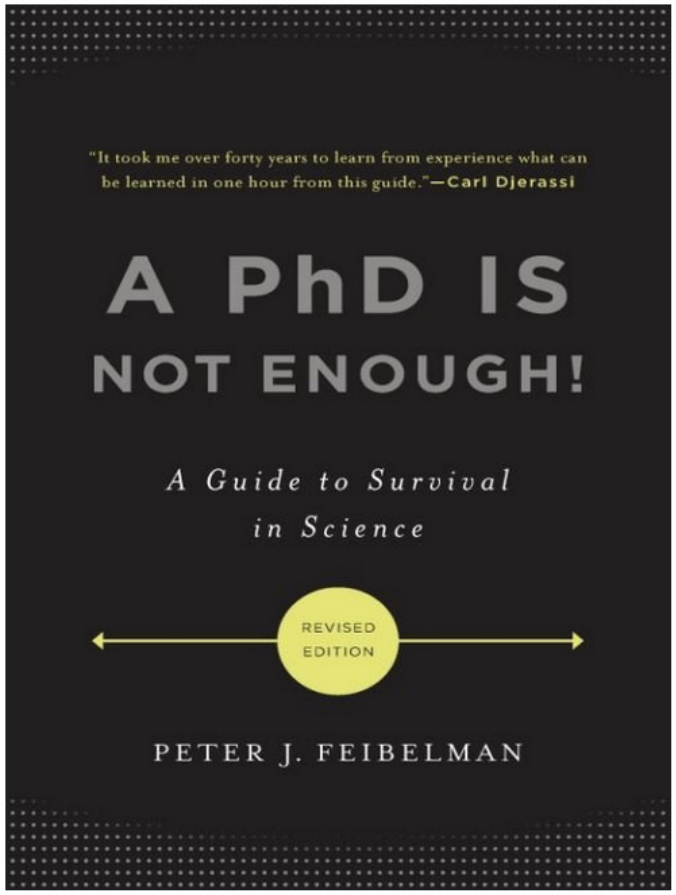
A Beginner's Guide to Survival in Science

Special Student Talk

July 19, 2012



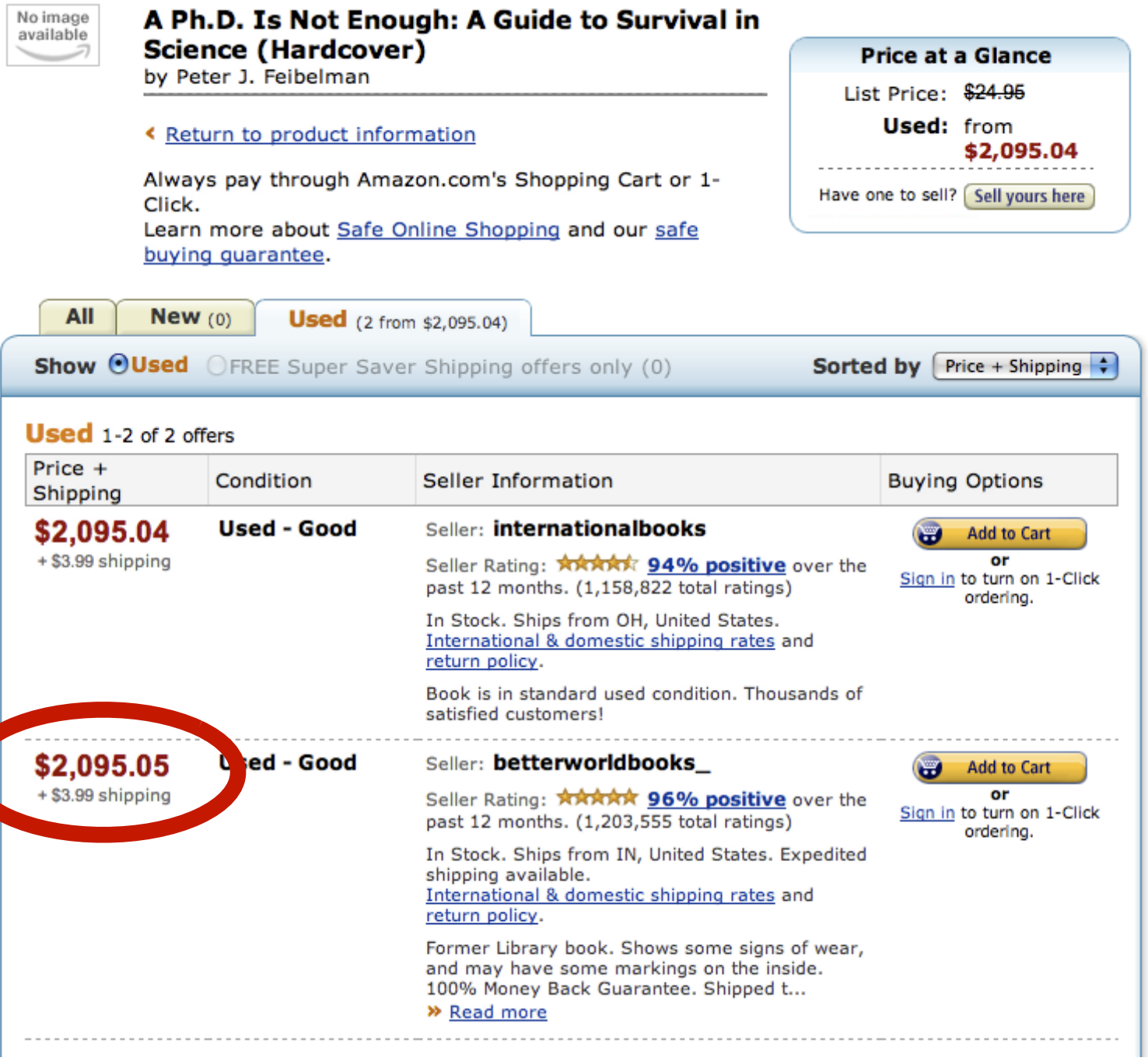
Jaideep Singh

jsingh@anl.gov

Argonne NATIONAL LABORATORY

Atom Trapping Group
Medium Energy Physics Group
Physics Division

In the past, I used to give these books away for free...



Disclaimers

(*) A lot of this talk uses examples from physics, but I believe that *the most important points are universal*.

(*) The *opinions* I've formed on these matters are derived from my experience, conversations with friends/mentors/colleagues, and stuff I've read from books/internets.

(*) If you find something useful, *then take it & share it!* Otherwise, feel free to ignore it.

(*) My plan is to be intentionally provocative in order to make you think about your career!

Short Version of This Talk

1a. You should **NOT** go to grad school, *unless*...

1b. Grad school is *not* school.

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2b. *Master* your craft.

2c. *"The goal of grad school is To Graduate."* - T. Gallagher

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2b. *Master* your craft.

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3a. Find a mentor.

3b. Take ownership of *your* research & career.

3c. Become known for something:

Step 1: Do something - requires lots of hard work!

Step 2: Make sure the appropriate people know about it.

see also Terrence Tao (UCLA): http://terrytao.wordpress.com/career-advice/

Path to Becoming a Research Scientist

0. Graduate School

a. Does it make sense to go?

b. 1-2 yrs of classes, then the Qualifier - will you pass it?

c. N years of research - how long will this take?

1. Postdoc

a. temporary 1 yr position, renewable up to ~3 yrs

b. Why does this position exist?

c. How many will you have to do?

2. Obtain a tenure-track/permanent position

a. How many people are you competing with?

b. How many new positions are there each year?

3. Get Tenure/Establish Yourself

a. How long do you have & what are your chances?

b. What happens if you don't get Tenure?

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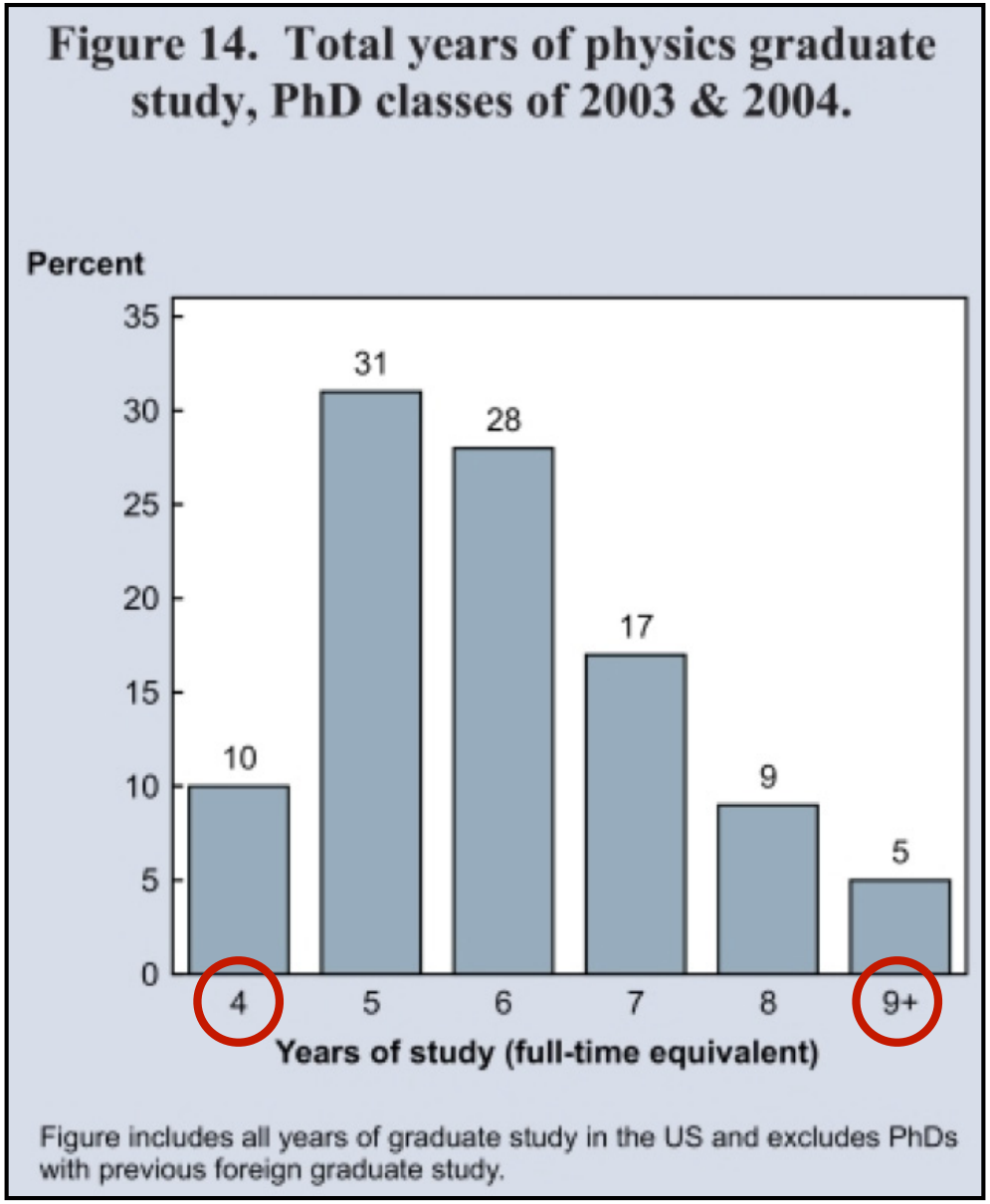
How long does it take to get a PhD?

phd comics by jorge cham

http://www.phdcomics.com/comics/archive.php?comicid=125

"I've been here five years!?"

How long does it take to get a PhD?



AIP Statistical Research Center
http://www.aip.org/statistics/trends/grad_support.html

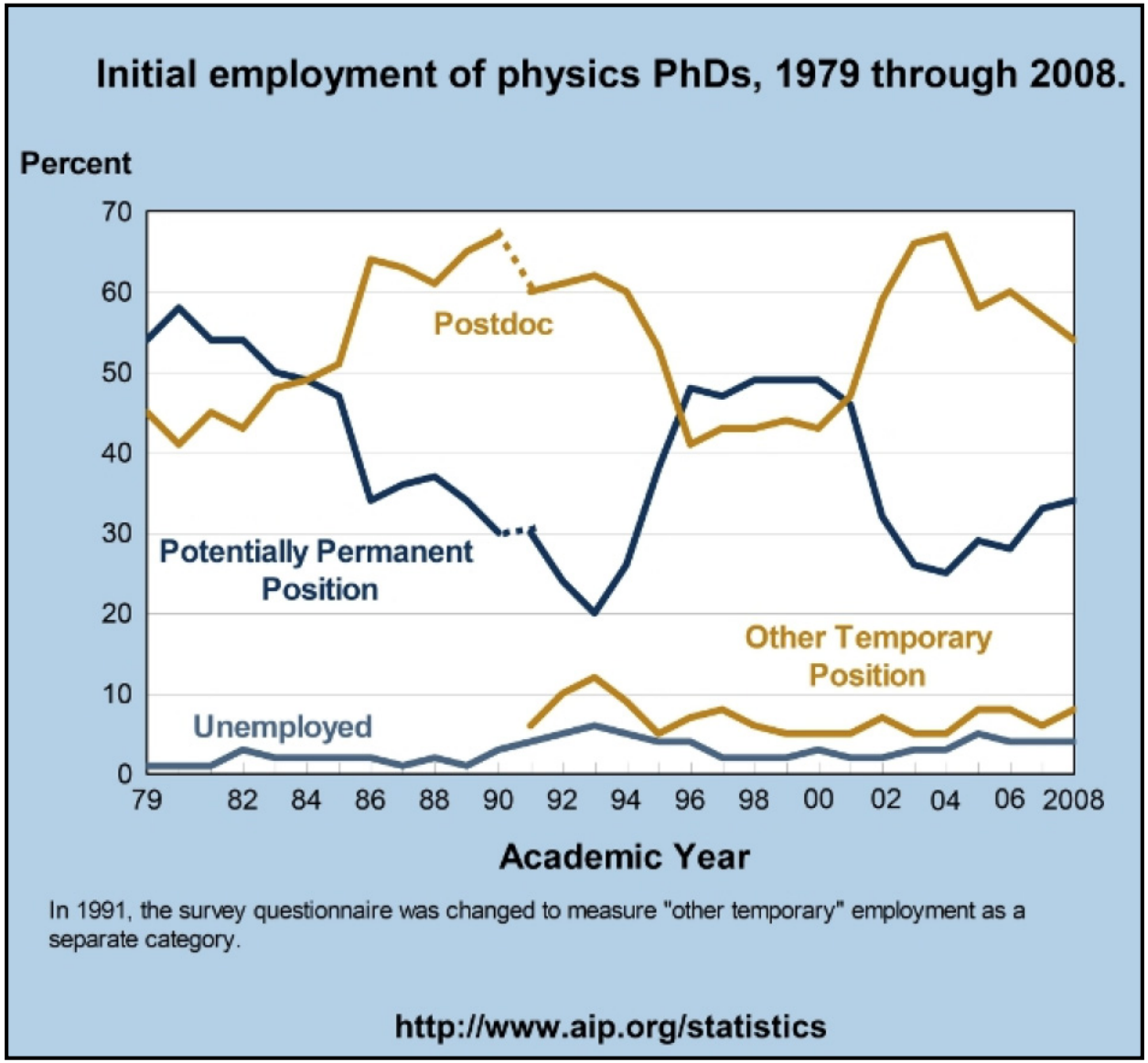
On average, ~6 yrs!

How many Postdocs will I have to do?

phd comics by jorge cham

http://www.phdcomics.com/comics/archive.php?comicid=125

How many Postdocs will I have to do?



AIP Statistical Research Center

A *long* time ago, the answer used to be <=1!

How many Postdocs will I have to do?

Academic Background of New Physics Faculty, 2007-08
for Tenured and Tenure-Track Hires*

	Highest Degree Awarded	
	PhD (%)	Bachelor's (%)
Earned PhD in US within last 5 years	44	55
Earned PhD outside US, any year	30	16
Earned PhD in US > 5 years ago; prior academic employment	22	29
Earned PhD in US > 5 years ago; prior employment outside academia	5	1

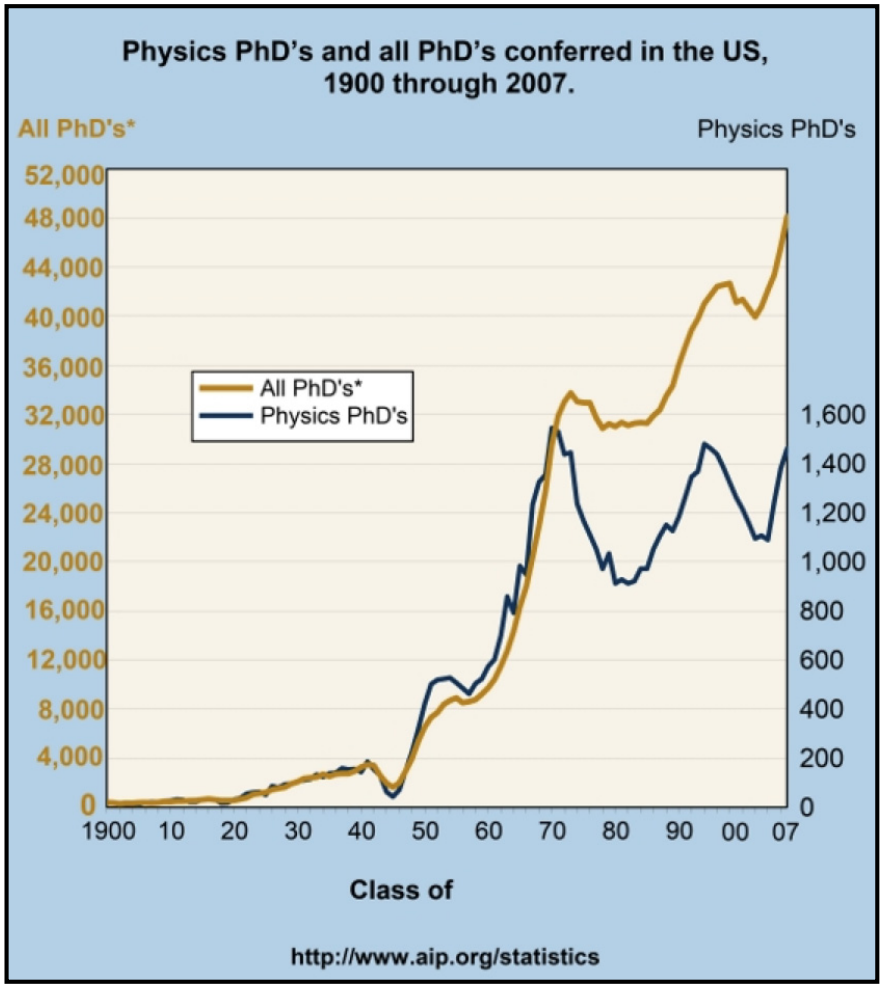
*Includes permanent non-tenured faculty at schools without tenure.

http://www.aip.org/statistics

AIP Statistical Research Center

(~4-6 yrs from PhD)/(~2-3 yrs per Postdoc) = ~2

Odds for a "Permanent" Position?



AIP Statistical Research Center

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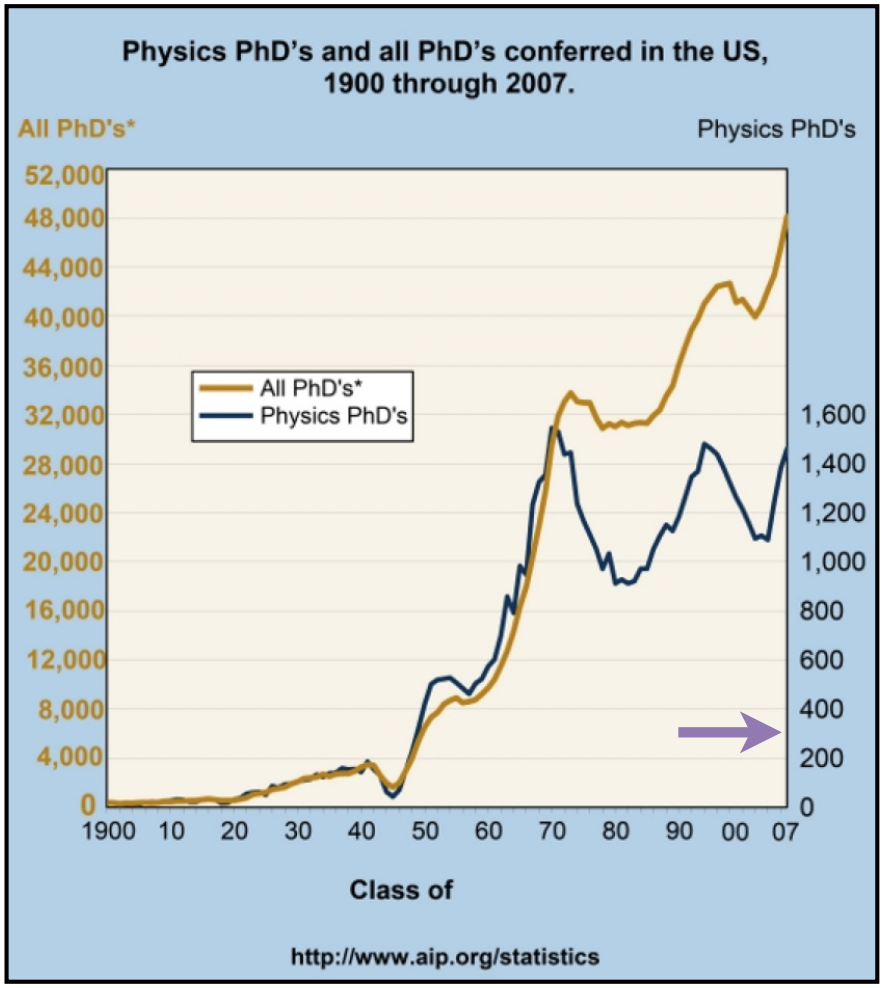

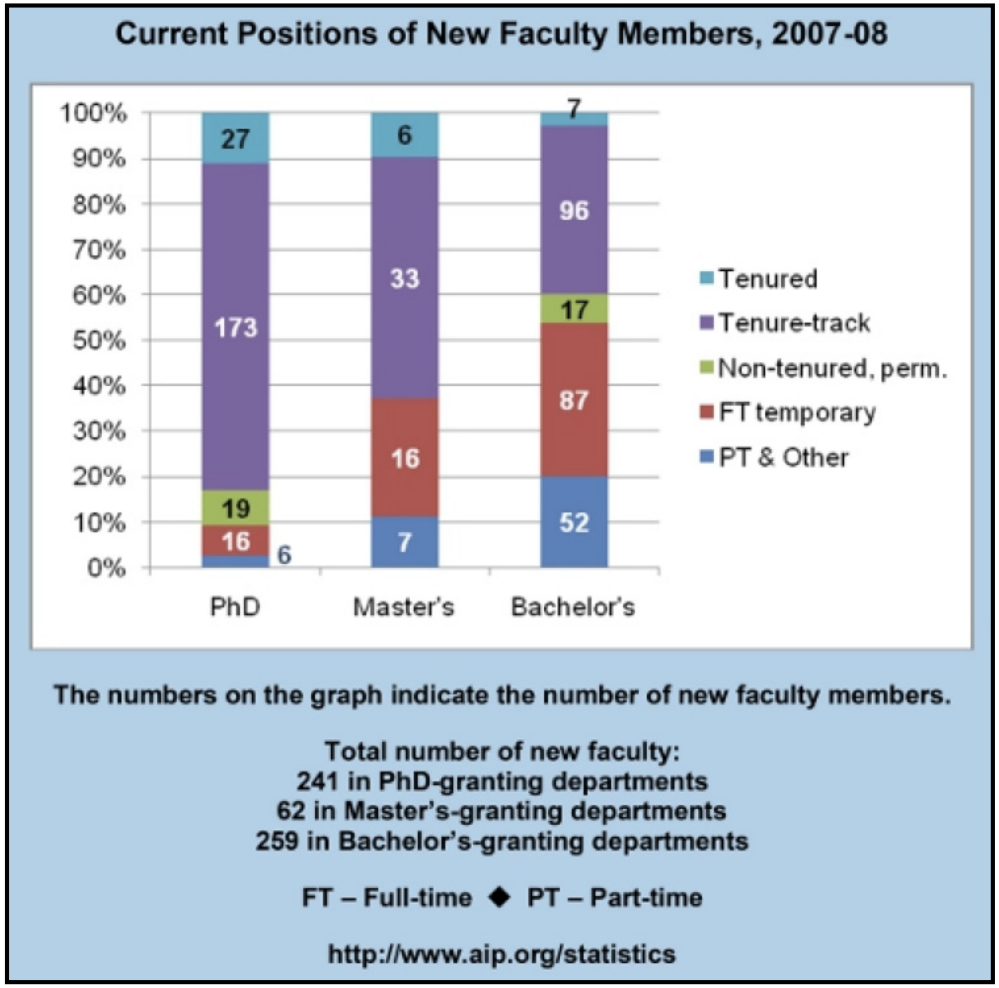

AIP Statistical Research Center

(300 new "permanent" faculty)/(1500 new PhDs) = ~20%

Tenure: How Long & How Likely?

School *Program*	% receiving Tenure	Mean yrs to Tenure
Virginia[1] *Physics*	78%	~6
Penn State[2] *All Fields*	55%	~6
Yale[3] *Physical Sciences*	27%	7.4

[1]based on my memory from 2000 to 2010

[2]M. J. Dooris & M. Guidos, Tenure Achievement Rates at Research Universities (May 2006)
http://www.psu.edu/president/pia/planning_research/reports/AIR_Tenure_Flow_Paper_06.pdf

[3]J. Butler, P. Salovey, et al., The Report of the Faculty of Arts and Sciences Tenure and Appointments Policy Committee (Feb 2007)
http://www.yale.edu/gateways/fas_tenure_report.pdf

Career Outcomes for Physics PhDs

Year of PhD	Work Activity					
	Teaching	Research - Academic	Research - Government/ Non-Profit	Research - Industry	Applications	Managing/ Supervising
1946 – 1965	22%	21%	7%	20%	16%	10%
1966 – 1970	25%	11%	7%	17%	23%	16%
1971 – 1975	18%	8%	10%	14%	31%	19%
1976 – 1980	12%	7%	18%	16%	26%	18%
1981 – 1985	13%	19%	12%	19%	22%	14%
1986 – 1990	20%	15%	15%	14%	25%	9%
1991 – 1995	14%	13%	8%	21%	35%	8%
1996 – 2000**	16%	11%	5%	26%	36%	4%

AIP Statistical Research Center
http://www.aip.org/statistics/trends/reports/careerphd.pdf

Career Outcomes for Physics PhDs

Year of PhD	Employer Type		
	Industry	Academe	Government, Non-Profit, Hospital
1946 – 1965	36%	49%	15%
1966 – 1970	38%	42%	20%
1971 – 1975	45%	31%	23%
1976 – 1980	46%	28%	26%
1981 – 1985	47%	34%	18%
1986 – 1990	41%	36%	21%
1991 – 1995	56%	28%	15%
1996 – 2000**	57%	31%	10%

AIP Statistical Research Center
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My buddies went to grad school...

Two of my closest friends treated going to grad school as the *default alternative* to "the real world."

They saw grad school as *hitting the snooze button on life*!

My buddies went to grad school...

Two of my closest friends treated going to grad school as the *default alternative* to "the real world."

They saw grad school as *hitting the snooze button on life*!

They took *8 & 11 years to finish* and are currently working for two of the biggest aerospace/defense firms.

Little of the technical training they received in grad school is relevant to their present jobs.

A PhD is *not a requirement* for their jobs and it *has not* opened any new doors for them.

What did grad school cost them?

phd comics by jorge cham

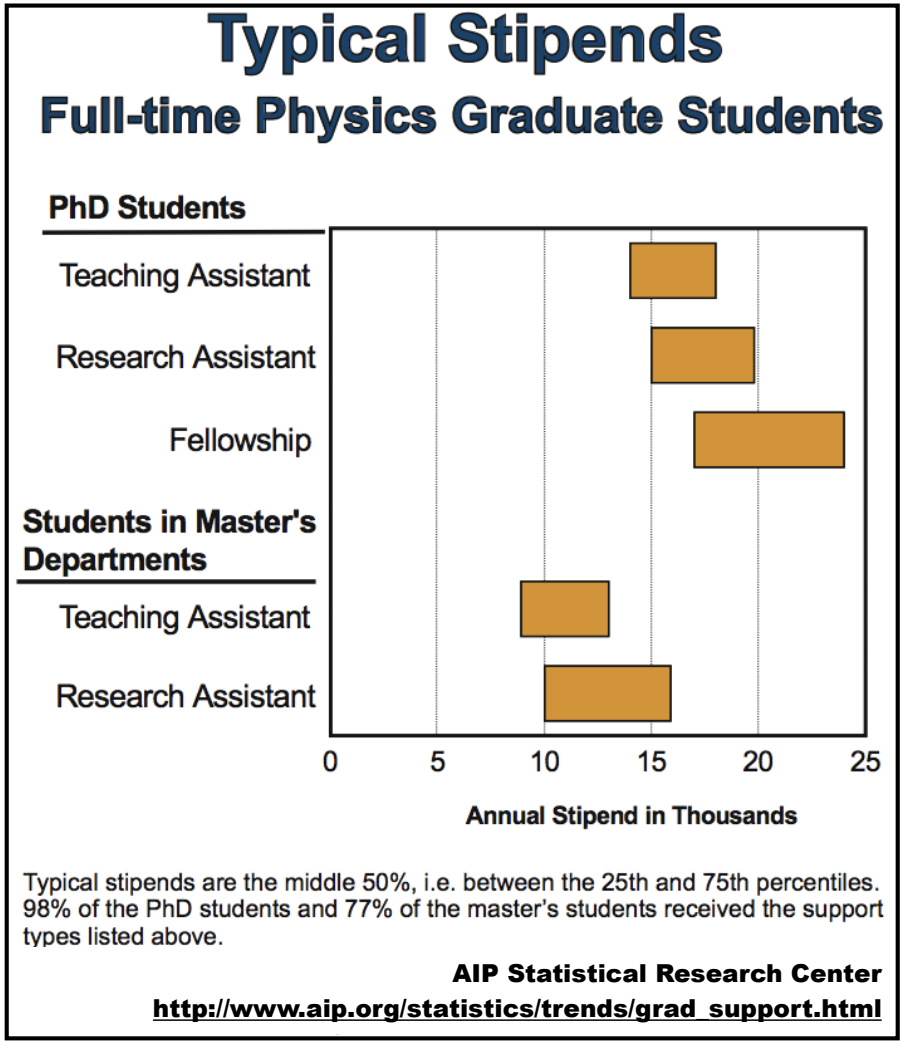
http://www.phdcomics.com/comics/archive.php?comicid=3

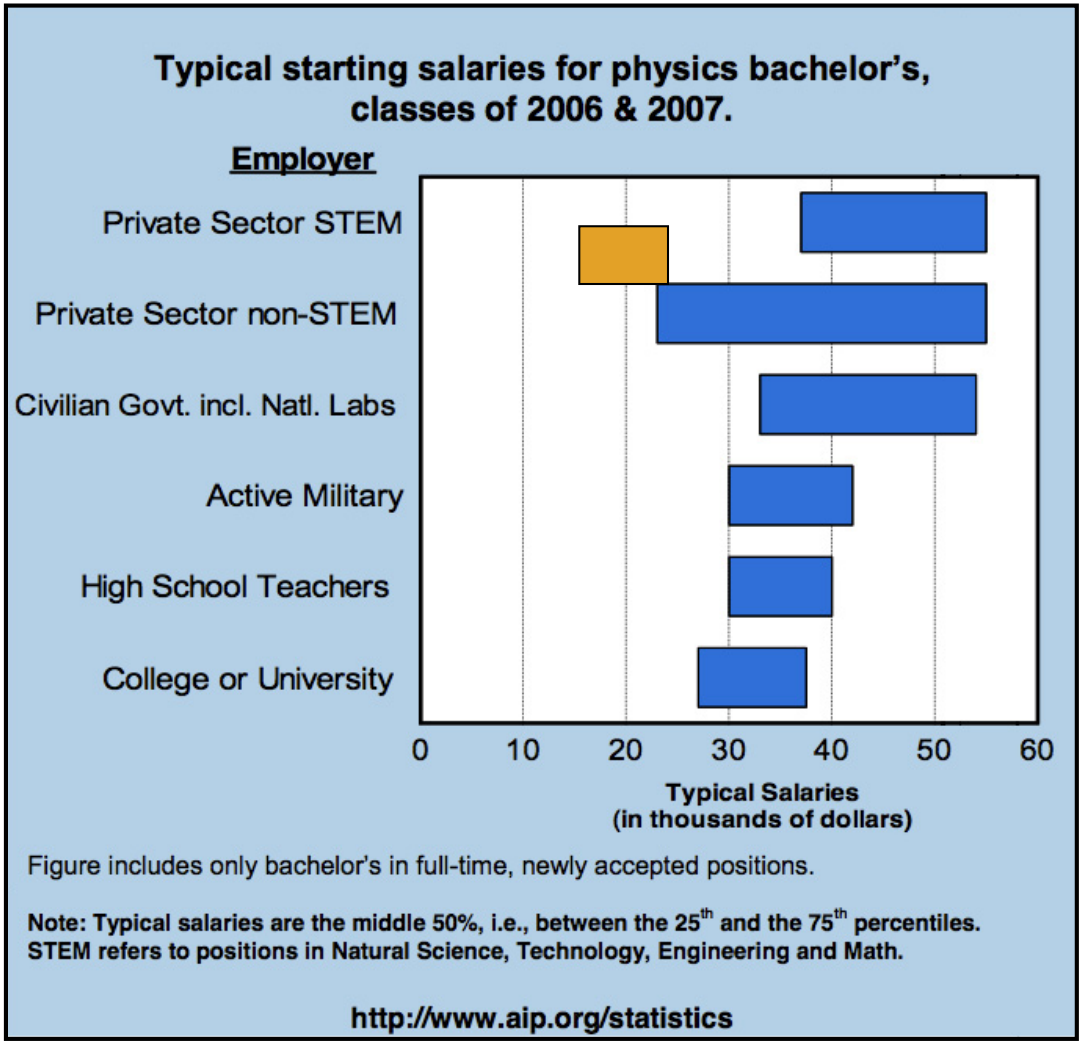
"Why are we submitting ourselves to grad school instead of working out there, getting rich, getting enough sleep, and actually enjoying life?"

What did grad school cost them?

~10 yrs of their life @ ~($45k minus $20k)/year

= a quarter of a million dollars!





STEM = Science, Technology, Engineering, Math

"Postdoc" until you are 45!

Median 12 month salary as of 2006 estimated by "eye"

Academia	*Salary*	*Industry*	*Salary*
Graduate Student	$20k	Starting w/ B.S.	$45k
Postdoc	$50k	Starting w/ M.S.	$60k
Untenured Faculty	$70k	Starting w/ Ph.D.	$80k
Tenured Faculty	$100k	Established w/ Ph.D.	$120k

AIP Statistical Research Center **http://www.aip.org/statistics**

True Facts to Consider

(*) After ~17 yrs, less than 1 in 5 students entering graduate school now will be tenured professors (research universities + liberal arts colleges).

(*) After ~12 yrs in industry or other fields (eg. law & medicine), relative job security + median salary ($120k to 160k) is achieved.

AIP Statistical Research Center http://www.aip.org/statistics
Association of American Medical Colleges http://www.aamc.org/students/considering/exploring_medical/
National Association of Legal Professionals http://www.nalp.org/research

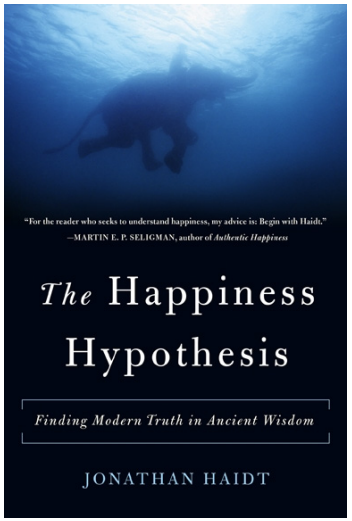
"If you can picture yourself doing something else, then you should probably consider doing that instead."
- adapted from N. Fomin via G. Greene

Why Choose Science?

phd comics by jorge cham

http://www.phdcomics.com/comics/archive.php?comicid=679

Why Choose Science?



Because it makes you happy, of course!

Haidt's Formula for Happiness (H):

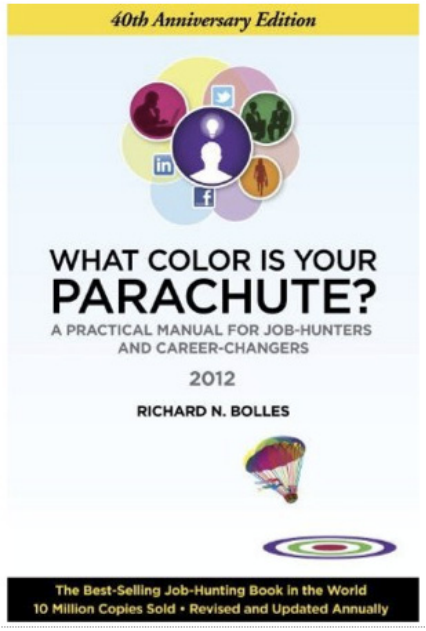
$$H = S + C + V$$

Haidt, Jonathon, The Happiness Hypothesis: Finding Modern Truth in Ancient Wisdom, Basic Books: New York (2006).

S	biological **S**et point	40%	no direct control	genetic factors, brain chemistry, etc.
C	living **C**onditions	10%	some control	race, gender, wealth, number of fingers, length of commute, fame, city, etc.
V	**V**oluntary activities	50%	total control	time spent with family / friends, hobbies, exercise, **your "calling"**

Why Choose Science?

job $\leq$ career $\leq$ "calling"



What is your "calling"?

start by working out the exercises in:

Bolles, Richard N., What color is your parachute? (2012 Edition) Ten Speed Press: Berkeley, CA (2012)

Dyson, Freeman, Science as a Craft Industry, Science 15 May 1998: Vol. 280 no. 5366 pp. 1014-1015

If Science is your "calling" in life: ***go for it!***

Obtaining job security in science can be a very long and very competitive marathon. To survive, you must have a passion for it!

Before Applying to Grad School

1. Develop a plan

2. Score sufficiently high on the GRE Physics

3. Demonstrate interest & aptitude for scientific research

phd comics by jorge cham **http://www.phdcomics.com/comics/archive.php?comicid=783**

see also: Cosmic Variance: 2008-01-29: "The Other Side of Graduate Admissions" by Julianne Delcanton
Cosmic Variance: 2005-12-20: "Unsolicited advice, 1: How to get into graduate school" by Sean Carroll

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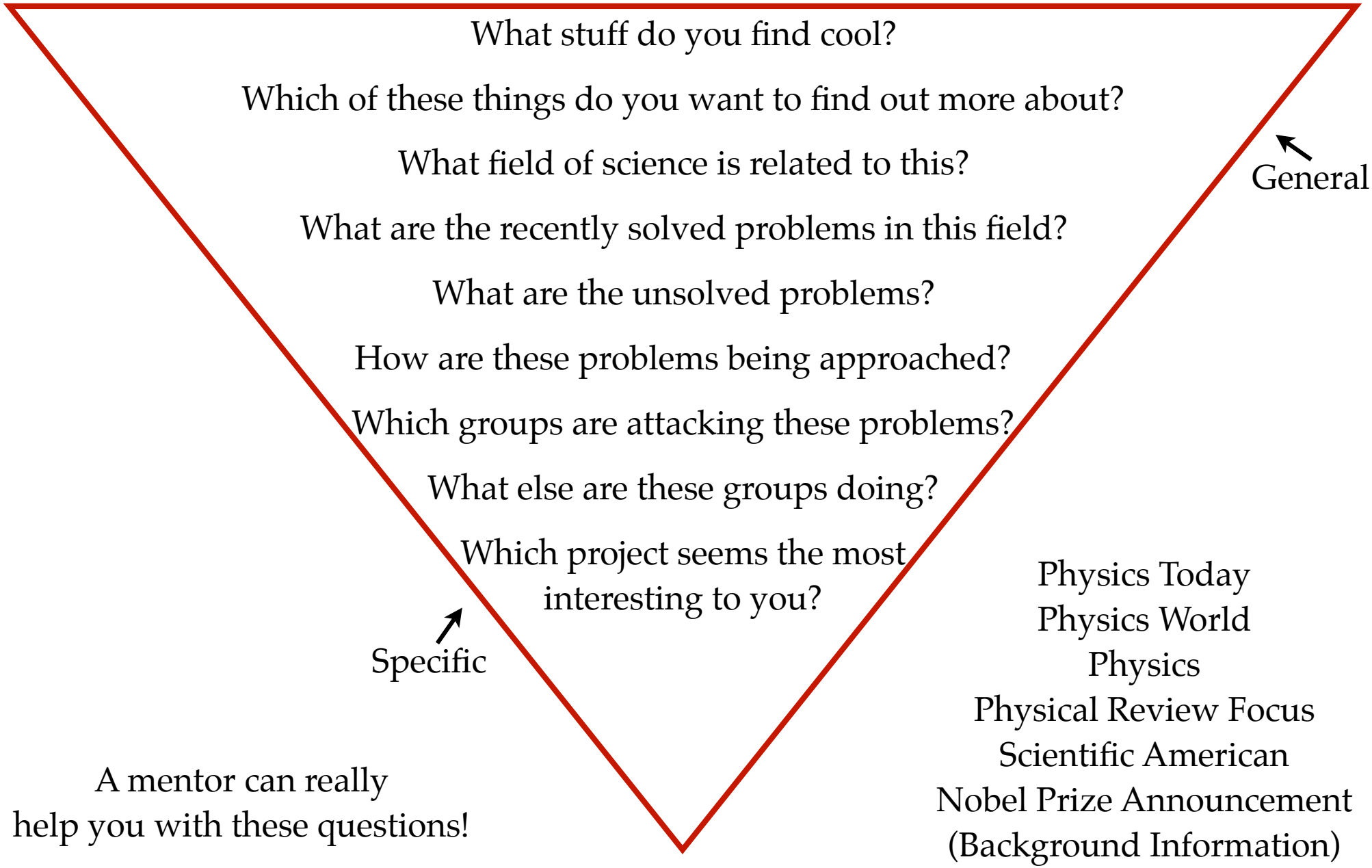
The graduate admissions committee is composed of faculty from the department that you are applying to. They are trying to answer two questions about you:

1. Will you pass the qualifying exam?
2. Will someone take you into their group and fund you?

see also: Cosmic Variance: 2008-01-29: "The Other Side of Graduate Admissions" by Julianne Delcanton
Cosmic Variance: 2005-12-20: "Unsolicited advice, 1: How to get into graduate school" by Sean Carroll

How to Develop a Plan: One Approach...



A mentor can really help you with these questions!

Physics Today
Physics World
Physics
Physical Review Focus
Scientific American
Nobel Prize Announcement
(Background Information)

see also: Cosmic Variance: 2006-03-29: "Unsolicited advice, Part deux: Choosing a grad school" by Sean Carroll

GRE Score = Ability to Pass Qualifier

"top 10"	Caltech, Princeton, Chicago	80th percentile
"top 25"	Penn, Wisconsin	65th percentile
"top 100"	Virginia	25th percentile

from respective websites and my own memory

(*) A theorist is expected to score much higher (10%+)

(*) This test is about speed and test taking skills. Practice!

http://onphysicsbooks.blogspot.com/2009/01/studying-for-physics-gre.html
http://www.wm.edu/research/ideation/science-and-technology/a-matter-of-timing-student-aces-physics-gre.php
http://fliptomato.wordpress.com/2006/09/13/the-physics-gre-a-guide-for-undergrads/
also several websites for run by Society of Physics Students

"Performing well on the physics GRE requires putting some time into it, an investment that reveals discipline and commitment, which are both good indicators of future success."

- Princeton Physics Graduate Admissions

http://www.princeton.edu/physics/academics/graduate-program/graduate-admissions/

Demonstrating Interest & Aptitude

1. Have some undergraduate research experience

2. Contact groups you are interested in

phd comics by jorge cham

http://www.phdcomics.com/comics/archive.php?comicid=16

3. Tailor your personal statement to each department

Demonstrating Interest & Aptitude

1. Have some undergraduate research experience

2. Contact groups you are interested in

-Don't waste their time! Do your homework beforehand!

-Read their CV, website, some of their papers

-Send email, say who you are, thinking about applying to grad school, learn more about their work, mention that you've already had a looks at some of their papers

-Ask if you can chat over the phone (or meet at conference if applicable)

-Ask for no more than 30 minutes of their time

-Be patient and polite, faculty are very busy!

-Keep conversation focused on learning about the research

-Are there are new projects that are going to be starting up in the next couple of years?

-Does this person have a passion for their work?

-Thank them for their time (also via email afterwards)

-The goal is to find out if their research is something that you want to participate in

3. Tailor your personal statement to each department

Hope for the best, plan for the worst

1. Only apply to places that would actually attend

2. Make sure each department has ~3 groups that you would be willing to work for

3. Ask for an honest assessment about your application from a faculty member on your own home institution's graduate admissions committee

4. If you don't get in:
   -have a backup plan in place beforehand
   -find out your weaknesses and strengthen them
   -see if one of the groups that you are interested in is willing to take you up for a year in a "lab tech" capacity

Choosing a Research Advisor/Group

1. Do your homework! Do not waste people's time!
2. Contact the group that you are thinking about joining
3. Talk to current/former students - *"Do they understand the big picture?"* (p. 30-31)
4. Find out where former postdocs/students are
5. Find out what lab culture is like from other students
6. Try the lab out for a summer
7. Are your personalities compatible?
8. Work for an established person

   "more readily gives you credit and promotes you"

   "has a network of colleagues that you can tap into" (p. 28)

Choosing a Thesis Project

	Large Contribution	Small Contribution
High Profile Project	?	?
Low Profile Project	?	?

should be: not impossible + funded + publishable in 3 yrs

Choosing a Thesis Project

	Large Contribution	Small Contribution
High Profile Project	1	?
Low Profile Project	?	4

should be: not impossible + funded + publishable in 3 yrs

Choosing a Thesis Project

	Large Contribution	Small Contribution
High Profile Project	1	3
Low Profile Project	done something > being known 2 *note: become known in your dept.*	4

should be: not impossible + funded + publishable in 3 yrs

Meet With Your Research Advisor Weekly

phd comics by jorge cham

http://www.phdcomics.com/comics/archive.php?comicid=382

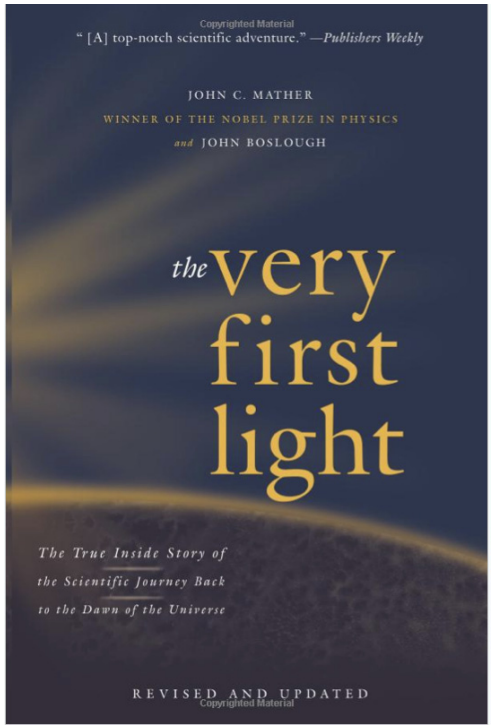
Make detailed notes of your discussion and then email them to all relevant parties to insure that everyone is on the same page - (also a time management tip!)

Find a Mentor (easier said than done...)

Dilbert by Scott Adams **http://dilbert.com/strips/comic/2009-09-16/**

The qualities of a good mentor:

1. *"little or no authority over you"* (p.17)
2. *"enough experience to give accurate advice"*
3. honest, forthright, trustworthy
4. willing to make time for you



Boslough, J. and J. Mather, The Very First Light, Basic Books:New York (2008)

"Good" Students Get "It" On Their Own

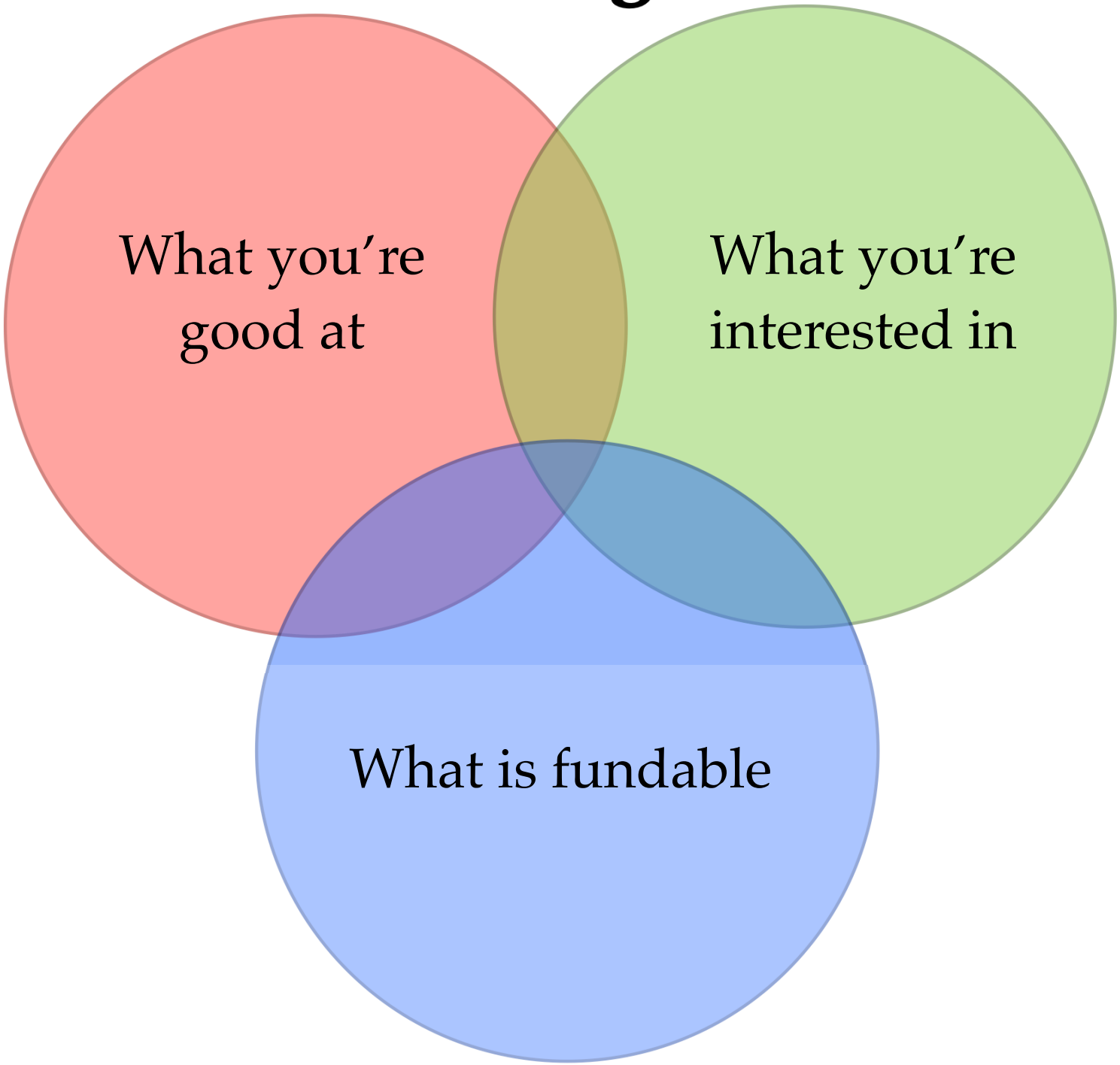
There are more qualified people than there are positions!

You will learn the technical skills, but what about the "other stuff?"

Other stuff ("Science Survival Skills") is rarely taught because the "good" ones figure it out on their own. (But what happens to the "bad" ones . . .) **A PHD Is Not Enough!**

"This book is meant for those . . . who naively suppose that getting through graduate school, doing a postdoc, etc., are enough to guarantee a scientific career." **A PHD Is Not Enough!**

What is "It" good for?



Build an Exhaustive Bibliography

Very useful when you are writing papers, your dissertation, review articles, grant proposals, etc.

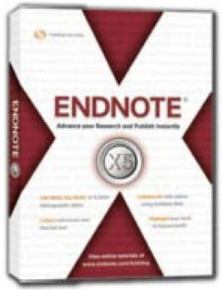
Knowing the literature gives you a better understanding of where your works fits into the big picture.

phd comics by jorge cham **http://www.phdcomics.com/comics/archive.php?comicid=286**

Use a program like Papers or Endnote.

Instrumental to the development of the Quark Model. See G. Zweig's "Origin of Quark Model"

http://authors.library.caltech.edu/18969/



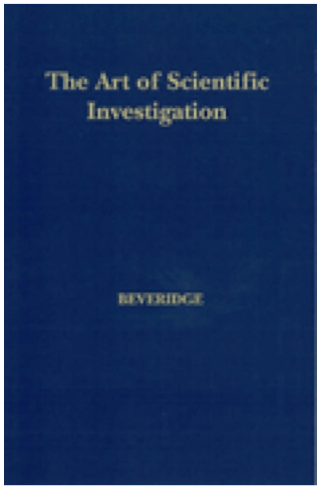
Actively Listen During Seminars/Talks

0. One of the things that we do as scientists
1. Keep notes & ask questions
2. Good way to find & interact w/ potential future employers
3. Essential to coming up with ideas

"[Seminars] provide a means for all of us to learn more of the science going on within the Division, outside our immediate special areas of interest...I would like to encourage the students in the Division to take advantage of these opportunities to broaden their horizon."
- RVFJ

Learn to Keep a Useful Logbook

"The careful recording of all details in experimental work is an elementary but important rule. It happens surprisingly often that one needs to refer back to some detail whose significance one did not realize when the experiment was carried out. The notes kept by Louis Pasteur afford a beautiful example of the careful recording of every detail. Apart from providing an invaluable record of what is done and what observed, note-taking is a useful technique for prompting careful observation."
- W.I.B. Beveridge



Beveridge, W.I.B. The Art of Scientific Investigation. Blackburn Press: Caldwell, NJ (1957)

Why is the experimental logbook important?

- It enables a complete reconstruction of the experiment or measurement at a later date.
- The "later date" can be many years; even after the death of the experimentalist.
- It enables the work to be repeated for re-evaluation of the reported results.
- The steps that led to the success or failure of a large project can be extracted.
- Patent lawyers need properly documented evidence of inventions.

http://personal.ee.surrey.ac.uk/Personal/D.Jefferies/logbook.html

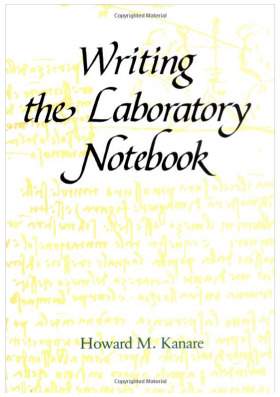
See also:

Bookfactory.com

http://www.bookfactory.com/

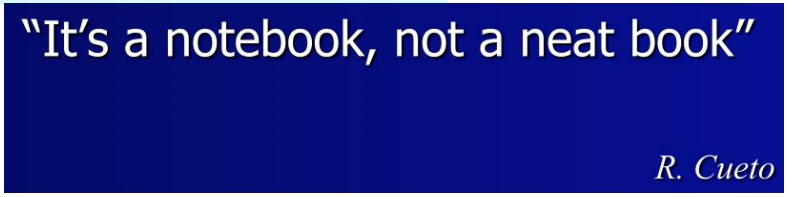
Colin Purrington @ Swarthmore

http://www.swarthmore.edu/NatSci/cpurrin1/notebookadvice.htm



H. M. Canare

Canare, H.M. Writing the Laboratory Notebook, ACS Publications (1985)



http://macro.lsu.edu/rcueto/PPT/Lab%20Notebooks_2010.ppt

Master Your Tools: Read the Manual!

Dilbert by Scott Adams http://dilbert.com/strips/comic/2001-06-02/

Manuals often have a “theory of operation” chapter.

Data sheets often tell you exactly under what conditions the device/component should work and how well.

Backup Your Personal & Lab Computers!

phd comics by jorge cham

http://www.phdcomics.com/comics/archive.php?comicid=382

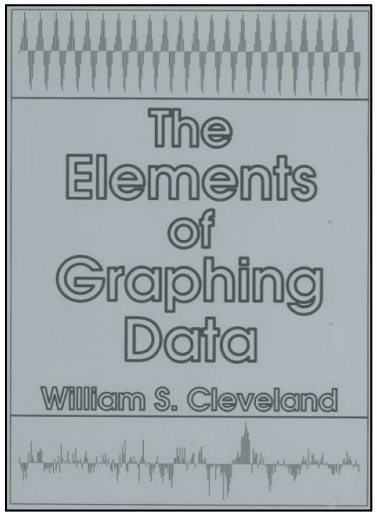
I recommend having both a local physical backup and a remote web-based backup. Also, keep a copy of all your email on your computer.

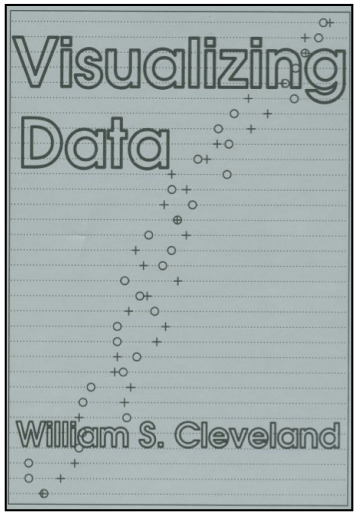
Learn to Make Useful Plots

xkcd by: Randall Munroe http://xkcd.com/833/

1. Make a template
2. Label your axes & include units
3. Put your name on it!

see also the works of William S. Cleveland:

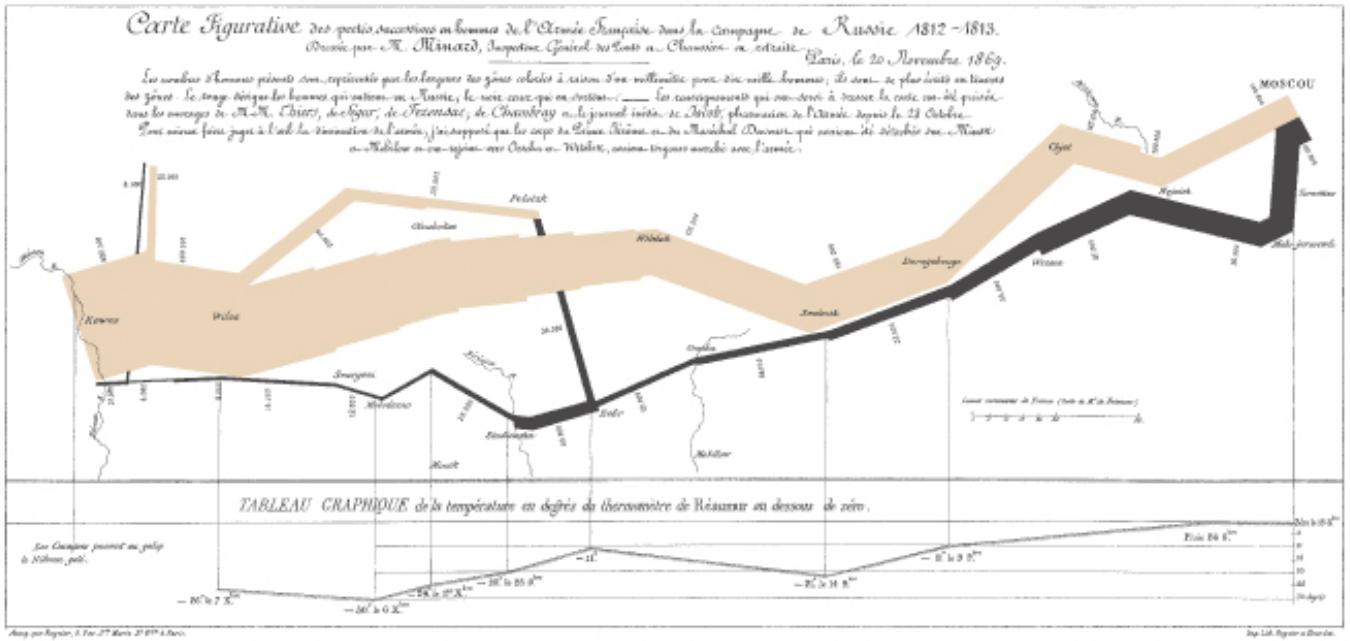




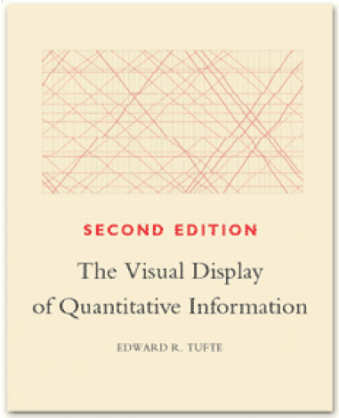
http://www.stat.purdue.edu/~wsc/

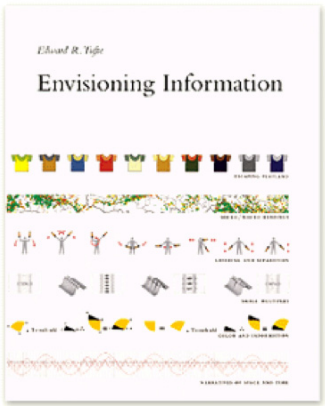
Learn to Make Useful Diagrams

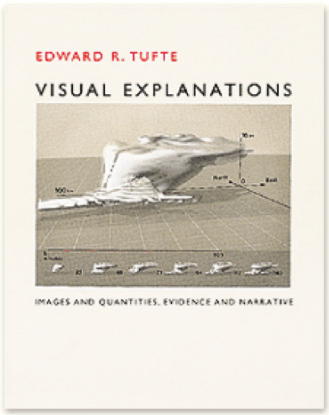
You're in good shape if you've seen this before:

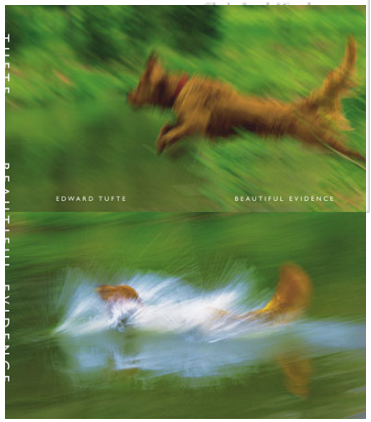


http://www.edwardtufte.com/tufte/posters









Edward R. Tufte

http://www.edwardtufte.com/tufte/books_vdqi

Learn to Give Good Presentations

1. A good presenter tells a good story.

check out this book: **McCloud, Scott, Making Comics: Storytelling Secrets of Comics, Manga and Graphic Novels, Harper: New York (2006).**

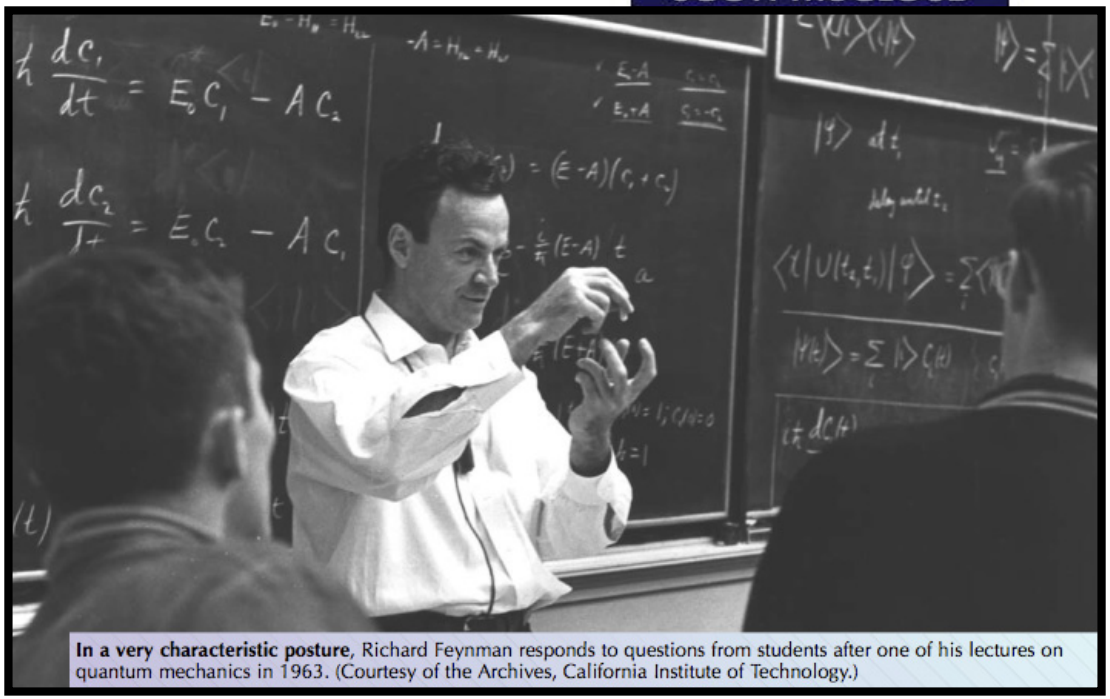
2. Practice, Practice, Practice:

present your work at 1 conference/yr & also your dept. yearly

"As soon as the bell rang to announce the start of the class, Feynman began his lecture. Each one was a carefully scripted, dramatic production that he had clearly planned in detail, and usually followed this order: introduction, development, climax, and denouement. And his timing was most impressive. Only very rarely would he finish more than a fraction of a minute before or after the end of the hour. Even his use of the chalkboards at the front of the lecture hall appeared to be carefully choreographed." - M. Sands

Physics Today, April 2005, pp. 49-55

Physics Today, November 2005, pp. 12-13

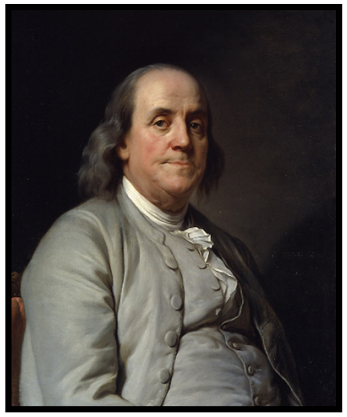


In a very characteristic posture, Richard Feynman responds to questions from students after one of his lectures on quantum mechanics in 1963. (Courtesy of the Archives, California Institute of Technology.)

3. Poster Presentations:

Colin Purrington @ Swarthmore **http://www.swarthmore.edu/NatSci/cpurrin1/posteradvice.htm**

Learn to Write Good Papers



1. Ben Franklin Method: Learn by imitation!
   - *offer to proof read your advisor's grant proposals and papers by others in the dept.*
2. Practice, Practice, Practice.
   - *write tech notes, monthly summaries of your work, reviews/summaries of literature searches...*
3. 

   http://www.nytimes.com/2009/04/22/books/22elem.html

   Strunk W. and E.B. White, The Elements of Style, Longman: Harlow, UK (2008).

4. *The Science of Scientific Writing* by Gopen & Swan

   http://www.americanscientist.org/issues/pub/the-science-of-scientific-writing

   Gopen, G. and J. Swan, The Science of Scientific Writing, American Scientist, Nov-Dec 1990.

5. *Some rules of good scientific writing* by D. Budker

   http://arxiv.org/abs/physics/0608246

Dima Budker, atom man.

Learn Time Management

	Important	Not Important
Due Soon	?	?
Due Later	?	?

Stolen from Randy Pausch's "Time Management" Talk @ UVa http://www.cs.virginia.edu/~robins/Randy/

Learn Time Management

	Important	Not Important
Due Soon	1	?
Due Later	?	4

Stolen from Randy Pausch's "Time Management" Talk @ UVa http://www.cs.virginia.edu/~robins/Randy/

Learn Time Management

	Important	Not Important
Due Soon	1	3
Due Later	important > due soon 2	4

Stolen from Randy Pausch's "Time Management" Talk @ UVa http://www.cs.virginia.edu/~robins/Randy/

Learn How to Get Things Done!

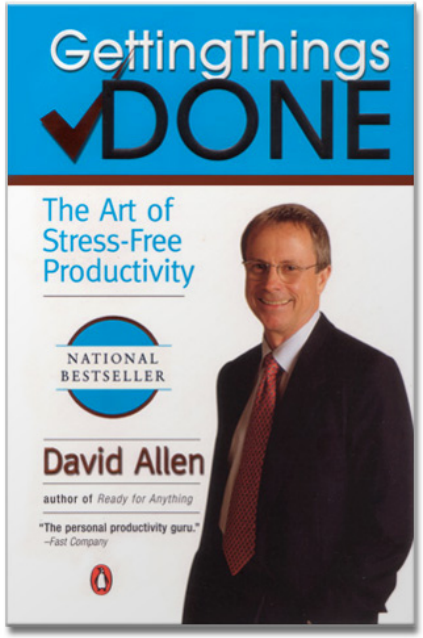
1. Define a desired outcome for each task

2. Be accountable/hold others accountable

3. Don't try to remember things:
   a. Have a system: paper or software (doesn't matter)
   b. Use a calendar

4. Learn to say no

zenhabits.net/say-no/



Allen, David, Getting Things Done (2002) Penguin Books

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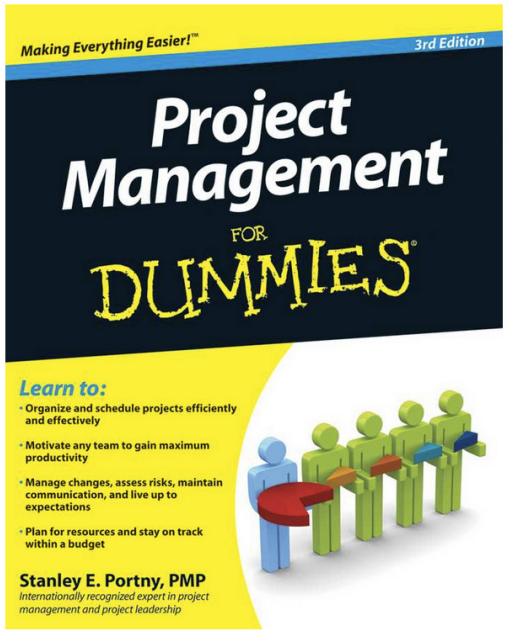
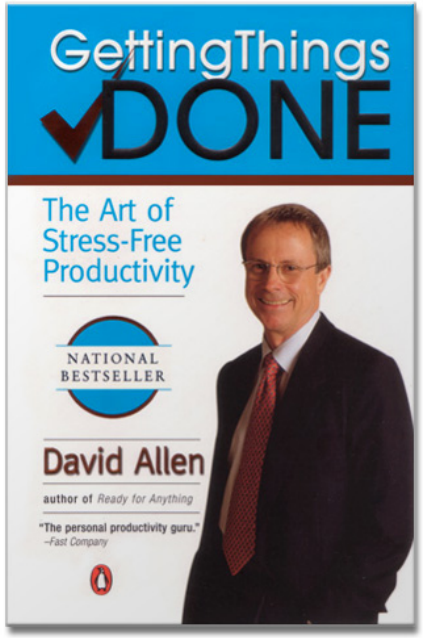
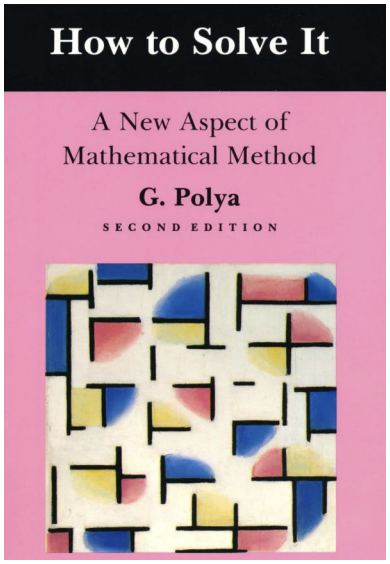


Portny, S.E. Project Management for Dummies, 3rd Ed. (2010) For Dummies Publishing



Allen, David, Getting Things Done (2002) Penguin Books

Learn How to Solve Problems



1. Understand the problem
2. Devise a plan
3. Carry out the plan
4. Look back on your work - how could have it been better

Polya, G, How to Solve It, Princeton University Press (1971)

Richard Zare: success = problem-solving

http://cpms.byu.edu/zare-lecture/

https://www.chem.byu.edu/node/9578

Work Hard! (What Does This Mean? How hard? ...)

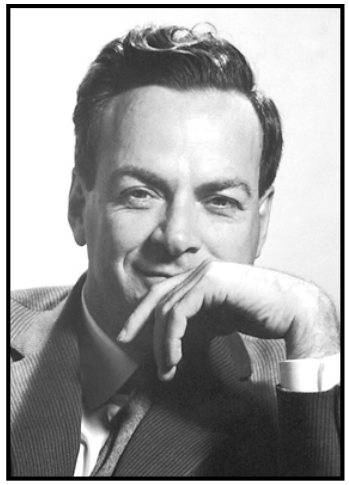
For Theorists:

HOW to BECOME a *GOOD* THEORETICAL PHYSICIST

See G. t'Hooft's website:

http://www.staff.science.uu.nl/~hooft101/theorist.html

Read R. P. Feynman's 1965 Nobel Lecture:
The Development of the Space-Time View of Quantum Electrodynamics



For Experimentalists:

Read C.E. Wieman's
2001 Nobel Autobiography

Read R. A. Hulse's
1993 Nobel Lecture:
THE DISCOVERY OF THE BINARY PULSAR

Don't Forget About Sleep/Life!

phd comics by jorge cham

http://www.phdcomics.com/comics/archive.php?comicid=1015

Wikipedia "Sleep Hygiene"

and also "Decision Fatigue"

http://www.nytimes.com/2011/08/21/magazine/do-you-suffer-from-decision-fatigue.html?pagewanted=all

Don't wait until after grad school
or after your postdoc
or after you get tenure
to "get married" and/or "have kids"

The Goal is To Graduate!

phd comics by jorge cham

http://www.phdcomics.com/comics/archive.php?comicid=1012

1. Have an early & honest discussion with your advisor about what is required to defend
2. Keep your "thesis committee" & mentor in the loop
3. Get feedback from all three about every 4 months
4. Make a realistic evaluation of your progress and make changes to the plan if necessary

Leaving Academia

"He is kind of crazy, talking always quickly...He is always asking questions and can be annoying." - Amy

http://ed.fnal.gov/projects/scientists/amy.html

If/when you decide to leave academia, you will have to deal with stereotypes.

Employers often assume that PhD's went to graduate school because they:

- have no people skills
- will not be a team player
- do not have time management skills
- do not have leadership skills
- do not have "real world" skills

Leaving Academia

"I know scientists are just normal people...Scientists lead a normal life outside of being a scientist." - Amy

http://ed.fnal.gov/projects/scientists/amy.html

You will have to be prepared these fight these stereotypes with stories that you should be easily be able to provide involving these skills:

*time management skills – finished grad school
*writing skills – can explain complicated stuff, published papers
*public speaking skills – presented at conferences
*teaching/mentoring skills – TA/grader for classes, younger students in your lab
*problem solver – know how to attack a problem with limited/no information
*self starter – did your own lab work
*team player – worked in collaborations
*people skills – talked to product vendors, talked to tech support, interacted with all levels of university admin, interacted with technical support, interacted with people from all over the world, know how to draw out shy people

Choosing a Project for a Postoc

How To Choose a Good Scientific Problem

Uri Alon[1,*]
[1]Department Molecular Cell Biology, Weizmann Institute of Science, Rehovot 76100, Israel
*Correspondence: urialon@weizmann.ac.il
DOI 10.1016/j.molcel.2009.09.013

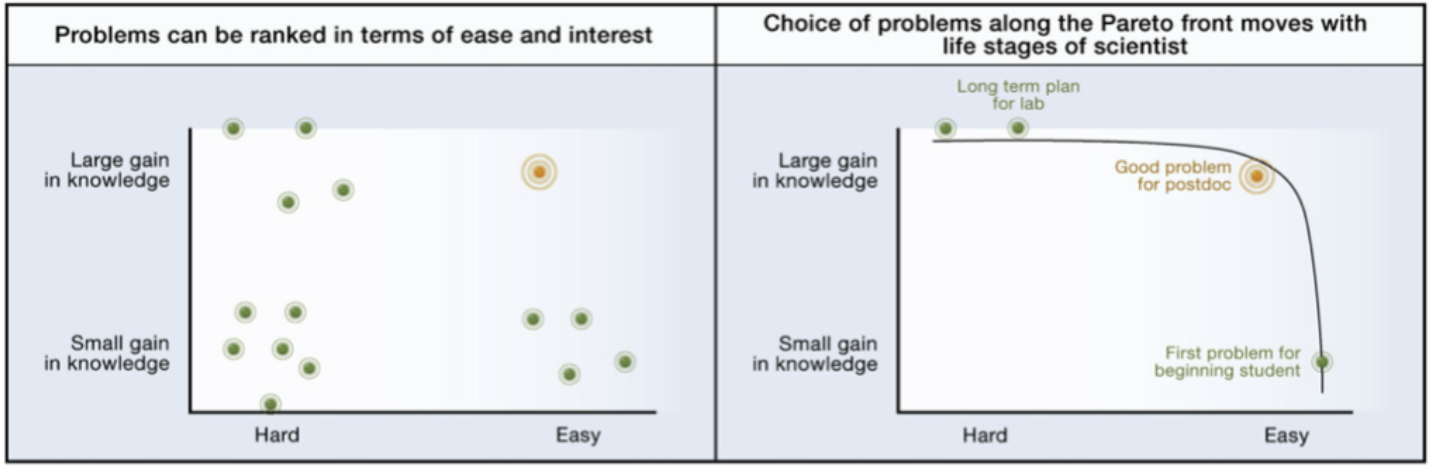
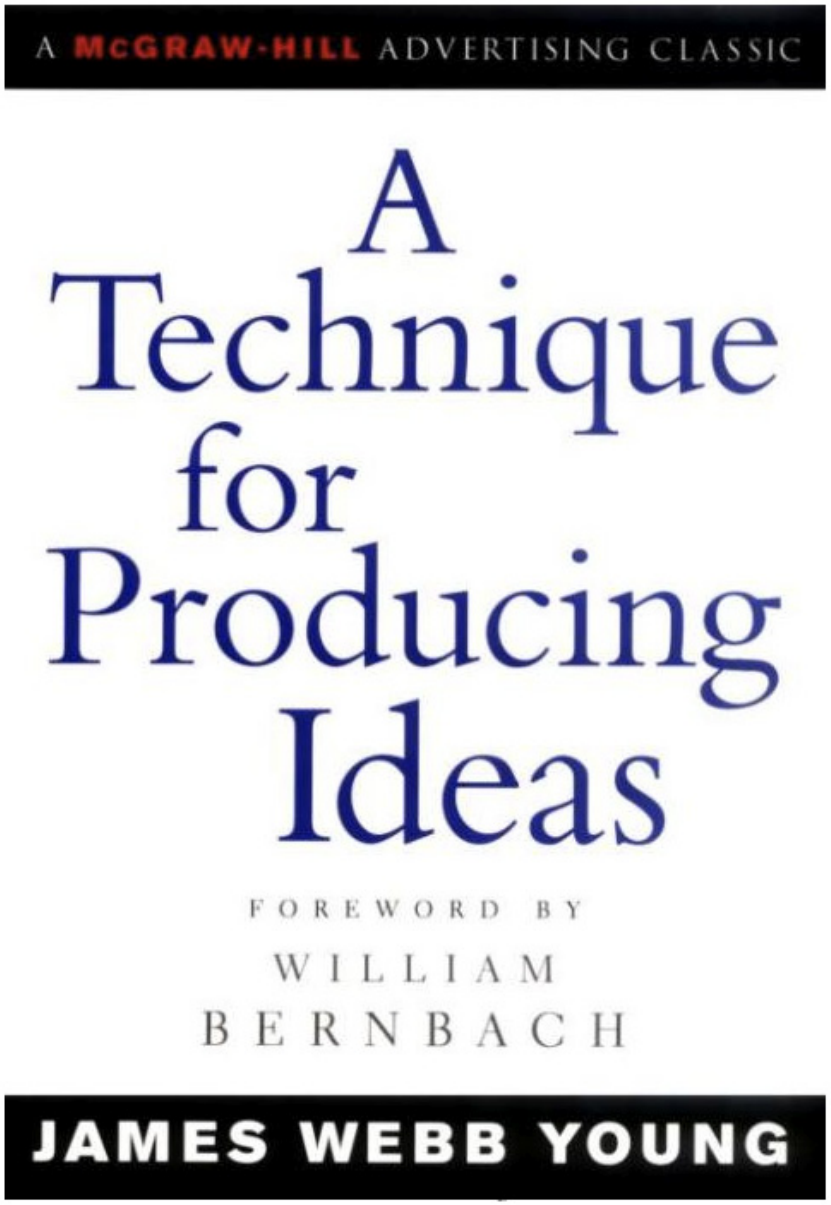


Figure 1. The Feasibility-Interest Diagram for Choosing a Project
Two axes for choosing scientific problems: feasibility and interest.

See also EWD 637: The Three Golden Rules for Successful Scientific Research

http://www.cs.utexas.edu/~EWD/transcriptions/EWD06xx/EWD637.html

How to Come Up With Ideas



1. Gather raw materials
(read papers, go to seminars,
talk to people about their research...)

2. Digest the materials
(takes notes, ask questions)

3. Unconscious processing
"no effort of a direct nature"

4. The "A-Ha" Moment
(document it)

5. Idea meets Reality
(work out the details
get feedback/criticism from colleagues)

http://www.brainpickings.org/index.php/2012/05/04/a-technique-for-producing-ideas-young/

What To Accomplish As a Postdoc

A PhD is Not Enough!: A Guide to Survival in Science by Peter J. Feibelman (Basic Books 2011) p. 34:

- decide what area of science you want to make your name
- finish at least one significant project (you must have something to talk about while job hunting)
- establish your identity within the research community

What They Didn't Teach You in Grad School: 199 Helpful Hints for Success in Your Academic Career by P. Gray & D.E. Drew (Stylus Publishing 2008)

- Hint 2: 100 people "rule" your field (Dunbar's Number = 150)
  - who are given invited/plenary talks at the big conferences in your field?
  - who are invited to talk at Gordon Research Conference in your field?
  - who are the most cited people in your field?
  - who are asked to write "viewpoint"-type articles in *Science, Nature*, etc.
- Hint 6: Get Known for Something
  - do something specific (find a specialty) really well (involves hard work)
  - make sure those 100 to 150 people know (hint 143: publish early and often, give good talks, go to conferences, setup an informative professional website)
- Hint 61: "Tenure Clock" is really 4.5 yrs

Applying for Postdoc

1. If you have followed my advice, then you will have given seminars in your dept. and kept several faculty / collaborators up-to-date with your thesis work.
You should have no problem finding at least 3 letter of support for a fancy "named" postdoc fellowship!

2. A postdoc is a good time to switch to a different, but related field.

3. Looking for a postdoc involves the same process that I described earlier for grad school, *except it requires more sophistication and the stakes are higher!*

4. Give a great talk on your thesis research!

Interviewing for a Postdoc

*What are the prospects of publishing during the time that you're a postdoc?

*How much mentoring of students will I be expected to take to on?

*What resources & tools are available to push the research forward?

*What are their former postdocs doing now?

*What is the institutional culture for promotion into a permanent position?

*What support will you receive to attend conferences?

*What support will you get to pursue your own research ideas?

*What type of professional development is available and will you be supportive of it?

(Wisconsin Program for Scientific Teaching, teaching opportunities, career development workshops)

Don't ever forget: you are the prize and this is your life!

Free (e)Books!

I've had (and continue to have) a great amount of help from mentors who have guided my career along.

There is nothing I can do to pay them back, *so thank YOU for listening to me and allowing me to pay it forward!*

Fooled you - *I'm the beginner*!

1. Email me just one ~mildly useful suggestion for how I can make this talk better.
2. I will buy & send you the ebook *"A PhD is NOT Enough!"*