**Center for Nanotechnology Education and Utilization Bulletin – September- October, 2008**

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 fall 2008 capstone semester began on August 25, 2008, and the students are presently immersed in the eight-credit fall session. Registrations are still being accepted for the spring 2009 capstone which will begin on January 12, 2009. Registration for the summer 2009, fall 2009, and spring 2010 capstone semesters are also being accepted. Please contact Lisa Daub at 814-865-9635 (ldaub@engr.psu.edu) to register, or for further information.

**Hands-On Nanofabrication Workshop for Educators:** The next Hands-on Nanotechnology Workshop for Educators to be held **December 2-4, 2008** at the Center for Nanotechnology Education and Utilization (CNEU) at Penn State University. This 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. Please contact Lisa Daub at 814-865-9635 (ldaub@engr.psu.edu) for further information. Please register online at [http://www.cneu.psu.edu/newsevents_Dec08EdWorkshop.html](http://www.cneu.psu.edu/newsevents_Dec08EdWorkshop.html).

**NMT Partnership Career Day:** The Pennsylvania NMT Partnership will again be holding a Career Day on November 10, 2008 at University Park. This event which will be held at the Penn Stater Conference Center in University Park, PA will bring together Pennsylvania employers, students enrolled in the capstone semester, and alumni of the NMT capstone semester. This NMT Career Day is a great way for students to update their skills, refresh knowledge, reconnect with former classmates, and network with Pennsylvania nanotechnology companies. For further information please contact Phi Oanh Pham at 814-865-6962 (ppham@engr.psu.edu). More information and an event registration form can be accessed from the CNEU home page at [www.cneu.psu.edu](http://www.cneu.psu.edu).

**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. For information on our upcoming schedule for these events, please see [www.cneu.psu.edu](http://www.cneu.psu.edu). Please contact Bob Ehrmann at 814-865-7558 (rehrmann@engr.psu.edu) or Darlene Fink at 814-863-2955 (dfink@engr.psu.edu) for any additional information.

**NMT Partnership Educational Outreach Initiative:** The fall 2008 recruitment season is underway. Jamie Houseknecht is presently in the process of scheduling a series of Educational Outreach events at NMT Partner facilities across the Commonwealth of Pennsylvania. These outreach opportunities will continue during the spring 2008. The objective of this initiative is to introduce nanotechnology and the nanotechnology education program available through PA NMT Partnership to as many students, administrators, and faculty as possible at NMT Partner institutions. This program along with the always welcome visits and tours to University Park are great opportunities to spread the word about the incredible academic opportunity available to Pennsylvania students. Please contact Jamie Houseknecht at 814-865-5285 (jsh147@psu.edu) or Darlene Fink at 814-863-2955 (dfink@engr.psu.edu) for additional information. To schedule a facility tours on line please see [http://www.cneu.psu.edu/edOutreachSecEdTour.html](http://www.cneu.psu.edu/edOutreachSecEdTour.html).

**Website Upgrade:** The CNEU website is presently undergoing redesign. The new and improved student-centric website is now scheduled to launch in January 2009. Watch for it!
CNEU Program Highlights for September- October 2008

PSU- CNEU Awarded NSF ATE National Center: The Penn State Center for Nanotechnology Education and Utilization (CNEU) will receive $5 million over four years from the National Science Foundation to establish a National Center for Nanotechnology Applications and Career Knowledge (NACK). Penn State has been a national leader in nanotechnology education and workforce development since 1998. From 2001 to 2008, Penn State was home to the NSF Regional Center for Nanofabrication Manufacturing Education. The new NSF grant establishes the National Center for Nanotechnology Applications and Career Knowledge (NACK) as successor to the Regional Center. According to Stephen Fonash, the Dunkle Chair Professor of Engineering Science, who will direct the new NACK Center, the Pennsylvania Department of Community and Economic Development was extremely farsighted when it created the Nanofabrication Manufacturing Technology (NMT) Partnership in 1998 to meet Pennsylvania industry needs for skilled micro- and nanofabrication workers. "The NMT Partnership prepares students to work in any industry using micro- and nanotechnology," said Fonash. "In addition to Penn State, the NMT Partnership includes the Pennsylvania Commission for Community Colleges, the Pennsylvania State System of Higher Education, the Pennsylvania College of Technology, other post-secondary and secondary schools, private industry and others." The nation's first associate degrees in nanofabrication were awarded in Pennsylvania through this partnership. The NMT Partnership also offers enormously popular summer Nanotech Academies for high school students, as well as professional development workshops for educators and industry personnel. The goal of the NACK Center is to provide national coordination of micro- and nanofabrication workforce development programs and activities on behalf of NSF. The center will assist educational institutions and industry across the nation to work together to develop and deliver micro- and nanotechnology education programs, including incumbent worker training programs. The center will also help to develop national education program accreditation and worker skill standards in micro-and nanotechnology. "There is tremendous interest within industry and educational institutions in finding ways to meet the growing need for workers with micro- and nanotechnology skills," says Fonash. "The NACK Center is already working with several hundred community colleges and other educational institutions in more than 20 states and Puerto Rico to help develop programs to meet this need." In addition to Penn State, other key partners in the NACK Center are the Dakota County Technical College in Minnesota, the Maricopa Community Colleges in Arizona, and the University of Puerto Rico, Humacao. For further information about NACK programs and activities please contact Mr. Robert Ehrmann by telephone at 814-865-7558 or e-mail at rke2@psu.edu or visit www.nano4me.org.

Advanced Technological Education (ATE) PI Conference: The ATE 2008 Principal Investigators Conference was held in Washington, D.C., October 29-31, 2008. The theme of the conference was Faces of Success and the conference highlighted successful students, graduates, projects, and program across the nation. The Nanotechnology Applications and Career Knowledge NACK Center exhibited at this event, and Paul Hallacher also hosted a roundtable discussion on “Developing Micro- and Nanofabrication Technician Programs” during the conference.

CNEU Outreach: During the months of September and October 2008 Center received 84 visitors representing 8 organizations. Offsite and remote access presentations impacted an additional 1319 individuals at 31 sites.

Educational Outreach Initiative Highlights: Included in the above outreach numbers are educational outreach at NMT Partner institutions across Pennsylvania. Collectively, Jamie Houseknecht (who led this effort) with assistance from other CNEU personnel met with NMT Partner representatives, and held information forums to a collective audience of 1211 educators, administrators and potential capstone attendees, during the months of September and October. The NMT Partner sites visited during this time period were Lehigh Carbon Community College, Montgomery County Community College, Bucks County Community College, Clarion University, California University of PA, Indiana University of PA, PSU- Fayette, PSU- Greater Allegheny, Allegany College of Maryland, Millersville University, Penn Highlands Community College, PSU- Altoona, Harrisburg Area Community College, Montgomery County Community College, Penn College of Technology, PSU- Hazleton, Bloomsburg University, Northampton Community College, Butler County Community College, Delaware County Community College, and Shippensburg University.

Center Assets Reminders:

Student Recruitment Brochure and Recruitment Video are Available: The Center published a new recruitment brochure and produced a new 9 minute recruitment video to attract students into nanotechnology degree programs at Pennsylvania Partner schools in the summer of 2008. The new tag line developed during this process is “Take Matter Into Your Own Hands: The Capstone Semester: Your Pathways to a Career in Nanotechnology”. The video can be viewed on the Center website at http://www.cneu.psu.edu/nePublications.html#capstoneVideo. The brochures and DVD copies of the video can be attained by contacting Darlene Fink at 814-863-2955 dfink@engr.psu.edu.
Penn College Nanotechnology Video Available on CNEU Website: 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).

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).

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)) and for now ([www.nano4me.org](http://www.nano4me.org)) 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 the 30 minute video entitled “Degrees that Work – Nanotechnology” which was produced by the Penn College of Technology, and the new 9 minute student recruitment video.

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

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