Canadian Light Source | Centre canadien de rayonnement synchrotron

Canadian Light Source: Lighting the way to discovery and innovation

www.lightsource.ca

Beamlines

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

Capabilities

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EXPLORE THE POSSIBILITIES

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

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