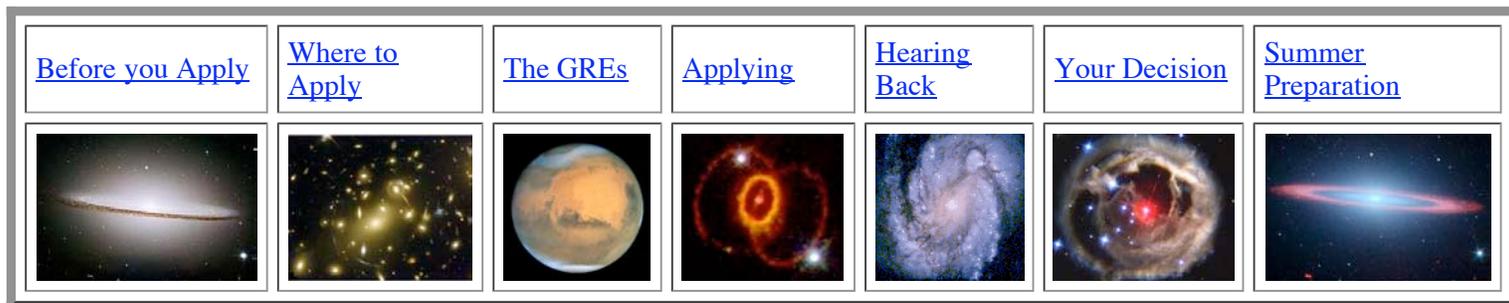


## So you want to go to graduate school in Astronomy?

*Seeking advice on choosing a place to earn your Ph.D. in Astronomy/Astrophysics? As a veteran of the process, and a past member of a graduate admissions committee, I wanted to pass on tips I received and my own advice. -Jane Rigby*



### Before you apply

First, consider: **do you really want to go to graduate school in astronomy/astrophysics?** It's a *lot* of work, long hours, crappy pay and benefits, and things won't be easier when you graduate -- astronomers have difficult jobs, they must move every few years from post-doc to post-doc until they find a permanent job, and there are far fewer permanent job openings per year than newly-minted Ph.D.s. Plus, industry pays much better.

No matter how serious you are, or how long you've dreamed of being an astronomer, you should step back and carefully consider whether professional astronomy is right for you. Have you investigated other career paths that might let you express your love of science and technology? I'm not saying, "Don't go to grad school" -- I'm saying, "Do the research and the cost-benefit analysis, and make sure you have a realistic understanding of the academic job market." If you're gonna dive in, dive informed, with your eyes open.

Here's some suggested reading to help you do that:

- First, read the [latest summary of the Astronomy Job Market](#). Vital reading.
- Second, find the book "Tomorrow's Professor" by Richard Reis (if your library doesn't have it, get it inter-library loan), and read chapter 4.
- Third, read Duncan Forbes' gung-ho "[So you want to be a professional astronomer?](#)"
- Fourth, read Don Barry's [pessimistic but not unwarranted examination of whether it makes sense to pursue a Ph.D. in astronomy](#).
- Then, browse these [resources on astronomy careers](#), and [these](#).
- Also, you may be interested in these two resources for women and minorities in astronomy: [Here](#) and [Here](#).

If you've seriously considered these issues and are still committed to getting an Ph.D. in astronomy, next consider this: **should you take a year off between undergrad and grad school?** Most departments, once they accept a student, are willing to "defer the offer of admission" for a year or so. If you feel burned-out, want to travel, want to feed the poor, or need to save up money working a normal job, you should seriously consider taking time off. You may come back more disciplined and prepared.

If you have subsidized student loans, find out when you'll have to start paying interest. Interest may be deferred as long as you're in school, and grad school counts as school. The details obviously inform the duration of break you can take.

## Where to Apply

Once you've made the decision to pursue grad school in astronomy, the next step is to figure out where to apply. This depends on your abilities, where you want to live, what kind of research you're interested in, and many other factors. Ask your astronomy or physics profs what schools they recommend, and follow up on the internet. If there's no one to ask, the web is a great resource. Here are some places to start:

- [National Research Council Rankings of Astronomy Ph.D. programs](#), last updated in 1993.
- [Annual Reports of Astronomical Observatories and Departments](#) from the American Astronomical Society. Many but not all schools are listed.
- [On the Importance of PhD Institute in Establishing a Long-Term Career in Astronomy](#)

## Studying for the GREs

You should study for the Physics GREs. I'm not kidding. It's a hurdle that could keep you out of grad school. Set aside time every day for 1--3 months to study. Find out from ETS [the makeup of the test, subject by subject](#). Study those portions of your textbooks.

Work through REAL past exams so you know what to expect. Two past exams have been published online by ETS: [GR0177](#) and [GR9677](#). Two other exams, [GR9277](#) and [GR8677](#) are also available online, for example through the yahoo group [PhysicsGRE](#), or by following links at [physicsgre.com](#). [These latter two exams were published by ETS in the now out-of-print book "[Practicing to take the GRE Physics Test](#)".]

REA publishes a purple Physics GRE book that will have you studying the wrong subjects, memorizing the wrong equations, and taking "practice tests" that are NOTHING like the real test. The reviews on Amazon are scathing for a reason -- avoid the purple book of evil!

Just promise yourself that, should you ever sit on an admissions committee, you'll remember how stupid the vaunted GRE really was....

## Applying

Ah, applications. Here are some resources:

- [Getting In: An Applicant's Guide to Graduate School Admissions](#), a very useful book.
- [Graduate Student Resource on the Web](#)
- [Fran Bagenal's article in STATUS, Applying to Graduate School, \(starts on page 15\).](#)

And here's my advice:

- Write your personal statement early, then show it to people you trust (especially professors you know well) and ask for feedback. Ideally, give copies (and your CV) to your letter-writers before they write your letters, and ask for feedback; they may have valuable suggestions. Also, reading your statement may help letter-writers recommend you better, by answering questions they may hesitate to ask you (like, Why does she want to go to grad school, anyway?) and telling them important details

- they may not know (scholarships, awards, community outreach.)
- Give your letter-writers several weeks to write their letters. Don't rush them. Make sure they know where to send each letter. Nicely remind them of deadlines.
- Check the instructions -- is your application complete? (transcripts, GRE scores, personal statement?) If you're sure it's complete, you may want to send a polite email to the department, asking if they received everything.
- Wait.

## Acceptance, Rejection, and the Wait-list

The Admissions Committee: In late January or early February, graduate admissions committees meet to decide whom they will accept. They usually make decisions in several "waves". The thinking for the first wave is often, "Wow, these candidates are the most exceptional, we'd better admit them fast!"; the thinking for the next wave is then "these folks are great, too, let's admit them." Don't worry which wave you're in -- it doesn't matter -- but know that you may be accepted a few days or weeks apart from a friend. Notification of acceptance usually comes as a phone call from a faculty member (sometimes an email.)

Admission committees target a specific class-size. Accordingly, the number of students they'll admit depends on their targeted class size, their usual acceptance rate, and vibes about whether students who've visited will accept admission. In general, the top schools have ~>100 applicants, which include more qualified applicants than they can possibly admit.

The Wait-list: A consequence is the dreaded wait-list. If several accepted students decline the offer in a timely fashion (in March or early April), the school can admit qualified students off the wait-list. Remember that **no one** will remember whether you were accepted February 1, February 10, or April 14. So don't think that if you're wait-listed, you "must not be good enough", or the school doesn't really want you.

In Limbo: Grad schools often fail to notify students that they've been denied admission. Ideally, a department should call admitted students, then contact wait-listed students and tell them where they stand, then send rejection letters to the rest. But schools are often slow about the rejection letters, and sometimes even slow about notifying wait-listed students. If it's late February or early March and you haven't heard back from a school, it's okay to email the chair of the admissions committee, politely, once. Explain who you are, that you're still very interested, and that you're wondering about the status of your application. If you're on the wait-list, it's acceptable to ask where you're ranked. But if they say, sorry, we haven't made offers yet, you'll have to be patient.

## Visiting

If you're accepted to an astronomy graduate program, they'll probably invite you to visit, expenses paid. (Students from overseas often can't get a visa on such short notice -- the department may schedule phone interviews instead.) During the visit, you'll meet potential advisors and current grad students. Remember, **YOU'RE interviewing them!** The department already wants you, whereas **you're sizing THEM up** to learn whether it's a place you could be happy and successful.

- Before you visit, read the department's website. Find faculty who interest you. (Remember that some of the best profs may be too busy to have useful websites. Look up Profs' [recent papers](#). A week before your visit, send the department a list of the profs you'd especially like to meet.
- Buy a "Grad School Visits" notebook and **take good notes** on each school, or they'll all blend into AriCaliMichiPennaWaii TechState.

- Record your impressions of potential advisors -- do you want to work with and learn from them? What do their grad students say about them?
- Advisors can switch schools or drop dead -- are there multiple faculty that would be good thesis advisors for you?
- Listen. Do the grad students seem happy? Do you think you would be? Try to gauge the zeitgeist.
- Ask good questions during each visit. Here are some sample questions:  
[My list of questions, compiled from other lists.](#)  
[Kartic Sheth's list of questions.](#)  
[Questions to ask, including special concerns for women.](#)

Ask questions, listen carefully, and think hard.

## Making your decision

Remember that you're not picking "the best school", but "the best school for **you**". Go where you think you'll be happy and productive.

If you're interested, ask each department whether they'll let you defer admission for one year. They'll probably say yes.

**As soon as you've crossed a school of your list**, email the admissions chair to respectfully decline their offer. DON'T WAIT until the deadline. Once they know you're not coming, the department may admit a wait-listed student -- your "Sorry, no" email may somebody else's ticket to grad school.

## Before you start grad school

Once you've accepted a school, concentrate on graduating or finishing your current job. Take a few months off to recover and think. Despite your eagerness to "get started", I recommend avoiding the temptation (and pressure from your advisor) to move out early and start research over the summer. You're planning to do research for the rest of your life!

Your department may pressure you to choose your first advisor over the summer, before you move. If so, check your notes from your visits -- which profs sounded promising? Next, email grad students you met during your visit -- they'll know which profs have cool-sounding projects that never work, which are terrible bosses, and which are great advisors.

**Assign yourself some summer reading.** Grad school is hard, and the transition is especially hard. What mattered in undergrad (classes, grades) suddenly doesn't matter; time management seems impossible; and there are many unwritten expectations. Prepare yourself -- read some of the excellent books on strategies for success in graduate school. You can find these books via inter-library loan from your local public or community college library, or from [Bookfinder](#). Here's my recommended reading list:

- "A Ph.D. is Not Enough: A Guide to Survival in Science" by Peter Feibelman. A well-recommended classic by a physicist.
- "Getting What You Came For: The Smart Student's Guide to Earning a Masters or Ph.D." by Robert Peters. A highly-regarded, detailed guide to grad school. How to get admitted, choosing your research advisor, doing research, and writing the thesis. Includes humanities as well as science.
- [How to Get the Mentoring You Want: A Guide for Graduate Students at a Diverse University](#) by the Grad College of U. Michigan. Explains what grad students can do to seek out better

- mentoring, including students from diverse backgrounds.
- "Advice to Rocket Scientists: A Career Survival Guide for Scientists and Engineers." By Jim Longuski. Aimed at engineers, but useful for physical scientists. Sage, pragmatic advice on academia, including priceless advice on how to give scientific talks, including job talks.
  - "Tomorrow's Professor: Preparing for Academic Careers in Science and Engineering" by Richard Reis. Soberly surveys the scientific and academic job markets, discusses specific strategies at the grad student, post-doc, and junior faculty levels, and discusses how to target job searches. The focus is mostly beyond grad school, but there are several excellent chapters on grad school.
  - Mary McKinney (the "Academic Coach") [reviews books she recommends to grad students](#).

Best of luck!!

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*This page was written by [Dr. Jane Rigby](#) and last updated August 2008.  
It represents only her personal opinion, not any official viewpoint.  
If you find this page useful, or have suggestions for improvement, please send comments.*

Send comments to [JRR166@yahoo.com](mailto:JRR166@yahoo.com).

*I envision an astronomical community that makes full use of the talents of humanity -- in which people of all [sexes](#), [races](#), [nationalities](#), [sexual orientations](#), and [gender identities](#) are encouraged to become astronomers, treated equally, and judged on their merits.*