The “How-To” Guide for Graduate School

Timeline

When to get started on thinking about grad schools, when to have essays and rec requests done, etc.

- **Junior year spring:** think about all your career options and make sure you can justify why you want to go to grad school
    - "I don't have anything else to do" is not good enough.
    - Think about what you want to get out of grad school and what you might want to do afterwards.
    - Talk to your mentors about these things to get a better sense of the possibilities.
- **After Junior year summer / Senior year early fall**: pick schools to apply to.
    - Ask your mentors about them and try to find out non-advertised things like department culture.
    - Consider connecting with current grad students for their perspective, especially if you already know them.
- **Senior year early October**: identify 3 mentors who know you well as a scientist for references.
    - They don't necessarily have to all be astro/physicists, but letters carry much more weight coming from people/institutions familiar to the reader. Ask them if they can write a *strong* letter for you. Optionally, coordinate with them so they each focus on something different.
    - If a letter writer has never written a letter for a US astronomy grad program before, make sure they have appropriate resources to guide them.
    - Consider discussing gender bias in recommendations (e.g., see here).
- **Senior year early November**: outline a general essay template (like the example linked below)
    - Write all of the parts that are not school-specific: who you are, what you've done, what you want to do. This will make it *much* easier to individualize them to schools later.
    - Send this around your network for feedback.
- **Senior year early November**: reach out to potential advisors at grad schools you will apply to.
    - **Briefly** introduce yourself and what you do, say you're applying to their institution, express interest in their research and ask if they're taking on students. Be succinct; it will give you a better chance for an initial response.
    - You may have to follow-up with a second email (faculty are super busy, especially during application season, and get a LOT of emails from students). Wait a week before sending the 2nd email.
    - If they email you back and are willing to talk to you about potential projects,
        - Ask them about things you are curious about (relevant to the application process, research, life at their University, etc.)
        - Ask if they are taking students, how collaborative the group is, average time for students to get PhD in their group, what their research program will look like in the next 5 years, etc.
        - Thank them for their time.
        - **Definitely** refer to that discussion and your takeaways in your essay.

        - Maybe stay in touch from time to time, e.g., if something new happens in your research that you want to share, or if you are curious about a new result you read about in one of their papers. (These emails should also be succinct.)
- **Senior year November**: do research on each institution/department and fill in your essay template with all the school-specific information.
    - Edit your research interests/goals as necessary to focus on the aspects that are relevant to each institution.
    - Get feedback on these (from your mentors and/or peers).
- **Senior year November**: make a spreadsheet for your letter writers with application due dates, information about how to submit letters, and spaces for them to confirm their submissions.
    - This way everyone can keep track of what still needs to be done.
- **Senior year November (optional)**: start looking for application fee waivers (also see below for more info).
    - If there isn't information on the application website, you can email whoever coordinates admissions.
- **Senior year ~1 week before first application due date**: email your letter writers to remind them of upcoming deadlines and your spreadsheet.

Picking schools

There are plenty of ranked lists of grad schools that you can find online. However, I'd recommend to start by listing what is important to you and searching for people and research topics that interest you. That will lead you to the schools that are the best match for you. It will take time and research (more than it took for deciding on where to apply for undergrad). Spend some time thinking about what is important to you in a grad school experience. Here are some examples:

- **Science**:
    - advisor fit and interest in their potential projects (this is probably the most important thing to consider!)
    - breadth of department research/relevance to your interests
    - number of potential advisors doing research you are interested in
    - prestige
    - what their previous PhD students are doing now
    - retention of PhD students
    - required courses
    - any qualifying/comprehensive exams
- **Other work stuff**:
    - health insurance/medical leave policy
    - graduate union
    - department climate and DEI efforts
    - demographics of/representation among faculty and grad students
    - whether the grad students are happy
    - years of guaranteed funding
    - TA expectations
    - professional development opportunities
    - preparation for non-academic career

- **Lifestyle**:
    - rural vs. city
    - cost of living
    - weather
    - proximity to family and friends
    - quality of public transit/commute options
    - access to your personal hobbies
    - housing
- **Application**:
    - GRE/PGRE requirements
    - application fees
    - availability of fee waivers

Come up with a list of schools that do fairly well on the criteria you identify (or at least the ones you can evaluate before visiting). Talk to your mentors about how selective each school is, and aim for a good mix of different tiers. Try to narrow it down to ~7-12 schools.

Leverage whatever connections you have to your schools to learn more about the hidden criteria like advisor fit and department culture before you apply — you might be able to eliminate a school and save time and money.

How to write the essay(s)

- Avoid cliches (e.g. ,"ever since I was a small child I've loved to look up at the night sky"). A lot of readers really hate them.
- Do not write things like "I had the opportunity to", "I helped", "I was involved in" -- these diminish your contributions and your qualifications. say "I did", "I analyzed", "I created", "I developed", etc.
- Be as specific as possible.
    - For example, a lot of people can say that they care about equity and inclusion. Distinguish yourself with how it relates to you personally, whether that means pointing to actions you've taken in your community or explaining why it's important to you.
    - For your research, describe specifically what *you* did on a given project (as opposed to what the group accomplished while you were a member).
- Be clear and concise - the committee have a LOT of these to read. Think about the main takeaways you want to impress on the readers and spend most of your time emphasizing and expanding on those.
    - Spend more time creating a well-structured essay than crafting a beautiful narrative — structure makes it easier for reviewers to quickly identify and then remember key points.
    - If you touch on each of your main takeaways in the intro paragraph, that gives a rough picture of you as a candidate right off the bat, and primes the reader for all the details you'll go into.
- When you're talking about what kind of research you want to accomplish and other career goals, it helps to describe (briefly) how accomplishing those will be valuable to the broader community.

- If you feel the need to explain something less than glowing in your past, spin it in a positive way. For instance, say how you've grown from this experience. It should be clear that you've overcome whatever you were struggling with, and it made you stronger.
- Stay positive! The reviewers want to hear about what you enjoyed, what you learned, what skills you gained, how you learned to approach problem solving, etc.

Example essay outline

1. **introduction**:
    1. who you are as a person/scientist
    2. your interests
    3. brief expression of interest in the institution specifically (catered to each university you apply to!)
    4. This introduction should primarily be a summary of you, highlighting strong points and key takeaways. Ideally, this is an abstract of your essay that has all the essential points (think first paragraph of a news item).
2. **for each research experience**:
    1. Explain in detail what *you* did, the motivation and goals for the project, what you learned, what you enjoyed, and takeaways (how did this experience contribute to following stages of your career or motivate you to pursue graduate research?)
    2. Explain the motivation of your specific project but avoid spending time explaining the mission that collected your data and other people's science except where it **directly** motivates your research question.
3. **If you have relevant non-astronomy work experience** (e.g. software engineering internship):
    1. Mention briefly what relevant things you learned and/or how it helped push you toward graduate research.
4. **Your research plans:**
    1. Clearly describe what you want to work on and what you want to get out of graduate school.
    2. Maybe talk about future career goals.
5. **Reasons you are applying here:**
    1. Explicitly lay out all the reasons why you want to work at that particular institution/department.
    2. Committees are looking for people who have serious interest in their department, so be specific about resources/opportunities they offer, **especially** anything that is new or growing.
    3. Tie these things back to your intended research explicitly.
6. **List a few professors you might want to work with:**
    1. Include the aspects of their research that you find interesting and optionally what you would want to work on with them.
    2. If you have had a conversation with any of them about grad school, mention it here.
7. **Any additional information that doesn't fit in the above points:**
    1. could be dedication to or interest in things like outreach, DEI, mentorship, science communication, teaching, etc.
    2. If you want to be in the area to be close to your family or something like that, you could include it here.

3. Committees care about yield (% of students who accept their offers) so any special reasons you have for preferring their institution could potentially make a difference.
4. Maybe add any personal passion projects that are relevant.

Insights on the application review process

- Each dept. has an application review committee, typically consisting of a handful of professors.
    - These individuals will read all applications and make suggestions on who to admit
    - If you mention a specific faculty member on your application (who is not on the review committee) they may send your application to that faculty member for review and comments.
- Review committees are typically trying to assess
    - If you have the ability and drive to conduct graduate-level research
    - Can you be a productive researcher at our school
    - Is there a faculty member here who you can work with (and ideally who has funding to support you)
- Reference letters carry a lot of weight! It's important for the letter to go beyond what is already available in a transcript or CV/resume.
- Typically, GPA and GRE scores, etc. are far less important than the essay(s) and reference letters.
- There is a networking aspect here. Sometimes who you know, who they know, and who is willing to strongly advocate for you plays a key role in you getting into a specific graduate school.
- If your application rises to the top, you may be contacted for an interview
    - Please prepare for this interview! Often the committee will send questions ahead of time.
    - If there is a question like "Why are you applying to our University?" definitely prepare a good answer. (Not e.g., "I like the weather"!)
    - Prepare a short elevator pitch on your research/plans.
    - Re-read your essay(s)!
- If you have a good interview, you will likely be invited to campus for a visit
    - Sometimes this is after students are admitted to the program and serves as a recruiting opportunity for the school; other times this is before admissions and is essentially part of the review process.
    - In either case, go on these visits! It is your best way to know if the school is right for you.
    - While there, talk to as many people as you can; including current graduate students and faculty. Ask them questions to get to know the school and the people better.

Fees and waivers

- Each application may cost ~$100 (!)
- Check each school's website to see what fee waivers they may have available. If there isn't information on the application website, you can email whoever coordinates admissions.
- Apply early for fee waivers. Sometimes schools provide waivers on a first-come first-served basis.

- Often schools will provide a list of eligibility options. You usually only have to meet one qualification (check one box). Sometimes having participated in an REU is listed as an option.
- Sometimes you can get fee waivers at conferences from the schools themselves, as coupon codes.

Fellowships

- A fellowship is a funding stream that gives you more freedom than being a TA or RA (e.g., funded by the University and/or a faculty grant).
- Some applications can be due as early as mid- to late-October (e.g., the NSF GRFP).
- Fellowship decisions usually come after you hear back from school applications, and sometimes after you need to accept a school. (So you can't rely on this to decide where you can go to grad school.)
- If you have the time, it's worth trying to apply to multiple fellowships. You can't get it unless you apply! And if you get it, a fellowship can be life changing (independent funding, prestige, peace of mind, etc..) Feel free to re-use text (and possibly an entire essay) in multiple fellowship applications.
- It's best if you can discuss the research plans in your fellowship application with your advisor – and/or your potential future advisor at the school you are applying to.
- Often it takes more than one application cycle to be successful. Don't be afraid to re-apply!And if you get feedback from reviewers, take that into account when you edit your application to reapply in the following cycle.
- Some examples of fellowships to look at: Ford Foundation Predoctoral Fellowship, NSF GRFP, Hertz Foundation Fellowship, (and lots more, e.g., se George Iskander's list in the link below).

Other Resources

- Additional pdf files on our CIERA REU GitHub repo.
- George Iskander's GitHub repo (from U Chicago). Note: this also has a good list of fellowships to consider applying to.
- "Kisses of Death" for applications
- List of possible interview questions