

My experience in the NASA-Olin Research Program Christina Powell

This past summer, I was lucky enough to have the opportunity to work on projects in conjunction with Franklin W. Olin College of Engineering and Goddard Spaceflight Center in Greenbelt, Maryland, along with University of Maryland – Baltimore County. The projects on which I worked centered on a CubeSat, a type of picosatellite, which, in this case, is designed to study profiles of clouds from an altitude of about 700 km.

The first of my projects was designing a solar sensor to determine the angle to the sun from one face of the satellite. We looked at and tested the possibility of using a position-sensitive photodiode as a sensor. For more information on our process and on our results, visit our website at nasa.ece.olin.edu/projects/2008/sos. I acted as the project manager for this project, making it a particularly valuable experience. I found that I really enjoyed being the manager, even though it presented an entirely different set of challenges. Our team was comprised of people with different personalities, so everyone needed to be able to work together, even when we had differing ideas. There were also people of varying levels of experience and interests. Everyone needed parts of the project that they would be willing to invest time in. This was part of my job, making sure that the tasks were finished when they needed to be done and that everyone remained satisfied with what they were doing. That also meant knowing what the overall picture was, instead of getting completely caught up in one aspect of the project. This means that I had to be able to adapt to various situations, lending a hand whenever and wherever it was needed.

The other project on which I worked was an attitude control system for the satellite. This system used magnetorquers to interact with the Earth's magnetic field and control the attitude of the spacecraft. Our website has more information on the project itself at nasa.ece.olin.edu/projects/2009/acs. This project was more ambiguous than the other in that the path which we were to follow was not as clear cut. There were more unknowns, more variables, and more potential problems. Whereas with the other project we were able to steadily progress through the tasks, we tended to move in fits and spurts for the ACS. We ran into many more problems, always having to work to solve them, before running into another problem the next day. On this project, I worked on a variety of tasks, moving around to wherever help was needed, instead of staying in one specific area. This again helped me to adapt to different situations. I had to be able to catch up on what had developed since the last time I worked on that part, than continue with more improvements. I believe that this is the most important skill which I gained over the course of the summer.

Both projects had more of a electrical engineering flavor. I can honestly say that I am more of a mechanical person, and in the projects I was able to work on whatever mechanical side there was. At the same time, I greatly increased my knowledge of electrical systems, although I do recognize that I am not interested in pursuing a career in electrical engineering. I very much enjoyed working on these projects over the course of the summer, and I definitely believe that they helped to prepare me for whatever I want to do next.