



Large Synoptic Survey Telescope (LSST) Mirror Blank

- > In its first month of operation, the LSST will see more of the universe than all previous telescopes combined. The 3.2 billion pixel camera will take more than 800 panoramic images every night to:
 - Image the entire sky every few days, creating movies of our universe
 - Explore the mysteries of dark matter and energy
 - Find potentially hazardous asteroids and new solar systems
- > Harris is on contract to process, mount and deliver the secondary mirror assembly
- > Harris provides assured quality of complex optical components for LSST mission success

HARRIS HELPS SCIENTISTS SEE THE UNIVERSE MORE CLEARLY

Harris employees in Rochester, N.Y., have received a large piece of glass that will, after their work is completed, help scientists research the mysteries of the universe.

The glass will eventually become a part of the Large Synoptic Survey Telescope (LSST), a large, ground-based telescope that can survey the entire visible sky every three nights. Harris is on contract to process the glass into a 3.5-meter diameter mirror, which will serve as the telescope's secondary mirror.

"This will be the largest optic Harris will manufacture to date," said Dan Adams, Harris director of precision optics. "Think of the glass like a block of wood. It's blank until you do something with it. In the case of the LSST secondary mirror, we have to grind and polish the mirror blank to a certain prescription. It's nothing more than a big glass paperweight until then."

The secondary mirror is a solid meniscus design fabricated from ultra-low expansion glass manufactured by Corning Incorporated. Harris will also manufacture the mirror's cell assembly, which consists of the polished secondary mirror, mirror support system, mirror cell electronics and sensors, thermal control system and the mirror control system.

The completed ground-based telescope will be located in Chile and provide scientists with data to address today's most compelling questions in astrophysics. The public will also have real-time access to the variable night sky.



LSST Mirror Blank

SHEDDING LIGHT ON DARK MATTER

"We are proud to provide our support to research in the science of dark matter and energy and to LSST's remarkable telescope and project," Adams said.

The LSST Project was named a top priority in the National Research Council's Astro2010 report, *New Worlds, New Horizons in Astronomy and Astrophysics*, a decadal survey that ranked it as the top large-scale, ground-based project for the next decade. Once operational, the telescope will survey the entire visible sky every three nights. Taking exposures every 10 seconds to track objects that change or move, the LSST will chart the history of the expansion of the universe.

The LSST will provide unprecedented three-dimensional maps of the mass distribution in the universe, in addition to the traditional images of luminous star and galaxies, according to the LSST Corporation. These mass maps can be used to better understand the nature of the newly discovered dark energy that is driving the accelerating expansion of the universe.

LSST construction 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). Funded by the Department of Energy, LSST 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 LSST Corporation.

For more than 50 years, Harris has supplied large aperture optical systems and components for ground and space-based systems. Notable astronomy applications include the final figuring of the Keck Telescope primary mirror segments, fabricating the primary mirror segments for the Hobby Eberly and Southern African Large telescope and the backup primary mirror for the Hubble Space telescope.

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■ Harris' employees pose with the glass that will become the LSST secondary mirror

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