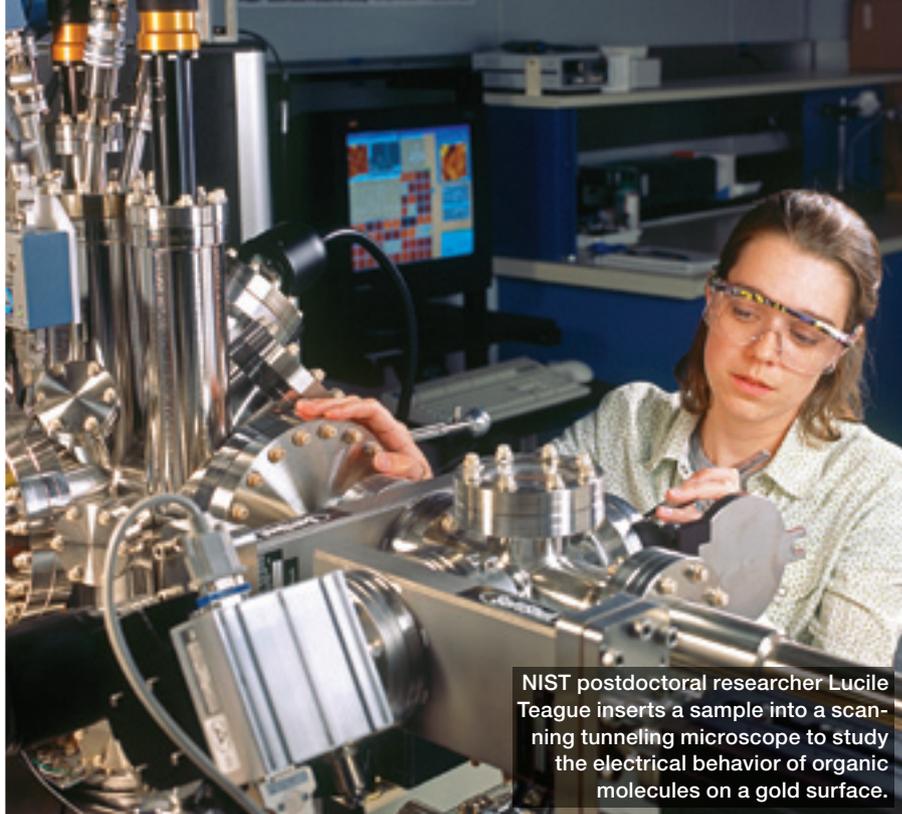


Choosing a Career at a National LAB

Tyler S. Ralston



NIST postdoctoral researcher Lucile Teague inserts a sample into a scanning tunneling microscope to study the electrical behavior of organic molecules on a gold surface.

Beamie Young/NIST

Physics or engineering graduate students often see only two choices for their career paths—academia in one direction and industry in the other. However, there’s a third option: a national laboratory. Tyler Ralston talks about his experience working for a national lab and the unique opportunities that this career choice provides.

This time of year many new physics graduates are choosing their niche in the working world—or at least giving it some serious thought. A national lab is an option that is often overlooked.

In the United States, many national labs are federally funded research and development centers (FFRDC) operated and staffed by private corporations or academic universities under contract to the government. In several ways, these labs straddle the gap between academia and industry, and they are an excellent place to build your career.

Broadening your professional pursuits

When students finish their degrees, they often feel that they are so specialized that they have only a few career options. Fortunately, in a national lab, there is room to expand and diversify, allowing you to build a broad knowledge base without sacrificing your area



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of expertise. National labs generally have several thousand people with many groups working on projects. They hold seminars to discuss the research conducted around the lab. This is a great way to meet your coworkers, survey other projects and find new opportunities to apply your specialty.

Publish or patent

While a national lab doesn’t necessarily subscribe to the “publish or perish” adage in academia, often there is value ascribed to publishing research articles (albeit sometimes classified ones). Patent writing skills are very valuable in an industry environment—equally so in a national lab. The onus is on you to complete the paper or patent while pushing your project’s objectives forward.

Research and development

National labs differ from industry in that there are generally few projects with manufactured deliverable systems. The deliverables tend towards technical analysis, system research and development, and proof-of-concept prototypes.

Sources of funding for national labs can vary, but it’s safe to say that a majority of funds come from Department of Defense and Department of Energy grants. In academia, on the

other hand, funding is derived from a variety of sources, both government and private. Having grant ideas to push forward the lab's mission areas are important. For new concepts that need some preliminary investigation, there are usually opportunities to apply for internal funding.

For each funding cycle, national labs have a budget for laboratory-directed research and development, which is used to promote highly innovative and exploratory research that supports the lab's mission. Generally, an advanced concepts committee reviews proposals and awards funds to projects that support the strategic initiatives for the growth of the lab. Other opportunities for funding include money set aside for collaborations with associated campus laboratories.

Reputation building

While building a reputation is crucial in any post-graduate position, different institutions value different sets of skills. Many FFRDCs operate by way of a technical meritocracy—a system in which the talented employees advance based on their achievement. For that reason, the first several months can be very critical in your career development; it's the time when you'll set the course for your career at the institution.

The faster you can hit the ground running, the more opportunities you'll have to demonstrate your skills and build achievements. It's important to find a mentor and a project so that you can see your contributions bloom.

When I started working at a national lab, I was given an excellent piece of advice: Select the people and projects that best suit your vision for your career path. National labs give you a unique

opportunity to get the lay of the land when entering a job. Don't be afraid to survey your appointment after a trial period and apply yourself within the groups that best suit your abilities.

Career roles

Careers at national labs fall into four main categories:

Technical guru: A field expert who may be well-renowned for publications, leadership and participation in professional societies. He or she may bridge gaps between universities and the lab for collaborative research.

Capability leader: This person is involved in lab review committees and programmatic strategic planning opportunities, which build lab capabilities.

Program developer: Someone who often responds to proposal calls. He or she has a broad knowledge of the lab programs and the sponsors' needs.

Project manager: A specialist at organizing tasks and projects. The role involves managing finances, scheduling and subject matter experts.

Any member of the lab staff may take on multiple roles throughout their career. A technical staff position is often thought of as secure and stable employment. Positions for foreign nationals may not be available at some FFRDCs. In my opinion, a national lab is the best place to rapidly grow and learn new skills. ▲

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Fortunately, in a national lab, there is room to expand and diversify, allowing you to build a broad knowledge base without sacrificing your area of expertise.

Federally Funded R&D Centers

Federally funded research and development centers (FFRDCs) are classified as research and development laboratories, study and analysis centers, or system engineering and integration centers. Here is a small sample of FFRDCs that are administered by universities, colleges and university consortia:

Lincoln Laboratory

- ▶ Administrator: Massachusetts Institute of Technology
- ▶ Sponsor: Department of Defense, Department of the Air Force

Thomas Jefferson National Accelerator Facility

- ▶ Administrator: Jefferson Science Associates, LLC
- ▶ Sponsor: Department of Energy

National Radio Astronomy Observatory

- ▶ Administrator: Associated Universities Inc.
- ▶ Sponsor: National Science Foundation

Argonne National Laboratory

- ▶ Administrator: University of Chicago
- ▶ Sponsor: Department of Energy

National Optical Astronomy Observatories

- ▶ Administrator: Association of Universities for Research in Astronomy Inc.
- ▶ Sponsor: National Science Foundation

Jet Propulsion Laboratory

- ▶ Administrator: California Institute of Technology
- ▶ Sponsor: National Aeronautics and Space Administration

A complete list of FFRDCs can be found at www.nsf.gov/statistics/ffrdclist.