Center for Nanotechnology Education and Utilization

HANDS-ON NANOFABRICATION WORKSHOP FOR EDUCATORS

This workshop will be an exploration of the world of nanotechnology. Participants will learn about the growing applications of nanotechnology in many industries including the biotechnology, MEMS, optoelectronics, chemical, and nanoelectronics industries. The basics of nanofabrication processes and tools will be covered and emphasized through processing labs held in the class 10 cleanrooms of the Penn State Nanofabrication Facility and the CNEU Teaching Cleanroom. This three-day workshop is broken down into daily morning lectures by nationally recognized Penn State researchers and engineering staff and into afternoon lab sessions in nanofabrication. The agenda is attached.

Target Audience: Secondary Science and Technology Teachers, Vocational-Technical Teachers, Guidance Counselors, school administrators and others

Where: Penn State Center for Nanotechnology Education and Utilization
101 Innovation Blvd., Suite 112
University Park - State College, PA 16802

When: May 19-21, 2009

Workshop Fee: $200.00 * PA Educators
$500.00 * Non PA Educators
* Participation support funds for educators is available to qualified participants. Please contact Lisa Daub @ ldaub@engr.psu.edu or 814-865-9635 if you would like to request support. Compensation for registration, lodging, as well as travel to/from your institution to the workshop are available for educators as part of the participant support funding.

Workshop Fee Includes:
- Workshop registration
- Workshop materials/lab manuals (distributed at the workshop)
- Breakfast/Lunch as a group function

How does it work?
- Complete and return the workshop registration form to the Penn State Center for Nanotechnology Education and Utilization by fax to: 814-865-9400 or email to ldaub@engr.psu.edu
- Lodging at a local motel will be covered, Rooms are currently being held at the Penn Stater Conference Center Hotel, please call 1-800-233-7505 and reference reservation identification #CNEE09A by April 19, 2009
- You will be responsible for your transportation to and from the workshop each day
- Additional details will be mailed/faxed to you as a confirmation
- If you have any registration questions, contact Lisa Daub at (814) 865-9635, or ldaub@engr.psu.edu
- If you have any workshop questions, contact Amy Brunner at (814) 865-8977 or abrunner@engr.psu.edu

Registration closes April 30, 2009. Please register as soon as possible; spaces fill up quickly.

This workshop is co-sponsored by the State of Pennsylvania under grant no. C000036659
and by
The National Science Foundation under grant no. 0802498.

HANDS-ON NANOFABRICATION WORKSHOP FOR EDUCATORS

(Must be received by April 30, 2009)

Name: _____

Title: _____

Organization: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Work Phone: _____ Home Phone: _____

Fax: _____ E-mail: _____

Institution Type: ☐ Secondary School ☐ Vocational Technical School
☐ 2-Year College ☐ 4-Year College/University

Workshop Fee: ☐ $200 PA Educators ☐ $500 non PA educators
☐ Requesting Financial Support

Special Needs: _____

Dietary Restrictions: _____

Sorry, we do not accept credit cards.

Make checks payable to Penn State and send to the address below:

Return To: **Penn State Center for Nanotechnology**
Education and Utilization
Attn: Lisa Daub
101 Innovation Blvd., Suite 112
University Park, PA 16802-7003

Phone: 814-865-9635
Fax: 814-865-9400
Email: ldaub@engr.psu.edu

This agenda is a sample only and subject to change.

AGENDA

Day One

8:00 a.m. – 8:30 a.m.	Continental Breakfast/Registration
8:30 a.m. – 9:30 a.m.	Welcome and Overview of the Workshop and the CNEU
9:30 a.m. – 10:30 a.m.	Keynote: The World of Nanotechnology
10:30 a.m. – 10:45 a.m.	Break
10:45 a.m. – 11:45 a.m.	Nanoscale Characterization
11:45 a.m. – 12:00 p.m.	Introduction to Lab Activities
12:00 p.m. – 1:00 p.m.	Lunch
1:00 p.m. – 4:30 p.m.	Rotating Activity Sessions: See Lab Agenda for Details • Nanotechnology Products, Applications, Careers, and Education • Tour of Clean Room / Lab

AGENDA

Day Two

8:00 a.m. – 8:30 a.m.	Continental Breakfast
8:30 a.m. – 9:45 a.m.	Lithography and Deposition Techniques
9:45 a.m. – 10:00 a.m.	Break
10:00 a.m. – 11:15 a.m.	Etch Techniques
10:45 a.m. – 11:00 a.m.	Break
11:15 a.m. – 12:00 p.m.	Nanoparticle Synthesis
12:00 p.m. – 12:45 p.m.	Lunch
12:45 p.m. – 3:15 p.m.	Rotating Lab Activity Experiments: See Lab Agenda for Details • Atomic Force Microscopy (AFM) • Lithography and Etching • Deposition and Characterization • Optical Metrology and Scanning Electron Microscopy.
3:15 p.m. – 4:15 p.m.	General Discussion / Q & A Session

AGENDA

Day Three

8:00 a.m. – 8:30 a.m.	Continental Breakfast
8:30 a.m. – 9:30 a.m.	Optical Devices
9:30 a.m. – 9:45 a.m.	Break
9:45 a.m. – 10:45 a.m.	Bio Sensors and Lab on a Chip
10:45 a.m. – 11:00 a.m.	Break
11:00 a.m. – 12:00 p.m.	Nanotechnology in Food
12:00 p.m. – 12:45 p.m.	Lunch/Workshop Evaluation/Wrap-Up
12:45 p.m. – 3:15 p.m.	Rotating Lab Activity Experiments: See Lab Agenda for Details • Atomic Force Microscopy (AFM) • Lithography and Etching • Deposition and Characterization • Optical Metrology and Scanning Electron Microscopy
3:15 p.m. – 4:00 p.m.	Final Workshop Q & A / Workshop Evaluations / Wrap-up