

Is grad school right for me?

If so, how do I get there?

Prof. Marjorie Olmstead

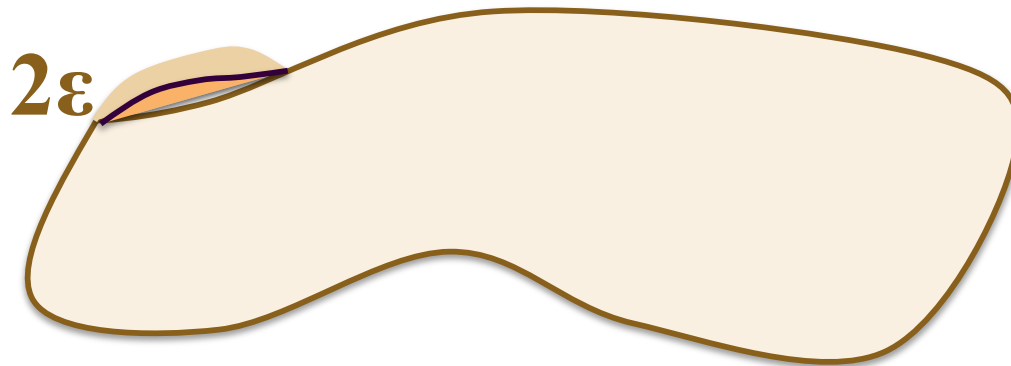
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What is a PhD?

- Take some piece of knowledge about the universe from (frontier $- \epsilon$) to (frontier $+ \epsilon$)



- Start out knowing nothing about a topic, and four years later you are the world expert
- “License to think” – allows you to direct research projects, teach @ college/univ, write grants

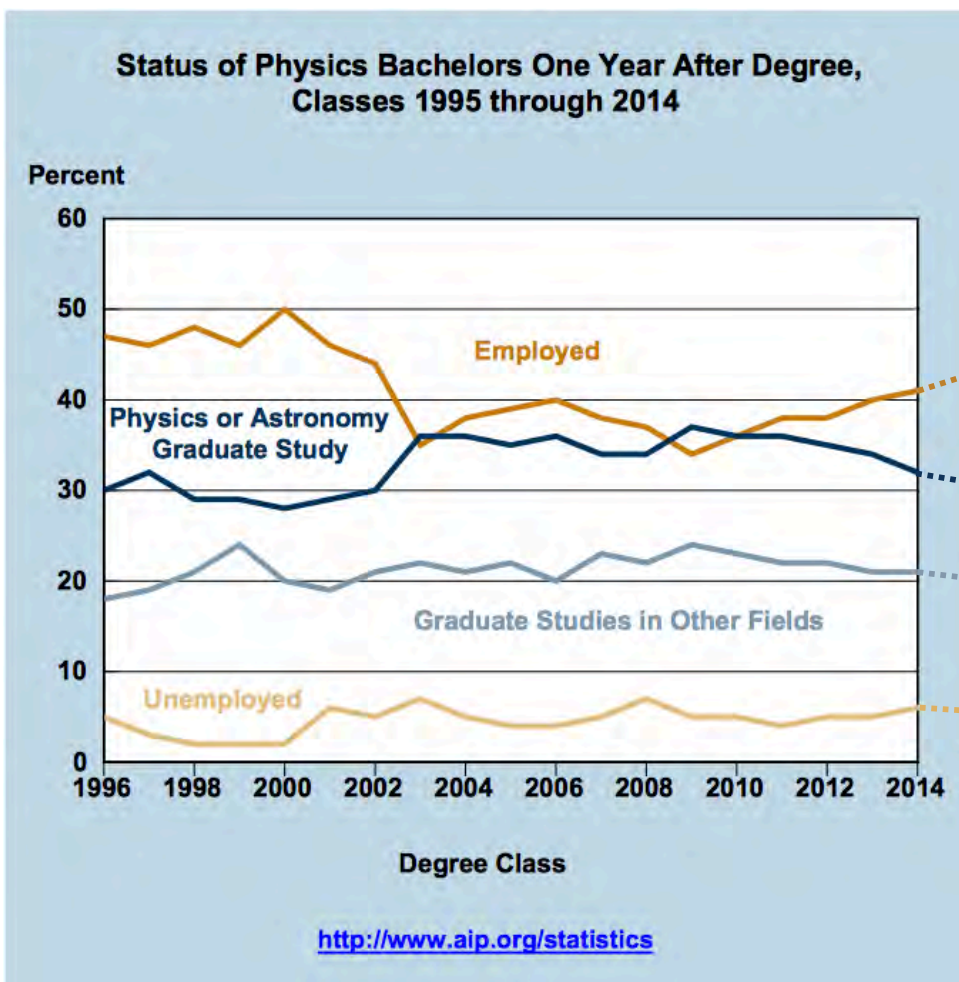
Why Go to Grad School?



- Participate in the excitement of the intellectual frontier
- Deeper understanding of a subject
- Better/different job prospects
- DON'T Drift into graduate school

What else could I do?

Trends in initial outcomes of physics bachelor's Classes of 1995 to 2014 (1 year post degree)



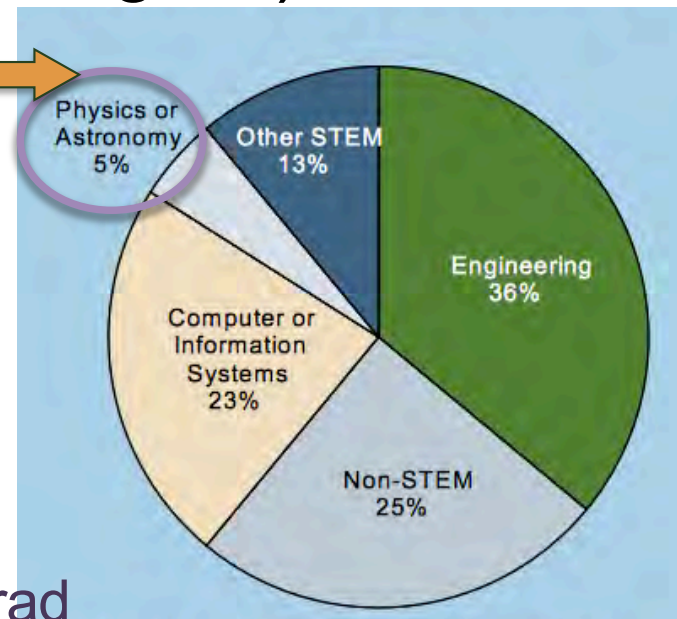
2017/18

47% job

29% P/A grad

19% other grad

5% seeking



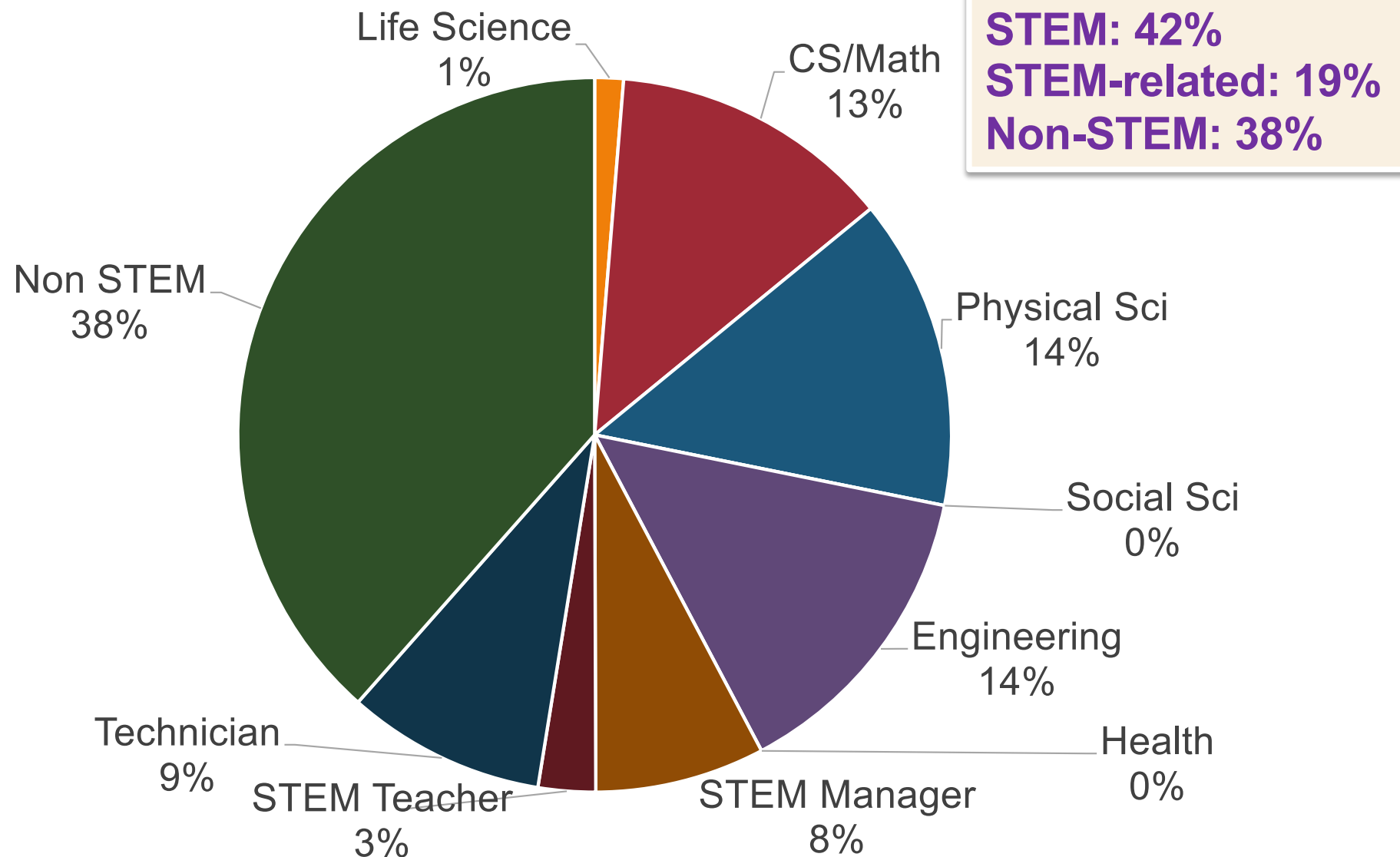
<http://www.aip.org/statistics>

Field of Employment

2013-14 data

NSF Data on Physics B.S. Careers

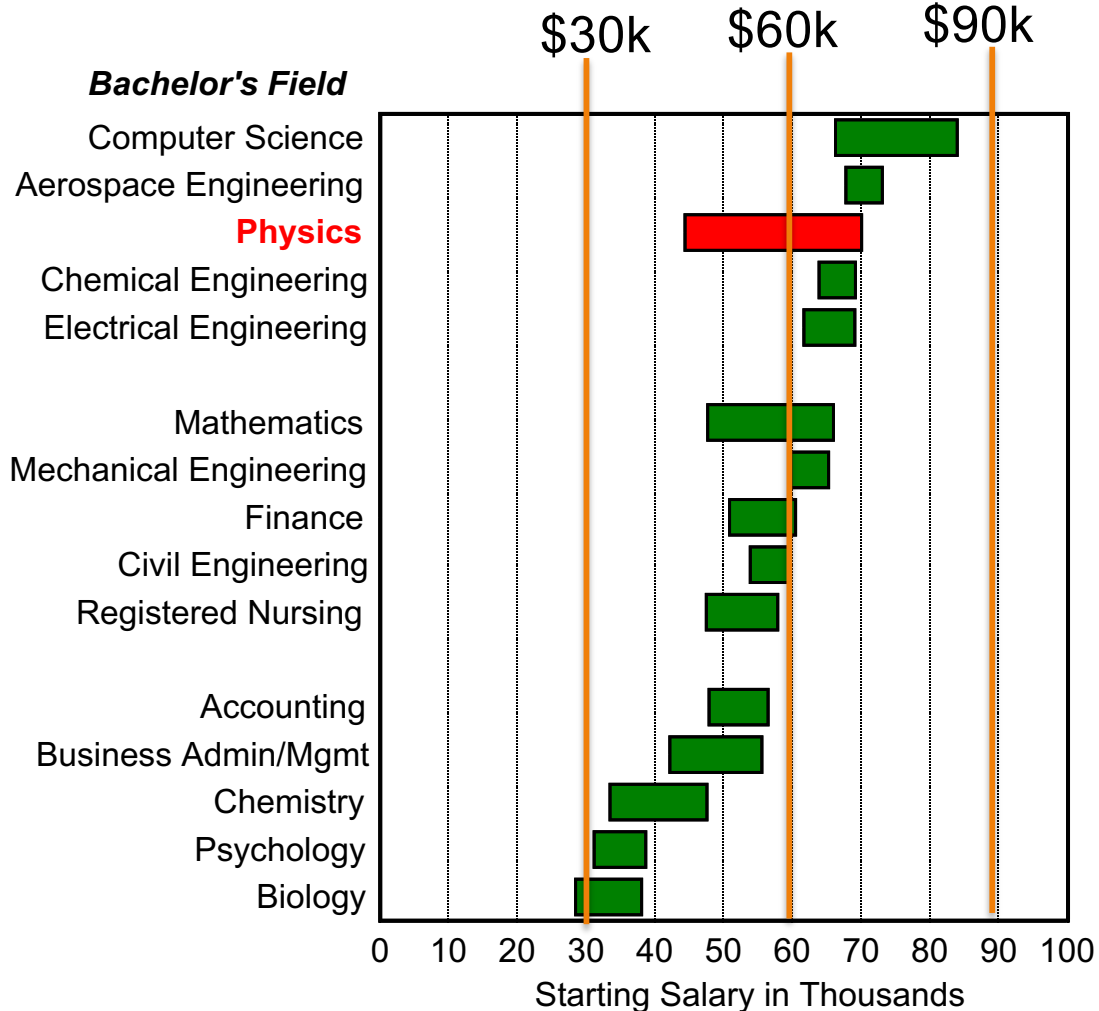
NSF Table 3-2. Broad occupation category of employed U.S. scientists and engineers with a bachelor's as the highest degree, by field of highest degree: 2013



What might I earn?

What's a Bachelor's Degree Worth?

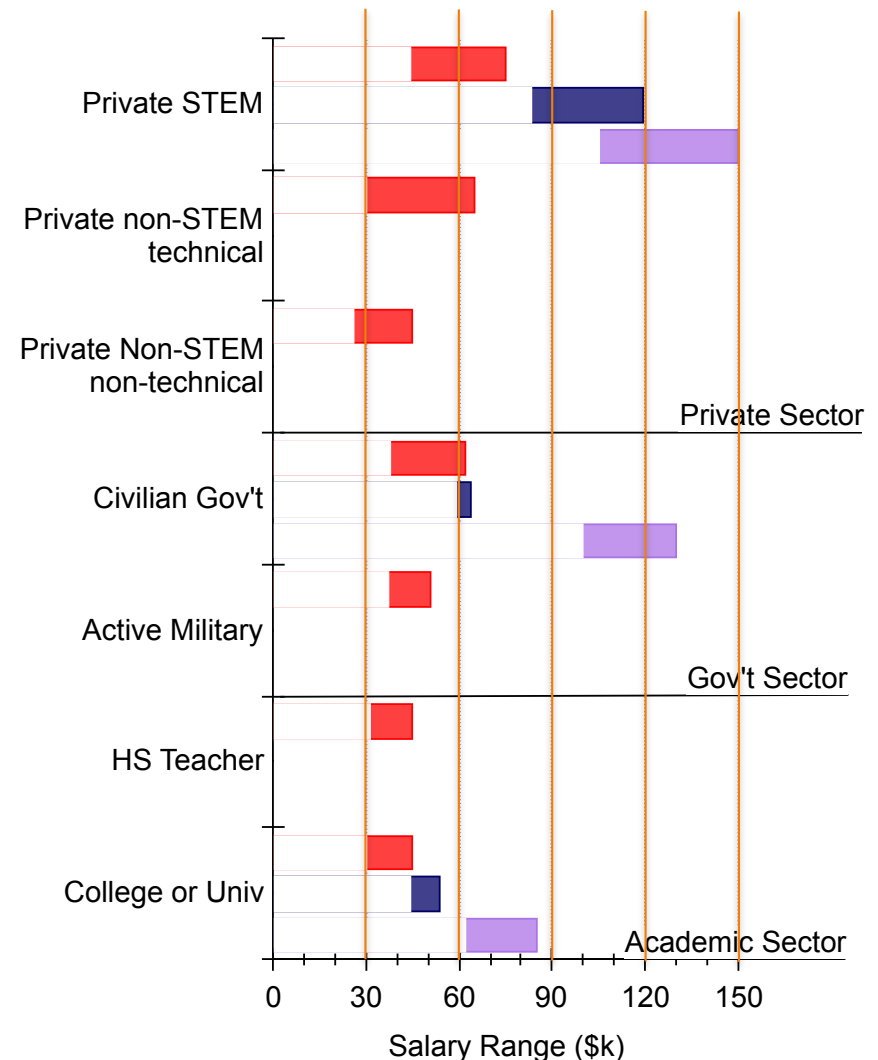
Typical Salaries for Bachelor's Degree Recipients, Class of 2015



1 yr post B.S. (2016/7)

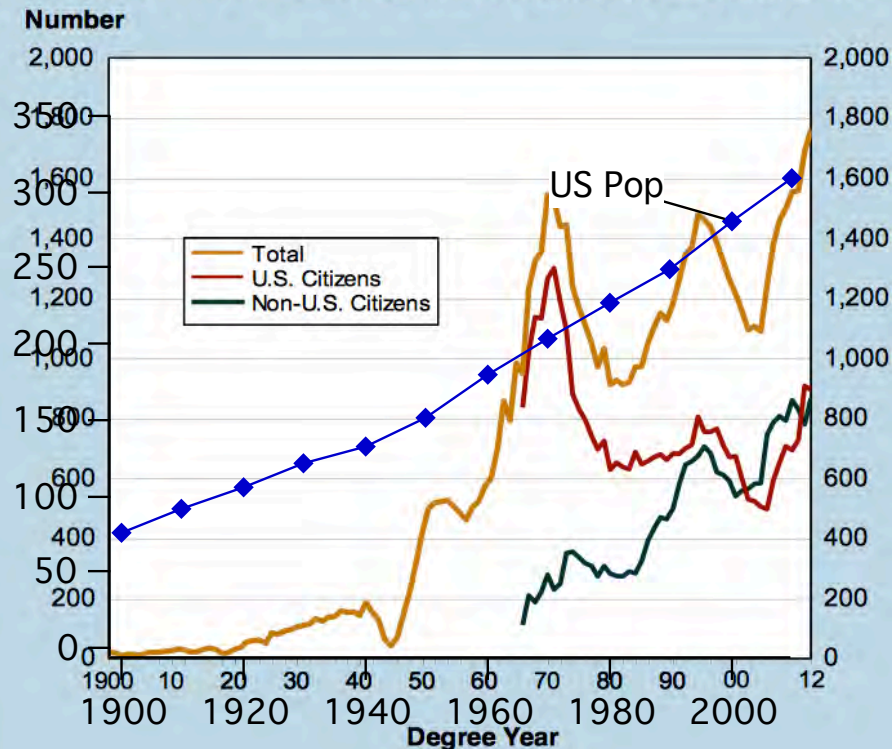
1 yr post Ph.D. (2016/7)

10 yr post PhD (2011)



Who gets a physics PhD?

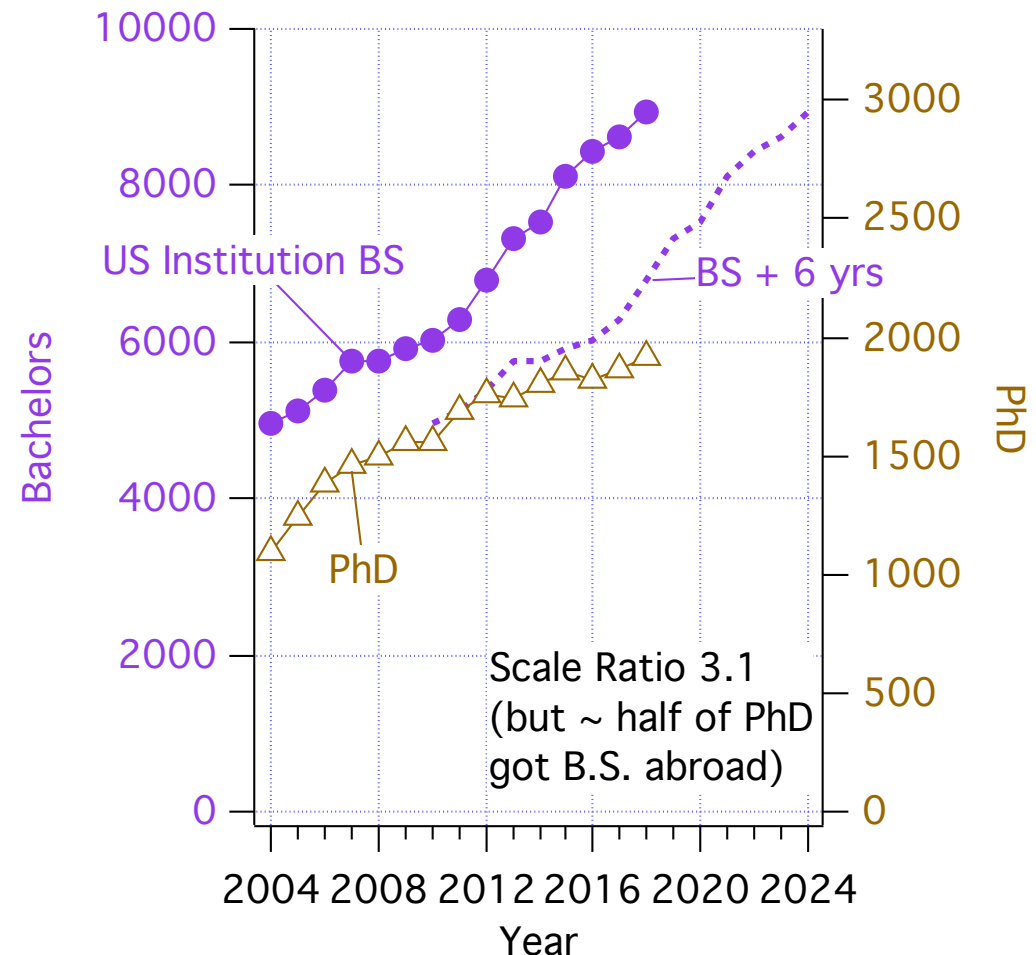
Physics PhDs Conferred in the U.S., 1900 through 2012.



<http://www.aip.org/statistics>

Physics PhD's– 2017 data N=1865

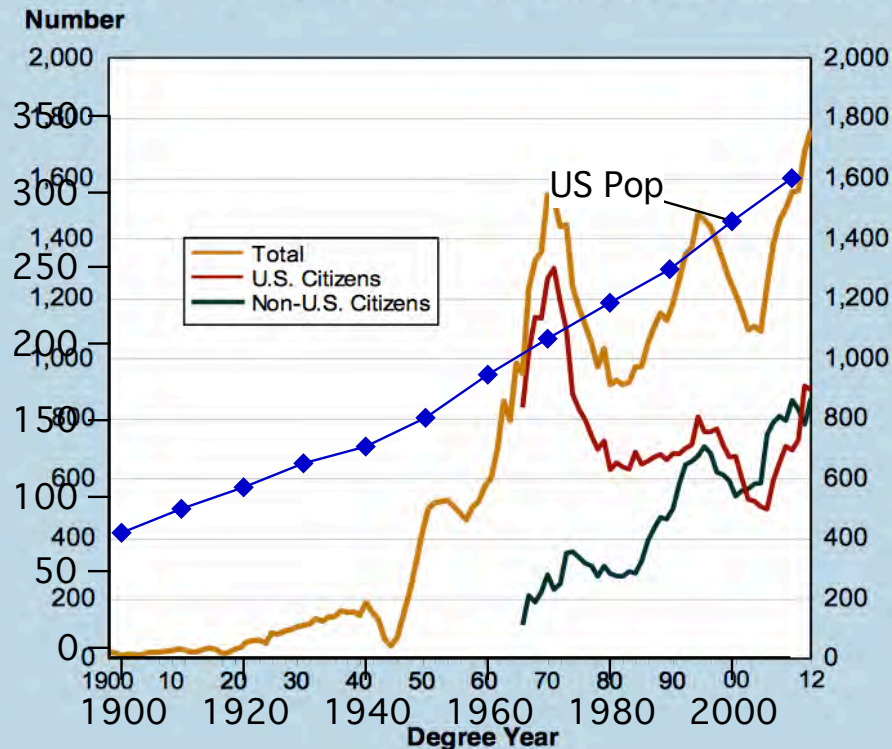
- 56% US Citizens
- 17% Female
- 27% of US citizens are non-white



PhD Programs are no longer tracking B.S.

Who gets a physics PhD?

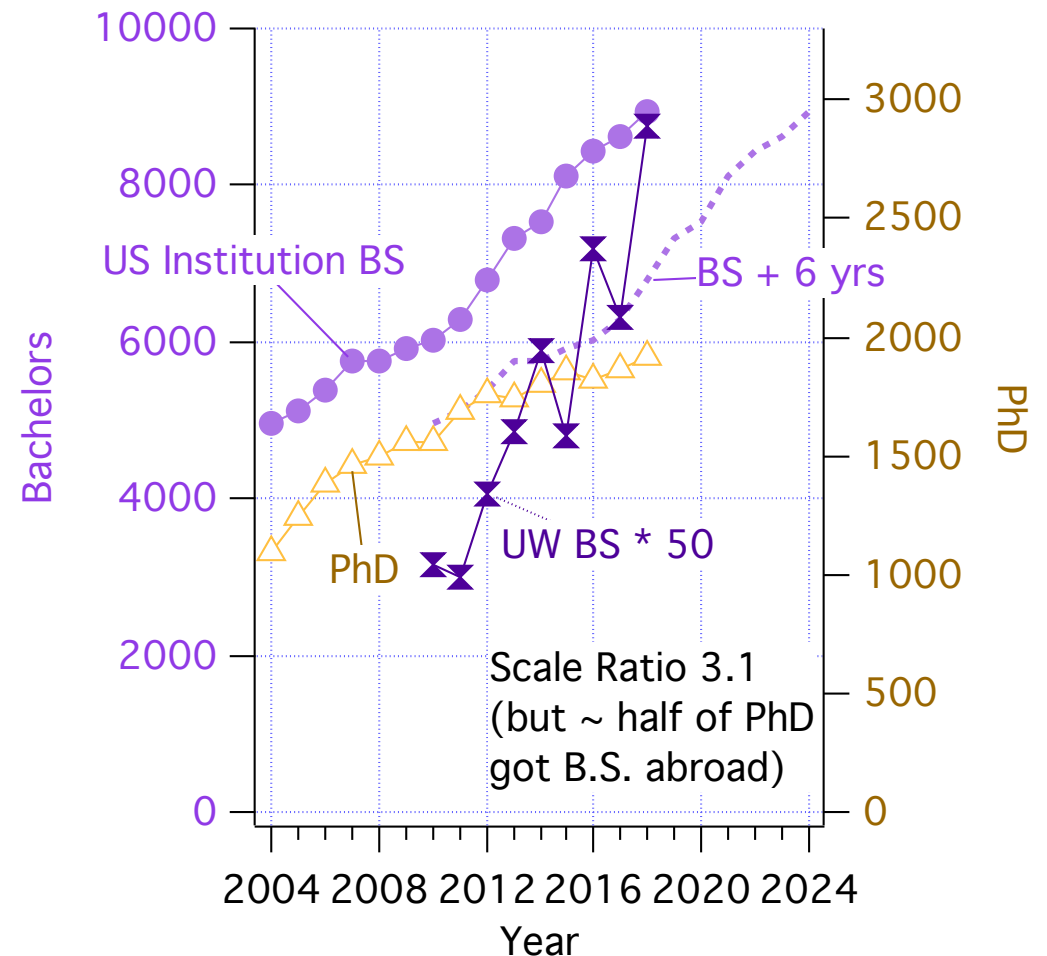
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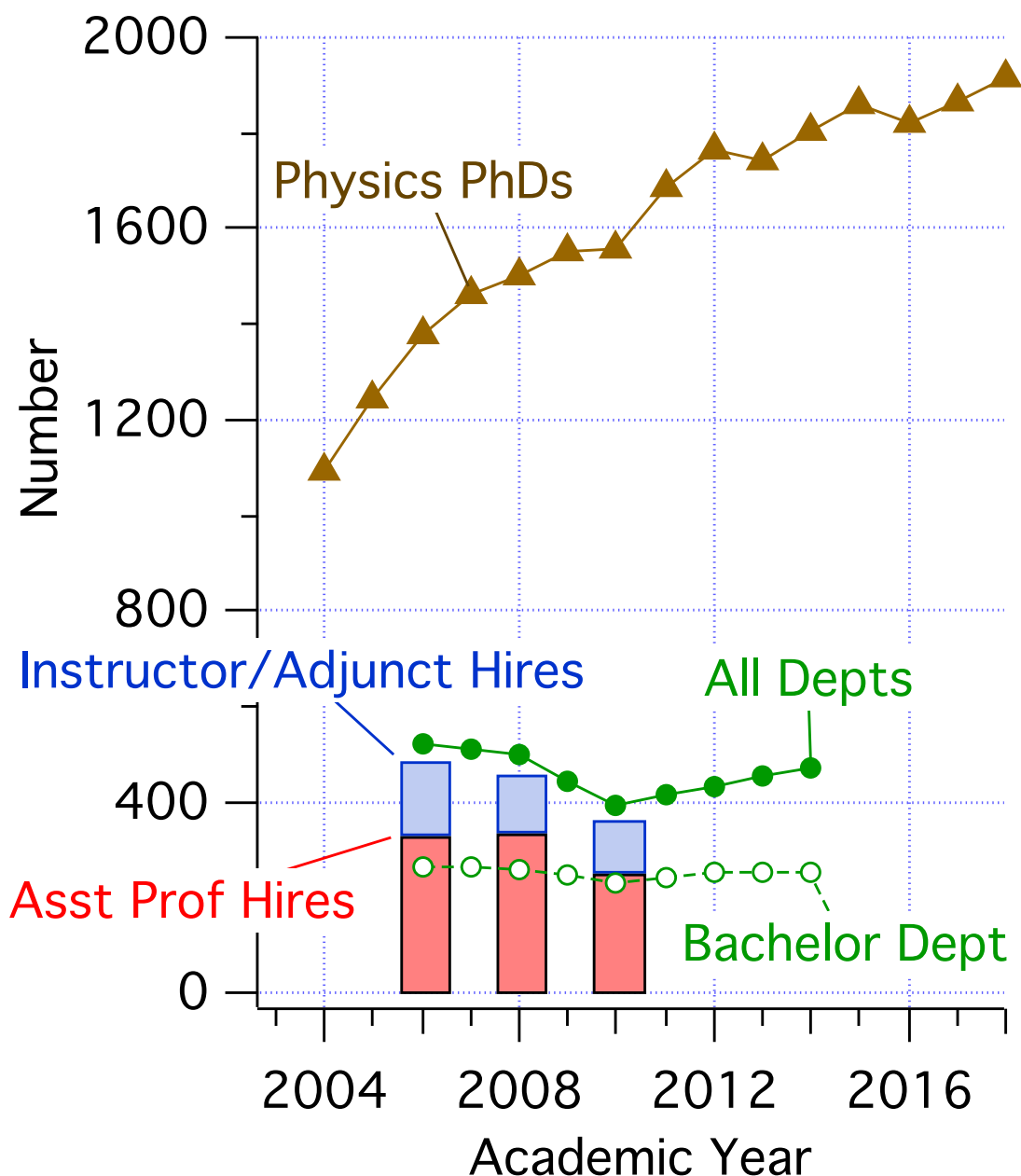
Physics PhD's— 2017 data N=1865

- **56% US Citizens**
- **17% Female**
- **27% of US citizens are non-white**



**UW now produces 2% of
Physics B.S.**

Newly Hired Faculty Growth < PhD



2008 Hire /2004 PhD = 40%

2010 Hire /2006 PhD = 26%

2014 Hire /2010 PhD = 30%

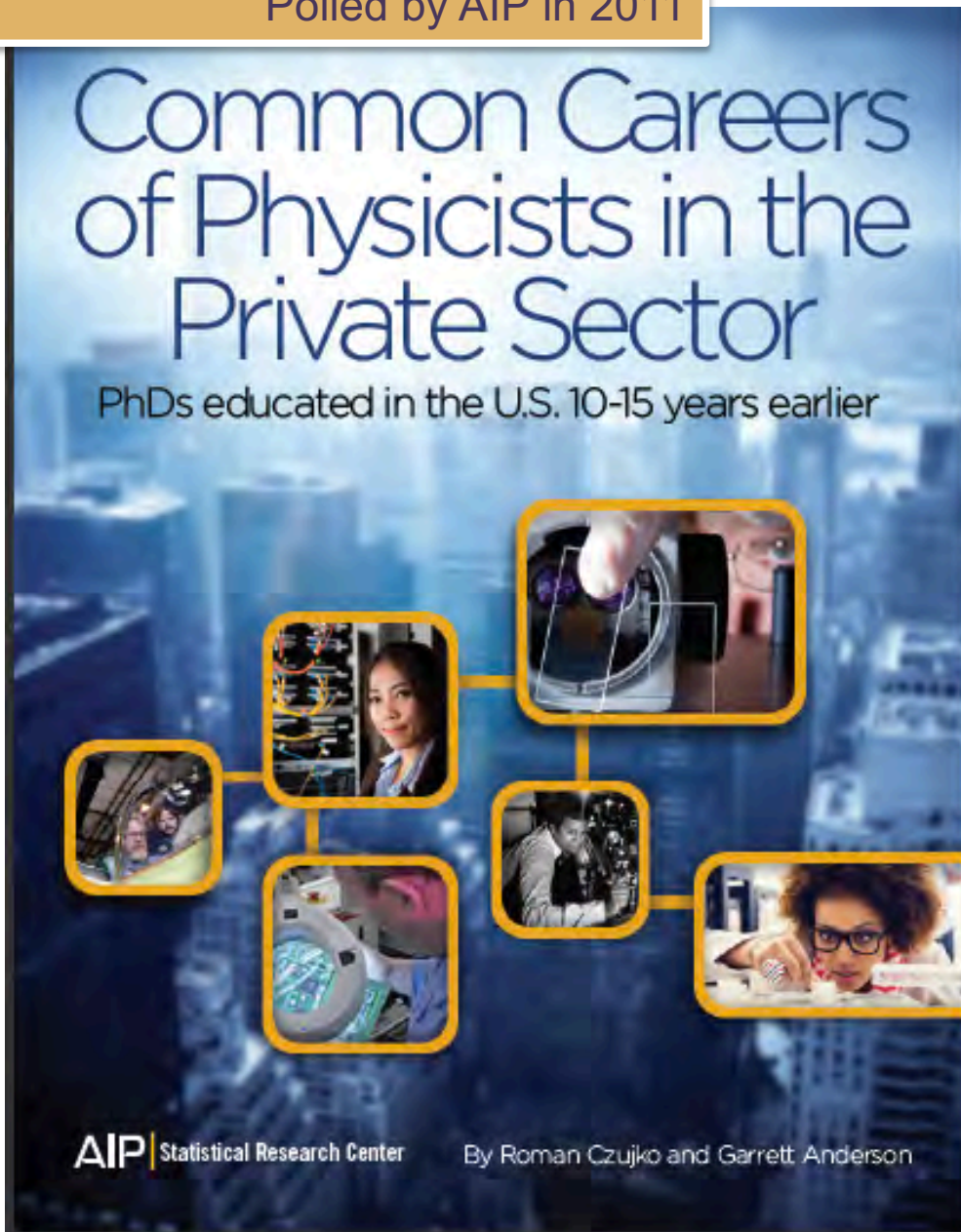
Jobs like mine: → 10%
General Academic: <30%

Total # Departments ~ Same

	2008	2013	2018
Bachelors	509	497	503
Masters	64	57	57
PhD	189	198	201
Total	762	752	761

What else can I do with a PhD?

Classes of 1996-7 and 2000-2001
Polled by AIP in 2011



- Self-employed
- Finance
- Gov't Contractors
- Health & Medicine
- Industry
 - Engineering
 - Computer Science
 - Physics
 - Other STEM
 - Non-STEM

Most Common Activities:

- solving complex problems
- managing projects
- writing for a technical audience

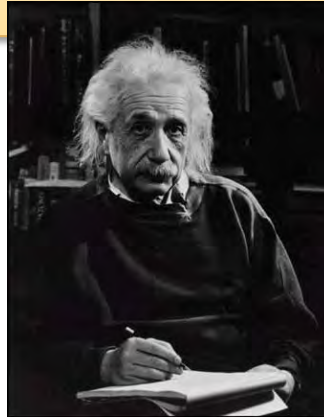
So if I do go to grad school ...

- What happens?
- How long does it take?
- How do I finance it?
- How do I figure out where to go?
- What are grad schools looking for?

“Standard Path” to the Ph.D.



Take Classes



Dream New Ideas



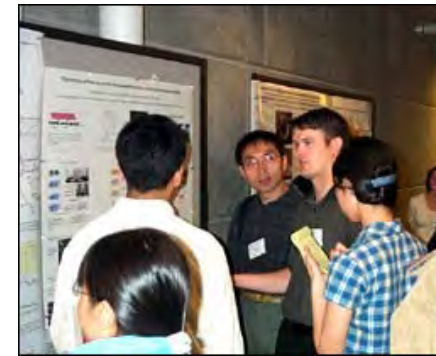
Analyze Results



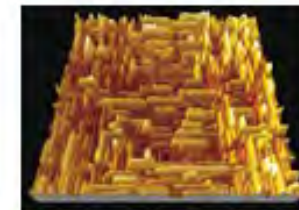
**Read other
people's ideas,
get trained**



Take Data/Calculate



Present work



Publish results



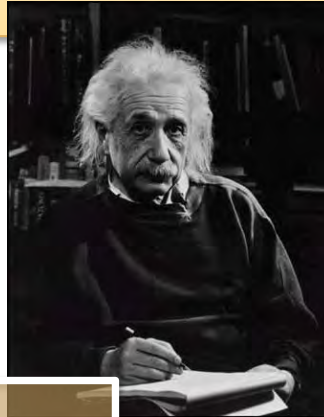
GRADUATE



“Standard Path” to the Ph.D.



Take Classes



Dream New Ideas



Analyze Data

2-3 years

2-4 years



Read other
people's ideas,
get trained



Take Data



Present work



Publish results



GRADUATE



So if I do go to grad school ...

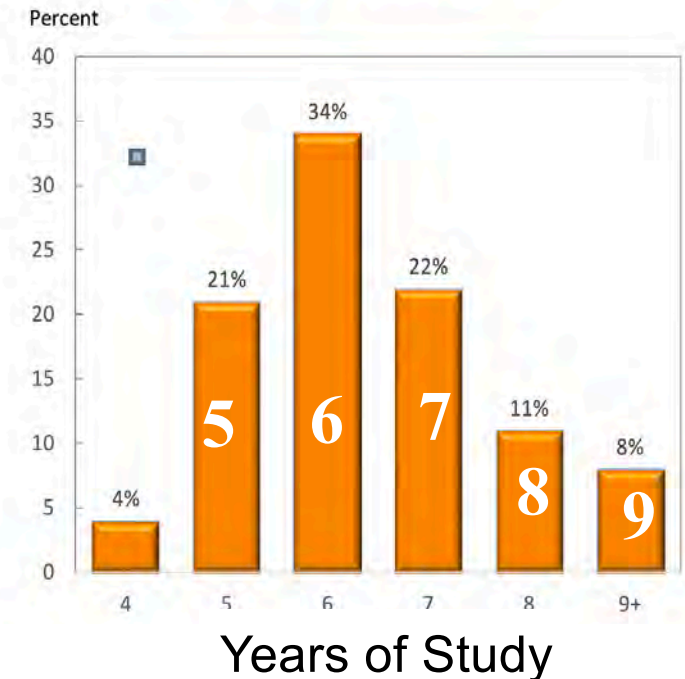
➤ What happens?

➤ How long does it take?

➤ How do I finance it?

➤ How do I figure out where to go?

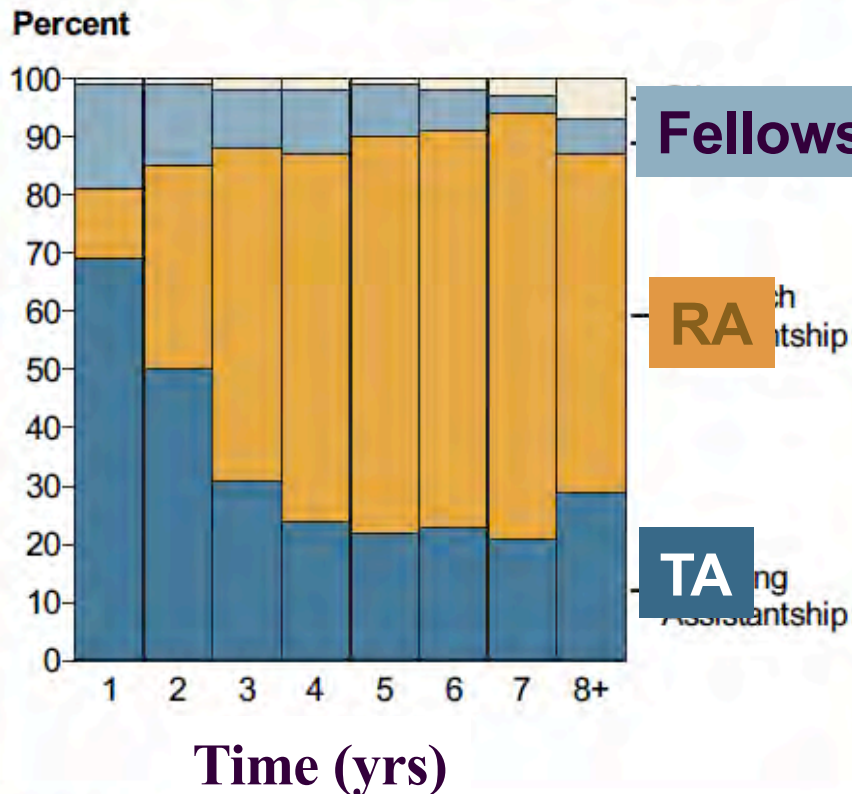
➤ What are grad schools looking for?



You get PAID to go to grad school!!

PLUS: Your tuition gets paid
& you don't have to pay off student loans until you graduate

Primary Type of Support for Physics Doctoral Students



Source: AIP Graduate Student Survey, 2006

You don't add to your savings, but
you don't deplete them, either.

Current UW Rates: \$27-31k/yr
Current NSF Fellowship: \$34 k/yr

Roommates
Used Car, New Computer

* NSF deadline is late October

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Gradschoolshopper.com

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Top Tier? Big? Close to home?

➤ Ranking

- Rankings are out of date – new hires make a big difference
- Top tier hire each other's grads
- Next tier = schools like UW
- Lower tiers often have pockets of top-ranked subfields

➤ Size

- Large comprehensive department lets you change sub-fields
- Small lets you be a bigger fish in a smaller pond
- Your professional network = your grad school contacts

➤ Interdisciplinary Connections

➤ Geography

➤ Department Climate – Visit!!

So if I do go to grad school ...

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Selection Criteria

➤ Probable success depends on traits such as:

- *Commitment*

- *Creativity*

- *Maturity*

- *Confidence*

- *Leadership*

- *Communication Skills*

Letters and Personal Statement

➤ Good match between your goals and research in the department (and not too many in one area)

➤ Successful research (or independent) experience

➤ Your UG academic performance and GRE

➤ Meet all deadlines; essay spelling and grammar

UW Admission Statistics

➤ 700 Apply \Rightarrow 90 – 100 Admit \Rightarrow 25 Enroll

➤ Physics GRE of US Admits:

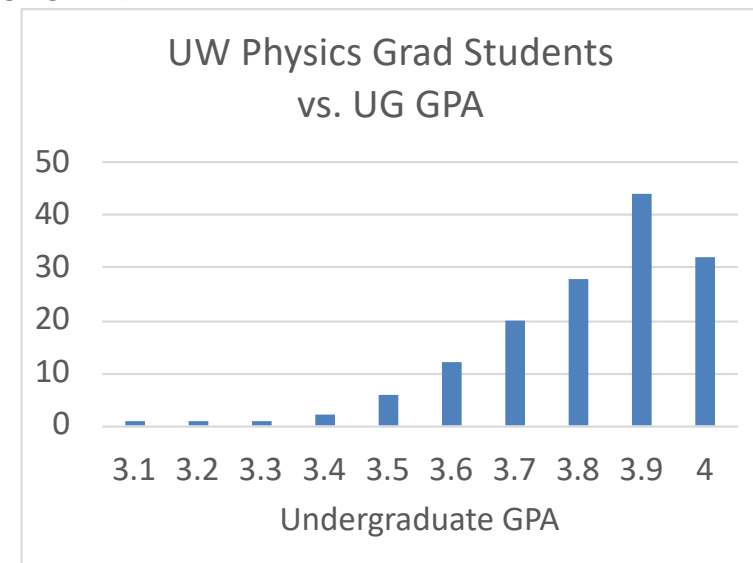
- Average in the low 800's (out of 990)
- Admission rare below the mid 600's

➤ Undergrad GPA:

- Average GPA = 3.8
- Admission rare below \sim 3.5

○ Research Experience

- Expected: Almost everyone has some



UW's current US News ranking is about 20

What do they know about me?

GRADES

Letter of Rec 1

Letter of Rec 2

Letter of Rec 3

GRE
Physics + General

Personal Statement +
Cover Letter

Study for the GRE!

- Very different from classroom exams
- Balance Speed vs. Silly Mistakes
- Get the book “Conquering the Physics GRE”

Personal Statement

- Be honest and sincere
 - Show, don't tell
- Speak to your strengths and goals
 - OK not to know your specialty, but don't sound wishy-washy
- Tailor and connect to the target department
 - Mention specific research areas, faculty
- Address any irregularities in your record
 - OK for this to be in letters of reference
- EDIT for grammar, spelling, coherence
 - Have someone read your essay
- Give a copy to your references

Letters of Recommendation

- You need 3 letters from people **with a PhD** who **know you well** outside the classroom
 - Thank them if they say you should find someone else
- At least one should be from someone with whom you have done research (either at UW or elsewhere)
 - Summer REU, Local project with results by Autumn Sr Year
- Provide background information
 - Aspects you want them to cover in their letter
- Give plenty of time
 - Send email with a list, including deadlines and links
 - Gently verify/remind as deadline approaches

Checkboxes for Recommenders

- **Intellectual Potential**
- **Intellectual Depth**
- **Intellectual Independence**
- **Intellectual Curiosity**
- **Critical Thinking**
- **Analyze a Problem and Formulate a Solution**
- **Creativity and Imagination**
- **Academic Performance**
- **Research Aptitude & Potential**
- **Lab Skills & Techniques**
- **Potential for Teaching**
- **Potential for career advancement**
- **Motivation**
- **Maturity**
- **Self-confidence**
- **Resilience**
- **Concern for others**
- **Social Skills**
- **Ability to Work with Others**
- **Ethics and Integrity**
- **Facility with English Language**
- **Oral Communication**
- **Written Communication**
- **Planning and organization**

Relative to other students at the same level, is this student:
Top 5%, 10%, 25%, above average, other, unable to judge.

Overall Advice

- Do research summer after junior year
 - Form a GRE study group wherever you are
- Don't overload your schedule senior year
 - Applications and visiting weekends = extra half class
- Apply to 7-10 places
 - 2-3 "Reach", 2-3 "Safety"
 - Don't apply anywhere you aren't willing to go
- Stand out from the rest
 - Apply WELL BEFORE the deadline
 - Visit, call and/or email someone you want to work with
 - (but don't bug them too much....)
- Check that file is complete
 - Contact Grad Assistant by email
 - Follow up on late letters, transcripts, etc.

It's not for everyone, but ...

- Grad study in Physics can be a grand adventure.
- A Physics PhD prepares you for a wide variety of careers and life experiences.
- If this is what you want, and you are willing to work towards it at subsistence wages for 6 years,

GO FOR IT!

Grad Student Panel