

## **Institute of Particle Physics Pre-Budget Submission to the House of Commons Standing Committee on Finance**

This submission from the Institute of Particle Physics (IPP) is in response to the June 2017 call from the House of Commons Standing Committee on Finance for focused input on:

1. What federal measures would help **Canadians** to be more productive?
2. What federal measures would help **Canadian businesses** to be more productive and competitive?

IPP is the community of particle physicists from across Canada who are engaged in advanced education and research in Canada and around the world. IPP members train highly qualified personnel how to conduct fundamental research at the frontiers of knowledge. In doing so, they learn how to develop cutting-edge technologies in an international environment and how to make breakthroughs in a broad swath of areas that range from accelerator and subatomic particle detector innovations through to big-data mining, mathematical modelling, computing and data analysis. They are trained how to attack problems that have never been solved by considering them from the most basic, first principles. In so doing, they learn how to think outside the box and develop new technological tools to attack and solve problems. Graduate students and postdoctoral fellows trained by IPP members take this ‘culture of innovation’ into Canadian industry where higher productivity and improved competitiveness are direct consequences. It is clear to IPP that both questions posed in your call for input are answered if the Government of Canada were to increase the resources for fundamental research across all disciplines to train more young Canadians to be innovative and, through that, to imbue the innovative drive within the fabric of Canadian culture. IPP calls on the Government of Canada to increase its investments in a special type of infrastructure – the intellectual and innovative infrastructure of this country.

In 2016, the Government of Canada commissioned a team of distinguished research leaders and innovators to advise it on “what more can be done to encourage Canada's scientists to take on bold new research challenges.” This “Advisory Panel for the Review of Federal Support for Fundamental Science” was led by Dr. David Naylor, former president of the University of Toronto and included Mike Lazaridis, co-founder, Quantum Valley Investments and the innovator who brought the computer-in-your-pocket to reality as well as Canada’s most recent Nobel Laureate, physicist Prof. Arthur McDonald. The Government of Canada stated on its webpage: “The review of fundamental science will be a core component of the Government's Innovation Agenda as science and research are key to Canada's innovation and economic objectives.”

IPP has reviewed the panel’s report, “INVESTING IN CANADA’S FUTURE: Strengthening the Foundations of Canadian Research” (the Naylor Report), which was publicly released earlier this year, and whole heartedly supports its well-founded and compellingly argued recommendations. If the Government of Canada were to simply follow the recommendations of this report, which it commissioned, it will have the biggest impact on helping Canadians in the medium and long term to be more productive and will help Canadian businesses to be more productive and competitive by providing them with a highly skilled, creative and innovative workforce.

We urge the Government of Canada to immediately implement the funding increases recommended by the Advisory Panel on Federal Support for Fundamental Science. Specifically, the recommendation detailed in the Naylor Report is to increase the funding in support of fundamental research in Canada from \$3.5B to \$4.8B per year ramped up over four years.