Put Your Science to Work: Practical Career Advice for Early Career Physicists

Dr. Peter S. Fiske
July 7, 2018
SLAC

Why am I REALLY here?

• Experience
  – My career path (so far) has been unusual (for a Geophysicist) but highly stimulating and enormously enjoyable.
  – I benefited from numerous mentors and got lots of good advice
    • Pass some of it along
• Concern
  – Young S&Es don’t get very good career development advice.
  – Such advice is of greatest value at the START of your career!
• Prejudice
  – I believe that technically-trained individuals have enormous opportunity to improve the world.

The world outside of academia has evolved...

Old
  Go to school for skills
  Job Security = Good
  Wages = Reward
  Infrastructure = Biggest Asset
  Seniority (mattered most)
  Guilds (were everywhere)
  Risk Aversion (was the smart thing)
  Passivity (was the safe bet)

New
  Life-long learning
  Risk-taking = Good
  Stock Options = Reward
  IP = Biggest Asset
The world outside of academia has evolved...

**New**
- Life-long learning
- Risk-taking = Good
- Stock Options = Reward
- IP = Biggest Asset
- Experience (matters most)
- Independents (are everywhere)
- Risk Management (is the smart thing)
- Entrepreneurialism (is the safe bet)

**Old**
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Unfortunately, much of academia reinforces...the OLD

The need for Physics students to think broadly about themselves is not new...

“Young people themselves don’t realize how valuable they are with a Ph.D. It means an ability to think deeply, solve problems, analyze data, criticize and be criticized. [PhD-trained graduates] often don’t realize the breadth of what they are capable of doing.”

Dr. Neal Lane  
(Former Director, National Science Foundation)  
“Producing the Finest Scientists for the 21st Century”  
Science 4, November 1994 741-743

S&E grads possess many of the traits and skills that are of highest value in the “real world”

Dr. Al Levin

Transferable skills

1. ability to function in a variety of environments and roles  
2. teaching skills; conceptualizing, explaining  
3. counseling, interview skills  
4. public speaking experience  
5. ability to support a position or viewpoint with argumentation and logic  
6. ability to conceive and design complex studies and projects  
7. ability to implement and manage all phases of complex research projects and to follow them through to completion  
8. knowledge of the scientific method to organize and test ideas  
9. ability to organize and analyze data, to understand statistics and to generalize from data  
10. ability to combine, integrate information from disparate sources  
11. ability to evaluate critically  
12. ability to investigate, using many different research methodologies  
13. ability to problem-solve  
14. ability to do advocacy work  
15. ability to acknowledge many differing views of reality  
16. ability to suspend judgment, to work with ambiguity  
17. ability to make the best use of “informed hunches”

Personal qualities

1. intelligence, ability to learn quickly  
2. ability to make good decisions quickly  
3. analytical, inquiring, logical-mindedness  
4. ability to work well under pressure and willingness to work hard  
5. competitiveness, enjoyment of challenge  
6. ability to apply oneself to a variety of tasks simultaneously  
7. thorough, organized and efficient  
8. good time management skills  
9. resourceful, determined and persistent (and able to live on $2K/month!)  
10. imaginative, creative  
11. cooperative and helpful  
12. objective and flexible  
13. good listening skills  
14. sensitive to different perspectives  
15. ability to make other people “feel interesting”

Employers in all fields are looking for people with these traits
20 successful S&E grads in non-academic careers were asked ... 

“Of the many skills you developed while in graduate school, which ones are the most valuable to you now?”

- Finding one’s own path and taking initiative with little assistance
- Ability to work in a high-stress environment
- Independence
- Maturity
- Computer skills
- Circumventing the rules
- Learning to seek out problems and solutions
- Ability to persuade
- Ability to create
- Ability to work productively with difficult people

and my favorite:

The ability and courage to start something even if you don’t know how yet

Employers in ALL sectors are hungry for people with these skills and qualities

What image does “Physicist” conjure?

The Curse of Being Smart

- We have become very highly skilled
- We can conceptualize
- We are used to knowing it all
- We are intellectually smart
- We are used to being exceptional

- We tend to value our skills the most
- We can conceive of complications
- We fear being the “dummy”
- We fail to appreciate other forms of smart
- We don’t like to fail

Match the Person and the Career

<table>
<thead>
<tr>
<th>Cell Biologist</th>
<th>Chemist</th>
<th>Astrophysicist</th>
<th>Biophysicist</th>
<th>Geologist</th>
<th>English</th>
<th>Plant Biologist</th>
<th>Theoretical Chemist</th>
<th>Geophysicist</th>
<th>Mathematician</th>
<th>Electrical Engineer</th>
<th>Medieval History</th>
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<tr>
<td>Science Media Entrepreneur</td>
<td>Congressional Staffer</td>
<td>Financial Analyst</td>
<td>Management Consultant</td>
<td>Rodeo Star</td>
<td>Experimental Physicist</td>
<td>Book Editor</td>
<td>Chancellor of Germany</td>
<td>Software Entrepreneur</td>
<td>High School Teacher</td>
<td>Secretary of Defense</td>
<td>Programmer</td>
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</table>

Match the Person and the Career: The Answers

- Cell Biologist — Science Media Entrepreneur
- Chemist — Congressional Staffer
- Astrophysicist — Financial Analyst
- Biophysicist — Management Consultant
- Geologist — Rodeo Star
- English — Experimental Physicist
- Plant Biologist — Book Editor
- Theoretical Chemist — Chancellor of Germany
- Geophysicist — Software Entrepreneur
- Mathematician — High School Teacher
- Electrical Engineer — Secretary of Defense
- Medieval History — Programmer

They do have ONE thing in common: They’re SMART ... like YOU!
The 80:10:10 rule

How will you grow and gain new skills if you don’t invest the time?
How will people know of your abilities if you don’t tell them?

"Opportunities are seldom labeled" - John Shedd

The skills that will REALLY count ...

Leadership
Persuasion
Humor
Tact
Understanding of Risk and Reward
Understanding of Investment and Return
Organization
Sensitivity
Drive
Perspective
Creativity

Good News: You can LEARN These!

"Give me ten people who have all of these skills and I could do anything"

Typical questions asked by Science grads facing an uncertain job market

“How do I get a job in ______?”
“How do I write a resume?”
“What jobs call for my skills?”
“What is the bathroom? I’m going to be sick!”

Better questions are:

What do I enjoy doing and what am I good at?
What are various career like?
What careers and jobs are a good match to my skills, interests, and values?
Who can I talk to?

Why are these questions better?

- Scientists and engineers (S&Es) are preoccupied with matching skills and ignore other important factors in choosing a career
- S&Es lack information and exposure to other career fields
- Career change for S&Es can be harder:
  - lack of an established pathway
  - fear/anger of getting a degree “for nothing”
  - ignorance/fear of life in the “real world"

If you don’t like what you do for a living, you probably won’t be very good at it

Steps in the Career Planning Process

Career development is a continual process
Career development is part of being a professional

most people think it starts here
but it really starts down here

Self-Assessment:

- Informal methods
  Initial brainstorming
- Self-guided methods
  Interest Exercises
- Formal methods
  Exams and Tests
  Career counseling

Make your neuroses work for you!
Initial brainstorming

- What do I enjoy doing most?
- What do I like most and least about my present career?
- What are my values?
- What do I like to read?
- What organizations or jobs sound interesting to me?
- When have I been my happiest at work?
- When have I been most unhappy?

Self-guided exercises

1. Make a two-column list of everything you can think of that you like and dislike about the academic career, and then assign priorities. What do you learn about your values, interests and skills as they affect the work and workplace?

Things I love about a research career
- Intellectual challenge
- Teaching
- Flexible work schedule
- Independence
- Smart colleagues
- Learning new things
- Collaborating

Things I hate about a research career
- Long hours
- Low pay
- Isolation
- Funding rat race
- Politics
- Arrogant colleagues
- Lack of teamwork

These differences are critical to career success and happiness

Self-Guided Exercises

Think back over the experiences you have had in your life - in the areas of work, leisure, or learning - and pick three to ten that have the following characteristics:

a. you were the chief or a significant player
b. YOU - (or the world or significant others) - regarded it as a success: you achieved, did, or created something with concrete results, or acted to solve a problem, or gave something of yourself that you are proud of and are pleased by
  c. you truly enjoyed yourself in the process.

List each of them, write why you consider it a success, and write a paragraph or two detailing the experience, step by step.

Formal methods of self-assessment

Myers-Briggs Type Indicator Test - analyzes your beliefs and interests and categorizes you into 1 of 16 personality types. Used to understand how individuals may work well or not well together.

Strong Interest Inventory - analyzes your interests and skills and compares them to representative people in a variety of careers and work environments.

Career Beliefs Inventory - assesses the sources of anxiety about jobs, careers and career change.

StrengthFinder – identifies the things you are BEST at (so you can play to your strengths)

What is a strength?

- The ability to provide consistent, near perfect performance in a specific given activity
- An activity that leaves you feeling strong
- A Strength is produced when a talent is refined with knowledge and skill
Exploring the World of Work

1. Keep your eyes and ears open
   - read the newspaper
   - talk to people
   - browse the Web
   - hear outside speakers

2. Build your skills base
   - stay conversant with the latest technologies
   - attend workshops
   - take a class or two outside your area

3. Build your NETWORK

Networking: Essential Career Tool #1

What is networking?

My definition:
Networking is developing relationships with people who share your professional and personal interests, and alerting them to your goals and abilities.

Networking: How most people get their jobs

Networking is not:
- Tiresome schmoozing for a job
- Restricted to the slick and superficial

As a young scientist you have been networking throughout your career, you just probably didn’t realize it!

Who is my Network?

Anybody you know and feel comfortable asking a specific favor from can be part of your Network:
- Schoolmates
- Recent graduates
- Collaborators
- Friends from High School or College
- Past bosses and colleagues
- Family
- People you meet at seminars, conferences and workshops
- Other people who are looking for jobs
- Anybody they know

Asking a favor

- Please introduce me to ___ who is in your network
- Please forward my (resume, latest reprint, etc.) to...
- Please provide a reference for me if ___ calls
- Can you tell me the latest about ___?
- Can you send me a copy of ___?

70% of your business connections will be made from ‘friends-of-friends’
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- Other people who are looking for jobs
- Anybody they know

The most valuable in your network are those already established in the career field that interests you and who are willing to give you help.

“The best preparation you can make toward the goal of having an [academic] career is to find yourself a “research aunt or uncle,” someone with little or no authority over you, who has enough experience to act as a sounding board and giver of accurate advice. Do not be shy about getting to know the people outside your advisor’s realm.”

Peter Feibelman, A Ph.D. is NOT Enough!

Your E-persona

- Facebook – for friends
- Linked In – for colleagues and professional friends
- Your/your group’s website
  - Post your papers
  - Post your bio
  - Don’t post your CV
- Vanity Google

You can link to me at Linked In (Peter Fiske – Put Your Science to WORK)
What do you want your image to be?

- What professional face do you want to project?
  - What are the consequences of choosing one part of your professional "façade" over another?
- What would a potential funder think when viewing your profile?
- What would a potential employer think when viewing your profile?
LinkedIn Etiquette

Rules to Link By

- Never Go Generic – when sending invitations, cordially explain the connection and motivation
  - Don’t use the automatic “link-to-everyone-in-my-contacts-list”
- Be timely – If you are going to seek a Link – do it within the first 24 ours of meeting the person
- Have a goal in mind
- Establish rules and stick to them
  - Fiske’s rules:
    - Always accept invites from people I have worked with, met in person, spoken to on the phone, had an exchange with on a chat room or LinkedIn Group or students from one of my classes
    - (Almost) always accept invites from people not in the above categories who provide a cordial and clear explanation for why they want to Link

How to get a meeting with a busy person

- Be persistent
- Make it easy for them
  - “I will come to your office/home/wherever…”
- Offer them something:
  - “I’d like to have coffee with you and pick your brain… In exchange, I will tell you everything I know about ___”
- Thank them
  - … and follow up a few months later with an update (very sticky!)

Constructing a bio

Business Cards

- Get a PROFESSIONAL looking card (spend the $)
- Talk to your Departmental Secretary or Campus Bookstore about logo and printing
  - 500 is usually the minimum
- Check out scannable versions

Business cards are a professional courtesy – and an indicator of professionalism
Focusing on Specific Opportunities:
Becoming an Insider on Every Job

Research your career field of interest as thoroughly as you research your science

Stalk your next job like a big game hunter

Techniques for getting on the inside track:
• Informational Interviewing
• Interning
• Volunteering
• Part-timing
• Moonlighting
• Consulting
• Incorporating the outside world in your research

Informational Interviewing

“Going directly to places where you would like to work is six times as effective as mailing out résumés and cover letters.”

Richard Bolles- What Color is Your Parachute

Advantages to Informational Interviewing:
• you are in control
• you can ask sticky questions that wouldn't be appropriate in a job interview
• you can see people in their actual work environment
• you can get feedback and advice
• you can make sure the work environment is right for you
• you can gain visibility
• you can practice being perfect for when it really counts

Informational Interviewing:
How do I get started?

• Get a point of contact through your network or the career planning and placement center you are using
• contact the person by phone or e-mail, explain that you want to learn more about the career field and that you got their name from _____. They may refuse or say that another person would be more appropriate. If so, contact that person and move forward.
• prepare some of your questions in advance - don't waste time: a typical informational interview is only 30 minutes. People do NOT enjoy answering questions that could or should have been investigated elsewhere
• questions asked usually pertain to:
  1. Required background and training
  2. Specific information regarding the career
  3. Personal experiences
  4. Advice
  5. Future trends

If you do well the person you talk to may end up being a useful part of your network

Informational Interviewing:
Some final advice

• Treat it like a formal interview for a job:
  -- do your homework
  -- think carefully about what you want to learn
  -- prepare questions
  -- act professionally
  -- write a thank-you note

• Do not treat it like a formal interview for a job:
  -- do not ask for a job, even indirectly
  -- do not speak with one person and assume you have the whole story

Why are people willing to be bothered?

• People like to “give back”
• People like talking about themselves
• Finding fresh talent is critical to an organization’s success
• Information transfer is a two-way process

The Science of Résumés and CVs

True or False:

The purpose of a résumé is to get you a job
A résumé is a description of all your past achievements and work history
An individual résumé can be sent out to many different employers without alteration
CVs and résumés are basically interchangeable

And now for the answers ....
The answers:

The purpose of a résumé is to get you an INTERVIEW, not a job.

A résumé is a description of those past experiences that are MOST relevant to the position being sought. A resume is as much about where you are going as it is where you have been.

You should adapt your résumé for each specific job opening and you should USE THE WORDS IN THE JOB DESCRIPTION as much as possible.

CVs and résumés are totally different documents and should NOT be used interchangeably. If you are uncertain whether an employer wants a CV or a résumé ASK THEM!

Action-rich past tense verbs:

<table>
<thead>
<tr>
<th>Management Skills</th>
<th>Research Skills</th>
<th>Technical Skills</th>
<th>Teaching Skills</th>
<th>Creative Skills</th>
<th>Financial Skills</th>
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<tr>
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The best resumes...

- The best resumes...
  - Connect clearly with the job being advertised
  - Highlight key accomplishments that are relevant to the position being sought
  - Are clearly laid out, easy to follow

- The best cover letters...
  - Are engaging, direct and well-written
  - Challenge the reader to rethink their preconceived notions of you
  - Explain the gaps and apparent mismatches

Resume and Cover Letter Advice

- On the web:
  - [http://www.nextwave.org](http://www.nextwave.org)
  - [Tooling Up](http://www.nextwave.org)
- Past columns:
  - How to Write a Winning Résumé
  - The Electronic Résumé Revolution
  - The Commandments of Cover Letter Creation

- On the bookshelf:
  - The Damn Good Resume Guide by Yana Parker

A methodology for answering questions: STAR

<table>
<thead>
<tr>
<th>Situation/Task:</th>
<th>Describe the situation you encountered. Give the background, and its relation to you.</th>
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<tbody>
<tr>
<td>Action:</td>
<td>Describe what YOU did to address the situation or solve the problem.</td>
</tr>
<tr>
<td>Result:</td>
<td>Describe the result of your actions.</td>
</tr>
</tbody>
</table>

Negotiating an offer

1. Delay the salary negotiations as long as possible - try not to get locked into a salary before you are offered a job

2. Value the offer fully. Consider these other parts of compensation:
   - health care
   - schedule of raises
   - bonus plan
   - commission plan
   - stock option
   - pension plan
   - profit sharing plan
   - employee education/tuition reimbursement
   - stability of company
   - dependent tuition reimbursement
   - paid parking
   - car provided
   - vacation
   - sick leave
   - maternity/paternity leave
   - flex time/alternative work schedule
   - anticipated work hours
   - relocation allowance
   - potential for advancement

[Get it in Writing]
Can you get the offer raised?

Consider the factors listed below. The more that are true, the greater your flexibility:

- You possess unique abilities
- They have few other candidates for the job
- The search has been going on a long time
- This is a unique position in the organization
- The organization is flexible in general
- You have other offers
- They really need someone soon

In contrast, you will have less flexibility to negotiate salary and benefits if the following are true:

- The job is at an entry level and similar to others in the organization
- The organization is highly structured and rigid
- The organization expects you will take what is offered

Some final advice on interviewing

- Arrive early–give yourself 10-15 minutes to sit and chill out
- Case the joint–If it is in a place you’ve never been before, swing by the day before just to make sure you know how to get there. The assurance of having been there before will help
- Bring along extra copies of your resume
- Give a good handshake–if you are unclear about what a good handshake is, go try out your handshake on your friends
- Make eye contact—one simple technique for ensuring that you have made good eye contact: make a mental note of the color of your interviewers eyes
- Ask questions—it’s better to be clear about the question at the start than go rambling down some tangent
- Be yourself–people tend to do a poor imitation of anything else but

Perceptions and Realities: Overcoming Stereotypes

According to business people, academics/scientists are:

- simple minded about money
- impractical about time
- no sense of deadlines
- socially passive
- value ideals as absolutes

Other potential perceptions to overcome:

- hermit vs. leader
- arrogant vs. team player
- rebel vs. organizer
- problem person vs. solution person

Don’t forget your own misconceptions...

Summing it all up: You must be a T-person

Adaptability, Problem-solving, Drive, Leadership

What your school can give you

What you must create for yourself

Myths and Realities of the Modern Job Market

Myth 1# Find a job that matches your skills
Myths and Realities of the Modern Job Market

Myth 1: Find a job that matches your skills

Reality #1: SKILLS, VALUES and INTERESTS are all critical aspects of finding a fulfilling career.

“You always end up overvaluing what you know and undervaluing what is out there in plain sight”

Thomas Friedman – The Lexus and the Olive Tree

Myth #2: Employers care only about technical skills

Reality #2: Employers care about lots of things in addition to skills:

- Personality
- Degree of Fit
- Learning Ability
- Leadership
- Communication Skills
- Persuasion Skills
- Drive

“We hire for attitude and train for skills”

VP for Product Development – Specialty Chemical Manufacturer

Myth #3: You should map out your career trajectory many years into the future

Reality #3: Serendipity, unplanned detours, and “setbacks” are inevitable. The people who can exploit chance opportunities, explore new areas and make the best of setbacks tend to be happier and more successful.

“Five years ago, I would never have predicted that I would end up here!”

Astrophysicist-turned-Financial Analyst

Some final thoughts

Job hunting in the new century involves personal connections, chance encounters, and random opportunities. The more people you know, the greater your “job cross section.”

Getting a job in science requires the same job hunting skills and techniques as any job (including getting a job in academia).

Thinking about finding a job is stressful, demoralizing and produces anxiety. Actually doing something about finding a job is liberating, empowering and fun.

You can serve science, your community, and your country in many different environments - don’t be afraid to consider a non-traditional career path just because it is unfamiliar to you, your advisor, your department or your family.