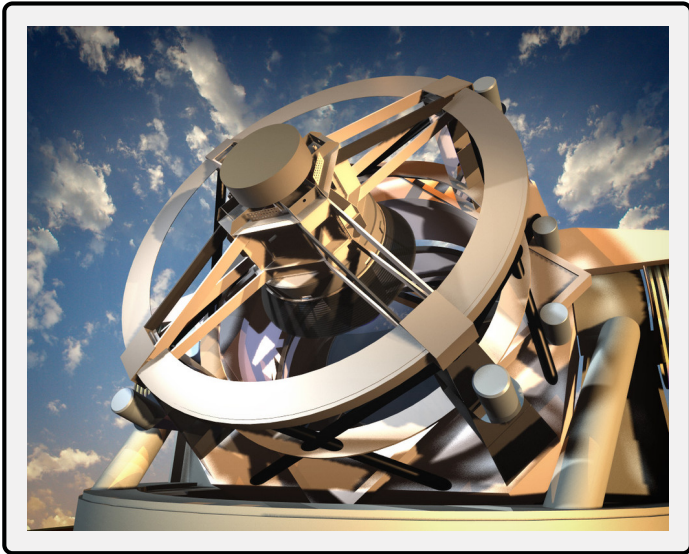


PENN STATE



Artist's drawing of LSST in profile.

Image: Todd Mason, Mason Productions Inc. / LSST Corporation

Penn State is a member of a new \$678 million telescope project

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The U.S. National Science Foundation and Department of Energy have completed an agreement to support the \$678 million construction costs of a major new tool for studying the universe, the Large Synoptic Survey Telescope (LSST), which will be located in Chile. Penn State has been a member institution of the LSST and a participant in its planning since 2005.

"The LSST data will provide an unprecedented view of the universe, and will allow investigation of important questions ranging from charting unknown objects in our own solar system, to the large-scale structure of the universe, to the mysterious nature of dark energy and dark matter," said Lawrence Ramsey, a member of the LSST board of directors, who is a professor of astronomy and astrophysics and an Eberly College of Science distinguished senior scholar at Penn State.

The telescope is expected to see its first light in 2019 and to begin full science operations in 2022.

"The heart of the LSST will be a 3-billion-pixel, specially designed camera the size of a small car that can obtain a deep image of the sky covering an area of 50 full moons," said Niel Brandt, Verne M. Willaman Professor of Astronomy and Astrophysics at Penn State, chair of the LSST's Active Galactic Nuclei Science Collaboration, chair of the LSST Deep Drilling Interest Group, and a member of the

major science collaboration, chair of the LSST Deep Drilling Interest Group, and a member of the LSST Science Advisory Committee.

The large size of the telescope mirror (27 feet in diameter) and its camera's wide field of view will allow the LSST to view the entire available sky every few days. One of the many scientific programs enabled by this frequent viewing of the sky is the identification and tracking of asteroids and comets with orbits that indicate they could collide with the Earth.

"In addition to the enormous dataset, LSST will produce nearly real-time alerts to unusual celestial events, ranging from powerful supernova explosions of giant stars to the destruction of stars by supermassive black holes," commented Donald Schneider, distinguished professor and head of Penn State's Department of Astronomy and Astrophysics.

The LSST mission directly addresses the most pressing questions in astronomy and physics, which also are driving advances in big-data science and big-data computing. By digitally imaging the sky during the decade after its completion, the LSST will produce a petabyte-scale database that is expected to reveal new knowledge that will enrich both scientific research and education in the sciences, technology, engineering, and mathematics.

The early development of the LSST was supported by the LSST Corporation, a nonprofit consortium of universities and other research institutions including Penn State. Fabrication of the major mirror components already is underway, thanks to private funding received from the Charles and Lisa Simonyi Foundation for Arts and Sciences, Bill Gates, and other individuals.

This new agreement, which provides support for the Association of Universities for Research in Astronomy (AURA) to manage the construction of the LSST, marks the official federal start of the LSST project, the top-ranked major ground-based facility recommended by the National Research Council's Astronomy and Astrophysics Decadal Survey in 2010. Receipt of federal construction funds now lets major contracts to move forward and sets the project on a pace that allows the science survey to begin in 2022.

The LSST project is an NSF and Department of Energy (DOE) partnership. NSF is responsible for the telescope and site, education and outreach, and the data-management system. DOE is providing the camera and related instrumentation.

Steven Kahn, LSST director, of Stanford University, commented on the unique contributions LSST will make to astronomy and fundamental physics: "The broad range of science enabled by the LSST survey will change our understanding of the dynamic universe on timescales ranging from its earliest moments after the Big Bang to the motions of asteroids in the solar system today. The open nature of our data products means that the public will have the opportunity to share in this exciting adventure along with the scientific community. The most exciting discoveries will probably be those we haven't yet even envisioned."

MORE INFORMATION ABOUT THE LSST

LSST project activities are supported through a partnership between the National Science Foundation (NSF) and the Department of Energy. NSF supports LSST through a Cooperative

Agreement managed by the Association of Universities for Research in Astronomy (AURA). The effort managed by the Department of Energy is managed by the SLAC National Accelerator Laboratory (SLAC). Additional LSST funding comes from private donations, grants to universities, and in-kind support from Institutional Members of LSSTC: Adler Planetarium; Brookhaven National Laboratory (BNL); California Institute of Technology; Carnegie Mellon University; Chile; Cornell University; Drexel University; Fermi National Accelerator Laboratory; George Mason University; Google, Inc.; Harvard-Smithsonian Center for Astrophysics; Institut de Physique Nucleaire et de Physique des Particules (IN2P3); Johns Hopkins University; Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) - Stanford University; Las Cumbres Observatory Global Telescope Network, Inc.; Lawrence Livermore National Laboratory (LLNL); Los Alamos National Laboratory (LANL); National Optical Astronomy Observatory; National Radio Astronomy Observatory; Penn State University; Princeton University; Purdue University; Research Corporation for Science Advancement; Rutgers University; SLAC National Accelerator Laboratory; Space Telescope Science Institute; Texas A & M University; The University of Arizona; University of California at Davis; University of California at Irvine; University of Illinois at Urbana-Champaign; University of Michigan; University of Pennsylvania; University of Pittsburgh; University of Washington; and Vanderbilt University. More information about the LSST is online at lsst.org.

CONTACTS:**Larry Ramsey , lwr@psu.edu****Work Phone:** 814-863-5573**Niel Brandt, niel@astro.psu.edu****Work Phone:** 814-865-3509**Donald Schneider, dps@astro.psu.edu****Work Phone:** 814-863-9554**Barbara Kennedy, bkk1@psu.edu****Work Phone:** 814-863-4682<http://science.psu.edu/news-and-events>*Last Updated August 19, 2014*