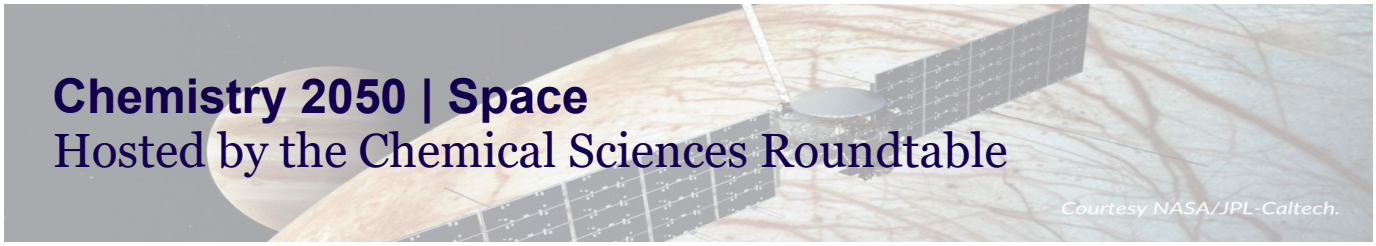
Draft Agenda #1

NATIONAL ACADEMIES Sciences Engineering Medicine

CHEMICAL SCIENCES ROUNDTABLE | BOARD ON CHEMICAL SCIENCES AND TECHNOLOGY



MONDAY, APRIL 14, 2025 | 12:00PM – 2:00PM ET (ALL TIMES ARE EASTERN STANDARD)

About

- **Event Page**
  https://www.nationalacademies.org/event/44612_04-2025_chemistry-2050-space
- **Registration**
  https://events.nationalacademies.org/44612_04-2025_chemistry-2050-space

This year, the CSR will host a series of webinars and a workshop guided by the central theme of ***Chemistry 2050*** across a range of intersectional chemistry topics, exploring how the chemical sciences will journey through the next quarter-of-a-century. This series will provide a forum that anticipates and re-imagines how the discipline could look in the year 2050.

Join us for the first ***Chemistry 2050*** webinar on **Monday, April 14, from 12:00pm to 2:00pm** which ventures into space chemistry 25 years from now. The webinar will feature a moderated discussion with expert panelists exploring how advances in astrochemistry intersect with our understanding of the origins of solar systems and future space travel missions. **Edward Ashton** (ICON plc, science fiction author of *Mickey 7*) will moderate a thought provoking discussion between our panelists, **Jennifer Bergner** (University of California - Berkeley), **Sara Seager** (MIT), **Jason Dworkin** (NASA), and **Jennifer Talley** (Air Force Office of Scientific Research**)** which will highlight the formation of planets in tandem with stars, the fundamentals and frontiers of astrochemistry, the observation of biosignatures in the atmospheres of exoplanets, and the methods of exploring our solar system.

12:00PM–12:05PM **Introduction to the National Academies, The Chemical Sciences Roundtable, Webinar Planning Committee, and NAS Staff**

Michael Janicke, CSR Director, National Academies

12:05PM–12:10PM **Welcome from Moderator, Introduction to Panelists and Webinar Topic**

Edward Ashton, Senior Director of Medical and Scientific Affairs, ICON plc

12:10PM–01:10PM **Background and Perspectives from Academia, NASA, and Space Force**

Jennifer Bergner, Assistant Professor for the Department of Chemistry, University of California - Berkeley
Sara Seager, *Class of 1941 Professor of Planetary Science, Professor of Physics, Professor of Aerospace Engineering,* Massachusetts Institute of Technology (MIT)

Jason Dworkin, *Senior Scientist for Astrobiology, Solar System Exploration Division Project Scientist, OSIRIS-REx*, NASA – Goddard Space Flight Center
Jennifer Talley, *Program Officer for Life Sciences in Space*, Air Force Office of Scientific Research (AFOSR)

01:10PM–01:30PM **Moderated Panel Discussion**

Edward Ashton, Senior Director of Medical and Scientific Affairs, ICON plc

Jennifer Bergner, Assistant Professor for the Department of Chemistry, University of California - Berkeley
Jason Dworkin, *Senior Scientist for Astrobiology, Solar System Exploration Division Project Scientist, OSIRIS-REx*, NASA – Goddard Space Flight Center
Sara Seager, *Class of 1941 Professor of Planetary Science, Professor of Physics, Professor of Aerospace Engineering,* Massachusetts Institute of Technology (MIT)
Jennifer Talley, *Program Officer for Life Sciences in Space*, Air Force Office of Scientific Research (AFOSR)

01:30PM–01:55PM **Q&A with the Audience**

Full Panel

01:55PM–02:00PM **Final Remarks**

Full Panel

(BIOGRAPHIES CONTINUED BELOW)

BIOGRAPHIES ON PANELISTS AND PLANNERS

Panelists

Moderator - Edward Ashton, *Senior Director of Medical and Scientific Affairs,* ICON plc

Edward Ashton serves as Senior Director for Medical and Scientific Affairs for ICON plc, a global clinical research organization, where he leads the company's efforts in oncology drug development. In this role, he has directed the conduct of more than 450 human clinical trials over the past twenty-five years. He holds a doctorate in Electrical Engineering with a specialization in medical imaging. His primary research interest is in magnetic resonance imaging. In particular, he has been a leader in the use of dynamic contrast-enhanced MRI as a tool for characterizing the tumor microenvironment, and of magnetic resonance elastography for the *in vivo* assessment of liver fibrosis. He is also the author of six published novels, most prominently including *Mickey7,* which is the basis for the recently released feature film *Mickey 17,* directed by Bong Joon-ho (*Parasite, Snowpiercer)* and starring Robert Pattinson, Naomi Ackie, and Mark Ruffalo. His short fiction has appeared in venues ranging from the newsletter of an Italian sausage company to *Analog, Fireside Fiction,* and *Escape Pod.* You can find him online at edwardashton.com.

Panelist - Jennifer Bergner, *Assistant Professor for the Department of Chemistry*, University of California – Berkley

Jenny Bergner is an Assistant Professor in the Department of Chemistry at UC Berkeley, with joint affiliations in the Department of Astronomy and Lawrence Berkeley National Lab. She is an expert in astrochemistry with a focus on understanding how the composition and potential habitability of nascent planets are influenced by the chemistry at play during their formation. In recent years, she has been recognized with the Annie Jump Cannon Award (American Astronomical Society) the Chevron Chair in Chemistry (UC Berkeley), and a Scialog Fellowship (RCSA). She completed her PhD at Harvard, followed by a NASA Sagan Postdoctoral fellowship at the University of Chicago.

Panelist - Jason Dworkin, *Senior Scientist for Astrobiology, Solar System Exploration Division Project Scientist, OSIRIS-REx,* NASA Goddard Space Flight Center

Jason Dworkin is the Senior Scientist for Astrobiology at NASA Goddard Space Flight Center (GSFC) and the Project Scientist for NASA's OSIRIS-REx mission. He is the founder and director of the Astrobiology Analytical Laboratory at GSFC which employs modern analytical methods to examine authentic samples of the early solar system as well as laboratory models of ancient environments. He has 40 years of experience in assessing the organic species available for the origin and early evolution of life with a focus is on understanding the extraterrestrial input and origin of organic molecules relevant for life. This objective has been to study increasingly documented and constrained systems, from plausibly early Earth chemistry, chemistry of astrophysically relevant laboratory ices, organic and chiral analysis of meteorites, to analysis of sample returned material and how to protect that material from contamination. He has received numerous awards for his work with OSIRIS-REx and for science leadership at GSFC. He received an A.B. from Occidental College and a Ph.D. from the University of California, San Diego both in biochemistry.

Panelist - Sara Seager, *Class of 1941 Professor of Planetary Science, Professor of Physics, Professor of Aerospace Engineering,* Massachusetts Institute of Technology (MIT)

Sara Seager is an astrophysicist and a Professor of Physics, Professor of Aeronautical and Astronautical Engineering, and the Class of 1941 Chair Professor of Planetary Science at the Massachusetts Institute of Technology. She is known for her pioneering research on exoplanets and their atmospheres. Her research has introduced many foundational ideas to the field of exoplanets, planets orbiting stars other than the Sun. She is now at the forefront of the search for the first Earth-like exoplanets and signs of life on them. In addition, she is pursuing exploration of Venus as a habitable world through laboratory experiments of biochemicals in concentrated sulfuric acid. Professor Seager earned her BSc in Math and Physics from the University of Toronto and her PhD in Astronomy from Harvard University. For her research Professor Seager was awarded a MacArthur "genius" grant, the Kavli Prize in Astrophysics, one of Canada's highest civilian honors, appointment as an Officer of the Order of Canada, membership in the National Academy of Sciences, and has Asteroid 9729 named in her honor. She is the author of, "The Smallest Lights in the Universe: A Memoir".

Panelist - Jennifer Talley, *Program Officer for Life Sciences in Space*, Air Force Office of Scientific Research (AFOSR)

Jennifer L Talley is a Program Officer of Space Biosciences at the Air Force Office of Scientific Research in Arlington, Virginia. As program officer she discovers, shapes, and supports basic research that will benefit the Air Force (AF), Space Force (SF), and more broadly the Department of Defense (DoD). Dr. Talley became an Air Force civilian researcher in 2011. She was a Senior Research Biological Scientist in the Integrated Seekers and Processing Branch, Guidance Division in the AFRL Munitions Directorate at Eglin Air Force Base, Florida. Some of her major awards and decorations include: 2023 Research Excellence Award, 2022 Demonstration Award, 2020 Notable Achievement Award, 2019 Special Act of Service Award, 2018 AFOSR Star Team Member, 2017 Outstanding Mentor Award, and 2017 Windows on the World AFOSR Award. In 2019, she was listed as the co-inventor on U. S. Patent No. 11,703,88 for Bio-Hybrid Odor-Localizing Autonomous Air Vehicle. Prior to her current position, Dr. Talley earned a master's in strategic studies at Air War College in residence, Grand Strategy Seminar, at Air University, Maxwell AFB, Alabama. Dr. Talley received a PhD in Biology from Case Western Reserve University in 2010 and a BS in Mathematics from the University of Arizona in 2003.

Planners

Planner – Michael Berman, *Program Officer for Molecular Dynamics and Theoretical Chemistry*, Air Force Office of Scientific Research (AFOSR)

Michael R. Berman is now a Program Officer for Molecular Dynamics and Theoretical Chemistry at the Air Force Office of Scientific Research (AFOSR). Dr. Berman joined AFOSR in 1991. He manages a cutting-edge basic research program in experimental physical chemistry, nanoscience, and theoretical chemistry that seeks to understand, predict and control chemical reactivity and energy transfer. The program emphasizes emerging and cross-disciplinary areas including efforts in areas such as catalysis, plasmonics, superatom chemistry, energy transfer, space-related chemistry, and propellants. He frequently participates in government review panels, advisory and editorial boards, and has been active as symposium organizer, session chair and presenter at national and international meetings. Dr. Berman has more than three decades of experience in scientific research and management in academia, industry and government. He is the author of over 40 published scientific papers and book chapters, and has been elected a fellow of the American Chemical Society, American Physical Society, American Association for the Advancement of Science, and the Air Force Research Laboratory. He has also received the Arthur S. Flemming Award and the Air Force Basic Research Award, and served as a Counselor for the Physical Chemistry Division of the American Chemical Society for nine years. Dr. Berman received his Ph. D. in Physical Chemistry from the University of California, Berkeley in 1981.

Planner - Jack Kaye, *Associate Director for Research in the Earth Science Division*, NASA - Science Mission Directorate

Jack Kaye is the Associate Director for Research in the Earth Science Division of NASA's Science Mission Directorate (NASA HQ, Washington, DC). He has worked at NASA for more than 41 years as a researcher, program manager, and executive, serving in his current role for ~25 years. In this role, he manages a research program for Earth System Science that covers all major Earth components (atmosphere, oceans, biosphere, cryosphere, surface/interior), as well as the interactions among them, addressing both naturally-occurring and human-induced changes. The program also supports enabling capabilities in airborne science, global modeling, scientific computing, space geodesy, and education/early career investigator support. Dr. Kaye is a Fellow of the American Meteorological Society and the American Association for the Advancement of Science, and an Honorary Member of the Asia Oceania Geoscience Society. He has received numerous NASA awards, including the Distinguished Service Medal. He is a three-time recipient of the Meritorious Senior Executive Award from the US government, and most recently was received the Pecora Individual award from NASA and the USGS. His PhD is from the California Institute in Technology, while his BA is from Adelphi University – both degrees are in chemistry. He has been an ex officio member of the Roundtable for Science and Technology for Sustainability and is currently a member of the Roundtable on Global Science Diplomacy.

Planner – **Susanna Widicus Weaver**, *Vozza Professor of Chemistry and Astronomy*, University of Wisconsin-Madison

Susanna Widicus Weaver, is the Vozza Professor of Chemistry and Astronomy at the University of Wisconsin. Before moving to Wisconsin, Dr. Widicus Weaver was a Professor of Chemistry at Emory University. She was a postdoctoral fellow in Chemistry and Astronomy at the University of Illinois from 2005-2008. She is an expert in prebiotic astrochemistry. Her research, combining laboratory spectroscopy, observational astronomy, and chemical modeling, is aimed at understanding the mechanisms driving interstellar chemistry and the pathways for the formation of life. She holds a PhD in Chemistry from California Institute of Technology and a BS in Chemistry from Illinois Wesleyan University.

Staff

Michael (Mike) Janicke, *CSR Director*, National Academies of Sciences, Engineering and Medicine

Darlene Gros, *Senior Program Assistant*, National Academies of Sciences, Engineering and Medicine

Kayanna (Kay) Wymbs, *Research Assistant*, National Academies of Sciences, Engineering and Medicine