



Canadian  
Light  
Source    Centre canadien  
de rayonnement  
synchrotron

# Canadian Light Source: Lighting the way to discovery and innovation

[www.lightsource.ca](http://www.lightsource.ca)

## The Canadian Light Source (CLS)

is Canada's national synchrotron light source facility and centre of scientific excellence. Since coming into user operations in 2005, the CLS has facilitated 2,416 peer-reviewed publications, 85 percent of which were produced by Canadian researchers in the disciplines of physics, chemistry, biology, animal and human health, agriculture, engineering, archaeology, geology and paleontology.

Unique in Canada, the CLS enables an extremely wide range of science projects on multiple experimental stations (beamlines) operating simultaneously. The beamlines are optimised for select parts of the light spectrum and used in a broad range of experimental techniques including spectroscopy, diffraction, imaging from the macro to the nanoscale and combinations thereof. Data collection can be relatively rapid (on the order of sub-second) and is of a quality and breadth not possible at any other facility in Canada.

The CLS focuses on areas most relevant to Canada and develops expertise in research areas including but not limited to:



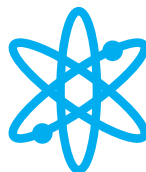
**Health** – cancer, multiple sclerosis, heart disease, HIV, cystic fibrosis, new drug development, antibiotic resistance, malaria, stroke and toxoplasmosis.



**Agriculture** – food security, crop development, fertilizers, drought, heat and disease resistant crops, and soil management.



**Environment** – climate change, mine remediation techniques, groundwater contamination, heavy metal contamination in soil, renewable resources and energy storage and generation.



**Advanced Materials** – next-generation batteries, high-temperature superconductors, fuel cells, eco-composite materials, solar power, new catalysts for more efficient industrial processes and energy conversion, microdevices, nanotubes, additive manufacturing and tools for the factories of the future.

The Canadian Light Source synchrotron is a national research facility of the University of Saskatchewan that offers innovative and unique-in-Canada infrastructure and support for research. Synchrotron-based techniques help scientists probe the nature and structure of molecules and materials, making the CLS a valuable tool for both academic and commercial clients.

Explore the possibilities of the CLS. For more information, visit [lightsource.ca](http://lightsource.ca)



Beamlines

# Capabilities



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## EXPLORE THE POSSIBILITIES

- 1. Imaging
- 2. Spectroscopy
- 3. Diffraction and scattering
- 4. Microfabrication

| Techniques                             | Energy (eV)<br>(CM <sup>-1</sup> FOR IR) | Beamlines  |
|--|--|--|
| X-Ray Imaging                          | 6,000 – 150,000                          | BMIT<br>CLS@APS<br>VESPERS                           |
| IR Microscopy                          | 0.0062 – 0.744                           | MID IR<br>Far IR                                     |
| STXM                                   | 130 – 2,700                              | SM   |
| X-Ray Fluorescence Mapping             | 4,300 – 50,000                           | SXRMB<br>VESPERS<br>CLS@APS                          |
| X-Ray Excited Optical Luminescence     | 55 – 30,000                              | SGM<br>SXRMB<br>VESPERS<br>VLS-PGM                   |
| ARPES                                  | 15 – 10,000                              | QMSC<br>SXRMB  |
| X-ray Photoelectron Spectroscopy (XPS) | 240 – 10,000                             | SGM<br>SXRMB   |
| X-Ray Absorption Spectroscopy          | 5.5 – 40,000                             | SGM<br>SXRMB<br>VESPERS<br>VLS-PGM<br>REIXS<br>SXRMB |
| X-Ray Emission Spectroscopy            | 100 – 2,000; 8,000 – 50,000              | CLS@APS<br>REIXS                                     |
| Resonant X-Ray scattering              | 2,700 – 94,000                           | BXDS<br>HXMA<br>CLS@APS                              |
| Small Angle X-Ray Diffraction          | 5,000 – 40,000                           | HXMA<br>BXDS   |
| Resonant Soft X-Ray Scattering (RSXS)  | 80 – 2,000                               | REIXS  |
| Macromolecular Crystallography         | 4,000 – 22,000                           | CMCF   |
| X-Ray Powder Diffraction               | 4,000 – 94,000                           | BXDS<br>CMCF   |
| X-Ray Lithography                      | 1,000 – 15,000                           | SyLMAND  |