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ABSTRACT:

Synthesis and Engineering with Electron Microscopes

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In this presentation, I will provide an overview of my research endeavors in several areas. These areas include the synthesis of nano-materials, nano-bio studies, nano-materials in ion insertion batteries, and electron beam materials science. A common thread throughout much of my work is the exploration of structure-property relationships, such as the chiral dependence of single wall carbon nanotubes on their electrical properties, or the biological cell response in relation to nanomaterial type, size, and morphology.
A key aspect of my research is the development of a transmission electron microscope (TEM) into an atomic-scale laboratory, enabling the fabrication, modification, and characterization of samples with high spatial and temporal resolution. As such, the core of my presentation will focus on various electron beam-driven chemical reactions and electron beam engineering techniques that allow for the fabrication and manipulation of nano-materials at the atomic level.

KEYWORDS
Nano-materials, electron microscopy, in situ, synthesis & engineering

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