

not adequately supervising LaCour's work.

Delegates in Rio broadly agreed that the case highlights the need for better supervision by senior academics. "Academia should be concerned that its system of checks and balances has problems," said Nicholas Steneck, who studies research integrity at the University of Michigan in Ann Arbor. "It will never be perfect, but it is far from perfect now." Sabine Kleinert, a co-organizer of the research-integrity conference and senior executive editor at *The Lancet*, said: "The wider lessons are still the same as many of these cases throw up — that of the role of the co-authors in taking steps to be accountable for the data, and the role of institutions in safeguarding or having repositories for the data underlying research that is done there."

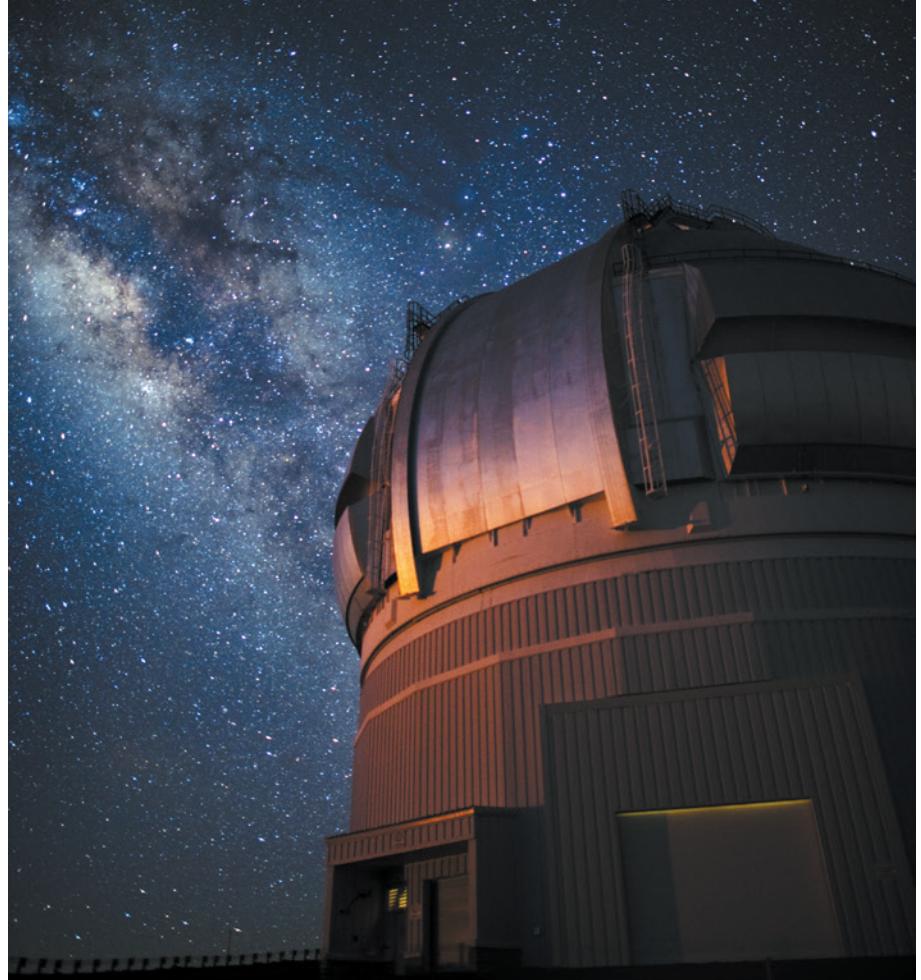
On the plus side, the retraction came swiftly after queries were raised about the data, noted Ivan Oransky, a journalist who runs the blog Retraction Watch, which first reported that Green had asked for the study to be retracted. Researchers posted their objections online on 19 May (see go.nature.com/qgrdav) and *Science* retracted the study on 28 May. That is in stark contrast to an earlier misconduct case — involving the cancer geneticist Anil Potti — in which whistleblowers tried for years to quietly raise concerns with Potti's institution, Duke University in Durham, North Carolina, before papers were finally retracted and Potti resigned.

Mysteries still linger in the LaCour case. In the 23-page reply that he posted on 29 May, LaCour raises statistical objections to the criticisms levelled at him. These "couldn't possibly be more beside the point", said Jelte Wicherts, a statistician at Tilburg University in the Netherlands.

LaCour also posted snapshots of an apparent survey set up with the firm Qualtrics, but these actually relate to a pilot study that was abandoned, according to Chris Skovron, a political scientist at the University of Michigan. He had worked on the study until LaCour cut off the collaboration, he says.

As to whether canvassing changes voters' attitudes, Brian Calfano, a political scientist at Missouri State University in Springfield, says that other literature suggests that it can, but that replication or extension of the LaCour–Green work would have to be done to know for certain that it does so in this particular scenario. LaCour wrote in his 29 May document that Calfano had replicated his study, but Calfano says that his own work is only a preliminary finding relating to a different kind of canvassing of voters. He shared the finding with LaCour at an early stage, but is not willing to stand behind it until further tests are completed.

LaCour did not respond to a request for comment. His graduate supervisor, political scientist Lynn Vavreck, says that UCLA has an ongoing inquiry into the issue. ■



PHILIP ROSENBERG/GETTY

The Gemini North telescope is one of several world-class astronomy facilities on Mauna Kea.

ASTRONOMY

Hawaiian telescopes pruned

Cultural fight over sacred mountain Mauna Kea prompts rule change.

BY ALEXANDRA WITZE

The quest to build one of the world's largest telescopes has radically reshaped the future of a Hawaiian mountain. On 26 May, Hawaii governor David Ige announced that the controversial Thirty Meter Telescope (TMT) could be built on Mauna Kea as planned — but that three or four of the mountain's 13 existing telescopes must be dismantled over the next decade.

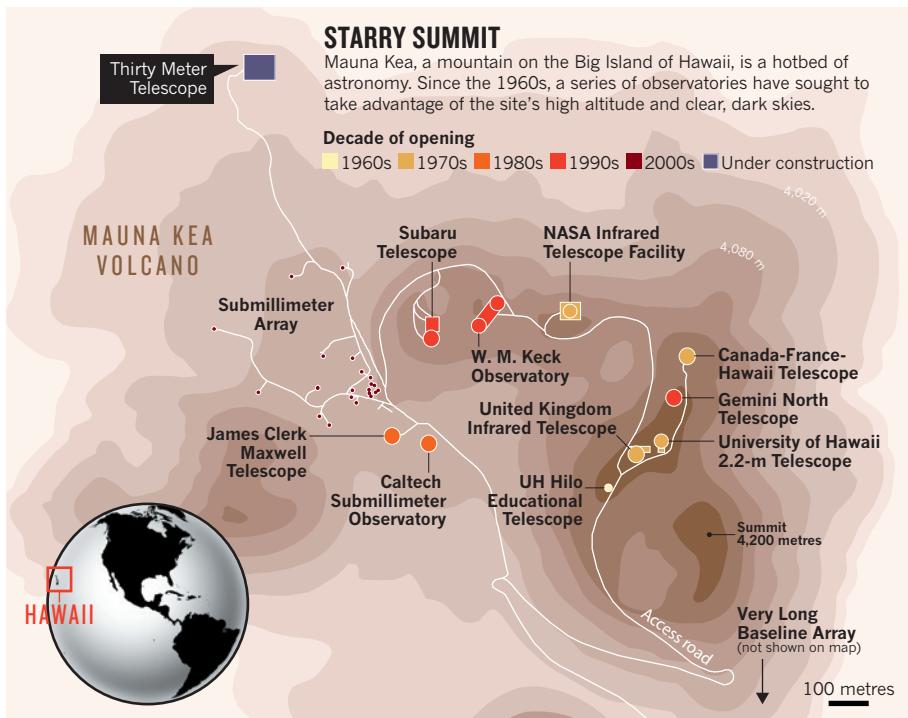
Mauna Kea is home to such world-leading facilities as the twin 10-metre Keck telescopes and the 8-metre-class Subaru and Gemini North telescopes (see 'Starry summit'). Speculation is already running high about which telescopes will be removed, and when.

Native Hawaiians regard Mauna Kea as sacred, and they view building the TMT as

another violation of an already desecrated site. Construction was to have begun in early April, but was put on hold when protests broke out on the mountain, in Honolulu and at other sites across the islands.

Ige's announcement, a direct response to the unrest, accelerates long-standing plans to decommission Mauna Kea telescopes as they grow older. "The idea of removing telescopes from the summit is not a new one," says Doug Simons, director of the Canada-France-Hawaii Telescope on Mauna Kea. "It's the natural evolution of a set of observatories that are ageing in a lot of ways."

The governor has ordered the University of Hawaii at Manoa, which leases the mountain top as a science reserve, to close 25% of the observatories there before the TMT begins operation in the mid-2020s. The ▶



► university owns a 2.2-metre optical telescope that is the oldest on Mauna Kea, dating back to 1970; a 0.9-metre educational optical telescope; and the 3.8-metre United Kingdom Infrared Telescope (UKIRT). It also manages the 3-metre Infrared Telescope Facility for NASA, which studies planets, asteroids and stars.

"We have always made the point that space on the top of the mountain should only be populated by the absolutely best telescopes," says Günter Hasinger, director of the university's Institute for Astronomy.

EYES SHUT

The first to go will be the Caltech Submillimeter Observatory, the closure of which was announced in 2009. It will end operations

in September, and then will be dismantled. Other telescopes, including Keck, Gemini and Subaru, involve complex international agreements that cannot be overwritten by the state of Hawaii alone. All have committed to operating on the mountain to the end of 2033.

"We intend to continue operating until we come to a point where the science return isn't worth it," says Raymond Blundell, an astronomer at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, and director of the Submillimeter Array, an eight-dish radio telescope array on Mauna Kea.

Some of the telescopes on the mountain have just begun a new lease of life. Earlier this year, a consortium of east Asian observatories took over the submillimetre-wavelength

James Clerk Maxwell Telescope to study how galaxies and stars form, among other things. And UKIRT has just begun a long-term science programme that involves studying space debris and near-Earth asteroids, says director Richard Green, an astronomer at the University of Arizona in Tucson.

For now, Green continues to plan for nearly two decades ahead — although he acknowledges that the situation may change. "We realize there has to be more attention paid to the culture and how the mountain is taken care of," he says.

In addition to closing telescopes, Ige levied a list of other requirements. When the University of Hawaii's lease ends in 2033, it must return to state protection more than 40 square kilometres of the 45 it leases. Visitors to the summit must receive cultural training. And the TMT location, which is a few hundred metres beneath the actual summit, will be the last area on Mauna Kea on which any telescope will ever be built.

Nearly every telescope project on Mauna Kea in recent years has faced local protests, although not the sustained high emotion inspired by the TMT. John Johnson, an astronomer at Harvard University in Cambridge, says that astronomers should not be on the mountain top at all, given the history of the Hawaiian Islands. "This goes way beyond whether we construct this telescope or not," he says. "It has to do with the fact that the United States stole Hawaii from a sovereign people and proceeded to systematically erase that culture."

The university says it will have a plan for removing 25% of the observatories by the end of this year. The TMT has not announced whether and when it will resume construction, and legal challenges to the project are still wending their way through Hawaiian courts.

Two competing next-generation telescopes are being planned for Chile. ■

PHYSICS

Atomic clocks face off

Next generation of hyper-precise timekeepers can only be tested against each other.

BY ELIZABETH GIBNEY

Happy birthday, caesium clock. Now move over. As the atomic clock used to define time itself turns 60, tests are set to begin on a new generation of clocks that are designed to give the caesium version a run for its money.

Such timekeepers would enable a variety of

experiments, including testing whether the fundamental constants of nature really are constant over time, and, eventually, a more precise official definition of the second.

Atomic clocks track the frequency of electromagnetic waves emitted by atoms as they change energy states. First demonstrated by British physicist Louis Essen in June 1955, the caesium clock became the world's official

timekeeper in 1967 — defining the second as the time it takes for the microwaves that are absorbed or emitted when caesium atoms switch between states to cycle through 9,192,631,770 oscillations.

Over the past decade, various laboratories have created prototype optical atomic clocks, which use different elements such as strontium and ytterbium that emit and absorb