

Overview of Graduate School Applications

October 9th, 2024

Motivation

- Entry into a PhD program
- Why an Astronomy PhD ?
 - Astronomy positions
 - Faculty
 - Staff scientists
 - Technical support
 - Positions in teaching colleges
 - Industry (computer science, data science, semiconductors etc.)
 - Other career opportunities - like entrepreneurship, teaching, astronomy administration

Disclaimer

- This lecture is specific towards PhD applications in the US
- However, a lot of things apply generically
- This lecture is just an OVERVIEW
- Most of it is based on my personal experience with applications, and experiences of those I have talked to/mentored for applications

If you want more details, I would be happy to chat about PhD applications in my office hours !

Overview of the application process

Most universities will have an application portal, where you would be required to:

- Letters of Recommendation
- Statement of Purpose/Research Statement/Essay
- Personal Statement/Diversity Statement
- Academic CV
- Transcripts
- Standardized test scores
- Application fee

Dates/Timelines

- Most places admit for the fall entry
- Application deadline is typically in December of the PREVIOUS year
 - So, if you are applying for a position starting Fall 2026, the deadline will be December 2025
- Start thinking about the applications from July of the previous year
 - So, in the above scenario it will be July 2025
- Ask your mentors for recommendation letters by early November 2025
 - Have a first draft of your statements and CV ready before this !
- Have your application ready at least a week before the deadline

Selecting Universities

- Most applicants apply to 10-12 schools
- Have a good mix:
 - 3 - 4 dream schools/ tier-1 schools
 - 3 - 4 quality schools/ tier-2 schools
 - 3 - 4 specific schools/tier-3 schools
- Generate a large sample of schools to choose from
 - Depends on the specific areas you target
 - Have a conversation with your advisors and collaborators
 - Seniors
 - Personal experience/research
- Narrow down - develop a set of criteria that suits you
 - Have conversations with your mentors
 - Be organized !

My criteria for selecting universities

- General vibes - heard of the univ before in some context ?
- Fully funded
- Observatory connections
- Professors:
 - Around 3 - definitely interested in working with
 - A couple more - maybe interested in working with
 - Should be active publishers (Astro ≥ 2 publication per year is active), at a decent authorship level
- Place where its located and weather

Optional criteria: do my current mentors have any connections to that univ ?

Have an spreadsheet where you analyze these criteria for each university

Letters of Recommendation

- Typically 3 letters of recommendation are required
- Can be from research advisors, course instructors, and in exceptional cases industry mentors
- In most cases, letters are confidential
- Preference:
 - Research letters > course letters
- May not always be possible to have 3 different research letters
 - Ask a course instructor who KNOWS YOU WELL !
- Start cultivating good academic relationships with your research mentors
- If you have space for additional research experience - go for it !

Statement of Purpose/Research Statement/Essay

- Requires the most effort - a part of your application that is in your direct control
- Typically 1000 words
- It should describe at least the following in a self reinforcing way:
 - Your research journey and what lead to it
 - Your research interests and why
 - Technical and non-technical skills
 - Research capability
 - Capability to persevere and go through challenging times in research
 - Your future aspirations
 - Your interest in that specific university, and how that connects to your SoP
- A good SoP can take upto 2-3 months to prepare
 - Iterate multiple times, have others review it - seniors, mentors, friends/family

One way to write an SoP - that is what I did

- Para-1: a brief intro about myself, what specific area(s) of astronomy am I interested in and why
 - Should be specific to you
 - Avoid cliches like “as a childhood I used to watch the night sky and got into space” unless you have a very good justification
- Para-2, 3, 4: describe research experience
 - What led you to start working on a project ? How did you get into it ?
 - How was the specific problem statement formulated ? Can be technical
 - What was your role in the investigation of the problem ? Can be technical. Highlight the research skills/tools you learned
 - Did you face any challenges ? How did you overcome them ?
 - What was the major result of the investigation ?
 - How does the result fit in the BIG PICTURE goals of the field, or your overall interests - connect back to para-1

One way to write an SoP - that is what I did

- If you can form a connection or a coherent story between your different projects that is great. It is perfectly fine if the projects were disjoint and you were just exploring
 - Para-5:
 - Specific areas I am interested in for my PhD - should connect to your research experience
 - Why do I want to do a PhD - future aspirations
 - Why that particular university ?
 - Professors I am interested in working with
 - Facilities that the university has to offer
 - Something personal
 - Should be specific and should connect back you your previous paragraphs. Can connect to the criteria you used to select the uni in your application list
 - Avoid very generic things like “this is one of the best uni’s in the world for astro”
 - AI usage: the SoP is personal to you. Would recommend not to use AI for generating the content or for sentence phrasing/structuring. Can use it to refine the language/grammar at the
- END STAGES

Personal Statement/Diversity Statement

- Another aspect of the application that is in your direct control
- This statement is usually optional, but everyone should think about this seriously
- This is the place to highlight:
 - If you have overcome significant challenges and barriers in your academic journey
 - Could be financial, societal, health, or something personal
 - If you think you belong to a community that is underrepresented in the field
 - How has overcoming those barriers helped you become a better researcher/person
 - How will you use this experience to make academia a better place
- Did any organization/fellowship/other form of support help you in your journey ?
- This statement can be crucial in breaking the tie between equally meritorious applicants !

Academic CV

- Usually 2-4 pages
- Contents:
 - Education (high school onwards)
 - Publications, conference proceedings
 - Research experience - a short bulleted description of your projects
 - Awards, achievements and fellowships
 - Key courses - relevant to the PhD program you are applying to
 - Any key course projects/term projects that you think enhances your application
 - Technical skills
 - Outreach activities/societal initiatives
 - Hobbies and extracurricular activities
 - References (optional)
 - Contact information/website

Transcripts & Grades

- Usually, the fall semester transcripts (the semester you are applying) are not required before the deadline
 - The university may ask it later
- For the purposes of the application, unofficial transcripts are fine with most places
 - Official transcripts are required upon admission
- Grades can be an important factor in the application
 - Try to get good grades in all subjects
 - If you have a good justification for why you did not get a good grade in a relevant subject, EXPLAIN THAT in the SoP/personal statement
- Most universities have official or unofficial requirements for a minimum GPA

Standardized test scores

- Post pandemic, most universities have dropped the requirement of standardized tests for PhD admission
 - Studies have revealed that standardized tests may not be a good indicator of success during the PhD
- Some universities may require the GRE general and physics tests
- Make sure you check the requirements before you apply
- Note: if you did not get good grades for some justifiable reasons, scoring well in the GREs is a good way to demonstrate your fundamentals !

Application fee

- Typically 100-150 USD PER UNIVERSITY
- If the application fee is a significant barrier for you, most universities offer waivers !

What to do after you have applied ?

- First of all - sit back and relax ! Congratulations !
- Graduate school applications teach you a lot of skills that are relevant later on in life
- Do not panic over social media posts on application results
 - Do not panic over the rejections/offers of your peers
- It is okay to face rejections - ultimately you can go to only one place at once
 - That is why you are applying to 10-12 places
 - It is normal to get one or two offers and rest rejections
 - You may get rejected from tier-3 schools but get an offer from tier-1
- Be patient, don't make future decisions in haste !

Useful resources

- If you are thinking about a gap year or a post-bacc, or gaining some more research experience before applying to grad schools:
 - TIMESTEP: <https://lavinia.as.arizona.edu/~timestep/for-graduating-students.html>
- Advice by Steward grads on PhD applications:
https://www.as.arizona.edu/sites/default/files/Applicant_Advice_2022%20%28002%29.pdf
- Which schools require standardized tests (always double check on the school website)
<https://docs.google.com/spreadsheets/d/19UhYToXOPZkZ3CM469ru3Uwk4584CmzZyAVVwQJJcyc/view>
- SoPs:
 - TIMESTEP: https://docs.google.com/document/d/1bw-x3t7fQdOxgmp5ab_pbuH9SKegBM83/view
 - Astrobits: <https://astrobits.org/2022/11/25/grad-app-personal-statement/>
- Ask mentors/seniors/faculty !