A GUIDE TO ACADEMIA

Getting into and surviving grad school, postdocs and a research job

PROSANTA CHAKRABARTY

WILEY-BLACKWELL

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The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

9600 Garsington Road, Oxford, OX4 2DQ, UK

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Dedication

To those students who want to continue learning and giving back...

Preface

I've tried to write the most straightforward guide to the academic life as possible, without the frills of first-hand accounts. (Except in those few cases where these accounts can help clarify the advice.) This book is certainly not a memoir, but it is my singular vision as it was shaped by my experience and the advice I've received over the years. As I've gone through the academic process, I've made mistakes, and this book is my attempt to help budding academics make the right decisions in order to efficiently reach their goals without making those same mistakes.

I started thinking about writing this book around my third year in graduate school. This was about the halfway point of my Ph.D., and I was right in the middle of older graduate students who were too busy writing up their work, and “newbies” still getting their footing. I was in a position to give advice for the first time, having advanced to candidacy and having already seen others pass and fail. Initially, this text was going to be a guide for graduate students, but alas, the science came calling and there was no time for extras. I am now an assistant professor, and even though there is even less time for extras, I've picked up on this idea again, expanding it over several professional levels with a heavy focus still on the graduate stage. This book can help the inquisitive undergraduate who is considering graduate work, but this text will also help the newly hired assistant professor struggling with the pressures of tenure. By seeing the entire academic landscape laid out before you, the reader can gain a sense of perspective no matter the current point of your career.

I know I've had some luck along the way (some would say a lot of luck), but I've learned some things that I think will help others traverse the academic wilderness. As with all

advice, the reader will need to tailor it to fit his or her own particular circumstances.

Each stage of your academic career is about getting to the next stage. You should realize that you are always being judged. The judges are your academic advisors, colleagues, and peers. This book will help you through the process of knowing what is expected of you and how to excel during the process. I've written this guidebook to focus on those who wish to have research academic careers. Engineering students and medical students have their own set of particular loopholes, and they perhaps will not get as much out of this guidebook as others.

Each person will have a different graduate experience; this guide is one that will help you through the general process and to learn what to expect. You should also talk to other students and professors and see how they got to where they are to fine-tune your guidance. Everyone ultimately has to pay their dues to get to where they want to be. There is no easy road to your goal; if there is, your goal is not ambitious enough. As you struggle through those rough patches, keep in mind what still needs to be accomplished to reach your destination. It may seem daunting, but hopefully with the help of this book, the steps you need to reach your academic goal won't come as a surprise.

During every step of the way, you should make time to talk to people and get their advice about moving along in the process. One of my favorite words of encouragement about the academic process was, “Everyone eventually ends up in the right place.” Remember those little words of wisdom and encouragement. I did, and that is largely what makes up this book.

This book is what I wish I had been handed when I first started thinking of becoming a scientist, and I hope it can save the reader some heartache and growing pains as you

start on your own path to your ideal career. Good luck to you, and happy reading.

Prosanta Chakrabarty
Baton Rouge, Louisiana
November 2011

Acknowledgments

To my many academic mentors—Melanie Stiassny, Bill Fink, John Sparks, Ellen Pikitch, Jerry Smith, Chris Austin, Robb Brumfield, James Albert, Bryan Carstens, Ron Oldfield, Deborah Goldberg, Doug Futuyma, Ian Harrison, John McCormack, Marc Ammerlann, Scott Schaefer, and countless others—thank you for showing me through your experience and shared wisdom what it is to be a scientist and academic. I hope you see your many lessons retold in these pages.

To my parents, Chitta and Anurupa Chakrabarty, who always told me to do what I love—thank you for being the first to teach me how to teach and to learn. To my wife, Annemarie Noël, whose support and understanding allow me to accomplish everything in my life from getting dressed in the morning to writing this book. As they say, “behind every great man there is a great women,” but of course there is a surplus of great women so sometimes a regular dope like me gets lucky and snags a great woman, too. My twin daughters Chaya and Anjali were born between the first and second drafts of this book, and their arrival gave me the courage to write the last chapter, which I dedicate to them. I hope by the time they choose their career path, they won't have to worry about gender inequality.

Many thanks to the Wiley-Blackwell team. I especially would like to thank Justin Jeffryes who sought me out, signed me up, encouraged me, and fought on my behalf. I would like to thank Shikha Sharma for her tireless efforts in the copyediting and proofreading of this book. I must also thank those who reviewed different sections of the manuscript and provided valuable comments, including numerous anonymous reviewers but also Parker House, Elizabeth Derryberry, Jahi Chappell, and Jeremy Wright. I

must also thank my lab—Caleb McMahan, Wilfredo Matamoros, Matthew Davis, and Valerie Derouen—who (without their knowledge or consent) I have been secretly reading this book to under the guise of giving advice.

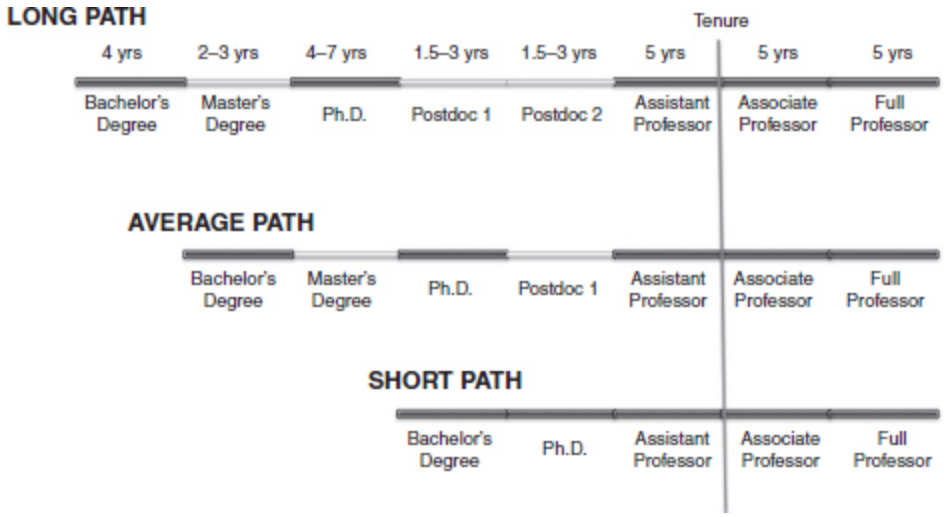
1

Preparing for Entering Academia

The Hard Truth About the Academic Life

Choosing the academic life is not an easy choice to make. But, if you feel it is the right choice for you and you are a hard, smart worker, then it can lead to a permanent position in a job that is intellectually fulfilling, stable, and rewarding. The hurdles to obtaining an academic research job (a professorship or equivalent) include getting the following: a bachelor's degree, research experience, possibly a master's degree, a doctoral degree (Ph.D.), maybe 2–5 years of postdoctoral research experience, an academic job (e.g., assistant professorship), and tenure (Figure 1.1).

Figure 1.1 The various route's to academic enlightenment. Dark bars are positions that are necessary and light bars are positions that are not always required.



You might be able to skip a few of these steps; perhaps you won't need a master's degree or a second postdoc, but there are still many hurdles that you will need to overcome to achieve your goal. Luckily these “hurdles” are what trains you to be an independent researcher and thinker, and that training can be among the most fulfilling and worthwhile experiences in your life. There is no real “typical path”; every individual's experience will be different. Academia is fun; you basically get to do what interests you, discover new things, and interact with other people who are also having fun learning about things they are interested in. It isn't always a bed of roses, of course, but compared with some other ways of making a living, it is a great gig. One academic I know always replies to the question “How's your job?” with “Beats workin'.”

The academic life has a lot of perks and can be very fulfilling, but it might not make you rich. Starting annual salaries range from $40K to $80K, and most never make it much past the $100K mark. However, there is a great deal of job stability, and—best of all—if you succeed, you can make a living doing something you enjoy. Academia is extremely fulfilling to those who find satisfaction in solving problems in a particular area of research. Researching subjects that interest you, teaching what you know best,

and, for the most part, making your own schedule are among the freedoms that research academics have that few others can claim. You can work 9 to 5 if you like, or 5 to 9. Nobody will be looking over your shoulder, telling you what to do; you must be your own nagging boss. Your ambitions have to match your academic goals; without this motivation, you will undoubtedly fail. You will receive very few pats on the back in academia; the only way you know you are doing a good job is if you notice that fewer people are complaining. Be warned, academia is not for the faint of heart. You will submit papers and grant proposals that you think are the best things since sliced bread, and you will be shocked by reviewers and advisors who will knock you down as low as you can possibly feel. The rewards of success are great, but only because academic success (e.g., discovering a new species, falsifying a long-standing hypothesis, etc.) goes hand in hand with your happiness. If you don't get excited about going to work for science, then science will make it very hard for you to succeed.

The people who I see achieving the most success are not necessarily the smartest, but they are almost always the hardest working. You might want to go to graduate school in order to become a lecturer at a small liberal arts college with no research component, but you will still have to play the game with those students getting doctoral degrees in order to land research positions at top universities; you won't be treated differently just because you have different goals and ambitions.

Academia is all about self-motivation, but one great incentive is tenure. (Tenured professors are those who have their positions guaranteed [i.e., they can't be fired unless they do something prohibited or illegal]; assistant professors are essentially on probation.) Tenure gives you nearly complete academic freedom. Getting tenure means you have made it through the academic ringer and that your

institution wants to keep you forever. You will only be granted tenure once the institution is sure that you are self-motivated enough to keep working hard, if not for them, for your own sake. If for no other reason, your work should keep your interest; as the old adage goes, “If you love your job, you never have to work a day in your life.”

Getting a Head Start as an Undergraduate Volunteer

It is never too early to start building up your resume by getting research experience. Research experience is something you most certainly need to distinguish yourself among the hoards of undergraduates whose only experience is classwork. This experience will also tell you how much you like research, and the more research you do, the more fun and interesting the research you are offered becomes. If you volunteer to work for an academic, you might start by doing menial jobs, like washing lab equipment or filling boxes with neatly arranged pipette tips. Once you've proven to be someone who can be trusted to arrive on time and not break things, you may then be asked to do something more exciting, like mixing and preparing chemicals or taking x-rays. This kind of menial experience is actually a good start. Begin creating your CV and adding things like the following:

> *Volunteer*—Wainwright lab, University of California Davis. Made x-rays of fishes for studies on the ecological morphology of darters (Etheostomatinae). Fall 2011

This might sound obscure, but someone looking at your CV might know Peter Wainwright, or they may need someone who knows how to make x-rays, or who is interested in darters. You want to provide as much information as you can in just a few lines (see more about your CV below).

You might not be the only volunteer in the lab; you might see that other volunteers are doing things you wish you were doing instead: Be patient, your time will come. People who work hard, learn quickly, and are inquisitive are almost always offered more opportunities. Whiners, complainers, latecomers, and the generally unenthused are quickly shuffled out the door.

You might not work directly with the PI (principal investigator, or head of the lab); more often you will work for a graduate student or postdoctoral fellow. You might even end up getting paid for your work, which is great. More important than the money, though, if you can believe it, is the experience. The ultimate prize is to be included as an author of a publication. A research publication with your name on it means you have just joined the ranks of researchers. People who Google you (or better yet, Google Scholar you) will find your paper and be impressed, and you will have an entry in the most important category of your academic CV—*Publications*. Before you get to that point, however, and maybe before you even get to work on a real project, you might have to wash 1,000 dirty beakers in a sink for 8 hours a week for 3 months.

If you volunteer and are excited about working in a lab or on a research project, that's great. It is okay to be happy, gregarious, and inquisitive. There is a fine line, however, between being outgoing and being annoying. If you are working with someone who is writing a manuscript on the computer in the other room, don't just barge in and start chatting them up about the party you went to last night. Academics are busy people with a lot on their plates, and they typically have short periods of time in which they need to concentrate fully on a particular task. Breaking their concentration with a myriad of questions will not go over well, but having all of your questions answered in one shot is better than interrupting someone five times in 1 hour. Try

to gauge your advisor's reactions to your questions to see whether he is becoming frustrated. It might not be your fault if he is upset, but it can quickly become your fault. The best volunteers are problem solvers and note takers who understand their roles and who want to move up in the world and know how to get there.

Try to solve problems yourself but not at the expense of making a mistake that could end up costing a researcher even more of his precious time. If the PI keeps his door closed, it is probably closed for a reason. But, an emergency is an emergency, and if you have a question that can stave off an emergency you better ask it—closed door or not. However, if there is a graduate student or technician you can ask instead, you probably should. As with any job, fitting into the group's social dynamics is almost as important as the work itself. Remember that, as a volunteer, you are on the lowest rung of the totem pole. That doesn't mean you should be mistreated, but it does mean you may not have as much access to the PI's time as you would like.

Aside from being including in a publication, the other thing that can be more valuable to you than money is a nice recommendation letter. Your professors or lecturers might write you recommendation letters for graduate school because you got an “A” in their classes, but these are typically informal letters that they write dozens of every semester. They might do little more than replace the name of the last “A” student who asked for a recommendation letter with yours. (You'd be surprised how many letters I've read where the gender of the student is incorrect throughout the recommendation, because the author didn't bother changing the gender along with the name.) If you work for someone as a volunteer for a couple of months, you should most certainly ask for a recommendation. Even if you worked most closely with a graduate student or a postdoc, you should ask them to write a letter that is signed

by the PI as well. The person who wrote the recommendation letter, in most cases, carries more weight than the actual content of the letter. If you get a recommendation letter from E.O. Wilson or Stephen Hawking, it won't matter if it is two sentences long; it is still better than a 15-page letter written by your graduate student TA (teaching assistant) who only knows you from class.

The Undergraduate CV

The CV is your *curriculum vitae,* from the Latin for “course of life.” It is your introduction to all who you will meet for whom you want to work and impress. If you send someone an e-mail about wanting to work for them, the first thing they will do is look you up on the Internet. If your Facebook profile is a picture of you drunk and naked at a frat party, then your correspondence with that person will likely not go any further than your introduction. Aside from being diligent about your social media profiles, you should also write a professional CV that you would use in corresponding with academics.

As an undergraduate, you are not likely to have a 15-page CV, but that's okay. The important things you need to showcase are your skills, who you've worked for, and your other relevant experience. See Appendix 1 for an example of an undergraduate CV.

Finding Your Research Interests

Perhaps you might only have a vague idea of what you are interested in—that's okay. If you know you like quantum mechanics and you admire Schrödinger, at least that's a start. It is okay to have only a broad interest at first. Don't think about your interests in terms of what jobs are out