

RUBIN OBSERVATORY SUMMARY

Rubin Observatory, currently under construction in Chile, is an integrated system designed to conduct an unprecedented decade-long optical survey of the visible sky. Featuring a wide field ground-based telescope with an 8.4-meter mirror, a 3.2 Gpix camera, an automated data processing system, and an online public engagement platform. Rubin Observatory seeks to enable science in four main areas: the nature of Dark Matter and understanding Dark Energy, cataloging the Solar System, exploring the changing sky, and Milky Way structure and formation.

Rubin Observatory will operate on an automated cadence, capturing an area the size of 40 full moons with each pair of 15-second exposures and returning to the same area of sky approximately every three nights. Over ten years of operations, hundreds of deep exposures will be acquired for every part of the visible sky. Dedicated computer facilities will process Rubin Observatory data in real time, issuing worldwide alerts within 60 seconds of detected changes in the sky. Prompt and data release products will be available to all U.S. and Chilean astronomers, and to Rubin Observatory's in-kind contributors. Rubin Observatory's massive data archive will offer vastly increased sample sizes and opportunities for scientists to "observe" the sky by mining the data and carrying out multiple independent research programs simultaneously. Rubin Observatory is a new kind of telescope requiring new research methods and skills for working with Big Data.

A subset of data will be widely available through Rubin Observatory's Education and Public Outreach (EPO) dynamic website portal, offering tools and activities for formal educators, citizen scientists, informal science centers, and the general public to engage, explore, and discover.



PROJECT COST

With Major Research Equipment and Facility Construction (MREFC) funding at a not-to-exceed cost of \$473M, and under cooperative agreement with AURA, the National Science Foundation supports construction of the Telescope & Site facility, Data Management system, and Education and Public Outreach components of Rubin Observatory as well as the Project Management and System Engineering efforts.

The Department of Energy (DOE) supports fabrication of the Rubin Observatory LSST Camera as a Major Item of Equipment (MIE), through the Office of High Energy Physics in the Office of Science, with a total projected cost of \$168M and SLAC National Accelerator Laboratory as the lead DOE lab.

Rubin Observatory is expected to achieve engineering first light in 2021 and is scheduled to begin science operations in 2022.

