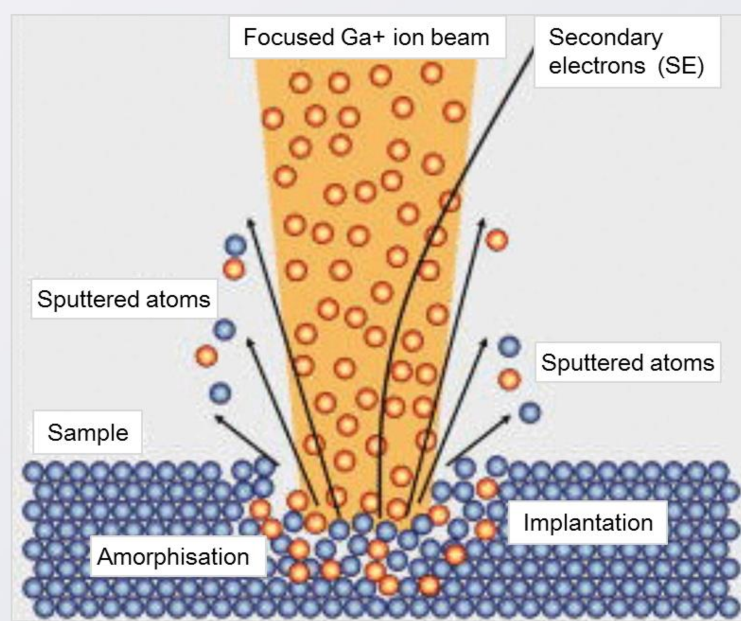
FEI Helios G4 UX Dualbeam FIB/SEM@ MCPF

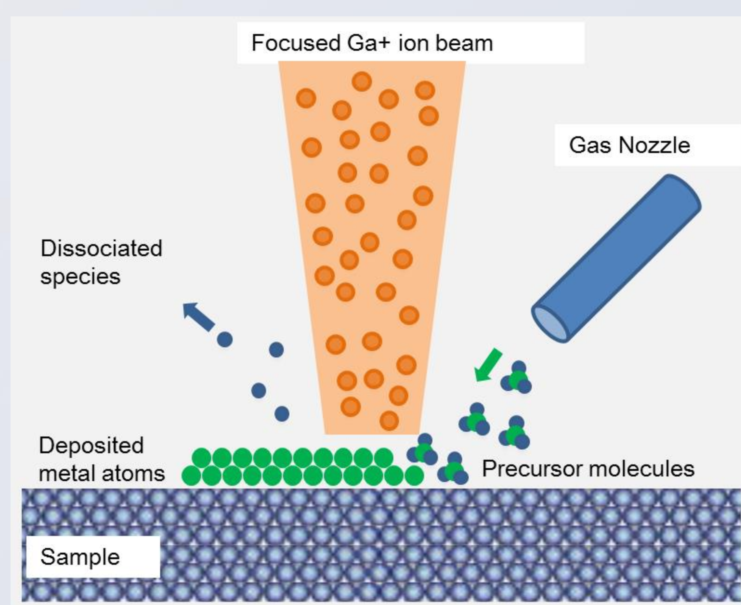
Theory

• **Focused Ion Beam (FIB) is a scanning ion microscope.** FIB is comparable to a scanning electron microscope (SEM), yet instead of electrons, it uses a beam of Ga+ ions. As the primary ion beam rasters on the sample surface, the signal from the sputtered ions or secondary electrons is collected by detectors to form a secondary ion image or secondary electron image.

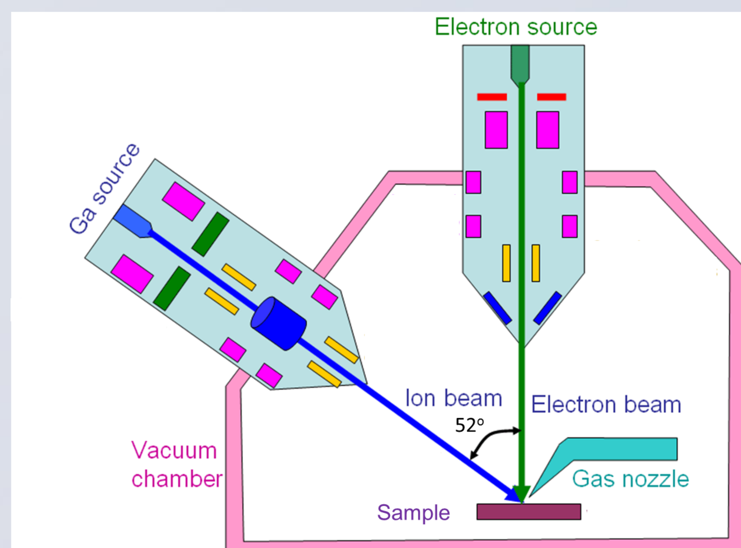
• **FIB is a milling machine.** The milling is site specific. The Gallium (Ga+) primary ion beam strikes the sample surface removing material through the physical sputtering of sample material.



• **FIB can deposit metals and chemical enhanced etching**. By injecting special gases, an ion beam is able to deposit materials with submicron precision. Gases can interacts with the primary Gallium beam to provide assisted chemical etching or deposition.



• **DualBeam FIB/SEM** integrates the features of a SEM with a FIB system. The electron and ion beams intersect at a 52° angle at a coincident point near the sample surface, allowing immediate, high resolution SEM imaging of the FIB modification in the sample. Such systems combine the benefits of both the SEM and FIB and provide complementary imaging and beam chemistry capabilities.



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Key Features:

• Ga ion column with superior high current (0.1pA-65nA) and low voltage (500V-30kV) performance.

• Ultra-high resolution field emission SEM (with monochromator), 1.2 nm resolution @ 1.0 kV.

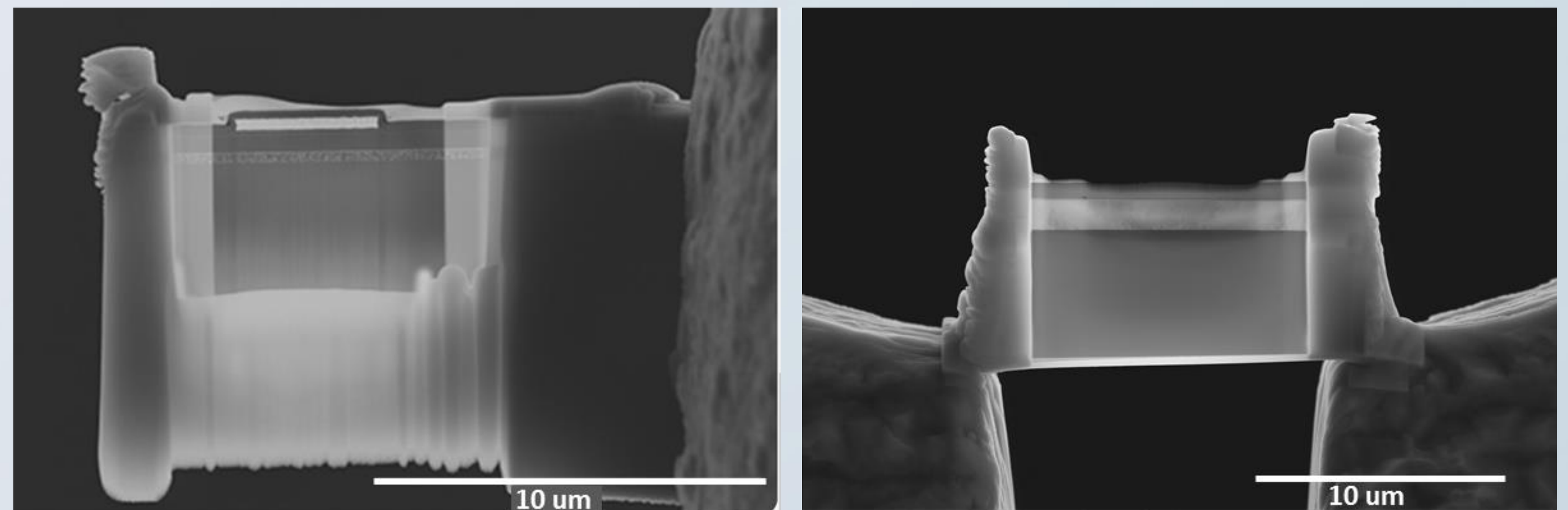
• With electron beam deceleration mode (BDM), curtailing charging on nonconductive specimens and improving low KV performance.

• Gas Injection System (GIS) for Platinum, Tungsten and Insulator deposition.

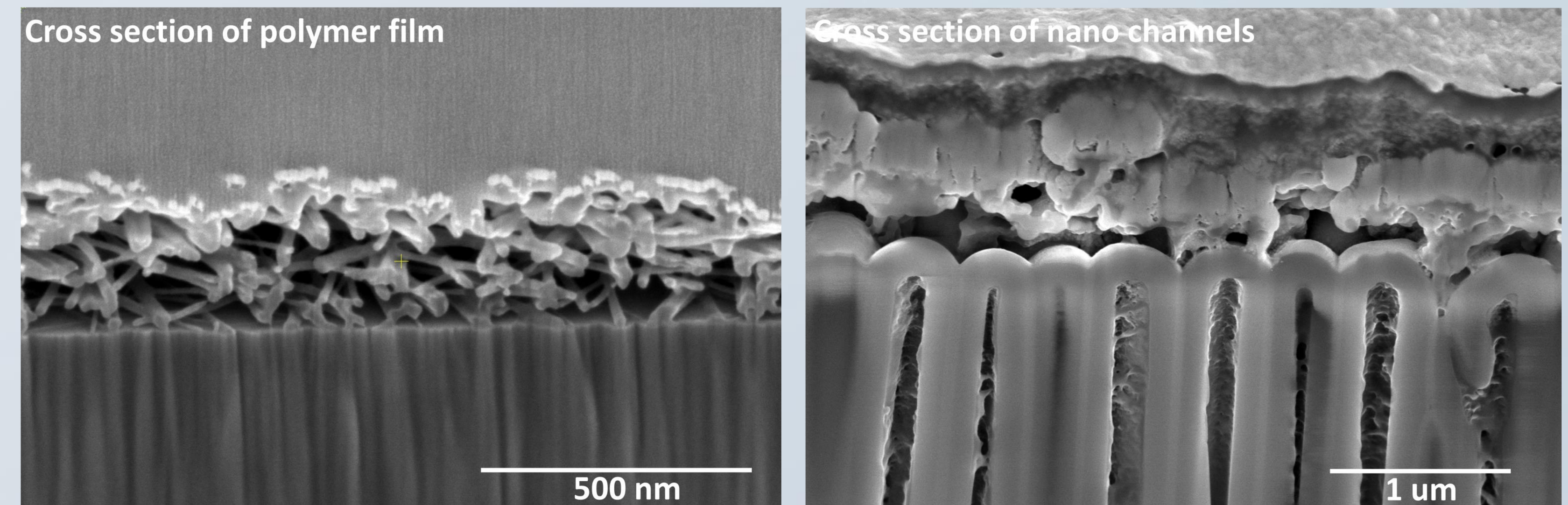
• EasyLift™ for precise in situ sample manipulation

Typical Applications

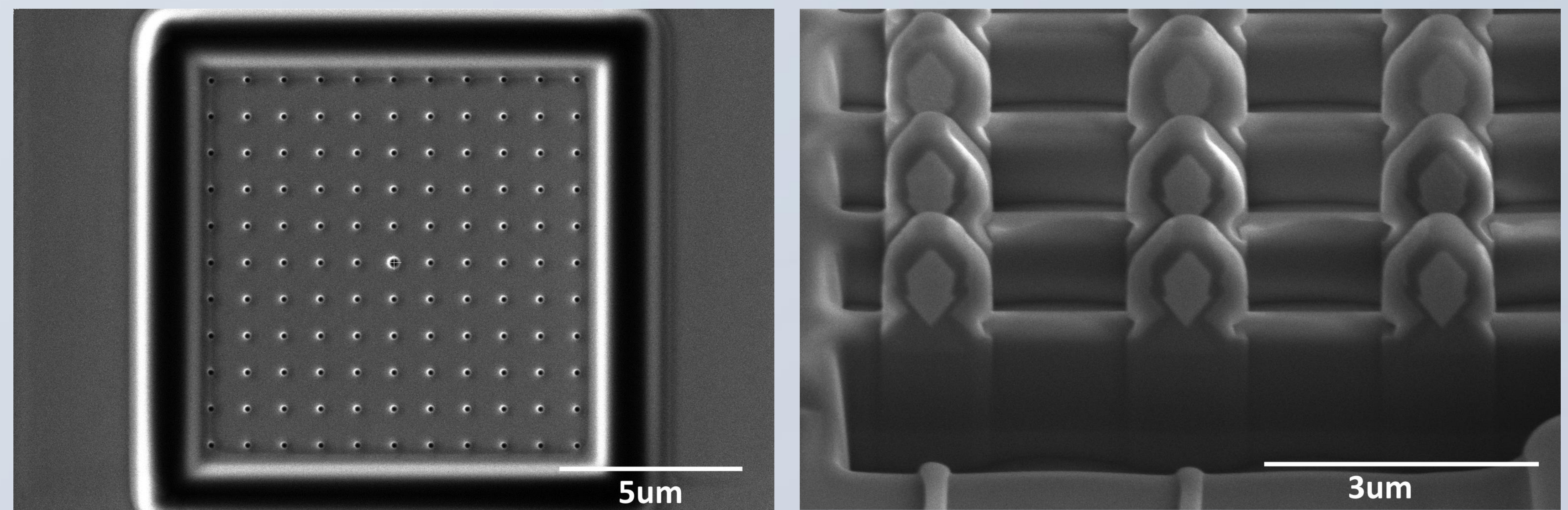
1. Preparation of site-specific, ultra-thin TEM sample



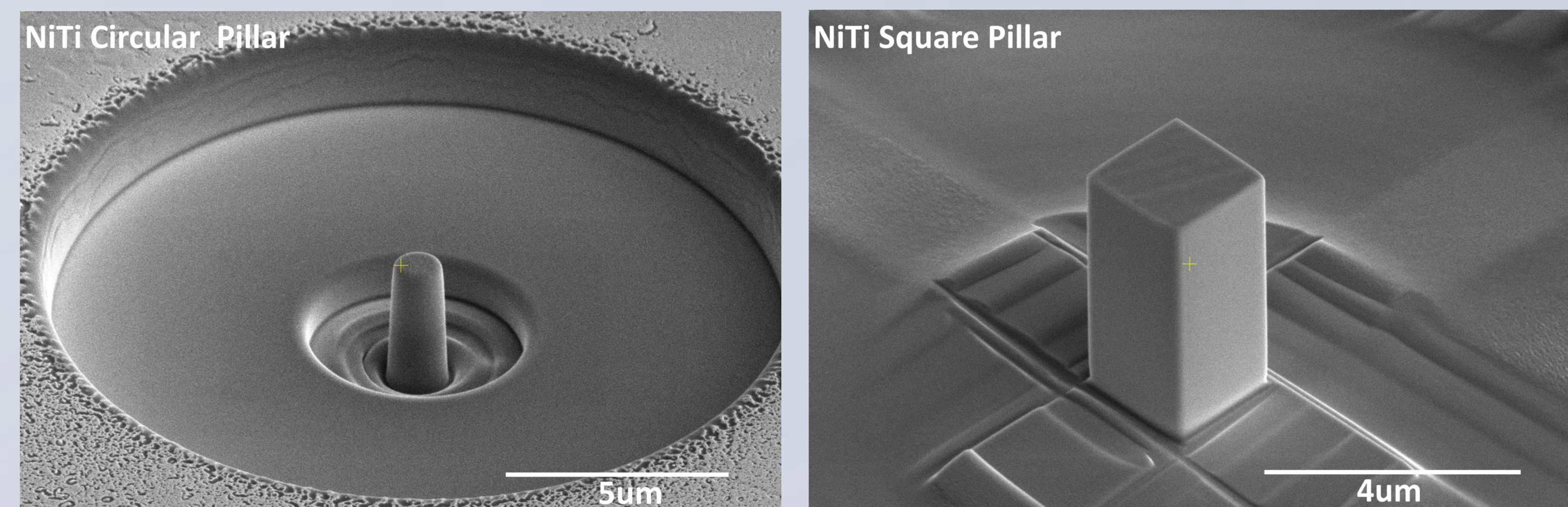
2. Cross-section milling and Imaging to reveal structures below the surfaces



3. Precise milling and deposition of complex nano structures



4. FIB micromaching



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■ advanced materials ■ nano technologies ■ new opportunities

MCPF

Materials Characterization and Preparation Facility

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