

PHYSICS COMMUNITY

Employment Outlook for New PhDs Improves, as Other Fields Hire More Physicists

Aided by a strong US economy, new PhD physicists are finding the job market a bit friendlier these days, but not necessarily in physics. According to the latest data from the American Institute of Physics, the proportion of new PhDs who found “potentially permanent” work more than doubled between 1994 and 1997, from 19% to 48%, with nearly three-fifths of the 1997 group taking jobs outside the field—as engineers, computer programmers, financial analysts and so on. Meanwhile, the proportion accepting postdoctoral appointments fell for the third year in a row, from 63% in 1994 to 41% in 1997. (These figures are from AIP’s annual *Initial Employment Report*, which surveys PhD recipients in the winter following graduation.)

Improvement in the economy is certainly a factor here, says AIP’s Patrick Mulvey. Additionally, “many degree recipients are widening the scope of their employment search,” a recognition that both research funding and competition for tenure-track openings remain tight.

The fact that more physicists are finding work outside their field is “not surprising,” says Mark Regets, a labor economist at the National Science Foundation who tracks employment trends among science and engineering PhDs. “Physicists are particularly notable for being able to work in a great many fields and occupations.” In the early 1990s, as the faltering US economy collided with the cold war’s end, physicists were among the hardest hit, he says, and unemployment among recent PhDs swelled to 5.3% in 1993; two years later, that figure had dropped back to 2.9%.

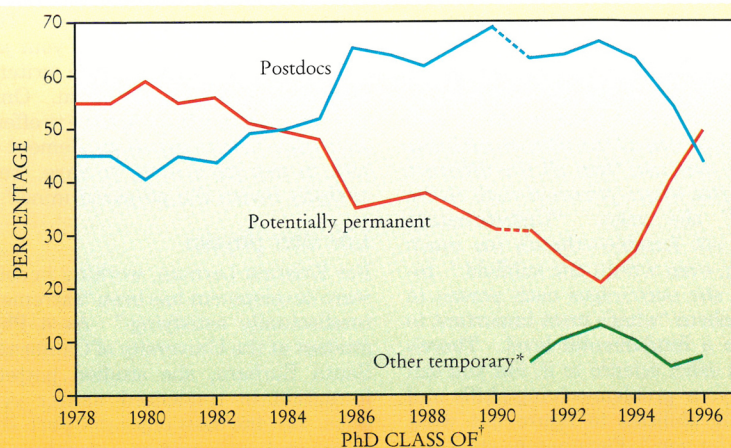
While unemployment rates are one measure of the “health of the profession,” Regets notes, perhaps a better indicator is the proportion of individuals working “involuntarily outside of field”—those who could not find full-time work related to their degrees. Among recent PhD physicists, that percentage grew from 6.1% in 1993 to 6.7% in 1995; by comparison, the overall figure among all recent science and engineering PhDs moved from 4.0% to 4.3%.

There are larger forces at work in all this, says Catherine Gaddy, executive director of the Commission on Professionals in Science and Technology.

For the third straight year, the proportion of new PhDs finding permanent full-time work has risen sharply, while the share taking post-doc positions has dropped.

“We’re caught up in broad workforce changes that are resulting in less permanence in employment.” The oft-quoted proclamation that today’s worker will change jobs seven (or more) times also extends to physicists and other scientists, she says. It’s therefore essential that employers develop “rea-

in downtown Brooklyn, eager to hear the advice of PhD scientists who had made the transition into finance, law, banking and other fields. The daylong workshop, cosponsored by the Overseas Chinese Physics Association, was the first in what organizer Ngee-Pong Chang, a professor of physics at City College of New York, hopes will be an ongoing series, aimed at “building up a network of new opportunities for our younger generation” and bridging the gap between scientists in industry and academia. In between talks, workshop participants rushed to exchange phone



*In 1991, the survey questionnaire was changed to measure “other temporary” employment as a separate category.

PhDs were polled approximately six months after graduation; for example, the class of 1996 was surveyed in the winter of 1997.

NEW PHYSICS PhDs ARE NOW OPTING for “potentially permanent” work over postdoc positions, reversing a 12-year trend. In the class of 1996, 57% of those in potentially permanent jobs were working outside physics—45% were in engineering, 33% in computer software and 11% in business and finance. (Source: AIP Statistics Division.)

sonable personnel policies that make it easier to change jobs”—like portable health care and pension plans and retirement policies that allow workers “to exit gracefully.” At the same time, graduate programs need to present to their students a realistic picture of what they can expect in their careers. Some departments have been exemplary in that regard, she says, “but it’s very uneven.”

Luck versus logic

On a raw and rainy Saturday in November, more than 300 students and recent graduates crowded into a large auditorium at Polytechnic University

numbers and press the speakers for more information. The mood was enthusiastic, but there was also an anxious undercurrent, which one student’s pointed question brought to the surface. “I’m wondering if there’s a more systematic way of looking for a job,” he asked a panel of speakers. “Because from where I’m standing right now, it looks like you got where you are more by luck than by a logical process.”

That sentiment is one Kristi Jen-toft-Nilsen hears often. As a physics career specialist at AIP, she spends a good deal of time fielding phone calls and e-mail from physicists who want to work outside of academia, but don’t

Career Resources for Physicists

A number of job-related sites on the World Wide Web are aimed at physicists and other scientists. Here are a few:

- ▷ The American Institute of Physics Web site, which includes information on careers (<http://www.aip.org/careers/>) and data on the physics job market (<http://www.aip.org/statistics/trends/trends.htm>).
- ▷ The University of Washington's Careers for Physicists Homepage (<http://weber.u.washington.edu/~dennisj/careers/index.html>).
- ▷ Open Forum on Alternative Careers for Physicists, based at the University of Illinois (<http://www.physics.uiuc.edu/jobs/non-physics/forum/>).
- ▷ Forum on Creating Careers in Physics, at Harvard University (<http://phys3.harvard.edu/careers/>).
- ▷ Science's Next Wave site (<http://www.nextwave.org/>)
- ▷ Other sites were listed in PHYSICS TODAY, February 1997, page 62.

Among the career books aimed at scientists are:

- ▷ Peter S. Fiske, *To Boldly Go: A Practical Guide for Scientists*, American Geophysical Union (Washington, DC, 1996).
- ▷ Stephen Rosen and Celia Paul, *Career Renewal: Tools for Scientists and Technical Professionals*, Academic Press (San Diego, Calif., 1997).

have a clear idea of how to get there. She can empathize. After graduating with a PhD in nuclear physics from the Georgia Institute of Technology, Jentoft-Nilsen spent nine months looking for work before getting the offer from AIP last spring. "I had strong support from my family, but it was still very hard."

"Wouldn't it be great to have a wall chart that lists all the physics subfields on one side and then all the different industries where you could work on the other?" she asks. "Unfortunately, that's not feasible—there's too much variety, even within one subfield." Instead, she encourages each person to think about "what's most important to you on a fundamental level. There's not an exact science to it, but you can apply your problem-solving skills and analytic abilities to figure out what works for you." Fortunately, she says, there are a growing number of resources available to the job-seeking physicist, including self-help books and sites on the World Wide Web.

Physics departments are also dispensing more career guidance these days. At the City University of New York Graduate Center, a team of physics and business professors offer courses on high-technology business, career management and communication skills. Course organizer Brian Schwartz, a Brooklyn College physicist, observes that students are more savvy now about the job market. "But we should be careful in holding up examples that make it sound too easy," he adds. "The brightest and most worldly students can find the jobs on Wall Street or start up a small business or whatever—they'll succeed no matter what." For the vast majority, he says, "it takes planning and effort to make a successful transition."

Stephen Rosen agrees. A PhD physicist turned career consultant, and

coauthor of the recently published *Career Renewal: Tools for Scientists and Technical Professionals*, he has advised hundreds of scientists and engineers looking to switch jobs or careers. The first step is to "take charge of your job search—don't rely on résumé writers, recruiters, agencies and so on. Only you can present what you have to offer." And while there may be an element of luck in any job search, he says, "serendipity favors the prepared mind."

Life after physics

For Kristina Lerman, working in software development has been "extremely intellectually satisfying." As a PhD student at the University of California, Santa Barbara, she studied pattern formation in condensed matter systems. But the most enjoyable part, she discovered, was writing algorithms to analyze experimental data. She also became fascinated with the World Wide Web: "I felt there was a revolution going on, and I wanted to participate in that." Lurking in the back of her mind was concern about the scarcity of jobs in physics.

And so, after completing her PhD in 1995, Lerman turned down a postdoctoral fellowship at the National Institute of Science and Technology and instead took a three-month internship at Silicon Graphics. That gave her enough experience to land a full-time job at Quarterdeck Corp, a software developer in Los Angeles. Although some familiarity with programming was necessary for getting both positions, she says, her enthusiasm also counted. "I had many ideas for things I'd like to implement, and I explained that I'd been doing my own research on text analysis." So many people started asking her for job advice that Lerman eventually wrote up a brief account of her experiences and posted

it on the Web (<http://tweedledee.ucsb.edu/~kris/misc/jobs.html>).

Physicist Andy Hollerman has worked for the past three years at the Alabama Center for Environmental Technology, where he trains industrial workers on handling hazardous materials. While he enjoys aspects of the job—maintaining the office's Web pages, for example, and keeping up on environmental science and law—for the most part, he says, "there's no technical challenge in it. I can sit there and put my brain on autopilot." Ultimately, he hopes to get back into full-time teaching and research, even if that means "starting over" in a postdoc position. The Internet has made the job search much more efficient, Hollerman notes. "Instead of looking through newspaper ads, I can just go to the AIP Web site or do a physics search on CareerPath.com or the Monsterboard." Since completing his PhD in 1996, Hollerman reckons he's sent out some 500 résumés; when he spoke to PHYSICS TODAY, he was awaiting the outcome of several recent interviews.

Down the road

Nobody is ready to predict whether the current trends will continue, or how the exodus of new PhDs will affect the field of physics down the road. Certainly, the fact that physics enrollments at both the undergraduate and graduate level have dropped sharply (see, for example, PHYSICS TODAY, June 1997, page 76) will have some impact on the job market and on the profession. And for the individual physicist, establishing a career will still mean "figuring out the connections" between one's education and one's desired occupation, says AIP's Jentoft-Nilsen. "The good news is that once you do figure out those connections, you'll be able to use those skills throughout your life."

JEAN KUMAGAI

One Europe, One Physics Journal?

Two of Europe's leading physics journals, Germany's 77-year-old *Zeitschrift für Physik* and France's 125-year-old *Journal de Physique* have merged to become the *European Physical Journal*, launched this month.

The aim is for the journal to become a European counterpart to the American Physical Society's *Physical Review* series, according to the publishers, Springer-Verlag in Germany and the French Physical Society's EPD Sciences. *Physical Review*, widely held to be the world's most prestigious physics journal, has been publishing more and