NPS Hosts Young Scientists, Engineers for Hands-on Internships

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In addition to being a key research institution for the Navy, NPS reaches beyond the gates surrounding the campus to connect with students in the science, technology, engineering and mathematics (STEM) fields. The various schools, departments and Institutes on campus host dozens of high school, undergraduate and graduate level students from schools locally and across the country with a desire to learn from some of the most seasoned researchers at NPS. The internships foster a sense of continuous learning and networking while encouraging budding scientists and engineers to pursue careers within the Department of Defense.

"These internships are important for the students because it gives them the opportunity to do hands-on laboratory work on focused research projects of national interest," noted Jim Newman, a professor in the Space Systems Academic Group (SSAG). "This kind of project-based learning and experience set the basis for my own career, and I feel that it really creates a very powerful environment for learning."

During the summer, the NPS campus is like a school within a school, bringing in dozens of interns to work alongside experienced faculty, researchers and graduate students on various projects. This summer, more than 180 interns, both new and returning, joined the NPS community. Funding for the interns comes from various grants either through NPS or the college where the students come from. In the fall, most of the students will return to their studies, while some will continue to work throughout the year.

The Space Systems Academic Group currently has 10 high school, undergraduate and graduate level students from Salinas, San Luis Obispo, Montana, Michigan, Tennessee and the Monterey Peninsula, getting hands-on lab experience alongside NPS students and faculty. Under the direction of Professor Newman and Professor Rudy Panholzer, the interns are paired up throughout the group with different researchers and projects that fit their interests or funding. Newman worked as an astronaut for NASA for almost 20 years before taking a teaching position in the Space Systems Academic Group at NPS. He brings a wealth of experience to the SSAG, making it an ideal place for aspiring young aerospace engineers to intern.

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Included in the group of interns working in the SSAG are York High School graduates Wilson Mefford and Michael Weissman. Both interns have worked in the SSAG lab for the past two summers and are working on various projects related to CubeSat development and testing, and with equipment like the Helmholtz coil. Mefford will begin studying Mechanical Engineering at Northeastern University in the fall, while Weissman will be entering his Junior year at Brown University

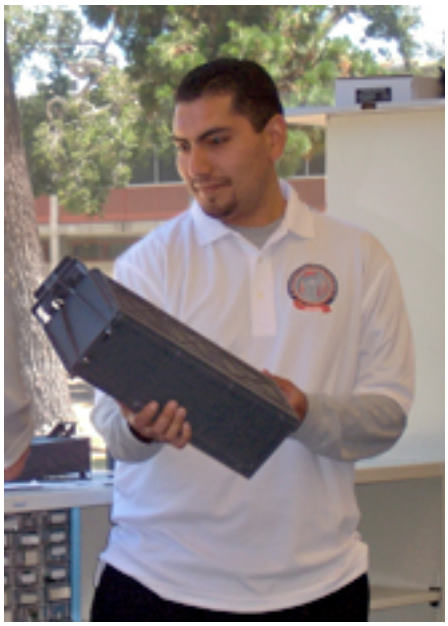
where he is studying Physics. The two noted the value of their experiences in the lab for both their resume and their understanding of the steps it takes to fund and execute a research project.

"Having someone like Dr. Newman writing a letter of recommendation for anything you are going towards is really something wonderful to have," said Weissman. "And as far as jobs in the community are concerned, coming home for the summer, for a college student to have a job like this … and the experience you get is invaluable."

Shane Driscoll, a yearlong senior intern on Newman's team, has been with the lab over a year. While attending Montana State University (MSU), he heard from a professor that NPS was looking for lab assistants. He took the internship to gain valuable lab experience, and has begun taking classes at NPS to further his education in Aerospace Engineering. In the fall he will return to MSU to pursue his Masters degree. For young scientists working their way into the STEM fields, the networking and contacts that NPS internships afford are often as valuable as the experience itself.

"We've been to a lot of different facilities where aerospace engineering is being done at the very top level when it comes to experience," explained Driscoll. "And we get to see how those people work and what the processes are. And to actually present at Critical Design Reviews, which is a very big deal in Aerospace. So we've had the opportunity to experience a lot of different aspects of aerospace application."

The contributions the interns make is often vital to the graduate student population as well. One of the projects in the works in the SSAG would bring laboratory classes to Distributed Learning (DL) students who may be taking classes through NPS but are unable to attend on campus. The proposed Innovative Spacecraft Laboratory Techniques Course is one of the first of its kind for NPS, factoring in hands-on lab experiments using computer, electrical and mechanical components to provide DL and in-residence students a learning experience that includes an online lab course. SSAG intern and Hartnell student Ernesto Yzquierdo is a new addition to the team, getting a running start in helping to bring various aspects of the course together. In particular, he hopes to fly an instrumented balloon to over forty thousand feet. While the completed project is still a few years away, the end result may benefit DL and in-residence students across the services.



Yzquierdo was hired through a partnership that NPS' Cebrowski Institute has maintained with Hartnell College for the past four years to place STEM students into labs on campus. In 2008, NPS was presented with the Hartnell President's Partnership of Excellence Award for contributions made in support of Hartnell's science program. The program is also unique in that students are exposed to defense-based projects and research, offering a connection between science and national security.

"From the Department of Defense aspect, it is important to replenish the work force in science, technology, engineering and math disciplines. That's the real criticality of what we are doing here. The workforce is aging," explained Sue Higgins, Deputy Director of the Cebrowski Institute. "This program helps us create a great building block to a variety of national labs. So whether it's Office of Naval Research or DARPA, two labs that we have research projects with, this kind of building block approach helps grow a new generation that will potentially lead in those directions."

Several interns have been granted the NASA Motivating Undergraduates in Science and Technology (MUST) award, and opportunities to work for NASA. Being in the graduate school environment provides interns with both a glimpse of what a graduate program is like and the options available to scientists and engineers with advanced degrees. Many NPS staff and faculty have taken part in internships across the country and express the value of being exposed to industry careers as an undergraduate.

The students coordinated by the Cebrowski Institute represent a fraction of the total number of interns participating in laboratory research on campus, preparing them for future careers in the STEM fields. The top quality equipment and access to knowledgeable researchers working on various projects around campus provides a unique learning environment for students looking at a future in any of the laboratory and research sciences.

"I was an intern at both IBM and PSG&E during the summers as an undergrad while attending Cooper Union in New York," said Physics Professor Jose Sinbaldi. "My internships in the industry made me realize how important an advance degree would be so that I could do the type of things that were intellectually stimulating. I realized that I did not want to take the jobs that were available with just a basic degree in science. And that made me stay in school instead of taking a job."

Throughout NPS, the roles and responsibilities of dozens of student interns vary. Those in the STEM fields learn not only how to conduct research, but also how to handle the clerical details that go along with their projects, offering a well-balanced picture of the inner workings of a laboratory. Like the graduate students studying at NPS who represent many different cultures, ethnicities, backgrounds and interests, the student interns bring.