

## *Soft X-Ray Beamline for Micro-characterization of Materials (SXRMB) Beamline*

The main focus of this beamline is to provide users with access to the “intermediate” photon energy range (1700 to 10000 eV) between what is defined as “soft” and “hard” X-rays. Covering the absorption energies of many main group and transition metal elements, this beamline will find wide application in a number of fields including but not limited to: materials science, life science, environmental science, geo- and soil science, and tribology. SXRMB will be capable several techniques once it is fully built and commissioned, including X-ray absorption spectroscopy (XAS), photoemission electron microscopy (PEEM), X-ray excited optical luminescence (XEOL), X-ray magnetic linear dichroism (XMCD), X-ray circular dichroism (XMCD), and photoelectron and Auger electron spectroscopies.

The following end stations are planned and/or are under construction for this beamline:

1. Solid state XAS station (in vacuum) which 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. Standard techniques such as near edge absorption (NEXAFS/XANES) and extended range features (EXAFS) will be available through transmission, absorption, and fluorescence measurements.
2. Standard XAFS (x-ray absorbance fine structure) station for transmission and fluorescence measurements to reveal information about the molecular structure of the material.
3. Microprobe and Micro-XANES station will collect XFL and XANES spectra as the sample is rastered through the beam producing a map or image of the material.
4. Hard X-ray photoelectron system to detect and measure the energy of the electrons emitted as the material absorbs the x-rays thus revealing details about the structure and properties of the interface and bulk of materials.
5. Transmission/Gas Phase Spectroscopy will be able to use similar techniques as those listed above for solid states.