

# AGU BOOKSHELF

# Navigating Graduate School and Beyond: A Career Guide for Graduate Students and a Must Read for Every Advisor

*Beginning his scientific career as an engineering student at PSG College of Technology, in Coimbatore, India, Sundar A. Christopher has negotiated and navigated the higher-education system to become the chairman of the Department of Atmospheric Sciences at the University of Alabama in Huntsville. Drawing on his own experiences and on insights gleaned from the students who have passed through his graduate-level professional development course, Christopher takes a lighthearted look at peer review, proposal writing, managing budgets, and making the most of conferences in the AGU book Navigating Graduate School and Beyond: A Career Guide for Graduate Students and a Must Read for Every Advisor. In this interview, Eos speaks to Christopher about overcoming the bureaucratic, logistical, and personal hurdles that too often lead students to disillusionment and conflict.*

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**Eos:** *How did you begin teaching professional development skills? How has your course evolved?*

**Christopher:** The course I started 15 years ago had one goal: to teach students how to write proposals. Many students eventually end up in careers that require proposal writing, and there is really nothing in the curriculum at most universities to prepare them. I picked NASA's New Investigator Program as a template for the course, and the students had to write a proposal for that program.

Over the years I've listened to my colleagues and my students, and I've added a lot of things to the class. Now they actually write a resumé or curriculum vitae; do some job hunting; and do a strengths, weaknesses, opportunity, and threats analysis. The class has evolved to include a lot of things, like time management and how to develop a proactive style of managing your advisor, which is probably the most popular topic I cover. It has become a well-rounded career development course, and pretty much everything that I teach is in this book.

**Eos:** In your experience, what has been the most common stumbling block for graduate students? How can they prepare for it?

**Christopher:** I think a lot of students, not all of them but many, come to a university thinking that an advisor is going to help them with all aspects of their career, that they're going to help the student write papers and proposals and help them with the job search. So I'd say that many students are really looking for a mentor, not just an advisor. An advisor is someone who is interested in the student's academic path; they tell them which courses to take and show them the nuts and bolts of how to do research. A mentor is more interested in the student's career, even after the student graduates. When a student comes into a graduate program looking for a mentor, not

an advisor, he or she can get disillusioned when there is a mismatch between the advisor's and the student's expectations. Not all advisors want to be mentors, and there is nothing wrong with that. But I think this expectation mismatch leads to a lot of conflict. Therefore, I tell the students, learn how to manage your advisor.

**Eos:** What do you mean by “manage your advisor”?

**Christopher:** Learn your advisor's rhythms; put yourself in his or her shoes. Case in point: Let's say that as a new graduate student, you have a young advisor who is just starting his career as an assistant professor. That means that you need to think, "Okay, maybe my advisor is nervous about tenure or about getting a promotion, and maybe he is writing a lot of grant and contract proposals." As a student, you need to know the number of classes he teaches and the other demands on his time.

It's tricky, because students tend to think that their advisor knows best, that their advisor is going to initiate meetings and help them with their career. A lot of times that doesn't happen because advisors are managing their own lives, going through

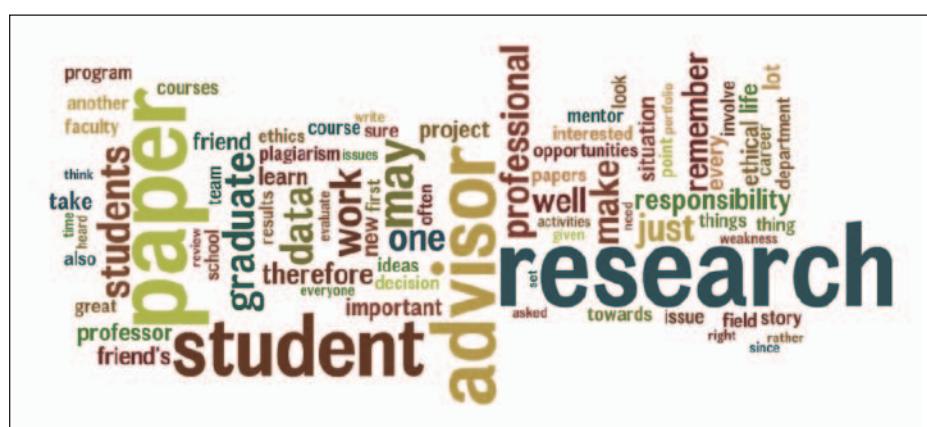
their tenure process, and climbing their own career ladder. So if your advisor is typically late for, or avoids, meetings, what do you do?

I tell my students to proactively manage their advisors. I tell students to be in the driver's seat: Initiate meetings, put together programs of study that the advisor can review and approve, put your schedule together for when you want to take your exams. Everything should be proactive rather than waiting for your advisor to say, "Why don't you write a paper in this area, or do this or that?"

**Eos:** How can being career focused, instead of class or grade focused, help a graduate student focus his or her time and energy?

**Christopher:** In the book I use the sowing and reaping paradigm; you really have to give some thought to where you're going and where you want to be. Ideas change, and I realize that—I used to be an engineer, and here I am with a Ph.D. in atmospheric science. But at the same time, I really encourage students to set aside a bit of time each week to think about where they want to end up, either as a professor or a researcher for a large institution or center, or in some other position. Once they have locked on to that, I think it is a little bit easier for them to start thinking about what they will need to get there.

In higher education, for example, you're going to be evaluated on teaching, research, and service. This means you need to work on developing a teaching portfolio while you are in graduate school. Research, too, is very competitive. If you write grants as part of your graduate school experience, it would be a huge benefit. So I think really knowing where you want to be, and working really hard at it, is critical. Otherwise it just becomes taking classes for the sake of taking classes. I'm pretty blunt when I tell my students that a Ph.D. is not really an academic degree; it's a research degree. Your papers count, your research counts. The number and the quality of papers that you publish while you are part of graduate



*A word cloud covering the themes of time and stress management, research productivity, and the student-advisor relationship. These terms exemplify Sundar A. Christopher's advice for navigating graduate school and early-career science.*

school are going to make your curriculum vitae stand out.

**Eos:** *One section of the book stands out as both rebellious and obvious. Can you explain your method for “ditching the dissertation”?*

**Christopher:** I do not recommend that students write a formal dissertation, and I have many reasons why. A typical dissertation is written like this: The student sits down and writes 100, 200, 300, however many hundreds of pages. Then draft 1 goes to his advisor, then draft 2, draft 3. He works on it for several months, and then the student sends it to his committee. Then there are more revisions. Finally, the student stands up and defends his dissertation. At the end of it all, after he's received his degree, he sits down and thinks, "Ah, now I have to write a paper." This leads to the task of slicing and dicing that many-hundred-page dissertation into 10- to 20-page papers that meet a journal's requirements. You'll need to change the tone of your writing, the figures, and some of the contents, so you've actually doubled your work. You've done a formal dissertation—which nobody ever reads, by the way—but you have so much more work to do.

So instead of this formal dissertation process, I recommend my students take a different approach. I suggest that they write two or three peer-reviewed papers. After they write these papers, the process is, basically, to write a very short introduction that says, "My dissertation is organized into two major sections." Then, they slide the entire peer-reviewed paper in as part 1 and the next paper as part 2. They write a very short future work or conclusions section and, if they have another paper, add it as an appendix and call it quits. This works on many fronts, because think about this: On the day of his defense, the student stands up to give his presentation. On the first slide is the title of his research. On the

second slide is the list of papers that he's already published. At that point, if the committee members knew what was going on, they would say, "Where do I sign the dotted line?" And why is that? Because the peer-review process typically puts papers in the hands of reviewers who are experts in that particular topical area. The thesis work has already been vetted by the international committee, which should make it easy for the thesis committee to also approve the work.

Seaming a dissertation together after you've written your papers means you have to do the work only once. It lets the larger research community know about your work, and, finally, peer-reviewed papers are what typically count in the geosciences. So it works well for everyone involved to reduce the time and the frustration.

**Eos:** *Recurring themes in the book are those of taking ownership and of becoming a resource center. What do you mean by this?*

**Christopher:** There is a definite link between lack of ownership and lack of productivity. When a student first joins a research group, there is a short period of time in which the advisor and the student are working together and the student sees the project that they are working on as "his advisor's project." With time and proper mentoring, the advisor should be able to hand over the project to the student. So what do I mean by that? The student should always think about going the extra mile in terms of doing research analysis, producing plots or figures, writing papers, and being part of the team. It doesn't happen overnight, but eventually there needs to be a transition during which the student starts to think of the project not as his advisor's project but as his own dissertation and his own research project.

As part of smoothing and enabling this transition, I think that becoming a resource

center is really critical, especially considering the fast pace of research. In my graduate school days I had to set up weekly meetings with my advisor, or maybe send the occasional e-mail with figures or plots or analysis. I tell my students not to do this. I tell them, "Well, you can design a blog or a Web site that says, 'These are the papers that I have read, and here are some figures and plots.'" As a student, you become a resource for your advisor for that particular topical area. This lets your advisor keep up with what you are working on without needing that weekly check-in, but above that, becoming a resource center also builds avenues for collaboration with the wider scientific community.

**Eos:** *Since you started teaching career counseling, have the infrastructure and support being offered to graduate students and recent graduates improved?*

**Christopher:** I think that there has been an increase in awareness of these issues. I'm not saying my book brought about that change, but at least in the places to which I have traveled there has been an increased awareness of how this could help students and eventually help the faculty, the department, and the university as a whole. I think we want our students to succeed and not to get disillusioned by the myriad things that can get in their way. I don't have numbers for how resources in this area have changed, but I can say that I have personally been given freedom to expand my course to all of the graduate students at my university, rather than just offering it to the Department of Atmospheric Sciences. So I think it is catching on.

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—COLIN SCHULTZ, Writer