Life After Ph. D.

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CORNING
Discovering Beyond Imagination

My background

- Ph.D. MIT, Theoretical Physics- Condensed Matter, 1982
  - electronic structure; quantum mechanics of materials
- Post-doc Univ. of PA, 1982-1984
- Corning Incorporated, 1984-present
  - about 8 years electronic structure
    - Collaborated with Cornellians
    - ABINIT project: www.abinit.org
  - next 12 years: lots of variety
    - strain-optical response, **laser damage of glass**
    - viscoelastic properties of glass
    - photonic crystals, photonic crystal fibers
    - Diffusion; GRIN lens design
    - “math/ computer modeling”

Corning Incorporated

- High-tech materials company
  - Display, Environmental, Life Sciences, Telecom
  - www.corning.com
  - Also known for dishes, pots and pans, Pyrex®
- High emphasis on R+D, invention
  - Materials but *also processes*
  - *Lots* of engineering
- Great place for a career
  - Talented colleagues
  - Global company (travel)
  - Great labs
  - Lots of variety, opportunities

Career insights

- Prepare: learn your subject deeply
  - Learn how to train yourself; keep learning; be opportunistic
- Practice communication and teamwork
- Use internships, interviews, networks (web sites, …)
  - For corporate: understand the business(es)

- Career paths (Corning)
  - Technical (keep doing science; research)
  - Project leader (management as well as technical)
  - Manager (manage scientists and projects)

What I did well

- Learned my subject
- Discovered that I loved it
- Took a few risks
  - Interviewed with Corning for fun and practice

What I might have done differently

- My beginnings: appalling naivety
  - Should have found more professional contacts at start
- Could have used more background in
  - Commercialization of inventions
  - Inventive process; patenting inventions
  - Project management/ teamwork

How my career has evolved (summary)

- Beginning: numerical methods, quantum mechanics of materials, “Density Functional Theory”
- Later: physical reasoning, mathematical and numerical solutions for wide range of industrial problems
- Now: trend continues, but now with more “managing people” activities as well
  - Still spend 50% of my time defining and solving math
    - By choice
  - The fun part: using mathematical physics to find answers that people actually care about