

## Personal Statement

Ryan Anderson

It isn't clear when I decided to become a scientist, but it was before elementary school. I know this because in kindergarten I told my parents that I wanted to be a locomotive conductor and a scientist on weekends. Thankfully, in subsequent years my interest in trains fell by the wayside as I focused on science. I was interested in everything, and read every science book in the school library. As classes became more and more specialized, I found myself especially interested in the physical sciences. After taking an astronomy course in high school, I realized that it is the only field that encompasses all the other sciences, and therefore decided to study astronomy in college.

In my second year at the University of Michigan I declared majors in astrophysics and physics. Shortly after declaring, I joined the Undergraduate Research Opportunity Program (UROP). Through that program, I worked with Dr. Diane Paulson to analyze high resolution spectroscopy of a flare on Barnard's star. It was my first experience with scientific research, but I took to it quickly. The most important lesson I learned during my UROP experience was the excitement of discovery. I identified several unexpected emission lines and realized for the first time what it is like to learn something that nobody ever knew.

The following summer, I participated in an REU program at the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts. I worked with Dr. Thomas Megeath studying molecular clouds with the Spitzer space telescope. The academic atmosphere, the hard work and rewarding results, and all the astronomers I met fueled my desire to become an active member of the scientific community.

By the end of my third year, I decided that my interests are chiefly in planetary science. In the summer of 2005 I worked at the Lunar and Planetary Institute (LPI) in Houston, Texas with Dr. Walter Kiefer. I studied the ancient history of Mars through careful analysis of the topography of buried craters. Once again, it was thrilling to be a part of the academic environment and to meet others who are just as passionate about their work.

Recently, I have been working with Dr. Hunter Waite in the department of Atmospheric, Oceanic and Space Sciences at the University of Michigan. I am helping him to develop a pattern recognition program to analyze data from a prototype 2D Gas Chromatograph/Mass Spectrometer. This project is my first experience with laboratory-based science, and I am enjoying it immensely. The instrument we are developing will fly on the next generation of Mars rovers to study organic molecules in the Martian surface environment.

Research is not the only experience that has inspired me to pursue graduate study. I am also very active in science education programs, and plan to continue teaching science throughout my professional career. My main involvement with astronomy education is as president of the Student Astronomical Society. The purpose of the group is to educate the public about astronomy through hands-on activities, planetarium shows, observing nights, lectures, and other events. As president, I have increased our membership, budget, and the number of events with which we are involved. This semester, I helped to organize a series of five public lectures to celebrate the World Year in Physics. Each lecture featured a distinguished speaker who explained how their

research builds on Einstein's great contributions to physics, and was attended by between 300 and 500 people. I have also led inreaches with local schools, girl scouts, and other campus groups to educate and inspire kids about science.

In addition to the astronomy club, I am a reporter for the science page of our campus newspaper. My articles feature the results of research done at the University in astronomy and planetary science. The goal is to inform the student body about exciting discoveries being made on campus, even if they do not have a strong science background. One of my articles, discussing the discovery of intermediate-sized black holes by Dr. Joel Bregman's research group, was selected by the New York Times and ran in their online college edition. My eventual goal is to write science books for a general audience.

My experiences in the last four years have prepared me well for advanced study, and allowed me to set definite goals for the future. I am particularly interested in the exploration of our solar system, and in developing a greater understanding of our own circumstances on Earth by learning about the processes that have shaped the history of the planets. I plan to follow those interests and enter graduate school in fall 2006 to pursue a Ph.D. in planetary science.

The NSF fellowship will help me build a foundation for my career. With the support of the NSF, I will have more freedom to focus on research early in graduate school. Doing so will give the opportunity to do research in several subfields of planetary science before incorporating them into a final thesis. With successful completion of graduate school, I will continue the pursuit of my goals with postdoctoral research at a leading center for planetary science. Finally, I will join the faculty of a university with a strong planetary science program or will work as a NASA researcher. There, I will be able to effectively contribute to mankind's knowledge about our solar system and our place in it. My aspirations have come a long way since kindergarten.