

ASTRONOMY

US grants trapped in vicious circle

Astronomers' resubmissions drive plunge in success rates.

BY CHRIS CESARE

Astronomers and astrophysicists in the United States are seeing their grant applications rejected at increasing rates because of stagnant budgets and an uptick in the number of resubmitted proposals, according to a draft report written for an advisory committee to the US National Science Foundation (NSF). The document, posted on the arXiv preprint server on 4 October, comes ahead of a November meeting set to discuss the issue (P. Cushman *et al.* Preprint at <http://arxiv.org/abs/1510.01647>; 2015).

The report highlights more than a decade of falling success rates for astronomical-science grants at the NSF and NASA as the number of proposals has increased faster than agency budgets. One key NSF programme in astronomy and astrophysics, for instance, funded fewer than 20% of proposals in 2014 — down from nearly 40% in 2002. And some NASA programmes saw rates fall from around 30% to 18% between 2004 and 2015.

The report rules out many explanations that scientists have suggested for the drop, such as a decrease in the quality of proposals; data from NASA show that, among the astrophysics grant proposals submitted to the agency, the fraction receiving scores from 'very good' to 'excellent' remained roughly constant from 2007 to 2012.

Instead, the report concludes, the main problem is that whereas funding has stayed flat, the total number of astronomer grants has continued to grow — and so the rate of resubmitted proposals has risen even faster because investigators who fail to secure funding in one year often try again the next. These resubmissions now account for a disproportionate number of grant applications, compounding the problem and leading to the dramatic drop in success rates.

The report enumerates the "knobs" that agencies can adjust to improve success rates, such as reducing the size of the average grant or shifting money from facilities to investigators — an idea that deserves a closer look, says Keivan Stassun, an astronomer at Vanderbilt University in Nashville, Tennessee, and a co-author of the analysis.

Other fixes, such as capping the number of proposals from investigators who have submitted too many unsuccessful applications, only "disguise the problem", the report argues. ■



Life Study aimed to find associations between factors early in life and outcomes later on.

EPIDEMIOLOGY

Massive UK baby study cancelled

After demise of similar US project, decision prompts rethink about design of future cradle-to-grave efforts.

BY HELEN PEARSON

An ambitious study that planned to collect information on 80,000 British babies throughout their lives has ended just 8 months after its official launch because not enough prospective parents signed up. The closure comes less than a year after the US National Institutes of Health (NIH) cancelled a similar effort to trace 100,000 children from birth, prompting fears that researchers will now shy away from proposing similar studies.

"I am afraid that the scientific community may not dare to embark on similarly ambitious cohort studies in the near future," says Camilla Stoltenberg, who heads the Norwegian Institute of Public Health in Oslo. She is responsible for a major birth-cohort study in Norway and chaired the international scientific-advisory committee to the UK project, called Life Study.

Prized by both medical researchers and social scientists, birth-cohort studies reveal associations between factors early in life, such as poverty or a mother's diet in pregnancy, and outcomes later on, ranging from diseases to cognition and earnings. Various efforts already exist around the world, but Life Study was to be one of the biggest and most ambitious yet. It got the green light in 2011 when government funding bodies, including the Economic and Social Research Council (ESRC) and the Medical Research Council, agreed to support the study with £38.4 million (US\$58.9 million) until 2019.

In January 2015, a team led by Carol Dezateaux, a paediatric epidemiologist at University College London's Institute of Child Health, opened the study's first dedicated recruitment centre, on the outskirts of London. The researchers hoped to sign up as many as 16,000 prospective mothers — of a total target of 60,000 — by July 2016. Another

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20,000 babies were to be recruited nationwide after birth. But between January and early September this year, just 249 women signed up, according to the ESRC, which oversaw the study. A review of the project in July identified recruitment as a major concern, and on 10 July, the ESRC decided that the study should close. The cancellation was publicly announced on 22 October.

PREMATURE DEMISE?

Dezateux and some of her colleagues say that the closure was premature, and that they were not sufficiently consulted on the decision. They accept that recruitment was difficult, a challenge intensified by the study's remit to include a substantial proportion of families from ethnic-minority and disadvantaged groups, who have historically been particularly hard to recruit.

But the researchers say that they intended to test and refine recruitment methods during the first phase of the study — for example, the team had planned to make the study less burdensome for women by collecting information during a routine ultrasound scan rather than asking for a separate visit — and that the review process did not take such plans fully into account.

Fiona Armstrong, who was responsible for Life Study at the ESRC, says that the research council did indeed consider the researchers' plans to adjust the recruitment process — and consulted the research team as part of that

process — but ultimately, it still concluded that “whatever might be done wasn't enough”. “We couldn't take the risk of putting more and more money into it,” she says. The study consumed around £9 million (\$13.8 million), a sliver of the more than \$1.2 billion — over 15 years — that was sunk into the US National Children's Study (NCS).

Epidemiologists are drawing parallels between Life Study's demise and that of the NCS. “It's déjà vu all over again,” says Mark Klebanoff, a paediatric epidemiologist at Nationwide Children's Hospital in Columbus, Ohio.

Clinical epidemiologist George Davey Smith, who co-directs a separate birth-cohort study at the University of Bristol, UK, notes that a huge challenge for both efforts was that they were trying to provide answers to extremely diverse questions, which put

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constraints on the studies' designs. For example, assessing inequalities between socio-economic groups requires data from a large, representative population sample that includes disadvantaged and minority groups — whereas answering questions relating to the origin of disease requires the collection of extensive biological samples such as blood and tissues. “It's incredibly sad,” he adds of Life Study's end.

Those involved in both studies hope to salvage something from the wreckage. After the NCS ended, plans emerged for a more modest study of influences on child health; Dezateux says that she and her colleagues are “determined to take forward key elements” of Life Study.

Whether and how such studies can be conducted in future is unclear. Response rates are falling in many surveys and population studies compared with those in decades past, say researchers — perhaps because there are more demands on people's attention. “We have to be mindful of the fact that people's lives are busier than ever,” says Klebanoff. “We have to find ways of doing this that pose the least burden possible to participants.”

Scientists need to exploit existing data sources more, says Stoltenberg. Extensive databases of health, educational and income data exist in many countries and provide vast amounts of information on the cheap — as long as people consent to their use. In Norway, such databases have been crucial to the success of its national birth-cohort study, which is following more than 100,000 children, she says.

But it is important to create systems through which information can be more easily extracted from such databases for use in cohort and other types of research, she adds. “We don't have the infrastructure,” she says. “We're trying to drive sophisticated vehicles like birth-cohort studies where there are no real roads.” ■

PLANETARY SCIENCE

Falling junk has scientific value

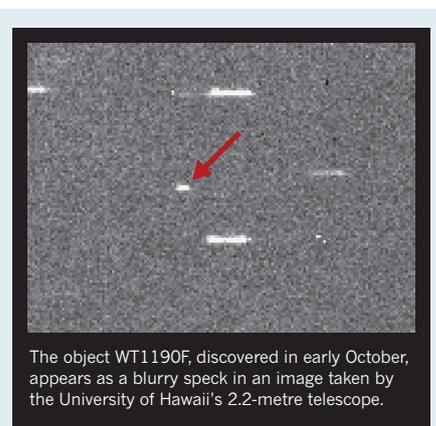
Astronomers prepare to observe an impact off Sri Lanka.

BY TRACI WATSON

Researchers call it sheer coincidence that a newly discovered piece of space junk is officially designated WT1190F. But the letters in the name, which form the acronym for an unprintable expression of bafflement, are an appropriate fit for an object that is as mysterious as it is unprecedented.

Scientists have worked out that WT1190F will plunge to Earth from above the Indian Ocean on 13 November, making it one of the very few space objects whose impact can be accurately predicted. More unusual still, WT1190F was a ‘lost’ piece of space debris orbiting far beyond the Moon, ignored and unidentified, before being glimpsed by a telescope in early October.

An observing campaign is now taking shape to follow the object as it dives through Earth's atmosphere, says Gerhard Drolshagen,



co-manager in Noordwijk, the Netherlands, of the European Space Agency's near-Earth objects office. The event not only offers a scientific opportunity to watch an object plunge through the atmosphere, but also tests

the plans that astronomers have put in place to coordinate their efforts when a potentially dangerous space object shows up. “What we planned to do seems to work,” Drolshagen says. “But it's still three weeks to go.” ▶