

Chapter 9 - Industrially Employed Physicists: Primarily in Physics

Employers

This chapter is based on the responses from 55 mid-career physicists employed in industry and engaged primarily in physics. They worked for a variety of companies that relied on research and development in the physical sciences to create or improve upon their products or services. Many of these companies produced specialized cutting-edge materials or devices, e.g. semiconductors or lasers, which were often then integrated into a wide array of useful products, e.g. consumer electronics or medical imaging instrumentation. Employers of physicists in the private sector working in physics included IBM, General Electric, Intel, Siemens, Schlumberger, and Northrop Grumman among many other large corporations.

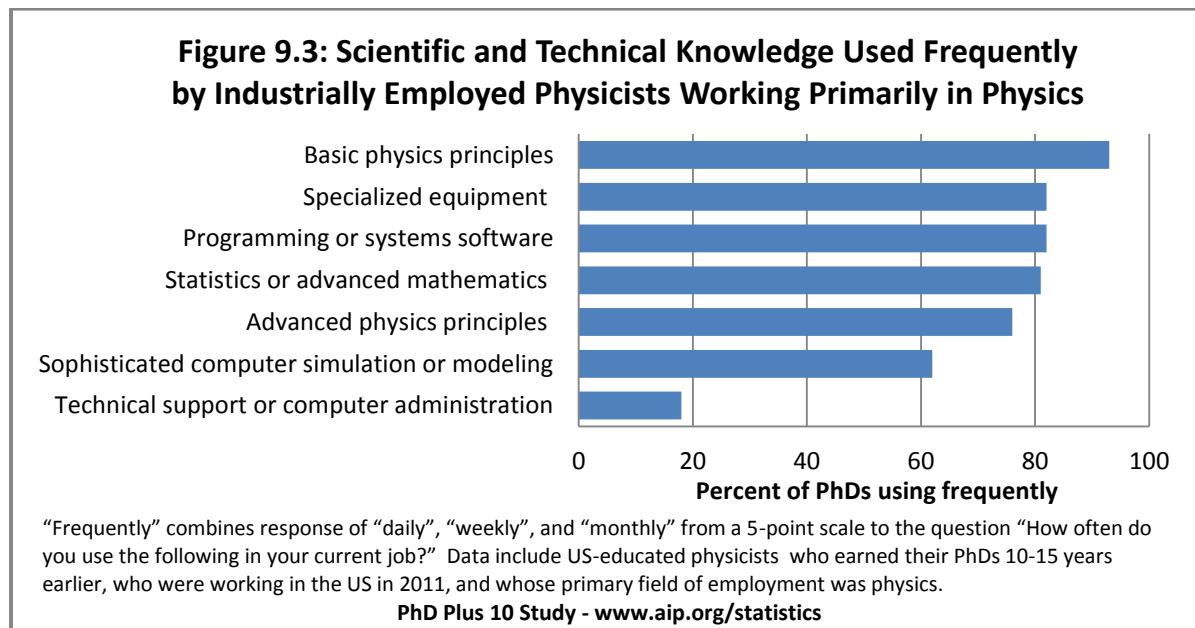
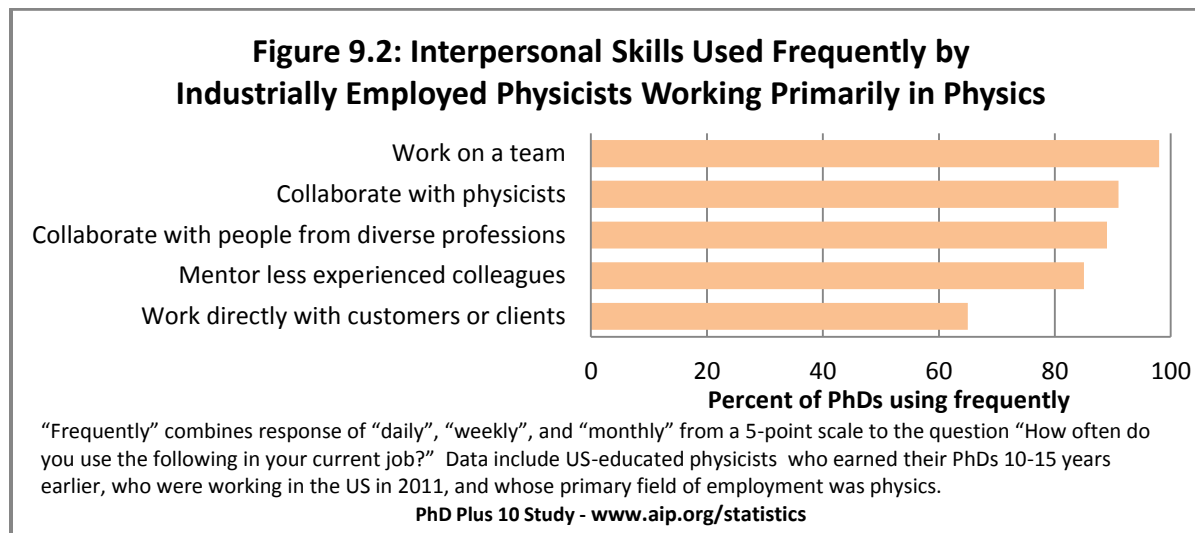
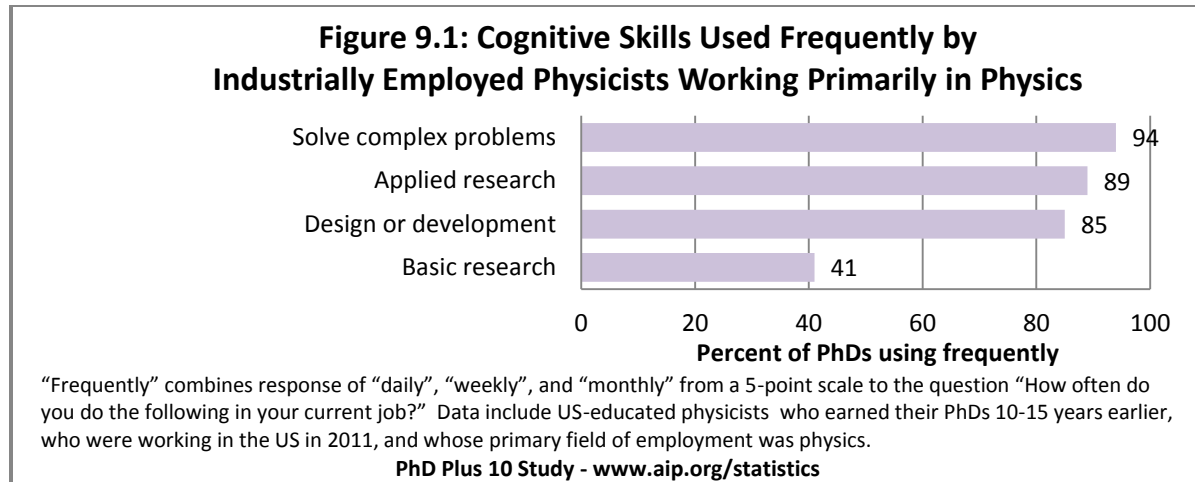
Job titles

Table 9.1 lists common job titles of mid-career physicists who were industrially employed working primarily in physics 10 to 15 years after earning their PhDs. Job titles were often preceded by words like “senior”, “principal” and “staff” to indicate levels of experience and responsibility.

Table 9.1: Common Job Titles of Industrially Employed Physicists in Physics, 2011
Scientist
Physicist
Director
Manager
Engineer
Member Technical Staff
Vice President
PhD Plus 10 Study - www.aip.org/statistics

Job duties

Many of the physicists working in the private sector doing physics were engaged in hands-on applied research in a variety of areas including optics and photonics, radiation sensors, electronics, and x-ray imaging with medical as well as security applications. Many were responsible for managing research teams and those in senior-level positions were responsible for directing their companies’ technology development and intellectual property agendas.



Knowledge and skills used on the job

Mid-career physicists who worked in industry primarily in physics used a variety of different kinds of scientific knowledge. Virtually all of them used basic physics principles frequently and three-quarters reported using advanced physics principles regularly (Figure 9.3). In addition, over 80% of them also frequently used specialized equipment, systems software, and statistics or advanced mathematics. Virtually all report that they frequently solved complex problems (Figure 9.1) and frequently managed projects (Figure 9.4).

Interpersonal skills were very important for mid-career physicists who worked in industry and were engaged primarily in physics. A significant percentage of them reported that they regularly worked in teams, collaborated with other physicists, collaborated with people from diverse professions, and mentored less experienced colleagues (Figure 9.2). Such a reliance on interpersonal skills inevitably increases the importance of communication as well. These physicists reported that they regularly wrote for technical audiences and their jobs often included public speaking (Figure 9.5). More than half regularly contributed to proposals intended to develop new business.

Most rewarding aspects of their jobs

Industrially employed physicists who worked in physics were asked to describe the most rewarding aspects of their work. The following themes were cited most often:

- Nearly half of the mid-career physicists described the intellectual stimulation of their work as very rewarding. Some used phrases like “solving challenging problems” while others enjoyed the variety of problems they encountered. A few physics PhDs highly valued that they could pursue topics that were of interest to them. Several physicists used the word “freedom”.
- The rewarding aspect that was cited the next most often by physicists was real-world impact. The application of knowledge in design and development was very rewarding. A few physicists wrote about the appeal of “advancing the state-of-the-art.”
- A few of these physicists also valued their working conditions, including working with smart colleagues and clients, and a good work-life balance.

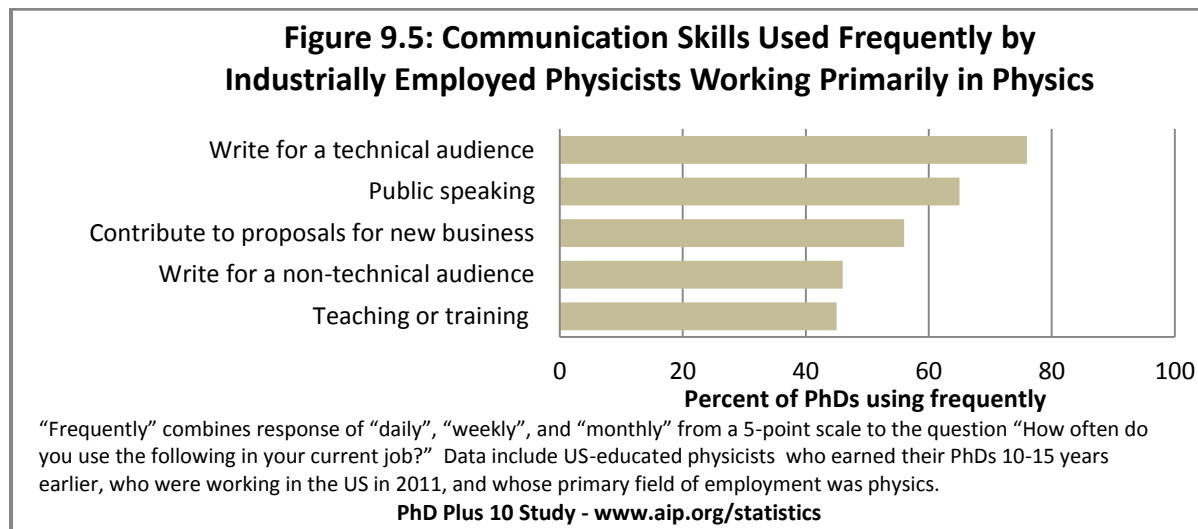
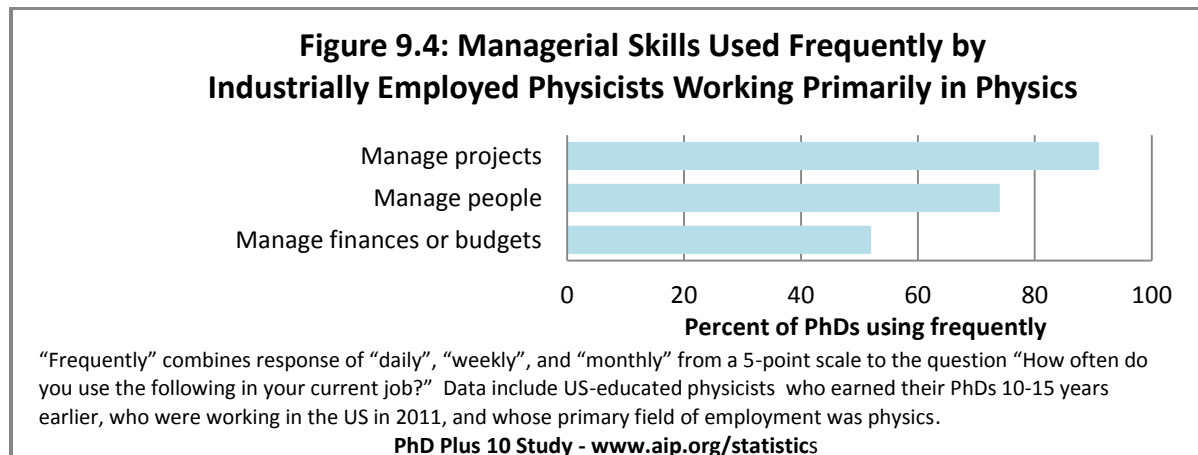


Table 9.2 What Are the Most Rewarding Aspects of Your Job?
Selected verbatim comments from PhD physicists working primarily in physics, 2011
<i>Bringing a vision on paper to life with the help of incredibly talented people.</i>
<i>It is intellectually stimulating. I work with very intelligent people on interesting technical problems, and I get to apply science in a business setting with the promise of realizing products which are deployed to solve real-world needs.</i>
<i>The intellectual pursuit of new knowledge, technology, and understanding. I love the “Aha!” moments of physics just like I did the first time I picked up a book on physics.</i>
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