

The NNN Newsletter

Business Opportunities in Nanotechnology: Impacts of the Economic Slowdown



The economic slowdown has had its effects on high technology businesses—particularly those engaged in early stage nanotechnologies—impacting issues such as investment funding, workforce, supply chain, equipment, and revenues. Broader implications for the future economic growth and proliferation of emerging

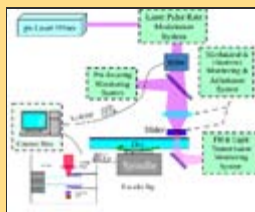
nanotechnologies and nanomanufacturing capabilities remain difficult to assess. Forecast scenarios range from slight corrections of previous growth trends to complete interruptions of new technology growth and implementation. While the long-term impact will likely be somewhere in between these extremes, there have been significant changes over the past two years in key enablers for early stage nanotechnologies that will impact the transition from fundamental research to scaled manufacturing of nano-enabled products. But the synopsis is not all negative: it turns out to be a good news, bad news scenario. [More...](#)

Regards,
Jeff Morse, Managing Director,
National Nanomanufacturing Network

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NNN Test Bed Reviews September 2009

NSF Center for Scalable and Integrated
NanoManufacturing (SINAM),
University of California Berkeley



Plasmonic Imaging Lithography

In order to leverage the dramatic advancements in nano-scale science and engineering, there is

an urgent need for versatile, high-throughput nanofabrication technologies that are adaptable to frequent design changes. Commonly used

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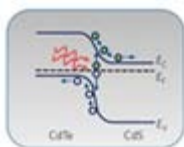
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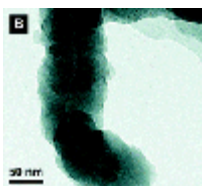
mask-less nano-lithography methods, such as electron-beam, focused ion-beam and scanning-probe lithography, can provide the desired flexibility, but prove to be rather limited by their throughput, mainly due to their slow scanning capabilities. [More....](#)

Benefits of Three-Dimensional Integrated Nanostructures for Energy Applications



While it has been known for many years that three-dimensional (3D) nanoscale architectures enhance the performance of energy storage and power generating devices, it has not been until recently that the tools to fabricate such structures are readily available for scalable processes. High surface area materials have previously demonstrated performance benefits for electrodes and catalyst supports in battery and fuel cell technologies, but new fabrication and integrated process capabilities now make it possible to address specific limitations of a given technology by enabling 3D designs. Three examples from the literature demonstrate the merits of 3D integration for power and energy storage devices. [More....](#)

Algal Cellulose Key to Polymer Battery



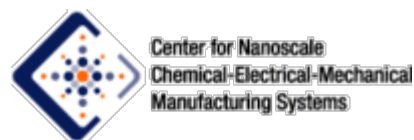
Researchers from Uppsala University have created a cellulose-polypyrrole composite electrode material with the highest reported charge rate and capacity for nonmetal batteries.

This work, reported in *Nano Letters*, significantly enhances the performance of polypyrrole (PPy), a conductive polymer, by layering it thinly over a large surface area substrate. In this case, the highly porous cellulose fibers of *Cladophora* algae--with 100 times the surface area of terrestrial cellulose--is coated with a 50nm layer of PPy. [More....](#)

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[Macromolecules 42\(15\): 5414-5415](#)



The Fluid Interface Reactions, Structures and Transport (FIRST) Energy Frontier Research Center at Oak Ridge National Laboratory has several opportunities for post doctoral research associates. The

FIRST Center will develop predictive computational models relating the nanoscale structures, dynamics and reactivities of fluid-solid interfaces in order to make transformational advances in electrical energy storage and catalysis for energy applications. [More...](#)

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