

November 2025

Landing A Job In The Private Sector

Technical knowledge and skills are only some of the considerations that managers have when hiring physical scientists. Soft skills, in particular communication, are also high on the list.

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Feature

Feature Article

Featured



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For many students in the physical sciences, a career in academia may seem like the default path. But for most, that's not the path taken. After obtaining a PhD in solid-state physics and working as a postdoc, Evgeni Gousev left the academic track and went to work for IBM and then the telecommunications company Qualcomm Technologies, where now he's a senior director. "Physicists have really good background and training," he says. "They know how to solve

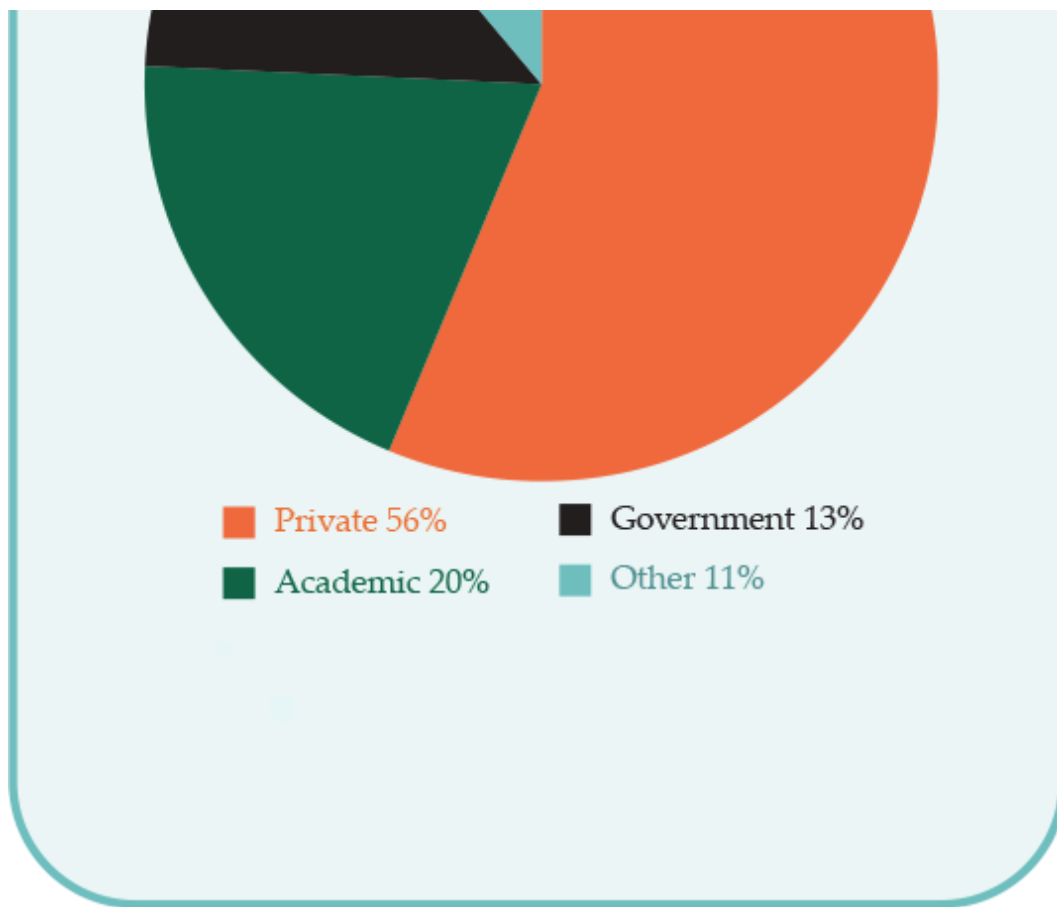
problems, how to tackle complex and challenging tasks, and how to research and learn."

An advanced degree isn't necessarily a prerequisite for technical jobs at many companies. Ryan Caverly, a senior technical recruiter at HRL Laboratories, a company headquartered in Malibu, California, that conducts applied R&D for automotive, aerospace, and defense applications, says, "The last few people we've hired for our quantum testing team have had bachelor's degrees or master's degrees with a couple years of experience." (For more on what education and skills are needed for jobs in the quantum workforce, see "Quantum sector jobs span specialties, degree requirements" on page 22.)

In fact, according to a report published by the American Institute of Physics (publisher of PHYSICS TODAY), more than 55% of students who graduated with a physics bachelor's degree in 2021–22 found employment in the private sector.¹ That's also where about one-third of recent physics PhD graduates work, and PhD-level industry positions are nearly five times as likely as academic posts to be potentially permanent.²

Physics Today interviewed scientists and engineers from private companies to better understand what attributes and skills companies look for when hiring for technical jobs. The 12 interviewees have a range of jobs, including conducting applied R&D in the physical sciences, manufacturing specialized equipment and instruments, exploring and extracting oil and gas resources, and developing software products. A few themes were persistent across all the conversations. Physical scientists have the training required to succeed in various types of jobs, but technical adeptness will get you only so far. Communication, teamwork, and flexible problem-solving are also important skills.





THE FIRST JOBS of the majority of US students who obtained physics bachelor's degrees in 2023 and 2024 were in the private sector. (Data courtesy of the American Institute of Physics.)

Transferring technical skills

Many companies look for candidates who have hands-on experience with installing, tuning, or repairing specialized equipment. A hiring manager isn't necessarily looking for someone who is familiar with instruments or products particular to their company but rather someone who is comfortable reading schematics, following established procedures, and learning the specifics on the job.

A test of those sorts of skills is conducted for some job seekers at TOPTICA Photonics, for example, which manufactures lasers and other optical equipment. "The level of education is not the only factor TOPTICA is considering during the hiring process," says human resources manager Michelle Prohov. Optical-assembly technicians, for example, are evaluated for their hands-on experience, and they may need to think creatively to solve problems with various instruments.

For other types of jobs—such as data scientists or machine-learning engineers—no hands-on experience is required, but some familiarity with programming is usually necessary to land an interview. Openings for machine-learning specialists required more-specific technical skills than postings for data analysts in 2017, when Jacob Lynn of the travel company [Booking.com](#) starting hiring for positions there. He has a PhD in physics and over the past eight years has hired around 200 people for the company. "About 25% of the interview is really specific technical knowledge that you have to know," he says, "and the other 75% is, Can you think through the problem?"

The vast majority of the time, he and others at [Booking.com](#) are seeking people who have a certain set of baseline skills. He looks for people "who can quickly wrap their head around a business problem," he says, "and then propose a technical or semitechnical approach to learn something from the data."

David Nelson, the president of Massachusetts-based Aerodyne Research, which offers R&D services, chemical sensors, and software products for global environmental research, says that "people who can write code are really helpful. Some projects slow down because nobody is facile at writing software to automate or facilitate or analyze data."

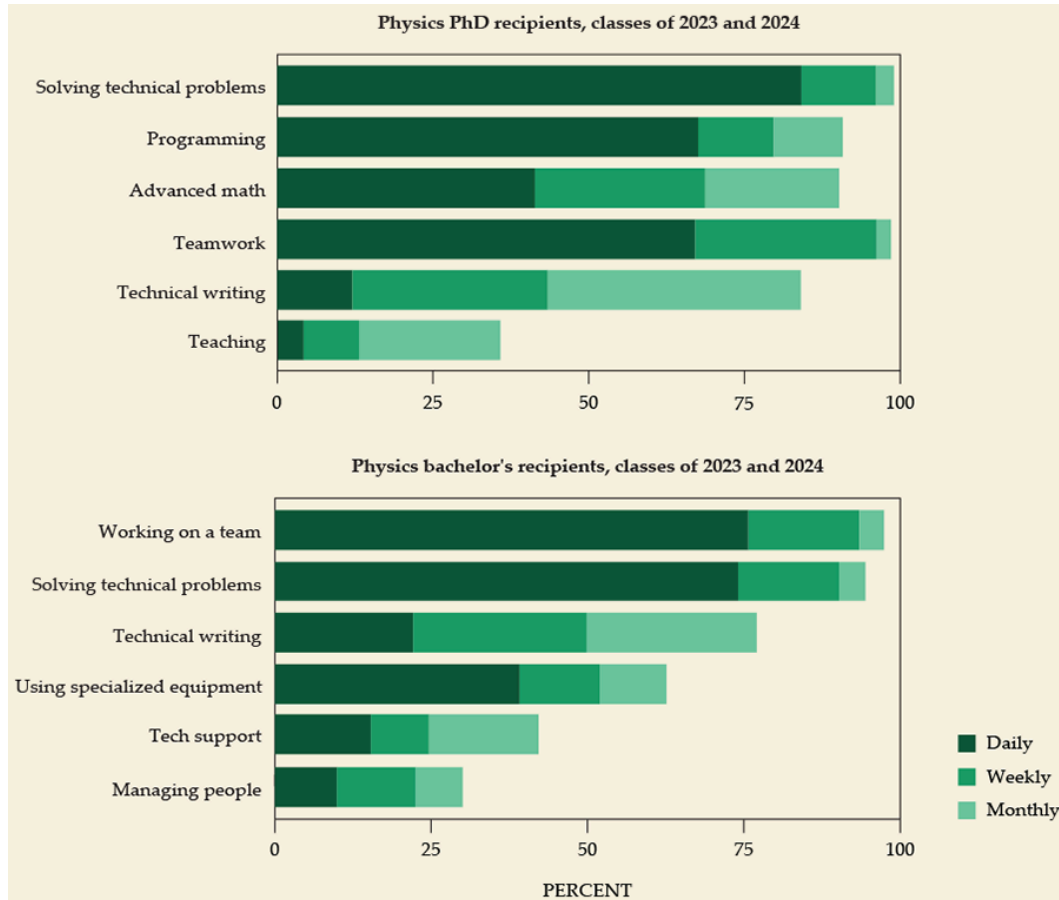
Technical competence can sometimes make a candidate more competitive, but managers typically expect the specifics to be learned on the job. "Learning is really important to TOPTICA," says Prohov. "We put aside money in our budget so that our staff can continue to take classes and learn."

At Intel headquarters in Santa Clara, California, engineering manager Annelise Beck says, "There's a long training process. There are specific tools used in the industry which you're going to find in just three or four companies in the world. There's no chance you're going to ever have experience with them."

Communicating to colleagues and clients

To be competitive for just about any job, employees need strong communication skills. ³ For physical science jobs, that may mean explaining details to technical and nontechnical coworkers and writing research proposals. "At every single

company meeting, we have a tech talk where one of the scientists or engineers talks about their work," says Nelson, whose background is in chemical physics. "They are charged with using as little jargon as possible to make sure that everybody in the company understands what they're working for, what they're supporting, and how cool it is."



SOME OF THE SKILLS used by employees in the private sector with a physics bachelor's degree or a PhD are specialized, such as solving technical problems, and others are nontechnical, including working on a team. Most PhD-level employees routinely use programming and advanced math skills; most bachelor's-level employees regularly use specialized equipment. (Data courtesy of the American Institute of Physics.)

Princeton Scientific Corporation, a supplier of materials science and engineering products that's based in Bethlehem, Pennsylvania, has similar needs. General manager Ashley Pascoe says, "Maybe the client needs to improve adhesion for one of their products, but they don't know why a plasma cleaner would do that. Our scientists need to communicate those technical concepts to our clients to help them understand."

Physicist Howard Winston spent years at the oil and gas exploration company Schlumberger and the aerospace company United Technologies Corporation (now owned by RTX). He's now a physics professor at the University of Connecticut Waterbury. "You have to communicate clearly with people in positions of power who control lots of money in a business unit," he says. "How are you going to get their business right?" Winston recalls that his communication skills got him and his team new business from a high-level executive. "He was very impressed," says Winston. "And in the end, he said, 'Wow, I want you guys in my marketing group. Take my wallet.'"

For six years, Satish Rao worked at Newlab, which seeks to commercialize and scale technology startup companies. After obtaining his PhD in physics and working at Columbia University's tech-transfer office, Rao moved to Newlab and built its consulting practice, which provides business strategy and advice to industries and the government on how to transfer specific physical science technologies to their markets and organizations. To succeed, Rao says, "you have to be able to explain the impact of the problem you're solving. We have to inspire minds that this type of science is worth pursuing and investing in."

“You have to be willing to drop everything and quickly do something else. For some people, their work style is suitable for that. And for other people, it's not."

—Annelise Beck, engineering manager, Intel

Solving problems and working in teams

Nearly every interviewee mentioned that the pace of industry is faster than that of academia. In such a dynamic environment, where priorities or projects shift according to business needs, candidates need to be flexible. "If you always strive for perfection, it will negatively impact your ability to deliver impactful results in a lot of industry roles," says James McBride, the vice president of R&D at CeresAI, an Oakland, California, company that provides predictions of agricultural crop

an engineer, someone, company that provides solutions or equipment to help health using remote sensing and data analysis.

McBride says that because of money and time constraints, industry employees need to "have the willingness to get a problem 80–90% of the way done." Then, refinements to a product can be made after it's launched. In a survey of employees who recently obtained physics bachelor's degrees, those in the private sector reported that the second most-used skill in their jobs was solving technical problems. ⁴

In that survey, the skill that private-sector employees most commonly reported using was working on a team. Likewise, in a similar survey of people who recently obtained their physics PhDs, respondents working in potentially permanent private-sector positions were most likely to list teamwork and solving technical problems as skills they use. ²

After earning a masters in physics, Carlos Guzman worked as a geoscientist at Shell for 30 years and for the past 18 years has been a consultant in oil and gas exploration. He says that companies are looking for multidisciplinary teams to solve complicated problems. "You're going to work with more than just physicists," says Guzman. "There will be geologists on your team. There will be physicists. There will probably be artificial intelligence and neural network researchers, and there will be business people."

Networking for jobs

People seeking career advice often hear about the importance of networking, and job seekers in the physical sciences are not exempt. Intel's Beck says to "talk to people that you know, use whatever connections you have to get your foot in the door, get the interview, but also just to understand what the jobs are like."

If you're still in school, Beck advises that any list of professionals that you build should include nonacademic contacts. "Many professors are thinking about academia as being the path that you should follow," says Beck. "Not all of them are going out of their way to put other contacts in your path." She encourages job seekers to call or email people whose jobs they find interesting. "I get those kinds of messages, and I'm very willing to talk to people for 30 minutes. It's not a big deal," says Beck.

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Job hunting is challenging in the current employment environment. Many private companies are supported, at least in part, by the US government, whose funding for science has been drastically cut by the Trump administration. Even some companies that don't directly rely on federal funding have been affected, and unpredictable tariffs are contributing to business uncertainty (see "Fluctuating tariffs exacerbate US science funding woes," PHYSICS TODAY, September 2025, page 18).

Despite the threats to science jobs, companies are still hiring for technical roles. "One of the latest hires on my team I met at a conference," says Qualcomm's Gousev. In-person conversations can help build a connection with a potential hiring manager. "You talk to a person and think they're smart. I want to keep an eye on them," says Gousev. "If I have any position, maybe I can hire them."

To get a sense of the gamut of jobs and career paths open to someone with a background in physics or the physical sciences, see the collection of short interviews in "What can physicists do?," which starts on page 26 of this issue.

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