

# Neutrons Canada Prospectus

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Updated June 2026

# 1 Overview

Canadian institutions that conduct research with neutron beams are invited to be Members of [Neutrons Canada](#), which was established in October 2022 to govern, manage, and represent Canada's infrastructure program for research and development with neutron beams. This prospectus provides potential Members with (1) the national strategic context; (2) purpose and roles of Neutrons Canada; (3) governance structure; and (4) the benefits and privileges of membership for the research faculty at the Member institution and for the institution itself.

## 2 National and Strategic Context

Innovation in materials underpins many technology advances for national priorities, and neutron beams specifically enable impactful research in energy, defence, critical minerals, advanced manufacturing, health, and quantum innovation. Problems that can only be solved with the knowledge generated by neutron beams include *in situ* observation of small atoms such as hydrogen or lithium in battery cathodes for clean energy storage or in bio-membranes for understanding health, disease, and treatments. Conducting materials research at major neutron facilities has been shown to profoundly impact the training of Highly Qualified People, inspiring students to pursue higher educational achievement and careers in sectors that need their skills for innovation.<sup>1</sup>

Canada has been a global leader in materials research with neutron beams for 70 years. However, Canadian researchers lost access to neutron beams in 2018, when the NRU Reactor in Chalk River closed and when Canada's only agreement with a foreign neutron source expired. Further, the restructuring of federal agencies has left no government institution responsible for providing neutron beam infrastructure for the user community.

Canada's ability to support these research priorities is thus challenged at a time when other G7 nations have invested \$9B in neutron source upgrades.

### **What are neutron beams? Who uses them?**

Neutrons are subatomic particles found inside the nucleus of every atom. Neutron beams are versatile and irreplaceable tools for materials research. They are one of several probes that engineers and scientists need to advance knowledge and improve materials. Neutron beams reveal nanometre-scale details about materials' molecular structures and motions that cannot be seen with other scientific tools. There are many fields of research for which beams from a bright neutron source are required. These fields span natural sciences and engineering and include certain areas of health research and the humanities such as treating cancer and non-destructive probing of historical artefacts. Neutron beams are among a set of complementary probes for materials research that are available only at Major Research Facilities, for example, the Canadian Light Source for X-rays and TRIUMF for muons.

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<sup>1</sup> Strategy Policy Economics (2019). Study of CNBC Performance and Impacts.  
[http://cins.ca/docs/Strapolec\\_2019.pdf](http://cins.ca/docs/Strapolec_2019.pdf)



Figure 1. Left: Geographic distribution of researchers participating in research relying on access to the former Canadian Neutron Beam Centre (CNBC) at the NRU Reactor, across 30 Canadian universities and 22 countries (represented by flags). Right: Beam time by user type over the last five years of the CNBC's operation (2013–2018).

Canada is beginning to rebuild its neutron beam capabilities. Canadian universities are leading the way by developing a national strategy, creating Neutrons Canada, and securing CFI funding for projects that will (1) develop a modest neutron beam facility at the McMaster Nuclear Reactor and (2) establish modest 6-year partnerships with major neutron sources in the United States and Europe. McMaster's proposals for these awards envisioned Neutrons Canada to not only operate the neutron beam laboratory at McMaster, but also to coordinate access to the requested infrastructure at foreign partner facilities, along with other infrastructure to be proposed in coming years. For example, the University of Windsor has been leading a national team conducting the conceptual design of a prototype compact accelerator-based neutron source.

The neutron beam community has laid out the next steps in the [Canadian Neutron Long-Range Plan for 2025 to 2035](#). These steps comprise a comprehensive program that will enable Canadian students, scientists, and engineers to address scientific, social, environmental and economic challenges by providing access to versatile and irreplaceable materials research tools. This Plan outlines the activities of the proposed national neutron beam program, and corresponding investments, required for:

1. Facilitating Canadian participation in world-leading neutron sources;
2. Building and operating domestic capabilities, including the neutron beam lab at the McMaster Nuclear Reactor; and
3. Developing new neutron sources in Canada for the long term.

### 3 Neutrons Canada's national role

To implement the proposed national neutron beam program, Neutrons Canada is seeking \$74 million from the centre of government over six years, starting in 2027-28, and \$25 million per year ongoing starting in 2033. If successful, Neutrons Canada will manage access to Canadian and foreign neutron sources whose replacement values are between \$200M and \$2B, a scale and complexity placing

Neutrons Canada among Canada’s Major Research Facilities (MRFs). Note this program does *not* yet include a world-class neutron source in Canada, which could also cost in the range \$200M to \$2B.

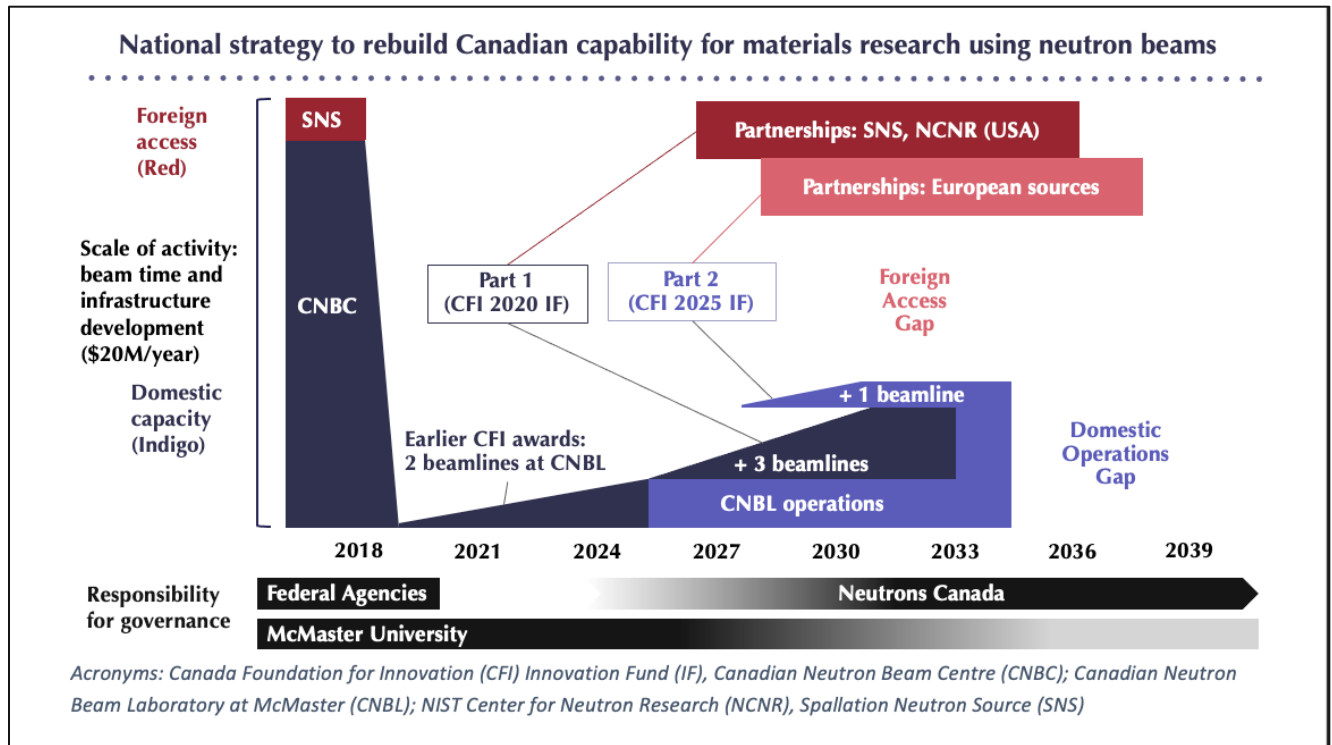


Figure 2 Illustration of the scale of the national program in domestic and foreign components, and the gaps to be filled.

Neutrons Canada’s intended purpose is to:

Govern, manage, and represent Canada’s infrastructure program for research and development with neutron beams, including international partnerships that secure access to world-leading neutron laboratories, operation of Canada’s domestic neutron beam facilities, and national initiatives for future neutron sources, thereby enabling Canadians to address major social and economic challenges.

Neutrons Canada has the national perspective and specialized knowledge of the neutron beam field to channel the requested federal government investment to maximum effect across three mission elements including investment in capital and operation of neutron-beam infrastructure in Canada, creating partnerships with European and American neutron-beam facilities, developing innovative neutron-beam methods and expanding the workforce of qualified people for materials research with neutron beams.

On behalf of its Member institutions, Neutrons Canada is representing the neutron community and its proposed program in a cohesive institutional voice to government. It is playing an essential role in consensus building and facilitating community activities to secure capital and operating funds for the national neutron beam program. It supports major neutron projects and related initiatives. Coordinating

such efforts nationally is the most effective means to deliver a truly pan-Canadian program that enables the community to speak with one voice.

## 4 Governance Model

Neutrons Canada is a not-for-profit corporation governed by an independent [Board of Directors](#) elected by Neutrons Canada’s Member institutions from coast to coast. The Board is composed of experts in science policy, corporate governance, and research facility management who will oversee the implementation of the national neutron beam program with the requested funding.

The governance model was developed through examination of best practices for Major Research Facilities (MRFs) in Canada and through stakeholder consultation. High-level goals of the model include:

- National scope and mandate with active participation of many institutions across Canada.
- Independence of the Board to make decisions in the national collective interest.
- Accountability to the Members.
- Inclusion of the full spectrum of multidisciplinary and multisectoral stakeholders.
- Scalability from a simple start-up organization to a more complex MRF with rigorous practice.

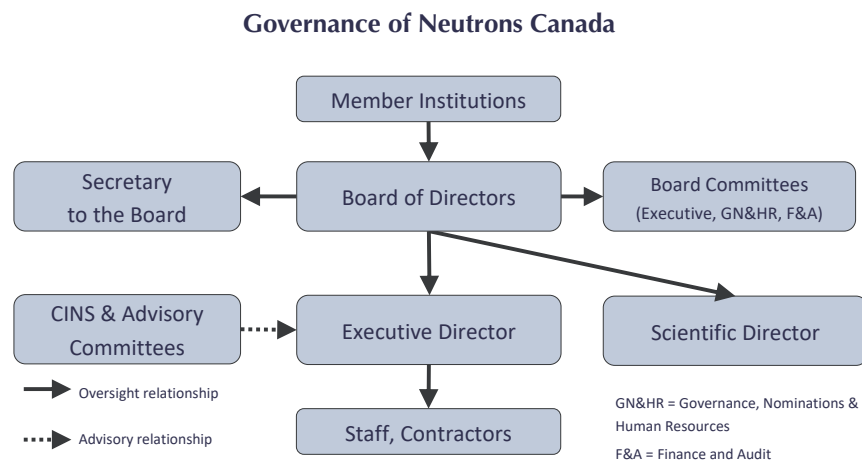


Figure 4 Illustration of the governance of Neutrons Canada

The Board of Directors is the principal governing body for Neutrons Canada. The Board oversees the strategic direction of the organization and the acquisition, operation, and allocation of resources. The Board appoints an Executive Director and a Scientific Director. The Board develops and approves the organization’s strategy and policies, and oversees the allocation of resources, performance reporting, and risk management. To ensure the Board’s independence, the Chair of the Board must be independent of institutions that host neutron beam infrastructure managed by Neutrons Canada.

The Executive Director leads Neutrons Canada’s strategy, government relations, and operations. The Executive Director is responsible for developing Neutrons Canada’s vision with the Board and then implementing it. The Executive Director is accountable to the Board for the general supervision of the staff and the management of the affairs of the corporation.

The Scientific Director serves as a key advisor to the Board on the scientific ecosystem, is responsible for the scientific strategy of Neutrons Canada, and is a key resource in strengthening partnerships both nationally and internationally within the research community.

Neutrons Canada seeks input from various advisory sources. Notably, Neutrons Canada has an agreement for mutual cooperation with the Canadian Institute for Neutron Scattering (CINS). CINS is a not-for-profit, voluntary organization that represents a significant portion of Canada's neutron users, mainly researchers from universities who need neutron beams to advance their programs.

## 5 Membership

Neutrons Canada's governance and operation draw upon the engagement and commitment of its Members. Collectively, the Members elect the Board of Directors and hold the Board accountable. Any Canadian university, government laboratory, business corporation or other organization in Canada that conducts research with neutron beams is eligible to apply for membership. As of 2026, there are 15 Member universities and 1 private-sector Member. The membership list is published at:

<https://neutrons.ca/about/#members-partners>

Benefits for research faculty at a Member institution may include:

- **Facilitated access to foreign neutron sources:** Neutrons Canada has recently managed a partnership agreement with the ISIS Neutron and Muon Source in the United Kingdom, providing Canadian researchers with preferential access to beam time and travel funds to go to ISIS to conduct experiments. <https://neutrons.ca/news-item/survey-confirms-success-of-canadian-access-program-at-isis-neutron-and-muon-source/>
- **Assistance in the development of funding applications for neutron beam infrastructure:** Neutrons Canada has provided expertise to support faculty from Member institutions in developing large grant applications for infrastructure. Recently, this expertise assisted Prof. Bruce Gaulin (McMaster) to develop and write a successful 'national' McMaster-led CFI 2025 IF proposal for neutron beam infrastructure; it assisted numerous faculty across Canada to write internal proposals to their universities to contribute CFI envelope to that proposal. This expertise was also recently accessed by Prof. Drew Marquardt (U. Windsor) to write briefing materials for the CFI concerning a CFI Exceptional Opportunities Fund proposal for neutron beam infrastructure, as well as by Prof. Markus Piro (McMaster) toward developing a national CFI 2027 IF proposal for nuclear and neutron beam infrastructure.
- **Resources to communicate research impact:** Neutrons Canada promotes the value of research with neutron beams by writing accessible stories about impact arising from the work of scientists from Member institutions: <https://neutrons.ca/#impacts>. Faculty use these stories about practical benefits to promote their research and strengthen applications for funding for research that requires access to neutron beams.
- **Assistance in collective strategic planning:** Neutrons Canada helps to coordinate the strategic activities of the neutron community, for example, by developing a single vision for the future of

this research field, providing project management, organizing events and surveys, and writing the Canadian Neutron Long-Range Plan for 2025 to 2035: <https://neutrons.ca/long-range-plan/>. This plan must be reviewed and updated every 5 years to help faculty continue to formulate and align with a collective vision. Neutrons Canada is also an institutional voice helping to implement that collective vision (e.g. convening a session at the 2023 Canadian Science Policy Conference to discuss policy innovations for better funding and governance of Major Research Facilities).

Member Institutions gain intangible benefits as well as the rights and privileges of membership.

Intangible benefits include:

- **Elevating the university's profile** as a leader or participant in research with neutron beams, through Neutrons Canada's briefings to the government;
- **Participating** as a stakeholder in strategic discussions that influence the direction of national collective efforts; and
- **Gaining a seat** at the governance table of Neutrons Canada.

Formally, the rights and privileges of Member Institutions are as follows:

- **Access to programs:** Members are eligible to participate in all programs of Neutrons Canada. While the infrastructure program operated by Neutrons Canada is intended to serve researchers and institutions across Canada, until sufficient public funds are available for that purpose, the Board reserves the right to restrict program access to Members.
- **Voting in meetings:** Each Member is entitled to receive notice of, attend and vote at all meetings of Members. Each Member has one vote. At the Annual General Meeting, Members elect the Board of Directors, receive presentations of strategic and business plans and financial statements, appoint a public accountant, and approve bylaws and Member fees.
- **Advice to the Board:** Members may advise the Board of Directors on the strategic direction, policies and programs of Neutrons Canada.
- **Member committees:** Members may have opportunities to sit on ad-hoc committees of Members that may be established by Neutrons Canada to fulfil its responsibilities.
- **Access to records:** Members may view Neutrons Canada's records.