

Abstract Submitted  
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**Applications of the Lithium Focused Ion Beam: Nanoscale Electrochemistry and Microdisk Mode Imaging** WILLIAM MCGEHEE, CNST, NIST, SAYA TAKEUCHI, MML, NIST, THOMAS MICHELS, CNST, NIST, VLADIMIR OLESHKO, MML, NIST, VLADIMIR AKSYUK, CNST, NIST, CHRISTOPHER SOLES, MML, NIST, JABEZ MCCLELLAND, CNST, NIST, CENTER FOR NANOSCALE SCIENCE AND TECHNOLOGY AT NIST COLLABORATION, MATERIALS MEASUREMENT LABORATORY AT NIST COLLABORATION — The NIST-developed lithium Focused-Ion-Beam (LiFIB) system creates a low-energy, picoampere-scale ion beam from a photoionized gas of laser-cooled atoms. The ion beam can be focused to a  $\approx 30$  nm spot and scanned across a sample. This enables imaging through collection of ion-induced secondary electrons (similar to SEM) as well as the ability to selectively deposit lithium-ions into nanoscale volumes in a material. We exploit this second ability of the LiFIB to selectively "titrate" lithium ions as a means of probing the optical modes in microdisk resonators as well as for exploring nanoscale, Li-ion electrochemistry in battery-relevant materials. We present an overview of both measurements, including imaging of the optical mode in a silicon microdisk and a comparison of FIB and electrochemical lithiation of tin.

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