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Working in a Government Lab

By Mary Beckman | MAY 20, 2003

When Ramon Leeper finished his Ph.D. in physics in the mid-1970s, faculty positions were scarce, so he took a staff-scientist position at Sandia National Laboratories, in Albuquerque. He figured he would work at Sandia and then go back and try to land an academic post. "It's 27 years later," he says, "and I never seriously considered that."

Sandia is one of 15 government research laboratories owned by the Department of Energy. The labs are found in 12 states, and although the land and the buildings belong to the federal government, they are run by universities and corporations, employing roughly 26,000 scientists and engineers. The department's national-lab system is best known for huge, expensive projects -- like building accelerators and nuclear reactors -- but national-lab scientists work across a wide array of disciplines, from particle physics and materials chemistry to environmental and life sciences.

For many Ph.D.'s, the advantage of a career in the labs is that they provide an environment for research and learning without the teaching obligations of universities. "We sit here halfway between the academic world and the industrial world," says Mr. Leeper, who is now manager of the department of diagnostics and target physics at Sandia.

Judy Campisi, a senior staff scientist at Lawrence Berkeley National Laboratory, agrees: "The life sciences [at Berkeley Lab] is like a soft-money research institute," she says. She has to provide her own salary through grants, but she doesn't have to teach like she would at a university.

I worked in public affairs at a national laboratory for a few years. I learned a lot about nuclear power, but I also learned about the culture of a world in which acronyms fill in for words. And when words were used, terms like "synergy" and "proactive" were especially popular. If you're interested in career options at the labs, don't worry about understanding the lingo. It can be learned through immersion.

The Organizational Chart

By and large, a scientist at a national lab doesn't cut out a piece of the research pie and then vie for grants from places like the National Science Foundation. Instead, scientists and engineers at the labs are grouped and financed by the project they work on and are led by a low-level manager. Leeper, for example, oversees 30 people, a third of whom are Ph.D. scientists while the rest are engineers, technicians, or facility operators. People in this first level of management, Leeper explains, are drawn from the scientific ranks and have firsthand research experience.

Money comes in large chunks, mostly from the Department of Energy, which receives its money, of course, through annual Congressional appropriations. For example, managers at Argonne National Laboratory recruited Stephen Milton to the Chicago lab to help build the Advanced Photon Source (APS), a circular machine two-thirds of a mile in circumference that cost $476-million to construct. The APS creates very bright X-rays that can be used to study new synthetic materials or small biological structures. Milton, who is now a senior scientist at Argonne, led a group of physicists who didn't have to worry about money; they could immerse themselves in science to create the APS. "At a university," he says, "you have a lot more responsibility with grant writing and running your own lab. A national lab buffers you from that."

An exception to that, Campisi says, is at Berkeley Lab, where scientists in the life sciences don't receive big blocks of Energy Department money like the physicists and chemists do, but the scientists do benefit from the use of top-notch facilities. "This is what the national lab does best. Big science. There's a real synergy between the national [Berkeley] lab and [the University of California at Berkeley] campus. We more or less consider ourselves academics."

In addition to the big-money projects, national labs can set aside some of the federal dollars for small research projects that the labs deem "high risk." Sometimes a small project can lead to results that allow the scientists to turn it into a big-money project.

The Other Layers

Leeper says that labs generally have two employment tracks for Ph.D.'s: research and management. Entry-level researchers sometimes come in as postdocs and sometimes as staff employees. Starting salaries for these positions vary by lab, field, and experience of the employee. For example, postdocs at Los Alamos National Laboratory in New Mexico start at an annual salary of $59,300, regardless of their field. While physics postdocs at Lawrence Berkeley Lab start at anywhere from $50,400 to $61,200, their counterparts at the lab in the biological sciences earn $31,000 to $46,300.

Much like professors at universities, scientists and engineers at the labs work their way up a series of ranks by publishing and being productive researchers. At Lawrence Berkeley, for instance, Ph.D.'s with less than five years of experience work in the intermediate levels, earning $42,000 to $110,000. Ph.D.'s with at least five years of experience start at $48,840 and can earn upwards of $188,000. Their official titles are usually some variation of staff scientist, senior scientist, or principal scientist.

Candidates for the management track at the labs often come from the ranks of the researchers and generally share similar salary ranges. At Sandia, four or five levels of managers exist, starting with the low-level ones who oversee scientists directly and moving to upper-level managers who oversee multiple groups of scientists. The top managers "are focused on keeping the money coming in -- $50-million to $60-million at a crack," Leeper says.

Some people do better than others in the national-lab setting. "It's not for everyone," Milton says. "There are problems working in a national lab. There's more paperwork, more rules and regulations you have to abide by than if you're in a university setting." Not only must you deal with the internal politics of the lab, you are also affected by how the labs fare on the national political scene.

Campisi thinks people who leave academe to work for a national lab are simply trading off one kind of bureaucracy for another. "The University of California is not much better on bureaucracy [than Berkeley Lab], but it's a different kind of bureaucracy. At the university, for example, postdocs can't get their own independent funding, but they can here" at the lab.

Getting In

Like any institution that hires and fires, national labs recruit actively and also advertise and post open positions. National labs also have a summer training program for students, says Leeper. "[The program] tries to bring in grad students and undergrads. It gives them a flavor of what it's about."

Milton says that whenever he has an open position in his own group, "I'll call up colleagues and ask around." But that's not the only way new researchers join a national lab. He says that everyone has to apply using the same process.

Some national labs engage in classified research. Because of that, foreign scientists are rare at some of the national labs. "Here there's a classified environment," says Leeper of Sandia. "Just going to the library, [security] wants you to be cleared."

The end of the Cold War and the decreased interest nationally in nuclear energy have left the national labs feeling a bit of a generation gap. "The professional staff is aging," says Leeper. "The labs have had a lot of lean years, and a high percentage of the staff is eligible to retire. It's probably a good time for grad students to consider [the national labs]. If you have a Ph.D. in physics, chemistry, or math, these labs really offer a lot of potential."

Milton points out that the need for new blood depends on the field. "In the area of accelerator physics, we're fast running into a crisis for people. There aren't that many places you can learn acceleratory physics." The situation is reversed in high-energy physics, where there are too many physicists and not enough positions.

National labs, he emphasizes, are not for everybody. "It's a bit more secure here than out there -- the national labs aren't going anywhere fast," says Milton. "But association with the government tends to be a bit cumbersome. You have to fit within the structure or you could be frustrated." And he adds that it's impossible to predict whom the system will work for.

Speaking in Acronyms

What I learned from my own experience working for a national lab is that for the system to work, the little things can't bug you -- like too many acronyms and too much paperwork, to start. I worked at the Idaho National Engineering and Environmental Laboratory, which stretches across the southeastern corner of Idaho. One of my happiest days was when a colleague handed me a stapled list of acronyms and their definitions, half an inch thick. As time passed, I came to speak the lingo myself and knew it was time for me to leave.

Scientists who stay, however, deal with the little things far more gracefully. Milton makes sure he's got help for paperwork. "We have all kinds of interesting forms," he says. "But we have good logistical support to take care of that. I cannot know a lot of things and focus on my work."

Mary Beckman writes about science from southeastern Idaho. Before the ink was dry on her doctoral thesis in molecular biology, she skipped out on research for the slightly less frustrating and eminently more fun world of journalism.