

David M. Rothstein
NSF Fellowship Application

Application Form Question 17

Since arriving at Cornell in the fall of 2000, I have focused on two main outreach activities. For the past year, I have volunteered to answer questions for “Ask an Astronomer”, a web page maintained by graduate students in the Cornell astronomy department which solicits questions from the general public. We respond via email to virtually all of the questions we receive; I’ve personally answered around 350, on topics covering every imaginable area of astronomy. I’ve also recently spurred an effort to revamp the “Ask an Astronomer” web pages; we plan to put more of the questions we receive in an archive, organize it efficiently and include large numbers of links to outside sites, so that the public can more easily find answers to simple questions on their own.

Also at Cornell, I have been involved with the Graduate Student School Outreach Program, for which I designed and taught a six session mini-course on astronomy (entitled “How Big is the Universe?”) for students in a physics class at a local high school in May-June 2001. I started the course by having students brainstorm ways to estimate distances in everyday life; over the next few sessions, we discussed in detail the methods that astronomers use to measure distances and how these methods relate to the ideas that students came up with. I also had students work on several hands-on projects: they measured the energy flux from the sun by observing how fast it heats a glass of water, and they used the “Astronomy Picture of the Day” website to research a current topic in astronomy and later presented their findings to the class.

As an undergraduate at Haverford, I was also involved with outreach activities. My senior year, I founded an astronomy club which allowed students to have access to some of the department’s small telescopes and organized a couple of observing nights for the club’s membership. I also worked as an assistant at the Haverford College Observatory, running observing sessions for the general public and several visiting youth groups. I also did educational work within the Haverford physics department, working as a physics tutor and a “physics clinic instructor” (organizer of homework help sessions) for several semesters. My senior year, I helped teach Haverford’s introductory physics class, through a physics education course I was enrolled in.

Although not directly related to astronomy, I was also heavily involved in journalism at Haverford, working extensively as a writer and editor for the weekly student newspaper, which helped me become a better, clearer writer and, indirectly, better able to communicate with the public about scientific topics. This year at Cornell, I am continuing these efforts by enrolling in a science journalism class.

Though none of the above activities are directly related to promoting diversity in science, I feel that they are all inextricably linked to this goal. Studies show that the astronomical community becomes less diverse the further “up the ladder” you go; underrepresented minorities and women drop out at comparatively high rates. It follows, therefore, that if you do outreach activities aimed at a wide variety of levels, in particular at children and high school students, you are more likely to encounter a diverse group of people who are potentially interested in science. Encouraging an interest in science among these groups is the best way to reverse the dropout trend.

I also feel that the topic of black holes, where my research interests lie, is particularly well-suited for outreach activities because of the public’s extreme interest in it. I have seen this in the high school mini-course I taught, where students were fascinated when I showed them light curves, related to my research, from a black hole candidate suspected to be undergoing jet formation. Since astronomy is primarily an aesthetic science, with limited *practical* benefit to society, astronomers have a responsibility to communicate their discoveries to the public so that it too can share in our understanding of the universe. And since the public is actually interested in what astronomers have to say, our efforts to tell people the details of what we do can improve their overall scientific literacy and entice them to become interested in other fields as well. My research in black holes and involvement in outreach activities related to them should provide ample opportunity to pursue this worthwhile goal.