Life beyond Earth is a possibility that has intrigued me since the age of five, when I read about the alien-like inhabitants of Madagascar in my first science magazine, "Ranger Rick." I encountered astronomy only once in grade school, in an eighth grade class on earth science. The teacher assigned to each student a planet or moon in the Solar system to study and describe in a report. My moon was Titan, and I remember my amazement when I learned how little was known of the mysteries hidden beneath the thick atmosphere of this world, which might even harbor strange forms of life suited for extreme cold. The movie "Contact" appeared the same year, planting mental seeds that would grow into a college major for me five years later.

I entered Princeton's Astrophysics department early in my freshman year, taking an introductory class and immediately starting my own research. I also began attending meetings of the Terrestrial Planet Finder group, absorbing all of the excitement and as much of the advanced optics as I could manage with only a high school physics background. Princeton has no academic program in astrobiology, so I have tried to construct the ideal curriculum for myself, majoring in astrophysics while taking classes in ecology and evolution, molecular biology, Martian mineralogy, planetary atmospheres, and space mission planning. I audited a graduate seminar on planetary dynamics, and enrolled in another such seminar on extrasolar planet observations, for which I gave an hour-long talk on *biomarkers* (observables indicating the presence of life on a planet).

The interdisciplinary nature of astrobiology, as well as its stated goal of answering our oldest questions about life in the Universe, render it an ideal subject for conveying the excitement of modern science to a popular audience. I first learned this while volunteering as an observer for the Harvard-Princeton Optical SETI project, which used a 36" Cassegrain reflector to search for nanosecond light pulses from nearby Sun-like stars. The other volunteers and I hosted public Open Houses at the observatory every few months, during which we would describe our project and then direct the telescope to planets and other bright objects of interest, allowing visitors to view them through an eyepiece. I was initially surprised by the number and quality of questions asked by the audience, whose professional backgrounds ranged from insurance salesman to homemaker to first grade student. These individuals came together because of a common interest in extraterrestrial life, but were also eager to learn about supernova explosions, dark matter, and spiral galaxies. They demonstrated to me firsthand the power of astronomy and astrobiology to inspire future scientists and to strengthen public support for scientific research.

Especially since this experience with the Optical SETI Open Houses, I have been happy to devote time each semester to education and related activities. In 2003 I created Princeton's first website on astrobiology, designed for both full-time and leisure-time students of the subject. Then last year I assisted with Princeton's first comprehensive course on astrobiology, operating a 5" telescope and image-stabilizing binoculars for sophomore students during a week-long trip to Yellowstone National Park. The primary focus of this trip was to measure the chemistry and observe the extremophile microbiology of hot springs, experiments in which I was fortunate to participate. But the fortuitous timing of a total lunar eclipse visible in the pitch-black sky over the park at night provided the perfect ambiance for a discussion of orbital mechanics, meteor impacts in the early Solar system, and other astronomical topics. To me, the fact that the students enjoyed this "astronomy night" despite the sub-freezing temperatures is proof positive of the subject's strong popular appeal.

In spring 2005, I worked as a teaching assistant for an introductory course on "The Universe" for non-science majors. This perennial and well-liked class enrolled roughly two hundred students, and my largest task was to grade one quarter of their exams and biweekly problem sets. Far more stimulating, however, were the review sessions and office hours I held every week. Most students attended these with the primary goal of getting help on homework problems, but inevitably the discussions took off in whatever directions the students' interests led. These conversations often tested my own astrophysical comprehension, pushing me to understand and explain a range of topics with ever improving precision. From these exchanges I learned that every individual is attracted to astronomy for a slightly different reason, and thus the teacher's greatest gift is to identify the issue that captivates each person and build on this existing interest in subsequent dialogues. My mother is a high school drama teacher, and I have long benefited from her experience with imaginative teaching and creative approaches to engaging students who find much of their required curriculum uninspiring. I hope to apply this knowledge and become an instructor who reaches out to my students in original and effective ways.

Currently, I am planning my most ambitious public event to date – a panel discussion of the past and future of manned spaceflight by those who have lived it. Astronauts from the Apollo and Space Shuttle programs have been invited, as well as members of the current NASA administration. This discussion will occur in spring 2006 at Princeton University, hosted by the newly founded Princeton Astrobiology Club (P-ABC). The event began with my personal desire to meet someone who has walked on the Moon, and has since grown into a major initiative that will require the energy of all P-ABC members to organize and raise the necessary funds. With several of the founders and interim officers of P-ABC planning to study abroad next semester, I have taken primary responsibility for coordinating our campus-wide effort. We are thrilled that Harrison Schmitt (Apollo 17), the only scientist sent to the Moon and the only professional scientist ever in the U.S. Senate, has already agreed to participate.

I will seek more teaching experience in graduate school, whether or not my institution requires it. With a Graduate Research Fellowship from the National Science Foundation, I will also be free to undertake the research that interests me starting in my first year. I have long had a clear idea of my intended scientific focus, and as an undergraduate I have developed much of the background required to pursue my own research goals. In addition to science classes – which at Princeton tend to emphasize theory over experimental methods and results – I have taken enough engineering courses for a Certificate in Engineering Physics. These courses have provided valuable hands-on experience in the lab. In particular, a graduate course on "experimental methods" that concentrated on optics and spectroscopy greatly deepened my understanding of how astronomical instruments are built and operated. I feel that I am prepared for instrumental, observational, and theoretical work in graduate school, all of which I hope to try. A fellowship from the NSF will provide me the freedom to try all of these by enabling me to choose my own advisers and projects, which will likely cross departmental boundaries and include collaborations with Earth and planetary scientists.

Scientific research is supported by public funds, and I feel strongly that both the researchers and the taxpayers benefit from communication and dissemination of scientific results. I also know the singular value that a good scientific education has had in my own life, and I look forward to helping others obtain the same. The dual roles of the scientist-educator appeal to me, and I feel able and eager to meet the challenges of such a career.