

# What can our Scios 2 DualBeam do for you?

## What can our DualBeam bring to your **Materials Science** research?

With an ongoing drive to improve the quality of fabricated materials and devices, materials researchers increasingly need structural and compositional information at the nano-scale.

Our Scios Dual Beam delivers just that, with multi-scale, multi-dimensional insight down to the sub-nanometer range, giving you a thorough look at both the surface and interior of your sample.

Not only that but, thanks to the FIB's ability to deposit material as well as remove it, our Dual Beam is equipped to produce functioning prototypes of miniature MEMS and NEMS devices.



ATC's Scios 2 DualBeam Laboratory

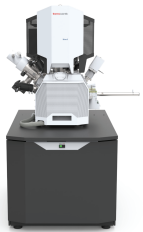


Photo Courtesy of ThermoFisher Scientific

## What can our DualBeam bring to your **Semiconductor** work?

Our Scios is also routinely used to create some of the highest quality samples for atomic-resolution scanning transmission electron microscopy (STEM) imaging, a technique that allows you to directly observe the fundamental building blocks of your materials and when combined with the unique AutoTEM™ Software for automated in situ lift-out.

### NanoBuilder Software

Nano-scale fabrication is possible with our DualBeam instrument. It requires a precise, layered application of FIB milling and deposition. NanoBuilder Software allows for the systematic planning of multi-layer nanostructures by dividing CAD files into ordered beam applications.

- Facilitates the generation of complex structures that were previously too tedious or impossible to build
- Accurate patterning of large and/or complex nanostructures on multiple sites

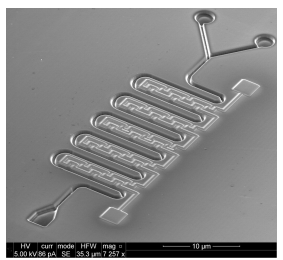


Photo Courtesy of ThermoFisher Scientific

Horizontal field width ~ 32  $\mu\text{m}$ . Nanofluidics building block created with NanoBuilder Software

### Auto Slice and View 4 Software

Thermo Scientific Auto Slice and View™ 4 Software is a multi-modal 3D data collection tool that enables the creation of high-resolution 3D images. Data is generated via the FIB milling and SEM imaging of serial sections (slices) of the sample.

### Easy Lift Nanomanipulator

Our DualBeam system has the Thermo Scientific EasyLift™ Nanomanipulator that allows you to extract lamellae and attach them to a TEM grid, In-Situ within the DualBeam chamber.

The Thermo Scientific EasyLift™ Nanomanipulator allows you to extract lamella and attach them to a TEM grid, all within the DualBeam chamber. Low-drift, high-precision movements for in situ TEM sample lift out. Control of the Easy Lift Nanomanipulator is integrated into the DualBeam user interface. Movement of the probe can be done on screen with the mouse.

### AutoTEM™ 4 Software

As sample preparation is considered to be one of the most important, but also most challenging and time-consuming, DualBeam use cases, Thermo Fisher Scientific has developed automation software to support complete in situ sample preparation. AutoTEM™ 4 Software enables fast and easy site-specific preparation of high-quality STEM/TEM samples for a large variety of materials.

- S/TEM sample preparation
- Robust, predictable results that can be acquired by our experts

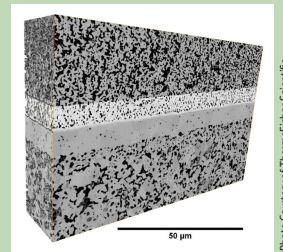


Photo Courtesy of ThermoFisher Scientific

All layers of a solid oxide fuel cell collected in a single run with Auto Slice and View 4 Software. 3D reconstruction and visualization were performed with Avizo Software.

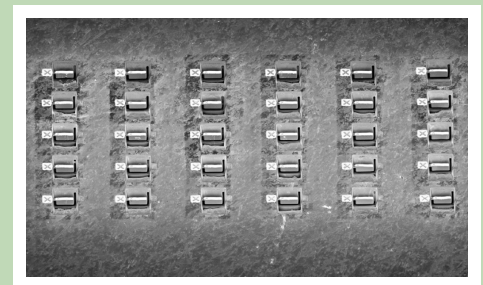


Photo Courtesy of ThermoFisher Scientific

Aluminum sample, where a 5x6 array of STEM lamella has been prepared in several hours with AutoTEM Software, undercut and ready for lift-out. The software allows automatic defining of arrays and/or shifting of positions to user-defined locations.

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