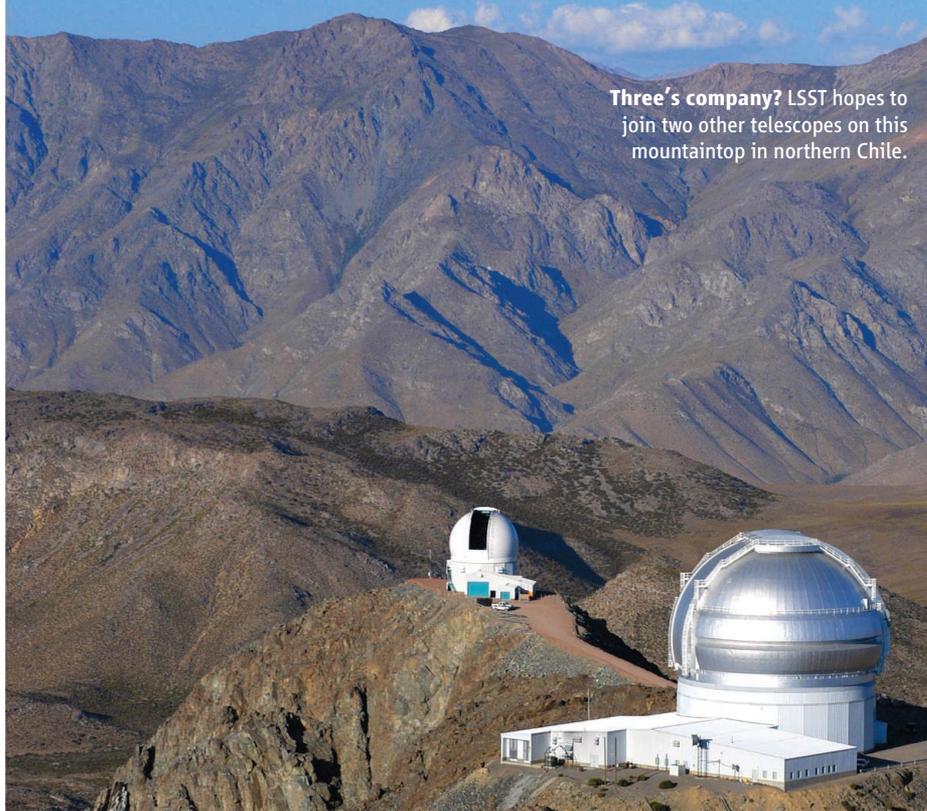


Three's company? LSST hopes to join two other telescopes on this mountaintop in northern Chile.



2013 U.S. BUDGET

Big or Small, Science Will Suffer If Sequestration Goes Into Effect

J. Anthony “Tony” Tyson, director of the proposed Large Synoptic Survey Telescope (LSST), felt last month like he had won the lottery. After a decade of tough negotiations with the U.S. National Science Foundation (NSF), the agency’s oversight body said the \$665 million project was ready to be built. But in the months to come, Tyson, an astrophysicist at the University of California, Davis, may discover that getting a green light to seek \$465 million from NSF’s large facilities account is more akin to winning permission to book passage aboard the *Titanic*.

For U.S. scientists doing research supported by the federal government, the 2013 fiscal year, which begins on 1 October, could be catastrophic. The financial iceberg heading their way even has a name: sequestration.

The word comes from the Budget Control Act, passed in August 2011 to avert a federal default. The law created a congressional commission, which last fall came up with a long-term strategy to reduce the country’s \$1.5 trillion annual deficit.

But Congress failed to adopt the commission’s recommendations. Its inaction triggered the second component of the act: a decade of mandatory spending cuts totaling \$1.2 trillion. The first bite—\$110 billion

across all agencies, divided equally between military and civilian programs—is scheduled to take effect on 2 January.

It may be the most unpopular law in Washington. All the key players in last summer’s high-stakes negotiations—President Barack Obama, Senate Majority Leader Harry Reid (D–NV), and Speaker of the House of Representatives John Boehner (R–OH)—have repudiated its blunt approach to deficit reduction. In particular, Republicans have tried to fence off military spending, while Democrats want to protect

domestic programs. White House budget director Jeffrey Zients says that sequestration “is bad policy, was never meant to be implemented, and should be avoided,”

Online

sciencemag.org

 Podcast interview with author Jeffrey Mervis (http://scim.ag/pod_6096).

and this month he and another senior Administration official told Congress that the law was “highly destructive” and would lead to “senseless chaos.” In fact, regret runs so deep that many believe Congress will find a way to postpone or avoid the cuts it mandated.

The uncertainty has left federal agencies groping in the dark. The Administration has

promised to follow the terms of the Budget Act. But on 31 July, Zients told each agency to “continue normal spending and operations since more than 5 months remain for Congress to act.” In reality, meaningful negotiations aren’t likely to begin until after the 6 November national elections, when legislators return for a lame-duck session. Another complication is that the cuts would apply to a FY 2013 budget that Congress is not likely to approve before next spring (*Science*, 10 August, p. 631).

Last week, Obama signed a measure, embraced overwhelmingly by legislators from both parties, that requires him to spell out the consequences of sequestration for each agency within 30 days. But Administration officials have already said the overall impact on science would be “devastating,” translating into an immediate cut of 8% to 10% for every federal research agency.

For two bastions of federally funded basic research, NSF and the National Institutes of Health, a cut of that size would mean making thousands fewer awards than planned and possibly trimming the size of current grants. Graduate students would need to find other sources of funding, and efforts to improve science and math education at all levels would suffer. In addition, support for innumerable programs, initiatives, and activities around the world would be curtailed or canceled.

The White House is hoping that the scientific community will help persuade Congress to reject that meat-ax approach. Last week, White House officials gave a pep talk to university and scientific society administrators, assuring them that the president opposes any further cuts to programs that fund research and science education.

A better way to eliminate the deficit without decimating vital government activities, Zients says, is “bipartisan, balanced deficit legislation.” That’s shorthand for a mixture of tax increases and spending cuts. But raising taxes is anathema to Republicans, and many Democrats object to any large cuts to domestic programs.

One scientist who participated in last

week’s briefing doubts that the White House will be any more specific next month. “When the other side won’t say what they will cut, you don’t want to make enemies by spelling out the details,” says Gilbert Omenn, a professor of medicine at the University of Michigan, Ann Arbor, who served as both a budget and a science officer under former President Jimmy Carter. Omenn’s biggest fear is that Congress will exempt military spending, placing an even heavier burden on civilian programs. But he thinks Congress is more likely to simply push back the start date for sequestration. In the meantime, science agencies are warning their constituents to prepare for the worst.

Yet Tyson remains optimistic. One reason is his unshakeable faith in the value of LSST. The telescope will teach scien-

end of the agreement. (Private donors have already put up the remaining \$40 million.) If not, he says, “other things will intrude and we won’t be able to stay on schedule.” And a delay would inevitably increase its overall construction cost.

Sequestration poses a serious threat to that schedule, however. At a minimum, NSF would need enough money in its large facilities account to build LSST without squeezing other projects already in the queue. NSF requested \$197 million for the account in 2013 to continue work on four projects—the National Ecological Observatory Network (NEON), the Ocean Observatories Initiative, the Advanced Technology Solar Telescope, and Advanced LIGO, a second-generation interferometer—and hopes to receive \$182 million more for them in 2014. That amount, if achieved, would allow NSF to request \$15 million to \$20 million for LSST without raising the overall size of the account. “I’ve been told we are a high priority for both agencies,” Tyson says. “But it’s hard to read the political tea leaves.”

Funding delays have become a way of life for David Schimel, scientific director of NEON. Sequestration represents yet another

threat to NEON, which was first proposed in 2000 but which officially broke ground only 2 months ago. “We’re constantly rearranging our schedule,” says Schimel about the \$434 million project. “It appears to be a full-time occupation.”

Sequestration notwithstanding, Schimel believes NEON is finally on its way. NSF traditionally favors existing projects over new starts when money is tight, he notes, and two aerial missions this month—one surveying a forested area in Colorado recently devastated by fire and the other a long-studied forest in western Massachusetts—demonstrate the scientific value of NEON. “It’s pretty cool to see these systems in action after such a long time planning them,” Schimel says.

Tyson, soon to become chief scientist under a new management structure, hopes to be able to say the same in a few years about LSST.

—JEFFREY MERVIS



A flying start. Aerial surveillance is part of the arsenal of tools for NEON, a fledgling national ecological network.

tists how to extract knowledge from massive data sets, he says, and give the public “a color motion picture” of the cosmos in unprecedented detail.

LSST’s funding profile holds another ray of hope. The project, to be built atop a mountain in northern Chile, doesn’t need to get its nose inside the NSF construction tent until late in FY 2014. The initial investment would be small, he adds, before ramping up to \$75 million or so in 2015 and subsequent years toward a scheduled completion in 2019.

The NSF money would be used to build the facility’s 8-meter mirror, site infrastructure, and data management systems. The Department of Energy has already agreed to fund a \$160 million, car-sized, 3.2-gigapixel digital camera that will make LSST what Tyson calls “the widest, fastest, deepest eye on the universe.”

Tyson hopes each agency will hold up its