

# **Planetary Science and Astrobiology Decadal Survey 2023-2032: Panel on Giant Planet Systems**

## **Committee**

### **Jonathan I. Lunine**

#### **Chair**

JONATHAN I. LUNINE (NAS) is the David C. Duncan Professor in the Physical Sciences at Cornell University, where he is also chair of the Department of Astronomy. His research focuses on how planets form and evolve, what processes maintain and establish habitability, and what are the limits of environments capable of sustaining life. He was an interdisciplinary scientist on the Cassini-Huygens mission to Saturn, and is currently co-investigator on the Juno mission in orbit around Jupiter and an interdisciplinary scientist for the James Webb Space Telescope. He has chaired or served on a number of advisory and strategic planning committees for NASA and the NSF. He is the recipient of numerous awards including the Harold C. Urey Prize of the Division for Planetary Sciences of the American Astronomical Society, the Macelwane Medal of the American Geophysical Union (AGU), the Zeldovich Prize awarded jointly by COSPAR and the Russian Academy of Sciences, the Basic Science Award of the International Academy of Astronautics, and the Jean-Dominique Cassini medal of the European Geosciences Union. He is a fellow of the AGU and American Association for the Advancement of Science. Lunine received a Ph.D. in planetary science from the California Institute of Technology. He has served on several National Academies committees including the Committee on the Origins and Evolution of Life (co-chair), the Committee for a Review of Programs to Determine the Extent of Life in the Universe (co-chair), the Committee on Decadal Survey on Astronomy and Astrophysics 2010 (member), and the Committee on Human Spaceflight (co-chair).

### **Amy Simon**

#### **Vice Chair**

AMY A. SIMON is a senior scientist for planetary atmospheres research in the Solar System Exploration Division at the NASA Goddard Space Flight Center. Her scientific research involves the study of the composition, dynamics, and cloud structure in Jovian planet atmospheres, primarily from spacecraft observations. She is also involved in multiple robotic flight missions, as well as future mission concept development. Simon was a co-investigator on the Cassini Composite Infrared Spectrometer (CIRS) and is the deputy instrument scientist for the OSIRIS-REx Visible and near-IR Spectrometer (OVIRS), as well as the Landsat 9 TIRS2 instrument, and the Lucy L'Ralph instrument (deputy principal investigator). She is principal investigator of the Hubble Outer Planet Atmospheres Legacy (OPAL) program. She earned her Ph.D. in astronomy from the New Mexico State University, Las Cruces. Simon was a member of the last planetary decadal survey steering committee and vice-chair of the decadal giant planets panel.

## Frances Bagenal

### Member

FRANCES BAGENAL is a senior research scientist at the University of Colorado, Boulder at the Laboratory for Atmospheric and Space Physics (LASP). Her research interests include studying the space environments of planets with magnetic fields and studying the magnetospheres of the outer planets by combining data analysis and theoretical models. While at LASP, Bagenal was also the associate chair and professor in the Department of Astrophysical and Planetary Sciences at the University of Colorado (UC). Prior to UC, she was a visiting scientist at the High Altitude Observatory at the National Center for Atmospheric Research, and a Science and Engineering Research Council Advanced Research Fellow in the Space Physics Group at the Imperial College in London. She is the recipient of numerous awards including the James Van Allen Lecture Award from the American Geophysical Union, and the Boulder Faculty Assembly's Excellence in Research Award. Bagenal received her Ph.D. in Earth and planetary sciences from the Massachusetts Institute of Technology. She previously served on the National Academies Committee on the Assessment of the Role of Solar and Space Physics in NASA's Space Exploration Initiative (chair) and the Committee on Solar and Space Physics: A Community Assessment and Strategy for the Future (member).

## Richard W. Dissly

### Member

RICHARD W. DISSLY is a senior manager for civil space at Ball Aerospace, where he is responsible for program management, instrument development, and mission formulation, primarily in support of NASA science missions. He has led or supported a wide range of proposal teams covering Earth, planetary, heliophysics, and astrophysics science opportunities. Dissly recently served as the Ball project manager on IXPE, an astrophysics SMEX Mission. Prior to joining Ball, he was a research scientist at the NOAA Aeronomy Lab where he developed instrumentation for the measurement of trace atmospheric gases from aircraft platforms. Rich received his Ph.D. in planetary science from the California Institute of Technology. He has not served on any National Academies studies.

## **Leigh N. Fletcher**

### **Member**

LEIGH N. FLETCHER is an associate professor in planetary science and a Royal Society Research Fellow at the University of Leicester. His research interests span planetary atmospheres (dynamics, chemistry, and climate), planet formation, and planetary satellites. In particular, his research focuses on the exploration of giant planet systems, including the circulation of the gas and ice giant atmospheres, via a combination of planetary missions and ground- and space-based planetary astronomy. He is a co-investigator on the Cassini mission to Saturn, a participating scientist on the Juno mission to Jupiter, and interdisciplinary scientist for ESA's forthcoming Jupiter Icy Moons Explorer (JUICE). Prior to joining the University of Leicester, he was a NASA fellow at the Jet Propulsion Laboratory and a research fellow at the University of Oxford. Fletcher is the recipient of numerous awards including the Harold C. Urey Prize of the Division for Planetary Sciences of the American Astronomical Society. He received his Ph.D. in planetary physics from the University of Oxford. Fletcher has not previously served on a National Academies committee.

## **Tristan Guillot**

### **Member**

TRISTAN GUILLOT is CNRS director of research at the Nice Observatory in France. His research interests include studying the interiors of Jupiter, Saturn, Uranus, and Neptune; the formation of planetesimals and planets; the evolution of giant exoplanets; and the spectra and detectability of giant planets and brown dwarfs. Guillot was formerly the associate editor of the publication *Astronomy & Astrophysics*, a research fellow at the University of Reading, and a research associate at the Lunar and Planetary Laboratory of the University of Arizona. He is the recipient of numerous awards including NASA Group Achievement Award for the Juno Science Team, the Harold C. Urey Prize of the Division for Planetary Sciences of the American Astronomy Society, and the Zeldovich Medal from COSPAR and the Russian Academy of Sciences. Guillot received a Ph.D. in astrophysics from the Observatoire de la Côte d'Azur/Université Paris 7, Nice. He has not served on any National Academies studies.

## **Matthew Hedman**

### **Member**

MATTHEW HEDMAN is an associate professor at the University of Idaho. His research focuses on astronomy and planetary science, orbital dynamics, planetary rings, and infrared spectroscopy. Prior to joining his current institution, he was a research associate at Cornell University and a research fellow at the University of Chicago. Currently, Hedman's research work focuses on Cassini observations of Saturn's rings and Enceladus' plume, the Moon's dust exosphere, and Uranus' rings. He has served on numerous review panels for NASA, including the Ice-Giant pre-decadal study, two planetary mission concept studies on Enceladus and Neptune, as well as many others. Hedman received his Ph.D. in physics from Princeton University. He has not served on any National Academies studies.

## **Ravit Helled**

### **Member**

RAVIT HELLED is an associate professor at the University of Zurich. Her research interests include planetary structure and evolution, planet formation, solar system exploration, and extrasolar planets. Previously, Helled was a postdoctoral fellow and researcher at the University of California, Los Angeles, and an assistant and associate professor at Tel-Aviv University. Current mission involvement includes co-investigator of the JUICE mission; science team member of the Juno mission; science team member of PLATO mission; working group leader and consortium member of the ARIEL mission; lead for the Switzerland's PlanetS Academic Platform; and the Swiss National Center for Competence in Research PlanetS science project leader for planet evolution. Helled serves the community intensively by frequently being an invited speaker and is involved in panels, committees, scientific forums and review panels. Helled is the recipient of various awards and was selected as one of the 50 most influential women of Forbes Israel in 2015. She received her Ph.D. in planetary science from Tel Aviv University. Helled has not served on any National Academies committees.

## **Kathleen Mandt**

### **Member**

KATHLEEN E. MANDT is the chief scientist for exoplanets at the Johns Hopkins University Applied Physics Laboratory. Her research interests focus on the dynamics, chemistry and evolution of planetary atmospheres and she is particularly interested in advancing both solar system and exoplanet understanding of planetary system formation and evolution by forging new connections between the planetary science and exoplanet communities. Previously, Mandt was an adjunct professor in the Department of Physics and Astronomy at the University of Texas at San Antonio and a senior research scientist at Southwest Research Institute. She serves in several community and NASA mission leadership roles, including membership of the steering committee of the Outer Planets Assessment Group. She previously served as a member of the Division for Planetary Science Professional Culture and Climate Subcommittee. Mandt served as the volatiles theme lead for the Lunar Reconnaissance Orbiter (LRO) mission and is the project scientist for the LRO Lyman Alpha Mapping Project instrument. She is project scientist for the Io Volcano Observer phase A study, the deputy project scientist for the Heliophysics Division-funded Interstellar Probe pre-decadal mission study, and is a science team member on the Europa Clipper Plasma Instrument for Magnetic Sounding teams. She earned her Ph.D. in environmental science and engineering from the University of Texas, San Antonio. She previously served on the Astro2020: Panel on Exoplanets, Astrobiology, and the Solar System.

## **Alyssa Rhoden**

### **Member**

ALYSSA RHODEN is a principal scientist within the Planetary Science Directorate at the Southwest Research Institute. Her expertise is in the geophysics of icy satellites, particularly those containing oceans, and the evolution of giant planet satellites systems through time. Rhoden utilizes a novel combination of numerical modeling, statistical analysis, and photogeology to interpret the surfaces of icy ocean worlds to assess their interiors, orbits, and habitability through time. She is co-leader of NASA's Network for Ocean Worlds Research Coordination Network. Prior to joining her current institution, she was an assistant professor of planetary science at Arizona State University in the School of Earth and Space Exploration. She participated in planning NASA's multi-flyby mission to Europa and a future mission to land on Europa's surface. Rhoden is the recipient of numerous awards including the Kavli Institute Frontiers of Science Fellowship, and an Early Career Fellowship by NASA. She received her Ph.D. in Earth and planetary science from the University of California, Berkeley. She was a member of the National Academies Committee on Astrobiology and Planetary Science.

## **Paul M. Schenk**

### **Member**

PAUL M. SCHENK is a staff scientist at the Lunar and Planetary Institute. His research over the years has focused on using Voyager, Galileo, Cassini, Dawn and New Horizons stereo- and mono-scope images to map the topography and geology of the icy bodies in the outer solar system from Ceres to Arrokoth. He also studies impact cratering on small bodies and plume deposition processes on Enceladus. Schenk was the lead editor of the Enceladus & the Icy Moons of Saturn publication. In addition, he is currently a co-investigator for the New Horizons mission, and was a participating scientist on the Cassini project and the Dawn mission to Vesta & Ceres, and is the scientific editor of the Lunar and Planetary Information Bulletin. Schenk received his Ph.D. in geology from the Washington University in St. Louis. He has not served on any National Academies studies.

## **Michael H. Wong**

### **Member**

MICHAEL H. WONG is a research scientist at the SETI Institute. He also has appointments at the University of California Berkeley and at the University of Michigan. His research interests focus on planetary atmospheres, where he leads Hubble/WFC3 and Gemini North/NIRI imaging programs in support of the NASA Juno mission to Jupiter. Wong is a founding member of the OPAL program that conducts annual imaging of the giant planets with Hubble. Prior to his current roles of Participating Scientist on the Juno mission, Collaborator on the Mars Science Laboratory mission, and Science Team Member on the IRIS instrument for TMT, he was affiliated with science and instrument teams for HST/WFC3, Cassini/CIRS, and the Galileo Probe Mass Spectrometer. Wong was previously a National Research Council research associate at NASA Goddard Space Flight Center, after earning his Ph.D. in atmospheric and space sciences from the University of Michigan, Ann Arbor. He has not served on any National Academies committees.