NSF-DOE Vera C. Rubin Observatory

The Legacy Survey of Space and Time (LSST)

LSST

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NSF-DOE Vera C. Rubin Observatory's Legacy Survey of Space and Time (LSST) will scan the entire visible southern sky every few days 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% of the universe, as well as galaxy formation and potentially hazardous asteroids.

Facts

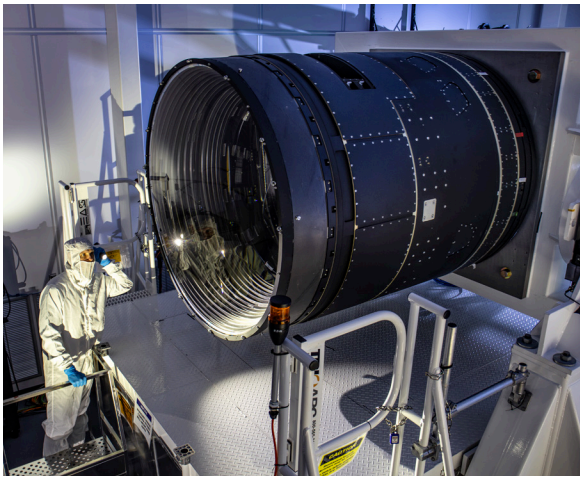
- 3.2 gigapixel camera
- Displaying one full-sky image would require over 1,500 high-definition TV screens
- In 10 years will detect tens of billions of objects
- Will archive 6 million gigabytes of data per year
- Equivalent to shooting more than a million images with a cell phone camera every night

A National Priority

The National Research Council's Astronomy and Astrophysics Decadal Survey, "New Worlds, New Horizons," ranked Rubin Observatory, formerly known as the Large Synoptic Survey Telescope, as the top ground-based priority for the field for this decade.

3-billion-pixel Camera

SLAC National Accelerator Laboratory led the design and construction of the LSST Camera, which will be mounted on the Simonyi Survey Telescope. The size of a small car and weighing more than 3 tons, the 3.2-gigapixel camera will be the largest digital camera ever built for ground-based optical astrophysics and cosmology. Displaying just



Top: The NSF-DOE Vera C. Rubin Observatory. (All photos by Rubin Observatory/NOIRLab/NSF/AURA unless noted) Right: The LSST Camera. (Jacqueline Ramseyer Orrell/SLAC National Accelerator Laboratory)

SLAC NATIONAL ACCELERATOR LABORATORY

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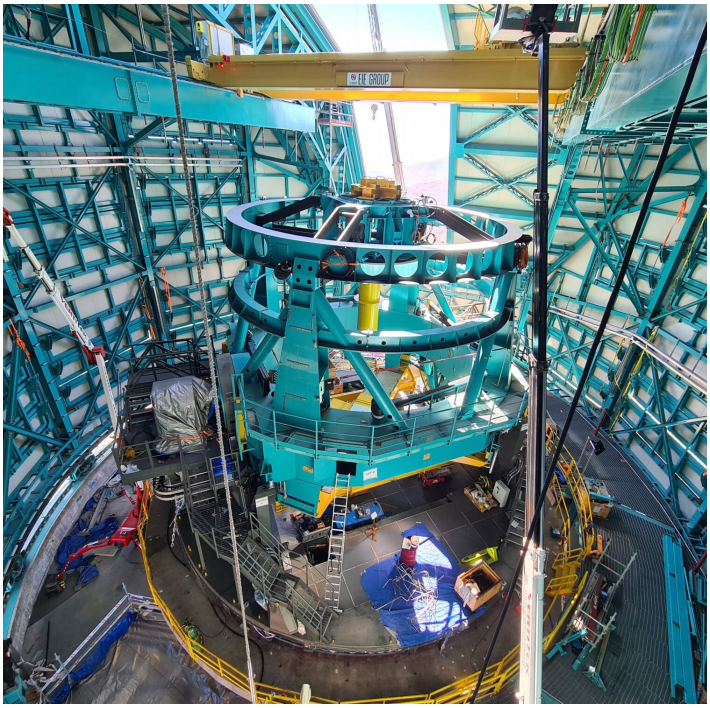
Rubin Observatory, which will take nearly a decade to complete, has a unique appearance compared to other observatories due to its large support building that will act as a maintenance shop for the supersized camera and telescope.



The interior structure of Rubin Observatory's dome will hold the Simonyi Survey Telescope and the LSST Camera.

one of its full-sky images would require over 1,500 high-definition TV screens.

Massive Data

During the first 10 years of operations, Rubin Observatory will detect tens of billions of objects – the first time a telescope will catalog more galaxies than there are people on Earth. This will create an unprecedented archive of 6 million gigabytes of data per year, the equivalent of shooting more than a million images with a cell phone 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

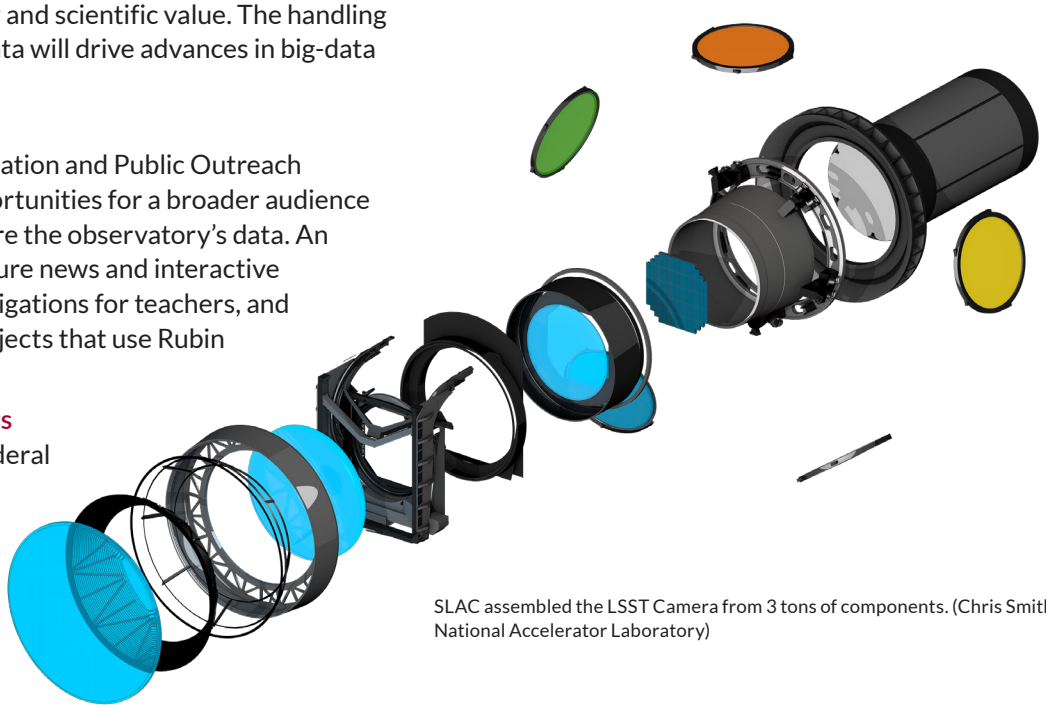
Rubin Observatory's Education and Public Outreach Program will provide opportunities for a broader audience to interact with and explore the observatory's data. An engaging website will feature news and interactive visuals, educational investigations for teachers, and links to citizen science projects that use Rubin Observatory data.

Partners and Stakeholders

Rubin Observatory is a federal project jointly funded by the National Science Foundation and the Department of Energy Office of Science, with early construction funding received from private donations through the LSST Corporation.

Current Status

Assembly and testing of the LSST Camera at SLAC was completed in April 2024. Construction of Rubin Observatory in Chile began in April 2015, and science operations are expected to begin in 2025.



SLAC assembled the LSST Camera from 3 tons of components. (Chris Smith/SLAC National Accelerator Laboratory)