
The Penn State Center for Nanotechnology Education and Utilization (CNEU) is the home of the Pennsylvania Nanofabrication Manufacturing Technology (NMT) Partnership, and the NSF Advanced Technology Education (ATE) Center for Nanofabrication Manufacturing Education. The CNEU also coordinates the educational outreach activities for the Penn State site of the NSF National Nanotechnology Infrastructure Network (NNIN), the national NSF nanotechnology resource for enabling academic and industry R&D.

The CNEU Mission:
The CNEU is dedicated to research, development, and education across all aspects of micro- and nanotechnology. The Center resources are focused on addressing the incorporation of nanotechnology into secondary education, into post-secondary education, and into industry applications.

CNEU – Highlights of Upcoming Activities:

Capstone Semester Update: The spring 2008 capstone semester is well underway. Sixteen students from all across Pennsylvania are presently immersed in the eighteen-credit sixteen week spring session. Registrations are still being accepted for the summer 2008 capstone which will begin on May 18, 2008. Registration for the fall 2008, spring and summer 2009 capstone semesters are also being accepted. Please contact Lisa Daub at 814-865-9635 (lدارة@engr.psu.edu) to register, or for further information.

Upcoming Hands-On Nanofabrication Workshop for Educators: Two separate Hands-on Nanotechnology Workshop for Educators will be held presently will be held May 13-15, 2008 and June 23-25, 2008 at the Center for Nanotechnology Education and Utilization (CNEU) at Penn State University. These three-day workshop utilizes the facilities at Penn State to teach nanotechnology at an introductory level and also enables the participant to understand how nanotechnology is and will continue to be integral to STEM curriculum and careers. Participants will learn about the growing applications of nanotechnology in many industries including the biotechnology, MEMs, optoelectronics, chemical and electronics industries. The basics of nanofabrication processes and tools will be covered and practiced through a combination of classroom lectures and hands-on processing, utilizing the Penn State NNIN Nanofabrication Facility along with the CNEU educational cleanroom. The June workshop is a partnership effort with the University of Pennsylvania’s Nano-Bio Center focused primarily on high school educators.

2008 NNIN REU Program: During the summer of 2008 CNEU will again host five students to participate in a Research Experience for Undergraduates (REU) Program from June 2nd through August 14th. This is the fifth year of a joint program of the National Nanotechnology Infrastructure Network (NNIN), which consists of 13 universities from across the country (for a detailed list of the network members, please see www.nnin.org). The experience will culminate with an NNIN-wide convocation which will be held at Cornell University. Engineering and science students with broad interests across disciplines focusing on nanotechnology are eligible to apply if they are not graduating before the end of the program in August 2008. For more detailed information about the REU program, eligibility requirements, and other important facts please see http://www.reu.nnin.org/nnin11_login.php.

2008 NNIN RET Program: During the summer of 2008, the Penn State National Nanotechnology Infrastructure Network site in conjunction with the Penn State Science Education Department will again be offering teachers (in-service and pre-service) the opportunity to experience the excitement of nanotechnology research and to share this experience in their classrooms and with their peers. This program will also be offered to teachers (in-service and pre-service) by four other NNIN sites: Georgia Institute of Technology, Harvard University, Howard University, and the University of California Santa Barbara. Some of the objectives of this program are to assist a diverse group of science teachers in understanding and communicating the importance of using inquiry-based methods to solve problems by doing research in nanotechnology and to establish a long-term mentorship support group of teachers who will become advocates for nanotechnology education and careers. The dates for the on-site University Park portion of this summers’ RET are June 23 through August 1. More information on program details and eligibility requirements will be available in the near future on the NNIN website www.nnin.org. Watch your inbox for an up-coming announcement. In the meantime, if you are interested and would like further information, please contact Bob Ehrmann at 814-865-7558 or rke2@psu.edu.

Summer Nanotech Academies: The CNEU will again be hosting three-day Nanotechnology Introduction Academies during the summer of 2008. The available dates for these 2008 experiences have been filled. These Nanotech Introduction Academies, for students in 9th grade and above, are a great opportunity to learn about nanotechnology and nanofabrication. Careers are explored and educational pathways to nanofabrication careers are discussed. The agenda is designed to be interactive and fun, while still maintaining a high level of introductory level knowledge.

NMT Partnership Industry Outreach Initiative: In collaboration with area NMT Partners, a series of Industry Outreach Workshops entitled “Competing in the 21st Century: The Nanotechnology Edge” are presently scheduled or are in the planning stages at various locations across the Commonwealth in the upcoming months. The desired outcome for this initiative is to reach as many companies as possible to share: a beginning understanding of what nanotechnology is and the immense opportunities that nanotechnology offers, the current and forecasted impact of nanotechnology upon the marketplace, and to make them aware of the nanotechnologist worker pool available to them through the NMT Partnership. Please contact Bob Ehrmann at 814-865-7558 (rehrmann@engr.psu.edu) or Darlene Fink at 814-863-2955 (dfink@engr.psu.edu) for additional information.
**NMT Partnership Educational Outreach Initiative:** Again, in collaboration with area NMT Partners, a series of Educational Outreach Meetings continue during the first few months of 2008 at NMT Partner facilities across the commonwealth of Pennsylvania. These outreach opportunities will continue during the spring of 2008. The objective of this initiative is to introduce nanotechnology and the nanotechnology education program available through NMT Partnership to as many students as possible at NMT Partner institutions. Please contact Jamie Houseknecht at 814-865-5285 (juh147@psu.edu) or Darlene Fink at 814-863-2955 (dfink@engr.psu.edu) for additional information.

**CNEU Program Highlights for March - April 2008**

**Industry Workshops held in Pittsburgh PA and Lancaster PA:** CNEU staff members presented two industry focused workshops during this bulletin period. The first of these was held in Pittsburgh PA at Seagate Technology on March 6th, 2008 and was sponsored and organized by the Advanced Manufacturing Career Collaborative (AMC²). The second workshop was held in Lancaster PA on April 8th 2008 at the PSU Lancaster facility and was sponsored and organized by the Lancaster County Workforce Investment Board (WIB). A total of 110 individuals attended these two workshops entitled “Competing in the 21st Century: The Nanotechnology Edge”. The goal for the workshop was to share with participants: a beginning understanding of what nanotechnology is and the immense opportunities that nanotechnology offers, the current and forecasted impact of nanotechnology upon the marketplace, and to make them aware of the nanotechnologist worker pool available to them through the NMT Partnership.

**2008 NMT Partners Meeting** This meeting was held on April 21st and 22nd, 2008 at the Penn Stater Conference Center. Over 60 NMT Partners and guests attended and participated in presentations and group discussions regarding the NMT Partnership. Information on the status of the partnership and future plans for the partnership were shared during this meeting. Some of the highlights items discussed during the meeting were capstone semester curriculum updates, new teaching cleanroom equipment additions, the industry outreach initiative, capstone semester skill entry skill set requirements, and the statewide capstone semester recruitment initiative.

**Testimony to U.S. House of Representatives Committee on Science and Technology:** On June 19, 2007 Professor Stephen Fonash gave invited testimony on Nanotechnology Technician Education before the House Subcommittee on Research and Science Education. This testimony was part the subcommittee’s examination of role that community colleges play in recruiting and training skilled technicians and industry workers in the advanced manufacturing industry. Complete transcripts and videos of this event are available at [http://www.cneu.psu.edu/newsevents_061907subCommitteeTestimony.html](http://www.cneu.psu.edu/newsevents_061907subCommitteeTestimony.html).

**Nanotechnology Video Released:** In mid November 2007, the Pennsylvania College of Technology and WVIA public television released a broadcast production entitled “Degrees that Work - Nanotechnology”. The video introduces 21st century career and education opportunities to viewers. This 30-minute presentation explores nanotechnology and the related career opportunities with experts in the field. The production follows a former Penn College student, Mark A. Atwater, as he completes the capstone semester at The Pennsylvania State University’s Center for Nanotechnology Education and Utilization. The video can be accessed at [http://www.cneu.psu.edu/edCapstoneVideo.html](http://www.cneu.psu.edu/edCapstoneVideo.html).

**Teaching Cleanroom Webcast:** We continue to have requests from associates across the nation to access the teaching cleanroom webcast entitled "Design and Implementation of an Educational Laboratory for Nanofabrication Manufacturing Technology". The webcast was held on Friday November 10, 2006 to introduce the new educational cleanroom at the Penn State Center for Nanotechnology Education and Utilization to a national audience. The webcast included a video tour of CNEU's new Educational Laboratory, a presentation discussing facets of the design process (including laboratory layout, equipment purchase criteria, safety, support and maintenance) and concluded with a live question and answer session. The webcast was recorded and is available for viewing at [http://www.cneu.psu.edu/labwebcast.htm](http://www.cneu.psu.edu/labwebcast.htm).

**CNEU Website:** The CNEU website ([www.cneu.psu.edu](http://www.cneu.psu.edu)) continues to be available as an aide to prospective students, parents, educators, counselors, and industry personnel. Highlighted website features include Nanotechnology Education Modules, Student and Industry Video testimonials, NMT Associate to Baccalaureate Pathways, overviews of the NMT Partnership Capstone Semester as well as other CNEU programs and offerings. Recent additions to the website include Dr. Fonash's June 2007 testimony to Congress along with a new 30 minute video entitled “Degrees that Work – Nanotechnology” which was produced by the Penn College of Technology.

**CNEU Outreach:** During the months of March and April 2008 Center received 230 visitors representing 12 organizations in addition to the earlier mentioned NMT Partners Meeting. Offsite and remote access presentations impacted an additional 264 individuals at 11 sites. In addition the Center hosted 9 remote tool access experiences during this period.

**For Further Information on these Highlights or on the NMT Partnership in general, please contact:**

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