MACO Investment Paying Dividends

by MC1 Lewis Hunsaker

Since its inception in September 2012, some 15 enlisted Sailors from the Information Systems Technician (IT) and Cryptologic Technician-Networks (CTN) ratings have earned Master of Science in Applied Cyber Operations (MACO) degrees at NPS.

The MACO program helps the Navy to meet the Department of Defense’s growing need for trained cyber professionals. After graduation they will be assigned to critical cyber billets throughout the fleet.

IT1 Thomas Skoff was one of the first enlisted Sailors to go through NPS’ MACO program.

“The opportunity to come to NPS and receive advanced training was amazing,” said Skoff. “We are leading junior Sailors in the Navy’s cyber domain and this education is invaluable to the fleet.”

The four-quarter resident MACO program combines coursework in the study of cyber operations, defending U.S. systems, and exploiting vulnerabilities in adversaries culminating in a comprehensive capstone project.

“The cyber threat is constantly evolving, and so must our defense. The true value of this program is the opportunity to provide operationally-relevant education to these Sailors.” — Vice Adm. Jan E. Tighe

“This program allows our students to look at a different aspect of cyber than what they are accustomed to,” said NPS Distinguished Professor Cynthia Irvine. “Cyber is a team activity.”

A few years ago, the Vice Chief of Naval Operations asked NPS to look at opportunities for enlisted service members to receive graduate level education in cyber operations, added NPS Associate Professor Duane Davis.

In May of 2015, Commander, U.S. Fleet Cyber Command and Commander, U.S. 10th Fleet, Vice Adm. Jan E. Tighe returned to NPS for an in-depth review of the program.

“The cyber threat is constantly evolving, and so must our defense,” said Tighe. “The true value of this program is the opportunity to provide operationally-relevant education to these Sailors, who return right back to the fleet, where they can apply what they’ve learned, and lead other Sailors in the fight.”
NPS’ Newest Satellite Prepared for Launch

By Kenneth A. Stewart

Students and faculty at NPS’ Space Systems Academic Group (SSAG) are tentatively scheduled to launch a 3-foot, 180-pound satellite dubbed NPSAT1 aboard a SpaceX Falcon Heavy rocket from Cape Canaveral Space Center, Sept. 15. The satellite is the product of years of student and faculty research and will carry several experiments from both NPS and the Naval Research Laboratory into orbit.

The primary motivation behind the building of NPSAT1 was education. Some 40 theses and many hours of student and faculty research contributed to the development of the satellite.

“We are not here to build satellites, but the satellite is a nice byproduct of the educational process … We designed it, built it and are testing it in house. We also developed the lab around it, and developed the curriculum that led to its completion,” said SSAG Chair Dr. Rudy Panholzer, a 52-year veteran of the university who has been helping guide students through the many theses that culminated in NPSAT1 since the program’s inception.

A key component to any mission in space is the advancement of science, and NPSAT1 provides university students and faculty with a unique platform on which they can conduct science and engineering experiments.

“Once in space, you get a lab in the sky and are able to pilot it. [Our students] can point up into space and say ‘my work is up there,’” noted Panholzer.

“We are educating students, so why not choose an educational vehicle?” added NPS Research Associate Daniel Sakoda. And while Sakoda and Panholzer could have contracted out the building of the satellite, they and their colleagues chose to build it themselves in NPS’ Small Satellite Lab.

“It is very important that students realize that engineering is not just about Power Point [documents] and white boards,” said Panholzer. “That stuff may work in the classroom, but it does not necessarily work in the real world.”

According to Sakoda, the success of the programs is largely a product of a systems approach to engineering that has incorporated many disciplines toward the success of the NPSAT1 project.

“NPSAT1 is being launched in conjunction with the Department of Defense’s Space Test Program (STP), which maintains a list of experiments to be launched into space. Researchers can apply to have their experiments incorporated into future launches in keeping with the STP charter, which calls for the organization to get as many experiments into space as possible.

“That’s why we are aren’t a department, but an academic group. We’re a hub that draws from disciplines all across the campus,” added Panholzer.

And while the development of NPSAT1 is quite an accomplishment, it will not be the first NPS-developed satellite launched into orbit. According to Panholzer, former astronaut Senator John Glenn launched NPS’ first satellite, the Petite Amateur Navy Satellite (PANSAT), from the Space Shuttle Discovery in 1998.

“‘It was a non-attitude controlled, tumbling satellite. [But] the NPSAT1 is attitude controlled, using the earth’s magnetic field to align itself in space,” explained Panholzer.

Graduate students from across the services and from varied backgrounds study under Panholzer at SSAG, and many of those who have contributed to NPSAT1 over the years have gone on to leadership positions within the DOD’s space and acquisition communities. According to Sakoda, what they learn at NPS will be valuable to them as they interact with the defense contractors that build satellites used by the Department of Defense.

U.S. Army Lt. Col. Thomas Pugsley is an SSAG graduate. He first came to NPS as an Army Space Systems Operations officer in 2005. After a series of increasingly difficult directed studies under current Acting NPS Provost and SSAG Professor Dr. Jim Newman, Pugsley went to work on a thesis that explored the use of Micro-Electro-Mechanical Systems (MEMS) aboard satellites – the NPS Small Satellite Laboratory and NPS SAT1 were

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Remembering a Legend in Rotorcraft Engineering

By Dale M. Kuska

NPS Department of Mechanical and Aerospace Engineering (MAE) Professor Emeritus Dr. E. Roberts Wood passed away following a lengthy illness, Jan. 23.

Current MAE Chair Dr. Garth Hobson remembers Wood very well … In fact, Hobson says Wood was the department chair who brought him to NPS back in 1990, and was highly regarded for his ground-breaking achievements in rotary-wing aircraft engineering.

“He was famous for being the first to implement Higher Harmonic Control (HHC) in a flight demonstration while working at McDonnell Douglas Helicopter Co., then Hughes Helicopters, in Arizona in 1985,” Hobson said. “He was very active in the AHS [American Helicopter Society] and also wrote the annual AIAA [American Institute of Aeronautics and Astronautics] and AHS design contest awards for their capstone designs,” Hobson recalled. “Bob also won numerous teaching awards, particularly for his rotorcraft design courses.”

“Some of my fondest memories were from the time I spent sitting here in the lab solving problems,” said Pugsley. “The guys that I studied with then are still here and offer a vast knowledge base that students can draw from.”

After graduating from NPS in 2007, Pugsley “exported” his education to the U.S. Military Academy at West Point where he started the institution’s Small Satellite Research Center. Today, he is back at NPS where in addition to completing his doctoral studies he serves as co-thesis advisor for SSAG students.

And while his current studies at NPS are not focused on Space Systems Engineering, Pugsley credits his work on NPSAT1 with creating a foundation of engineering expertise that has served him well throughout his career.

“Engineering by itself is just good problem solving … As much as any other engineering field, [Space Systems Engineering] gives you a lot of background experience and knowledge. It teaches you different methods and approaches for solving problems,” said Pugsley. And had it not been for the problems that Pugsley solved on NPSAT1, it is likely that the satellite would look very different. Pugsley’s work with MEMs led to the replacement of several bulky satellite components with very small MEM sensors.

“At that time, MEMs were fairly new to the space industry and there were questions about their accuracy and ability to operate in the cold vacuum of space. Pugsley went to work, spending hours in NPS’ vacuum chamber, building wiring harnesses and testing his minute components at very low temperatures. All of that hard work may soon pay off. If all goes well, this coming September, Pugsley will be one of those students Panholzer hopes to see pointing into the sky, saying “my work is there.”

An Honorary Fellow in AHS International, Wood was a prolific researcher while on campus, and mentored countless students through their thesis research, resulting in several awards for the officers, and the institution.

“While at NPS, first as Chair of the Department of Aeronautics and Astronautics, his students won numerous engineering awards, particularly for his rotorcraft design courses.”

“Some of my fondest memories were from the time I spent sitting here in the lab solving problems,” said Pugsley. And had it not been for the problems that Pugsley solved on NPSAT1, it is likely that the satellite would look very different. Pugsley’s work with MEMs led to the replacement of several bulky satellite components with very small MEM sensors.

“When it comes to spacecraft, mass is everything … Rather than having big bulky, mechanical sensors, we started asking ourselves, ‘what can we use that is smaller and lighter?’ Pugsley recalled.

“Engineering by itself is just good problem solving … As much as any other engineering field, [Space Systems Engineering] gives you a lot of background experience and knowledge. It teaches you different methods and approaches for solving problems,” said Pugsley. And had it not been for the problems that Pugsley solved on NPSAT1, it is likely that the satellite would look very different. Pugsley’s work with MEMs led to the replacement of several bulky satellite components with very small MEM sensors.

NPS Research Associate Professors Vladimir Dobrokhotov and Kevin Jones showcased their work on energy-independent intelligence, surveillance and reconnaissance (ISR) at the latest Defense Energy Seminar, held in the Mechanical and Aerospace Engineering Auditorium, Jan. 22.

Through the application of classroom instruction and hands-on research, Dobrokhotov and Jones help students understand how existing systems can be advanced through energy-independence. Their recent fabrication of the low-cost Aqua Quad rotary aircraft is capable of landing on the ocean surface and deploying a detection sensor while using the sensing time to regenerate the craft’s photovoltaic cells. It is also capable of transmitting what it finds below the surface up to a ‘flock’ of hovering UAVs, operating in tandem in the area.

“Our goal is to develop technologies that most reliably deliver persistent coverage over a wide area, and it is our hypothesis that this is more readily achieved using large numbers of low-cost, lower-capability assets rather than small numbers of high-cost, higher-capability assets,” explained Jones.

“To survive on only energy sources that the assets can freely capture from the environment is extremely difficult, but this objective … can more easily be met with improved knowledge of the surroundings, which is greatly improved with the dispersed sensing obtained by the many rather than the one,” Jones continued.

NPS’ Energy Academic Group holds Defense Energy Series lectures on select Fridays throughout the quarter.

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Menneken Award Winners Highlight NPS Research

By Kenneth A. Stewart

NPS Professor Clay Moltz has been named the 2015 recipient of the Menneken Faculty Research Award for Significant and Sustained Contributions. He was recently honored along with NPS Department of Systems Engineering Associate Professor Timothy Chung and Graduate School of Business and Public Policy (GSBPP) Associate Professor Nicholas Dew, who share the recently revamped Menneken Award for Highly Meritorious Research.

“This award is truly a highlight of my career,” noted Moltz. “I am very thankful to have two such supportive department chairs in Mohammed Hafez and Rudy Panholzer.”

Moltz is considered a leading national and international expert in the fields of space and nuclear policy, authoring eight books and more than 50 articles and book chapters during his prolific career. His most recent book, “Crowded Orbits: Conflict and Cooperation in Space,” highlights the difficulties of operations in space given the active space programs of so many nations around the world.

Chung’s Menneken Award comes on the heels of his successes in the field of unmanned aerial vehicle (UAV) swarms. He and his colleagues at NPS’ Advanced Robotics Systems Engineering Laboratory (ARSENAL) flew a record breaking 50 autonomous UAVs at Camp Roberts last August.

“It is an honor to receive this Menneken Award, which highlights the collective achievement of a talented and inspiring team. This recognition serves to remind us that innovation is born of conversation and collaboration. With this tenet in mind, I intend to continue these various research initiatives in the future through active engagements across students, faculty, warfighters, and the fleet,” said Chung.

Dew, who shared the award with Chung, is also an advocate for innovation.

“I was delighted to receive this award. Traditionally, it has been given to faculty with expertise in the areas of science and technology. It’s wonderful to see it awarded to a researcher in the social sciences and I hope other social scientists will be honored with it in the future,” said Dew.

For Dew, the social sciences are a critical component of the Navy’s future success, especially as it attempts to incorporate new technologies throughout the fleet.

“[In many instances] the technology is already there. The problem is getting people to adopt it. That’s a social science problem. Social scientists are important to the Navy as it attempts to move forward,” Dew explained.

The Menneken Awards were established in the memory of Distinguished Professor Carl E. Menneken who served as NPS Dean of Research from 1962-1972. Funding for the awards is provided from a bequest to the NPS Foundation by his wife Jesse W. Menneken.

Annual Essay Contest Deadline Approaches

By NPS Public Affairs

The NPS Foundation/U.S. Naval Institute Annual Essay Contest’s March 31st deadline is fast approaching. The contest is a great way to join important conversations that directly affect professionals within the naval services.

“We sincerely hope this contest serves as a visible and important outlet for the work and ideas generated by NPS students,” said NPS alumnus and U.S. Naval Institute Chief Executive Officer retired Vice. Adm. Peter H. Daly.

The contest is open to NPS students, faculty and staff and offers a $5000 cash award for an essay that demonstrates critical thinking in an area of concern to the sea services.

The winning essay will be selected by the U.S. Naval Institute’s editorial board and published in the institute’s flagship publication, “Proceedings.”

Essay contests are part of the institute’s focus on spurring conversation and debate around important naval matters and have been central to their work for more than 130 years. Past contest winners have made significant contributions toward on-going problem sets across a wide swath of naval disciplines.

Essays based on theses, research, or operational experiences that best advance the military profession are eligible for submission. For more information visit www.usni.org/npsessay.
NPS, Union Reach Telework Agreement

By NPS Public Affairs

NPS and Local 1690 “The Union” signed a Memorandum of Agreement regarding the interpretation of key terms within the NPS telework policy, Jan 13. Local 1690 Vice President Kenneth Stewart and NPS Chief of Staff Anthony Parisi were the lead negotiators during bargaining.

“This agreement shows that we can collaborate in a manner that is both productive and beneficial to Team NPS,” said Parisi.

“It was a pleasure to sit across the table from the management team and to represent the hardworking members of our bargaining unit. This agreement clarifies some ambiguities in the previous agreement and protects the interests of our members while supporting our ‘mission first, people always’ approach,” added Stewart.

The new MOA addresses recall procedures, the status of telework agreements when supervisors change, and the criteria used to make telework agreement adjustments, terminations and cancellations.

SNA Monterey Chapter Honored With Membership Excellence Award

By MC2 Michael Ehrlich

NPS student Lt. Zachery Martens accepted the Surface Navy Association’s (SNA) Membership Excellence Award on behalf of the association’s Monterey chapter at the SNA National Symposium in Arlington, Va., Jan. 14. The chapter, led by Martens, supports the needs of members of the surface warfare community.

“It is truly an honor for our chapter to be recognized with this award. It is a testament to the support and engagement of the surface warfare community both on campus and in the local area,” said Martens.

The SNA’s Monterey Chapter has been engaged on a variety of levels throughout the year. They have offered everything from lectures to golf tournaments to bring the surface warfare community together.

“As a student at NPS, it is very easy to drift away from the current status of the surface community,” said Martens. “Through a variety of formal presentations, our chapter has worked to maintain the ‘pulse’ of the fleet.”

NPS has also taken an active role in the development of the surface warfare community. Last year, the university welcomed Capt. Charles Good as its first Surface Warfare Officer (SWO) chair.

“SNA Monterey takes pride in being the only chapter to be run by lieutenants rather than senior officers,” said Good. “It’s really a means for SWO students on campus to congregate, share ideas, and stay grounded in their warfare community.”

Former NPS Department of Defense Analysis student U.S. Navy Lt. Deward Cummings was awarded a patent for his Explosives Storage Systems invention, Jan. 12. His invention provides a storage system for safely and securely storing collected explosives such as unexploded or abandoned ordnance. The storage system can be built using a simple construction methodology and locally-sourced building materials allowing the system to be deployed to, or built locally, in at-risk areas.

NPS Senior Intelligence Officer Capt. Dan Verheul spoke at an Information Warfare Community (IWC) training seminar in Ingersoll Hall, Jan. 26. Verheul emphasized the importance of teamwork in the development of the recently-formed IWC.

“We as a community have to understand the different sections of our community, and the strengths that each has to offer,” said Verheul.

“One of the first things I did when I started working was I reached out to the space systems and METOC [meteorology and oceanography] personnel,” Verheul continued. “Since I’m an Intel guy, I have an Intel gap that has to get filled. I can’t get there if the weather doesn’t cooperate … I have shut down operations because my METOC officer said no.”

Another primary message to the diverse group of IWC officers was the likelihood of seeing more of them on campus in the future, as the Navy recently approved an increase to the number of IWC students to be enrolled at the university.

Send your campus news and notes to update@nps.edu.
In an attempt to meet the educational needs of some of the Navy's most highly-trained officers, NPS' Department of Mechanical and Aerospace Engineering (MAE) offers a graduate education program for Nuclear Trained Officers that leverages both specialized nuclear training and defense-focused graduate education.

The Distance Learning Program for Nuclear Trained Officers utilizes NPS distance learning courses, which when combined with training at the Naval Nuclear Power School, lead to a Master of Science in Engineering Science (Mechanical Engineering) (MSES-ME) degree from NPS.

“The Department of Mechanical and Aerospace Engineering just completed the successful curriculum review of this important asynchronous distance learning program as well as a similar synchronous program that is taught directly to Naval Reactors at the Washington Navy Yard,” said MAE Chair Dr. Garth V. Hobson.

“The department sees these two programs as vital to our contribution to the further education of Nuclear Trained Officers. We continue to develop new courses for this program as well, to ensure that students progress through the program smoothly,” Hobson added.

Program Administrator retired Navy Capt. Daniel Prince plays a lead role in facilitating the effort.

“To be eligible for the program, officers must have graduated from Naval Nuclear Power School, a rigorous six-month program in Charleston [South Carolina], with the Naval Nuclear Power Training Command, where they learn the principles of electrical, mechanical and nuclear engineering in support of their future leadership roles on nuclear powered vessels,” said Prince.

After a careful evaluation of the course work offered to aspiring nuclear officers at the Nuclear Power School, NPS was able to offer 28 credits to Nuclear Power School graduates toward an NPS master’s degree. Those credits are automatically posted by the NPS Registrar to a preliminary transcript so that Nuclear Power School graduates will have a leg up when they apply to NPS.

The courses are offered in a series of recorded lectures combined with texts supported by a cadre of NPS professors. Coursework is shipped to students around the world where they are able to work through it at their own pace under a professor’s guidance. The average student finishes each of the courses in three to four months.

“We currently have over 50 students worldwide actively enrolled in the program. We offer them a true engineering degree if they are willing to buckle down and complete the coursework and a research paper,” said Prince.

Lt. Cmdr. Jake Kennedy is an MSES-ME student nearing completion of the program. He was able to complete the coursework despite a demanding tour aboard a fast attack nuclear submarine. "Alternating between sea and shore duty, nuclear officer schedules are very tight. The [MSES-ME] program gave me the opportunity to complete the course work I needed. Without that distance learning format and the program’s schedule flexibility, I wouldn’t have been able to pursue my degree,” said Kennedy.

Focus On … Self Development

A Monthly Look at Names and Faces on Campus

Lisset Cortes has recently assumed the title of Office Automation Assistant, a responsibility that she began training for during a high school internship with the Cebrowski Institute in 2009.

“I am truly honored to work at NPS, I continue to meet spectacularly intellectual people across campus and it’s remarkable how refreshing and illuminating they are as passionate professionals,” said Cortes. “[The Operations Research Department] is where I learned to be the young professional I have come to be today.”

Currently, Cortes supports more than 70 NPS faculty members and students in the OR department. She coordinates travel and administrative logistics, and then follows up with reimbursement claims.

“I continued my internships during the summers while I attended California State University Chico to keep my foot in the door … working for the Cebrowski Institute and [NPS Professor Dr. Daniel] Nussbaum,” said Cortes. “There’s a lot of paperwork to keep the office going and keeping the faculty members happy with whatever they need.”

Cortes is also utilizing NPS’ Health and Educational Wellness program to begin studies with NPS’ Department of National Security Affairs.
Any Day at NPS ...

STUDENT voice

Army Special Forces Maj. Tim Ball, Chairman of the President’s Student Council

Greetings from the President’s Student Council!

The PSC is working to increase our outreach and communication to both the student body and the faculty. We have started having a weekly get-together in the Trident Room on Thursdays at 3:00 p.m. This gives students an opportunity to come by and discuss any issues going on around campus, or to simply bring up some suggestions. I’ve received some great feedback so far, and look forward to the continued dialogue. We also want faculty and staff to know that they are always welcome to join in as well!

The PSC is working hard to consolidate volunteer opportunities in the Monterey area and to act as a conduit for students to find events that they are interested in. We get contacted several times a week by organizations looking for help, ranging from local high schools to the Monterey County Library. These events are often mentioned in weekly e-mail correspondence to the student body, and are also posted on our daily muster page.

We’ve also received a great amount of feedback for potential Secretary of the Navy Guest Lecture series speakers. Students have submitted some great nominations, ranging from former POWs to innovators in modern organizational design. The PSC will be working in the next few weeks to bring some of this top notch talent to NPS for future SGLs.

We hope everyone has a great February, and look forward to seeing everyone around campus!

Have a story to share? Public Affairs is constantly seeking interesting news and stories for Update NPS. Send your tips to pao@nps.edu.
On Campus this Month

February 5
Defense Energy Seminar
1:00 p.m. at the MAE Auditorium

February 9-12
JIFX 16-2
Aboard the MV Cape Orlando in Alameda, Calif.

February 9
SGL with the Honorable Richard J. Danzig
3:00 p.m. at King Auditorium

February 12
Lincoln’s Birthday

February 15
President's Day
Washington's Birthday
(No Classes)

February 23
GMT - Suicide Prevention
3:00 p.m. - 5:00 p.m. at King Auditorium
* All active duty Navy personnel are required to attend. *

Historical Highlights

This month’s Historical Highlight honors NPS alumnus Rear Adm. Lillian Elaine Fishburne.

It was 18 years ago this month that a former NPS student in Telecommunications Systems Management was promoted to the rank of rear admiral.

Then Lt. Cmdr. Fishburne arrived at NPS seeking a second master’s degree after having been placed in charge of the Naval Telecommunications Center in Great Lakes, Ill. Noting shrinking manpower resources there, she recognized an emerging problem with relying on the public sector to staff broader naval telecommunications services. Her 1982 master’s thesis, “Lessons learned in communications services contracting” proposed specific reforms to service contracts and called for improvements to written statements of work and quality assurance plans.

Fishburne was appointed by President Bill Clinton to the rank of rear admiral (lower half), becoming the nation’s first African American woman to achieve that rank on Feb. 1, 1998.

Fishburne’s master’s thesis can be read in Calhoun, the NPS Archive.