

## The NNN Newsletter

### Commercialization of Emergent Nanomanufacturing Platforms: Establishing Synergies and Roadmaps



A critical dimension of nanomanufacturing is how to address the numerous technological, economic, and regulatory challenges for scaling nanoscience developments in the research laboratory into commercializable, value-added market products. Various approaches have

proven effective in fostering such transitions, including corporate and venture investments, industry consortia collaborations, private-public partnerships, and technology transfer collaborations wherein academic institutions or small businesses work with large companies to expedite the transition of technologies to mainstream applications. Although several successful prototype products and demonstrations of advanced processes exist, the outcomes for many have yet to be adopted by main stream markets and manufacturing infrastructure.

A significant barrier to wide-spread adoption is the cost and difficulty of supplanting existing manufacturing capabilities and platforms, thereby limiting investment in the manufacture of nanotechnology-enabled products to high value products having no alternative pathways. Consequently, many emerging nano-enabled products, tools, and materials are achieving pilot scale commercialization. A crucial next step for nanomanufacturing is to overcome the hurdles to mass production for sustainable markets.

[More...](#)

Regards,  
Jeff Morse, Managing Director,  
National Nanomanufacturing Network

Learn More about the



## NNN Test Bed Reviews February 2010

NSF Center for Hierarchical Manufacturing (CHM),  
University of Massachusetts Amherst

## Upcoming Events

March 7 - 10, 2010

[Surface Analysis 2010](#)

March 7 - 11, 2010

[SPIE Smart Structures/NDE](#)

March 9 - 12, 2010

[NanoImpactNet Lausanne 2010](#)

March 21 - 25, 2010

[ACS Spring 2010 National Meeting and Exposition](#)

March 24 - 25, 2010

[Nanocomposites and Nanotubes 2010](#)

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## Upcoming Calls

March 19, 2010

[Nanotoxicology 2010](#)

Deadline to submit abstracts

April 17, 2010

[Nanosens 2010](#)

Deadline to submit poster abstracts

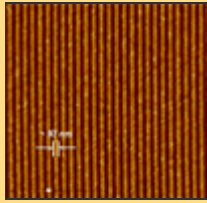
May 4, 2010

[Greener Nano 2010](#)

Deadline to submit poster abstracts

May 18, 2010

[International Conference on](#)



### Hierarchical Metal Oxide Films

Patterned metal oxide films having well-defined order and morphology are essential device layers in microelectronics,

photovoltaics, and microfluidics for separations and sensors. In a typical fabrication process sequence, a planar metal oxide film is deposited, coated with multi-layer resist structures, patterned by optical lithography, etched, stripped, ashed, and cleaned to generate a patterned oxide film. This cycle often consists of 10 or more process steps. Moreover, the resolution of current lithography and etch techniques limit the minimum feature size precluding the direct fabrication of complex geometric structures. [More....](#)

## NNI 2011 Budget and Signature Initiatives

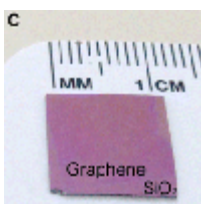


The National Nanotechnology Initiative has released its 2011 Supplement to the President's Budget. In his introductory letter, Presidential Science and

Technology Advisor John Holdren

notes that "Nanotechnology R&D constitutes a core building block of innovation that will ultimately accelerate job creation and transform many sectors of our economy through commercialization." The NNI budget continues to grow, with \$1,701 M reported in 2009 and \$1.781 M estimated for 2010. The 2011 request is slightly less - \$1,762 M - but is likely to be exceeded when next year's estimates appear. In addition, the identification of three signature initiatives in areas that are "ripe for significant advances through close ... interagency collaboration" gives us a glimpse of future plans, although few program details are presently available. The topics are nanoelectronics, sustainable nanomanufacturing, and solar energy. [More...](#)

## Two Approaches to Large-Area Graphene Synthesis For Device Quality Materials



Graphene has been attracting considerable interest in recent years as a result of its unique band structure and physical properties, including extremely high carrier mobility, that make it a promising material for the

### [Green Remediation](#)

Deadline to submit abstracts

May 22, 2010

[Gordon Research Conference: Plasmonics](#)

Deadline to apply to attend

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## Recently Published

From Our Affiliates

Ultralyophobic Oxidized Aluminum Surfaces Exhibiting Negligible Contact Angle Hysteresis

[Langmuir 26\(4\): 2567-2573](#)

Formation of SiO<sub>2</sub> Air-Gap Patterns Through scCO<sub>2</sub> Infusion of NIL Patterned PHEMA  
[Chemistry of Materials 22\(4\): 1445-1451](#)

Laser Desorption/Ionization Mass Spectrometry Analysis of Monolayer-Protected Gold Nanoparticles  
[Analytical and Bioanalytical Chemistry 396 \(3\): 1025 - 1035](#)

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## Affiliated Centers



semiconductor industry, though not one without challenges. One issue to consider has been the methods used to produce graphene films, including exfoliated graphite which yields graphene sheets sufficient only for research studies. Recent approaches to large-area synthesis of high quality single layer and multilayer graphene films have been explored by thermal decomposition of single crystal silicon carbide and chemical vapor deposition (CVD) on single crystal transition metals. While these approaches represent a significant step towards scaled production of quality graphene films, the requirements of high vacuum processing and expensive substrates with limited size still fall short of an integrated approach to incorporate this materials system. [More....](#)

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