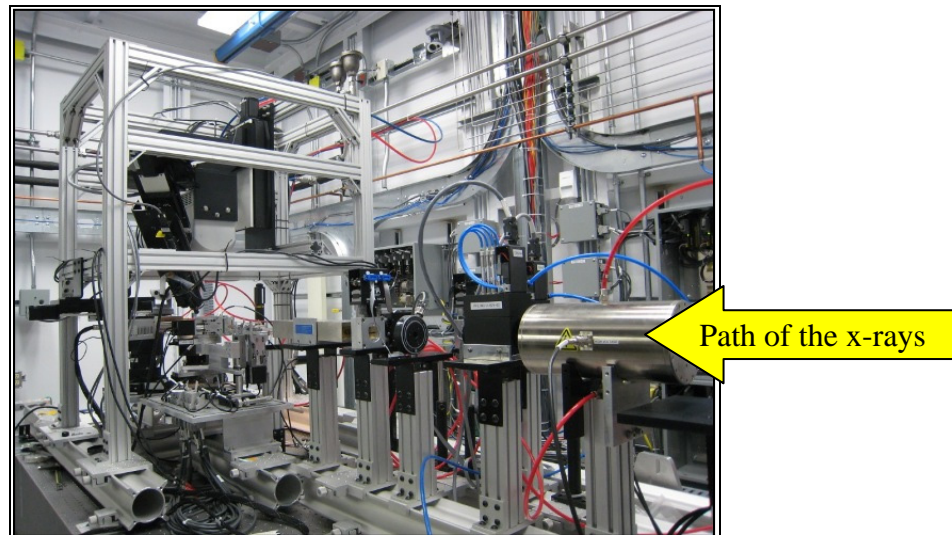


Very Sensitive Elemental & Structural Probe Employing Radiation from a Synchrotron (VESPERS) Beamline

The object of VESPERS is to deliver a micro-focussed hard x-ray beam to solid materials so that a microscopic volume can be analysed using x-ray diffraction (XRD), x-ray absorption spectroscopy (XAS) and x-ray fluorescence (XRF) either simultaneously or sequentially, and can create a map displaying the distribution of specific elements within an area of interest in the sample.

XAS measures the amount of radiation absorbed by the sample as the monochromator changes the energy of the synchrotron light the sample is exposed to. The energy at which the radiation is absorbed is element specific. XRD refers to the recording of the pattern of x-rays as they pass through a crystalline material revealing information about the structure of the material. XRF is a technique where the atoms within the sample absorb the synchrotron light creating an excited state in the atoms of the element being probed. As these atoms return to their rest state they emit a photon the wavelength of which is specific to the element that was excited.

CLS, in collaboration with the University of Western Ontario, Concordia University and IBM, is undertaking the development of a beamline experiment management system called Science Studio that has the capability to function remotely using the Internet. VESPERS is the beamline being used to develop this software.



This is a view of the equipment inside the experimental hutch.

VESPERS will be extensively used by researchers in the earth sciences, materials sciences, and analytical science. A significant feature of VESPERS will be its accessibility via the Internet potentially from any point in the world.