

**Written Submission for the Pre-Budget
Consultations in Advance of the Upcoming
2021 Federal Budget**

**By: Canadian Association of Physicists
(CAP)**

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Recommendations

- **Recommendation 1:** That the Government of Canada provide a one- time 25% increase in investment in the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC) and the Social Sciences and Humanities Research Council (SSHRC) for research restart and recovery from the setback of the COVID-19 pandemic to research laboratories in Canada.
- **Recommendation 2:** That the Government commit to providing robust and reliable funding for basic discovery research to sustain and grow Canada’s scientific community by increasing funding to each of the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC) and the Social Sciences and Humanities Research Council (SSHRC) by at least 10% yearly, until commensurate with other G7 countries.
- **Recommendation 3:** That the Government increase the budget for the existing Canada Foundation for Innovation (CFI) Infrastructure Operating Fund (IOF) and the NSERC Research Tools and Instruments (RTI) grants by \$30M per year, as requested in the Naylor report.
- **Recommendation 4:** That the Government take steps to identify all major research facilities that are in need of repair/restoration/upgrade in the short-term and provide adequate funding to address those needs.
- **Recommendation 5:** That the Government manage its investments in Big Science in a more coordinated manner from conception/approval, building, and operations through their lifespan to decommissioning and, if appropriate, also allow for the establishment of replacement facilities.

Introduction:

The House of Commons Standing Committee on Finance is seeking expert consultation as it develops its economic strategy for 2020. The Committee is interested in receiving written submissions and oral testimony on how to restart the Canadian economy as it recovers from the COVID-19 pandemic.

Who We Are: The CAP, with 1800 members, is Canada's national association for physicists working in industry, academia and government across all sub disciplines of physics. The CAP strives to unleash the full potential of physics and physicists for the benefit of Canada. The CAP is recognized and respected for its science and technology expertise, and has testified at House of Commons Committees, including the Standing Committee on Industry, Science and Technology for a study on the "State of Disruptive Technologies" on June 9, 2015.

We look forward to working with your Committee to help restart the Canadian economy, as it recovers from the COVID-19 pandemic, through judicious infusions of funding for scientific research, education and, training.

Background:

In considering the questions asked in the Finance Committee's July 2020 press release, the CAP submits that both will be addressed if the federal government substantially increases Canada's investments in its intellectual infrastructure. COVID-19 has challenged our society in unprecedented ways. Personal life, economy and health care systems are affected by this global crisis. Canada has already committed to more than \$100 billion in wage subsidy and emergency benefits, but the true costs of the pandemic and its impact on the Canadian economy cannot be foreseen at this point. The competitiveness of Canada's economy critically depends on its investment in and support of research, including discovery-driven fundamental research, and training of highly qualified people in key technologies. Fundamental research is critical for Canada to develop the technologies that are transformative, the so-called "disruptive technologies" which will ensure the global competitiveness of our economy and secure prosperity and safety of current and coming generations of Canadians.

In June 2016, the Government of Canada announced the appointment of a review panel on Federal Support for Fundamental Science. Headed by David Naylor of the University of Toronto, the Panel included university and funding agency administrators, industry leaders, and Canada's most recent Nobel Laureate at that time, physicist Art McDonald of Queen's University. The Panel's mandate was to undertake "a review of the federal system of supports for extramural research."

The Panel's report (the Naylor Report)¹, released in April 2017, documents Canada's declining support of fundamental research, defines the real needs in this area, and outlines a concrete path forward to meet that need. Over the past 15 years Canada's research funding as a

¹ <http://www.sciencereview.ca/eic/site/059.nsf/eng/home>

percentage of GDP has declined from 2% to 1.6% while that of virtually all other major nations grew.

Fundamental Research

To date, through Budgets 2018, 2019 and 2020, the Government has acted on some of the report's recommendations. However, more must be done to help the research community, and thereby the advancement of Canada's global competitiveness and prosperity. Canadian researchers and students are at the forefront of important discoveries, and their findings and expertise are crucial to ensure the competitiveness of the Canadian economy in numerous key technologies from materials science and information technology to life sciences and the discovery and development of anti COVID-19 drugs and vaccines.

We strongly encourage the Government to provide a one-time 25% increase in investment in the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC) and the Social Sciences and Humanities Research Council (SSHRC) for research restart and recovery from the setback of the COVID-19 pandemic in 2021, and a commitment to an increase in each of their budgets of at least 10% yearly until investments in research funding reach levels that are commensurate with other G7 countries. This will drive the development of the new technologies needed to support Canada's economy and improve its international competitiveness. We make this statement in parallel with many other Canadian organizations including the Partnership Group for Science and Engineering (PAGSE), the Canadian Consortium for Research (CCR), and the Association of Canadian Early Career Health Researchers (ACECHR).

Training of Highly Qualified People

Fundamentally, investing in our intellectual infrastructure means training our best and brightest to develop cutting edge technologies that will be required to solve some of the world's most critical challenges. This will only occur if funding for fundamental research, including funding to train the next generation, is significantly increased. These highly qualified personnel, who are trained at the frontier of knowledge and driven to solve new problems, will take what they have learned to develop new technologies to support economic growth, helping Canada and Canadian businesses tackle the challenges posed by the COVID-19 pandemic. The value and number of graduate scholarships have not increased in the last decade despite greatly increased enrollments.

A one-time 25% increase and further 10% yearly increases are essential to ensure that Canada is to remain a competitive and prosperous nation in the 21st century where young Canadians can thrive to their full potential.

Research Facilities and Equipment

Equally devastating to the Canadian research landscape are instances where a facility has reached its useful lifetime and there is no mechanism for the establishment and funding of a replacement facility to ensure the continued health of the vibrant Canadian research program. A lack of continued access to a viable research facility will most likely lead to a loss of a strong research capacity in that area within Canada. **The Government is, therefore, urged to take steps to identify and address all facilities that are in need of attention in the short-term.** For the longer term, the Government needs to ensure that there is a coordinated national system of review for these major facilities and, once established, that adequate funding for the operations of Canada's national research facilities – which accounts for inflation, new infrastructure, future planning, staff growth, and increasing client demand – is made available through their funding providers at the time of renewal.

The Government is urged to manage its investments in Big Science in a more coordinated manner from conception/approval, building, and operations through their lifespan to decommissioning and, if appropriate, also allow for the establishment of replacement facilities.

The Naylor panel found that “the current level of CFI's Infrastructure Operating Fund (IOF) is insufficient to cover more than a small fraction of the ongoing costs of research infrastructure at a wide range of institutions. This leads to ineffective use of smaller-scale equipment and means that researchers sometimes spend inordinate amounts of time trying to secure funding.” Additional funding should be provided to the CFI to meet the special operating needs of individual researchers through small capital awards.

NSERC RTI grants provide crucial support to replace aging research equipment for Canadian researchers. Shortfalls in this budget have a significant impact on the available equipment, the quality of the research, and the training of highly qualified people.

We recommend increasing the budget for the existing CFI IOF and NSERC RTI grants by \$30M per year, as requested in the Naylor report.

Conclusion

Introducing a one-time infusion of funds to help address the recovery of the research community post-COVID-19 as well as implementing the remaining recommendations outlined in the report from the Fundamental Science Review will help Canadian researchers be as productive as possible in their workplaces and their communities; will help Canadians find answers to the challenges posed by the COVID-19 pandemic to keep businesses productive and competitive and to enhance the well-being of Canadians; and will support a strong science culture upon which the development of good policy and programming is based.