

Advising Science Students on Graduate School

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Target Audience

Students working in the natural or physical sciences who have taken enough upper division science classes to graduate with a B.S. degree need particular advising about graduate school. In addition, students who have worked hard and demonstrated initiative through independent research or outstanding work have an excellent chance to get full support for their graduate studies.

Graduate school catalogs are fairly useless in terms of locating appropriate graduate schools in the sciences. However, they are useful for determining what prerequisites are needed. Begin by selecting several that offer degrees in the general area of interest and see what courses they require. This is a good way to see what courses you need.

By following the course of action outlined below, students can locate one to several appropriate schools, meet researchers working in their field of interest, and line up support for graduate work. This proven method worked for me when I went to graduate school and has worked for many Evergreen students that I have advised.

Locating potential graduate schools

Preferably, this time-consuming step needs to begin one year or more before graduate school applications are due. I liken the process to mining, you've got to prospect for awhile to locate one to several "veins of interesting papers." There are a number of ways to find these veins. You need to be dedicated throughout this process, but especially during this phase. Think of the gold prospectors who headed into the hills for years with little other than a sack of flour, a side of salt bacon, a mule, and some tools. Your job is a little easier, but can be just as discouraging...keep going, that vein could show in the next shovelful.

Begin by reading journal articles in the field you're interested in, you've got to find a topic that really gets you excited—something that you think would be really fun to work on. Graduate school is a serious undertaking and if you're not working on something that you really enjoy, what's the point? You'll also need that enthusiasm to finish up your thesis. Regardless of how excited you are by your graduate school project, you'll be pretty tired of it by the time you are in the writing phase. Enthusiasm and interest are key to finishing...you'll get first-hand experience about the "re" part of research.

Your tools for this search are the computer and the library.

Begin your search using a general online database that includes the general area you're interested in. I like Science Citation Index because of its broad, general coverage. If you've already focused your area of interest, a specialized database may be more appropriate. Think about the indexing databases you've used in writing papers or for researching independent projects. For the steps outlined below, I'm going to choose a topic of phytoremediation (using plants to clean up toxic waste) as an example of a topic that I want to study in graduate school.

1. Begin your search by typing in your topic plus the word "review." This will locate papers that have been written by researchers in the field that summarize the current level of understanding. Not only will this give you a good understanding of what has been done, often these articles end with future research needs. Concentrate on the most recent review papers you can find. Read through these and ask yourself if this sounds like fun to you.

2. These review papers are one of the best places to prospect for info veins. Look at the references for interesting sounding papers (“mining a paper”).
3. Get these papers and read them. Mine their references.
4. If using review didn’t turn up any interesting papers, try a general search, e.g. phytoremediation. Look at the abstracts online and read anything that strikes your interest. Once you’ve located a paper of interest, mine the references in that paper. This will allow you to go back in time into the literature
5. If you’ve located a really cool paper that isn’t very current, do a “Cited reference search” using Science Citation Index to locate papers that used this paper as a reference

Once you’re located one or several interesting info veins, you’ll notice that most of the work is coming out of one or several labs at particular universities. Also, you’ll notice that the papers are published in a narrow range of journals. Make a habit of skimming these journals weekly (or whenever they come out) to locate other interesting papers. By looking at the authors and their affiliations and looking for the common ones, you can figure out who is running the lab at each university.

Now it’s time to focus on some particular schools

You’ve found a couple of labs that are doing interesting work and you’ve identified one or more key researchers working in these labs. Go through the steps below for each lab.

6. Do a computer search for these particular authors. Go back into the literature about ten years.
7. Read all of these papers to get an idea of where the research came from and where it’s going (the “Future research” part of the Summary/Discussion section is key for this). See if you’re excited about where you think it’s going. This is what you might be working on.
8. Once you’ve located one to several labs that are doing work you’re excited about, it’s time to make contact with the key researcher.
9. Got to the college/university’s web site and read about the researcher who’s running the lab. If you’re still interested, get his/her email address.
10. Send an email to the researcher. The purpose of this email to:
 - To demonstrate your interest in their work
 - Show that you’ve “done your homework” and are intellectually engaged in the topic
 - Ask them about their current unpublished research
 - Inquire if you can visit their lab
 - Do not mention graduate school in this email.

Begin with a statement about how interested you are in their research and that you’ve read their papers in (list of journals) with great interest. If there are any questions that you’ve had while reading their papers, ask them. Generally, researchers love to talk/email about their work with interested and informed people. Ask them what current projects they have going. Ask if it might be possible for you to visit their lab.

The Visit

So you've lined up a couple of lab visits to places you might be interested in going to for graduate school. The purpose of this visit is to meet the research and associates to see how you get along with them. You also want to demonstrate through your questions and interest that you are seriously interested in this area of research and you want to find out where their research is headed. **You don't want to mention your interest in graduate school unless you're specifically asked.** Background psychology: researchers are currently writing grants for future work, and in a productive lab (which you've located through your mining), have graduate students written into these grants. If you've done your homework correctly and make a good impression, the researcher will subconsciously begin to associate you with one of these grad student positions.

During your visit, ask questions about the work, tour any cool machines they use, get a feel for the place.

Back home

After your visit, write the researcher and thank them for the visit and the time they spent with you. If you got a good vibe from them and the lab, this is the time to mention that you're interested in grad school and that you'd be interested in working with them, especially on the topics you've identified as the ones where the lab is going.

After you get a reply, you've accomplished several major goals. You've located a good potential for graduate work and have established a rapport with the key researcher. At this point, if you're still interested and they are interested in having you work in their lab, it's time to be frank. Write and tell them that you really interested in graduate study in the area where they're working, but that getting support for graduate school is a really important part of your decision. If you've done all the previous steps properly, the researcher is already thinking about how perfect you'd be in this grant they've just finished writing.

Now you'll have to apply to the grad school, but you've got an advocate who wants you to work with them. This can be really helpful in getting the admissions office to deal with the Evergreen transcripts if they're not used to it. I know of two instances when the researcher called their Admissions office and said "Admit this student, I've got a research assistantship for them."

Good luck!