

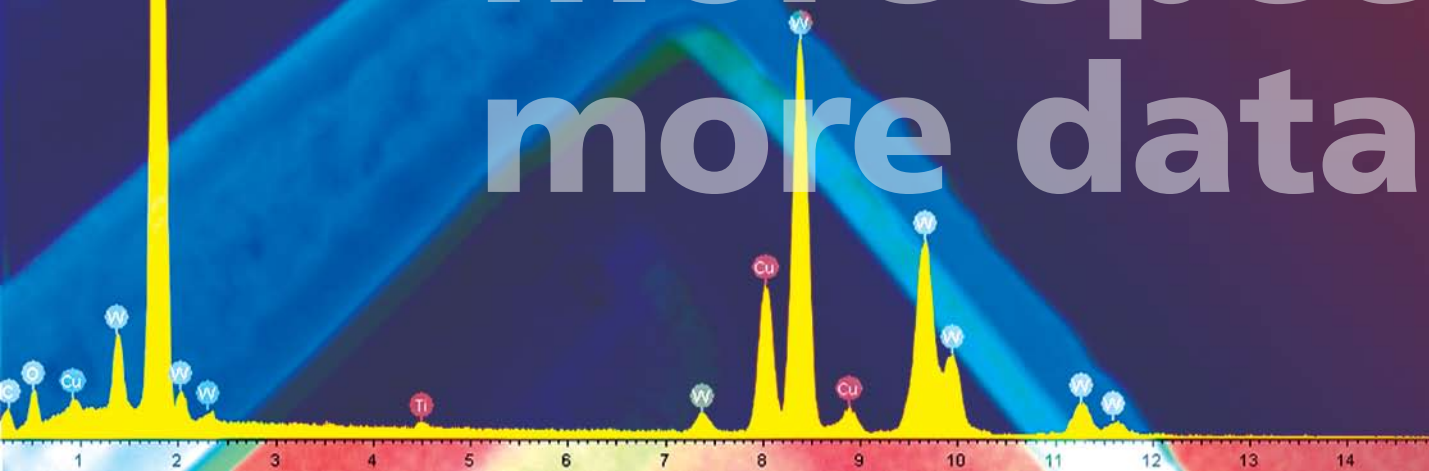
# SDD

## X-MaxTEM

Large Area Silicon Drift Detector for Maximum  
Collection Efficiency in your Analytical TEM



more power  
more speed  
more data



*The Business of Science®*



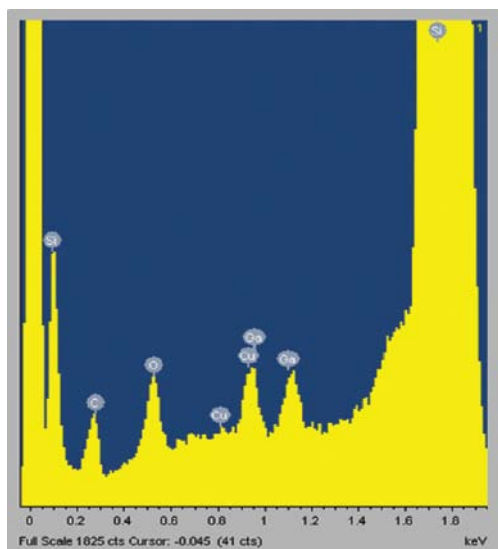
# Maximum Efficiency

Large SDD solid angle means the highest count rate without sacrificing resolution

## BIG Performance at the NANO scale

Oxford Instruments' revolutionary **X-Max** large area Silicon Drift Detector (SDD) is now available for the analytical TEM. Equipped with an 80mm<sup>2</sup> sensor, this detector demonstrates the best solid angle available for any TEM silicon drift detector. In addition to spectacular peak resolution, especially at low energies, the ability to handle high count rates in a liquid nitrogen-free environment makes **X-Max** the leader in cutting edge detector technology. When combined with the **INCAEnergyTEM** software, **X-Max** will maximise the analytical performance of any TEM.

129eV/80mm<sup>2</sup>  
detector with  
geometry  
optimised to suit  
each TEM



Spectrum showing the Li (90eV) peak of silicon collected at 200kV. TEM analytical mode

## Best SDD Solid Angle

- 80mm<sup>2</sup> sensor guarantees high counts giving excellent analytical performance down to and including Be. In contrast to Si(Li) detectors, this excellent resolution is even maintained at high count rates over 100,000cps.
- These faster acquisition rates allow mapping and linescans in thicker samples where high counts would normally cause the Si(Li) detector to retract or the shutter to close. There is no need to turn down the beam current. High quality X-ray maps and linescans can be collected much more rapidly.

## Liquid Nitrogen-free Operation

- **X-Max** is peltier cooled and requires no liquid nitrogen
- Rapid cool down ensures analytical readiness
- No moving parts or boiling LN<sub>2</sub> to cause vibration
- Motorised slide may be used to retract the detector from high electron flux in low mag mode
- Safe, convenient and environmentally friendly



# Maximum Performance

Specially designed to extract the highest level of qualitative and quantitative information from the TEM

## Unparalleled Quantitative and Qualitative Analysis

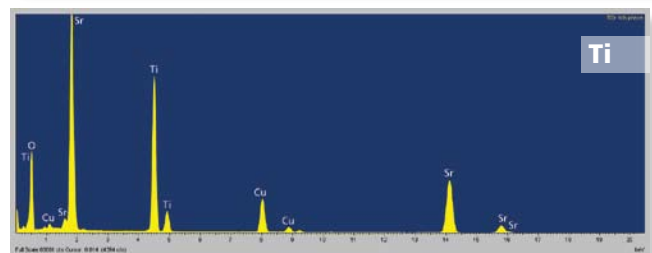
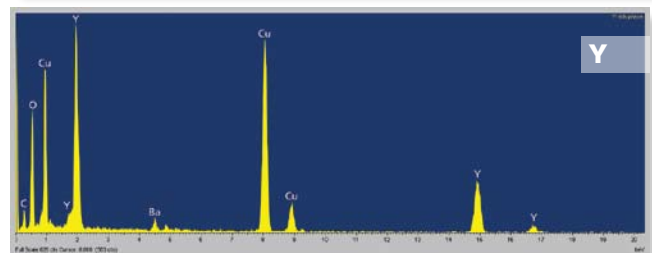
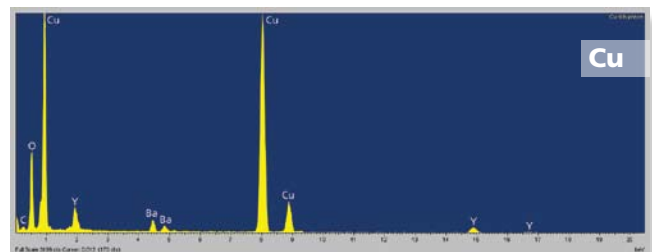
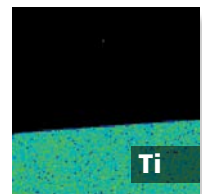
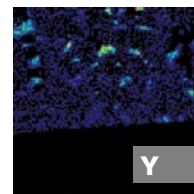
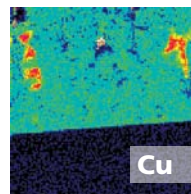
**X-Max** SDD technology and **INCA**EnergyTEM provide a user friendly platform for casual users combined with all the sophistication required for the analytical expert. The system provides:

- Fast and accurate quantitative analysis with modified Cliff-Lorimer algorithms for thin and thick samples including user defined k-factors that may be used discretely or in combination with theoretical values
- Corrections for density and thickness can be applied for samples over 100nm thickness
- Smartmap fast X-ray mapping and linescan capabilities with spectrum imaging as standard
- Point&ID accurate positioning of the beam for spectrum collection and for unattended analysis
- Reliable AutoID for peak identification at all count rates
- Sitelock compensates for sample and beam drift during long acquisitions
- Automatic pulse pile-up correction for the accurate removal of sum peak artefacts that could occur at the high count rates



FIB section showing Copper and Yttrium-rich segregations in a YBaCuOxide Superconductor on a SrTiO<sub>3</sub> substrate, identified using QuantMaps of Cu, Y and Ti. Spectra from these phases can be observed below the maps.

Data courtesy of A Sarkar, JS Abell and MQ Chu, University of Birmingham, UK





# X-MaxT

## Maximum Capability

Large count rates open up a new range of processing power for TEM data

### Enhanced Functionality (options)

The large solid angle and the ability to handle high count rates lends itself to other processing tools for X-ray maps that are more commonly used for SEM applications:

#### QuantMap

QuantMap displays quantitative mapping data. Data at each pixel are corrected for dead-time, matrix, X-ray background, pulse pile-up and peak overlaps. Quantmap ensures correct representation of elemental concentrations in maps, even when there are peak overlaps.

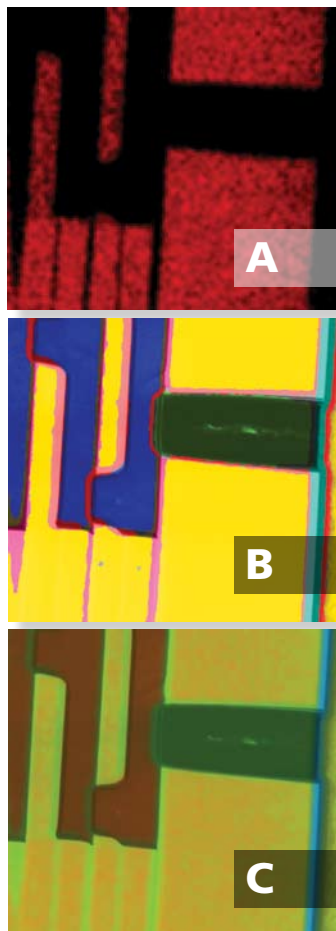
#### PhaseMap

PhaseMap provides a convenient method for identifying the distribution and chemistry of the phases that make up a sample.

#### Cameo+

Rapid and repeatable colour phase imaging of samples using the visible spectrum superimposed on the X-ray energy range.

*Sample courtesy of Michael Phaneuf, Fibics Inc. Ottawa, Canada.*



*Enhanced processing of a semiconductor.  
A – Oxygen QuantMap B – PhaseMap C – Cameo+ Image*

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