

Micro Nano Tech Conference 1



Photo: Ken Scheffe, NRCS

Educating and Preparing the Emerging Technology Workforce

May 9-11, 2011

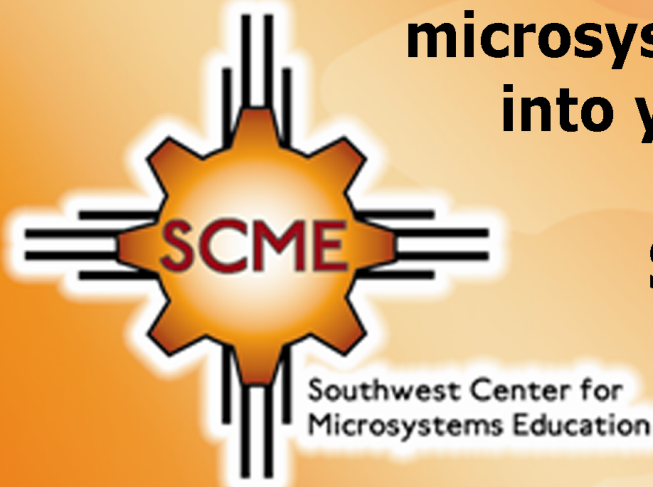
University of New Mexico

Albuquerque, NM

This conference is presented by a consortium of
National Science Foundation Advanced Technological Education Centers



Do you need help incorporating microsystems (MEMS) technology into your STEM curriculum?



SCME can help!

We provide educational materials, activity kits, and workshops on a variety of topics related to MEMS, MEMS applications and MEMS fabrication.

SCME has over 30 learning modules that you can download from our website. Each learning module contains instructional information, activities, and assessments.

Topics include

- MEMS Applications
- Transducers, Sensors, Actuators
- BioMEMS
- A Comparison of Scale
- Crystallography
- MEMS Fabrication
- MEMS Fabrication Safety

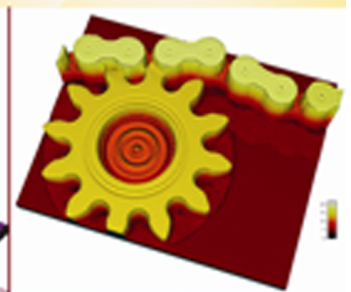
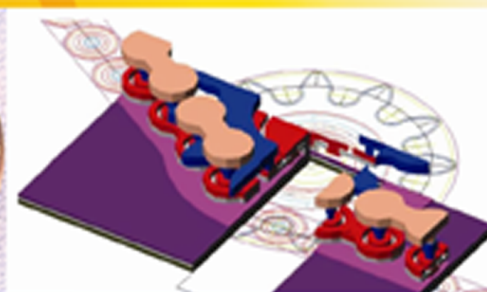
Visit our website for a complete list of learning modules.

Activity Kits are also available through our website:

- Crystallography
- Lift-off (process step)
- LIGA Simulation
- Pressure Sensor Model
- Pressure Sensor Process
- Rainbow Wafer

SCME offers 5-day, 2-day, and 1-day workshops designed to fit your needs.

Visit our website and let us know how we can help you!



www.scme-nm.org

Micro Nano Tech Conference 1 - ***Educating and Preparing the Emerging Technology Workforce***

Hosted by the Southwest Center for Microsystems Education (SCME)

The Micro Nano Tech (MNT) Conference is a faculty-focused conference co-sponsored by the National Science Foundation's Advanced Technological Education (ATE) Micro and Nano Technology Centers. The mission of this conference is to enable micro and nano technology education at community and technical colleges across the United States by:

- **Providing quality education services and best practices**
- **Offering technical assistance to aid in micro and nano curriculum integration**
- **Collaborating with industry to address workforce needs**

The SCME is funded by a National Science Foundation Department of Undergraduate Education grant DUE0902411 in collaboration with the University of New Mexico, Central New Mexico Community College, and Southwestern Indian Polytechnic Institute.

Day 1 – Monday, May 9th

<p>All events prior to the tours on Day 1 are held in the Rotunda Room - Rotunda Building, 801 University Drive SE</p>	
7:30	Registration opens - coffee
8:00	<p>Welcome - Conference Mission - Why MNT?</p> <p>What is NSF's ATE Mission? – Gerhard Salinger, NSF (tentative)</p>
8:30	<p>Centers' Introduction - Who we are and what we do</p> <ol style="list-style-type: none"> 1. SCME - Matthias Pleil 2. MATEC - Michael Lesiecki 3. NACK - Robert Ehrmann 4. Nano-Link - Deborah Newberry 5. NEATEC - Abraham Michelen
9:30	<p>Industry Presentation I</p> <p>Cutting edge industries will present on what they do, their technology, what the future looks like for their industry and what they expect of the technicians they hire.</p> <ul style="list-style-type: none"> • Jeb Flemming - Life BioScience Inc. • David Arney - 3M • Ed Spivak - NM Optics Industry Assoc. • John Krieg - Plextronics
10:30	Break
10:45	<p>Industry Presentation II</p> <ul style="list-style-type: none"> • Terry Sullivan - HT Micro, MEMPro Ceramics, Albuquerque Econ. Dev. • Ray Tsui - Raydis LLC • Joe Ward - RJA Dispersions • Paul Behrendsen - Senda Microtechnologies
11:45	Lunch and networking
12:15	Panel of Alumni from Micro and Nanotechnology Programs
13:00	<p>Industry Panel</p> <p>Panel discussion with Q&A from the Audience</p> <p>Panelists: Paul Behrendsen, Jeb Flemming, Ed Spivak, Terry Sullivan, Ray Tsui</p>
14:15	<p>Meet tour busses- consult your tour ticket for which bus to board</p> <p><u>Sandia National Laboratories/Los Alamos National Laboratories Center for Integrated Nanotechnologies (CINT)</u> - see where researchers synthesize and</p>

	<p>characterize nanostructured materials. Limit 25 participants.</p> <p><u>Sandia National Laboratories MicroFabrication Facility (MESA)</u> - a world-class fabrication facility dedicated to providing development and engineering capabilities for MEMS and radiation-hardened CMOS. Limit 20 participants.</p> <p><u>N.M. Museum of Natural History and Science</u> – docent-guided tour of STARTUP, the first museum exhibit dedicated to the history of the microcomputer and the innovations that revolutionized the modern world.</p>
17:00	Meet busses to travel to the National Museum of Nuclear Science and History
17:30	Dinner at the National Museum of Nuclear Science and History – 601 Eubank SE
18:00	Keynote: Dr. Neal Shinn - Center for Integrated Nanotechnology
18:45	Tour of the National Museum of Nuclear Science and History
20:30	Meet busses to return to hotel

Day 2 – Tuesday, May 10th

	Rotunda Building - 801 University	MTTC Building - next to Rotunda Building - 800 Bradbury			
Time	<u>Rotunda Room</u>	<u>Auditorium</u>	<u>Classroom 158</u>	<u>Classroom 160</u>	<u>Computer Lab – Room 163</u>
7:30	Coffee				Open Lab
8:00	Advanced Technology Education for Micro- and Nanotechnologies				
9:00	Lithography in a Box Micro Fluidics	Crystals Self Assembly	Forces and Interactions Polymers- Structure and Properties	NanoDays NISENet Activities for CC Classrooms	
9:30	Rotate to next session				
9:35	Lithography in a Box Micro Fluidics	Crystals Self Assembly	Forces and Interactions Polymers- Structure and Properties	NanoDays NISENet Activities for CC Classrooms	

10:05	Rotate to next session				
10:10	Lithography in a Box: Micro Fluidics	Crystals Self Assembly	Forces and Interactions Polymers- Structure and Properties	NanoDays NISENet Activities for CC Classrooms	
10:40	Rotate to next session				
10:45	Lithography in a Box: Micro Fluidics	Crystals Self Assembly	Forces and Interactions Polymers- Structure and Properties	NanoDays NISENet Activities for CC Classrooms	
11:15	Move to the Rotunda				
11:20	Wrap up				
11:30	Lunch				
12:30	Group I Remote Access to Nano Equipment Utilizing Hands-on Labs for the Science and Technology Classroom	Group II A Nano Integration Program Success Story: Show me the Program & Show Me the Benefits			
1:40	Rotate to next session				
1:50	Group II Remote Access to Nano Equipment Utilizing Hands-on Labs for the Science and Technology Classroom	Group I A Nano Integration Program Success Story: Show me the Program & Show Me the Benefits			
3:00	Break				
3:15	Forum				
17:00	Adjourn - dinner on your own				

Day 3 – Wednesday, May 11th

Time	Rotunda Building - 801 University	MTTC Building - next to Rotunda Building - 800 Bradbury			
	<u>Rotunda Room</u>	<u>Auditorium</u>	<u>Classroom 158</u>	<u>Classroom 160</u>	<u>Computer Lab – Room 163</u>
7:30	Coffee				Open Lab
8:00	Report out - Forum Summary and Discussion				
9:00	SCME Kit Overview				
9:25	Go to first session				
9:30	Pressure Sensor Process	What are MEMS? MEMS Overview & History Making Micro Machines Kit	Online Resources and the Synergy Project Scale-Shift-Evolution	BioMEMS Overview	
10:25	Go to second session				
10:30	Pressure Sensor Model Kit	MEMS Components - Transducers and Micropumps		DNA Microarrays GeneChip Model	MEMS Design
11:25	Meet in Rotunda for lunch				
11:30	Networking lunch, wrap up and educational materials showcase				
12:30	Adjourn				
13:00-16:00 Executive Centers Team Wrap Up Meeting - lessons learned - next conference location – closed meeting					

MATEC



MATEC supports **FACULTY** and **CURRICULUM** development to meet the ever-advancing **WORKFORCE** demands of the semiconductor, automated manufacturing, electronics, and energy related **INDUSTRIES.**

matec.org



NETWORKS

NetWorks offers a digital resource library, web seminar series, national conference, and a virtual technology education community.

matecnetworks.org

eSyst revises Electronics curriculum, shifting the focus from the component level to a holistic systems approach.

esyst.org



WORKREADY ELECTRONICS

Work Ready Electronics develops instructional modules to synchronize Electronics curriculum to the rapidly changing workplace.

work-readyelectronics.org

High Tech U provides students with an intensive industry-led introduction to the high tech industry, potential career paths, and educational requirements.

semi.org/foundation

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MARICOPA
COMMUNITY
COLLEGES

The Maricopa Advanced Technology Education Center (MATEC) is a member of the Division of Academic and Student Affairs at Maricopa Community Colleges. MATEC was originally founded as a National Center of Excellence under the National Science Foundation's Advanced Technological Education Program.



The NACK Center is committed to supporting development of two-year degree programs in micro- and nanotechnology across the country by offering academic and educational resources.



Curriculum Resources



Faculty Professional Development



Access to Hands-on Labs

Workforce Development Opportunities



Incumbent Worker Education

Upcoming Webinars

May 26, 2011
Recruiting Underrepresented Minorities
September 30, 2011
Introduction to Nanotechnology
November 4, 2011
Tech Intersection: Understanding the
Bio and Nano Link
January 27, 2012
Ways of Introducing Nanotechnology
Into Your Program
February 24, 2012
How is Nanotechnology Changing the
Electronics Industry?
March 30, 2012
Building a Nanotechnology Workforce
April 27, 2012
Nanotechnology and Materials
May 24, 2012
How Safe is Nanotechnology in Our Lives?

Upcoming Workshops

September 19-22, 2011
Nanotechnology Course Resources I:
Safety, Processing & Materials
August 8-11 or October 3-6, 2011
Nanotechnology Course Resources II:
Patterning, Characterization
& Applications
November 15-17, 2011
Hands-on Introduction to
Nanotechnology for Educators

Webinar and workshop dates are subject to change.

To register and get more information go to www.nano4me.org/educators.html and click the Attend Webinars tab or the Attend Workshops tab.

Find All These Resources and More At:

Nano4Me.org EDUCATION & CAREERS
IN NANOTECHNOLOGY

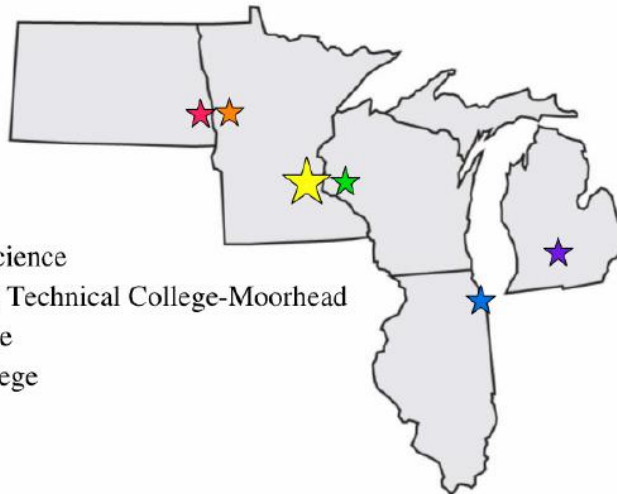
Working to support the integration
of nanotechnology concepts into
**industry,
college,
and high school education**

- **Lecture Material**
- **Background information**
- **Experiments**
- **Demos**
- **Videos**



Midwest Regional Center for
Nanotechnology Education

- ★ North Dakota State College of Science
- ★ Minnesota State Community and Technical College-Moorhead
- ★ Dakota County Technical College
- ★ Chippewa Valley Technical College
- ★ William Rainey Harper College
- ★ Lansing Community College



www.nano-link.org

Lead Institution: Dakota County Technical College

Partner: University of Minnesota

Contact: Deb Newberry deb.newberry@dctc.edu



NEATEC

NORTHEAST ADVANCED
TECHNOLOGICAL EDUCATION CENTER

www.rcsne.org



HUDSON VALLEY
COMMUNITY COLLEGE
TROY, NY



- » Educates the general public about nanotechnology and semiconductor technology.
- » Enables individuals from populations underrepresented in science, technology, engineering and math (STEM) to pursue educational opportunities that lead to technological careers.

- » Analyzes and identifies the technical skill sets needed to develop and maintain high-tech industries in the Northeast.
- » Enhances, develops, and expands 2-year nanoscale science, engineering, and semiconductor technology curricula and delivery methodologies to ensure student success.
- » Augments educators' skills to teach NEATEC's advanced technology curricula.
- » Establishes experiential learning opportunities for both students and teachers with industrial and university partners.



NEATEC PREPARES TECHNICIANS FOR CAREERS IN THE TECHNOLOGICALLY ADVANCED SEMICONDUCTOR MANUFACTURING FACILITIES EXPANDING IN THE NORTHEAST.

NEATEC Offers Paths to Nanotechnology and Nanoelectronics Manufacturing Careers

NEATEC has assembled extraordinary opportunities for community college and secondary school students to engage in cutting-edge nanotechnology and nanoelectronics education programs. The center provides students with hands-on learning opportunities in semiconductors and photovoltaics (PV) at Hudson Valley Community College's TEC-SMART facility. It also offers internships and cooperative learning opportunities at the University of Albany's College of Nanoscale Science and Engineering's (CNSE) NanoTech Complex. Learning and working in the 300mm Wafer NanoFab facility within the complex will add to students' technical qualifications and career preparation.

Outreach programs for students and educators at NEATEC community colleges and Rensselaer Polytechnic Institute (RPI) allow students to explore careers in a variety of nanotech fields through associate degree programs. HVCC's Semiconductor Manufacturing Technician (SMT) program and NEATEC's capstone semester at CNSE's NanoFab facility directly feed the resurgent nanotechnology manufacturing sector.

We are working closely with the community colleges and other partners in the region to educate the skilled technicians needed to drive the next wave of innovation in the global semiconductor manufacturing industry. The NEATEC regional center provides a unique focal point for education and workforce development in our area.



Register now! Visit www.highimpact-tec.org for details.

**July 25–28, 2011
Hyatt Regency San Francisco**

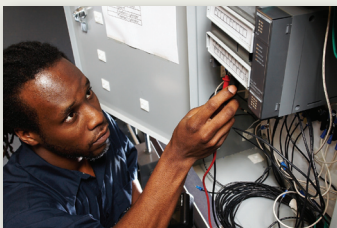
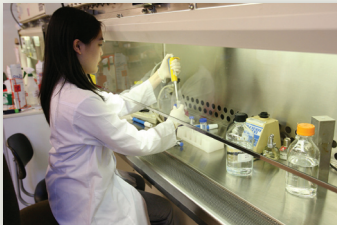


High Impact Technology Exchange Conference

**18 Workshops, 3 Industry Tours, Technology Showcase
60+ Sessions on the Convergence of High-Technology Disciplines**

Advanced Manufacturing • Energy and Environmental • Biotechnology and Chemical Process • Engineering • IT, Geospatial, and Security Electronics, Micro-, and Nanotechnologies • Optics and Photonics

“Educating America’s Technical Workforce”



About HI-TEC

Produced by a consortium of National Science Foundation Advanced Technological Education centers and projects, HI-TEC is a national conference that presents postsecondary and secondary educators and stakeholders with professional development, educational materials, collaborative ventures, and insights into the convergence of scientific disciplines and technologies and emerging market trends essential to developing and advancing the technical workforce of the 21st century.

Attendees learn strategies for building and expanding educational programs, improving student recruitment, integrating advanced technologies into existing curricula, shaping workforce development policy, and more.

Who Attends HI-TEC?

- STEM faculty
- Technicians
- College representatives, program development specialists, and counselors
- Secondary teachers
- Industry trainers and learning managers
- Workforce development personnel
- Individuals concerned with skill standards and employability issues



www.highimpact-tec.org



TeachingTechnicians.org
Expanding Excellence in Technician Education

The mission of TeachingTechnicians.org is to connect technician educators with exemplary NSF/ATE and STEM professional development.

Do you want to learn about upcoming events of interest to you? Register at TeachingTechnicians.org and receive email updates as events are posted.

Do you want to increase participation at your events? Posting at TeachingTechnicians.org reaches our registered users and connects your event to ATE Central, ATECenters.org, Facebook and multiple RSS feeds. We'll even tweet it for you!

Go To teachingtechnicians.org

Sponsored by SC ATE



ATECENTRAL

ATE Central connects you to NSF's **Advanced Technological Education** community. Discover the world of ATE and find free educational resources, new partnerships, and professional development and mentoring opportunities to help advance applied **STEM** education and build a better workforce for the 21st century.



UNM MANUFACTURING ENGINEERING

GRADUATE STUDIES IN MANUFACTURING ENGINEERING AT THE UNIVERSITY OF NEW MEXICO

DEGREES OFFERED

- MASTER OF ENGINEERING IN MANUFACTURING ENGINEERING WITH TRACKS IN COMPUTER INTEGRATED MANUFACTURING, MECHANICAL AND EQUIPMENT MANUFACTURING, AND SEMICONDUCTOR AND ELECTRONICS MANUFACTURING
- MASTER OF ENGINEERING IN MANUFACTURING ENGINEERING AND MASTER OF BUSINESS ADMINISTRATION (DUAL-DEGREE) WITH TRACKS IN COMPUTER INTEGRATED MANUFACTURING, AND MECHANICAL AND EQUIPMENT MANUFACTURING

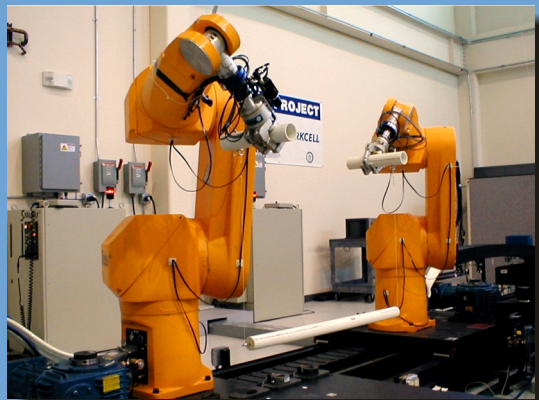
FACILITIES

- MANUFACTURING TRAINING AND TECHNOLOGY CENTER (MTTC) HOUSES LABS, CLEANROOM, CLASSROOMS, COMPUTERS, CAFÉ, AND CORPORATE OFFICES

PROJECTS

- SPONSORED RESEARCH PROJECTS IN THE AREAS OF ROBOTICS AND AUTOMATION, MEMS AND SEMICONDUCTOR MANUFACTURING
- INDUSTRY PROJECTS

THE MANUFACTURING ENGINEERING PROGRAM
THE UNIVERSITY OF NEW MEXICO
MANUFACTURING TRAINING & TECHNOLOGY CENTER
800 BRADBURY DRIVE SE, SUITE 235
ALBUQUERQUE, NM 87106-4346
(505)-272-7000
WWW.MFG.UNM.EDU



The University of New Mexico

Albuquerque Local Information

The address for shuttle or taxi pick up is “801 University Blvd. Southeast, across the street from Central NM Community College.”

Airport Shuttle - www.sunportshuttle.com/ , 505-883-4966

Albuquerque Cab Company - www.albuquerquecab.com/ , 505-883-4888

Albuquerque International Sunport - www.cabq.gov/airport/

Albuquerque Convention and Visitors Bureau - www.itsatrip.org/default.aspx - dining, attractions, shopping, events

ABQ Ride – www.cabq.gov/transit - bus maps, how to get around Albuquerque

Chamber of Commerce – www.abqchamber.com

Hispano Chamber of Commerce – www.ahcm.org

New Mexico Department of Tourism - www.newmexico.org/index.php

University of New Mexico – www.unm.edu

Albuquerque International Balloon Fiesta, Oct. 1-9, 2011 - www.balloonfiesta.com/

A note on the climate and altitude

Albuquerque is a mile high and the air is extremely dry. People from lower elevations sometimes experience the dehydrating effects of the climate as headaches, lightheadedness, and fatigue. Do as the locals do – sip water continuously throughout the day. By the time you begin to feel thirsty, you are already getting dehydrated.

See you next year!

Micro Nano Tech

Conference 2

May 7-9, 2012

Hosted by

Nanotechnology Applications
and Career Knowledge (NACK) Center

Penn State University

University Park, PA

www.Nano4Me.org

