

Planetary Science and Astrobiology Decadal Survey 2023-2032: Panel on Mars

Committee

Victoria E. Hamilton

Chair

VICTORIA E. HAMILTON is an Institute Scientist in the Department of Space Studies at Southwest Research Institute (SwRI) in Boulder, Colorado. Dr. Hamilton is a geologist with extensive experience in laboratory spectroscopy and remote sensing data analysis of Mars and asteroids. She was an affiliate of the Mars Global Surveyor TES science team, a participating scientist on the Mars Science Laboratory mission, and is deputy principal investigator for the THEMIS instrument on the 2001 Mars Odyssey mission. She is Mission Spectroscopy Scientist, a science team co-investigator, and the OTEIS deputy instrument scientist on the OSIRIS-REx and OSIRIS-APEX asteroid sample return missions. She is also a co-investigator and deputy instrument principal investigator (for LTES) on the Lucy Trojan asteroid survey mission. She has published on laboratory mineral and meteorite spectroscopy, numerical modeling of infrared spectra, Martian surface and atmospheric aerosol composition, Martian thermophysical properties, and the composition of asteroid Bennu. Dr. Hamilton has built, operates, and manages a spectroscopy laboratory equipped with spectrometers for measuring visible, near infrared, and thermal infrared properties of rocks, minerals, and meteorites in reflectance and emission. She has received the NASA Group Achievement Award for the OSIRIS-REx Thermal Emission Spectrometer Team, Mars Science Laboratory Science Office Development and Operations Team, 2001 Mars Odyssey Thermal Emission Imaging System Team, and Mars Global Surveyor Thermal Emission Spectrometer Team. She received her Ph.D. in geology from Arizona State University. She was a member of the Academies' Committee on Cost Growth in NASA Earth and Space Science Missions, Co-chair of the Committee on NASA Science Mission Extensions, member of the Committee on NASA Large Strategic Missions: Science Value and Role in a Balanced Portfolio, Vice Chair of the Committee to Review the NASA Science Mission Directorate Science Plan (2019), and Chair of the Panel on Mars for the Planetary Science and Astrobiology Decadal Survey 2023-2032.

Bethany L. Ehlmann

Vice Chair

BETHANY L. EHLMANN is a professor of planetary science at the California Institute of Technology. Ehlmann's research interests include planetary surface processes, infrared spectroscopy, the evolution of Mars, and chemical weathering and hydrothermal alteration throughout the solar system, among others. Previously, she was a European Union Marie Curie Fellow and a collaborator on the Mars Exploration Rovers during their primary and first extended missions. Ehlmann is a co-investigator and deputy principal investigator for the Compact Reconnaissance Imaging Spectrometer for Mars, participating scientist on the Mars Science Laboratory mission, co-investigator for the Mars-2020 rover Mastcam-Z and SHERLOC instruments, and an affiliate of the Dawn science team. She is a recipient of the Harold C. Urey Prize of the Division for Planetary Sciences of the American Astronomical Society, the American Geophysical Union's John B. Macelwane Medal, the Zeldovich Medal of COSPAR and the Russian Academy of Sciences, the National Geographic's Emerging Explorer Award, the Mineralogical Society of America Distinguished Lecturer Award, as well as NASA Group Achievement Awards. She is also on the board of directors of the Planetary Society. Ehlmann earned a Ph.D. in geological sciences from Brown University. She has served on the National Academies Committee on Astrobiology and Planetary Science.

William B. Brinckerhoff

Member

WILLIAM B. BRINCKERHOFF is a senior scientist at NASA's Goddard Space Flight Center in the Solar System Exploration Division. His research interests include small body geochemistry, planetary mission design, and astrobiology. Brinckerhoff currently serves as project scientist for the Mars Organic Molecule Analyzer instrument on the European Space Agency's ExoMars rover mission, deputy lead for the Dragonfly Mass Spectrometer, and co-investigator for the Mars Science Laboratory's Sample Analysis at Mars investigation. He has served in numerous positions at NASA GSFC, including associate chief of the Planetary Environments Laboratory, and research space associate. In addition, he was a senior professional staff member of the Johns Hopkins University Applied Physics Laboratory. Brinckerhoff received a Ph.D. in experimental condensed matter physics from the Ohio State University.

Tracy K. Gregg

Member

TRACY K.P. GREGG is an associate professor at the University of Buffalo in the Department of Geology. Gregg's research focuses on the behavior of volcanic deposits, particularly lava flows, and how emplacement processes are affected by different ambient conditions. Previously, she was an NSF Ridge postdoctoral fellow and an assistant research scientist at the Woods Hole Oceanographic Institution. Gregg served as chair for NASA's Geologic Mapping Standards committee (2002-2007). Most recently, she served as the U.S. co-chair for the NASA/Roscosmos Venera-D Joint Science Definition Team to generate the Venera-D Phase II report. Gregg received a Ph.D. in geological sciences from Arizona State University.

Jasper S. Halekas

Member

JASPER S. HALEKAS is an associate professor at the University of Iowa in the Department of Physics and Astronomy. His research focuses on the interaction between the solar wind and the planets and moons in the solar system. Halekas designs and builds spaceflight instruments to make high-fidelity measurements of charged particles, and uses them to understand the plasma physics that occurs in the interplanetary medium and the environments near planetary bodies. As such, Halekas' research spans the intersection between planetary science and space plasma physics, touching on planetary geology and atmospheres, magnetic reconnection, shocks, plasma sheaths, and plasma waves and turbulence. He is involved in multiple spacecraft missions including Mars Express, Mars Atmosphere and Volatile Evolution, Parker Solar Probe, and ARTEMIS. Halekas received a Ph.D. in physics from the University of California, Berkeley.

John W. Holt

Member

JOHN W. HOLT is a professor at the University of Arizona in the Lunar and Planetary Laboratory. He is the co-investigator on the SHARAD radar instrument on the Mars Reconnaissance Orbiter, and co-investigator on NASA's Operation IceBridge program. In addition, he conducts field studies of Alaskan glaciers and Mars analog debris-covered glaciers using airborne and surface geophysical methods; and has developed clutter mitigation techniques for airborne and orbital radar sounding and airborne radar hardware for terrestrial deployments. Previously, Holt was a research professor at the University of Texas, the Herbert J. Reich Professor of Natural Sciences at Deep Spring College, and a postdoctoral scholar at the Jet Propulsion Laboratory. He received a Ph.D. in geology from the California Institute of Technology.

Joel Hurowitz

Member

JOEL HUROWITZ is an assistant professor at Stony Brook University in the Department of Geosciences. His research projects include in-situ exploration of the surface of Mars, studying the geochemical and mineralogical composition of clastic sediments through analog field studies, analyzing the reactivity and toxicity of planetary regolith, and using experimental approaches to aqueous geochemistry. Previously, Hurowitz was a research scientist at Stony Brook University, a research scientist at the Jet Propulsion Laboratory, and a hydrogeologist at Leggette, Brashears and Graham, Inc. He received a Ph.D. in geosciences from the Stony Brook University.

Bruce M. Jakosky

Member

BRUCE M. JAKOSKY is a professor and associate director for science in the Laboratory for Atmospheric and Space Physics and the Department of Geological Sciences at the University of Colorado, Boulder. His research interests are in the geology of planetary surfaces, the evolution of the martian atmosphere and climate, the potential for life on Mars and elsewhere, and the philosophical and societal issues in astrobiology. Over the years, Jakosky has been involved with the Viking, Solar Mesosphere Explorer, Clementine, Mars Observer, Mars Global Surveyor, Mars Odyssey, Mars Science Laboratory, and Lunar Reconnaissance Orbiter spacecraft missions. He is the principal investigator of the Mars Atmosphere and Volatile Evolution mission to Mars. Jakosky received his Ph.D. in planetary science and geophysics from the California Institute of Technology. He chaired the National Academies' Committee on Origins and Evolution of Life and the Committee on Astrobiology Strategy for the Exploration of Mars.

Michael Manga

Member

MICHAEL MANGA (NAS) is a professor in and chair of the Department of Earth and Planetary Science at the University of California, Berkeley. His research interests include studying geological processes involving fluids, including problems in physical volcanology, geodynamics, hydrogeology, and geomorphology. Previously, he was a Miller Research Fellow at the University of California, Berkeley, and an assistant professor at the University of Oregon. Manga is the recipient of numerous awards including a 2005 MacArthur Fellowship, the Robert Wilhelm Bunsen Medal from the European Geoscience Union, and the Donath Medal from the Geological Society of America. He received a Ph.D. in Earth and planetary sciences from Harvard University. Manga chaired the National Academies' Committee on Improving Understanding of Volcanic Eruptions.

Harry Y. McSween, Jr.

Member

HARRY Y. MCSWEEN is the Chancellor's Professor (emeritus) at the University of Tennessee. His research focuses on meteorites. Previously, McSween was the head of the Department of Earth and Planetary Sciences and interim dean of the College of Arts and Sciences at the University of Tennessee. He was a member of the science teams for the Mars Pathfinder and the Mars Global Surveyor spacecraft missions, co-investigator for the Mars Exploration Rovers and the Dawn spacecraft missions, and is currently a co-investigator for the THEMIS instrument on Mars Odyssey. McSween is the recipient of numerous awards, including the Leonard Medal of the Meteoritical Society, the J. Lawrence Smith Medal of the U.S. National Academy of Sciences, and the Whipple Award of the American Geophysical Union. He was president of the Geological Society of America and is a fellow of the American Academy of Arts and Sciences, the American Geophysical Union, and the Geological Society of America. McSween received a Ph.D. in geological sciences from Harvard University. He has previously served on numerous National Academies' committees, including the Committee on Planetary and Lunar Exploration and the Committee on Planetary Science Decadal Survey: 2013-2022.

Claire E. Newman

Member

CLAIRE E. NEWMAN is a research scientist and co-owner of Aeolis Research, a small private research company. Her research focuses on the atmospheres of Mars and Titan, with a special interest in understanding the connections between the surface and atmosphere, from measuring weather in the lowest few meters of the atmosphere, to studying aeolian processes on multiple bodies, to simulating martian dust lifting and dust storms using numerical weather prediction models. She is a team member on the Mars Science Laboratory, InSight, Mars 2020, and Dragonfly missions, and currently co-leads the Mars 2020 atmospheres working group and is a member of InSight's solar array cleaning team. She has received NASA Group Achievement Awards for her work on the Mars Science Laboratory mission, including observations of the 2018 global dust storm. She was previously a research scientist at Ashima Research, a staff scientist and postdoctoral research scholar at the California Institute of Technology, and a postdoctoral researcher at the University of Oxford, where she received her doctorate in atmospheric physics. She was an Associate Editor at the Journal of Geophysical Research (Planets) from 2017 through 2021, and is convener of the session "Aeolian Processes on Earth and Other Planetary Bodies" at the Fall meeting of the American Geophysical Union.

Alejandro M. San Martin

Member

ALEJANDRO M. SAN MARTIN (NAE) is the chief engineer for the Guidance, Navigation, and Control Section at the Jet Propulsion Laboratory (JPL). His research interests include spacecraft guidance, navigation, and control, with a specialization in the problems surrounding landing spacecraft on planetary bodies. In addition, San Martin has many years of experience with designing end-to-end guidance, navigation, and control systems. Previously, he has served in many different roles at JPL, including chief engineer for articulation and attitude control system of the Mars Pathfinder mission, chief engineer of the guidance and control system of the Mars Exploration Rovers, and chief engineer of the guidance, navigation, and control system of the Mars Science Laboratory. San Martin is the recipient of numerous awards including the NASA Exceptional Achievement in Engineering Medal of Honor and was named a fellow at the Jet Propulsion Laboratory in 2013. He received an M.S. in aeronautical and astronautical engineering from the Massachusetts Institute of Technology.

Kirsten Siebach

Member

KIRSTEN L. SIEBACH is an assistant professor at Rice University in the Department of Earth, Environmental, and Planetary Sciences. She is also a member of the Science and Operations Team for the Mars Science Laboratory. Prior to joining Rice University, she was a postdoctoral research associate at Stony Brook University studying the geochemistry of martian sediments. Her work focuses on understanding the history of water interacting with sediments on Mars and early Earth through analysis of sedimentary rock textures and chemistry; she is also actively engaged in promoting education and outreach related to Earth and planetary sciences. She has received several NASA Group Achievement Awards for her work on the Mars Science Laboratory, Mars Exploration Rovers, and Phoenix missions. She completed her Ph.D. in geology at the California Institute of Technology. Siebach was a member of the National Academies Committee to Review the NASA Planetary Protection Independent Review Board Report.

Amy J. Williams

Member

AMY WILLIAMS is an assistant professor of geology at the University of Florida. Her research interests include the formation and preservation of physical and molecular biosignatures in terrestrial environments as an analog for putative biosignature formation on Mars. She has been a member of the NASA Curiosity rover science team since 2009, and currently works with the Sample Analysis at Mars (SAM) instrument team to explore the distribution of organic molecules on Mars' surface. She received a nomination in 2017 for the Maryland Academy of Sciences Outstanding Young Scientist Award. She holds a Ph.D. in Geology from the University of California, Davis.

Robin D. Wordsworth

Member

ROBIN D. WORDSWORTH is an associate professor of environmental science and engineering at Harvard University. He is also an affiliate faculty member of Earth and planetary sciences. His research interests include theoretical and numerical modeling of planetary climate, paleoclimates of Earth and Mars, exoplanet atmospheric composition and habitability, radiative transfer, and geophysical fluid dynamics. He leads the Wordsworth Planetary Climate and Atmospheric Evolution Research Group at Harvard University, which focuses on the boundary between solar system and exoplanet atmospheres and climates. Past work of the Wordsworth group has included studies of Mars' Jezero crater, ultraviolet radiation and life, snowball Earth, methane on Mars, and oxygen on exoplanets. He received his doctorate in physics from the University of Oxford.