

Put Your Science to WORK: Practical Career Strategies for Scientists and Engineers

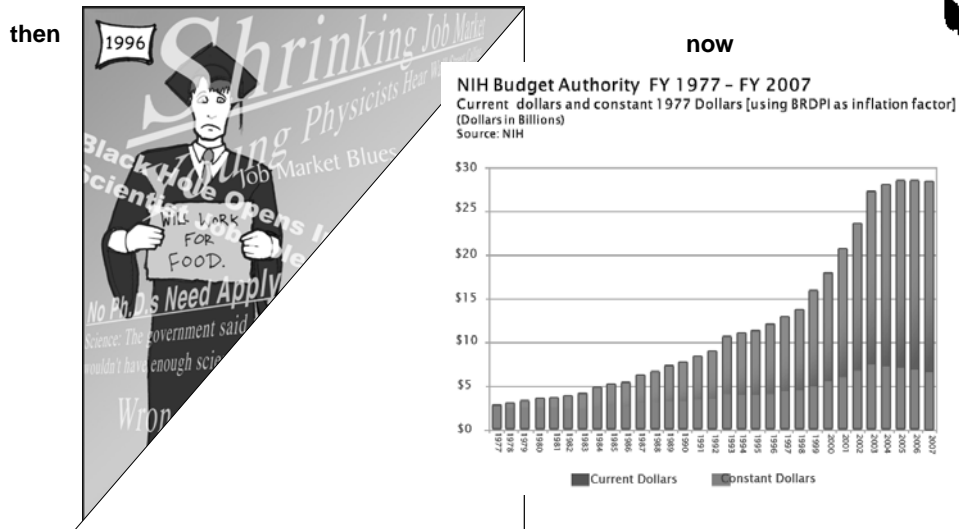


Dr. Peter S. Fiske
August 7, 2008



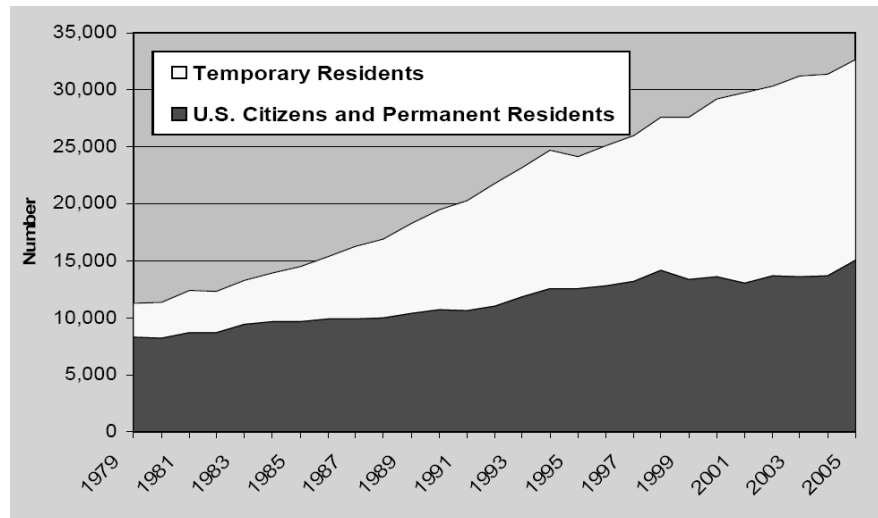
Sandia National Laboratory

Why am I here?



Copyright 2008 – Peter S. Fiske

Post-docs in the Biomedical Sciences...



Copyright 2008 – Peter S. Fiske

Source:

<http://www.nsf.gov/statistics/gradpostdoc>

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!

Copyright 2008 – Peter S. Fiske

Exploring outside of our own career field can be ...

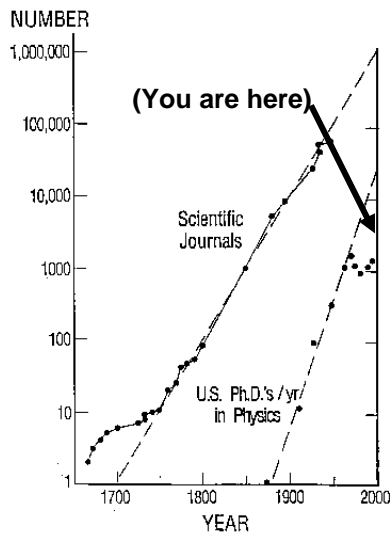


from page 163 of *L'atmosphère: météorologie populaire*, by Camille Flammarion, 1888.

**Frightening
Confusing
Amazing
Liberating
Empowering**

Copyright 2008 – Peter S. Fiske

Research science is changing ...



“With national laboratories being refocused and industry’s research and development laboratories being restructured and often attached to the corporate business units, newly minted Ph.D.’s more and more are facing the prospects of exploring non-traditional career paths.”

**Mary Lowe Good and Neal Lane
Producing the Finest Scientists and
Engineers for the 21st Century**

50th Anniversary of Sputnik

Copyright 2008 – Peter S. Fiske

More than the Job Market is Changing ...



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

Experience (matters most)
Independents (are everywhere)
Risk Management (is the smart thing)
Entrepreneurialism (is the safe bet)

Unfortunately, much of academia reinforces ...the OLD

Copyright 2008 – Peter S. Fiske

Now the Good news!



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. [Science-trained graduates] often don't realize the breadth of what they are capable of doing.

Neal Lane (Former Director, National Science Foundation)

We possess many of the traits and skills that are of highest value in the “real world”

Copyright 2008 – Peter S. Fiske

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"

Did you know a Science degree teaches you these things?

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

20 successful PhDs 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?"

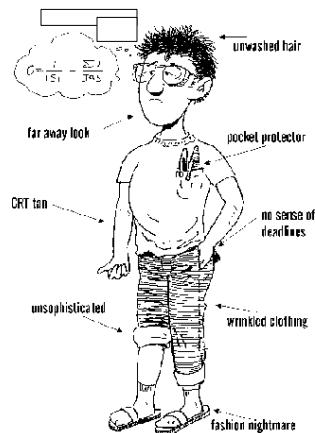
Finding one's own path and taking initiative with little assistance
Ability to work in a high-stress environment
Independence
Maturity
Computer skills
Circumventing the rules
Learning to seek out problems and solutions
Ability to persuade
Ability to create
Ability to work productively with difficult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

and my favorite:

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

Copyright 2008 – Peter S. Fiske

What image does the PhD conjure?



Copyright 2008 – Peter S. Fiske

The Curse of Being Smart



- | | | |
|------------------------------------|---|--|
| We have become very highly skilled | → | We tend to value our skills the most |
| We can conceptualize | → | We can conceive of complications |
| We are used to knowing it all | → | We fail to ask basic questions |
| We are intellectually smart | → | We fail to appreciate other forms of smart |
| We are used to being exceptional | → | We don't like to fail |

Copyright 2008 – Peter S. Fiske

Match the Person and the Career



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

Copyright 2008 – Peter S. Fiske

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
Oceanographer	_____	Acquisition Editor
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!

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

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”

Copyright 2008 – Peter S. Fiske

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?”

“Where 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?

Copyright 2008 – Peter S. Fiske

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!

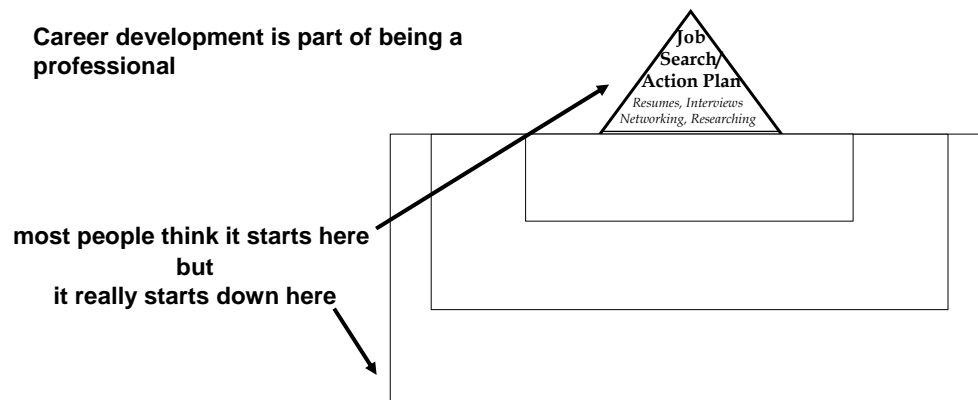
Copyright 2008 – Peter S. Fiske

Steps in the Career Planning Process



Career development is a continual process

Career development is part of being a professional



Copyright 2008 – Peter S. Fiske

Self-Assessment:



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



Make your neuroses work for you!

Copyright 2008 – Peter S. Fiske

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?

Career Development Journal

Copyright 2008 – Peter S. Fiske

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?
2. If you could live five lives simultaneously, and explore a different talent, interest, or lifestyle in each, what would you be in each of them?
3. 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 - (± the world or significant others) - regard 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.

Copyright 2008 – Peter S. Fiske

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.

Skills and Values Card Sorts - enables you to rank and examine the types of activities you find fulfilling and the skills you feel strongest in.

Your school's Office of Career Services has some of these (and others)... for free

Copyright 2008 – Peter S. Fiske

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**

Copyright 2008 – Peter S. Fiske

Networking: How most people get their jobs



Networking is:

Developing relationships with people who share your professional or personal interests

Alerting them to your career goals and abilities

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!**

Copyright 2008 – Peter S. Fiske

Who is my Network?



Anybody you know and feel comfortable talking to
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

and

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

Copyright 2008 – Peter S. Fiske

“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!



Copyright 2008 – Peter S. Fiske

Another Resource: ScienceCareers.Org



www.nextwave.org (now merged with ScienceCareers.org)

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

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
they may learn something important from you

Copyright 2008 – Peter S. Fiske

Becoming an insider through ...



- Internships
- Volunteering
- Part time work
- Moonlighting
- Consulting
- Incorporating outside topics into your research

Academic and national Lab job searches can utilize many of these same “insider” strategies

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

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!

Copyright 2008 – Peter S. Fiske

Resume and Cover Letter Advice



On the web:

<http://www.nextwave.org>
Tooling Up

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

Don't give "salary history" or "expected salary"... even when asked!

Copyright 2008 – Peter S. Fiske

A methodology for answering questions: STAR



Situation/Task: Describe the situation you encountered.
Give the background, and its relation to you.

Action: Describe what YOU did to address the situation
or solve the problem.

Result: Describe the result of your actions.

Copyright 2008 – Peter S. Fiske

What shouldn't they ask?



These types of questions are legally off-limits in a job interview:

- your religion, political beliefs or affiliations
- your ancestry, national origin or parentage
- the naturalization status of your parents, spouse or children
(they can ask whether or not you are a U.S. citizen or the status of your visa)
- your birthplace
- your native language (they can ask about the languages you
claim to speak on your resume)
- your age, date of birth or ages of your children (they can ask whether
or not you are over 18)
- your maiden names, or whether you changed your name, your marital
status, number of children or spouses occupation (this is the most
commonly encountered illegal question asked of female job applicants)

Copyright 2008 – Peter S. Fiske

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!

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

Perceptions and Realities: Overcoming Stereotypes

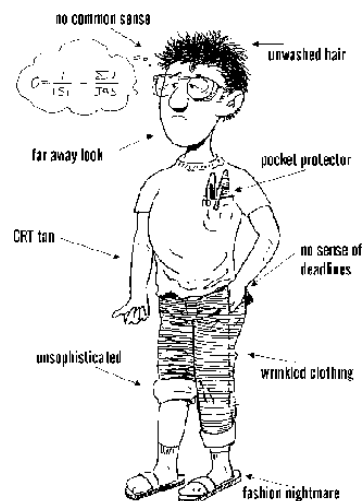


According to business people, academics/scientists are:

- 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



Copyright 2008 – Peter S. Fiske

Don't forget your own misconceptions...



Copyright 2008 – Peter S. Fiske

Myths and Realities of the Modern Job Market



Myth 1# Find a job that matches your skills

Copyright 2008 – Peter S. Fiske

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

Copyright 2008 – Peter S. Fiske

Myths and Realities of the Modern Job Market



Myth #2: Employers care only about technical skills

Copyright 2008 – Peter S. Fiske

Myths and Realities of the Modern Job Market



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

Copyright 2008 – Peter S. Fiske

Myths and Realities of the Modern Job Market



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

Copyright 2008 – Peter S. Fiske

Myths and Realities of the Modern Job Market



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

Copyright 2008 – Peter S. Fiske

Some final thoughts



1. Job hunting in the new century involves personal connections, chance encounters, and random opportunities.
2. The more people you know, the greater your "job cross section."
3. Getting a job in science requires the same job hunting skills and techniques as any job (including getting a job in academia).
4. Thinking about finding a job is stressful, demoralizing and produces anxiety. Actually doing something about finding a job is liberating, empowering and fun.
5. The more you enjoy what you are doing the better you'll do it.
6. 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.

Copyright 2008 – Peter S. Fiske

This is a carbon-neutral presentation!



www.terrapass.com

	AROUND TOWNER	CROSS TOWNER	OUT OF TOWNER	ROAD TRIPPER
CO2 REDUCED:	<input type="radio"/> 6,000 LBS	<input type="radio"/> 8,000 LBS	<input type="radio"/> 12,000 LBS	<input type="radio"/> 20,000 LBS
EXPIRES:	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC / 2008			

Drive to SNL (60 miles)

100 lbs

Copyright 2008 – Peter S. Fiske

Further information and resources



**Peter Fiske's new
columns at
ScienceCareers.org:
"Opportunities"**

[Master of Disaster](#)
19 October 2007
[The Curse of Brains](#)
2 February 2008
[The Golden Chapter](#)
20 November 2007
[Walking on the Dark Side](#)
19 October 2007
[The Most Important Venture
Capitalist](#)
14 September 2007
[The Power of Poverty](#)
10 August 2007
[The Accidental Consultant](#)
13 July 2007
[From PDF to IPO, One Scientist's
Journey](#)
8 June 2007

[More School?](#)
11 May 2007
[A Day in the Life, Part 2](#)
13 April 2007
[Breadth Versus Depth](#)
9 March 2007
[A Day in the Life](#)
16 February 2007
[Insubordination](#)
12 January 2007
[Intellectual Property, Part 2](#)
8 December 2006
[Intellectual Property, Part 1](#)
10 November 2006
[Stealing Time](#)
13 October 2006
[Opportunities](#)
8 September 2006

Engineering Scientists – a blog on science employment trends, public policy and economics (with Dr. Geoff Davis) – at <http://blog.phds.org>

Copyright 2008 – Peter S. Fiske