

UW undergrads discover more than 1,300 asteroids

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Undergraduate astronomy students at the University of Washington combing through images from a specialized telescope have discovered more than 1,300 asteroids that had never before been observed. That is about one out of every 250 known objects in the solar system.

The five students set out in 2005 to find exploding stars outside our solar system but their efforts were quickly sidetracked.

"We started searching for supernovae using data from the second phase of the Sloan Digital Sky Survey and all these asteroids were in the way," said Andrew Becker, a UW research assistant professor in astronomy.

"We decided that rather than get frustrated by the asteroids we should do some science and note details about our observations. I kept asking the students what they had found and they kept saying, 'More asteroids. No supernovae, but lots of asteroids.'"

Becker is a research adviser to the UW Pre-Major in Astronomy Program, which aims to increase diversity in the sciences by allowing freshmen and sophomores to begin doing research at a time when they are still determining their majors. The program began in 2005 with funding from the UW Office of Minority Affairs and Diversity.

"It's real science that these students are doing in their first and second years of college, and the data sets they are using are pretty large, which gives them skills such as data-mining that they can use for a long time,"

Becker said.

The undergraduates who found the asteroids -- Amy Rose, Amber Almy, Amanjot Singh, Kenza Sigrid Arraki and Kathryn Smith -- made the discoveries in 2005 and 2006. They used computers to search through images made by the 2.5-meter Sloan telescope at Apache Point, N.M.

The findings were submitted to the Minor Planet Center at Harvard University for verification. The center has given each asteroid a preliminary designation, but if enough data is gathered during a three-year period each can be named by its initial discoverer.

"It's an amazing feeling -- I feel like I'm jumping into research," said Rose, a junior who went to high school in Lake Stevens and now lives in Edmonds. "It's not just taking tests and going to class."

The students recorded data on the asteroids' orbits and colors, which are important because asteroids of similar color and orbit are likely made of the same material and possibly came from a single larger body that was broken up by a collision in space millions of years ago. For instance, recent evidence suggests that the asteroid responsible for killing off the dinosaurs 65 million years ago was sent hurtling to Earth when it broke off from a larger body in a space collision. Other remnants of that collision remain in solar orbit in the asteroid belt between Mars and Jupiter.

Eric Agol, a UW assistant professor of astronomy and faculty adviser to the pre-major program, said the observations could help trace the history of some space bodies, particularly in the asteroid belt. It is significant, he said, that the undergraduates have found so many asteroids to add to the catalog of about 335,000 known bodies in the solar system.

"That's the whole goal, to start in the first quarter and get the students

excited about research and about science," Agol said. "So far we have two or three who are going to major in astronomy, but there are others who are going into other sciences, which is a broader goal."

For Rose, who plans a double major in astronomy and physics, the program has had the desired effect. Though she planned an astronomy major when she chose the UW, the pre-major program has reinforced that decision and strengthened her desire to join NASA as an astronaut.

Besides discovering asteroids, the students' observations added information for more than 14,000 asteroids that were already known. Of all the asteroids they observed, only one has a path that crosses Earth's orbit, Becker said.

"There's no immediate danger, but anything that crosses Earth's orbit could, in a hundred, a thousand, a million years, crash into us if we reach the same point at the same time," he said.

The Sloan Digital Sky Survey-II is creating a detailed, three-dimensional map of about 1 million galaxies and quasars in one-quarter of the night sky using images captured by a highly specialized telescope.

The survey is managed by the Astrophysical Research Consortium on behalf of 25 participating institutions, including the UW. It is funded by the Alfred P. Sloan Foundation, the National Science Foundation, the U.S. Department of Energy, NASA, the Japanese Monbukagakusho, the Max Planck Society of Germany and the Higher Education Funding Council for England.

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