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Investments in Canadian labs win Nobel Prizes

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On behalf of the Canadian neutron scattering community, I would like to congratulate Arthur McDonald and Takaaki Kajita for their 2015 Nobel Prize in Physics. Their discoveries of neutrino oscillations and neutrino mass have forever changed the landscape of modern physics. It is worth noting that Dr. McDonald, a Canadian, completed much of his work using the Sudbury Neutrino Observatory.

We, as Canadians, should be proud of his accomplishments, which were made possible only with key investments in national laboratories. Canada has a proud tradition of supporting such large science initiatives, which have paid off in not only Nobel Prizes, but also in the advancement of knowledge and the development of new technologies.

On Feb. 6, 2015, the federal government announced the shutdown of the National Research Universal (NRU) reactor at Chalk River, Ont. The decommissioning process will begin after March 31, 2018, ending an era of nuclear research and economic development in this region that started in 1957. Without a clear nuclear science agenda, it is uncertain how Canada will carry on with nuclear science.

Canada is a world leader in nuclear science and applications, which range from the production of the molybdenum-99 isotope essential for medical imaging to the innovative new reactor designs and nuclear fuels pioneered at Chalk River.

However, there is much more to this success story than isotopes – the scientists trained at Chalk River are widely regarded as being highly influential in the development of the technique known as neutron scattering. One of Canada's only other Nobel Prize in recent years that was not in Literature was awarded to Chalk River's Bertram Brockhouse in 1994 for his contributions to neutron scattering studies of materials (Physics). Much of his work was completed at the Chalk River Nuclear Laboratories, which is now at risk. Dr. McDonald started his work as a research officer at Chalk River as well.

The neutrons produced by nuclear reactors provide a way for scientists to “see” atomic structures, and to be able to predict how materials will behave. This has led to countless advances in our modern world, such as the development of storage hard drives in computers, the determination of how and when bridges fail, and a greater understanding of how drugs interact with biological systems. The technique, which began in the 1960s at Chalk River, is now so important to the world economy that other countries have invested billions of dollars in foreign neutron sources to build upon the success of scientists such as Dr. Brockhouse. Canada has every reason to be proud of these accomplishments and optimistic about what the future holds.

Canada has a significant scientific capability in this technique. Many of the world leaders in neutron scattering were trained at Chalk River, and there are many economic benefits to retaining our capabilities. The risk in the near future is that without concrete plans for a new source, we will lose our competitive edge and our talent will move elsewhere. The “neutron gap” is real, and another example of brain drain that will undoubtedly occur if there is no action taken by interested parties that wish to invest in Canada’s future in neutron science.

The Nobel Prize won by Dr. McDonald is an important reminder of how key investments in national laboratories have shaped science on the world stage and have led to many benefits to Canadians. It would be short-sighted and disappointing if we do not have an alternative to the NRU reactor, and we lose our legacy in this field.

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