PARTNER PERSPECTIVE

How Canadian Science Drives Innovation

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TRIUMF is Canada's national laboratory for particle and nuclear physics, and the name itself symbolizes Canadian innovation.

Nearly fifty years ago, three universities came together to build the world's largest cyclotron. TRIUMF, the TRI-University Meson Facility, quickly outgrew its name. Today, TRIUMF includes 18 member universities stretching from Halifax to Victoria. (On November 6, Western University will join TRIUMF as its nineteenth member.) From the beginning, scientific excellence has been at the core of TRIUMF, driving innovation for the benefit of Canada.

In October, at a conference in Halifax, I met with the directors of Canadian laboratories to learn how these facilities fuel innovation. The laboratories produce world-class science and, although the subject matter may differ, each values a culture of passion, curiosity, and creativity.

TRIUMF, among the oldest and most established of Canada's laboratories, has a rich history of innovation. Why? Because the questions we ask demand it. Our experiments are beyond the state of the art; therefore we must invent the necessary tools and technology. This requires innovation, each and every day.

Science and society advance together; they are two sides of the same coin. At TRIUMF, the tools we invent also have applications ranging from medicine to materials. As director, my job is to fuel the spirit of innovation and realize benefits from our research.

Fortunately, I have the wind at my back. From healthcare to information technology, laboratory-born inventions have reshaped our everyday lives. Two examples offer important lessons.

First, let us look to CERN, the world's largest particle physics laboratory. Thousands of scientists from around the world go to CERN to collaborate on experiments, and when they go home, they continue to work together. Before the Internet, organizing such global collaborations was an extraordinarily difficult challenge.

In 1989, Tim Berners-Lee, a CERN computer scientist, was driven to find a solution. He developed a computer interface to connect CERN's far-flung collaborations. The laboratory saw the potential and invested resources into the technology that became the World Wide Web. Over time, CERN's tool for collaboration evolved into a revolutionary platform for commerce, education and entertainment.

For an example closer to home, let us look to the medical isotope crisis that took center stage in 2010. With failures in the global supply chain, Canada was desperate to secure the medical isotope used in 80% of procedures to detect, image, and treat disease. TRIUMF rose to the challenge.

With its expertise in nuclear physics and accelerator science, and with funding from Natural Resources Canada, TRIUMF led a multidisciplinary team with the BC Cancer Agency, Lawson Health Research Institute, and Centre for Probe Development and Commercialization. The team devised a new way to produce the isotope on existing cyclotrons across the country. TRIUMF is now in the process of commercializing this process to help secure the supply of this essential medical isotope.

Why was TRIUMF able to help? The answer is simple: TRIUMF had the expertise, the funding, and the human capital. Laboratories like CERN and TRIUMF provide powerful platforms for progress, but only if they are sustained over time with appropriate funding.

At TRIUMF, our mission includes the challenge to "transfer knowledge, train highly skilled personnel, and commercialize research for the benefit of all Canadians." TRIUMF trains 150 students and postdocs every year. With our partner Nordion, TRIUMF produces 2,500,000 doses of isotopes each year for hospitals around the world – and we've been doing this for over 35 years. Through Advanced Applied Physics Solutions, Inc., TRIUMF creates spin-off companies – five in the past five years – each contributing to Canada's innovation landscape.

TRIUMF's newest facility ARIEL, the Advanced Rare-Isotope Laboratory, builds on our excellence in science and research commercialization and is poised to become one of the top rare-isotope facilities in the world. Today, ARIEL is two-thirds complete and when fully operational it will triple our scientific capacity, allowing Canada to advance the frontiers of science, medicine, and business.

Budget 2014 announced continued funding for TRIUMF and for that we are grateful. We acknowledge the pressures as the nation emerges from a challenging economic period. Nevertheless, TRIUMF's level of funding has been frozen since 2005. With no accommodation for increasing costs, TRIUMF will lose its ability to innovate.

It is for these reasons that TRIUMF proposed CAPTURE, an innovation-based initiative for Budget 2015. CAPTURE will allow TRIUMF to continue to push the frontiers of science and develop "Made in Canada" solutions to real-world problems.

With Canada's ongoing support and commitment, we will continue to challenge the limits of what's possible and take Canada towards an even brighter future.