Canadian Neutron Beam Centre

The Canadian Neutron Beam Centre (CNBC) is a unique and versatile element of Canada's research infrastructure. The CNBC enables academia, government and industry to use neutron beams as tools for world-class materials research, providing new understanding of materials and improving products for businesses. Each year, over 200 scientists, engineers, and students participate in research that depends on access to the CNBC's six neutron beamlines.

Why work with us

Improved safety and reliability, reduced costs, or opening of markets are a few of the benefits industrial clients have gained from employing neutron beams as part of their research programs. For example, safety and reliability can be enhanced when engineers know the amount of stress - e.g., in pipes, or car and airplane parts - that is created by manufacturing processes. Direct stress measurement deep inside metallic industrial components is uniquely suited to neutron beams.

The CNBC is the only facility within Canada where you can employ neutron beams for world-class research on materials. The CNBC is one of 20 such facilities around the world, each of which has its own strengths. At the CNBC, you can work with world-leading expertise and facilities for analyzing structural chemistry of materials, magnetism in quantum materials, and stress and texture in engineering materials. If you wish to measure residual stress, you will work with our experts who helped to develop the current ISO standard for measurements of residual stress using neutron diffraction.

What we offer

We offer access to world-class neutron beamlines and expertise. We offer assistance at all stages of a neutron beam experiment - from conceptual design to publication of results - so that researchers can use the facility productively, even without prior experience in applying neutron beams.

If you conduct experimental research on materials, you probably employ multiple probes to learn about your material, such as beams of visible light, x-rays or electrons. Probing your material with neutrons as well can generate knowledge that cannot be obtained from these complementary techniques.

Users of the CNBC study many kinds of materials that underlie advances in scientific, industrial and medical fields, and which benefit all Canadians. Examples include:

- development of light metals to reduce vehicle emissions for internal combustion engines,
- analysis of nuclear power plant components to improve reliability and safety,
- measurement of the hydrogen storage capacity of materials to support a shift to hydrogen-powered transport,
- development of targeted nanoparticles to enhance drug treatments, and
- fundamental studies of quantum materials to gain knowledge needed to develop room-temperature superconductors, which will have disruptive impacts in processors in computers and electronic devices as well as in energy conservation and medical diagnostics.

Neutron beams can be used to examine a wide range of materials including, but not limited to, metals, alloys, minerals, ceramics, polymers, nano-structures, bio-materials, drugs, and foods. You can study these in various forms, such as crystals, powders, surfaces, composites, liquids, colloids and gels.

To determine whether you can employ neutron beams to advance your research program, please contact us using the contact information at the right of this page. The following pages also contain more information:

- Specific capabilities offered to industry
  - Services for industry
  - Stress mapping
  - Nuclear applications
- More about neutron beams from the Canadian Institute of Neutron Scattering (CINS)

How to work with us

If you haven't used neutron beams before, we strongly encourage you to contact us before applying. We will put you in touch with one of our experts to discuss your potential research project. Our experts will help you determine whether neutron beams can provide the knowledge you need and if so, assist you with the application process.

Different application procedures apply depending on whether you plan to publish the results of your research in the public domain or to protect your results as your intellectual property.

Public domain research

If you plan to publish the results of your research, you may directly download an application form for public domain research from CINS. CINS provides the information you need to apply for beam time, from application to visiting the lab, to reporting after the experiment is complete. For public domain research, access is provided on the basis of scientific merit and technical feasibility.

Proprietary research

If you plan to protect the results as your intellectual property, please contact us to speak with an expert to develop a scope of work that will be defined in a research contract. After an agreement is reached and we receive your specimen(s), our researchers and technicians will perform the specified measurements, deliver a report to you and return the specimen(s). The information contained in the report will be protected as your intellectual property.

You will be charged a fee. Canadian clients are charged a harmonized sales tax (HST 13%). Project prices are estimated on the basis of standard hourly rates for personnel and facility access. Charges for material consumption, shipping, and incidental services, if any, are also billed.

More information on conducting proprietary research at the CNBC

Proprietary research undertaken at the CNBC is carried out within the following framework:

- All experimental work and data reduction with error analysis will be performed by CNBC staff at standard rates for facility and personnel. The deliverable will be a report with data, uncertainty estimates, and statements about the reliability of the data. Subsequent application or interpretation of the data is the responsibility of the client.
- The client will be encouraged to provide input into the course of the experiment as it progresses, either in person or via electronic communications.

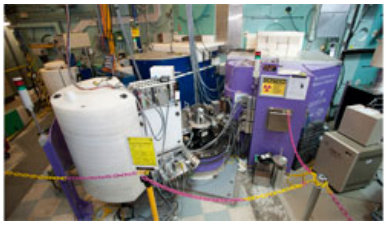
- Clients must fully disclose the details of the specimen, including design of sample holders, dimensions, proposed locations of measurements, sample history, and any other information, as reasonably requested by CNBC staff. This information will be used to evaluate the feasibility of the measurements and to advise on a scope of work. If the samples are proprietary in nature, we will sign a standard non-disclosure agreement in advance of any information exchange.
- The normal mode of business is through a Service Agreement, based on a scope of work and standard costing model.
- CNBC will not schedule time on a scientific instrument or make any other staff commitment (including in-house design work, etc.) until the scope of work is settled, appended to the agreement and signed by the client.
- We will make our best effort to accommodate the scheduling needs of our clients, while also ensuring that other CNBC priorities are met.
- CNBC reserves the right to decline a project for any reason.

Facilities & Expertise

- All Facilities
- Canadian Neutron Beam Centre
- ZED-2 Research Reactor
- SMR Technology

Contact

Email: cnbc@cnl.ca



Apply for Beam Time (CINS)

2014-2015 Activity Report

Download the report

(best viewed in Adobe Reader two-page view)

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