

Professors lead Purdue in astronomy project in hopes to define dark energy

By MICHAEL TAKEDA Executive Reporter | Posted: Thursday, September 4, 2014 10:00 am

Two Purdue professors have been developing what could be a defining moment for dark matter and space studies.

Since 2007, Purdue has been a part of the Large Synoptic Survey Telescope (LSST) project as an institutional member. The project plans to build the biggest astronomical camera ever made, unlocking the sight of many galaxies in deep space. Purdue's team, made up of physics professor Wei Cui and associate professor John Peterson, has been contributing to the project.

The LSST project has been under the spotlight for several decades, but with the recent approval of a \$473 million budget by the National Science Foundation, the project has taken off. The budget covers the construction of the LSST, which will be constructed on a mountain in Chile. Along with the telescope, other surrounding facilities will be built, such as a data center that will transfer data to the National Center for Supercomputing Application at the University of Illinois at Urbana — Champaign.

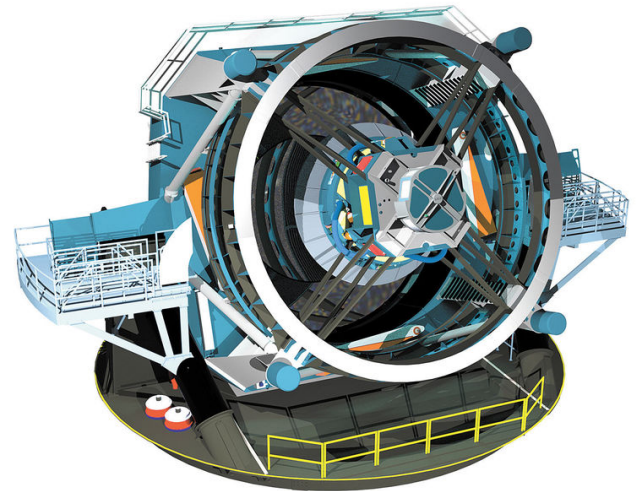
Purdue contributes a vital key to the project by providing the Photon Simulator, a software that creates images of what the completed LSST might see. The simulator, also known as PhoSim, takes atmospheric, camera and telescopic values into account, making the images as realistic as possible.

“We really have to design the software very well to be able to analyze all those images and make those measurements,” said Peterson. “So that’s what these practice (PhoSim) images are used for.”

According to Peterson, the telescope will take 10 years before it completes its full 120 petabyte image — about 30 terabytes per night.

“It’s the product of the field of view and the size of the mirror that gives the big survey,” Peterson said.

Since Purdue joined LSST seven years ago, Peterson, Cui and their students have had many opportunities to give input for the project with the help of the University.



LSST Telescope, Artist's Rendering 9/4/14

An artist's rendering of the LSST telescope, which is to be built in Chile.

“Purdue has been very supportive at different levels,” said Cui. “The student involvement has been very successful and helpful. Without these two things, it’ll be difficult.”

Both Peterson and Cui are always looking for undergraduate, graduate and post-doctorate students to participate in the worldwide project.

“This completely changes the way astronomy is done,” said Cui.