

UC SANTA BARBARA

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## **PACKARD FELLOWSHIP AWARDED TO UCSB ASTROPHYSICIST**

Crystal Martin, an astrophysicist and assistant professor of physics at the University of California, Santa Barbara, has recently been awarded a prestigious Packard Foundation Fellowship for Science and Engineering for the year 2002.

The Packard Foundation Fellowship Advisory Panel, made up of distinguished scientists and engineers, invites the presidents of 50 leading research universities to nominate two young professors each from their institutions every year. The panel selects 24 fellows. Candidates must be young faculty members in the first three years of their academic careers. The intent of the fellowship program is to provide support for unusually creative researchers early in their careers. The fellowship may be used for any reasonable research expenditure.

"The physics department wants to grow the astrophysics program," said S. James Allen, chair of the Department of Physics. "Being able to hire a bright and energetic young astrophysicist like Crystal Martin helps us along that path."

Martin hopes to learn why the efficiency of star formation varies so widely in different parts of a galaxy and from one galaxy to another. For example, most of the stars in our Milky Way galaxy formed in the distant past, but the star formation in other nearby galaxies is still accelerating toward a peak rate. Martin also hopes to learn which properties of a galaxy or which characteristics of a galaxy's environment determine how fast the cooled interstellar gas is turned into young stars.

She explains that once the stars form, they have impact on the surrounding gas. The stars emit radiation which ionizes the gas, stripping the electrons off the atoms. This heats the gas. The massive stars burn up fuel very quickly and then explode as supernovae, adding turbulent energy and complex elements to the interstellar gas. This affects the rate in which it can condense into dense lumps and form more stars. All this activity contributes to a crucial astrophysical process in the formation and evolution of galaxies.

Martin observes nearby and distant galaxies across the electromagnetic spectrum. She frequently goes to the Keck Observatory on Mauna Kea in Hawaii, where she records spectra of galaxies on an electronic camera. She observes ultraviolet and x-ray wavelengths using satellites such as the Hubble and Chandra, and one named FUSE, short for "far ultraviolet spectroscopic explorer." She measures things like the gas outflow rate from galaxies, the star formation rate, and elemental abundances. Martin is also teaching a course on galaxies and cosmology to undergraduates this quarter.

UCSB has been on the Packard list since the early 1990s, according to Allen. In that short time, seven Packard Foundation Fellowships have been awarded to UCSB faculty members. Four of these were in physics.

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## **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.