



NAVAL POSTGRADUATE SCHOOL

UPDATE
NPS



(U.S. Navy photo by MC2 Shawn J. Stewart)

Deputy SECDEF Honors Spring Grads

by Kenneth A. Stewart

NPS welcomed Deputy Secretary of Defense and NPS alumnus the Honorable Robert O. Work to its Summer Quarter Graduation ceremony, June 19. Work addressed a graduating class comprised of some 290 graduates from every U.S. branch of service, and 19 countries, earning 296 advanced degrees.

Prior to addressing the graduating class, NPS President retired Vice Adm. Ronald A. Route and Provost Dr. Douglas A. Hensler presented Work with NPS' Distinguished Alumni Award, noting Work's "extraordinary leadership," his contributions to military service, and his "unsurpassed and continued support of graduate education and the Naval Postgraduate School."

"I have so much affection for this institution and so much respect for its graduates," said Work. "There is absolutely nothing more important to the future of our security establishment and the future of our great nation than preparing our future leaders."

"There is absolutely nothing more important to the future of our security establishment and the future of our great nation than preparing our future leaders." — The Honorable Robert O. Work

During his address, Work discussed the challenges that the U.S. is facing as its "unipolar moment" as the world's sole super-power comes to an end and rival nations begin to assert themselves across the world stage.

"We are at a pivotal moment in our history. We are coming out of more than 14 years of hard fighting, including the longest war in our nation's history," he said. "We are witnessing a more multipolar world where American leadership is being increasingly challenged, perhaps no more so than in the military realm."

Work concluded by thanking the service members in attendance for their service to the nation.

"To the American Soldiers, Sailors, Airmen, Marines and DOD civilians here today, I want to thank you for stepping forward and choosing to serve our country during this difficult period in our nation's history," Work concluded. "You are part of a proud tradition of voluntary service that extends back to the continental Army and Marine Corps. The secretary and I and the entire nation are absolutely grateful everyday for your willingness to serve."

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HAPPY 4TH OF JULY

July 2015

Professor Leaves Lasting Legacy on NPS, Systems Engineering

By MC2 Shawn J. Stewart

Naval Postgraduate School (NPS) Professor of Systems Engineering (SE) Dr. David H. Olwell will soon be settling in to his new position as Dean of Engineering at Saint Martin's University in Lacey, Washington, but colleagues say he has made a lasting legacy on both the university, and the systems engineering discipline, here at NPS.

"I am grateful that the school recognized my efforts with two Navy Superior Civilian Service Awards," said Olwell, "a Navy Meritorious Civilian Service Award, the Graduate School of Engineering and Applied Sciences (GSEAS) Service Award, along with multiple teaching awards."

Olwell says his accolades and accomplishments are all extensions to how he views his purpose to teach, and the relationship he has with his students.

"I like my students, and I think they like me, we value and respect each other as professionals," Olwell said. "I try to help them achieve their full potential, so they can fulfill their goal of serving our country to the best of their ability, and they flourish. I have enjoyed being the primary thesis/capstone advisor to 88 students and the second reader or co-advisor to nine others.

"I learned to teach from great mentors like Frank Giordano and Bill Fox, and when I was on the faculty at West Point, and that has served me well. I tried to help my colleagues as I've been helped," he added.

Over the years, the Navy has placed significant value on the study of systems engineering, and Olwell has been deeply involved in evolving the university's program.

"When SECNAV [Donald C.] Winter called upon NPS in 2007 to help lead the revitalization of the systems engineering workforce in

the Navy, we were positioned and we responded by expanding both the breadth and reach of our educational and research programs," said Olwell.

"Working with my colleagues, especially Bob Harney and Chuck Calvano, who had the initial vision for systems engineering at NPS, and Wally Owen, who has been our strong outreach champion, and partnering with other departments at NPS, we built a set of programs that grew from a few dozen students to over 500 students per year," he added.

As he looks back on his time at NPS, Olwell says his colleagues aren't the only influences on his 26-year career; his love of country played a big part as well.



Former NPS Professor of Systems Engineering (SE) Dr. David H. Olwell has accepted a new position as Dean of Engineering at Saint Martin's University in Lacey, Washington, but colleagues say he has left a lasting legacy on both the institution, and the systems engineering discipline, here at NPS. (U.S. Navy photo by Javier Chagoya)

"For the 26 years I have been teaching, I've always kept a sign outside my office, a quotation from Douglas MacArthur. It reads, 'Your duty remains fixed, inviolate. It is to win our nation's wars,'" said Olwell.

"Since 1974, it has been my life's work to contribute to that effort of winning our nation's wars. I consider my teaching years as fighting the very deep battle, helping to shape and strengthen those who will shoulder the responsibilities of our future national defense," he added.

As he departed NPS for new challenges outside

of the DON/DOD, he expressed thanks to the colleagues who have helped him along the way.

"Forty years in the uniformed and civilian service is a long time; it is time to move on," he said. "As I retire from the Navy, I am excited by this new challenge and I am grateful for the friends and colleagues who have helped me along the way ... you have made this opportunity possible."

"Update NPS" is a monthly publication for students, faculty and staff of the Naval Postgraduate School produced by the Public Affairs Office. For additional copies, comments, or to suggest story ideas, contact the editorial staff at pao@nps.edu.

Novel Thesis Project Turned Patent Offers Satellite Solutions

By Kenneth A. Stewart

NPS alumnus Cmdr. William Crane along with NPS Professor Jim Newman, NPS Associate Professor Marcello Romano and NPS alumnus Paul Oppenheimer, an engineer with Naval Research Laboratories, were recently issued a patent for a novel release actuator, the Micro-coupling Active Release Mechanism, that may one day be used aboard satellites and other spacecraft.

The Micro-coupling Active Release Mechanism leverages the unique properties of a shape memory alloy (SMA) whose characteristics almost seem to defy physics.

“SMA is not a naturally occurring substance. It is made of nearly equal parts nickel and titanium,” explained Crane. “The easiest way to think about it is ‘metal shrink wrap.’ Normally, heated metal expands, but SMAs do the opposite, they shrink.”

The release mechanism works like this: a cylinder made of an SMA in its inert state is inserted into a hardened steel hub. The outer diameter of the shaft is bigger than the hole in the steel hub and when forced together under high pressure, an “interference joint” is created.

The interference joint concept has been used for over a century in the construction of gears.

“When making a gear, the gear is heated so that it expands and the hole in its center gets bigger, then a shaft is placed into the hole. When the gear cools, the shaft is trapped, shrink fit ... versus forcing a shaft into a hole, force fit,” explained Crane.

But while the interference joint is not a new



NPS alumnus Cmdr. William Crane with NPS Professor Jim Newman, NPS Associate Professor Marcello Romano and NPS alumnus Paul Oppenheimer were recently issued a patent for a novel release actuator that may one day be used on Cube Satellites like the one pictured here. (Courtesy artist's rendition by Montana State University)

concept, Crane's incorporation of SMAs into the process has taken a tried-and-true method and turned it on its head. When heat is applied to an interference joint made with SMA, the SMA contracts rather than expands, and the resulting loss of diameter in the SMA shaft allows a previously force fit SMA tube to be released with minimal force.

“The process can be used to develop any number of coupling devices. We first patented the concept, then added provisions relative to its various uses and possible configurations,” said Crane. “When I figured out that this is something that could be used in a coupling device for small satellites, it was a real ‘ah ha’ moment.”

The properties of SMAs vary dependent upon their particular metallic make up and whether they expand or retract is dependent upon the stimuli to which they are subjected. The SMA used by Crane and his colleagues, like most SMAs, has the ability to not only contract when heated, but to return to its “memory shape” when it cools, ensuring that the release mechanism can be used repeatedly.

According to Newman, one of the patented mechanism's strengths is its simplicity.

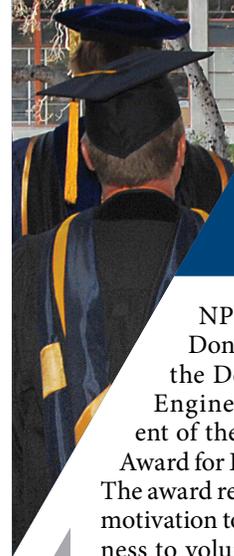
“The SMA interference joint is designed with very few parts. Its simple, single-motion actuation minimizes failure modes and increases coupling mechanism reliability,” he said. “The invention has applications in new and existing Navy, DOD and commercial satellite systems where dependable release mechanisms are needed.”

Oppenheimer worked with Crane on the release mechanism while studying at NPS.

“One of the things that has always been lacking in CubeSats has been a robust, mechanical release device. The things that we use in regular spacecraft do not scale down to the appropriate size for a CubeSat,” said Oppenheimer. “Other processes can cause up to 20-Gs of impulse force ... 20-Gs on a small satellite can be devastating. But with our process very minimal force is necessary.”

Crane has graduated from NPS and returned to the fleet, but like many NPS graduates, the research that he conducted as part of his graduate education continues. His thesis may one day contribute to the future of both defense and civilian applications in space.

FACULTY news & notes



NPS Professor of Practice Donald Muehlbach Jr. with the Department of Systems Engineering was the recipient of the 2015 Allen S. Griffin Award for Excellence in Teaching. The award recognized Muehlbach's motivation to teach and his willingness to volunteer within the local community.

NPS Department of Electrical and Computer Engineering (ECE) Associate Chair for Operations Cmdr. Zachary Staples and Program Officer Lt. Cmdr. Eric McMullen were honored by Military Officers Association of America (MOAA) President retired Vice Adm. Norbert R. Ryan with the Joint Service Warfare Faculty Award during a ceremony in the Barbara McNitt Ball Room, June 9.

The Excellence in Joint Service Warfare Faculty Award recognizes significant contributions to the study, implementation and spirit of joint service warfare. It is presented to select faculty each quarter.

The 63rd graduating class of the Naval War College (NWC) Monterey partnership with NPS for Joint Professional Military Education (JPME) stands for a group portrait in front of Herrmann Hall, June 11. Through the partnership, 4,076 officers have earned their NWC Command & Staff diploma with JPME phase 1 certification since the program's inception in September 1999.

NWC Monterey Chair Professor Fred Drake and Naval War College Provost Dr. Lewis Duncan presided over the ceremony where a total of 98 U.S. Navy, Coast Guard, Marine Corps, and Army officers earned their NWC Command and Staff diplomas this past quarter.

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Bertelsen Takes Command of NSAM

By Melinda Larson

Capt. Kevin Bertelsen assumed command of Naval Support Activity (NSA) Monterey from Capt. Timothy Faller during a ceremony at the installation, June 25.

After welcoming guests to the “finest Naval Support Activity in the Navy,” Commander, Navy Region Southwest Rear Adm. Patrick Lorge, praised the accomplishments of the outgoing commanding officer and his team.

“The installation has matured and grown, proving itself a valuable host to several specialized tenant commands. Captain Faller and his team embraced my guidance and executed my prescribed business lines as the newest installation within Navy Region Southwest continues on its path of success,” Lorge said.

The list of awards earned by the command include the 2014 Secretary of the Navy (SECNAV) Safety Award. The Environmental division won both the 2014 SECNAV and Chief of Naval Operations (CNO) Environmental Awards for Sustainability for a non-industrial base.

“As energy costs continue to eat away at installation budgets, the importance of sustainable water supplies and renewable energy for the armed services will increase, along with a culture of conservation and community partnerships,” Lorge said. “Naval Support Activity Monterey is already implementing aggressive water and energy conservation measures.”

In his last duty as commanding officer of the installation, Faller thanked the staff for their dedication.

“The key ingredient for success is present in this workforce’s pride in ownership. And they have the top Navy awards and accolades to back it up. They are the heart and soul of this installation. Thank you, team Monterey,” Faller said.

With those words, Faller saluted his relief, and transferred the absolute authority, responsibility and accountability of the command to Bertelsen.

Faller will now report to the Department of Defense’s Office of Economic Adjustment at the Pentagon.

Bertelsen, a native of Sacramento, Calif., reports to NSA Monterey from Command Navy Region Europe, Africa, Southwest Asia, headquartered in Naples, Italy,

where he was the Chief of Staff. The new commanding officer says he looks forward to leading the NSA Monterey team.

“I’m honored to have this opportunity to lead the finest Naval Support Activity in the Navy. I look forward to working along-side Team Monterey to continue to provide world-class support to our tenants and to strengthen and build upon our already tremendous relationship with the greater Monterey community,” Bertelsen said.

NSA Monterey supports over 160 buildings and 15 tenant commands.



Incoming Naval Support Activity Monterey (NSAM) Commanding Officer Capt. Kevin L. Bertelsen, above, addresses attendees during the change of command ceremony at NSAM headquarters, June 25. Bertelsen replaces outgoing commander Capt. Timothy Faller who thanked members of his team before saying farewell. (U.S. Navy photo by MC2 Shawn J. Stewart)

GSBPP Lecturer Conducts Tasty Thesis Prep

By MC2 Michael Ehrlich

Students in the Graduate School of Business and Public Policy’s (GSBPP) Master of Business Administration (MBA) program recently took their research to a tasty new level. Rather than relying upon dry numbers and the brain-busting formulas that many of them are destined to encounter in the near future, they conducted a pizza taste test in Reed Hall.

But the taste test was designed to be more than a mere culinary experiment. It was designed to help participating MBA students prepare for their upcoming thesis work through the experience of designing, implementing and analyzing the data from a controlled survey. And while the subject matter may have been less than groundbreaking, it served its purpose nonetheless. “We offer four

different types [of pizza], the origin of which is unknown to the population. They then fill out a worksheet that asked each of the students to rate the pizzas in a variety of different categories,” explained Army Capt. David Delassus.

Armed with the results of their surveys, students initiated a statistical analysis of their findings under the direction of GSBPP Lecturer Bryan Hudgens, who teaches a course on basic research methods.

“They are going to do research from start to finish. When they go to do their thesis project they will know how to collect data appropriately, how to do the background research to understand the whole process, then how to analyze and interpret the data,” said Hudgens.

NPS Student Makes Senior Chief

By MC2 Shawn J. Stewart

NPS Master of Applied Cyber Operations student, Cryptologic Technician Networks Senior Chief Melanie Labbe has passed a major career milestone - she was pinned to the coveted rank of Senior Chief Petty Officer, June 6.

“It’s been 18 years,” said Labbe. “It’s a proud moment, one of the proudest moments of my life.”



Cryptologic Technician Networks Senior Chief Melanie Labbe is pinned to the rank of Senior Chief by family members during her promotion ceremony in Glasgow Hall, June 6. (U.S. Navy photo by MC2 Shawn J. Stewart)

Labbe graciously accepted her promotion, and noted during her promotion ceremony that she could not wait to get back to the fleet to continue her efforts with the Navy’s cyber workforce.

“To make Senior Chief is such a blessing, and I plan on continuing to do good things in the fleet ... I can’t wait to get back to the fleet and apply what I learned here at NPS,” she said with a big smile.

In spite of the excitement and both the added prestige and responsibility of her promotion, Labbe expressed that the challenge of her coursework required her to stay laser focused on her classes.

“Right now, I’m focused on my studies, raising my daughter and taking advantage, when I can, of the Monterey area,” said Labbe.

“I’m studying computer science and applied cyber operations, and will [soon complete] a final capstone ... We are building something that will affect the fleet, and benefit the Sailors ultimately,” she continued.

German Forces CO Visits NPS

By Kenneth A. Stewart

The commander of German Forces Command U.S./Canada, German Air Force Col. Joachim Bohn recently visited NPS in conjunction with a visiting tour of the 80 locations where German military personnel are stationed in the U.S. and Canada.

“In the German military, NPS has a reputation as an excellent academic institution, known for its first-class education programs and a unique, multinational learning environment,” said Bohn. “Based on a long-standing and close cooperation between NPS and the German Bundeswehr, 23 German students are currently attending NPS.

“I look forward to further deepening and intensifying this cooperation, hoping that U.S. military personnel also take the opportunity to go to Germany for education and training,” Bohn continued.

While at NPS, Bohn attended NPS Associate Military Professor German Army Col. Peter Frank’s class. Frank used the visit to explain to his students the opportunities and challenges presented by EU led military operations.

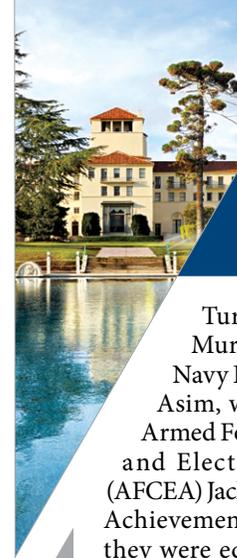
“The EU is not operating as a single actor. It is part of a system including host nations and international organizations such as the United Nations and the African Union,” he said.

“It is important to prepare U.S. military students for the future operational environment and for cooperation with the other actors, like the EU,” Frank continued.



German Armed Forces Command U.S./Canada Commander German Air Force Col. Joachim Bohn and NPS Associate Military Professor German Army Col. Peter Frank listen to a presentation at Glasgow Hall, June 4. (U.S. Navy photo by MC2 Shawn Stewart)

CAMPUS news & notes



Turkish Air Force 1st Lt. Murat Dogen and Pakistan Navy Lt. Cmdr. Tahir Majeed Asim, were honored with the Armed Forces Communications and Electronics Association’s (AFCEA) Jack Wozencraft Academic Achievement Award, June 1. And they were equally honored by the NPS Hall of Fame inductees who presented the honor.

Retired U.S. Navy Adm. Mike Mullen, former Chairman of the Joint Chiefs of Staff, and U.S. Army Gen. Keith Alexander, the former Director of the National Security Agency and the first Commander of the U.S. Cyber Command were on campus to make a special presentation of the award.

NPS Director of Cybersecurity Bob Goodwin is urging network users to be vigilant and to take measures that will mitigate future attempts to breach Department of Defense networks.

“What matters is that we have a defense-in-depth strategy that strives to continuously monitor our networks and defeat attempts to infiltrate them,” said Goodwin.

Goodwin is optimistic about the effectiveness of NPS’ cybersecurity team, but he urges NPS users to attend the upcoming Cybersecurity Awareness Training to help prevent a future breach.

NPS on YouTube



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Alumnus Directs Major Changes to Georgian MOD

By Kenneth A. Stewart

NPS alumnus Georgian Army Col. Giorgi Jachvadze has managed a series of reforms within the Georgian Ministry of Defense (MOD) that have effectively overhauled the Georgian military personnel system, and he directly credits his NPS education for giving him the knowledge to make the aggressive changes.

“The main objective of the military personnel management systems reform was to establish objective, fair and transparent military personnel planning and management systems in accordance with NATO standards and principles,” explained Jachvadze.

“My NPS experience created significant preconditions for all of these accomplishments and my NPS classes and thesis played a significant role in the success of these reforms,” he added.

NPS Senior Lecturer retired Navy Cmdr. Bill Hatch served as Jachvadze’s thesis advisor during his time at the university.

“[Jachvadze] led the implementation of many reforms outlined in his thesis, ‘Quantitative Analysis in the Georgian Armed Forces Manpower/Personnel Policy Decision Making Using Markov Models.’ These reforms have been integral to advancing [Georgia] on its path to NATO membership,” said Hatch. “This is a huge deal for Georgians, and a strategic imperative for the U.S. given Russia’s aggressive expansion in recent years.”

Jachvadze completed NPS’ Manpower Systems Analysis curriculum in the university’s Graduate School of Business and Public Policy (GSBPP). Upon graduation, he returned to Georgia where he was

selected to lead the J1 Personnel Department of the General Staff of the Georgian Armed Forces (GAF).

The Georgian J1 Personnel Department is responsible for manpower and personnel issues, including among other things, pay, allowances, and promotions throughout the GAF. The J1 also works with the Ministry of Defense’s Human Resource Management Professional Development Department to implement personnel policies within the GAF.

One of the most successful of the reforms led by Jachvadze was a MOD transition to a pay-by-rank compensation system.

“Before transitioning to a pay-by-rank system, a large portion of GAF military personnel’s basic pay, about 95 percent, was defined by the position they held, and only about five percent was related to their actual rank,” explained Jachvadze.

According to Jachvadze, transitioning to a pay-by-rank system was important because the prior practice, which offered compensation based upon position, created an improper set of incentives and hampered the ability of the GAF to implement a Western-style

military personnel system.

Transitioning to a pay-by-rank system to align with NATO standards has been one of the Georgian MOD’s top priorities for the last decade. After years of failed attempts, Jachvadze, with support from MOD leadership, was able to successfully make the transition.



NPS alumnus Georgian Army Col. Giorgi Jachvadze is congratulated by commencement speaker retired Adm. Henry Mauz during the 2013 Winter Quarter Graduation Ceremony. (U.S. Navy photo by Javier Chagoya)

Focus On ... Financial Responsibility

A Monthly Look at Names and Faces on Campus

The materials at the Dudley Knox Library are an important resource for students, faculty and alumni alike, but if it weren’t for the hard work and vigilance of dedicated library personnel like Library Financial Analyst Bardomina Lopez, those resources would quickly become inaccessible.

“I manage the budget and expenditures, which is important for the school and the students because it allows us to purchase library content so students and

faculty can do their research and do their projects,” said Lopez.

In addition to the work she does supporting students, Lopez is a student herself. She is currently pursuing a Master of Business Administration that she hopes to complete in the near future.

“I’m halfway through a business degree and I hope I can move up to a management level position in the library [after graduation],” said Lopez.

Becoming an employee at the library requires a Bachelor of Arts (BA) in Business Administration. Prior to coming to the Dudley Knox Library, Lopez was completing her BA and looking for an internship, which she found at NPS. She later transitioned to doing full time work as a federal employee.

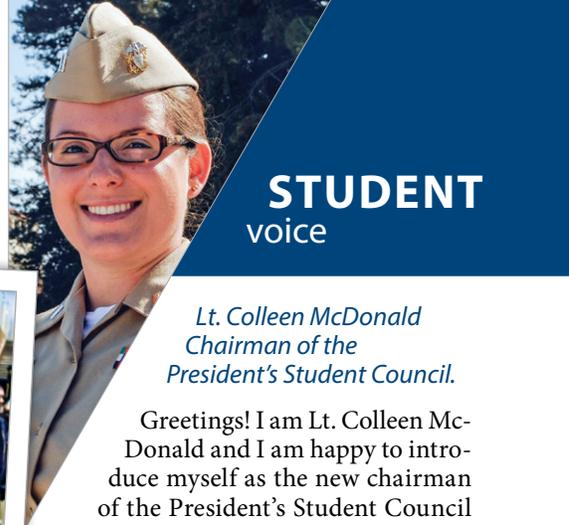
“Working with the library has been a great experience,” said Lopez. “I may not deal directly with the students, but I know

what I do helps them with their education.”



Library Financial Analyst Bardomina Lopez

Any Day at NPS ...



STUDENT voice

*Lt. Colleen McDonald
Chairman of the
President's Student Council.*

Greetings! I am Lt. Colleen McDonald and I am happy to introduce myself as the new chairman of the President's Student Council (PSC). After graduating from Villanova University in 2005 I was commissioned as a Navy Surface Warfare Officer. My tours include deployments with the USS ANZIO (CG 68) and USS HALSEY (DDG 97), followed by a shore position on the Sixth Fleet Staff in Naples, Italy. In 2012, I transferred into the Navy's Meteorology and Oceanography Community and became an operations officer. I am currently studying Meteorology and Oceanography and am scheduled to graduate in December of 2016.

Serving by my side is PSC Vice-Chairman Lt. Cmdr. Jesse-LaRou Walsh. Jesse is a Navy Human Resource (HR) Officer. She graduated from Texas A&M University in 2003 and was commissioned in 2005. Her first duty station was teaching at the Naval Nuclear Power Training Command. In 2009, she left active duty and joined the reserves where she served at Fleet Forces Command and on the Joint Staff. In 2013, she went on Active Duty for Special Work (ADSW) orders at Joint Staff as the Assistant Operations Support Officer, and became a full time support HR officer in 2014. She is studying Manpower Systems Analysis at the Graduate School of Business and Public Policy (GSBPP).

Jesse and I look forward to being a voice for the faculty in addition to the student body. If you see us around campus, please stop and introduce yourself. We are proud to serve you, eager to meet you, and ready to make a positive impact.

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seeking interesting news and
stories for Update NPS. Send
your tips to pao@nps.edu.**



IT Specialist Alyce Austin is pinned by NPS Provost Dr. Douglas A. Hensler after receiving the Meritorious Civilian Service Award during her retirement ceremony at Ingersoll Hall, June 6. Austin is retiring after 48 years of service. (U.S. Navy photo by MC3 Brian H. Abel)



Members of the NPS Color Guard stand at attention during NPS' Spring Quarter Graduation Ceremony, June 19. (U.S. Navy photo by MC2 Shawn Stewart)



Deputy Secretary of Defense and NPS alumnus the Honorable Robert O. Work, above right, is pictured with NPS Professor Jim Newman, above left, in the Small Satellite Test and Development Laboratory, June 19. (U.S. Navy photo by MCI Lewis Hunsaker)



NPS Mechanical Engineering student Lt. Eric Smitley flies the Cross-Flow Fan (CFF) propelled quadrotor aircraft he built for his thesis in the Center for Autonomous Vehicle Research (CAVR) lab, June 2. (U.S. Navy photo by Javier Chagoya)



Education Technician Alice R. Lee displays her Meritorious Civilian Service Award during her retirement ceremony at Spanagel Hall, June 24. Lee is retiring after 42 years of service. (U.S. Navy photo by MCI Lewis Hunsaker)



Operations Specialist 1st Class Vincent Hummel, right, is joined by his father Gene Hummel, left, and grandfather Harold Smith, center, following his promotion ceremony outside of Herrmann Hall, June 12. (U.S. Navy photo by MC2 Shawn Stewart)

On Campus this Month

HAPPY 4TH OF JULY

July 4

Independence Day



July 7

ITT Info Fair

11:00 a.m. - 1:00 p.m. at Dudley Knox Library and Ingersoll Hall

July 8

The RoboDojo Grand Opening

11:00 a.m. - 4:00 p.m. at Root Hall 125 B
Ribbon Cutting at 12:30 p.m.

July 9

Welcome Back BBQ
4:00 p.m. - 7:00 p.m. \$13 for Adults and \$6.50 for Children at the Trident Room



July 13

CRUSER: Syria Airlift Project

12:00 p.m. - 1:00 p.m. at ME Auditorium

July 17

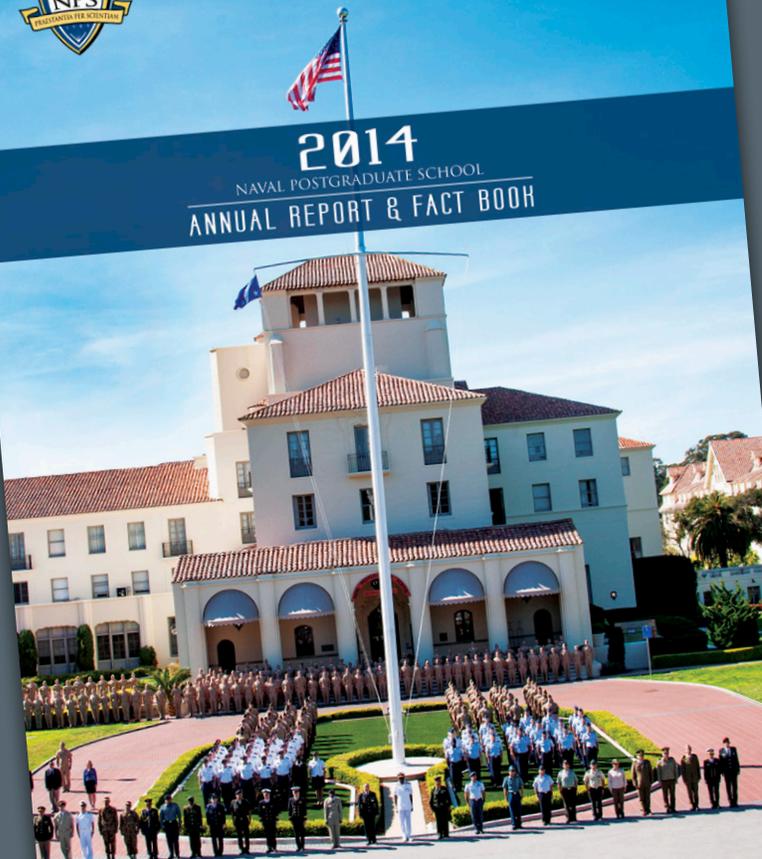
All American Family Fun Run 5K
3:00 p.m. in front of Herrmann Hall



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2014
NAVAL POSTGRADUATE SCHOOL
ANNUAL REPORT & FACT BOOK



Historical Highlights

Computing has been a core component of NPS academics since the institution's inception in 1909. Early calculating machines included mechanical integrators and electromechanical analyzers. NPS acquired its first computer, a Boeing Electronic Analog Computer (BEAC), after WWII. The photograph shows two students with the BEAC around 1953.



Mathematics Department Chairman Randy Church guided NPS into the digital era in the 1950's and, in 1960, the school acquired Seymour Cray's first CDC 1604. This pioneering all-digital "supercomputer" was capable of about 100,000 mathematical operations per second and had 32 kilobytes of memory.

Today, NPS' Information Technology and Communication Services (ITACS) operates the Hamming supercomputer which can run nearly 30 trillion mathematical operations per second – about 1,000 times faster than a standard desktop computer and 300 million times faster than the CDC 1604. The Hamming can do in a second what the CDC 1604 would have done in 9.5 years noted Dr. Jeff Haferman, director of the Hamming Supercomputing Center.

Historical Highlights are provided by the Dudley Knox Library.