

LSST

The Large Synoptic Survey Telescope

The Large Synoptic Survey Telescope camera will survey the entire visible southern sky every week for a decade – the widest, fastest and deepest view of the night sky ever observed. Its vast public archive of data will dramatically advance our knowledge of the dark energy and dark matter that make up 95 percent of the universe, as well as galaxy formation and potentially hazardous asteroids.

A National Priority

The National Research Council’s Astronomy and Astrophysics decadal survey, Astro2010, ranked the LSST as the top ground-based priority for the field for the current decade.

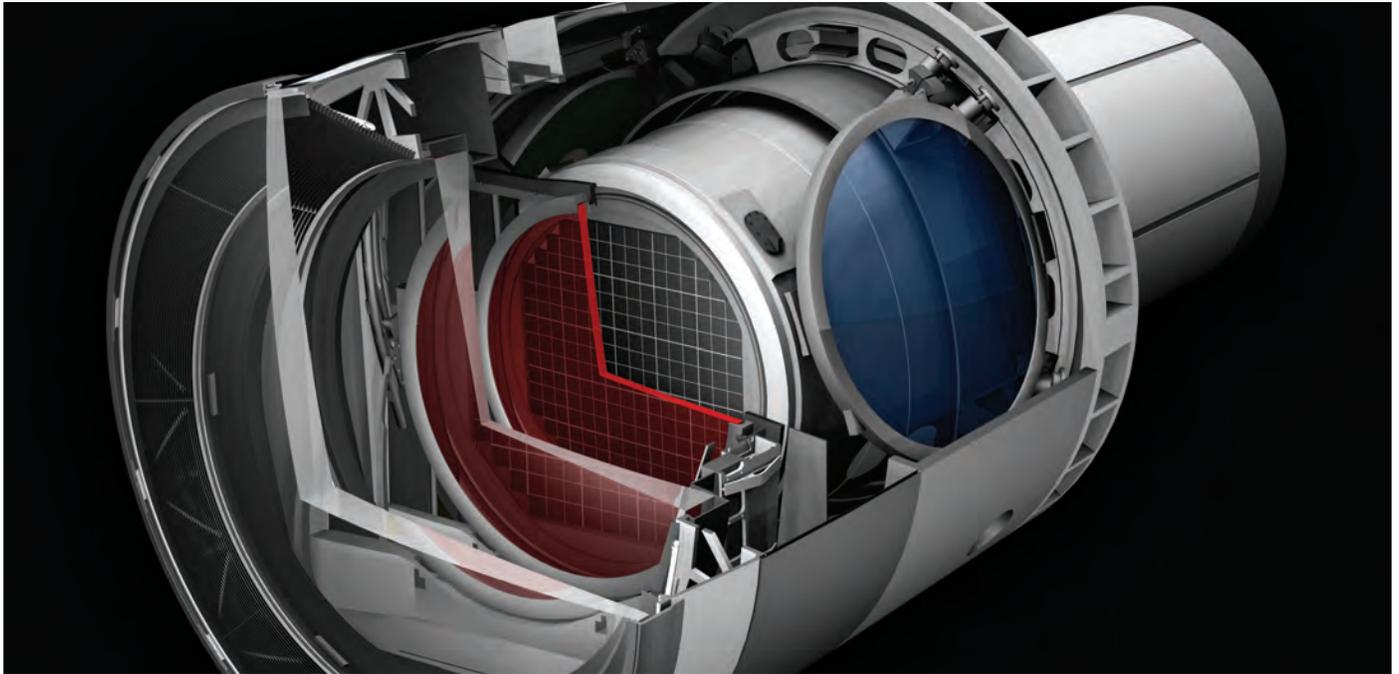
The World’s Biggest Camera

SLAC National Accelerator Laboratory is leading the construction of the LSST camera (see image on back page). The size of a small car and weighing more than 3 tons, it will be the largest digital camera ever built. Displaying just one of its full-sky images would require 1,500 high-definition TV screens.



Above: An artist's rendering of the LSST facilities building against a simulated night sky. Below: The telescope depicted at its future site atop Cerro Pachón in Chile. (Top image by Todd Mason, Mason Productions Inc. / LSST Corporation. Bottom image courtesy of LSST Corporation / NOAO)





A rendering of the LSST camera, whose development is being led by SLAC.
(Image by Greg Stewart, SLAC)

Massive Data

Over its 10 years of operation the LSST will create an unprecedented public archive of data – about 6 million gigabytes per year, the equivalent of shooting roughly 800,000 images with a regular eight-megapixel digital camera every night, but of much higher quality and scientific value. The handling and analysis of all these data will drive advances in big-data science and computing.

Public Engagement

LSST data will be available not only to professional scientists, but also to the public, including students and people involved in “citizen science” projects. This will broaden public participation in science and enhance education in STEM – science, technology, engineering and mathematics.

Two Agency Partners

LSST is being developed as a partnership between two federal agencies. The National Science Foundation is the lead agency, responsible for the telescope facility and data management system, and the Department of Energy is providing the camera and related instrumentation.

LSST Stakeholders

The LSST collaboration includes 36 institutional members and has received non-federal support from a number of sources,

including significant gifts from the Charles Simonyi Fund for Arts and Sciences, Bill Gates, Richard Caris, the W.M. Keck Foundation, Research Corporation for Science Advancement, Wayne Rosing and Dorothy Largay, Eric and Wendy Schmidt, and Edgar Smith.

Current Status

The project is awaiting authorization for construction, which could begin in FY2014. Preliminary, privately funded work has already started on LSST’s 8.4-meter primary mirror, its 3.5-meter secondary mirror, and the initial excavation of its site atop Cerro Pachón in northern Chile.



The LSST up close.
(Image by Todd Mason, Mason Productions Inc. / LSST Corporation)

SLAC is operated by Stanford University for the U.S. Department of Energy Office of Science. Work on LSST at SLAC is performed under the auspices of the Kavli Institute for Particle Astrophysics and Cosmology. LSST project activities nationwide are supported in part by a Cooperative Agreement with the National Science Foundation managed by the Association of Universities for Research in Astronomy (AURA), and the Department of Energy. Additional LSST funding comes from private donations, grants to universities, and in-kind support from LSSTC Institutional Members.