Microscopy

ANSTO has a dedicated microscopy unit with scanning electron microscopy (SEM), transmission electron microscopy (TEM) and atomic-force microscopy (AFM).

The analytical equipment available within this capability can probe structure down to one Angstrom resolution (TEM), provide chemical compositions (SEM and TEM) and crystal structure information (SEM, TEM, and XRD). Samples can be studied at various temperatures above and below room temperature, using TEM and XRD equipment.

The SEM laboratory has capabilities in high-resolution imaging, chemical microanalysis and mapping, and electron backscatter diffraction and mapping. The TEM laboratory has STEM imaging, high-resolution imaging, chemical microanalysis, and electron energy loss spectroscopy and mapping capabilities.

Capability Selections

- Sample preparation processing
- Electron microscopy – TEM
- Electron microscopy – SEM
- FIB (Focussed Ion Beam)
- AFM and Indentation

Sample preparation processing

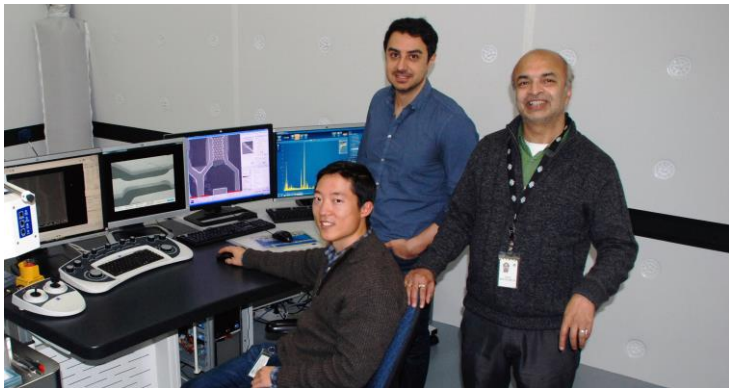
A wide variety of state-of-the-art sample preparation processes are available to enable the collection of high quality electron microscopy studies.

Electron microscopy – TEM

This capability has two transmission electron microscopes: a JEOL 2010F and a JEOL 2200FS. Both TEMs are capable of high magnification, phase contrast imaging, energy filtering, and electron energy loss spectroscopy.

Electron microscopy – SEM

This capability has two scanning electron microscopes: a JEOL 6300 and a Zeiss Ultra Plus. The Zeiss Ultra Plus is capable of very high magnifications with quantitative elemental analysis using energy dispersive X-ray dispersive spectroscopy (EDS), coupled with advanced backscattered imaging and electron backscattered diffraction (EBSD) mapping.



Focussed Ion Beam (FIB)

A relatively new technique, FIB milling allows very small samples to be machined from solids. These samples can then be tested to measure mechanical property changes and as they are very small (down to approx. 5 µm x 5 µm x 40 µm) are suited to neutron irradiated experiments.

Atomic Force Microscopy (AFM) and Nanoindentation

AFM allows the acquisition of topographical images of surfaces with sub-nanometre resolution and can be applied to problems in a wide range of disciplines in physics, chemistry and biology.

Nanoindentation is a method for measuring and testing the mechanical properties of small sample volumes. It can be used to assess the modulus of elasticity, hardness, yield strength, and fracture toughness of small samples.

For further information please contact:

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Please note: Access to these capabilities may be limited to work which includes ANSTO research. Please submit an expression of interest before commencing an Access proposal.