



# Arizona Daily Star

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## TUCSON SCOPE PROJECT WINS FUNDING PRIORITY



JEFFRY SCOTT / ARIZONA DAILY STAR

Optical engineer Bill Gressler, on ladder, discusses the mirror cast with Elaine Halbel during a tour Friday of the Steward Observatory Mirror Lab by members of the Large Synoptic Survey Telescope project.

# Astronomical success

### Telescope to be built in Chile, but HQ for LSST will be here

By Tom Beal  
ARIZONA DAILY STAR

Scientists from around the country applauded, cheered, exchanged high-fives and sipped champagne here Friday morning.

A National Academy of Sciences panel announced the selection of their project - the Large Synoptic Survey Telescope (LSST) - as the top priority for ground-based astronomy for the coming decade.

Sidney Wolff, president of the Tucson-based LSST Corp., said she fully expected a positive recommendation from the Astro 2010 panel, which sets priorities for federal spending on astronomy and astrophysics, but, "This is our dream

come true as to what we might get out of this panel."

Project manager Don Sweeney brought a bottle of Scotch to the morning meeting at the Ritz-Carlton Dove Mountain Resort in Marana, saying he'd drink it if the LSST was not given a good recommendation.

Instead, the scientists working on the LSST were served champagne after being chosen as the No. 1 priority for ground-based astronomy and being recommended for immediate funding from the National Science Foundation and the Department of Energy for two-thirds of the project's \$465 million cost and a similar sum for operating the telescope for 10 years.

The Astro 2010 Decadal Survey is used to guide funding to astronomy projects by federal agencies, including NASA, the National Sci-

ence Foundation and the Department of Energy.

The panel identified three science objectives:

- Understanding the cosmology of the "cosmic dawn" or early years of the universe.

- Finding habitable, Earthlike exoplanets around nearby stars.

- Probing the physics of the universe to better understand gravitational forces and the elusive dark matter and dark energy theorized to make up most of the cosmos.

Sweeney said the LSST, slated for Cerro Pachon in Chile, is a good fit for those science goals, and he predicted it will be good for Tucson. "As soon as the funding starts, we'll have 20 to 30 extra professional jobs here. We'll be spending \$70 million a year. It will have a huge impact," he said.

"There is every possibility that

the world headquarters will come to Tucson. Three of our four founding partners (the University of Arizona, Research Corp. and the National Optical Astronomy Observatory) are here."

Peter Strittmatter, director of Steward Observatory, said selection of LSST is good news for the UA and Tucson, as were other aspects of the report.

UA scientists participate in aspects of the space telescope programs recommended by the report and will be competing for others, he said.

Strittmatter said he wasn't particularly pleased by the committee's recommendation that NSF quickly pick a winner from two competing proposals to build a giant segmented-mirror telescope in the coming decade.

The UA is a partner in an international consortium building the Giant Magellan Telescope, whose seven mirrors will provide work for Steward's Mirror Lab for the coming decade.

Strittmatter said "the urgency (of selecting one) is questionable." He thinks both should be built and the NSF should fund each at a level lower than the 25 percent share proposed by the committee.

The report also suggested a new role for the National Optical Astronomy Observatory (NOAO), the Tucson-based organization that provides access to research telescopes for U.S. astronomers based on the worth of their science proposals.

The relevance of NOAO's smaller telescopes on Kitt Peak and in Chile will "diminish further" in the era of 20- to 30-meter telescopes, the report said.

Its current level of support cannot be justified, the report said, though it did single out Kitt Peak's largest telescope, the 4-meter Mayall, whose concept plan to survey the sky spectroscopically is cited as a "compelling midscale innovation" in the report.



ARCADIS / LSST CORP.

## LARGE SYNOPTIC SURVEY TELESCOPE (LSST)

The big winner in the decadal report on astronomy, the LSST is headquartered in Tucson and slated for construction in Chile. Its unusual 8.4-meter mirror, which contains both primary and tertiary mirror surfaces, was cast at the Steward Observatory Mirror Lab and is currently being readied for grinding and polishing.

Steward's Imaging Technology Laboratory is one of two vendors competing to build the telescope's camera - the largest and fastest CCD camera ever built.

The decadal survey report recommends that the National Science Foundation and the Department of Energy provide two-thirds of its estimated \$465 million construction costs and two-thirds of its annual operating budget of \$42 million for 10 years.

The LSST bills itself as the "widest, fastest, deepest eye of the new digital age." Its three-mirror, compact design provides for quick movement and wide field of view that will be captured on 3 billion pixels of solid state detectors.

It will photograph the entire southern sky in three nights, repeating that process 1,000 times over the next 10 years.

## THE NATIONAL OPTICAL ASTRONOMY OBSERVATORY (NOAO) AND KITT PEAK

The report suggests that NOAO, now based in Tucson, consolidate its operations, focusing on the larger Gemini telescopes in Chile and Hawaii and on its new role with the next generation of very large telescopes.

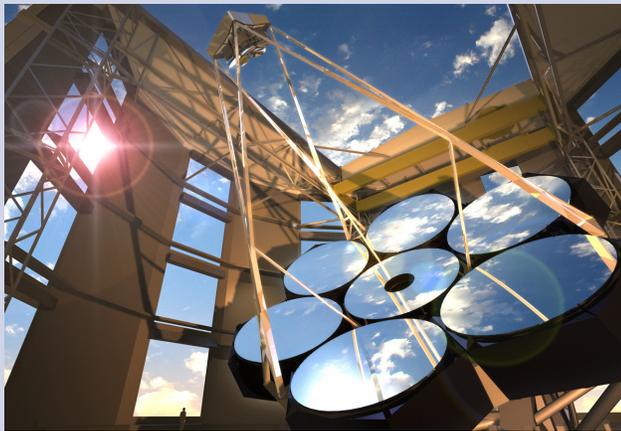
The report says:

"NOAO's future is not without controversy. As the world of OIR (optical and infrared) astronomy moves into the 20-40 meter class telescope era, the relevance of the current NOAO facilities will diminish further, along with the level of support that can be justified.

"Any specific direction on how to find economies within the NOAO budget falls outside of the charge of this report and will, presumably, be part of the next Senior Review. However, the committee notes some options including: consolidation of part or all of the staff and management of NOAO and Gemini; closure or privatization of some of the telescopes; closure or privatization of one of the sites; and a gradual transition in the staffing and staff responsibilities towards an operations-focused model."



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## GIANT MAGELLAN TELESCOPE (GMT)

The University of Arizona is a partner in the Giant Magellan Telescope, whose seven mirrors would form a single aperture 24.5 meters in diameter. Casting and polishing those mirrors would keep the Steward Observatory Mirror Lab busy for the next decade.

Its U.S. competition is the Thirty Meter Telescope proposed by a consortium of California universities and its international partners. The European Southern Observatory is planning an even larger, 42-meter telescope. The report suggests that the National Science Foundation pick one of the two U.S. projects for 25 percent funding.

The report says:

"Astronomers are poised to take the next major step-adaptive optics telescopes with 3 times the diameter, 10 times the optical collecting area, and up to 80 times the near-infrared sensitivity compared to existing telescopes. These Giant Segmented Mirror Telescopes (GSMTs) will be essential to understanding the distant galaxies discovered by JWST (James Webb Space Telescope) and to obtaining spectra of the faint transients found by LSST, and they will be transformative for a broad range of science aimed at understanding targets ranging from stars and exoplanets to black holes."

## ASTRO

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NOAO Director David Silva said he appreciated the report's direction to give the observatory a role in the LSST and in whatever giant segmented-mirror telescope is chosen, as well as expanding its role in the 8-meter Gemini telescopes in Hawaii and Chile.

"We are the national observatory," Silva said. "If we are not running world-class, cutting-edge facilities

and continuing to move forward, that's not healthy. Hard choices have to be made," Silva said.

Defunding by the NSF would not mean the end of Kitt Peak, Silva said. About 40 percent of the mountain is already occupied by non-federal tenants, and the NSF budget there is about \$6 million. "That's not trivial," he said, "but it can be replaced."

Abhijit Saha, interim director of Kitt Peak National Observatory, said any change in support from the National Science Foundation

will come only after a "senior review" of the facility.

"I don't see that as Kitt Peak going away," said Jonathan Lunine, a member of the panel that produced the report. Lunine, on leave from the UA Lunar and Planetary Lab to teach at the University of Rome, said he expects that private money and consortia of universities can be found to keep the smaller scopes occupied.

Lunine said he didn't find it difficult to set aside his allegiances with Tucson-based projects while serving

on the committee.

"We all feel a certain pressure from colleagues at home but the responsibility of serving on the committee imposes a really large burden to be fair, to be impartial," he said.

"In the case of Tucson, it's not all that difficult. The UA and Tucson in general has such a richness of astronomy. Whatever the outcome, Tucson will step up to be a leader."

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