Comments on Graduate School

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Various things I learned over my career, which I wished I had known earlier.
0. Graduate Student Timeline

1. Apply, thinking of becoming a professional scientist / academic.
2. Year 1: Take more advanced courses
3. Year 2: Pass qualifier*
4. Full-time research**
5. Graduate, find postdoc or permanent job.

*Most stressful - but all of these can be stressful.
**Most fun!
1. You are working too much*

- I recall from grad school lots of physics - working on equipment, running experiments (for months at a time), analyzing data, writing papers, writing proposals for new experiments, going to meetings, giving talks, ...

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- I also recall lots of bike riding and gym time, hikes in the mountains and national parks, dinners in Santa Fe, “parties” with colleagues, ...
- Time off will improve your mental health and your overall productivity.
- In all my years at Rutgers, I only had one student / postdoc who took off too much time.

* Probably. Almost certainly.
2. You might be wondering if you belong here

• For most of you, more than ever in the past, you are among a group of really talented people.
• You are perhaps starting to look forward to the future, comparing yourselves to faculty, wondering how you can ever be that good.

“Imposter syndrome”
https://www.npr.org/2021/01/22/959656202/5-steps-to-shake-the-feeling-that-youre-an-impostor
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• For most of you, more than ever in the past, you are among a group of really talented people.
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• A lot of us wondered that too when we were in graduate school.
• The game is fixed.

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- Many skills contribute to your success as a professional academic / scientist, beyond the intuition and math skills that determine much of your success in classes
  - Recognizing interesting problems that you can contribute to
  - Ability to give good science talk / teach a class
  - People / “political” skills
  - Organizational skills
  - Coding skills
  - Self direction
  - Determination
  - ...
3. You are probably worried about your qualifier next fall
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• “We” got really worried before our quals – about 50% pass rate then.
  – I picked a school with only written qual; yours is much more aligned to professional activities.
• I find I do better if I am a little worried, about giving a good talk, etc. But not too worried.
• So... worry appropriately.
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- So... worry appropriately.
- What is appropriate?
- Recent qual results:
  - 2020-2021: 14 passed, 2 to redo parts, 4 delayed, 1 left w/o taking qual
  - 2019-2020: 9 passed, 1 taking now
  - 2018-2019: 21 passed, 1 left w/o taking qual
  - 2017-2018: 21 passed, 3 failed
4. Doing research

- Faculty want students who are productive and self-supervising.
- In addition to being deeply focused on your particular research,
  - think about what is the next step or project.
  - is there something you learned / heard about from elsewhere that could help your research?
- Writing peer-reviewed papers is not a program requirement, but it is something that most faculty consider either very important or required for your professional success.
4.a Giving talks*

• Take notes on what others do poorly. Do not imitate them.
• Be interested and excited in your talk. If not, why should your audience think it is interesting or exciting?
• Think about your audience; only give them the needed technical details, at an appropriate level
  – I only hear about 1 talk per decade that is too simple.
  – Almost no one can follow the algebra.
  – Your experimental details are very exciting to you.
• Avoid “you know”, “uhhhhh”, sighs, etc.
• Know what you talk about; arrange your talk to talk about things you know.
• There should be reminders on the slide for everything you want to say - but don’t read it.
• End seminars a couple minutes early.

* This slide is too busy.
4.b A pretty slide

- Your beautiful slide transitions are distracting.
- Your fonts are too small.
- Your figures are too small, and there are too many on the page.
- Your lovely slide background adds noise and confusion.
- The contrast is poor.
- Your margins are too narrow.
- At least you did not put every word in a different color to emphasize everything.
- Did I provide references for these figures? None are my work.
- Some rooms have small screens.
- Green may not project well.

Hard to see postage stamps, limit to 1-2 figures per slide.
5. Getting ready to be hired (for a postdoc position)

• Faculty often hire postdocs to support a particular technical project, rather than trying to find the “best” person
• But some of us think: this is a chance to hire someone who will work with / for us for decades

• You are the product. What does your customer want?
  • Explain why you want the position, but also how hiring you benefits them.

• Don’t take the last plane flight the night before.

• Learn from the mistakes of others.
6. Things that can get you into trouble

• Academic integrity violations.
• Being unprofessional / abusive / harassing.
• Being irresponsible – in your classes or as a TA or ...
Thank you