate administrator for Science Mission Directorate. Figueroa was named the 2005 Service to America Federal Employee of the Year and was awarded the 2008 Smithsonian Institution Latino Center Legacy Award, the 2010 NASA Distinguished Service Medal, the 2016 National Space Society Pioneer Award, and the Senior Executive Service President Rank Award. Figueroa earned a B.S. in mechanical engineering from the University of Puerto Rico, Mayaguez. Figueroa served on the National Academies' Committee on Planetary Science and Astrobiology Decadal Survey 2023-2032 and the Committee on Increasing Diversity and Inclusion in the Leadership of Competed Space Missions.

Abigail Fraeman

Member

ABIGAIL FRAEMAN is a research scientist at the Jet Propulsion Laboratory, a visiting associate at the California Institute of Technology, deputy project scientist for the Mars Science Laboratory, a former deputy project scientist for the Mars Exploration Rover mission, and a former co-investigator for the Compact Reconnaissance Imaging Spectrometer for Mars. Fraeman's research focuses on the history and evolution of Mars, Phobos, and Deimos, and reflectance spectroscopy from the macro- to micro-scale. Fraeman holds multiple NASA Group Achievement Awards, the NASA Early Career Award, and the NASA Early Career Public Achievement Medal. Fraemanearned a Ph.D. in earth and planetary science from the Washington University in St. Louis as a National Science Foundation Graduate Research Fellow. Fraeman was a member of the National Academies' Committee on Planetary Protection Requirements for Sample-Return Missions from Martian Moons.

Timothy L. Grove

Member

TIMOTHY GROVE (NAS) is the Robert R. Shrock Professor of Earth and Planetary Sciences at the Massachusetts Institute of Technology (MIT). Grove's research is focused on the processes that have led to chemical evolution of the Earth and other planets including the Moon, Mars, Mercury, and meteorite parent bodies, a topic Grove studies by combining field, petrologic, and geochemical studies of igneous rocks with high pressure and high temperature experimental petrology. Grove is recognized for important contributions to understanding magma generation on Earth, other planets, and early formed planetesimals. Before being appointed to the faculty at MIT, Grove served in teaching and research roles at Harvard University, the State University of New York, Stony Brook, and the California Institute of Technology, as a visiting scientist at the University of Cape Town, a research scientist at the University of Zimbabwe (Harare), a visiting professor at ETH Zürich, and a guest professor at the University of Lausanne. Grove is the recipient of the Harry H. Hess Medal from the American Geophysical Union, the V.M. Goldschmidt Award from the Geochemical Society, and has been named a fellow of the Geochemical Society, the American Geophysical Union, and the Mineralogical Society of America. Grove's Ph.D. in geology was awarded by Harvard University. Grove served as chair of the National Academies' Panel on Mercury and the Moon for the Planetary Sciences and Astrobiology Decadal Survey 2023-2032 and as an ex officio member of the U.S. National Committee for the International Union of Geodesy and Geophysics.

Brandon Johnson

Member

BRANDON C. JOHNSON is a professor at Purdue University in the Department of Earth, Atmospheric, and Planetary Sciences, whose research focuses mainly on impact cratering and impact processes in the evolution of planets, moons, and asteroids. This research extends to the study of the geophysics of planets and the various processes that modify planetary surfaces, in addition to the early solar system and meteorites, the breakup of comets, and the understanding of the lunar gravity field. Before joining the faculty at Purdue University, Dr. Johnson was a postdoctoral associate at MIT and an assistant professor of Earth, environmental, and planetary sciences at Brown University. Dr. Johnson is the recipient of the Ronald Greeley Early Career Award in Planetary Science from AGU, the Lark-Horovitz Award for outstanding research in physics from Purdue University, and the Nininger Meteorite Award from the Center for Meteorite Studies at Arizona State University. Dr. Johnson earned a PhD in physics from Purdue University.

Emily S. Martin

Member

EMILY S. MARTIN is a research physical scientist at the Center for Earth and Planetary Studies at the Smithsonian Institution’s National Air and Space Museum. Martin’s research focuses on planetary surface processes and tectonic deformation across the solar system, especially the icy bodies of the outer solar system. Martin has a particular interest in the evolution of subsurface oceans on Saturn’s moon Enceladus and other icy satellites, which are prime targets for understanding the habitable potential of the outer solar system. In support of this work, Martin has served as a collaborator on a NASA mission concept study for Flagship Concepts for Astrobiology at Enceladus; as a co-Investigator on a NASA Discovery mission team proposal to explore Neptune’s moon Triton; and as a research associate on the NASA Lunar Reconnaissance Orbiter Camera instrument team. Martin was awarded the Peer Recognition Award from the National Museum of Natural History. Martin is the recipient of an Outstanding Graduate Student award from the University of Idaho Department of Geological Sciences. Martin’s Ph.D. in geological sciences was awarded by the University of Idaho. Martin served on the National Academies’ Planetary Science and Astrobiology Decadal Survey 2o23-2032: Panel on Ocean Worlds and Dwarf Planets.

Joseph G. O'Rourke

Member

JOSEPH G. O’ROURKE is an assistant professor at the School of Earth and Space Exploration (SESE) and an affiliated faculty member of the Interplanetary Initiative at Arizona State University (ASU). O’Rourke’s research focuses on the interior dynamics in planetary bodies made of metal, rock, and ice; on the application of solar system discoveries to exoplanet characterization; and on the mission and instrument development for spacecraft exploration. O’Rourke’s was formerly an SESE Exploration Postdoctoral Fellow at ASU and a postdoctoral scholar in planetary science at the California Institute of Technology. O’Rourke has received the Antarctica Service Medal and was a finalist of the Hertz Foundation Fellowship. O’Rourke earned a Ph.D. in planetary science as a National Science Foundation Graduate Research Fellow. O’Rourke served as a member of the National Academies’ Planetary Science and Astrobiology Decadal Survey 2023-2032: Panel on Venus.

Edgard G. Rivera-Valentin

Member

EDGARD G. RIVERA-VALENTÍN is a senior planetary scientist at the Johns Hopkins University Applied Physics Laboratory. Rivera-Valentín's research focuses on applications for planetary protection policies and planetary defense strategies. Rivera-Valentín studies surface processes with implications for planetary habitability and uses ground- and space-based radar observations to characterize asteroids and planetary surfaces. Rivera-Valentín was a planetary scientist at the Lunar and Planetary Institute and a planetary radar astronomer at the Arecibo Observatory in Puerto Rico, following a postdoctoral research appointment at Brown University. Rivera-Valentín was named a NASA Early Career Fellow by the NASA Planetary Science Division in 2016, and the asteroid 2010 ER87 is now officially designated as 389478 Rivera-Valentín. Rivera-Valentín earned a Ph. D. in space and planetary sciences from the University of Arkansas, and was recognized as a Doctoral Academy Fellow. Rivera-Valentín serves as the science editor of the American Astronomical Society's Planetary Science Journal and has served on the National Academies' Planetary Science and Astrobiology Decadal 2023-2032: Panel on Small Solar System Bodies.

R. Frank Rosenzweig

Member

R. FRANK ROSENZWEIG is a professor of biology at the Georgia Institute of Technology and the director of the University of Montana Institute on Ecosystems. Rosenzweig's research is aimed at illuminating the evolution of complex traits that augment biodiversity, control cell lifespan and drive major transitions in the history of life. The goal is to understand how changes in genome ar-chitecture alter global patterns of gene expression, whether such changes explain the physiology and behavior of novel genotypes, and the extent to which adaptation is shaped by trade-offs and constraints. Rosenzweig served as the lead author of the 2015 NASA Astrobiology Strategy Document and on the NASA Astrobiology Institute Executive Committee. Rosenzweig received a Ph.D. in biology from the University of Pennsylvania.

Orenthal J. Tucker

Member

ORENTHAL J. TUCKER is the associate lab chief of the Planetary Magnetospheres Lab (Code 695) in the Sciences and Exploration Directorate at NASA's Goddard Spaceflight Center (GSFC). Tucker's research interests include understanding how dynamics at the molecular level affects planets and planetary materials, which includes developing and carrying out molecular level simulations to model gas flows on planetary bodies and describing radiation effect in solids. At GSFC, Tucker has been a co-investigator on the Solar System Exploration Research Virtual Institue's Dynamic Response of the Environments at Asteroids, the Moon, and moons of Mars (DREAM2) and Lunar Environment and Dynamics for Exploration Research (LEADER) science teams investigating dynamics of the lunar exosphere, and is a co-lead of the Exosphere Ionospheres Magnetospheres Modeling theme at GSFC. Previously, Tucker was a research scientist at the University of Virginia and the University of Michigan and served as a member of the Cassini Plasma Sectrometer science team developing and using numerical models to examine dynamics of the atmospheres of Titan, Enceladus, and Saturn's rings. Tucker is a recipient of NASA's Susan Mahan Niebur and Robert H. Goddard Science awards and the University of Virginia's Robert A. Bland Award. Tucker was a participant in the CAS-NAS Forum for New Leaders in Space Science in 2015 and earned a Ph.D. in engineering physics from the University of Virginia.

Amy J. Williams

Member

AMY WILLIAMS is an assistant professor of geology at the University of Florida (UF). William's research interests include the formation and preservation of physical and molecular biosignatures in terrestrial environments as an analog for putative biosignature formation on Mars. Prior to the University of Florida, Williams was a faculty member of the Towson University Department of Physics, Astronomy, and Geosciences. Outside of these appointments, Williams works as a participating scientist on the NASA Perseverance rover science team and as a participating scientist on the NASA Curiosity rover science team, collaborating on the Sample Analysis at Mars Instrument team and studying Mars sedimentology and stratigraphy. Williams has received multiple NASA group achievement awards, received a nomination for the 2017 Maryland Academy of Sciences Outstanding Young Scientist Award, and was a NASA Earth and Space Science Fellow. At the University of Florida, Williams has won the UF Provost's Excellence Award for Assistant Professors and the UF Research Promotion Initiative Award. Williams' Ph.D. in geology was awarded from the University of California, Davis. Williams was a member of the National Academies' Planetary Sciences and Astrobiology Decadal Survey 2023-2032: Panel on Mars.