Exoplanet Science Strategy

Committee

David Charbonneau

Co-Chair

DAVID CHARBONNEAU (NAS) is a professor of astronomy and a Harvard College Professor at Harvard University. His research focuses on the detection and characterization of exoplanets with the goal of studying inhabited worlds, the development of novel observational methods in support of these efforts, and stellar astrophysics focusing on nearby solar and low-mass stars as planet hosts. He led the team that made the first detection of transits of an exoplanet across its parent star; the first detection of an exoplanet atmosphere; and the first direct detection of light emitted by a planet outside the solar system. Using data from the NASA Kepler Mission, Dr. Charbonneau and his student Courtney Dressing determined the galactic rate of occurrence of planets that were similar to the Earth in both size and temperature. He currently leads the MEarth Project, which has found several of the terrestrial exoplanets whose atmospheres are amenable to study with upcoming observatories, and he is a Co-Investigator on the NASA TESS Mission, scheduled for launch in 2018. Dr. Charbonneau has received numerous awards for his research, including the Alfred P. Sloan Research Fellowship, the David and Lucile Packard Fellowship for Science and Engineering, the Alan T. Waterman Award from the NSF, the Medal for Exceptional Scientific Achievement from NASA, and he was the 2016 Blavatnik National Laureate in Physical Sciences and Engineering. He earned his Ph.D. in Astronomy from Harvard University in 2001, and his B.Sc. in Math, Physics, and Astronomy from the University of Toronto. In 2017, Dr. Charbonneau was elected to the National Academy of Sciences and he previously served on the Astro2010 Panel on Planetary Systems and Star Formation.

B. Scott Gaudi

Co-Chair

B. SCOTT GAUDI is the Thomas Jefferson Professor for Discovery and Space Exploration and Professor of Astronomy at the Ohio State University Department of Astronomy. A member of the faculty since 2006, Dr. Gaudi is a leader in the discovery and statistical characterization of extrasolar planets using a variety of methods, including transits and gravitational microlensing. In 2008, he and his collaborators announced the discovery of the first Jupiter/Saturn analog. Dr. Gaudi is deeply immersed in analytic and numerical techniques for assessing the yield, biases, and discovery potential of current and next-generation surveys to determine the demographics of exoplanets. Dr. Gaudi is a member of the Formulation Science Working Group for NASA’s Wide-Field Infrared Survey Telescope (WFIRST), is the chair of NASA's Astrophysics Advisory Council, and is co-community chair of NASA's Habitable Exoplanet Imaging Mission study. Dr. Gaudi was the 2009 recipient of the Helen B. Warner Prize of the American Astronomical Society, won an NSF CAREER Award and Presidential Early Career Award in Science and Engineering (PECASE) in 2012, and received NASA's Outstanding Public Leadership Medal in 2017. Dr. Gaudi earned his Ph.D. in Astronomy from Ohio State University.

Fabienne Bastien

Member

FABIENNE A. BASTIEN is an assistant professor of astronomy and astrophysics in the Department of Astronomy and Astrophysics at the Pennsylvania State University (PSU). At PSU, Dr. Bastien is leading efforts to understand the stellar processes that impact exoplanet detection and characterization and to find ways to mitigate or remove them. Her research interests include stellar variability, stellar astrophysics, exoplanet detection and characterization, the influence of stellar variations on exoplanet habitability, and stellar and planetary system evolution. Dr. Bastien was previously a NASA Hubble postdoctoral fellow at PSU. She earned her Ph.D. in physics from Vanderbilt University.

Jacob Bean

Member

JACOB BEAN is an associate professor of astronomy and astrophysics at the University of Chicago. His research is focused on the use of ground- and space-based facilities to detect and characterize planets around nearby stars with particular interest in studying planets around low-mass stars and in probing the atmospheres of the smallest known exoplanets. Dr. Bean previously served as a Sagan Fellow at Harvard University and a Marie Curie International Fellow at the University of Geottingen. He earned his Ph.D. in astronomy for the University of Texas at Austin.

Justin R. Crepp

Member

JUSTIN R. CREPP is Frank M. Freimann Assistant Professor of Physics and the director of the Engineering and Design Core Facility at the University of Notre Dame. He designs and builds instruments for the largest telescopes in the world. Dr. Crepp's research involves developing new technologies and observational techniques to detect and study planets orbiting other stars. Prior to working at Notre Dame, Crepp was a postdoctoral scholar at the California Institute of Technology. He has published over 100 peer-reviewed journal articles. Dr. Crepp was awarded a NASA Early Career Fellowship for his work to develop a new type of astronomical spectrograph that uses adaptive optics. He won the National Science Foundation Career Fellowship for his research at the Large Binocular Telescope. He received his Ph.D. in astrophysics from the University of Florida.

Eliza Kempton

Member

ELIZA KEMPTON is an assistant professor of physics at Grinnell College. Her research is focused on the detection and classification of exoplanets, with particular interest in the structure and observable properties of super-Earths and their atmospheres. Dr. Kempton previously served as a Sagan Fellow at the University of California, Santa Cruz. She has received numerous awards, including the Cottrell Scholar Award from the Research Corporation for Science Advancement and the NSF CAREER Award. Dr. Kempton earned her Ph.D. in Astronomy at Harvard University.

Chryssa Kouveliotou

Member

CHRYSSA KOUVELIOTOU (NAS) is an astrophysics professor in the Department of Physics at The George Washington University (GWU). She is also director of the GWU Astronomy, Physics, and Statistics Institute of Sciences (APSIS). Before joining GWU in 2015, she was at NASA's Marshall Space Flight Center in Huntsville, Alabama from which she retired as a senior technologist of High-Energy Astrophysics (Senior Executive core). Dr. Kouveliotou's research interests include high-energy astrophysical transients, in particular gamma ray bursts (GRBs) and magnetars, which she discovered in 1998; she has also published papers in X-ray binaries, solar flares and merging galaxy clusters. Dr. Kouveliotou has initiated large research projects in the U.S. and Europe including Xenia, a cosmology mission proposed to the 2010 decadal survey. She is currently an affiliate scientist of the NASA/Swift and Fermi missions. Dr. Kouveliotou has over 450-refereed publications, including a book on GRBs (co-editor); her Hirsh-index is 100 with a current total of 48,929 citations (Google Scholar; for refereed and non-refereed publications). In 2013 Dr. Kouveliotou chaired the team of the 30-year Roadmap of NASA's SMD/Astrophysics Division. Dr. Kouveliotou has received multiple awards, including the Descartes Prize, the Rossi and Heineman Prize, and she has been decorated by the Greek Government as a Commander of the Order of the Honor, for excellence in science. She has a Ph.D. in astrophysics from the Technical University of Munich, a M.Sc. in astronomy from the University of Sussex, and two honorary degrees, from the Universities of Sussex (UK) and Amsterdam (NL). She is a member of the U.S. National Academy and of the U.S. Academy of Arts and Sciences and a foreign /corresponding member of the Dutch Royal Academy and the Greek National Academy. She has been a Councilor and a vice president of the American Astronomical Society and a president of the HEAD (AAS) and DAP (APS); she is currently the president of Division D of the IAU. She is currently a member of the Executive Council of the NAS and the Space Studies Board and of the Committee on Council Affairs (CCA) of the AAAS.

Bruce Macintosh

Member

BRUCE A. MACINTOSH is a professor of physics at Stanford University. His research focuses on the detection of extrasolar planets (primarily through direct imaging), and on using adaptive optics to shape the wavefronts of light for a variety of applications. He is a co-discoverer of four planets orbiting the star HR 8799 and is the principal investigator of the Gemini Planet Imager, an advance adaptive optics planet-finder for the Gemini South Telescope. He served on the Exoplanet Task Force in 2006. He received his Ph.D. in astrophysics at University of California, Los Angles. Dr. Macintosh has served as a member on the Academies' Astro2010 Panel on Optical and Infrared Astronomy from the Ground, the Committee on the Review of Progress Toward the Decadal Survey Vision in New Worlds, New Horizons in Astronomy and Astrophysics.

Dimitri P. Mawet

Member

DIMITRI P. MAWET is an associate professor of astronomy at the California Institute of Technology. He is also a senior research scientist at the Jet Propulsion Laboratory, and his research is focused on the formation and evolution of extrasolar planetary systems, as well as optical and infrared astronomy instrumentation. Dr. Mawet previously served as research scientist at the Jet Propulsion Laboratory and operations staff astronomer and instrument scientist for the Very Large Telescope of the European Southern Observatory (ESO). Dr. Mawet invented the Vector Vortex Coronagraph, an instrument to image exoplanets, and (co-) authored more than 275 scientific publications. He has received multiple awards, including the ESO Exceptional Performance Award, the NASA Group Achievement Award, and the JPL Team Award for outstanding contributions to the Exoplanet Coronagraph Technology Group. Dr. Mawet was a Marie Curie fellow at the Paris-Meudon Observatory (France) in 2002, and at the Institut of Astrophysique Spatiale in Orsay (France) in 2003. He received postdoctoral training as a NASA postdoctoral fellow at the Jet Propulsion Laboratory. He received his Ph.D. in sciences from the University of Liège.

Victoria S. Meadows

Member

VICTORIA S. MEADOWS is a professor of astronomy at the University of Washington in the Department of Astronomy. There, she is also director of the Astrobiology Program and principal investigator for the NASA Astrobiology Institute’s Virtual Planetary Laboratory. Her research interests include theoretical modeling of terrestrial planetary environments to understand their habitability, the generation and detectability of planetary biosignatures and their false positives, and solar system planetary observations. The overarching goal of her research is to determine how to recognize whether a distant extrasolar planet can or does support life. Previously, Dr. Meadows was a research scientist at the Jet Propulsion Laboratory and an associate research scientist at the Spitzer Science Center at the California Institute of Technology. She is a recipient of several NASA Group Achievement Awards, has been on the SETI Institute Science Advisory Board, and was a Frontiers of Science Kavli Fellow. She earned her Ph.D. in physics from the University of Sydney. Dr. Meadows served on the National Academies Searching for Life Across Space and Time: A Workshop committee and is currently a member of the Committee on Astrobiology Science Strategy for the Search for Life in the Universe.

Ruth Murray-Clay

Member

RUTH MURRAY-CLAY is a professor of astronomy and astrophysics at the University of California, Santa Cruz. Her research is focused on the formation and evolution of the solar system and of exoplanetary systems, including the evolution of the protoplanetary disk, planet formation, gravitational dynamics, and the evolution of atmospheres. Dr. Murray-Clay previously served as a professor of astronomy at the University of California, Santa Barbara. She has received numerous early career recognitions, including the Helen B. Warner Prize for Astronomy from the American Astronomical Society. Dr. Murray-Clay earned her Ph.D. in astrophysics from the University of California, Berkeley.

Evgenya L. Shkolnik

Member

EVGENYA L. SHKOLNIK is an assistant professor of astrophysics at Arizona State University in the School of Earth and Space Exploration. She is an expert on exoplanets and stars, including the Sun, and studies stellar activity and star-planet interactions using telescopes on the ground and in space to answer questions involving stellar evolution and planetary habitability. Dr. Shkolnik previously served as an assistant astronomer on the tenure track at Lowell Observatory. Prior to that, she served as a fellow in the Department of Terrestrial Magnetism at the Carnegie Institution for Science and as an NRC fellow at the University of Hawaii at Manoa. She earned her Ph.D. in astronomy from the University of British Columbia.

Ignas Snellen

Member

IGNAS SNELLEN is a professor of observational astrophysics at Leiden University in the Netherlands. His research is focused on the development of new techniques and ground-based instrumentation for the detection and classification of extrasolar planets. He previously served as an astronomy lecturer at the University of Edinburgh. Dr. Snellen received his Ph.D. in astrophysics from Leiden University.

Alycia J. Weinberger

Member

ALYCIA J. WEINBERGER is a staff scientist at the Carnegie Institution of Washington in the Department of Terrestrial Magnetism. Dr. Weinberger's research is focused on observational astrophysics, planet formation and circumstellar disks, young stars, exoplanets, and high angular resolution imaging. She is currently a member of the NASA Large Binocular Telescope Interferometer Key Science Team, the SOFIA Science Council, and the Magellan Telescope Science Advisory Committee. Previously, Dr. Weinberger served as a NICMOS Postdoctoral Research Astronomer and Astrobiology Postdoctoral Fellow at UCLA. She has received multiple awards and fellowships, including the Annie Jump Cannon Award in Astronomy from the American Association of University Women and the American Astronomical Society, as well as the Vainu Bappu Gold Medal from the Astronomical Society of India. Dr. Weinberger earned her Ph.D. in physics from the California Institute of Technology.