

Find the Hidden Physicist

On the job, engineers are called engineers, chemists are called chemists, and computer scientists, computer scientists. But physicists are called physicists only if they have Ph.D.'s and are engaged in research—usually research that is thought of as “basic.” In fact, however, physicists work in many industrial settings, employed by a diverse range of industries and doing a variety of technical jobs. The numbers would probably surprise you.

Over the past 40 years approximately 43,000 doctorates in physics have been granted in the United States. Over the same time period, nearly 25,000 physics students have earned terminal master's degrees and 200,000 physicists have switched their tassels from right to left as they officially became baccalaureates. Let's analyze this latter source:

- About one out of three physics baccalaureates enters graduate school to study physics. About half of the entering students receive the Ph.D. and about a third of those Ph.D.'s eventually go into industry.
- About one out of five enters graduate or professional schools to study something other than physics.
- About two out of five (43%) enter the workplace directly. Sixty-three percent of these workplace-bound bachelors choose industry as their first place of employment; many of them later earn graduate degrees as their career develops.

These numbers lead to the recognition that over the past 40 years an average of about 2,000 physicists have entered industry every year. And this number is increasing.

So where are the physicists?

They are hidden.

Physicists in industry have a variety of job titles. Most commonly, physicists are called engineers: test engineer, senior design engi-

neer, manufacturing engineer, senior process development engineer, and so forth. Or they are called computer scientists: systems analyst, software developer, software engineer—and the list goes on. Physicists labor under an array of other position titles as well, but rarely are they identified as physicists, thought of as physicists, or formally called physicists. Industry hides its physicists behind misnomers.

There is nothing wrong with being called an engineer or working under an alias. But these misnomers are symptomatic of a perception that plagues the discipline of physics—that physicists are “academic,” that physicists only do “pure” research, that they are



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unwilling or incapable of doing practical, applied work.

Of course, this perception contains a partial truth. The accurate part is that many physicists do, in fact, conduct basic research and they find it intellectually and emotionally fulfilling. However, physicists also are engaged in a spectrum of applied work and they find this intellectually and emotionally fulfilling as well. So much of the “popular” perception about physicists is false.


History documents the practical and applied talents of the physicist. The MIT Radiation Laboratory, established during World War II and run by physicists, developed a myriad of land-, aircraft-, and ship-based radar systems in a matter of months. At Los Alamos, physicists engaged in a massive “engineering” project (but were still called physicists!) with the atomic bomb as its outcome. But you don’t have to go back 50 years. The semiconductor industry, the optics industry, the electronics industry, and the communications industry, to name just a few, are replete with physicists doing applied research and applied development.

The misnomers are inaccurate in another sense. By virtue of their training, physicists think differently and approach an applied challenge differently than do their aliases. Not better, but differently. Physicists tend to see things as physical rather than, say, electronic, and approach an application in terms of a few physical principles that can integrate and synthesize what often appear as unrelated aspects of the application. This can pay valuable dividends for an industry. A knowledgeable observer, watching a physicist qua engineer at work, would often recognize that something lies hidden behind the alias job title.

As always, part-truths are dangerous. When physicists are hidden, the source of their contribution goes unrecognized. As one immediate consequence, many managers and human resources folks lose sight of the fact that they have physicists working for them and so the job titles become the reality. The result? When a new physicist comes looking for employment, the response can be, “We don’t employ physicists.” Eventually, all physicists get good jobs, but the process is much more complicated for them than for their engineering or computer science classmates. It is not uncommon to hear physicists say something such as, “I had to

knock the door down to get a hearing.”

Many conversations with “hidden” physicists reveal that they are proud they majored in physics and they think of themselves as physicists. It is time for the academic physics community to redefine what a physicist is and to embrace industrial physicists—bachelors, masters, and Ph.D.’s—as their colleagues. It is also time for industry to take the

mask off these hidden physicists and identify them by their proper title. The physics profession and industry would be well served if both these things happened. 

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