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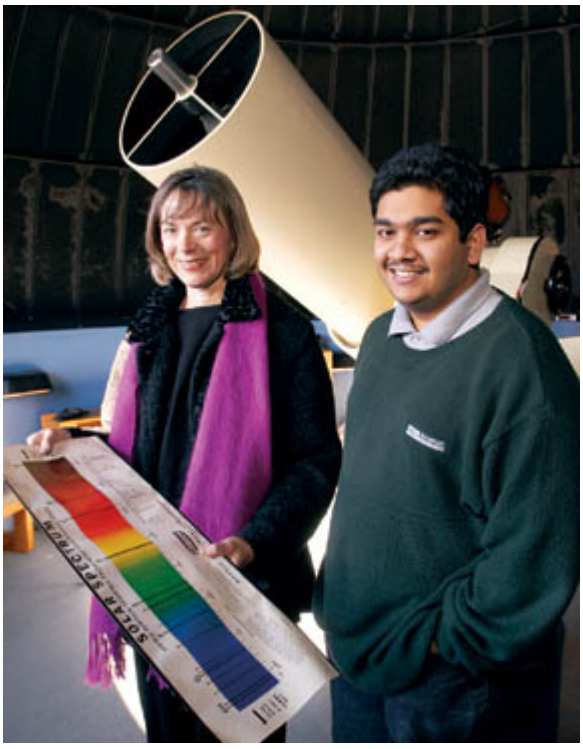
Professor and student travel to Chile to track an asteroid that may really be a comet

By Christopher Weber ’04



French and Gautham Narayan ’05 at IWU’s Evans Observatory. *(Photo by Marc Featherly)*

As Linda French and her student Gautham Narayan sit in front of a computer in the Center for Natural Sciences, meticulously studying photos of findings from a recent research trip, it is hard to believe that only a few months earlier the two astronomers had taken these same pictures halfway across the globe.

French and Narayan, a junior at Illinois Wesleyan, traveled to the Cerro Tololo Inter-American Observatory in La Serena, Chile last fall. Located in the Andes Mountains at an altitude of 2,200 meters, Cerro Tololo is an observatory primarily financed by the U.S. government and the National Science Foundation.

During October, French and Narayan used the facility to observe an object designated as asteroid 2002 CE10. The object is listed among some 40,000 catalogued asteroids, which are small rocky or metal-like bodies that orbit the Sun.

However, French and Narayan question whether 2002 CE10 is, in fact, an asteroid. “The object we were observing was in a very strange orbit, taking it above and below the paths of the other planets. Because of this, we had a hunch that it might be a comet made up of ice, frozen gases and dust, rather than an asteroid,” says French.

Although pleased with the initial results of their work, French and Narayan will not reach any firm conclusions until they have finished analyzing the data they collected — a process that will take hundreds of hours.

Twice a year, scientists like French submit proposals outlining their planned research and what they hope to accomplish with their observations at Cerro Tololo, which is considered an ideal spot for astronomy because of its dry climate and low humidity. About four of every 10 proposals are accepted, creating stiff competition among scientists to obtain research time on any of the observatory’s several telescopes.

Even after a proposal is accepted, there is no guarantee that an astronomer will enjoy clear skies during the stay. “I’ve been at Cerro Tololo before and never had the chance to open the telescope,” says French. “Once it sleeted and rained for a week. We actually ended up devising a way to go sledding in order to keep us in good spirits.”

This time, accommodating weather meant that Narayan was able to do field research in astronomy for the first time. A physics major and international student from Chennai, India, Narayan described the experience as both exciting and stressful. “You go into your research very naïvely without realizing how much work is involved,” he says. “Then you have ridiculously long days up in the observatory thinking everything is going to go smoothly, but of course it doesn’t always.”

The Cerro Tololo Inter-American Observatory in Chile. *(Photo provided by Linda French)*

For example, the dry climate creates a lot of static electricity. “One night, a small static burst went through Dr. French and shut down the focus data on the telescope and computers,” Narayan recalls. “We had three things beeping at us at once and we were running around trying to fix them so we could get on with our observing.”

“We were fortunate,” says French, “because those kinds of small problems can take many hours to fix; however, we were up and running again in about two hours.”

Despite such minor setbacks, French and Narayan considered the trip a success. However, “it can sometimes be years before you are able to present your findings,” says French. “In between teaching and other obligations, I have been examining results and preparing a manuscript for something I observed all the way back in October of 2001. It is really good if you turn around your findings in about a year.”

Data from astronomical observation is valuable because it can help us learn about our own home in the Galaxy. French explains that comets and asteroids are like the fossils of the Solar System and can teach us much about the physical history of our own planet.

“A planet like the Earth has been molded by gravity, by weather, and by geology. That molding is still going on today, meaning we don’t have a piece of the Earth that hasn’t been reworked in some fashion.” In contrast, she says, “The materials that comets and asteroids consist of are the bits and pieces that have been around since the creation of the Universe.”