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 2007 capstone semester is now complete. Congratulations to the students who successfully completed the rigorous semester and are now on to the next step in their educational journey or have graduated their degree programs and are entering the working world to contribute to our economy. The spring 2008 capstone semester began on January 14, 2008, and these students are presently immersed in the eighteen-credit sixteen week spring session. Registrations are still being accepted for the spring 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 (ldaub@engr.psu.edu) to register, or for further information.

Hands-On Nanofabrication Workshop for Educators: Attention educators! Registrations are now being accepted for the next Hands-on Nanotechnology Workshop for Educators to be held May 13-15, 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) to register, or for further information.

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. The application deadline for this program is February 19, 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 Camps: The CNEU will again be hosting three-day Nanotechnology Introduction Camps during the summer of 2008. These Nanotech Introduction Camps, 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. For further information on Nanotech Camps and to make camp reservations, please contact Ms. Darlene Fink at 814-863-2955 or dfink@engr.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. 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 were held during the Fall of 2007 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 Bob Ehrmann at 814-865-7558 (rehrmann@engr.psu.edu) or Darlene Fink at 814-863-2955 (dfink@engr.psu.edu) for additional information.

CNEU Program Highlights for September – December 2007

NMT Partnership Career Day: An NMT Partnership Career Day was held on October 30, 2007. Representatives from Advantech, Cosmos Technologies, Cyoptics, Fairchild, Keystone Nano, Plextronics, and Veeco were featured. Each company presented an overview of their organization, its’ mission, and how it is tied to nanotechnology to an audience of fifty prospective, current, and former NMT students. The annual NMT Career Day is a great way for students to refresh knowledge, update their skills, get in touch with former classmates, and network with Pennsylvania nanotechnology companies. A large number of resumes were submitted to the represented companies for employment consideration and substantial time was allotted for student and company representative networking / interviewing. CNEU personnel also held cleanroom tours and training sessions on new AFM techniques and our latest piece of equipment the Atomate LPCVD for nanowire growth.

November 2007 - Hands-On Nanofabrication Workshop for Educators: The latest offering of this three-day workshop was held November 13-15, 2007 with 28 participants in attendance. The participants learned about the growing applications of nanotechnology in many industries including the biotechnology, MEMs, optoelectronics, chemical and electronics industries. The basics of nanotechnology processes and tools were covered and practiced through a combination of classroom lectures and hands-on processing labs in the Penn State Nanofab and the CNEU educational cleanrooms. Six of the workshop participants were non-Pennsylvanians (Arkansas, Colorado, Maryland, New Jersey, and Ohio) representing secondary and post-secondary institutions in those states. The workshop was well received by the participants in attendance. The next workshop in this continuing series will be held May 13-15, 2008.

Selected Pictures from November 13-15, 2007 Educators Workshop
Educational Outreach Initiative Highlights: CNEU personnel (Amy Brunner and Bill Mahoney) visited 24 NMT Partner sites, met with NMT Partner representatives, and held information forums to a collective audience of 699 educators, administrators and potential capstone attendees, during the months of October and November 2007. The NMT Partner sites visited during this time period were Beaver County Community College, Bucks County Community College, Butler County Community College, Delaware County Community College, Harrisburg Area Community College, Lehigh Carbon Community College, Luzerne County Community College, Montgomery County Community College, Northampton Community College, PA Highlands Community College, Community College of Philadelphia, Westmoreland County Community College, California University of PA, Clarion University, Indiana University of PA, Lock Haven University, Mansfield University, Shippensburg University, Penn State Berks, Penn State Fayette, Penn State Greater Allegheny, Penn State Hazleton, Penn State Wilkes-Barre, and Penn State York.

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.

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.

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.

CNEU Website: The CNEU website (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”.

CNEU Outreach: During the September through December period, the Center received 253 visitors representing 18 organizations. Offsite and remote access presentations impacted an additional 1626 individuals at 35 locations. The offsite outreach included meetings / presentations / exhibitions at the Two Year College Chemistry Consortium at Bergen Community College in Paramus NJ, the NSF ATE Principle Investigators Conference in Washington DC, the State of Pennsylvania WIB, the Society of Hispanic Professional Engineers Annual Conference in Philadelphia PA, the PDE Integrated Learning Conference in University Park, and the MRS Education Outreach Showcase in Boston MA.

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

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