Grad school and research: Tips and advice
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.