

**WHAT IS THE NATIONAL SCIENCE FOUNDATION REGIONAL CENTER?**

The National Science Foundation Regional Center for Nanofabrication Manufacturing Education is a partnership for enhancing nanotechnology education. The partners include the National Science Foundation, the state of Pennsylvania, Penn State University, Pennsylvania's community colleges, the State System of Higher Education, Penn College of Technology, CAMtech, MET Inc., secondary schools, private industry, and other participants.

The primary goal of the Center is to use the resources of the Penn State Nanofabrication Facility to develop and support K-12 and post-secondary nanotechnology awareness and education. The Center is dedicated to introducing students to the full range and full impact of nanofabrication applications including biotechnology, pharmaceuticals, optoelectronics, information storage, materials manufacturing, and many others, as well as micro- and nanoelectronics.

**WHERE ARE THE NANOTECH CAMPS HELD?**

The Nanotech Camps are held at the Penn State Nanofabrication Facility located in Innovation Park on Penn State's University Park campus in State College, PA.

**WHO CAN I CONTACT TO GET MORE INFORMATION?**

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# NANOTECH

## CAMPS

PENN STATE NANOFABRICATION FACILITY



**THE PENNSYLVANIA NANOFABRICATION MANUFACTURING TECHNOLOGY (NMT) PARTNERSHIP**

*A National Science Foundation Regional Center for Nanofabrication Manufacturing Education*

Penn State is committed to affirmative action, equal opportunity, and the diversity of its workforce. U.Ed.# ENG 04.35



NMTPartnership.org



## WHAT ARE NANOTECH CAMPS?

Nanotech Camps are opportunities for secondary school students to learn about nanotechnology and nanofabrication. They are a joint effort by the Pennsylvania NMT Partnership and local sponsors. Students participate in classroom and cleanroom lab activities exploring the many aspects of nanotechnology including nanoelectronics, nanobiotechnology, and nano-optics.

Students are introduced to the nanofabrication processes and to the tools used in these processes in the Penn State Nanofabrication Facility. Career opportunities are explored, and educational pathways to nanofabrication careers are discussed.

## WHAT IS NANOTECHNOLOGY?

Nanotechnology has been defined as "the creation of functional materials, devices and systems through control of matter at the scale of 1 to 100 nanometers, and the exploitation of novel properties and phenomena at the same scale." Put succinctly, nanofabrication is "machining and assembling at the atomic level" and it is used to create materials, devices, and systems with new and unique properties.

## WHAT TYPES OF NANOTECH CAMPS ARE AVAILABLE?

There are one-day Nanotech Camp opportunities for students in 7th grade and above throughout the year. These one-day camps are focused on introducing nanotechnology to students and on increasing student awareness of the impact of this technology and its career opportunities.

There are also three-day Nanotech Camp opportunities only offered during the summer for 9th grade and above students. The three-day camps are focused on a more detailed look at nanotechnology, nanofabrication, career opportunities, and educational pathways.

## 3 DAY NANOTECH CAMP AGENDA

### DAY 1 (HALF DAY)

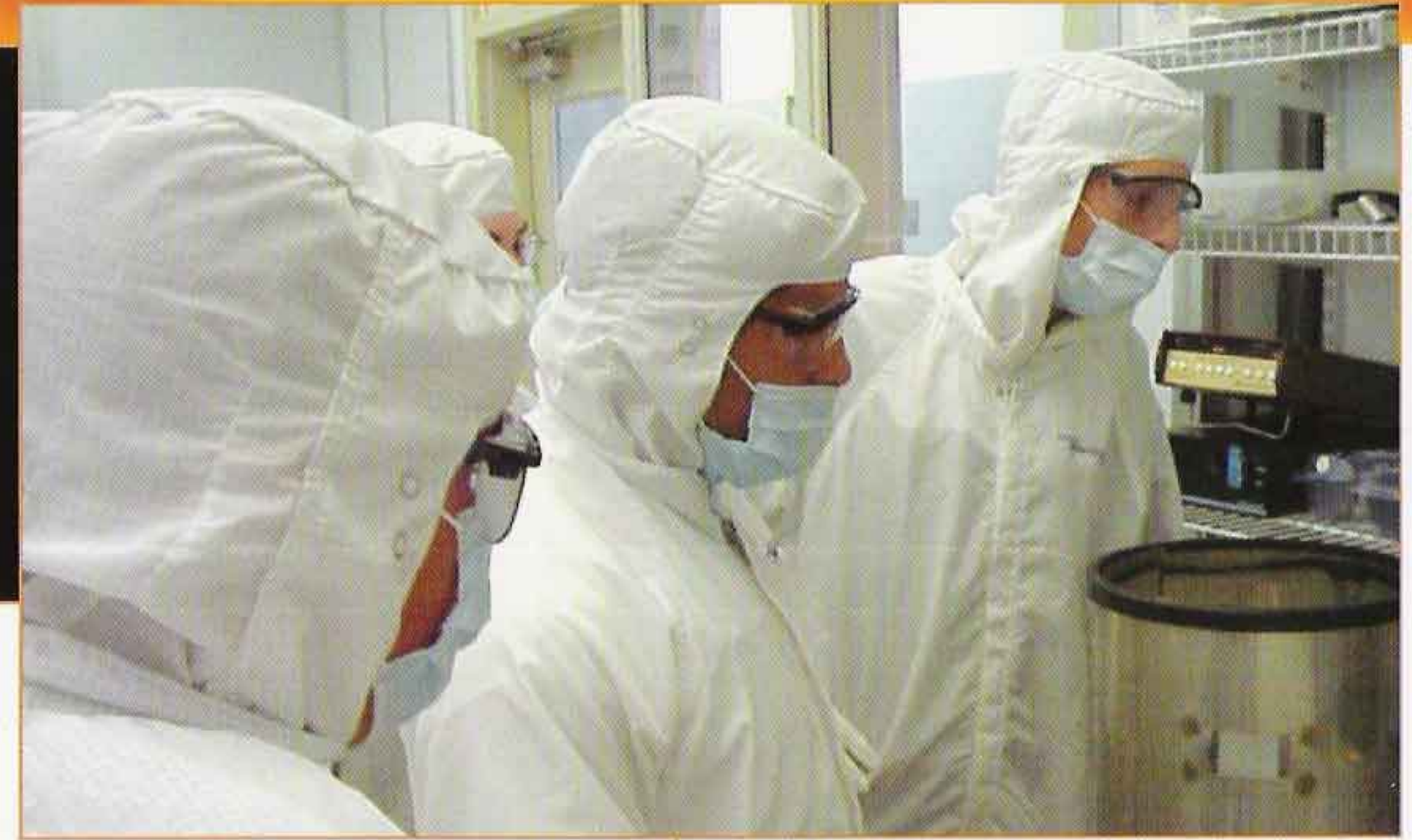
- Welcome & Introduction to Nanotechnology
- *Activities*
  1. Cleanroom tour
  2. Survey of Micro- and Nanotechnology Applications

### DAY 2 (FULL DAY)

- Nanofabrication Processes Overview I
- *Cleanroom Activities*
  1. Deposition
  2. Patterning
  3. Etching
- Lunch with Staff Engineers & Technicians
- Pathways to Nanotechnology Careers
- Colleges/Universities and the NMT Partnership Programs

### DAY 3 (HALF DAY)

- Nanofabrication Processes Overview II
- *Cleanroom Activities*
  1. Self-assembly
  2. Probe techniques
  3. Characterization



## 1 DAY NANOTECH CAMP AGENDA

Agendas are customized with selected activities from the 3-day agenda based on arrival/departure times, student ages, and group size.

## WHAT IS THE COST TO PARTICIPATE?

The only cost to participate in the Nanotech Camps are costs incurred for the transportation to and from the Nanotech Camp and any additional activities not included in the camp agenda. These costs are to be covered by the sponsoring group.

## HOW DO I SPONSOR A NANOTECH CAMP?

A local sponsor, such as a school, church, or civic organization must sponsor a camp. Interested sponsors should download, complete, and submit the appropriate registration form from the website link.  
[http://www.nanofab.psu.edu/ATE/Education\\_Programs/k12.prog.htm](http://www.nanofab.psu.edu/ATE/Education_Programs/k12.prog.htm)

## WHAT ARE THE RESPONSIBILITIES OF A NANOTECH CAMP SPONSOR?

The Nanotech Camp sponsor is responsible for the following:

- Organizing a group consisting of 20 or fewer students, plus one chaperone for every 4-5 students
- Arranging and funding all transportation

Additionally, the 3-Day Nanotech Camp sponsor is responsible for undertaking the following prior to the camp:

- Holding a meeting for participating students and their parents to review the Nanotech Camp agenda and other camp/organizational details
- Completing and submitting the required parental permission forms

