

POLICY

Innovation agency takes centre stage

Business-focused funding agency Innovate UK is driving British efforts to commercialize research.

BY ELIZABETH GIBNEY

UK scientists fearful for their research funds ahead of Brexit were cheered last November when the government announced it would plough an extra £4.7 billion (US\$6.1 billion) into research and development (R&D) by 2020–21. But the biggest winner from the largely industry-focused cash may be a government innovation agency that is rapidly gaining clout.

Innovate UK began operating ten years ago this month as an independent body called the Technology Strategy Board — a prosaic title that reflected its origins as a small government advisory panel of industrialists and civil servants. Since then, the organization has rebranded and has seen its budget quadruple to around £800 million a year (see ‘Innovation boom’), mainly doled out as grants to consortia of research organizations and businesses, which must match the money with private funds.

That budget is soon expected to grow further, says Ruth McKernan, the agency’s chief executive. The government’s R&D windfall includes an Industrial Strategy Challenge Fund (ISCF) to help researchers working on key technologies that might benefit the UK economy. That fund has already been promised £1 billion, including £246 million to help develop batteries; on 24 July, the government announced that this would include

a £45-million competition to establish a new centre for battery research.

It was a team at Innovate UK that first suggested the challenge concept after studying the workings of the US Defense Advanced Research Projects Agency (DARPA), McKernan says. And her agency has been allotted joint responsibility for running the ISCF alongside the research councils, the main funders of UK university science. Ties between the two groups are growing because of a shift in the United Kingdom’s funding landscape: from April 2018, both Innovate UK and the research councils will become part of a central organization called UK Research and Innovation (UKRI).

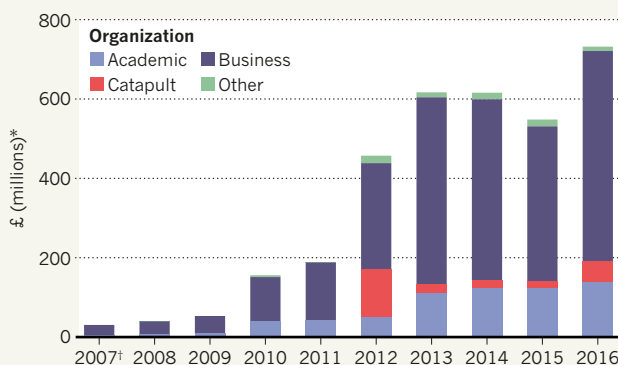
The government is relying on the R&D boost, and on the ISCF in particular, to reassure researchers who are wary of Brexit’s detrimental impacts on science, says Kieron Flanagan, a science-policy researcher at the Alliance Manchester Business School. “I think the fund is going to be too big for academics to ignore.”

TECHNOLOGY CATAPULTS

Innovate UK is more focused on businesses than on universities. The largest beneficiary of its funding is car-maker Rolls-Royce, which has received almost £300 million since 2007; the agency’s most-quoted success story is its early funding of SwiftKey, a firm making predictive text apps that was bought by Microsoft for a reported \$250 million in 2016. Only 20% of

INNOVATION BOOM

British funder Innovate UK has been able to award more funding after seeing its total budget swell amid a push to commercialize research.



*Chart shows funding awarded within year, which may be spent over several years; does not include all annual expenditure. [†] Financial year.

£838
MILLION

Innovate UK total budget, 2016–17

£6.4
BILLION

UK research budget, 2016–17

£4.7
BILLION

Promised boost to UK R&D spending, 2016–21

SOURCE: INNOVATE UK

its cash ends up at universities, although some are adept at winning funds: the University of Sheffield, which has strengths in engineering and manufacturing research, has received £150 million, for instance.

Outside Britain, the name Innovate UK is familiar to scientists and business people, but few know what it does, says Dan Breznitz, a researcher in innovation policy at the University of Toronto, Canada. One of the agency's major outputs is more widely appreciated, Breznitz says — its Catapult centres. This network of physical centres, which are loosely based on the Fraunhofer Institute's centres in Germany, provides equipment and resources to bridge the gap between university research and commercial technologies.

The largest, with £150 million in Innovate UK funding, is the Cell and Gene Therapy Catapult in London. It has “galvanized” UK researchers in the field, says Stuart Forbes, who works on regenerative medicine at the University of Edinburgh. He relied on its advice to help get a potential cell therapy for liver cirrhosis

into phase II trials. A first formal evaluation of the success of the Catapult centres — most of which are now five years old — will be published in September.

As Innovate UK's influence grows, it is in danger of losing focus on its core mission, says

Breznitz. If it now tries to act both like DARPA, with calls to solve key challenges, and like the US Small Business Innovation Research programme, which hands out grants to small research firms, it will struggle, he says.

The agency may also sharpen UK science's focus on economic returns. It uses economy-based metrics, such as jobs generated and return on investment, to analyse its success, McKernan says.

She thinks that under UKRI, research councils might learn from this approach. “I would anticipate a much stronger analytics group across UKRI that understands how to get the return on investment from early, translational and applied research — and how we change some levers to get a stronger output,” she says. ■

ASTRONOMY

Giant radio telescope scaled back to contain costs

Changes may affect the Square Kilometre Array's ability to observe the early Universe.

BY SARAH WILD

Designs for the world's largest radio telescope have been downgraded to save money — a decision that astronomers say could affect the instrument's ability to peer deep into the Universe's past.

The Square Kilometre Array (SKA), a telescope 50 times more sensitive than current instruments, is expected to cost billions of dollars. Its final design calls for around 2,000 radio dishes in Africa, together with up to 1 million antennas in Australia, with a total light-collecting area of roughly 1 square kilometre — hence the project's name.

But the first phase of construction, called SKA1, is a more modest affair. Already slimmed down from a larger design proposed in 2013, it now comprises 194 dishes in South Africa and around 130,000 antennas in Australia. In March, the SKA's board said that the project

would have to find further cuts of around 20% so that it could be built within a €674-million (US\$785-million) cap imposed by the project's ten funders — Australia, Canada, China, India, Italy, New Zealand, South Africa, Sweden, the Netherlands and the United Kingdom. And at a meeting in the Netherlands on 18–19 July, the board decided to make the savings by, among other measures, scaling back SKA1's computing power and crowding its antennas and radio dishes closer together.

It's the latter idea that concerns astronomers the most. Packing the telescope's individual components into a smaller space will mean a loss of resolution, making SKA1 less able to pick up on fine details. In most cases, this change won't seriously affect the array's scientific projects, says Tony Beasley, an astronomer and head of the US National Radio Astronomy Observatory in Charlottesville, Virginia. But Heino Falcke, an astronomer at Radboud

University in Nijmegen, the Netherlands, says that it may have an impact on the project's ability to detect faint signals emanating from a few hundred million years after the Big Bang, when the Universe's first stars and galaxies formed and began to emit light.

These low-frequency radio waves are to be picked up by the Australian antennas. Under the new cuts, clusters of these antennas — known as low-frequency stations — will be placed a maximum of 40 kilometres apart, rather than 65. With inferior resolution, the telescope could struggle to pick up low-frequency signals over the noise of the Milky Way, says Falcke.

Astronomers were consulted about the changes at a meeting in Manchester, UK, in June. But since then, they have grown more concerned about the idea of crowding the Australian stations closer together. So the SKA board's decision may not be final: working ▶

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