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Physics Professor Awarded Top Astronomy Prize

The American Astronomical Society (AAS) has awarded UC Santa Barbara's Ruth Murray-Clay the 2015 Helen B. Warner Prize for Astronomy for her theoretical studies of star and planet formation.

Presented annually in recognition of a significant contribution to observational or theoretical astronomy during the five years preceding the award, the Warner Prize is given to an astronomer who is under 36 years of age in the year designated for the award, or within eight years of receiving his or her Ph.D.

"We are proud of Ruth for winning the 2015 Warner Prize," said Philip Pincus, chair of the Department of Physics, where Murray-Clay is a newly appointed assistant professor. "We were delighted for her to join our faculty. She brings a wealth of expertise to UCSB, not only in the area of planet formation, but also in the evolution of their atmospheres and how they migrate."

"I feel very honored to win the Warner Prize," said Murray-Clay. "I really like doing this work partly because there are all sorts of different physics involved. What really drew me to this subject is that it's about where we came from and how the Earth formed — and, by extension, how we came to be."

The prize committee also cited Murray-Clay's substantial contributions to numerous other areas of astrophysics. Her citation states that she has advanced models of

planet formation by clarifying the role of gravitational instabilities, illuminating how orbital migration leads to short-period “hot Jupiters” and exploring photoevaporation of close-in exoplanets.

According to the AAS, Murray-Clay follows up testable predictions of her theoretical models by delving directly into the observational data. The committee noted that she also has made outstanding contributions to the theoretical interpretation of G2, an ionized gas cloud plunging toward the supermassive black hole at the center of the Milky Way.

In addition to planet and star formation, Murray-Clay is interested in the extrasolar planetary systems recently discovered by NASA’s Kepler spacecraft and by ground-based direct imaging. “One place where we can really learn a lot about planet formation right now is by studying planets that orbit far from their stars — farther than our most distant planet, Neptune,” she explained. “In particular, there is the first directly imaged planetary system, HR 8799, which has at least four very large planets with very wide separations. We know that this kind of system is the tip of an iceberg. Is it the tip of star formation on a small scale? Or could it be that the processes that we think formed Jupiter and Saturn, our giant planets, actually do work at very large distances and that we haven’t figured out how yet?

“This is an exciting place to be looking because there are several big direct imaging surveys ramping up now,” Murray-Clay continued. “So we’re really going to be able to study these giant planets and their wide separations, which will help us distinguish between different types of models.”

Murray-Clay received her bachelor’s degree in physics and astronomy and astrophysics from Harvard University in 2001 and her master’s degree and Ph.D. in astrophysics from UC Berkeley in 2004 and 2008, respectively. She was a postdoctoral fellow at Harvard’s Institute for Theory and Computation from 2008 to 2010, at which time she became a federal scientist at the Smithsonian Astrophysical Observatory and an astronomy lecturer and then an affiliate of Harvard’s Department of Astronomy. She is a Kavli fellow of the National Academy of Sciences.

At UC Santa Barbara this past fall, Murray-Clay taught a graduate seminar on magnitude estimation; in the spring quarter, she will teach Astronomy 1. “I’m excited to be at UCSB and on the faculty of an excellent physics department,” she said.

Murray-Clay is UC Santa Barbara’s second recipient of the Warner Prize. Lars Bildsten, director of the campus’s Kavli Institute for Theoretical Physics, received the award in 1999.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.