University CubeSats, NPSCuL Set for Launch

By Amanda D. Stein

In many ways, it will be a monumental launch for the Space Systems Academic Group (SSAG) at NPS. After a recent successful test run, two exciting projects are scheduled to head into space in August…one is a CubeSat, a small satellite destined for Low Earth Orbit, and the other, the NPS CubeSat Launcher or NPSCuL, is the payload platform that will carry it there.

NPS students and faculty, in a project funded by the National Reconnaissance Office (NRO), have designed and built the NPSCuL, pronounced NPS-cool, axillary payload platform to allow multiple CubeSats to be launched aboard rockets as secondary payload — meaning the rocket would be able to carry satellites on onboard space that would otherwise be unused.

“The CubeSat platform provides an opportunity to develop technologies that better serve our current military’s needs. The small size of a CubeSat, compared to a typical large satellite, lends itself to be more responsive and efficient, which are important advantages in the planning and operations of space programs.”

—Wenschel Lan, Space Systems Engineering Ph.D. Student

“NPSCuL, which can accommodate up to 24 CubeSats in a single…payload volume, enables these technologies to be developed at a much higher rate than any other U.S. launch capability to date,” Lan noted.

The August 2012 mission carrying 11 CubeSats will enable NPS researchers to get one of their own CubeSats into space for the first time. That CubeSat is part of a collaborative effort between NPS and the Lawrence Livermore National Laboratory known as STARE, and will observe other satellites and help determine threats posed by space debris.

Space debris is a costly and dangerous problem for the space community, one that the Navy and NASA have to be concerned about.

“The Navy is interested because they have a lot of assets in space which they rely on,” explained SSAG Professor and Chair Rudy Panholzer. “And if we find a ways of locating the space debris or space objects with a little more accuracy than they are doing now, they can save a lot of money.”
President Oliver established the Search Committee for the Executive Vice President and Provost position last month, and asked me to chair the group. I am honored to serve in this role, and would like to keep the campus community informed of our progress. In order to respond to President Oliver’s request that the committee be representative of the academic enterprise, the committee consists of representatives from each of the schools, the Faculty Council, military faculty and administration — the membership is listed at left. President Oliver also asked that the Search Committee include an of counsel group that could include additional faculty input and advice. I have reached out to a number of faculty members who graciously agreed to serve in that role.

The Search Committee has begun its work with enthusiasm and energy and I would like to highlight some of the progress to date. President Oliver’s charge to the committee outlines a number of qualifications for the position that were used to finalize the position description. The latter was approved by President Oliver and used as the basis for the advertisement in national publications. Both documents are available on the NPS Intranet at http://intranet/Announcements/Postings/Provost_Search_Committee.htm.

Advertisements have been posted since mid-March in higher education publications, a national newspaper and relevant online sites – specifically in the “Chronicle of Higher Education,” the online version of the “Washington Post,” as well as LinkedIn and AcademicKeys. The Search Committee is also proactively soliciting nominations via contacts at the National Academies, the Institute of Defense Analyses and other top-tier organizations. I would like to ask the entire faculty of NPS for assistance in this important search. If you know of someone you think would be a qualified candidate, please contact me directly by phone or e-mail. The Search Committee is committed to having the strongest and most competitive pool of candidates possible and looks forward to your recommendations.

The deadline for applications is May 15, 2012. Reference calls will be made on a long list of qualified candidates and campus visits will begin soon after. The Search Committee may meet with a longer list of candidates first and then bring in a smaller group for full two-day campus visits, which will include a presentation by each candidate, as well as meetings with groups of faculty and administrators.

The Chief of Naval Operations has asked President Oliver for periodic updates on the Search Committee’s progress, and the first one was sent March 27, 2012. President Oliver also asked for engagement by the Board of Advisors in the process, and I have met with the Chair of the Board of Advisors, retired Vice Adm. Lee Gunn, by phone to begin that involvement.

Very respectfully,

John Arquilla
Professor and Chair, Defense Analysis
Chair, Search Committee for Executive Vice President and Provost
NPS Establishes Interdisciplinary Cyber Academic Group

By Amanda D. Stein

In the January 2012 “Priorities for the 21st Century Defense” report, the Department of Defense listed cyberspace operations as one of the 10 primary missions for the armed forces. The growing threats posed by adversaries within the cyber domain have the DOD placing a renewed focus on advancing the nation’s ability to defend its networks and create resilient systems.

To help meet those objectives, a number of faculty at the Naval Postgraduate School have joined together to form the interdisciplinary Cyber Academic Group (CAG), dedicated to building the school’s cyber program curricula, and helping further collaboration in the field.

Leading the charge are Professor Cynthia Irvine, Chair of the CAG, and Distinguished Professor Dorothy Denning, Associate Chair. Born from the Cyber Systems and Operations Academic Committee, the CAG brings together expert faculty from across departments and disciplines to determine the best interdisciplinary curriculum for the school’s new Master of Science Degree in Cyber Systems and Operations.

“Cyber is a domain of warfare that has become increasingly important to all of the services,” said Denning. “We need to excel in that domain.”

The group started with a blank slate, and based on feedback from the Deputy Chief of Naval Operations for Information Domiance, developed a list of courses — both existing and new — to help the program meet the Navy’s and DOD’s cyber needs. Irvine explained the CAG’s 15 faculty members bring with them a wide range of expertise, from defense analysis to computer science.

“The cyber ‘question mark’ didn’t fall directly into one department at NPS. That’s why we created the academic group,” explained Irvine. “The topic is too broad for any single department.”

Irvine noted that in addition to Computer Science and Electrical and Computer Engineering, which provide the technical foundations that support cyber operations, the Defense Analysis, Operations Research, Applied Mathematics and Information Sciences departments also have an integral role to play in the CAG.

“We’re reaching out across the spectrum. Ultimately, the CAG is also going to support Navy executive education programs in cyber. We are also exploring the idea of an annual update course,” said Irvine. “This is a technology area where things are not standing still. The way we use cyberspace is changing, so new material must be incorporated on an ongoing basis. Ten years ago, we would have never thought that mobile devices would be so popular. You’d be surprised how much changed from 2000 to 2010.”

Another task being taken up by the CAG is the establishment of a Cyber Battle Laboratory on campus. The lab will be comprised of both classified and unclassified facilities, and will be essentially an “erector set for building cyber scenarios,” according to Irvine. The facility can be configured to be a physically isolated network to prevent activities from exercises and training from leaking out and compromising other networks.

On Mar. 9, Vice President for Information Resources and Chief Information Officer Dr. Christine Haska welcomed local City of Monterey City Manager Fred Cohn and Chief Information Officer Dianah Neff to campus for an extensive facility tour and in depth discussion on potential collaboration opportunities.

On Tuesday, Mar. 13, Haska and other senior information technology leaders attended the CENIC Annual Conference in Palo Alto, Calif. At the conference, NPS was awarded CENIC’s 2012 Innovations in Technology Award for an effort to transition the nearby Defense Language Institute Foreign Language Center onto an academic network.

On Friday, Mar. 16, Executive Vice President and Provost Dr. Leonard Ferrari traveled to Washington, D.C., for in depth discussions with officials from National Defense University, iCollege, and the Institute of National Strategic Studies.

On Friday, Mar. 23, Oliver traveled to Wright-Patterson Air Force Base to serve as the Commencement Speaker for the graduation ceremony at the Air Force Institute of Technology. The graduating class consisted of 209 Air Force officers, five non-commissioned Air Force officers, five Army officers, two Marine Corps officers, 15 civilians and 14 international students.

From the Mezz provides a brief report on the activities of NPS senior administration. For more details on any of these reports, please contact the Office of Institutional Advancement at pao@nps.edu.
Students Explore Carbon Nanotubes for Space Propulsion

By Amanda D. Stein

Like something from a sci-fi movie, researchers at NPS are looking at using carbon nanotubes to propel satellites in space. Recent NPS Space Systems Engineering (SSE) graduate Lt. Paul Camp explored the technology in his thesis, designing and building a field ionization test chamber for the nanotubes to be tested for propulsion.

Although the science behind the process is plenty complicated, the concept is fairly basic and eerily similar to the propulsion drives made famous in Gene Roddenberry's "Star Trek" franchise. The carbon nanotubes would ionize a propellant gas, which in turn provides a small but constant thrust to accelerate and maneuver the spacecraft.

"Carbon nanotubes have the ability to tolerate very high current densities and can handle very high potentials," explained Camp. "When you apply a potential to a carbon nanotube, the very tip of the carbon nanotube, since it is so skinny and so small in diameter, can greatly amplify that potential and create an electric field that is high enough to ionize the propellant.

"These engines have oppositely charged grids where the ionized propellant will be attracted to the negatively charged grids, while being repelled by the positively charged grids," he continued. "This repulsion, then attraction, of the ions to the grids accelerates them out of the spacecraft. At the same time the spacecraft is ‘pushing’ them out, it will be thrust in the opposite direction.

Carbon nanotubes are gaining momentum in the scientific community, and for Camp and his research advisor, Assistant Professor of Physics and Mechanical and Aerospace Engineering Sebastian Osswald, the nanotubes’ exceptional electronic and mechanical properties make them an appealing alternative to traditional propulsion systems.

"For the past four years, the Postgraduate School has been working on trying to develop new electric propulsion engines for use on spacecraft," explained Camp. "One of the advantages of using these engines is the fact that they are pretty small. And although they don't generate a lot of thrust, they don't require a lot of room, allowing for substantial weight savings while achieving very high efficiencies."

Since Camp graduated in December, SSE student Lt. Jessie Hallan has picked up where Camp’s research left off. Hallan's thesis will execute tests in the chamber and make the appropriate measurements to determine the thrust and efficiencies achievable with the carbon nanotube-based ion thruster. Through the research facilities at NPS’ Center for Materials Research, Hallan is able to grow the nanotubes directly onto a mount that will later be placed into the test chamber.

Because the Navy relies heavily on space for communications and navigation satellites, the carbon nanotubes could potentially mean big cost savings if researchers were able to reduce the size of propulsion systems and the fuel needed to keep satellites in orbit.

Alumni in the Fleet

NPS Alumnus Takes Command of VX-23


Grad Assumes Command of NVSUP FLCPH

Navy Capt. Paul Verrastro, a Management graduate from NPS, assumed command of Naval Supply Systems Command Fleet Logistics Center Pearl Harbor (FLCPH) during a ceremony, Mar. 12 at Joint Base Pearl Harbor-Hickam. FLCPH provides logistics support services to the fleet, the wing, shore and industrial commands of the Navy and Air Force, Coast Guard, Military Sealift Command and other joint and allied forces.
At the invitation of Hiroshi Inomata, Consulate General of Japan, military officers assigned to the Naval Postgraduate School took part in a ceremony, Mar. 13, to commemorate the one-year anniversary of the 2011 earthquake and ensuing tsunami that devastated Japan in 2011. All of the NPS officers in attendance, representing the Navy, Marine Corps and Air Force, took part in the Operation Tomodachi relief efforts.

In total, 15 NPS officers joined more than 600 members of the Japanese and American community at the Presidio of San Francisco to take part in the ceremony to remember the victims of the disaster and to thank the people of California and the United States for their support.

“Operation Tomodachi really exemplifies the possibilities of that partnership between our military and our two great countries spanning the Pacific Ocean,” said Lt. John Vokley, an NPS student that delivered formal remarks at the ceremony.

We have a very strong and committed relationship with Japan and the Japanese Self Defense Force, added Cmdr. Tim Unrein, a Naval officer assigned to NPS’ Information Dominance Center of Excellence. Unrein discussed his role in the relief efforts and noted the important role a strong maritime presence in the region played in providing timely assistance to Japan.

“My role was behind the scenes at Submarine Group 7. We were tasked with radiological monitoring and advising,” noted Unrein.

“The U.S. Navy is a global force for good and we are capable of delivering aid when natural disasters strike. We have resources such as transportation capabilities, and we can go where others can’t. It only makes sense that we provide assistance when others are affected by unforeseen natural disasters.”

Of note, the reception was actually held in the same historically-relevant room at the Golden Gate Club on the Presidio of San Francisco that the U.S.—Japan Security Treaty was signed on Sept. 8, 1951.

Physics Professor R. Christopher Olsen was recently honored with the 2012 Richard W. Hamming Annual Faculty Award for Interdisciplinary Achievement. Olsen’s primary research focuses on remote sensing, with an emphasis on the general problem of target detection.

Faculty, students and researchers in the Common Operational Research Environment (CORE) Lab provided advanced network analysis training and field data collection supporting the Joint Special Operations Task Force—Philippines. The effort hopes to greatly improve knowledge of the nation’s sociocultural environment through data collection and analysis — part of the CORE Lab’s larger Lighthouse Project.

A Naval Postgraduate School lecture by Naval War College Monterey Professor Donald Stoker was featured on C-SPAN 3, Mar. 10–11. C-SPAN recorded Stoker’s lecture after his most recent book, “The Grand Design: Strategy and the U.S. Civil War,” won the 2010 Fletcher Pratt Award for the best non-fiction book on the Civil War.

Send your faculty news and notes to update@nps.edu.
The Naval Postgraduate School’s Dudley Knox Library has announced the launch of an extensive online institutional archive. The electronic repository, known as Calhoun, was created to bring NPS’ scholarly contributions together, creating an easily searchable collection of scholarly, instructional and institutional publications and research products authored by members of the NPS community.

“Calhoun gives everyone one place to go to find out about the Naval Postgraduate School’s scholarly contributions,” said University Librarian Eleanor Uhlinger. "Right now you have to browse through many, many web pages, look through faculty websites or look through our library catalog to find theses. This is one central location that says these are the products of NPS.”

Calhoun, named after Prof. Guy K. Calhoun who is the first known appointment and published author from NPS, is based on the open source software DSpace created by the Massachusetts Institute of Technology and Hewlett-Packard, and is reflective of a new wave of thinking amongst library professionals.

“The whole idea was to bring together research material that NPS institutions acquire. We wanted to make sure you can easily access this material,” said Irene Berry, DKL's digital service librarian. “We're doing real-world applicable stuff here at NPS and we want to share, to disseminate, to extend the reach of NPS to the world.”

Calhoun extends the reach of NPS-authored content by digitizing old documents and assigning electronic descriptions, or meta-tags, that allow search engines such as Google or Yahoo! to find them. Documents that were originally electronic are also assigned metadata, allowing search engines to easily find them as well.

“If you just go in the Internet and search a specific topic, you can’t see what is in our library’s catalog. Search engines can’t see beyond a certain point and it is metatagging that makes it possible for the search engines to index our content out to the world,” noted Berry. “Now when you look for terms in a search engine, it goes straight to this institution. Our stuff isn’t hidden under a layer of cataloging and other stuff; it’s right out there on the web now.”

Although much of the content being prepared and populated in Calhoun comes from student theses and dissertations, all NPS-authored content is welcome and can be submitted to Berry at the library … Calhoun includes any and all things that are created by NPS authors.

The system is currently in Beta testing, but is planned to go live Apr. 2. To view and explore the archive, visit http://calhoun.nps.edu/.

Andrea Davis, a reference and instruction librarian at NPS’ Dudley Knox Library was named a 2012 “Mover and Shaker” by a prominent library magazine, "Library Journal". Annually, “Library Journal” spotlights librarians and others in the field who are nominated by their peers for doing extraordinary work to serve their users and to move libraries of all types and their services forward.

Named a “Mover and Shaker” in the Advocates category, Davis was recognized for her efforts in establishing and promoting the presence of libraries and librarians at the South by Southwest Festival (SXSWi), an annual event blending music, films and emerging technologies to foster creative and professional growth. Davis attributes her success in the library community to her dedication and personal passion for libraries and technology.

“I don’t take things slow. I get passionate about what I do and spread that around to others and try to get them to jump onboard,” noted Davis. “South by Southwest was a wonderful opportunity for both libraries and NPS to stretch beyond academia and beyond government outlets to really insert ourselves where the public eye is focused. If we want to have an impact, and show the public what our worth is, we have to meet them where they are.”

While attending SXSWi, Davis used her time and talent to broaden perspectives on her role as a librarian working for the Federal government.

““There is so much amazing research done here at NPS, as we are at the forefront of technological innovation,” said Davis. “I wanted to make the library community aware that working for the Navy and for the Federal government is not a boring position.”
Any Day at NPS ...

Spring is in full swing here in Monterey and it’s a great time to be a student at NPS! With the upcoming Submariners Ball and the Battle of Midway Dining Out, the opportunities to enjoy life on the Peninsula are growing every day!!

With the coming of spring comes yet the beginning of another quarter, so I want to welcome all the new students to the NPS campus and wish you all the best in your studies here. There is no greater opportunity to learn, explore, and be a part of such a collaboration of thoughts as there is at NPS. Be sure to take full advantage of your time here and be a part of the greater NPS community.

Consider being a part of the NPS community, beyond the classroom as well, by joining one of our many extracurricular organizations such as the Student Council (for students who wants to make a difference on campus), Surface Navy Association (for the SWOs in the crowd), the NPS Sailing Association (for those who love to or want to learn to sail the “old school” way), or the NPS Flying Club (for those who want to sail through the clouds).

These are just a few of the many amazing groups around campus and I encourage each of you to seek out those that interest you and truly make the most of your time!

Lt. Yokeley is the Chairman of the President’s Student Council. Visit the PSC on the intranet at http://intranet/psc/index.html.
On Campus this Month

April 3
Cdr. Kirk S. Lippold, USN (Ret.)
Former CO, USS Cole
Secretary of the Navy Guest Lecture
POC Lt. Jenny Phillips, Ext. 2466

April 5
The Naval Postgraduate School’s New Spouse Orientation
La Mesa Community Center Ballroom
POC MBOSC, president@montereybayosc.com

April 17
Kevin Freeman
CEO of Freeman Global Holdings
Secretary of the Navy Guest Lecture
POC Lt. Jenny Phillips, Ext. 2466

April 25–26
NPS Board of Advisors Meeting
POC Jaye Panza, Ext. 2514

April 28
112th Submarine Birthday Ball
Guest Speaker Adm. Cecil D. Haney
Commander, Pacific Fleet
POC Lt. Justin Kirkpatrick, jpkirkpa@nps.edu

Historical Highlights

The earliest example of an NPS logo was discovered last month, tucked away in a Dudley Knox Library storeroom. The logo, which was used in a World War II NPS publication, shows the school’s year of establishment (1909) and identifies the program’s relationship with the Naval Academy.

The logo was printed on the cover of the school’s General Instructions booklet for 1944. Several post-war publications were stored with this booklet and, together, the books in this set provide an important historical snapshot of the evolution of NPS as it became independent from the Academy.

The eight-page 1944 General Instructions booklet has been added to the DKL archives and is among hundreds of historical documents and books available to researchers. The archives reading room in Knox Room 261 is open Monday, Wednesday and Friday from 10 a.m. until noon and by appointment.

Historical Highlights are provided by the Dudley Knox Library.