

Heterogeneous Functional Integration and Manufacturing at the Nanoscale

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Presentation

Abstract: Nanoscience – the ‘science of the small’ – produces stunning revelations that, almost daily, redefine the realm of the possible. Yet, the manufacturing processes and systems to transform this new knowledge into technologies and products that benefit us in our daily life is a crucial missing element. At Illinois, the Nanoscale Chemical-Electrical-Mechanical Manufacturing Systems (Nano-CEMMS) Center, a NSF-sponsored Nanoscale Science and Engineering Center (NSEC), is exploring and developing new methodologies and tools that exploit chemical, mechanical, and electronic phenomena and processes for manufacturing at the nanoscale.

This talk is a broad overview of the research within the Center. Specifically, it will describe heterogeneous integration in product design as a motivation for a repertoire of micro and nanoscale manufacturing processes. Processes such as electrohydrodynamic printing, electrochemical patterning, micro transfer printing, etc. will be described. The possibilities for patterning and integrating mechanical, optical and mechanical functions into materials will be discussed.