

Alberta Synchrotron Institute

Backgrounder

What is synchrotron technology?

Synchrotrons are very large science facilities that produce laser-like light across the spectrum, from infrared to X-rays. This light source can be used for many purposes, including chemical mapping of microscopic mineral samples, thin films, computer chips, human tissue, or even living cells. Synchrotron light is crucial to modern techniques for discovering the structures of proteins and designing new pharmaceuticals. New techniques using synchrotron X-rays are also being developed in medical imaging, therapeutics, micromachining and nanotechnology. Synchrotrons allow many scientific experiments to be carried out simultaneously at workstations called beamlines.

What is the Canadian Light Source?

The Canadian Light Source, Canada's national synchrotron facility, is the largest scientific project undertaken in Canada in the last 25 years. Located at the University of Saskatchewan, the CLS will be a strong multi-disciplinary research and development facility that will promote research and networking in pure and applied sciences. The CLS will begin operations in 2004.

Currently, there are no synchrotrons in Canada. Canadian scientists must go to facilities in other countries to collect the synchrotron-based data needed to keep their research globally competitive. Quick and convenient access to a nearby Canadian synchrotron will provide key advantages to research and technology in Alberta.

What will Alberta funding be used for?

Alberta funding will assist in the construction of two essential components of the Canadian Light Source, a protein crystallography beamline and an X-ray microprobe beamline. Protein crystallography has direct applications to biomedical and pharmaceutical research and development. Through this technology, studies of enzymes in viruses can be conducted that have the potential to lead to cures for illnesses such as Hepatitis A and the common cold. The X-ray microprobe will allow detailed and specific analysis of microscopic areas of samples. This is relevant to many industries, including oil and gas, oil sands, mining, petrochemicals, pipelines, mineral exploration, computer chip manufacturing and advanced materials.

Alberta funding will also be used to set up the Alberta Synchrotron Institute (ASI), which will educate and train scientists in the use and benefits of synchrotron technology.

What is the Alberta Synchrotron Institute?

The Alberta Synchrotron Institute is a partnership of the Alberta Universities (University of Alberta, University of Calgary and University of Lethbridge), with the support and collaboration of government and industry. It is intended to operate during the period of construction and establishment of the Canadian Light Source. The ASI will have two offices, one in Edmonton and one in Calgary, to manage projects in Alberta involving synchrotron technology.

Who are the major funding partners?

Funding partners for the ASI include Western Economic Diversification Canada (WD), the Alberta Heritage Fund for Medical Research (AHFMR), and the Alberta Science and Research Authority (ASRA).

WD is a federal program that promotes the development and diversification of the economy of Western Canada and advances the interests of the West in national economic policy.

AHFMR supports a community of researchers working to improve the health and quality of life of Albertans and people throughout the world. Its long-term commitment is to fund health research with international standards of excellence, carried out by both new and established investigators.

ASRA has an independent board of members of the business and research communities in Alberta, who seek to enhance the contributions of science and research to the sustainable prosperity and quality of life of all Albertans.

The University of Alberta has also contributed funding towards the design and construction of the protein crystallography and X-ray microprobe beamlines, in order to ensure synchrotron access for its scientists.