



Microscopy Solutions

Product Guide

www.axt.com.au

Solutions for Science and Industry



SEM Products

World's first fully integrated Plasma-FIB



Xe Plasma FIB-SEM [XEIA and FERA]

- Sputtering rates up to 50X conventional Ga source FIBs
- Ultra-high (XEIA) and high (FERA) resolution SEM columns
- Choice of different FIB working distances (9 and 5mm)
- High ionisation rate suitable for TOF SIMS analysis

FIB-SEM [GAIA and LYRA]



- Choice of ultra-high res (GAIA) or analytical (LYRA) SEMs
- Various ion beam columns (COBRA, CANION, ExB mass filtered)
- Choice of different FIB working distances (9 and 5 mm)
- World's best chamber design for simultaneous 3D EDS/EBSD
- Optimised chamber for simultaneous analytical techniques
- Most sophisticated drawing software

FEG-SEM [MAIA and MIRA]



- Ultra-high resolution (MAIA) & super analytical variants (MIRA)
- High vacuum and variable pressure with controlled atmosphere
- Excellent for cryo applications
- World's best chamber design for simultaneous analysis
- Fully automated column with multiple imaging modes
- Unique live stereoscopic imaging using 3D beam technology

Economical SEM [VEGA-SB]



- Full-featured SEM with fully-automated column
- Small foot print
- Low cost, comparable to bench top systems

World's first fully integrated Raman & SEM



Correlative Raman/SEM [RISE]

- Combines ultra-high resolution SEM imaging with fast, high resolution Raman mapping
- No compromise in Raman signal collection

Unique microscope for Quantitative Phase Imaging



Q-Phase – Multimodal Holographic Microscope

- QPI uses patented Coherence-controlled holographic microscopy
- Purpose designed for imaging living cells *in vitro*
- Suited to imaging cells in scattering/turbid media



Angle-resolved mode makes new types of research possible

CL/SEM [SPARC]

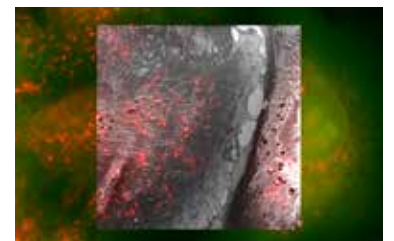
- High performance cathodoluminescence detection system
- Modular optics with additional detectors
- High precision, automated mirror alignment stage gives unprecedented photon yield and reliability
- Class-leading nanoscale spectroscopic information with SEM resolution



Seamless switching between fluorescence and electron microscopy

Fluorescence/SEM [SECOM]

- Streamlines your correlative workflow
- Fully integrated system with unmatched optical performance
- Fully automated overlay with an accuracy better than 50nm
- Modular design & open-source software

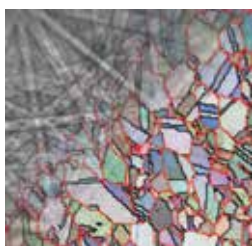


Thermo
SCIENTIFIC

Thermo Scientific Microanalysis

EBSD [QUASOR]

- Acquire EBSD, WDS and EDS spectra simultaneously
- Wide range of mapping display options e.g. Euler, HKL & UVW
- Phase and grain boundary maps
- Texture analysis and rapid pole figure interpretation



EDS [Ultradry and Compact Ultradry]

- Superior resolution at incredibly high collection rates
- Integrated FET eliminates almost all electronic noise
- Light element sensitivity down to Be
- The best solid angle detector on the market



WDS [MagnaRay]

- Unparalleled microanalysis results
- Automatically handles alignment, analysis settings & acquisition
- High sensitivity for trace elements
- Continuous spectrometer coverage over the entire spectral range



Sample Preparation



Ion Mills

- PicoMill – Optimal TEM sample preparation
- NanoMill – Ultra-low voltage ion mill
- SEM Mill – Ultra-flat surfaces for EBSD
- TEM Mill – Conventional ion mill



Contamination Solutions

- NanoClean – Multiple gas inlets and customised recipe
- Plasma Cleaner – High efficiency with no sample alteration
- Cryo-Can – SEM contamination solution
- Vacuum pumping station – 1 pump, multiple holders



Conventional Sample Prep

- Electropolishers
- Specimen punches
- Specimen grinders
- Ultrasonic disk cutters
- XTEM prep kit
- Dimpling grinders



Tomography Holders

- Dual Axis – Suitable for narrow samples
- Double Tilt – Up to 90° tilt
- Rotation – 360° rotation
- Cryo – -170°C Liquid nitrogen compatible



In Situ TEM Platforms



Wildfire

Heating stage for thermal studies

Heating



Lightning

Biasing and heating for controlled electrical/thermal studies

Biasing



Climate

Gas & heating for high pressure gas studies at elevated temperatures

Gas



Ocean

Liquid cell for studying materials and biologicals – static and flowing

Liquid

Thermo
SCIENTIFIC



XPS

K-Alpha™+

- High performance, low exposure X-ray sources
- Next generation electron optics and detectors
- An ion source for all sample types
- Real-time, hi-res sample visualisation
- Easy operation
- High throughput
- Experimental flexibility
- Affordable, reliable and cheap to run



Nanomanipulators & Plugins

- Suited to SEM and optical microscopes
- Simple to use/plug-and-play
- Additional capabilities**
- Liquid/gas microinjection
- Microgrippers
- Gas injection
- Rotational axis
- Cleaning

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XPS+Auger

ESCALAB 250Xi and Theta Probe

- Spectroscopy with unbeaten sensitivity and energy resolution
- Fast parallel imaging, <math><3\mu\text{m}</math> resolution
- Real-time physical imaging for accurate sample alignment
- Microfocussed monochromator for rapid sample analysis of small areas
- ISS included/REELS available in base system
- Optional field-emission AES and UPS
- Thin film analysis & Parallel ARXPS
- Ion source for depth profiling



Probe Workstations

- Precise electrical characterisation
- Manipulation & nanocharacterisation
- Superflat AFM for *in situ* SEM use
- Lift out stage for TEM preparation
- Atom Probe sample prep

3D Microscopy

HIROX



Hirox Digital Zoom Microscope

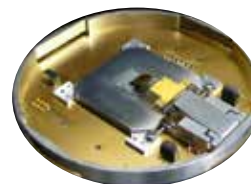
- One touch 3D imaging
- Rotational head allows tilted viewing of samples
- Unique lens design combines brightfield/darkfield imaging
- Unrivalled range of lenses
- Real time 1920 x 1200 HD video
- Rapid auto focus & tiling
- High dynamic range imaging
- Frame capture rate up to 100fps

Raman Mapping



Laser Raman Microscopes

- Ultra-fast Raman imaging by line illumination
- Fast & accurate laser beam scanning
- User-friendly/sophisticated software
- Compact and light
- High spectral resolution by 500mm spectrograph
- 250nm spatial resolution guaranteed
- Choice of multiple lasers



Super-Flat AFM

- AFM measurements in your SEM
- Generate topographical & frictional data *in situ*
- Compact size fits most SEM load locks
- Excellent stability & vibration damping
- Easy handling and tip exchange



Stages

- Eucentric 5 axis stage with X,Y, Z, up to $\pm 90^\circ$ tilt and unlimited rotation
- Superflat substage with 2D/3D travel
- High precision travel with repeatability
- Compact 4-axis stages



Educational AFM/STM



Nanoeducator

- Full range of standard SPM techniques
- Compact rigid design with metrological scanning accuracy
- Easy-to-adjust, easy-to-use, easy-to-teach
- High performance (low noise/high resolution)
- Excellent scanner with closed loop control
- Environment and temperature control
- Teaching kit + research quality SPM

Revolutionary cartridge with 38 tips

Revolutionary AFM/STM



Titanium

- Fast/automated tip exchange and operation
- Hybrid mode for nanomechanical & chemical mapping
- World's lowest drift - 0.2nm/min
- Excellent long-term stability - 25fm/ $\sqrt{\text{Hz}}$
- Multi-frequency AFM



NTEGRA

- Fully modular AFM and spectroscopy solution
- Combines AFM, confocal Raman, SNOM and TERS
- Inverted and upright configurations
- Hybrid mode for nanomechanical & chemical mapping
- Simultaneous acquisition of mechanical, electrical, magnetic, elastic and topographical data
- Dual scan: 6 piezo-driven coordinates ("laser + sample" or "tip + sample")

Integrable SPM



NanoFrazor Explore

- Rapid prototyping of nanostructures and nanodevices
- High resolution fabrication of nano-sized geometries
- Single step fabrication of 3D nanopatterns
- Unmatched precision
- Simultaneous inspection of written nanostructures for immediate QC
- Faster than other nanolithography techniques
- No need for vacuum or high voltage supplies
- Highly automated operation

Rapid Nanofabrication

