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The United Kingdom Infra-Red Telescope is setting records for scientific publications.

ASTRONOMY

Stellar UK scope faces closure

Specialize or die is the mantra for medium-sized instruments.

BY ERIC HAND

Perched near the 4,200-metre summit of Mauna Kea in Hawaii, the United Kingdom Infra-Red Telescope (UKIRT) enjoys one of the finest sites in all of astronomy. It was among the world's largest telescopes when it opened more than 30 years ago, and its enviable record of publications shows no signs of slowing. Yet on 30 May, the UK Science and Technology Facilities Council (STFC) announced that it will close the 3.8-metre telescope in 2013, unless a buyer can be found.

UKIRT's closure could be the first of many, say concerned astronomers. Just as 1- and 2-metre telescopes began to be mothballed in the 1990s to free up funding for a new class of 8–10-metre instruments, more than a dozen 4-metre telescopes around the world could face a similar fate as astronomers prepare for the arrival of 30-metre behemoths (see *Nature* **479,** 18–19; 2011).

"Is this a sign of things to come? It may be," says Gary Davis, director of the Joint Astronomy Centre in Hawaii, which operates UKIRT. The cash-strapped STFC decided to sacrifice UKIRT to preserve its membership commitment to the European Southern Observatory (ESO), which is planning a 40-metre giant. "Once again, the UK is leading the way," Davis adds archly.

But survival strategies are coming to light. Chief among them is that, rather than using 4-metre telescopes as general-purpose observatories, with time being divided among hundreds of astronomers, they should be dedicated to specific problems requiring large collaborations, long campaigns and custom-built instruments. "We've become much more like particle physics, oriented towards doing specific things in big teams," says Janet Drew, an astronomer at the University of Hertfordshire in Hatfield, UK, who chaired a committee planning the future of Europe's 2–4-metre telescopes.

In the United States, for example, the Department of Energy is hoping to fund the development of instruments that will allow two ageing, 4-metre-class telescopes belonging to the National Optical Astronomy Observatory (NOAO) to engage in a quest to understand dark energy, the mysterious force that is speeding up the expansion of the Universe. One collaboration, the Dark Energy Survey, will install a 570-megapixel camera on the 4-metre Blanco telescope in Chile. By taking pictures of hundreds of millions of galaxies, it could reveal tiny distortions in their shape that would betray the effect of dark energy. Another group, called BigBOSS, plans to investigate dark energy by looking for patterns in the distribution of 20 million galaxies using an instrument installed at the 4-metre Mayall telescope in Arizona (see *Nature* **481,** 10–11; 2012). "The highest-impact science right now are these things where you want to put in more than 100 nights a year," says NOAO director David Silva.

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In Europe, one productive niche has been the search for planets outside the Solar System. An instrument at the ESO's 3.6-metre telescope at La Silla in Chile has already discovered more exoplanets than any other ground-based search. And in April, the University of Geneva in Switzerland installed a near-clone of that instrument in the Northern Hemisphere, at Italy's 3.6-metre National Galileo Telescope in the Canary Islands.

A third emerging use for these telescopes is to obtain spectra of millions of stars in the Milky Way, to try to understand their chemistry and their wanderings through space. This would allow astronomers to reconstruct a detailed history of the Galaxy's formation. A spectrograph specialized for this purpose is already being built for the 3.9-metre Anglo-Australian Telescope in Australia, and the ESO is considering one for its 3.6-metre New Technology Telescope in Chile.

But Drew says that it is sometimes difficult to convince disparate user groups to coalesce around a coordinated scientific campaign. And, especially in Europe, multinational ownership makes it difficult for telescope operators to change course. "Structures in Europe are oddly complex," she says. "They get in the way a bit."

Moreover, UKIRT itself is proof that a dedicated speciality campaign does not guarantee survival. In 2005, for example, its operators invested in a wide-field camera that allowed it to survey galaxies across the sky. Patrick Roche, an astronomer at the University of Oxford, UK, and chair of UKIRT's oversight board, says that in the first four months of this year, more than 70 papers have been published containing UKIRT data. That puts UKIRT on course to being the most scientifically productive telescope in the world — outstripping any of the 8-metre-class instruments.

The telescope's board, which has protested against the closure decision, claimed that the facility could be kept open a year longer for a mere £100,000 (US$155,000). And Davis thinks that he might be able to find an institution willing to take on the costs, although he hasn't quite settled on the best way to advertise a 34-year-old telescope with a fine 3.8-metre mirror.

"eBay?" he wonders. "I don't know." ■