

## **Request for advice and information from Canadian institutional perspectives for the Canadian Neutron Long-Range Plan for 2025 to 2035**

**May 2023**

### **Overview**

The organizing committee for the Canadian Neutron Long Range Plan (LRP) requests advice and information from Canadian institutional perspectives on actions and activities needed to build up and fully exploit Canada's domestic capabilities for research using neutron beams. Submissions should describe activities that are in early-stage planning, are proposed, or are on-going for (1) operations of facilities in Canada, for (2) capital projects in Canada, for (3) initiatives to build Canadian expertise, or for (4) any other action needed to enable Canadians to be successful in such research. Submissions should estimate resource requirements, including funding.

*Representatives of major funding awards or proposals for research using neutron beams, and those planning to pursue major funding proposals for this field, are strongly encouraged to participate.*

All input will be reviewed and prioritized in fall 2023 by the Canadian neutron-beam community for inclusion in the Neutron LRP. The resulting LRP will then serve as a single unified vision of the community for the highest priority projects, operations, and other activities. It will enable the community to speak coherently to funders and policy makers concerning its common needs and thus secure funds to be invested in the LRP's recommended activities.

### **Background**

Canada is beginning to rebuild its neutron beam infrastructure following the closure of its primary neutron source in 2018. Canadian universities have developed a [national neutron strategy](#) and created Neutrons Canada, which has 14 Member universities. They have secured a major CFI grant in support of a \$47M project led by McMaster University: (a) to develop the neutron beam user laboratory at the McMaster Nuclear Reactor; and (b) to establish short-term partnerships with two foreign neutron sources. They have proposed a further CFI grant in support of a \$55M project led by the University of Windsor to (c) develop a prototype compact accelerator-based neutron source and to (d) create further partnerships with three foreign neutron sources.

These projects are critical seeds for the strategy's envisioned \$20M/year infrastructure program for research and development with neutron beams. The strategy has four objectives:

1. Forge partnerships with high-brightness neutron sources in other countries;
2. Build on existing domestic capabilities, including full exploitation of the McMaster Nuclear Reactor, a medium-brightness neutron source;
3. Explore and invest in developing new neutron sources for the long term; and
4. Create a new, national governance and management framework for these activities.

The \$20M/year program breaks down notionally to \$9M/yr, \$9M/yr, and \$2M/yr for objectives 1, 2, and 3, respectively. A major investment (\$100M to \$1B) for a new high-brightness neutron source

(Objective 3) would be in addition to the \$20M/year program. Objective 4 included the creation of Neutrons Canada and includes a new government funding channel for Major Research Facilities.

### **Requested Advice and Information**

We request advice and information from Canadian institutional perspectives on actions and activities needed over 2025 to 2035 to fully exploit and build on Canada's domestic capabilities for research using neutron beams.

Submissions should describe actions and activities that are on-going, proposed or in early-stage planning for (A) operations of facilities in Canada, for (B) capital projects in Canada, for (C) initiatives to build Canadian expertise, or for (D) any other action that can be taken within Canada to enable Canadians to be successful in such research. (Neutron users interested in proposing ideas for activities outside Canada are encouraged to communicate with their scientific contacts at the foreign neutron source. The foreign neutron sources have a parallel channel to propose investment ideas as input into the long-range plan.<sup>1</sup>)

Examples of each include:

- A. Operations of a neutron beam lab and associated neutron source in Canada
- B. Capital projects:
  - a. Building new, or upgrading, neutron instruments and ancillary equipment
  - b. Exploring and developing new neutron sources in Canada, which may include feasibility or conceptual design studies, development and testing of technology and instrumentation for the neutron source, including prototypes, or major investments in construction of neutron sources
- C. Initiatives to attract, train, and retain expertise, whether faculty, students, or neutron professionals, such as funding research chairs or programs of scholarships and exchanges
- D. Other actions may include:
  - a. Changes to the funding, management and governance framework
  - b. Support for research (e.g. user support, travel, training, outreach to industry)
  - c. Operations of a neutron beam infrastructure program, including aspects such as EDI, indigenous relations, science outreach and communications, knowledge mobilization, and technology transfer

*Those planning to pursue major funding proposals to the funding competitions below within the next 7 years are strongly encouraged to participate to ensure that whatever funding or other supports are needed for these initiatives can be prioritized and supported by the national community:*

- the Canada First Research Excellence Fund (CFREF),
- the CFI Innovation Fund,
- the New Frontiers Research Fund (NFRF) Transformation Stream,
- Canada Excellence Research Chairs, or
- the NSERC CREATE program.

Submissions may also include activities that would require direct government investment because they do not fit within an existing granting program.

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<sup>1</sup> A separate request for information to neutron sources in other countries as potential partners was issued in March: <https://neutrons.ca/wp-content/uploads/2023/03/Neutron-LRP-Request-for-Information-2023-March.pdf>

All proposed investments should begin, or require substantial action to pursue, before 2030.

### **Submission**

Please summarize your advice and information regarding each distinct action or activity in a brief note (no more than 2 pages each), containing the following as applicable:

- A description of the action or activity with sufficient detail for a panel of neutron experts to understand how it will contribute to the building of Canadian capability and ensure Canadians can be successful in research using neutron beams
- The extent to which it addresses Canadian scientific needs, such as the needs identified by users in the [LRP white papers](#)
- The estimated cost of the required investment and approximate time frame of the investment over 2025 to 2035
- Whether and how it may fit into an existing funding program, and if so, indicate the funding program and your interest in leading an application

Please send us your note with the above information by June 30.

Following receipt of your submission, we will work with you to develop it further as appropriate to prepare it for evaluation of and prioritization by the Neutron LRP Panel for inclusion in the Neutron LRP.

All documents, questions and other communications regarding this call or regarding the Neutron Long Range Plan process should be directed to Daniel Banks ([Daniel.Banks@neutrons.ca](mailto:Daniel.Banks@neutrons.ca)).

### **More Information**

The following resources may be useful:

- The Neutron Long-Range Plan 2025-2035 website (<https://neutrons.ca/lrp2025/>)
- The National Neutron Strategy (<https://neutrons.ca/national-neutron-strategy/>)