

## Make the Most of the Penn State Nanofab

The Penn State Nanofabrication Laboratory can be an intimidating place for first-time student researchers, full of expensive, complex tools and busy technicians in an environment where dangerous chemicals are part of the equation. Nanofab director and professor of electrical engineering Theresa Mayer offers some suggestions for getting the most out of your Nanofab experience and taking the first steps in becoming a “happy user.”

**What can we do for you?** First of all, we will meet with you and your faculty advisor to perform a project review. This gives you and your advisor a chance to lay out the steps of your research project, to discuss what particular tools you might need, and to give you and your advisor a sense of how difficult, time consuming, and expensive your project is likely to be. Happily, many of our rates have been dramatically reduced, so your project is likely to be much less expensive than it might have been in the past.

Your next step will be to schedule safety training. Safety training, required for all new users, is offered on Tuesdays from 9 am until 1pm. It will not only help you to navigate your lab sessions safely, but will make you more comfortable with the protocol of working in a clean room environment.

### **A new rate structure fosters a culture of interaction**

After safety training it is possible to go on and schedule formal instrument training, but we would recommend not moving too quickly. Other highly successful laboratories have developed a culture of peer training that we would like to encourage in the Nanofab. In this culture, new students spend time observing senior graduate students and postdocs in the lab. They learn from more experienced team members the basics of using the instruments and begin to discover how a complex process is put together. An added benefit of this type of learning is that senior members of your group or even a collaborator’s group are likely to be doing research related to your project. After a couple of weeks of observing and becoming familiar with basics, you can take the formal instrument training and get much more out of it. The staff training will correct any faulty techniques you might have picked up and convey all the important information about the instrument.

A revised rate structure makes this possible. Rather than an hourly rate to be in the lab, a student now pays an all-day fee of \$15. This nominal rate makes it affordable for faculty to send senior and junior students to the lab to teach and learn from each other. We have also made it easy to keep track of usage and billing through an online portal system.

**What can’t we do for you?** We can’t do your research for you. Developing the steps and processes of your project is part of your training and a significant part of your research. You will need to work this out with your advisor. Not only do we not have the number of staff it would take to guide each student through his or her entire project, but our staff may not have the exact

expertise necessary to advise you on your project. Also, don't ask us to replicate the results of the great paper you have just read in a journal. It is unlikely that we will have the same equipment in our lab or that it will be calibrated in the same way. As with most research, the successful paper you have read is likely to be the result of many failed attempts. This is true for even the most talented researchers.

**Make the most of your lab experience.** The Penn State Nanofab is a world-class laboratory, part of the 13-member National Nanotechnology Infrastructure Network, with some of the most sophisticated, and expensive, instruments available to graduate students anywhere. Take advantage of the opportunity to learn the tools, get to know the staff, and become part of the culture of scientific discovery at the Penn State Nanofab.

The Nanofab is part of the Materials Research Institute (MRI). You can learn more about the Nanofab and MRI on the Web at [www.mri.psu.edu](http://www.mri.psu.edu).