Funding

Calls for Canada to support basic research

Canada's decade-long shift of financial support from fundamental studies towards applied research is dismantling the nation's funding of basic science, according to a report by the Global Young Academy (GYA) – an international society of young scientists. The report – *Restoring Canada's Competitiveness in Fundamental Research* – concludes that many Canadian researchers now receive no federal research funding at all. It calls for increases in funding to "ensure that Canada benefits from an outsized concentration of world-leading scientists and scholars".

The shift towards applied research, which began under the previous Conservative government led by Stephen Harper, saw the proportion of researchers who reported that they carried out only fundamental research fall from 24% between 2006 and 2010 to just 1.6% between 2011 and 2015. The GYA notes that between 2005 and 2015 success rates of grant applications for fundamental research fell from 40% to 23% at the Social Sciences and Humanities Research Council and from 28% to 14% at the Canadian Institutes of Health Research. The Natural Sciences and Engineering Research Council of Canada's "capacity to support excellent fundamental research", meanwhile, fell by 35.55% during the same period.

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Show me the money A report by the Global Young Academy recommends a minimum investment of C$459m for basic research programmes.

"All of us in the research community have been deeply impacted by the changes to the system over the past decade," says biologist Julia Baum of the University of Victoria, who led the GYA report together with fellow biologist Jeremy Kerr from the University of Ottawa. The GYA recommends that the government should link funding for fundamental research to the number of active researchers in the country and that it should invest a minimum of C$459m in pure research through the three government granting agencies. It also says that funding for fundamental research should be linked to the number of active researchers.

The GYA's findings mirror those found in the Fundamental Science Review (FSR). Released in April, this called for an increase to federal research funding from the current C$3.5bn to C$4.8bn in 2022. "[The reports] were executed independently, but ended up being highly complementary in arguments, outlook and conclusion," says David Naylor, president emeritus of the University of Toronto who led the FSR panel. "It's reassuring that the findings were mutually reinforcing."

Despite the problems, Baum detects signs of optimism among researchers, adding that "there is still an enormous amount of goodwill and cautious optimism in the Canadian research community". In a statement, the Ministry of Innovation, Science and Economic noted that Prime Minister Justin Trudeau, who was elected in 2015, "has been taking action" in response to the findings. "The minister of science will be leading the implementation of new measures to ensure Canada's researchers have what they need to achieve excellence in science," the statement says.

Peter Gwynne
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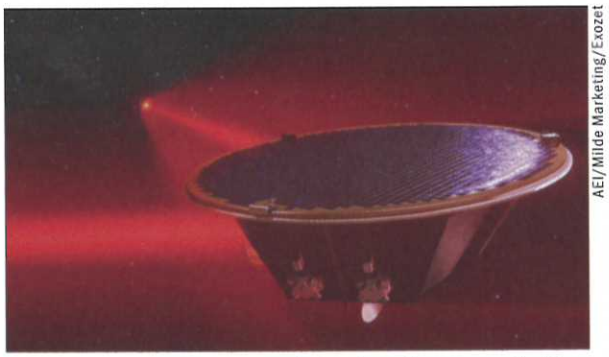
Space

Gravitational-wave mission selected for launch

The LISA gravitational-wave mission has been selected by the European Space Agency (ESA) as its third and final large-class mission. The other two missions, which had already been selected, are the Jupiter Icy moons Explorer and the Advanced Telescope for High-Energy Astrophysics. The decision means that the design and costing for LISA – the Laser Interferometer Space Antenna – can now be completed with the mission set for launch in 2034.

ESA first identified the "gravitational-wave universe" in 2013 as the theme for its third large-class mission, which is part of the agency's Cosmic Vision long-term plan for space science. Since then, the ground-based Laser Interferometer Gravitational-Wave Observatory (LIGO) has detected three gravitational waves caused by black-hole mergers and the LISA Pathfinder space mission has demonstrated key technologies that are required for LISA. Earlier this year, for example, scientists working on LISA Pathfinder showed that test masses on the spacecraft can be successfully isolated from electrostatic forces. That mission was switched off last month following 16 months of operation.



AEI/Milde Marketing/Exozet

Flying high The Laser Interferometer Space Antenna will launch in the mid-2030s.

LISA will comprise of three satellites in Earth-like orbits of the Sun. Each will have a test mass with lasers making precise measurements of slight displacements of these masses caused by gravitational waves. LISA will be sensitive to gravitational waves produced by mergers of supermassive black holes, each with millions or more times the mass of the Sun. It will also be able to detect gravitational waves emanating from binary systems containing neutron stars or black holes, which causes their orbits to shrink.

The mission was chosen during a meeting of ESA's Science Programme Committee in June, where members also approved the exoplanet hunter Plato to move into development. Following its launch in 2026, Plato will monitor thousands of bright stars over a large area of the sky, searching for tiny, regular dips in brightness as their planets cross in front of them, temporarily blocking out a small fraction of the starlight. In the coming months businesses will be invited to bid on contracts for the mission.

Sarah Tesh