

# What's new at Fresno State's Observatories

Students train at Fresno State's Campus Observatory, near the Downing Planetarium.



Fresno State Physics has a vigorous Astronomy program, with our Campus Observatory, our station at Sierra Remote Observatories, and our work with *Hubble Space Telescope* and other NASA spacecraft.

Students are welcome to participate in hands-on research on exoplanets, cataclysmic variable stars, flare stars, starburst galaxies, quasars, and black holes.

Professor Frederick A. Ringwald, with Fresno State undergraduates Carlos Caudana, Miguel Dizon, Katherine Elder, Ashton Ellis, Matthew Garrett, Kendall Hall, Aaron Hathaway, Kelly Khamvongsa, Nathan Miller, José Ortiz, Jonathan Roveto, Philip Sarkisian, and Lorin Zozaya, and graduate students Dan Chase, Randal Clark, Scott Endler, Simon Gonzalez, Michelle Meyers, John Prigge, David Reynolds, Gerald Rude, Dillon Trelawny, and Kenia Velasco (Department of Physics) and Dr. Greg Morgan (Central Valley Astronomers)

How much of an improvement is the remote observatory?

Campus Observatory

Fresno State's station at Sierra Remote Observatories



Both images here show M16, the Eagle Nebula, where stars are forming. The image **above** was taken with the Campus Observatory, by math undergrad Nathan Miller. The image **at right** was taken at the remote observatory in the same amount of time, by physics graduate student Gerald Rude. Notice how the remote observatory's image covers more of the sky, because of its more advanced telescope optics and camera. It shows fainter objects because of the dark sky, away from city lights. It also shows more detail, because the remote observatory is at an altitude of 4610 feet, above the obscuring haze/pollution of Fresno's air.

We do research at Fresno State's station at Sierra Remote Observatories, 47 miles from Fresno's city lights, near Shaver Lake.



My students and I operate the station mainly from campus, over the internet.



The station was among the first eight Sierra Remote Observatories, built in 2007. Sierra Remote now has over 30 telescopes. Sierra Remote was founded by Dr. Greg Morgan, Dr. Keith Quattrocchi, and Dr. Mel Helm. It is now operated by Dr. Helm, Dr. Quattrocchi, Larry Van Vleet, and Geoff Stone. We also thank the Downing family for the Downing Planetarium, which began all of this. Publications from Fresno State's station at Sierra Remote Observatories include 7 papers published in refereed journals, 5 of which had student co-authors, as well as 4 M.S. theses for the Department of Physics at California State University, Fresno.

New Allsky Meteor Camera in collaboration with Dr. Peter Jenniskens (SETI Institute/NASA Ames Research Center)

