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Three-dimensional in situ nano manipulation and nano fabrication inside the scanning electron microscope

ROBERT W. COHN, ElectroOptics Research Institute and Nanotechnology Center, University of Louisville

Beyond visualization and composition analysis, scanning electron microscopes (SEMs) provide limitless opportunities to probe, manipulate and fabricate materials and devices in real-time. Using a field emission electron microscope outfitted with a four arm nanomanipulator and numerous vacuum feedthroughs, a number of experiments and studies will be described, including bending and vibration mechanics of nanowires and polymer fibers, e-beam induced deflection and rotation of polymer nanofibers, selective growth of individual metallic nanowires from a room temperature alloy melt, field emission induced melting of sharpened tungsten tips and contact angle measurements of vacuum oils on nanowires.