

David M. Rothstein
NSF Fellowship Application

Application Form Question 16

During the summer of 1999, I worked as an intern at the Harvard-Smithsonian Center for Astrophysics – the single most important experience that contributed to my decision to pursue graduate work in astronomy.

Before that summer, I was, as I still am, interested in research for its own sake. I was fascinated by the amount we can learn about the unimaginably distant, unimaginably exotic objects in the night sky just by applying simple and diverse laws of physics, and I wanted the opportunity to make my own contribution to this effort. However, I did not want to spend the rest of my life doing research and nothing else, and I worried that the specialization required in graduate school might be too confining. I thought about careers that would involve astronomy or physics but also some of my other interests, such as education and journalism – I remember thinking that if it existed, my “dream job” would have been a high school physics teacher, part-time research scientist who advised the student newspaper in his spare time!

Coming from Haverford, a small liberal arts college, I was able to do significant, graduate-style research as early as summer 1998, after my sophomore year. Though the work was interesting, the fact that Haverford is so small may have given me the impression that science is traditionally done in isolation – or at the very least, in small, disconnected groups. I could go to my lab every day and work, independently, on my experiment, but with fewer than ten professors in the department and about an equal number of undergraduate majors each year, there was virtually no one else whose work was related to mine.

Then came Harvard. I arrived at the Center for Astrophysics the summer after my junior year, one of twelve research interns working in a facility that housed hundreds of Ph.D. astronomers. The interns all worked in the same office, and without leaving my computer I could look over the shoulder of the person next to me and see what he or she was working on. There were colloquia and research talks every week. I met people who did astronomy, but who also did an incredible variety of activities on the side: one of my program advisors was writing a history of the U.S. space program, and another was organizing outreach activities related to Chandra. Just as important, I met people who did the opposite, people who worked at one of the greatest centers of astronomical research in the world but still didn't seem engaged in anything outside of their narrow field of specialization.

What I realized that summer is that not only is it *possible* to integrate astronomy research into other activities in life, but it is beneficial. Explaining your research to someone else helps you understand it better; hearing about someone else's research might give you new ideas for your own. And the very act of *doing* research makes it easier to explain scientific concepts to anyone, because having gone through the process of generating new knowledge, you are forced to confront a topic on its most basic, fundamental level.

Now that I've spent a year in graduate school, I still don't want to spend the rest of my life doing research and nothing else. But I've come to realize that I don't have to. The best way to pursue my interest in communicating science is to simultaneously pursue my other interest, research. If I continue my graduate studies and also continue to be involved in outreach activities through which I can teach or write about topics related to what I am studying, I can best serve the scientific community, as well as the public at large.