Opening Remarks from Alex Panchula

Panel Session I on Preparation for Non-Academic Careers

Examining the whole career arc of Industrial Physicists, we find a trajectory that is full of the twists and turns, job changes, responsibilities shifts, and industry moves. As educators of industrial physicists, only the initial conditions of this complex system can be affected. Educators provide a basic tool set, but individuals will choose their own path, their own breadth and depth for their own career.

What do Industrial Physicists do that is still Physics?

In preparation for this meeting I asked 8 early and mid-career industrial physicists what is the most “physics-y” activity they do today. Their answers:

- Design hardware
- Deep dive analysis of complex problem
- Understand technical/mathematical concepts

Apparently, this is still in line with the fundamental training of physicists. So where is the problem? *Hiring managers need to be convinced to hire a physicist!*

A Marketing Problem

A colleague of mine interviewed a young PhD Physicist from top school. He approached me with the following concern: Although this person seemed smart in the interview, the candidate lacked direct experience in the field. He specifically asked, “Can this person learn?” I answered yes, and today this physicist is doing very well in that position.

This is clearly a marketing problem and not a physics problem.

- We need to train physicists to interview
- We need to train physicists to write “the how” and not “the what” in resumes.

  Example: My dissertation title is “Magnetotransport in Magnetic Nanostructures”. To a small group of trained solid state physicists this sets off a series of questions about my thesis. To an outsider (and most hiring managers are not trained solid state physicists) this triggers no such synaptic firing; it is meaningless. If, on the other hand, I write in my resume “Experimental design, execution, data analysis and mathematical models of complex systems” this actually has content to any hiring manager, and a place to start the conversation.

Where did education fall short?

I also asked these same early and mid-career physicists what they wish they had as part of their graduate education:

- Exposure to the toolsets used in industry: software, programming, statistics.
- Exposure to business methods. This can be achieved through:
- Co/ops
- Internships
- Project management experience

- Communications
  - Interpersonal Skill
    - This is more important in industry than in the lab, and extremely important for individuals looking to lead team, and manage.
    - Concise writing
    - Presentation skills—personally I think that physicists get some of this through the March/April or section meetings.

OTHER NOTES:

1) Departments should reach out the physics alumni in industry and invite them to speak to both graduate and undergraduate students
2) The technology transfer model at MIT, Stanford, and Georgia Tech can be replicated
3) Management/project management classes for scientists
4) Make all tenured faculty members apply for 3 jobs every five years...It’s the only experience many of them will have with industry! (insert rimshot here)

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