

Sarah Marie Michelle Bruno *21
Baltimore, MD

Recent Graduate School Alumni Trustee Candidate

Currently an assistant research scientist in Physics & Astronomy at Johns Hopkins University, Sarah Marie Bruno was initially drawn to the field of cosmology because of the fundamental questions being addressed: Where do we come from? What will be the future of our universe?

Throughout her academic journey, including her graduate studies at Princeton, her work has centered on building cosmology telescopes that sit atop a high-altitude plateau in the Atacama Desert of Chile. These telescopes observe the Cosmic Microwave Background, the oldest light in the universe remaining from the Big Bang, to uncover the mysteries of the early universe.

Bruno has also become increasingly interested in an emerging area of science policy: how to ensure astronomy can continue to flourish in the modern world, especially given the impacts of new large satellite networks for broadband internet. As an active member of the American Astronomical Society's Committee for the Protection of Astronomy and the Space Environment (COMPASSE), she focuses on advocacy related to protecting the radio environment for astronomy. In 2024, she has taken on a new role as co-chair of a COMPASSE subcommittee on electromagnetic interference to address the ways frequency transmissions used for communications can impact and interfere with astronomy observations. In addition to impacts on astronomy, she notes that "light pollution from satellites as well as ground-based sources can inhibit the ability to connect with and witness the beauty of the night sky, once a fixture of human experience and an inspiration for the star stories of indigenous peoples."

Bruno's policy interests also led her to take on a new role supporting the National Science Foundation (NSF) spectrum management team as an NSF Spectrum Innovation Initiative awardee. In this position, she works primarily in international diplomacy, engaging with policy leaders worldwide to decide how use of the radio spectrum will be allocated to various services. She recently participated in the World Radiocommunications Conference, a meeting of the International Telecommunications Union attended by over 4,000 delegates. The conference reviews the international treaty governing use of radio frequencies. Bruno works actively with satellite operators to mitigate impacts of their communications systems on ground-based astronomy, and participates in the creation of treaty language for the protection of astronomical pursuits.

Her efforts in this area were born out of Bruno's belief that scientists have a public service responsibility to bring scientific knowledge to policy-making. For Bruno, her commitment to engaging in science policy initiatives began during her graduate studies at Princeton. She took advantage of resources at the University, completing coursework in the School of Public and International Affairs. After receiving her degree, she returned to Princeton to participate in the Princeton School on Science and Global Security. She was also an active member of the Princeton Citizen Scientists, through which she organized a series of monthly Advocacy Days for student participants to write to members of Congress regarding science policy issues.

What she is most proud of from her time at Princeton, however, is her role for three years as Health & Life Chair of the Graduate Student Government (GSG). She led a team that organized a

Graduate Mental Health Week in November 2018 as well as a larger campus-wide Mental Health Month in November 2019 and November 2020. The skills and experiences she developed during her time on GSG have since translated both to her current work engaging with a variety of stakeholders within the policy arena to achieve desired outcomes and to her sense of optimism that ultimately those outcomes can be achieved.

Bruno credits Princeton with instilling a sense of duty to use her scientific knowledge to create a better world. She notes: “Scientific research takes place within a broader human context; increasingly, responsible policy decisions in the modern world require a deep understanding of scientific principles, and it is up to us scientists to bring our knowledge to bear.”