National Nanomanufacturing Network Newsletter

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The NNN Newsletter

Economic Impact of Nanomanufacturing Initiatives

Early projections for global market growth of nano-enabled products—which have increased by about 25% per year since 2000 and predict US $1 trillion by 2015—are still relevant in 2009. With significant investment for nanoscience and technology initiatives being seeded at the federal and state levels, new models have emerged for sustaining critical research within academic institutions while providing the necessary industrial interactions to transition key technologies for commercialization.

A growing trend for new initiatives around the U.S. includes regional, state, and local collaboration in nanoscience research and development. Such initiatives target critical research and development partnerships for sustainable commercialization of nano-enabled products. Regional efforts are typically established around core academic research institutions providing an integral industrial partnering platform for R&D, technology transfer, and commercial scale-up. The technology focus may be based on key expertise of the institution and target specific industrial sectors.

While most states have embraced this model in order to attract and sustain a new industrial base, the economic impact is not always immediately evident, and may take years to emerge. Impact and success will ultimately depend on multiple factors including size of the industrial sector being targeted, initial funding by state and federal sources, industry matching funds, strategies for licensing, commercialization, and economic growth.

More...

Regards,
Jeff Morse, Managing Director,
National Nanomanufacturing Network

Learn more about the NNN...

Hybrid Solar Cells with Potential for Large-scale Manufacture

Upcoming Events

March 23, 2009
Nanotechnology: Will it drive a new innovation economy for the U.S.?

March 26, 2009
DoE Webcast: ITP Nanotechnology Research and Development

March 29 - April 2, 2009
Nanotech Insight

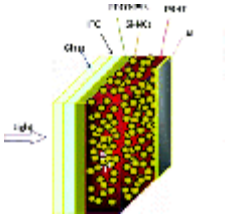
April 1 - 2, 2009
SME Nanomanufacturing Conference and Exhibit

April 1 - 3, 2009
Regional, State, and Local Initiatives in Nanotechnology

Affiliated Centers

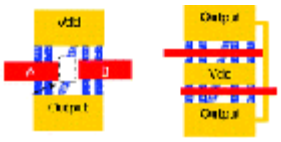
CHM Center for Hierarchical Manufacturing University of Massachusetts Amherst

Center for High-rate Nanomanufacturing



While single-crystal silicon based photovoltaics are a well-developed technology, the costs associated with producing and fabricating high-purity Si limit the widespread use of photovoltaics as a renewable energy source. Recent efforts to circumvent these costs have focused on a number of developing technologies, including polymer- and nanomaterial-based solar cells. A recent paper by Kortshagen and co-workers reports a photovoltaic cell with a photoactive region consisting of a blend of Si nanocrystals and conductive polymer P3HT that can be processed from solution. The solution processability of this “hybrid” solar cell is ideally suited for inexpensive, large-scale manufacture, while the use of Si nanocrystals avoids the presence of heavy metals. More...

Wafer-scale Fabrication of CMOS Logic by Aligned Arrays of Single-wall Carbon Nanotubes



The interest in developing electronic devices based on single-wall carbon nanotubes (SWNT) derives from the promise of higher performance than silicon-based CMOS integrated circuits, which are at the heart of the microelectronics industry. Among the challenges to fabricate SWNT devices at a wafer-scale are the difficulty of synthetizing carbon nanotubes with controlled chirality and therefore controlled transport properties and the accurate positioning and electrical addressing of a large number of nanotubes. The idea at the core of Ryu and colleagues' recently-published report is the use of a horizontal array of aligned, non-overlapping nanotubes with lithographically patterned electrical contacts for a group of nanotubes. This paper describes advances obtained in multiple fabrication steps, which enable the implementation of advanced electronic logic functions at a full 4” wafer scale. More...

Direct Writing of Ordered Nanostructures with LIL

Compared to conventional lithographic methods for the preparation of

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Recently Published

From Our Affiliates

Vapor-Phase Formation of Alkyl Isocyanate-Derived Self-Assembled Monolayers on Titanium Dioxide
Langmuir 25(5): 2875-2880

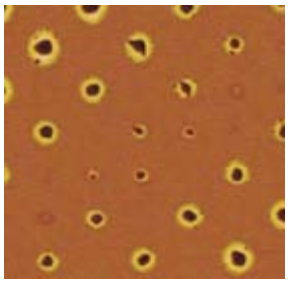
Linear Dipole Behavior in Single CdSe-Oligo (phenylene-vinylene) Nanostructures
ACS Nano3(2):453-461

Macroscopic 10-Terabit-per-Square-Inch Arrays from Block Copolymers with Lateral Order
Science 323(5917): 1030-1033

Magnetic Assembly of Colloidal Superstructures with Multipole Symmetry
Nature 457:999-1002

Directed Assembly of Polymer Blends Using Nanopatterned Templates
Advanced Materials 21(7): 794-798

Centrifugal Sedimentation for



nanostructures, which typically reqire time-consuming process sequences and expensive masks, Laser Interference Lithography (LIL) is an inexpensive and efficient option to produce nanopatterns over large areas. An international team of researchers demonstrates a simplified method of laser interference lithography for ordered surface nanostructures <5nm. More...

Read more on InterNano

Selectively Packing Channels with Silica Microbeads in Three Dimensional-Micro/Nanofluidic Devices
Analytical Chemistry
81(5):2022-2026

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