

Today's discussion ... Graduate and  
Professional School Applications

So ... you want to get a PhD ...  
Now what?

Things you want to hear  
Things you don't want to hear

MS, PhD, MD, MBA

What, how, why

Important note: although we will be focusing on graduate and professional degrees, the same principles govern your job applications and interviews

# Disclaimer

- If anyone tells you they have answers to your career questions ... they are lying to you!
- There is no recipe for success
  - Lots of books and lots of people trying to show off
- Keep your eyes and ears open but at the end of the day it is your decision
  - However, **you should** gather as much information as you possibly can!
  - Talk to mentors, professors, graduate students

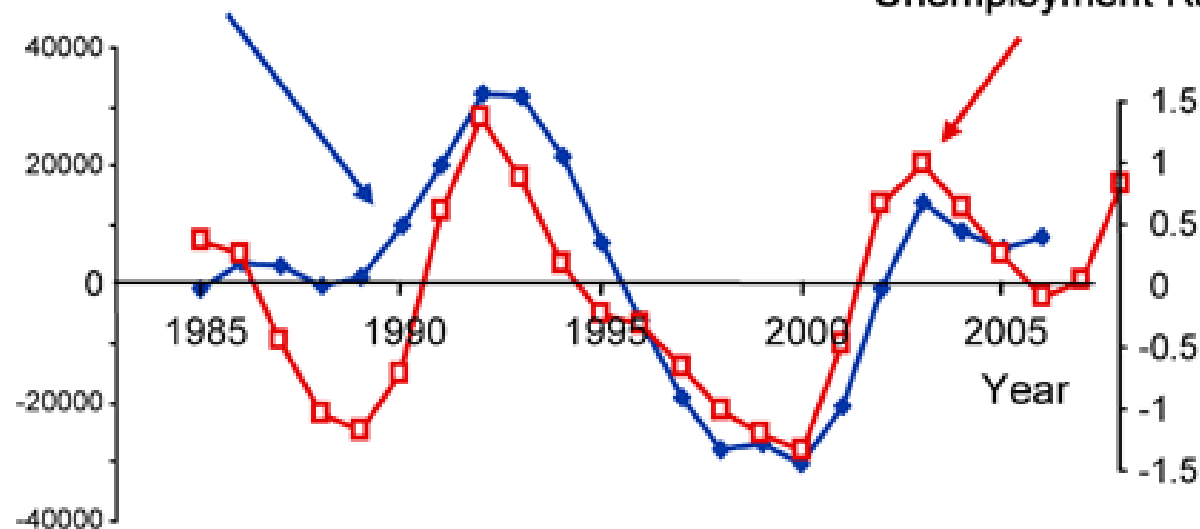
# If no one has the answers, then why am I here?

- Been there, done that
- I spent 9 years in industry interviewing graduates so I know what people are looking for when hiring
- At Rutgers I have appointments in two departments and I have served continuously since 2004 in the graduate admissions committee of both departments
  - I have participated in the review over 2,000 applications

# Be aware of your competition

Fluctuations in Grad Student Enrollment (Science & Engineering)

Fluctuations in the Unemployment Rate



Correlation  
Coefficient:

$$\rho = 0.75583$$

(that's pretty high)

JORGE CHAM © 2006

grad school is for  
suckers! wall street  
here i come!



## Guess Who's Coming to Grad School?

Sources: NSF/Bureau of Labor Statistics. Fluctuations obtained by subtracting the mean regression line from the absolute values.

WWW.PHDCOMICS.COM

i always wanted  
to go to grad  
school...



## PhD

**Professional Interests:**  
Research or technology development in academia, industry, or government.

**Duration:**  
Average is 6 years

**Ideal Candidates are:**

- Interested in leading specialized **research** efforts in academia, industry or a government lab
- Motivated to publish peer-reviewed research with faculty advisers
- Prepared to present research efforts to professional and technical societies at conferences
- Interested in careers that focus on research and technology development
- Willing to work in a highly collaborative, interdisciplinary environment

## MS

**Professional Interests:**  
Research or technology development in academia, industry, or government.

**Duration:**  
1.5 - 2 years

**Ideal Candidates are:**

- Seeking a career in a research environment or want to use a master's program as preparation to apply for a doctoral program
- Interested in working in areas such as **technology development** and product design
- Willing to work in interdisciplinary research groups to gain practical research skills
- Interested in co-authoring published research and presenting to professional peers

## ME

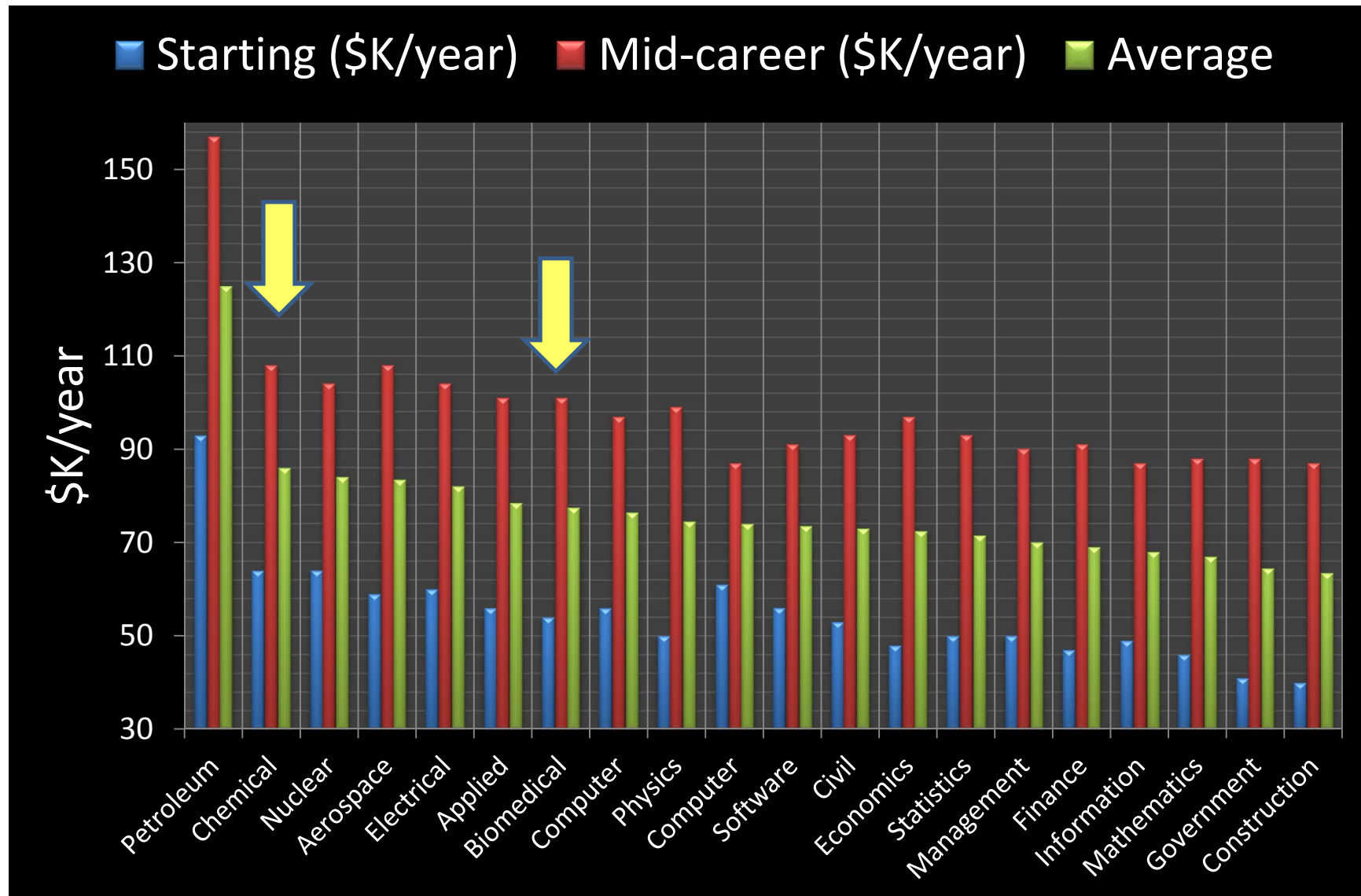
**Professional Interests:**  
Product design, product development, and innovation in industry

**Duration:**  
1.5 - 2 years

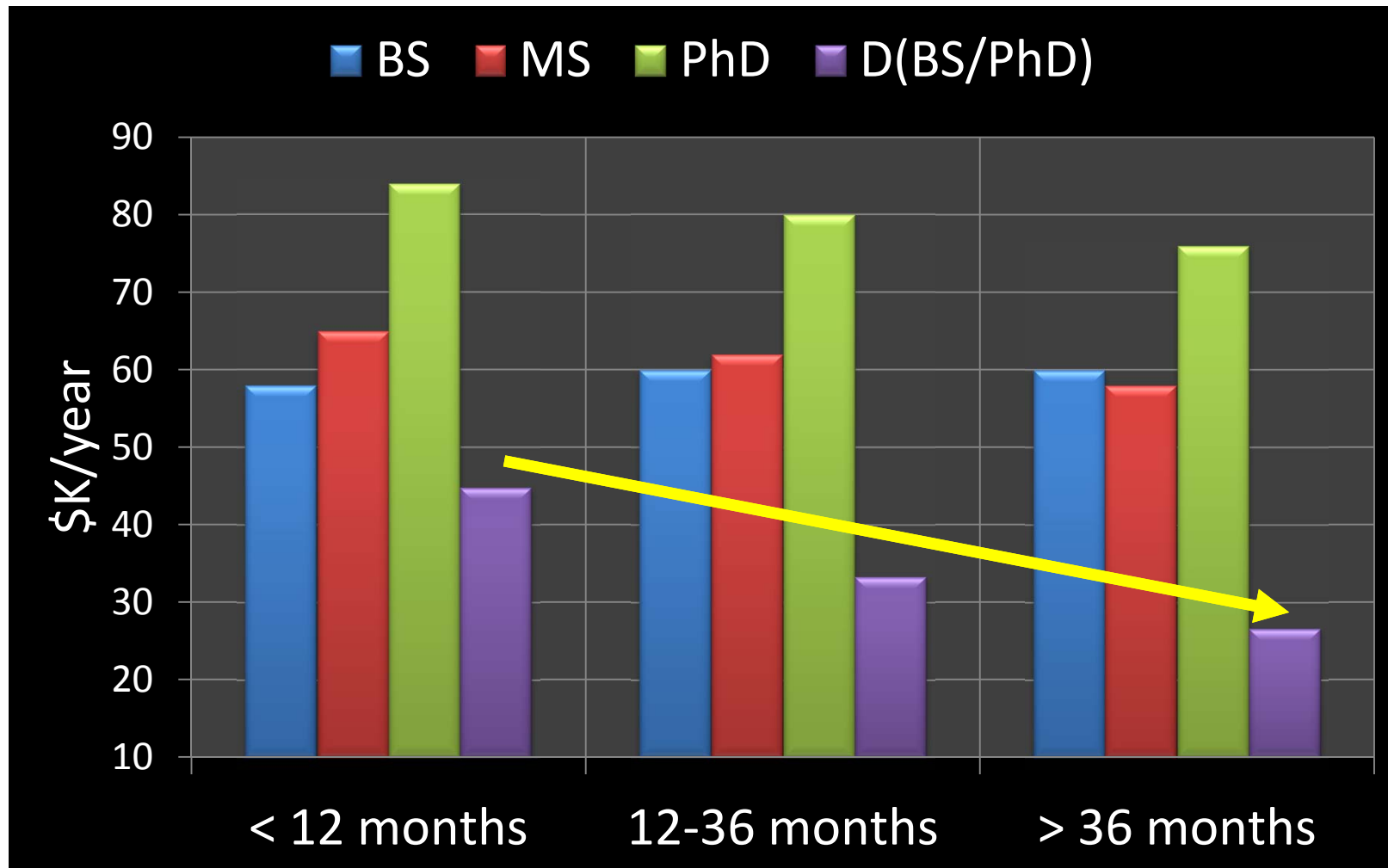
**Ideal Candidates are:**

- Early career technical professionals pursuing a practice-oriented degree in industry
- Interested in product development, **engineering support and technology innovation**
- Interested in a curriculum that encompasses strong technical depth supplemented with core business fundamentals
- Willing to gain real world experience through an internship or applied research experience
- Interested in a non-thesis master's program

# Engineering salaries (Bachelor's degree)



# Does it pay to get a PhD? Maybe



# Why should you pursue an advanced degree?

- Good question 😊
- Make sure you articulate a long(er) term career path
- Do not expect a quick return on your investment
  - This may actually backfire !
- An advanced degree will possibly place you in jobs which may be far from “profit centers”
  - R&D is considered a cost centre
  - PhD holders tend to be directed towards research
- **An advanced degree is neither necessary nor sufficient for your future success, but it can help!**

# Should you get a PhD?

WOW! YOU HAVE THREE  
MASTERS DEGREES AND  
A PHD!



YES, IT'S ALL VERY  
IMPRESSIVE, BUT  
INTERESTINGLY, I  
HAVE NO COMMON  
SENSE WHATSOEVER.



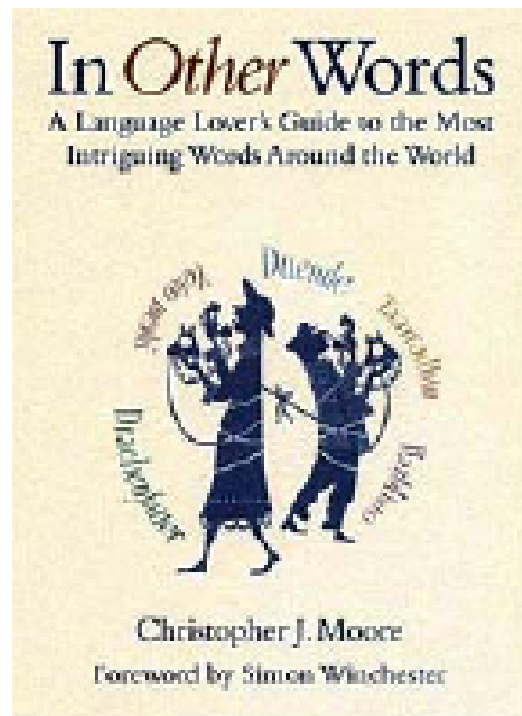
THAT'S NOT THE SORT  
OF THING YOU SHOULD  
SAY DURING A JOB  
INTERVIEW.



I DON'T SEE  
WHY NOT.

... only if you want it !

PhD = μεράκι



Translating the untranslatable ...

**meraki** [may-rah-kee] (adjective)

This is a word that modern Greeks often use to describe doing something with soul, creativity, or love -- when you put "something of yourself" into what you're doing, whatever it may be.

The most serious hurdle to overcome:  
Stop acting like a “student”



# Research is NOT homework !

## Homework

- You are told exactly what you are looking for
- You are given all the necessary data
- The answer exists, is unique, someone already knows it and you have to figure it out or verify it

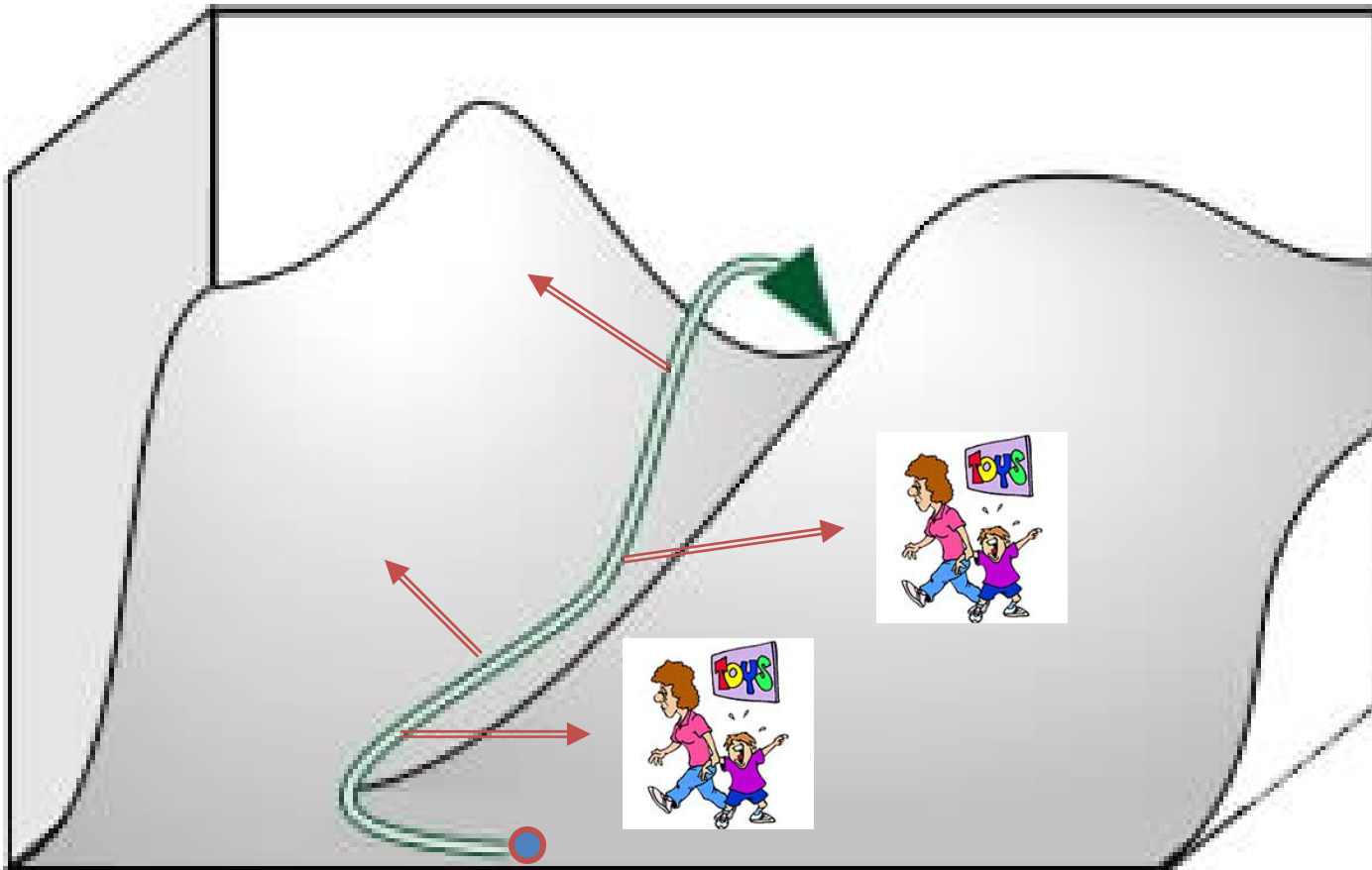
## Research

- You do not know what you are looking for
- You do not have all the data, if any
- The answer may not exist, may not be unique, no one knows whether it exists or how to find it

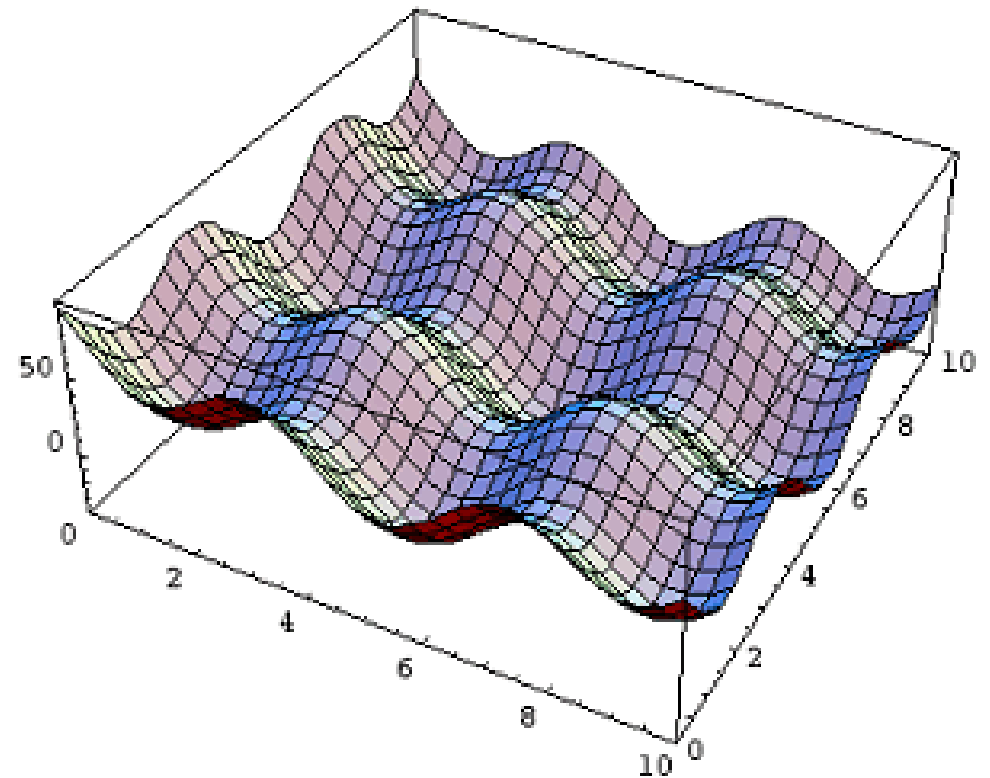
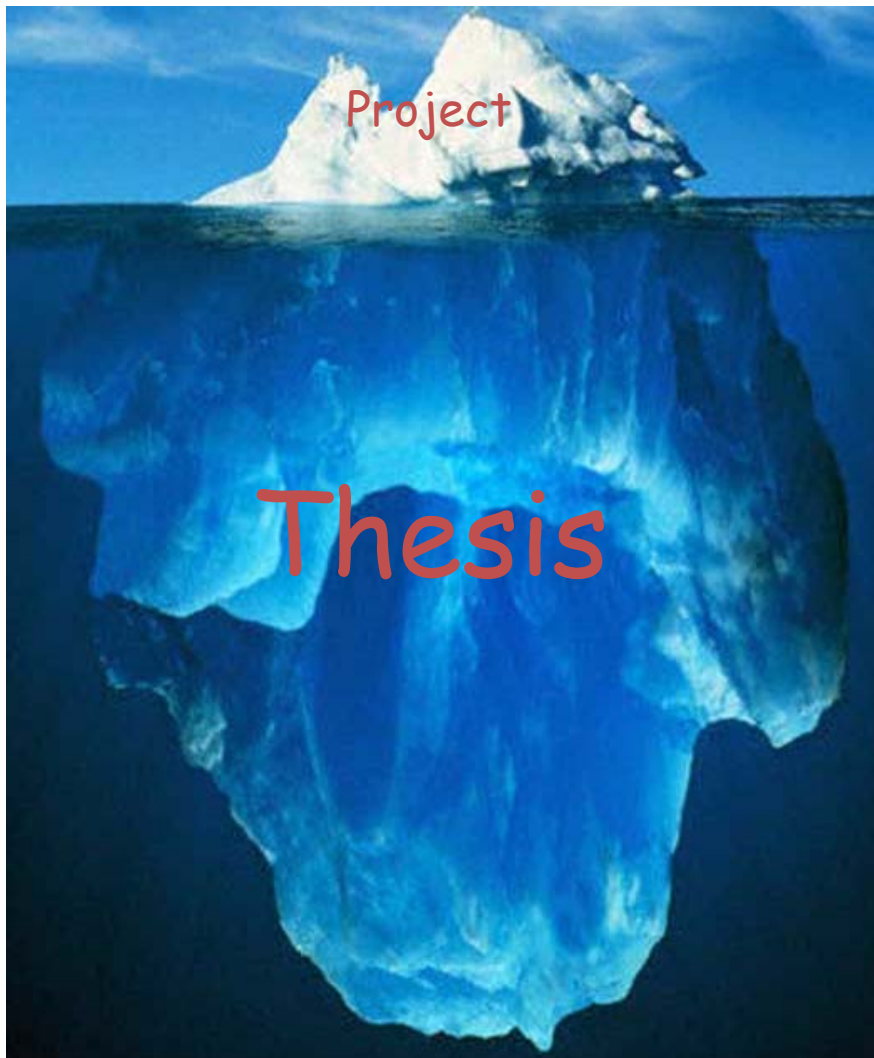
# Interpret ... don't just answer

- Develop your interpretive skills
- In research, unlike hwks/exams, we are not looking for “a” single **answer** which is the end of it
  - Usually it is hard to define an answer
- In research we are looking for **understanding** which will leads us to the next question

It's the journey that is exciting!



It's not about **answering** questions  
It's about **asking** questions



# Imagine the big picture

- Research is like a jigsaw puzzle only you don't really know what you are trying to make and not sure where the pieces are



# The application and selection process

- Prepare and submit your application
- Selecting the program
- Selecting the advisor
- Selecting the project
- Important:
  - You do not need an MS to apply to a PhD program
  - You do not need to go through the MS to get a PhD

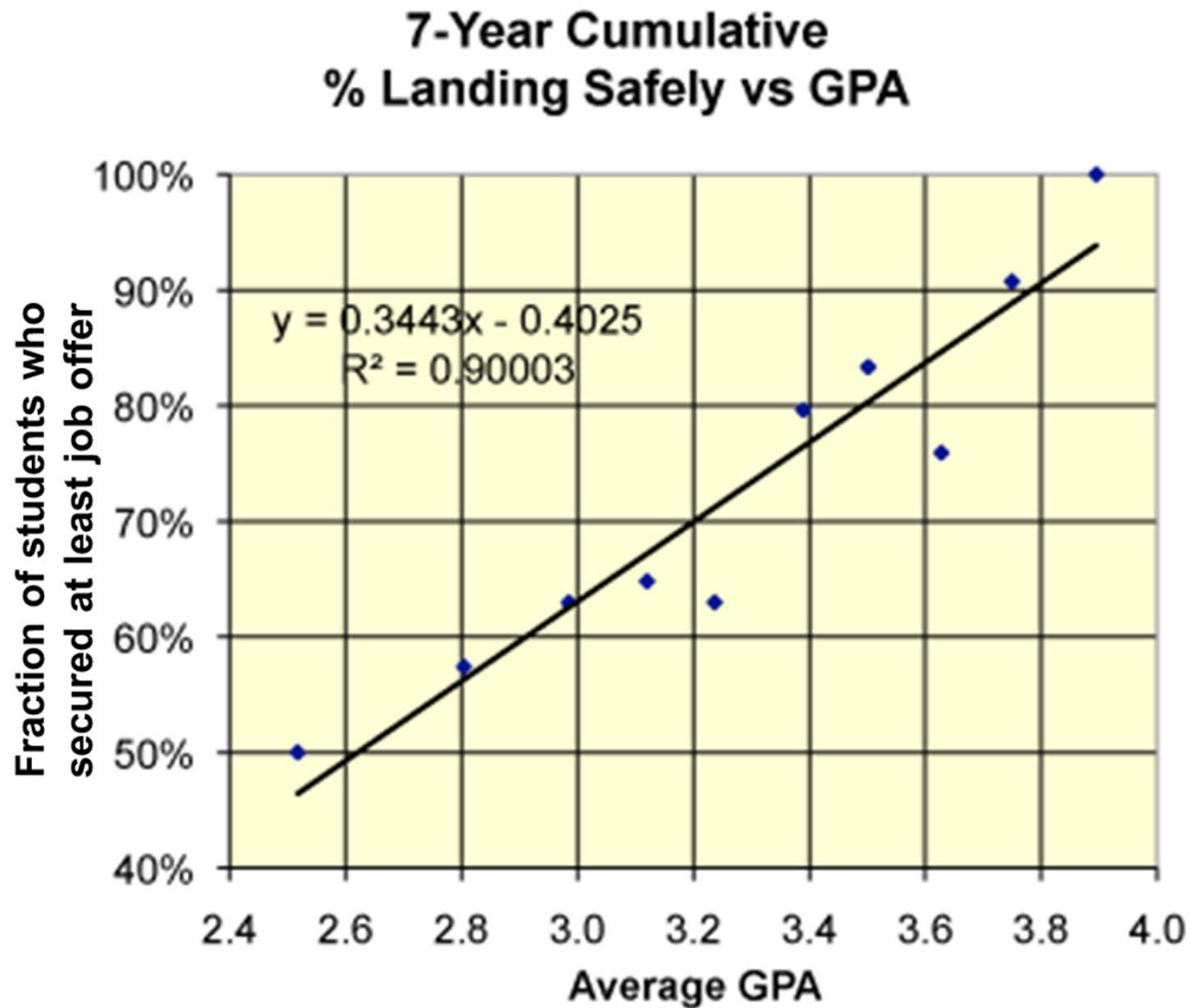
# The process

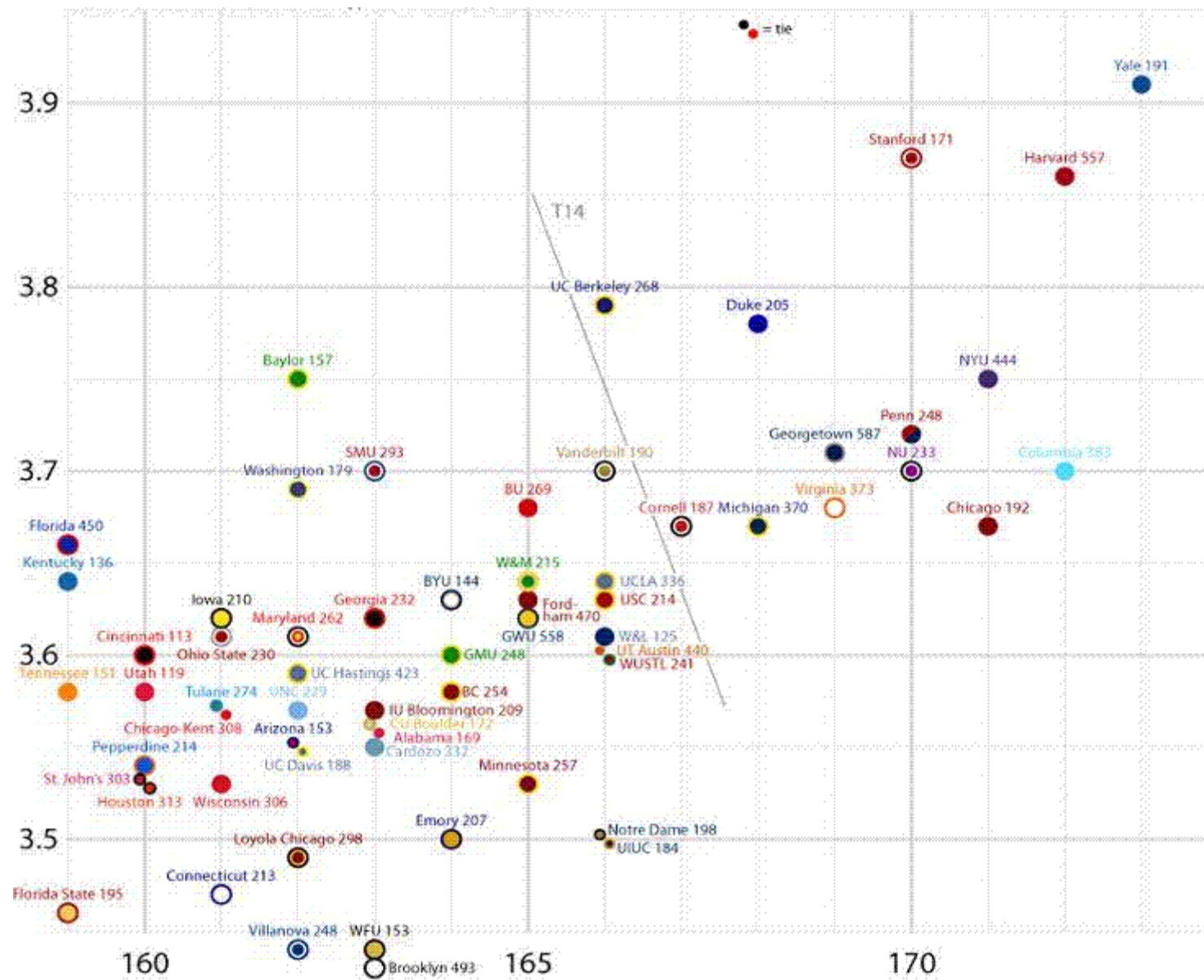
- Application deadlines usually sometime between 12/15/YYYY and 01/15 /YYYY+1 (senior year)
  - Check with university and department
- **Don't be afraid to apply to a lot of schools and always have a "Plan B"**
- Application process:
  - GPA, GRE, Letters of recommendation
  - Prior research experiences and publications are very important
    - Makes recommendation letters meaningful
  - **Personal statement**
    - **Be exact, precise, quantitative, to the point. Graduate admissions committees have to go over 100s of applications!**

# The value of GPA

- Your GPA is a good indicator because
  1. It averages your performance over 3.5 years
  2. It averages your performance over many courses and subjects
  3. It averages your performance relative to your peers

# The value of GPA



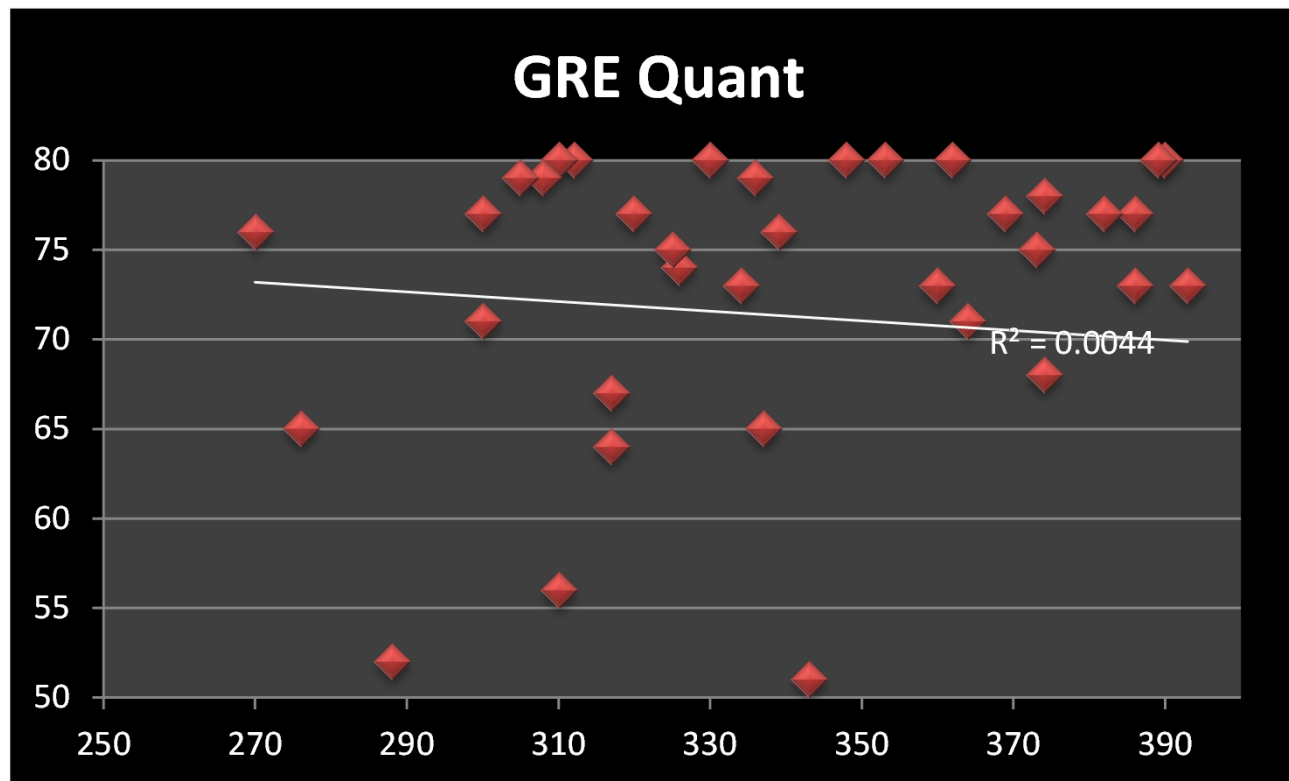


# Something important to keep in mind

- You will be submitting your application during the fall semester of your Senior year
- What that means is that your senior year grades will NOT make it into your application
  - GPA is based on F/S/J courses
  - Maybe you will regret some of the fun you had in your freshman year!
- Therefore, do not count on Senior year grades unless you delay your application

# What about GRE

- To be honest ... you are expected to do well
- GRE scores can only hurt if you do badly ...
- So, high GRE will not offset a poor GPA



# Personal statement

- This is also your response to the first interview question  
*“Why should we hire you?”*
- The answer is tricky ...
- In general you should make an effort to tailor it to the specific program, but keep in mind a few subtle points
  - Statements are used by Graduate Directors to determine the chances of an applicant finding an advisor (and funding)
  - Making it **too targeted** has risks
    - What if the advisor is not taking students or is not even research active
  - Making it **too broad** has risks
    - Does the student know anything about the program?
  - **Strike a balance**
    - Target a group of advisors or thematic areas in a program
- **Emphasize your personal experiences as they relate to graduate studies and not to the meaning of life**
  - I am not talking about spiritual enlightenment, but rather how your UG studies (courses, research experience) led you to consider a research career, a particular program, a specific research area. You have to be precise!

# Be aware who your letters

- I know the student, they took a class with me, they did well → almost any one can get this
- I know the student because they have worked with me for 2 years on XYZ, have accomplished this, exceeded in that, completed the other → few will get this letter!
- And then there is this letter ...

Dear Chair of Graduate Admissions Committee: I am writing this letter on behalf XXX who is applying to the graduate program in XXX at Rutgers University. Mr. XXX is currently a fourth-year undergraduate student majoring in XXX. He has been a student in two of my classes. This is the sole capacity in which I have come to know XXX. Is a very good student; Overall GPA is 3.85/4.00 and GPA within the XXX courses is as strong. Has performed exceedingly well in my classes, having received an A in XXX and an A in my XXX class. XXX has been highly successful in his academic career to date because Is intelligent and most of all hard-working. Puts in countless hours studying the course material, thinking critically about the subject matter. Is frequent contributor during course discussion and often asks insightful and/or clarifying questions.

**XXX is quite high strung and can at times be a very needy student; it is an absolute guarantee that upon return of a homework assignment or an exam, he will be at my door looking for additional points. It appears he has a hard time accepting the original grade received and his basis for re-evaluation is typically weak or flawed.** I think that as XXX matures, this part of the personality will disappear. **Can be quite intense and high strung; for example, has reminded me at least a dozen times that his application to Rutgers is due soon.** Will be a very intense graduate student during study which should make him/her highly successful as long as he/she can direct this intensity in the right direction. **He/She often exerts significant effort on a cause (i.e., exam regrade) that is not constructive or worthy of the time commitment.** In research, he/she will have to learn and/or be taught how to channel this intensity into research productivity. XXX can easily get lost in the details.

**The transition from the first to second semester of graduate school will be difficult for XXX. Its going to have to learn how to balance course work with research.** Tendencies will be to focus on coursework due to his overriding desire to get an A in ALL courses. Straight As in courses is, of course a good thing, but balancing hs studies with research will be new. **Will need significant mentorship during the graduate experience; mentorship that goes beyond what most students will need.** Once approached me about performing research in my laboratory (We are an experimental catalysis group.). **I typically expect undergraduates to work 10-12 hours a week in laboratory if working for credit. XXX suggested 1-2 hours a week (!). I informed him/her that research is time consuming, full of failures and do-overs, and because of this, at least 10 hours a week in the laboratory are necessary for the student and my laboratory to benefit from the experience. Was unwilling to commit that amount of time to the laboratory, and eventually never ended up working in the laboratory.** If appropriately mentored regarding classroom-research balance, I anticipate that XXX will become a productive graduate student, the type of student that your department will be proud to call one of your own.

**XXX has relevant experimental research experience back in XXX over the last two summers. It appears that this experience amounts to nothing more than 1-2 months each summer.** I will let the research adviser's comment on his proficiency in the laboratory since I don't know much about performance in this role. I've talked with XXX about research interests, and they are not necessarily specific regarding discipline or even experimental versus computational. I imagine this will evolve as he/she learns more about research opportunities in your department.

**In summary, I provide XXX with a very strong recommendation. He will not be the student who hits the ground running and fully understands the research process from the first day.** Will need significant mentoring by the adviser and/or senior graduate students. However, I think once XXX learns how to do research; has the potential to be one of Rutgers's finest. If I can answer any additional questions about XXX, please do not hesitate to contact me by phone or email (The details of which are included in the letterhead.).

# Selecting a program after admitted

- I wish I had the answer 😊
- Look for
  - Reputation of university and program
  - Dynamic environment
  - Try to get a sense of the dynamics of the research and not the social life
    - You are about to make an investment for the rest of your life and not for the next 5 years
    - However ... you must like the place

# Selecting an advisor

- Large/established vs. Small/up-and-coming
  - Large groups require you to become quickly a leader and separate yourself from the rest of the pack; advisors tend to have less face time with students and may not be as aggressive with publishing at the individual level
  - Small/up-and-coming tend to offer closer interactions and are more aggressive in publishing

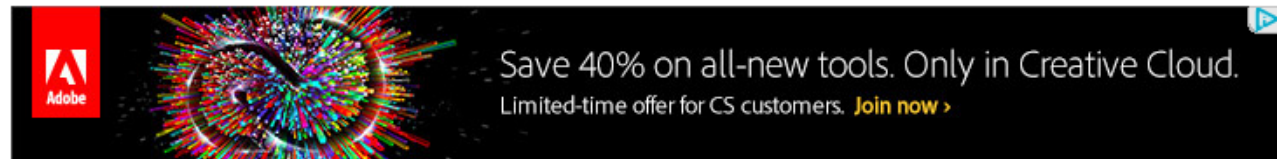


# Selecting an advisor

- Large/established vs. Small/up-and-coming
  - Large groups require you to become quickly a leader and separate yourself from the rest of the pack; advisors tend to have less face time with students and may not be as aggressive with publishing at the individual level
  - Small/up-and-coming tend to offer closer interactions and are more aggressive in publishing
- In addition to considering the “name” you should also consider the group’s dynamics and output

# A few hints regarding advisor selection

- You need someone who can motivate and inspire you, not necessarily someone to have a beer with
- Find out what members of the group do after they graduate
- Find out if the group has an aggressive publication policy
- Talk to members of the group taking everything with a grain of salt
  - Comments often times depend on outcome of most recent advisor/graduate student interaction
- Find out if members of the group publish scientific papers, present in conferences, and are involved in proposal writing
  - Graduate students are not willing slaves! You have to learn and develop your scientific skills
- It would be great if your future PhD advisor becomes your drinking buddy, but more than anything else you are looking for a mentor and a process which will help you grow intellectually and professionally



Mobile: [iPhone](#) [Android](#) [Web](#)

Follow: [Facebook](#) [Twitter](#) [Google+](#)

Subscribe: [RSS Feeds](#) [Email Newsletters](#)

[Home](#)
[HEALTH](#)
[PHYSICAL/TECH](#)
[ENVIRONMENT](#)
[SOCIETY/EDUCATION](#)
[QUIRKY](#)

[Search](#)

[Latest Headlines](#)
[Health & Medicine](#)
[Mind & Brain](#)
[Space & Time](#)
[Matter & Energy](#)
[Computers & Math](#)
[Plants & Animals](#)
[Earth & Climate](#)
[Fossils & Ruins](#)

## Featured Research

from universities, journals, and other organizations

Save/Print: [Print](#) Share: [Email](#) [Facebook](#) [Twitter](#) [Google+](#) [+](#)

### For scientists, early to press means success

Date: September 20, 2013

Source: James Cook University

**Summary:** A provocative new study suggests it is straightforward to predict which academics will succeed as publishing scientists. Being English-speaking and male also helps.

#### Share This

- > [Email to a friend](#)
- > [Facebook](#)
- > [Twitter](#)
- > [Google+](#)
- > [Print this page](#)
- > [More options](#)

#### Related Topics

##### Mind & Brain

- > [Gender Difference](#)
- > [Infant and Preschool Learning](#)

##### Plants & Animals

- > [Biology](#)
- > [Life Sciences](#)

##### Science & Society

- > [Education and Employment](#)
- > [Educational Policy](#)

#### Related Articles

- > [Squid](#)

A provocative new study suggests it is straightforward to predict which academics will succeed as publishing scientists. Those who publish earlier and more often while young are typically the long-term winners.

"We were really surprised," said Professor William Laurance of James Cook University in Cairns, Australia, who led the study.

"It doesn't matter if you go to Harvard or a low-ranked university. If you begin publishing scientific articles when you're still a graduate student, you are far more likely to succeed in the long run."

Laurance's team scrutinized more than 1400 biologists on four continents, and then selected 182 to study intensively.

They found the researchers varied greatly – by almost a hundred-fold – in the number of scientific articles they published during their careers.

"For reasons that are not totally clear, some people just 'get' the publishing game early in their careers, and it's these scientists who are most likely to keep on publishing strong research," said Professor Corey Bradshaw of the University of Adelaide's Environment Institute in South Australia.

[Like](#) 127

[Tweet](#) 44

[g+](#) 8

#### Breaking News:

Death Stars Blast Planets Before They Even Form



#### Related Stories

##### Cultural Differences Explain Non-Completion of HPV Vaccination in Girls in Low-Income Families

Oct. 4, 2013 — Although they are at higher risk for cervical cancer, girls from low-income families are less likely to receive the human papillomavirus vaccine that prevents it, and the reasons they are not fully ... > [full story](#)

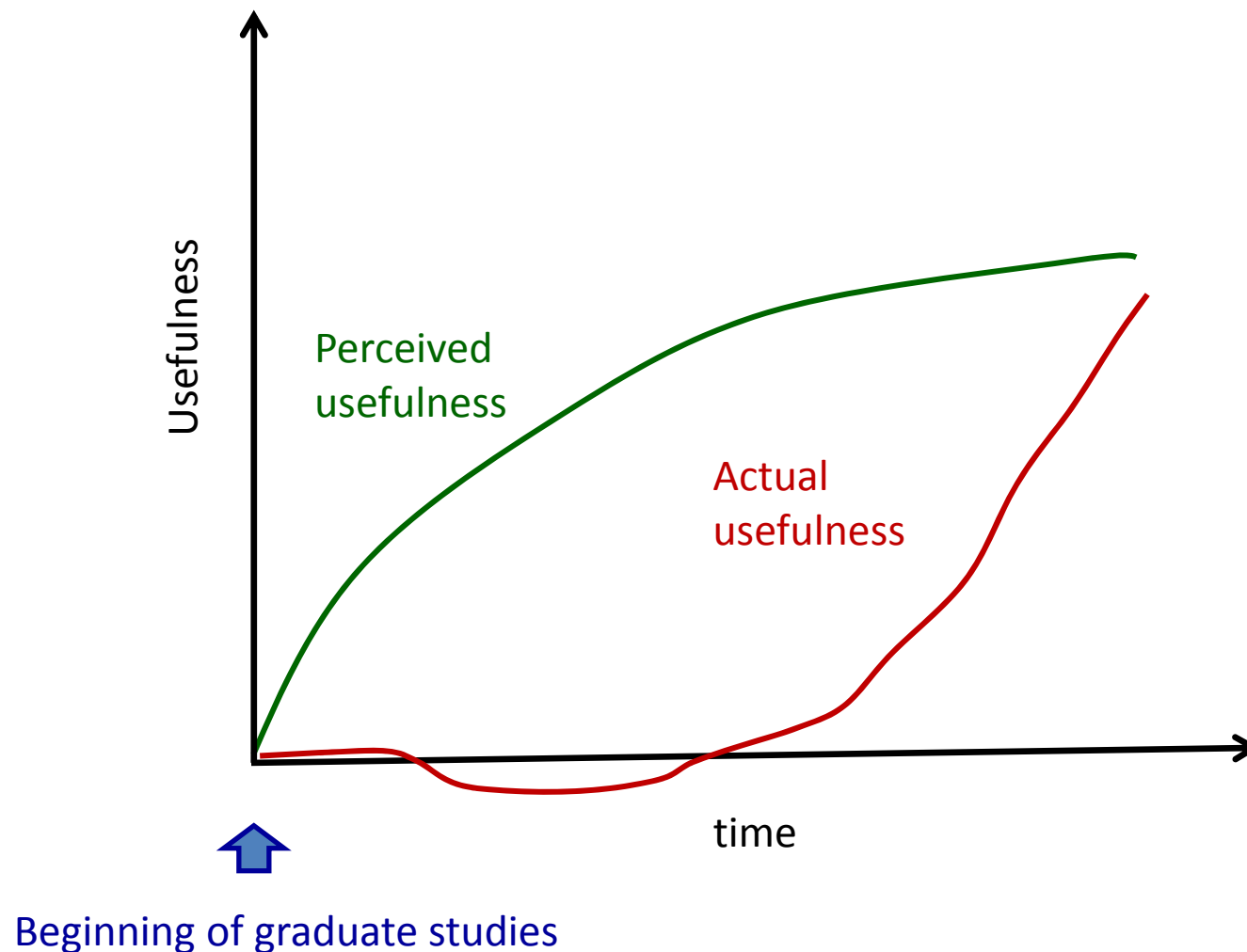
##### Language May Be Dominant Social Marker for Young Children

Dec. 1, 2011 — Children's reasoning about

# Selecting the project

- Because students get involved in research projects as UGs they tend to think that their very limited (SD/HA/JJ Slade/internship) experience is all there is in this world

# Perceived vs Actual usefulness of a graduate student vs time



# A cup of tea ...



Nan-in, a Japanese master during the Meiji era (1868-1912), received a university professor who came to inquire about Zen.

Nan-in served tea. He poured his visitor's cup full, and then kept on pouring.

The professor watched the overflow until he no longer could restrain himself. "It is overfull. No more will go in!"

"Like this cup," Nan-in said, "**you are full of your own opinions and speculations. How can I show you Zen unless you first empty your cup?**"

# Selecting the project

- Keep your options open; listen and learn; don't be afraid to try new things
  - Challenge yourselves by moving away from your comfort zone!
    - Classic example ... Applicants tend to shy away from more theoretical/computational work
  - Most programs will give you time to decide after you join
    - Advisor selection at the end of 1<sup>st</sup> semester or 1<sup>st</sup> year
- Your future success depends on your work and not on perceived notions about “the flavor of the month”

# Once in the PhD program

- Typical timeline
  - Core courses, depending on the program (Y1)
  - Elective courses (Y1-3)
  - Qualifying examination (Y1/2)
  - Thesis proposal (Y2/3)
  - Annual progress updates (Y1-n)
  - Final PhD examination ( $Y_n$ ,  $4 \leq n \leq 5.5$ )
- Research
  - PhD is not a 9-5/5-days-a-week kind of job
  - Your research should be consuming you, and you should be constantly thinking about your project and ways for developing yourself

Well ... some  
advisors  
overdo it ...

CALIFORNIA INSTITUTE OF TECHNOLOGY

Division of Chemistry and Chemical Engineering, 164-30  
Pasadena, California 91125

Arnold and Mabel Beckman  
Laboratory of Chemical Synthesis

Professor Erick M. Carreira  
Associate Professor of Chemistry  
(818) 395-6064  
FAX: (818) 564-9297

July 27, 1996

Division of Chemistry and Chemical Engineering  
California Institute of Technology  
Pasadena, CA 91125

Guido:

I would like to provide for you in written form what is expected from you as a member of the research group. In addition to the usual work-day schedule, I expect all of the members of the group to work evenings and weekends. You will find that this is the norm here at Caltech. On occasion, I understand that personal matters will make demands on your time which will require you to be away from your responsibilities to the laboratory. However, it is not acceptable to me when it becomes a habit.

I have noticed that you have failed to come in to lab on several weekends, and more recently have failed to show up in the evenings. Moreover, in addition to such time off, you recently requested some vacation. I have no problem with vacation time that is well earned, but I do have a problem with continuous vacation and time off that interferes with the project. I find this very annoying and disruptive to your science.

I expect you to correct your work-ethic immediately.

I receive at least one post-doctoral application each day from the US and around the world. If you are unable to meet the expected work-schedule, I am sure that I can find someone else as an appropriate replacement for this important project.

Sincerely,

*Erick M. Carreira*

Erick M. Carreira

# Entering a Master's program

- Application deadlines usually sometime between 12/15 and 01/15
  - **Check with university and department**
- The application process is in principle simple
  - GPA, GRE, Letters of recommendation
  - When asking for a letter provide the letter-writer with enough information to prepare a meaningful letter
  - Prior research experiences and publications are very important
- **A number of departments offer specialized MS/ME programs. This may actually be something to consider carefully!**
  - RU Pharma/MBA program
  - RU Pharmaceutical Engineering
  - USC Medical Imaging and Imaging Informatics
  - ... many more !

# MS vs PhD

- If unsure about making the 5-year commitment, then the MS can be a good choice
- GPA is very important when applying to a PhD program
  - $\text{GPA} \geq 3.5$  ... Competitive candidate (the higher the better)
  - $3.3 < \text{GPA} \leq 3.5$  ... Design your choices well
  - $\text{GPA} < 3.0$  ... Troubling. Consider an MS to improve your application since your PhD application will reflect the MS GPA
- In a PhD program (engineering) all expenses should be paid
  - Tuition, stipend (salary) and fringe benefits (health insurance)
    - You may not see it, but your advisor will invest a fortune in you. At RU a graduate student costs about \$60K/year
  - PhD students are effectively university employees, with all benefits and responsibilities
    - At RU students are members of the Union
- In a master's program you have to pay for everything

# What about medical school?

- The interview is a key step
  - ✓ Communication attributes
  - ✓ Interpersonal skills
  - ✓ Interest in serving the needs of others
  - ✓ Depth of medical experience
  - ✓ Maturity
  - ✓ Ability to relate to people
  - ✓ Motivation for medicine
  - ✓ Ability to handle stress
  - ✓ Realistic understanding of medicine
  - ✓ Depth of extracurricular activities
  - ✓ Right fit for medicine
  - ✓ Right fit for Thomas Jefferson
  - ✓ Etc.

# What about an MBA?

- It depends on the career you wish and the company you work for
  - Exxon's CEO was a PhD Chemist, all presidents and VPs are engineers; Mobil's CEO was an Applied Mathematician with an MBA, most presidents and VPs were economics majors
  - Moral of the story ... try to figure out what is needed for success and pursue it
- Having said that, an MBA gives you advantages in that you can at least have the “right vocabulary”
- May wish to consider an Executive MBA down the road
  - The company will pay for it

# What if you have no current plans for an advanced degree?

- In your career it is your work which will be most important. Degrees will setup the initial condition, but where you will end up will depend on your work
- It's never too late. It may be worth exploring your options now and figure out what you would be needing to do to improve your career in the future
- Having prior experience is often considered a plus when applying for an advanced degree
  - But ... up to a point ...

# Bottom line

- Think hard about what you would like to do when you grow up
- Try to develop a plan and identify long term goals
  - Talk to your faculty (us) – Listen critically
- Identify a “role model”, i.e., a career path you would like to pursue
- But always remember
  - a) There are things we are good at
  - b) There are things we think we are good at
  - c) There are things we have to be good at
  - d) It's the intersection of a) and c) that matters!

# Learn how to ask questions

- How? **WORK AND STUDY!!!**
- Learn the area, be the “master of your domain”
- Follow the literature and the recent advances
  - There is nothing more embarrassing than re-inventing the wheel
- Identify the challenges and learn how to ask tough questions
- Your favorite question should be ... **so what?**
- Realize that research is not like homework problems where the answer can be found in some book. You have to synthesize the approach
  - **It is not magic! It's hard work!**

# You have to master the **process** and not just the **project**

- Projects evolve and often come and go
- What stays with you is your ability to analyze problems and synthesize answers
- **You have to learn the process of learning**
- There is no textbook to teach you that it is trial-and-error and hard work
- Dissect the problem and proceed to look at it piece by piece
- Learn to speak other peoples' language (and I do not mean Greek ...)

# The things I learned in graduate school

- Learn how to read, especially between the lines
- Learn how to ask questions
- Learn how to identify targets
- Learn how to analyze systems
- Learn how to synthesize systems
- Learn how to think
- These are the qualities future employers are looking for in future successful people
  - Otherwise they would be looking for lab technicians

# Your work is an extension of yourself

- One of the most challenging tasks is to learn how to excite others and how to communicate with people from other fields
- No one has patience for nonsense. If you have something to say, say it! It has to be clear, consistent and meaningful
  - Otherwise, no one will ever pay attention to you. Why should they?
- If you don't care about expressing yourself properly it is usually an indication that you don't really care about what you do. So, why should I waste my time trying to understand what you are saying?

# Take every task seriously

- When preparing a manuscript, assume you are working on the final version
- When preparing a talk, assume it's a job interview
- The way you present yourself and your work says much about who you are
- Deadlines are there for a reason
- Everybody has lucky breaks ... You have to be ready when yours comes along
  - It's not about being lucky, it's about being well prepared

# Life is self-similar

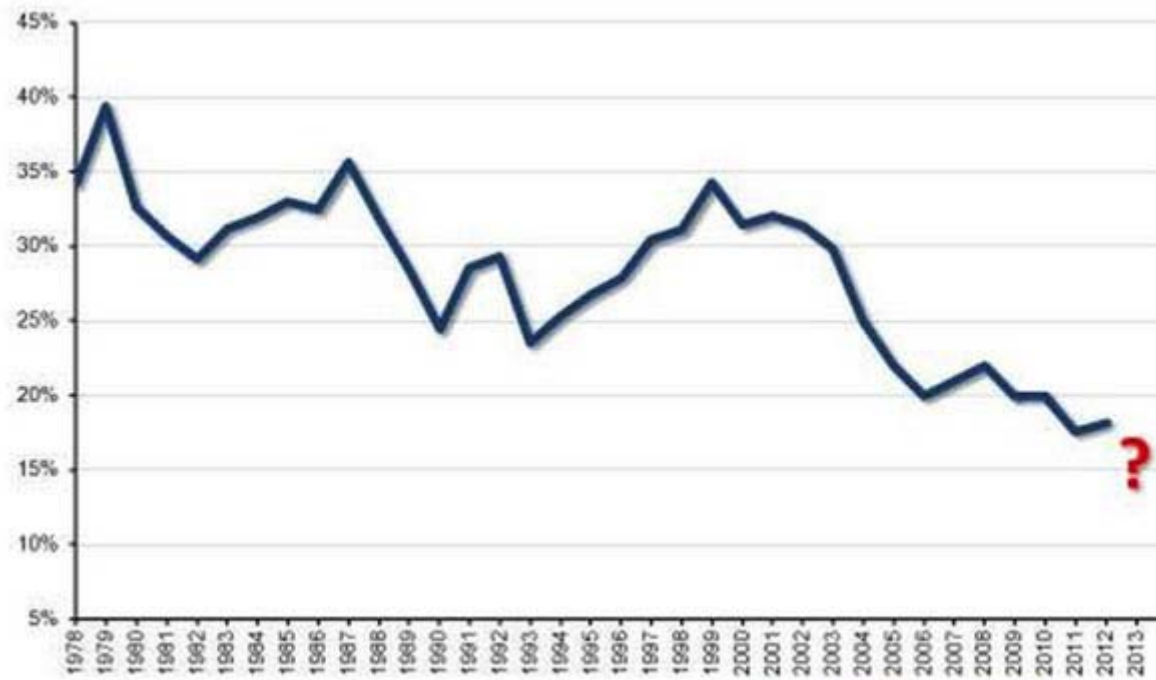
- We all have deadlines
- We all have bosses
- We all have constraints
- Realize that we all are part of a team and we all have responsibilities to each other

You are not cheap 😊

ORGANIZATION <b>Rutgers University</b>				PROPOSAL NO.		DURATION (MO)	
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR				AWARD NO.		Proposed	Granted
						Funds Granted by NSF	
A. SENIOR PERSONNEL: PI/PD, Co-PI'S, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)				NSF Funded Person-months		Funds Requested By	
0.	First Name	M	Last Name	Title	CAL	ACAD	SUMR
1.	Ioannis	P	Androulakis	Title	0.00	0.00	1.00
( 1 ) TOTAL SENIOR PERSONNEL (1-6)							\$0
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)							
1.	0 ) POST DOCTORAL ASSOCIATES				0.00	0.00	0.00
2.	0 ) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)				0.00	0.00	0.00
3.	0 ) GRADUATE STUDENTS						\$23,500
4.	0 ) UNDERGRADUATE STUDENTS						\$0
5.	0 ) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)						\$0
6.	0 ) OTHER						\$0
TOTAL SALARIES AND WAGES (A+B)							\$23,500
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)							\$5,405
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)							\$28,905
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000)							
							\$1,000
TOTAL EQUIPMENT							\$1,000
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)							
							\$2,000
2. FOREIGN							
							\$0
F. PARTICIPANT SUPPORT COSTS							
1. STIPENDS							\$0
2. TRAVEL							\$0
3. SUBSISTENCE							\$0
4. OTHER							\$0
( 0 ) TOTAL NUMBER OF PARTICIPANTS							\$0
G. OTHER DIRECT COSTS							
1. MATERIALS AND SUPPLIES							\$1,000
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION							\$1,000
3. CONSULTANT SERVICES							\$0
4. COMPUTERS SERVICES							\$0
5. SUBAWARDS							\$0
6. OTHER							\$9,607
TOTAL OTHER DIRECT COSTS							\$11,607
H. TOTAL DIRECT COSTS (A THROUGH G)							\$43,512
I. INDIRECT COSTS (SPECIFY RATE AND BASE)							
Name of indirect cost item		Amount		Rate			
FirstIndirectCostItem		\$33,905		54.00%		18309	
TOTAL INDIRECT COSTS							\$18,309
J. TOTAL DIRECT AND INDIRECT COSTS (H+I)							\$61,821
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.D.7.j.)							\$0
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)							\$61,821

# \$\$ is not everything, but ...

- No free lunch
- We all are resource-limited so learn to respect that
  - A PhD is not an all-expenses-paid vacation



Source: NIH [http://report.nih.gov/success\\_rates/](http://report.nih.gov/success_rates/)

# More \$\$\$ numbers

**FIGURE 2. MEDIAN STARTING SALARIES FOR INEXPERIENCED CHEMICAL ENGINEERS WORKING FULL-TIME, 1975–2007 (IN CURRENT DOLLARS)**

