

Physicists and Engineers

I was saddened to read the letters from physicists who are having a hard time finding suitable employment in industry. In my experience, physicists who don't get interviews with companies are often speaking the wrong language to potential employers on their resumes and interviews.

WRONG WAY:

Applicant: "I am a nuclear physicist."

Employer: "Oh. We'll call you." (Won't)

RIGHT WAY:

Applicant: "I can read schematics and troubleshoot electronics. I can make machine drawings using CAD programs and perform statistical analysis on large quantities of data. I'm not afraid to disassemble instruments to fix them or to think hard. I did all these things as part of my graduate training in physics."

Employer: "You're hired! By the way, why did a smart young person like you study an obscure topic like physics?"

Okay, so I'm exaggerating here. The point is that you should tell employers what you can do and what skills you possess. They don't really care what degree you have as long as you can solve their problems. Don't hide the fact that you're a physicist, but don't blurt it out and emphasize it so as to scare people.

On a related topic, I found the remarks of physicists who hated having the job title "engineer" somewhat offensive. I can't imagine how anyone could believe that physicists in general are smarter or better trained than engineers (or chemists or whatever). This type of snobbery has no basis in fact and is the same type of ugly bias as racism or sexism.

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I am an engineering physicist with classes in electrical engineering. I graduated with my B.S. in December 1997, and I immediately had companies seeking to recruit me. There are a few things that I did to ensure that I would be employed:

1. Long before graduating, I started inves-

tigating the types and quality of jobs of physicists who I knew. I talked to them about their level of satisfaction.

2. Over the course of 5 years, I developed a resume that would rival that of any engineer in any discipline. I did this by publishing, winning national honors, and taking classes that would make me employable. I also stated that I have an engineering physics degree, E.E. primary.

3. I made an on-line resume—this is a great tool. My on-line resume is 3-1/2 pages and my professional resume is one page. When I handed my resume to a company, I would make sure to showcase my on-line resume address. After a few days, I would e-mail the company and again showcase my on-line resume address. Many people have said they were impressed with it.

4. I also am a firm believer in networking. If I know of a good student or professional who needs an opportunity, I will make every effort to help this person find a job.

Physicists are very malleable. If you want employment in a certain field, make yourself and your credentials fit that opportunity. Although my job is tough, I can quickly learn anything that I need to in this highly technical field from my training as a physicist.

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I have spent the past 29 years in the chemical industry, after completing my Ph.D in atomic physics in 1969. Most of my peers are chemical or mechanical engineers, and a few are chemists.

My experience has been that a physics background is excellent preparation for the type of industrial problem-solving that is required in R&D, especially when it is combined with the skills of the other disciplines.

I spent a few years in management before returning to the technical ladder, and presently hold a relatively high position on that ladder. Despite my technical success, as well as the good achievements of the few other physicists in our organization, our



company does not usually target physics departments in our college recruiting efforts. Part is due to the "good old boy" network; engineers recruit other engineers.

However, most engineers also interview better than do most physicists. They are more attuned to the needs of industry and speak the language. Many if not most new engineers have industrial experience through co-op programs. New physicists tend to come across as somewhat naive about industry. Their focus is more research-oriented, befitting an academic career. That's not what the industrial recruiter wants to hear.

Physics departments would serve their students better if they provided better linkage to industry. Cooperative work-study programs are excellent vehicles for communication between universities and industry, as are senior-level projects that are funded by industry. These programs give physics students exposure that allows them to compete with engineers for that important first job offer. Once physicists are inside the organization, I know that they can contribute.

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I received my B.S. in physics in 1952 and did three years of graduate work, but no Ph.D. It's the best education for any technical job I can imagine. I have worked on lasers, built a better refrigerator, and developed and installed control programs for hydroelectric dams. I'm now a "development engineer" working on photovoltaics. The point is it's the background that physics education provides that counts, not the title. Although it can be difficult to convince some personnel directors of this, it's still the way to go.

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I enjoyed reading your editorial in the latest issue of *The Industrial Physicist*. I guess I'm not alone in feeling like a misplaced

physicist. I started out as a theoretical electronic energy band computational solid-state physicist with a background in high-energy physics, who couldn't find a job in 1967. But fortunately I got into polymer physics. I'm now back into a form of solid-state physics—MEMS, MOEMS, MOMS, BioMEMS, or NanoMEMS—and I'm loving it!

For ten years I was in industry, at a corporate research center for a \$2.2 billion company. In 1996, the CEO decided that a high-tech company didn't need research as it was being done, so he gave early retirement to all corporate research personnel. The CEO was a nuclear physicist who moved into economics. I don't blame him: it had to be done. But while in industry, I kept up with new ideas by reading *The Industrial Physicist*, *Trends in Polymer Science*, *Physics World*, and so on. *Trends* has been canceled, and I was wondering if *The Industrial Physicist* could pick up some of this flavor, i.e., carry a feature article

that reviewed some area of science. You've had articles on molecular modeling, which I thoroughly enjoyed because this is the field in which I work.


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I follow this column with considerable interest. I have spent all of my working life—56 years at this point and still going—within industry. I have generally had a fascinating career and believe that I have made some real contributions in thermal physics. Job titles never concerned me, as long as I knew who I was.

My bachelor's degree is in languages and philosophy. In philosophy I was quickly drawn to epistemology—the question of how we know, and how we know that we

know—and I read, independently of course work, a good deal of physics and mathematics. However, I believe that my career—and aside from that, my life and my joy in it—owes most to my extensive exposure to the liberal arts and its disciplines of constructive reading, logical thinking, and writing clear, compact, and persuasive prose.

I suggest to the young physicist a broad liberal arts experience in addition to scientific training. In such breadth lies satisfaction as well as opportunity.

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If you would like to share your reactions, mail responses to Hidden Physicists, The Industrial Physicist, One Physics Ellipse, College Park, MD 20740-3043, fax (301-209-0842), or e-mail (tip@aip.org).