

National Nanotechnology Infrastructure Network Vol.4 # 5

A Periodic Newsletter of NNIN News and Announcements

October 2008

NNIN

The [National Nanotechnology Infrastructure Network](#) consists of 12 nanotechnology user facilities at 12 major academic institutions. Funded by the National Science Foundation, our facilities are available to the national user community on an open basis. We provide accessible resources across the entire breadth of nanotechnology. To this end, each site has specialized areas of expertise within the network, ranging from biology and chemistry to materials characterization and traditional microfabrication. Complete information on NNIN sites, resources and access is available via the web site at nnin.org (*note to recipients: All links clicked in this newsletter are redirected through a proxy server and are thus tracked. You may access the links directly without tracking by opening them manually in your browser*)

Nanotechnology Events in NNIN

Nanoscience Workshop for Teachers and Educators

The Lurie Nanofabrication Facility at the University of Michigan is offering a free one-day workshop on microtechnology and nanoscience on Friday November 7th 2008. It is targeted towards middle, high school teachers or school curriculum staff who would like a better understanding of micro/nanotechnology and how to use it in the classroom. The workshop will include some lecture material, but will focus on hands-on classroom and laboratory activities that can be used to introduce students to nanotechnology. More information is available at <http://www.mnf.umich.edu/Events.aspx?id=99>

NANOFANS Forum at GA Tech

The Fall Ga Tech NANOFANS Forum was held on October 10, 2008 at the Microelectronics Research Center (MiRC), Georgia Tech. The focus for this meeting was "Nanotechnology Applications in Cancer Research." 45 external researchers (representing 20 organizations) and 38 GT researchers attended the forum. The goal for the forum is to connect the medical/life sciences/biology and nanotechnology communities, and to reach out to researchers in the biomedical / life sciences areas to let them know what nanotechnology can offer them in the advancement of their research. For more details related to NANOFANS event, please click the link below: <http://www.mirc.gatech.edu/nanofans.php>

Upcoming Nanoscale Science and Technology Event at the Center for Nanotechnology, University of Washington

Tuesday, November 4 AFM Life Science Workshop Staff scientists from the University of Washington and Veeco's Nano-Bio lab will highlight the the BioScope II in a morning presentation with an afternoon demonstration workshop to follow. Learn about how atomic force microscopy is providing new insights to life science researchers around the

world on topics as diverse as neurodegenerative diseases, metabolic dysfunction, infectious diseases, single molecule interactions, implantable medical devices, and many others.

For further information about this event, please see <https://depts.washington.edu/ntuf/> and/or contact Mack Carter, 206-616-9320, mcarter@u.washington.edu

University of Minnesota hosting 4th Annual Nanotechnology Conference

The University of Minnesota will be hosting its 4th Annual Nanotechnology Conference November 11-13. The three-day workshop offers presentations and discussions on topics including Nano Sensors, Energy, Optics, Microfluidics, Materials and Medicine. For complete information visit: <http://www.nano.umn.edu/conference2008/>

New Equipment

Chemical Mechanical Polishing Processes Available at Michigan

The Lurie Nanofabrication Facility at the University of Michigan has completed the installation and qualification of an IPEC 472 Chemical Mechanical Polisher configured for 4 wafers. This is a dual platen (possibility of using two different pads) CMP polisher with three slurries processes and in-situ or ex-situ wafer conditioning. Recipes are available for Si oxide, Si and Si nitride polishing. Post-CMP-cleaning is done in an OnTrack DSS-200 wafer cleaning tool, which uses two sets of top and bottom PVC brushes with NH₄OH chemistry and a spinner rinser/drying station. Both tools can process a whole cassette or single wafers. The LNF has also finished the installation and qualification of a KLA-Tencor HRP-220 high resolution profilometer mostly dedicated to CMP characterization.

New Film Capabilities added to Harvard ALD

The CNS Savannah Atomic Layer Deposition system is now capable of depositing thin 100% conformal layers of the following materials, with single monolayer thickness control: Al₂O₃, HfO₂, SiO₂, Pt. Copper, cobalt, titanium, strontium (titanate) will also soon be available. Up to 8" wafers can be deposited, with roughly 0.5% uniformity. Contact Hathaway@cns.fas.harvard.edu for further information.

ITO Sputtering at the Cornell Nanoscale Facility

CNF has installed a Kurt Lesker PVD75 system configured for the sputtering of Indium Tin Oxide. ITO is used as a transparent conductor in a variety of electronic applications. The acquisition of this tool was made possible by a semiconductor equipment award from Intel.

Other News

New Nanofab Staff at Penn State

William Mansfield will join the Penn State University Nanofabrication Facility staff in mid October as the Director of Operations. Bill will be responsible for day to day activities of the facility and interfacing with both the external and internal user communities. Bill comes to Penn State with a wealth of experience in fabrication operation and management and was most recently the technical manager of the Micro and

Nanofabrication Research Lab at Alcatel Lucent Technologies in Murray Hill, New Jersey.

Kathleen Gehoski recently joined the Penn State Nanofab as an imprint lithography process engineer. Her previous experience includes 25 years working in Motorola's fabrication facility in Tempe, Arizona working on a tool set very similar to what Penn State maintains in the Nanofab.

Groundbreaking for Millennium Science Complex at Penn State

Penn State will break ground for its new showplace research building for 21st century science is breaking ground in fall 2008. The Millennium Science Complex on Pollock fields in the heart of the University Park campus will provide a central location for faculty and students involved in materials research to collaborate across departmental boundaries in a state-of-the-art research facility. This 275,000 square foot building will bring together both materials researchers and life scientists from the Materials Research Institute and the Huck Institutes of the Life Sciences. Through this interface, the Millennium Science Complex will foster collaborations in the developing convergence of materials and biomedical engineering.

The materials research program will provide 10,000 square feet of clean room space, with another 6,000 square feet of clean room support space. Total user facilities will occupy 50,000 net square feet with several state-of-the-art characterization and fabrication tools housed in a specialized quiet space with low acoustic and electromagnetic noise suitable for future generations of image analysis instruments. Characterization tools will be placed in approximately 10,000 net square feet of high caliber space, much of which will have separate isolated slab flooring. Another 10,000 square feet are set aside for other characterization tools.

Along with providing central user facilities and flexible desk and meeting space for faculty and students from across campus, the materials building will be home to a number of materials faculty groups, along with 30 full-time technical staff. Research areas will include electronic materials and devices, nano and micro fabrication and thin films, optics and biophotonics, surface science, functional polymers, complex oxides, and NEMS and MEMS. The Millennium Science Complex is scheduled for a summer 2011 opening.

<http://www.mri.psu.edu/NewBuilding/index.asp>

Cornell NanoScale Facility office at Weill Medical School in NYC

CNF announces the opening of its satellite office at the Cornell Weill Medical School in NYC. CNF User Program Manager Mike Skvarla and CNF Nanobiotechnology Liaison Dr. Beth Rhodes will staff the facility on a part time basis. They will work to establish user projects within the medical community at Weill and as well as elsewhere in the NYC area. For additional information visit the [CNF web site](#)

or <http://www.news.cornell.edu/stories/Sept08/nano.wcmc.aj.html>

Education News

Stanford and Georgia Tech partner in new Education Program

NSF has awarded funding for *NanoTeach*, a partnership between Mid-continent Research for Education and Learning (McREL; lead site), an education research and development organization; Stanford Nanofabrication Facility; Georgia Institute of Technology (NNIN education & outreach office), Aspen Associates, an applied research and evaluation services in education, and The Cannery, an advanced technologies media agency.

NanoTeach is a combination of intensive face-to-face and year long online professional development experiences for high school science teachers designed to increase their nanoscale science and technology content knowledge and their repertoire of content-specific instructional strategies. NanoTeach will use previously tested student learning modules and online resources, and an appropriate instructional framework to engage teachers in collaborative learning experiences with the goal of teachers being prepared to infuse nanoscale science and technology into their existing curricula. *NanoTeach* will also test the Versatile Classroom (instructor controlled DVD technology) to deliver online professional development to underserved science teachers in rural and urban areas.

NNIN staff will coordinate scientists with expertise in various areas of nanoscience research across the NNIN network to provide content expertise. The NNIN will also be responsible for field test recruitment at districts located near NNIN facilities and will assist with dissemination efforts

Nanooze

[Nanooze](#) is the NNIN science news/nanotechnology magazine for children. The final two issues of the three issue series on the Five Senses are now available. Issue 3 covers Sight; Issue 4 covers Smell and Taste; Issue 5 covers Touch and Hearing. Much of the content is available on line at www.Nanooze.org. Printed copies are distributed to teachers on request in classroom packs of 30. Contact Lynn Rathbun @ rathbun@cnf.cornell.edu

Employment Opportunities

Job Openings at Michigan

The Lurie Nanofabrication Facility at the University of Michigan is hiring motivated individuals for two positions:

- Research Engineer for User Support, posting #26226 (open until 11/05)
- Education/Outreach and User Recruitment Coordinator, posting #26196 (open until 10/31)

To find more details about the positions or to apply, please visit www.umich.edu/~jobs/

NNIN is a network of open user facilities. All resources at member facilities are available equally to users from Academia, industry, and government. Contact information and facility details are available via the NNIN web site at <http://www.nnin.org>.