

Grad school and research: Tips and advice

Slides available here: nattrass.utk.edu/Talks/NSBP2016/

Who I am



- Tenure Track Assistant Professor, University of Tennessee, Knoxville
- High energy nuclear physicist on ALICE experiment
- Undergraduate academic advisor
- Currently supervising 2 post docs, 4+2 graduate students, 4 undergraduates
- I brew beer & wine, keep bees, bike ride as much as possible, and have a toddler

Advice

- Think strategically about your career
- Build a network of mentors
- Take advantage of opportunities
- Build a network of support
- Be selfish & self-promote



Should you do undergraduate research?

- Most undergraduates do some research
- Nearly all graduate students did undergraduate research
- Undergraduate research is
 - The best way to find out if you like research
 - Find out what you like to do
 - Practical training
 - Leads to letter of rec
- **Yes for almost everyone**



How to do undergraduate research

- Data base of almost all summer programs nationwide
<http://pathwaystoscience.org/>
- Talk to faculty at your university
- Be persistent
- Be flexible
 - Topic doesn't matter
 - It's only a summer



Should you go to grad school?

- About 23% of students go to grad school
 - 2014-2015: 8122 bachelors degrees, 891 masters, 1860 PhDs
(<https://www.aip.org/statistics>)
- Major career decision
- Specialization: lose some career and geographic flexibility
- Normal *not* to go to graduate school
- Most people who go to graduate school do not stay in a research career
- You should only go to graduate school if doing so helps you achieve your career goals.
- Any credible school gives you a stipend and covers your tuition.

Getting in to grad school

- Three components
 - GRE subject exam
 - Letters of recommendation
 - Grades
- Grades & GRE are best predictors of performance in classes
- Letters of rec are best predictors of research ability
- Rejections are not a reflection of your self worth. Do not take it personally.

Choosing a grad school

- Try to choose a school with 2-3 people you think you could work with
- Look at qualifier pass rate and student graduation rates
- Consider selectivity, academic difficulty and reputation
- Consider school environment, location, cost of living, culture, etc.

Choosing an advisor

- Where are his students now?
 - In and out of research!
- What do his students say about him?
- What is his style?
 - Working with post docs and senior grad students is fine.
- What topic?

Once you're there

- Develop network of mentors beyond your research advisor
 - Faculty, students, post docs
 - Others in your field outside your university
- Approach this like a job. Show up 9-5. Make sure your supervisor knows what you are getting done and show progress/report problems regularly.
- Take advantage of flexibility and resources of academia
- Network, network, network
- Have a life outside of work



What I am thinking when I meet with students to discuss research

- Do I have the resources to take this student on?
- What impact would this student have on my group?
- Does working in my group help this student?
- Does taking on this student help me?
- Does taking on this student help the community?

What I am looking for?

Good traits

- Strong work ethic
- Enthusiasm
- Skills, experience
- Squeaky wheel

Red flags

- Severe interpersonal problems
- Unrealistic/mismatched career expectations
- Attendance problems

Random good advice I've gotten over the years

- If you are not available outside of normal working hours, do not make excuses – just say you're not available.
- Learn to say no.
- If you can't say anything nice, don't put it in writing.

