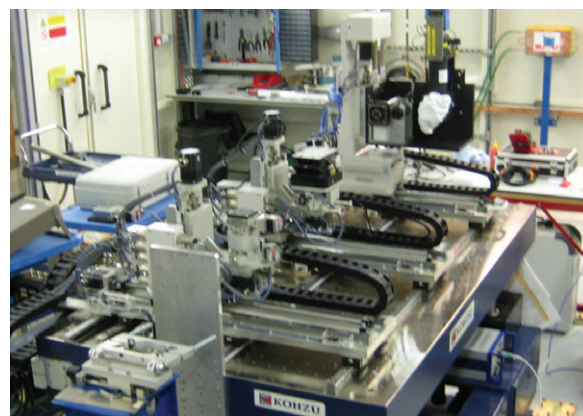
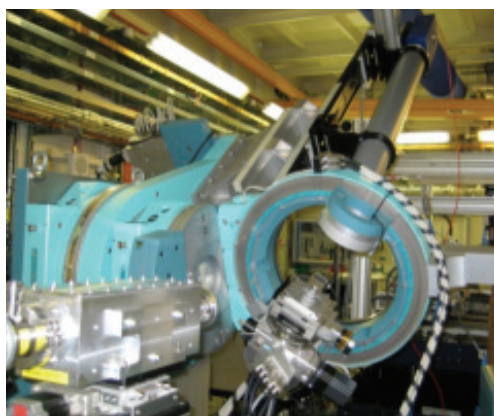


## B16 - Test Beamline

Beamline B16 is a flexible and versatile station designed for testing new developments in optics and detector technology and for trialling new experimental techniques. In essence, it is a general purpose beamline with liberal flexibility built in, which enables a wide range of experiments to be performed. The beamline provides both white and monochromatic X-rays in several operational modes.

Due to the versatility of this station a wide range of techniques are available including X-ray diffraction, reflectometry, spectroscopy, imaging and topography. Moreover, an important scientific activity of this beamline is the development of novel, unusual techniques requiring specific experimental layouts such as metrology type measurements and white beam measurements e.g. Laue diffraction.



## Beamline Specification

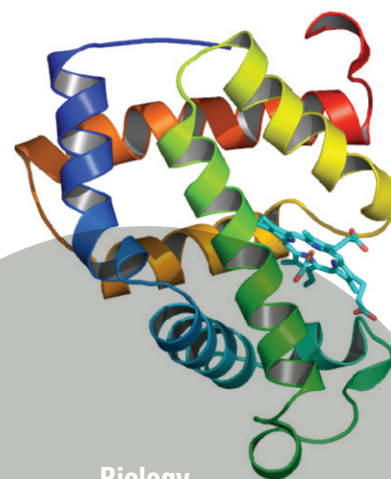
Energy range [keV]	4 – 25
Type of beam	Monochromatic, white beam
Energy resolution [ $\Delta E/E$ ]	$10^{-4} - 10^{-2}$
Beam size at sample position	< 200 $\mu\text{m}$ x 200 $\mu\text{m}$ in focused mode $\sim 2 \mu\text{m} - 5 \mu\text{m}$ in micro-focused mode $\sim 100 \text{ mm} \times 10 \text{ mm}$ in unfocused mode
Flux at 10 keV at sample [ph/s]	$\sim 4 \times 10^{11}$ in monochromatic focused mode - up to $10^{13}$ depending upon the operational mode
Diffractometer	Huber 5 axis diffractometer
Optics table	3 stations with several motorised stages for setting up of bespoke experiments

# Applications



## Instrumentation

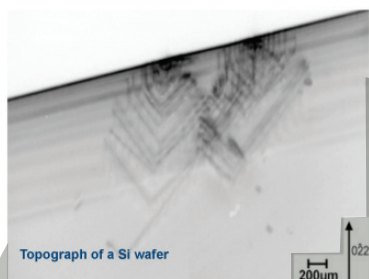
- Test and characterise X-ray optical components (mirrors, crystals, Fresnel Zone plates, X-ray lenses, X-ray beam position monitors);
- Test and characterise X-ray detectors;
- Exploratory experiments in new research areas;
- Development of the “proof of principle” experiments for new technologies.



## Biology

- The study of X-ray dose tolerance of biomaterials;
- The study of nanoparticle preparations as candidates for tumour-specific dose enhancement of radiotherapy.

# Industrial research at Diamond

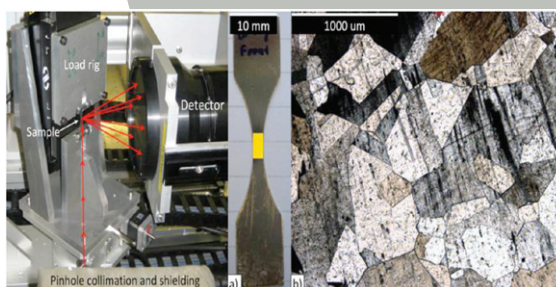


## Semiconductor Materials and Devices

- White beam and monochromatic X-ray diffraction topography;
- 3D X-ray reciprocal space mapping with microfocused beam;
- Combined X-ray fluorescence mapping and X-ray diffraction with microfocused beam.

## Material Science

- The design and characterisation of novel advanced materials;
- The study of sub-grain microstructures during deformation using micro-beam Laue diffraction for engineering structural applications.



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[www.diamond.ac.uk/industry](http://www.diamond.ac.uk/industry)