

Nanomanufacturing: Challenges and Opportunities

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Presentation

Abstract: The National Science Foundation (NSF) provided approximately \$27 million in Fiscal Year 2008 for fundamental research and education in nanomanufacturing in the United States, mostly to colleges and universities, with some support provided to small businesses. The core Nanomanufacturing Program emphasizes scale-up of nanotechnology to increase the production rate, reliability, robustness, yield, and efficiency of manufacturing processes and reduce the cost of nanotechnology products and services. Nanomanufacturing capitalizes on the special material properties and processing capabilities at the nanoscale, promotes integration of nanostructures to functional micro devices and meso/macro scale architectures and systems, and addresses interfacing issues across dimensional scales. The program promotes multi-functionality across all energetic domains, including mechanical, thermal, fluidic, chemical, biochemical, electromagnetic, optical etc. The focus incorporates a systems approach, encompassing nanoscale materials and structures, fabrication and integration processes, production equipment and characterization instrumentation, theory/modeling/simulation and control tools, biomimetic design and integration of multiscale functional systems, and industrial application. In this talk, I will overview research projects recently funded in the Nanomanufacturing Program at NSF. I will also talk about tips for NSF proposal writing.