HENRY ROYCE INSTITUTE

UNIVERSITY OF OXFORD

Department of Materials

APPLICATIONS NOTE

Plasma focussed ion beam

The P-FIB can be used in wide range of scientific, engineering and technological applications

Cross-sectional studies

The focussed ion beam enables access to sub-surface structures; across electrode interfaces, or within integrated circuits.

Patterning at the microscale

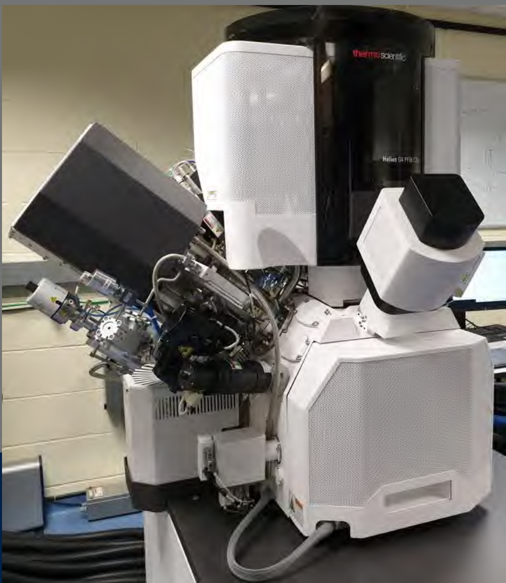
Rapid creation of bespoke patterned structures at the scale of hundreds of microns.

Post-service analysis

Automated 3D milling and combined imaging and spectroscopy studies, opens up insights into materials architecture and failure mechanisms. Examine changes to microstructure within the bulk or through degradation and explore the effects of cycling.

Helios G4 Plasma-FIB

Dual Beam with Secondary Ion Mass Spectrometry (SIMS) and Energy Dispersive X-Ray Spectroscopy (EDS)



Key functions of the p

3D mapping/sectional c
Automated investigatio
thousands of cubic micr
datasets with nanometr

Examine the chemical c
through an electrode or

Low damage preparatio
Large area lamellae can
investigation and for su
(transmission electron r
minimised through the u

Large-scale patterning
Accurate patterning per
extent of hundreds of m

Micro-scale mechanical
Produce micron-size me
sites on your sample, ar

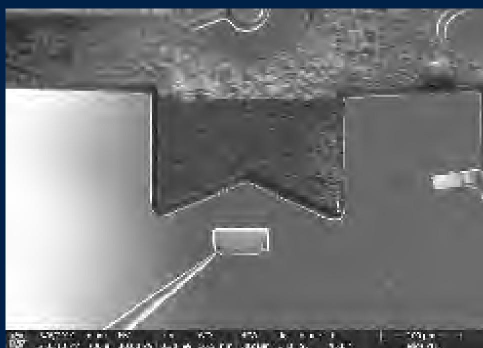
lasma focussed ion beam (PFIB)

characterisation of large volumes
n of material in volumes of tens of
rons, realising three-dimensional
re-scale chemical resolution.

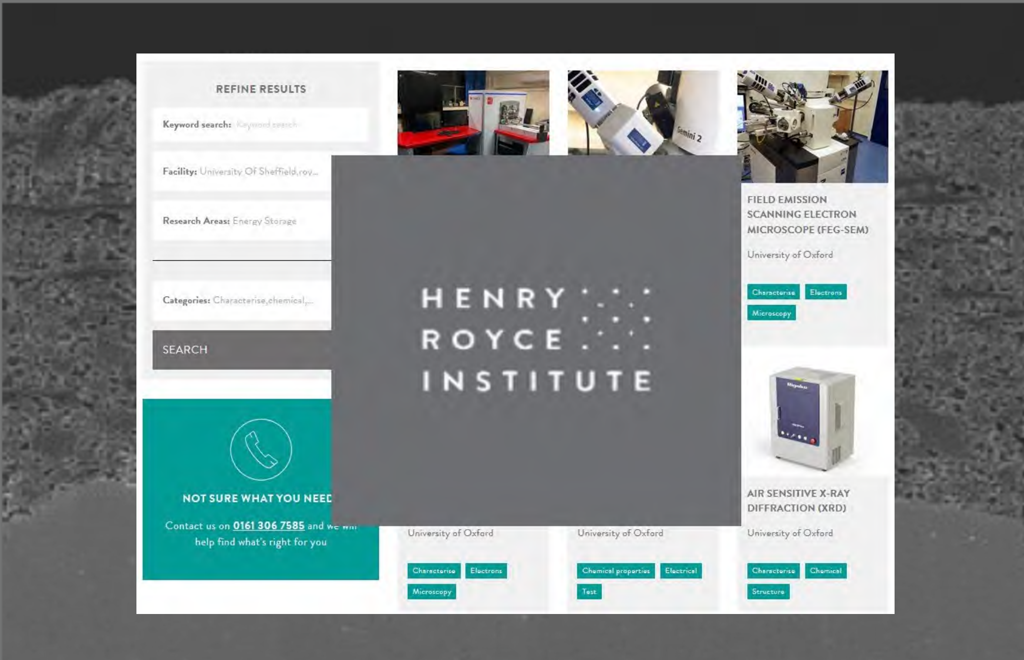
omposition of a cross-section
semiconductor component.

n of a large area specimen leaf
be produced, for site-specific
b-nanometre studies by TEM
microscopy). Sample damage is
use of a gallium-free beam.

rformed across regions with an
nicrons.



test specimens
echanical test pieces from specific
nd in novel geometries.



Henry Royce Institute, the UK's national institute for materials science research and innovation, is home to advanced capabilities across nine leading materials research institutions: Universities of Oxford, Cambridge, Imperial College London, Liverpool, Leeds, Sheffield, the hub at the University of Manchester; together with UKAEA and the National Nuclear Laboratory. All Royce-supported and -funded equipment is available for external academic and industrial use.

University of Oxford leads on energy storage activities within the Royce.

At Oxford, the **Department of Materials** hosts a suite of state of the art facilities and equipment. Investment through the Royce contributes to the focus on analysis of energy materials and development of next generation energy storage solutions.

Capabilities at Oxford are backed up by scientists based in the **David Cockayne Centre for Electron Microscopy**, the **Oxford Materials Characterisation Service** and the **Atom Probe Group** – along with the battery research groups of **Professors Peter Bruce, Patrick Grant, Mauro Pasta** and **Rob Weatherup**.

royce.ac.uk royce.materials.ox.ac.uk