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NAVAL POSTGRADUATE SCHOOL

IN REVIEW

MAGAZINE

OCTOBER 2011

WELCOME HOME

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SECRETARY OF DEFENSE **LEON PANETTA**
RETURNS TO HIS PENINSULA HOMETOWN TO
INSPIRE AND INFORM THE NPS COMMUNITY.

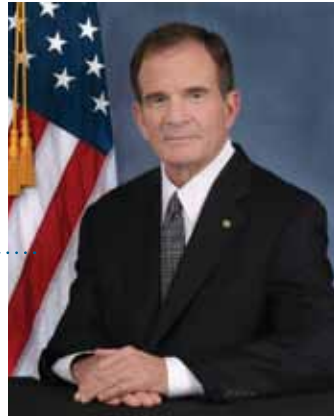
INSIDE:

Secretary Mabus Announces
NPS' Energy Degree Programs

Committee on the Future
Sets the Stage for Strategic Plan

Research Reports: Directed Energy,
Unmanned Systems, More





Daniel T. Oliver
Vice Adm., United States Navy (Ret.)
President, Naval Postgraduate School

And while there is abundant proof of our value in and far beyond the pages of this magazine, there is one constant beyond value or praise that will always drive our institution — our commitment to the security of the United States and our allies across the world.

PRESIDENT'S MESSAGE

Like any institution of higher education, the Naval Postgraduate School is much more than just a collection of classrooms, students and professors — it is a living, vibrant community transforming the lives of individuals, every day. And our calling, our single and seminal purpose, is to improve the national security of the United States, and the global security of our world.

I am sometimes asked how we contribute to the accomplishment of such a lofty goal — how do we prove our value, demonstrate our transformative power with relevant, responsive graduate-level education and research on behalf of the security of the American people? The answers are quite simple, and one needs to look no further than the pages of this quarter's edition of "In Review" for proof.

We were privileged to have Secretary of Defense Leon Panetta on campus in late August. The Secretary, born in Monterey, is definitely not a newcomer to NPS, having spent 16 years as the Congressional representative for the district in which our university resides. In addition, he spent 10 years, prior to joining the Central Intelligence Agency, as co-director of the Leon and Sylvia Panetta Institute for Public Policy at nearby California State University Monterey Bay. In short, Secretary Panetta is very familiar with the Naval Postgraduate School — where our institution has been, where we are today, and our prospects for the future. And I could not have been more proud of the compliments the Secretary paid to our institution, and to our students, during his visit.

Just one week later, Secretary of the Navy Ray Mabus came to campus with a very definitive purpose for his trip. The Secretary has a bold vision for an energy-independent Navy and Marine Corps, declaring aggressive energy efficiency goals for his services. And, having been on the staffs of senior Naval leaders during my active duty career, I can assure our readers that Secretary Mabus has no intent of allowing these objectives to fail — which makes me even more honored that he turned to the Naval Postgraduate School to help. Secretary Mabus announced NPS' new, dedicated energy degree programs and educational offerings to a packed King Auditorium, stating that NPS was the right place to develop the kind of leadership the Navy needs to achieve his goals. He is counting upon our ability to be responsive to this need, and we will not let him down.

And while these senior defense leaders both express and demonstrate a profound respect for our institution, it is the daily work of our faculty, staff and students that is the truth upon which all our claims stand firm — and there are myriad examples within these pages as well. A student/faculty team has developed a unique software package for Landing Signal Officers that portends significant improvement in the process of rating our carrier aviators. And two Marine Corps students are experimenting with one-of-a-kind payload packages that integrate into existing unmanned air systems with hopes of expanding the potential mission sets for which these already operational assets can be used.

These are all wonderful stories of success that express our true value to the defense establishment, but they would be in vain without keeping a keen eye toward the future ... and I am proud to note we are doing just that. This past September, a yearlong effort of extensive interviews and evaluations culminated with the presentation of the final report of our Committee on the Future. This team of visionaries across NPS and beyond has done us a tremendous service, for they have laid the foundation for our upcoming strategic planning effort.

In closing, while we are similar in many ways to our peer universities, we are also a very unique institution. And while there is abundant proof of our value in and far beyond the pages of this magazine, there is one constant beyond value or praise that will always drive our institution — our commitment to the security of the United States and our allies across the world.



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ON THE COVER

Secretary of Defense Leon Panetta will be the first to tell you he is a firm believer in the classic American Dream — in fact, he's an example of it. The son of Italian immigrants who came to America, and eventually Monterey, to create better lives for their children is now one of the most influential leaders in the nation. This past quarter, he returned to Monterey to address NPS students, and to inspire them to above all else ensure that American Dream remains alive and well for the next and future generations.

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Student Explores Algorithm for Force Protection

Cmdr. Jay Foraker just received his Ph.D. in Operations Research (OR) this past September, but his research in optimal search patterns is likely to live on for some time. In partnership with the Office of Naval Research, Foraker developed an algorithm for optimal search patterns for detecting incoming threats to ships and carriers in narrow waterways, such as a straight or channel.

Like a car traveling along a highway, Foraker explained, the ships are on a set path through a narrow waterway, with no room to deviate from that path. If the adversaries know the ship's path, they can easily attack. In order to protect the ship and crew, search helicopters or cruisers can use time and distance factors to determine an optimal search pattern to seek out threats.

"You choose your metrics and run the software that we developed as a part of this research, and it



Cmdr. Jay Foraker, Ph.D.

tells you the output of that path," explained Foraker. The path is the best possible means to pursue and detect potential threats based on complex mathematical modeling.

After his graduation in Sept., Foraker has moved on to teach

mathematics at the U.S. Naval Academy at Annapolis, Md. He noted the value of his NPS

have to make decisions," Foraker explained. "I think it behooves us as a nation to educate the officer corps — and the military in general, but especially the officer corps that lead the military and [are] making some of the hard decisions — and imbue them with as much ability as possible to think and understand the tools that are out there."

Doctoral Graduate Edits Book on Hybrid Conflict

Air Force Maj. Paul Brister, a special tactics officer and graduate from the doctoral program in security studies at NPS' Department of National Security Affairs, recently co-edited a book titled "Hybrid Warfare and Transnational Threats: Perspectives for an Era of Persistent Conflict."

The book is a compilation of essays from a broad spectrum of security professions, from scholars and researchers to military

education, and of education in general, for the men and women of the armed forces as they confront the ever-changing challenges facing the warfighter.

"The world is complex ... Machines are great and technology is great, but fundamentally, people

Ops Research Grad Leads Pacific Partnership 2011

When the Pacific Partnership 2011 (PP11) Team completed the final phase of its five-month mission in July, PP11 Mission Commander Capt. Jesse Wilson reflected on the U.S. Pacific Fleet-sponsored humanitarian assistance mission, and the role his 1991 master's degree in Operations Research from NPS played in helping him execute the diverse requirements of this critical mission.

According to Wilson, many of the insights gleaned from his studies at NPS directly affected the planning and leadership he provided to the force, for PP11 and throughout his Naval career.

"Almost every day, my NPS

experience influences what I do. In the military we operate in a resource-constrained environment related to time, space, forces and money," said Wilson. "The analytical framework and methodical approaches to problem solving I learned in the Operations Research program at NPS have been extremely valuable in helping me plan and execute missions throughout my Naval career."

"You can see things in the classroom that you couldn't see before. You can also bring back the perspective of how the knowledge is applicable to current operations and that keeps the institution as a whole



Capt. Jesse A. Wilson, mission commander of Pacific Partnership 2011 and a 1991 Operations Research graduate, is escorted into the Nakamal Chief Lodge by ni-Vanuatu customary dancers during the opening ceremony for the Vanuatu phase of Pacific Partnership 2011.

from becoming stagnant," Wilson added. "NPS provides a rigorous education by offering a dynamic curriculum with terrific faculty and amazing

cohorts of students with diverse military backgrounds. It's a chance to work amongst the best and brightest in the military and academia."

Business School Students Talk Shop With Senior Navy Acquisitions Advisor

Elliott Branch, Executive Director of Acquisitions and Logistics Management in the Office of the Assistant Secretary of the Navy, took time away from his busy schedule in the capital to speak with Graduate School of Business and Public Policy (GSBPP) acquisitions and contract management students, Aug 18. Branch is the senior civilian responsible for acquisition, contracting and logistics policy that governs the operation of the Navy's worldwide, multibillion dollar acquisition system.

Branch remarked during his lecture that DoD has significant cost structural liabilities, and some hard choices will be made in defense spending. He noted, "We spend money on three things — readiness, modernization and force structure. I am going to have to give up significant amounts of money because of the political process and the last budget agreement, which says that defense gives up \$350 billion over a ten year period."

He emphasized that the students in this room would be the ones making the decisions on how DoD spends money in the future. "The leaders don't decide. You all influence the leadership by the data that you give them, and the information that you have to make decisions," he said.

He closed by thanking the students for the hour that was given him to speak, and for all that they do. "On a personal note, I got into this business because I really enjoy the complexity of it," he noted. "The thing that I came away most impressed with is the young men and women who ... chose to put on the uniform, [they] are giving my children choices, and I want to thank you for your service."



is fast becoming a reoccurring theme that is necessary for sustainability.

Distilled from the original 44 projects, Farr heard from subject

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professionals with years of field experience. The book examines new and emerging aspects of the U.S. security environment.

"The book looks at concepts of future warfare, what we can expect and how we can respond to the threats that confront us," said Brister.



Air Force Maj. Paul Brister

Brister's chapter, along with the introduction by lead editor Dr. Robert Tomes, sets the stage for later chapters by framing the debate and establishing context for the contributor's essays. Hybrid warfare is an emerging term within the security community. Proponents of the term claim today's security threats come from a more diffuse group of actors, thereby increasing the complexity of the security environment and requiring a more resilient and adaptable response from security professionals. Detractors claim today's security threats are not radically different from unconventional and guerilla warfare of the past, and therefore do not require new strategies or terminology to define them.

"We really get into the concept of hybrid warfare, presenting viewpoints both for and against. We definitely have authors that

take both sides of the debate. We explore theoretical, conceptual, and operational aspects of hybrid warfare," said Brister.

"This collection of essays highlights the ongoing debate about the way globalization and the information revolution are transforming the nature of war," said Dr. James Wirtz, the Dean of the NPS School of International Graduate Studies, which houses the Department of National Security Affairs. "The authors explore how all sorts of actors are integrating technology, social networks, and violence to achieve their political objectives."

The book was published by the Council for Emerging National Security Affairs, which is a non-profit research organization that strives to contribute to the national security policy conversation.

Consortium Explores Military Research With Potential Civil Applications

Members from the California Homeland Security Consortium (CHSC) Advisory Board met with local Congressman Sam Farr (D-17th District), Sept. 6, for an update on project work that is currently being performed by NPS faculty and students for the CHSC. The consortium is sponsored by the Department of Homeland Security Science & Technology to support cutting-edge technologies focused on domestic security.

After vetting 44 proposals last fall, the CHSC Advisory Board selected research work that incorporates and leverages existing Monterey County emergency response agency resources with projects that strengthen collaborative efforts between and within agencies. In recognition of today's economic strains, sharing information, resources and assets



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independently-powered command, control and communications and Lighthouse, which is the application of commercial-off-the-shelf and open-source technology and analytic methodologies developed in the Common Operational Research Environment Lab to help solve complex problems.

Kennedy Space Center Honors NPS' Legacy in Space Flight

A set of framed NASA Space Shuttle photographs memorializing the crews of the Space Shuttles Challenger and Columbia were presented to NPS Vice President and Dean of Research Dr. Karl van Bibber, Sept. 29, by NASA Senior Researcher Dr. Bruce Vu following his talk on the 21st Century Space Launch Complex at NASA's Kennedy Space Center.

The photos are memorials to both the Challenger and Columbia flight crews who perished during the space shuttle program's 30-year run, both of which had NPS alumni on board during their respective tragedies. Presented in honor of NPS' relationship with NASA and the Kennedy Space Center (KSC), both prints are signed by KSC Director Bob Cabana. Cabana himself was an

astronaut who flew with one of NPS' handful of former faculty astronauts, Jim Newman, on STS-88. Further, Vu himself served as a NASA Chair Professor at NPS during 2008-2009.

Vu, who serves on the physics department committee for NPS doctorate candidate Nathan Moshman, was on campus to listen to Moshman's Ph.D. dissertation defense.

NSA Students Talk Libyan Conflict with U.S. Ambassador Gene Cretz

U.S. Ambassador to Libya, the Honorable Gene Cretz, offered a special lecture to National Security Affairs students, Aug. 16, about the conflict that has intensified in the country since late last year. In what was his first visit to the NPS campus, Cretz spoke candidly about the challenges facing Libya and the humanitarian crisis that, at the time, had rebels violently clashing with forces loyal to Col. Mu'ammarr al-Quadhafi. The dictator has since been in exile.

Cretz answered questions about the region, and what's next for the country after their struggle to overthrow an oppressive regime. Cretz noted that he interacts frequently with military personnel, but to have the opportunity to engage directly with young officers

helps both sides understand each others' roles.

"We don't normally get the opportunity as practicing diplomats, because of the pace of travel and the everyday routine, to get out and talk to audiences



U.S. Ambassador to Libya Gene Cretz answers questions following a special lecture to students, Aug. 16.

beyond the beltway," explained Cretz. "So I find it very important to reach out not only to civilian audiences, but certainly to military audiences. While we have interactions certainly at the Pentagon and in Washington daily with our military colleagues, the opportunity to come here to talk to officers from the different services who are expanding their regional awareness beyond the training they get from the military itself is very positive."

NPS Team Participates in San Francisco Fleet Week

In celebration of the 30th year of San Francisco's Fleet Week, NPS took the opportunity to support the theme of this year's events — humanitarian assistance and disaster response efforts — with a display booth featuring some of the university's key research projects in the field.

Working completely off of solar power, NPS students and faculty manned three booths featuring battlefield medical technologies, maritime nuclear detection research, and the Hastily Formed Network's Emergency Operations Center. They highlighted not only the research projects that are part of worldwide humanitarian relief and disaster response efforts, but also the commitment demonstrated by NPS' military and civilian students.

Visited by over a million people, San Francisco's Fleet Week featured an air show with the Blue Angels and the Canadian Snowbirds, as well as the Parade of Ships led by the USS *Carl Vinson*. It was NPS' first time taking part in the Fleet Week activities, although the school's influence has been felt in previous years through significant alumni and student involvement — current San Francisco Fleet Week Association Chairman, retired Maj. Gen. Michael Myatt, is an NPS alumnus.

Workshop Explores the Complexities of Prevention Strategies

Prominent military strategists have stressed that prevention of conflict is equally as valued as victory in conflict. The Navy, Marine Corps and Coast Guard's very own "Cooperative Strategy for 21st Century Seapower" clearly states, "preventing wars is as important as winning wars."

The concept of prevention, however, is difficult to transition from strategy into action. In support of this effort, the Global Public Policy Academic Group recently held a Prevention Regimes and Strategies Workshop on the NPS campus — three days of dialogue and discourse among a diverse group of attendees on the tactics and challenges of implementing prevention strategies.

Research Associate Professor, and workshop co-organizer, Marc Ventresca noted, "The workshop brought together people from several communities, that frequently don't speak directly, and the spirit and purpose was to find common language and concerns about prevention ... The term 'prevention' is widely used, though with wide variance in meaning, and possesses even less agreement about specifics in policy and practice."

The goal of the workshop is to explore how prevention looks as a strategic goal, a policy strategy,

and in practice in these different worlds. Assistant Professor Karen Guttieri, also a co-organizer of the workshop, added that the idea of prevention, as the former United Nations Secretary General Kofi Annan described it, is to shift "from a culture of reaction to a culture of prevention."

Guttieri explains, "The first step is to clarify the term, asking 'prevent what?' What are the boundaries of prevention? A lot of the discussion on prevention has been seen focused in recent years looking at the prevention of deadly conflict, particularly civilian on civilian conflict.

"What lessons can we draw from prevention strategies in different areas of international security," she continued. "What systems of positive and negative prevention work best ... we see a range of approaches including deterrence, compellence and denial — even pre-emption."

Faculty Establish Center Dedicated to Materials Research

Distinguished Professor of Physics Nancy Haegel, along with a corps of faculty from the Physics and Mechanical and Aerospace Engineering (MAE) departments, displayed the newly-established Center for Materials Research during a campus open house of their research labs and facilities in late July.



Executive Vice President and Provost Dr. Leonard Ferrari welcomes attendees to the Prevention Regimes and Strategies workshop.



Latest Group of Distinguished Professors Honored for Careers of Academic, Research Achievements

Pictured from left to right, Distinguished Professors Larry Jones, Douglas Porch, Peter Chu and Yun Xiaoping hold the medals they will now wear as part of their academic regalia with their recent selection into the exclusive and honored group of select faculty.

There are currently 23 active faculty that hold the title of Distinguished Professor, an honor that is conferred upon a select community of NPS faculty in recognition of exceptional and sustained scholarly accomplishments that have made, and continue to make, outstanding contributions to the NPS mission. During September's graduation ceremony, the four NPS professors were selected and honored for their extraordinary accomplishments in their fields of expertise.

Visitors were educated on the facilities available to the center, beginning with the Raman Spectroscopy Lab, where Assistant Professor of Physics Sebastian Osswald demonstrated the Raman Spectrometer. Osswald noted that Raman Spectroscopy is the vibration of spectroscopy that probes actual lattice vibrations between atoms and molecules, and looks at the different energies of the vibrations using laser light.

Research Assistant and current master's student, Will Young, displayed the center's Scanning Electron Microscope, a high-volume, high-resolution microscope capable of 400,000 magnification. He demonstrated

a live image from the chamber of carbon nano tubes and the fibers, which are approximately 20 nanometers wide. Physics Ph.D. student, Cmdr. Rich Downey, explained the Nano Indenter, designed for analyzing materials by making very small indentions into the material and measuring the stiffness.

Concluding the tour was a visit to the Functional Material Lab where MAE Associate Professor Claudia Luhrs detailed an experiment using heat to transform graphite into graphene. A relatively new material, graphene has significant potential application to the military. Graphene is a light material with

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"I, State Your Name ..."

A total of 49 students state the oath of allegiance while gathered with their families and friends on the steps of Herrmann Hall for an en masse promotion ceremony, Sept. 1. In total, the ceremony recognized the promotions of two commanders, four lieutenants and 43 lieutenant commanders.

As part of the Navy's recent officer promotion phasing plan for FY11, officers selected for promotion to the grades of captain, commander and lieutenant commander were promoted at a rate of three percent for 11 months, which left remaining officers to all promote in September, thus the high number of promotions in this month. Modification of the promotion phasing plan will assist the Navy's efforts to keep their manpower account in fiscal balance.

FACULTY SHOWCASE



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a single layer of carbon but still flexible and extremely strong, making it a suitable candidate for armor. In addition, a current experiment is underway studying electrical properties of the material as well for use in energy sources such as batteries.

Faculty Keynote Workshop on Ethics in Emerging Defense Technologies

Faculty from across campus offered keynote lectures during the Consortium for Emerging Technologies, Military Operations and National Security three-day workshop titled “Ethics and Warfighting Technologies,” held at the nearby Marriott Hotel in Monterey, Aug. 2–4.

Participants from the military, DoD and leading universities around the country gathered to share ideas, explore research topics of interest, and hear presentations

and briefings from NPS faculty on what has rapidly become a critical national security issue.



Defense Analysis Chair and Professor John Arquilla keynotes ethics in emerging technologies workshop.

“Over the past several years, there has been a great deal of public anxiety over military uses of emerging technologies, especially in the fields of robotics and cyber warfare,” explained Dr. George Lucas, Professor of Ethics and

Public Policy in NPS’ Graduate School of Business and Public Policy — Lucas also served as the workshop’s organizer. “This workshop is an integral part of a national dialogue among scientists, engineers, military and civilian policy leaders, and people working in the fields of ethics and international law, aiming to work together to address that anxiety through careful reflection on the moral and legal implications of these new technologies.”

“Whatever knowledge we have of the information age of conflict is not something that springs from one or even a few minds,” said Defense Analysis Professor John Arquilla during his keynote lecture. “It is from a generation of scholars, some of whom I see in this room. We are, I think, pioneering a kind of group intelligence, which is one of the most exciting things about the emerging technologies of our time.

“We collaborate in ways that I

don’t think academics were able to do a century ago or even 50 years ago,” he continued, “and I am very excited to see the pace at which knowledge begins to expand. In particular, in our academic community where students from all of the services and around the world come together to talk about these difficult subjects of war and peace, and society and security.”

MAE Faculty, Researcher Honored with NASA Award

Professor I. Michael Ross and Researcher Mark Karpenko, along with a team of outside researchers, were recently awarded NASA’s Group Achievement Award for their groundbreaking experiments in minimum time spacecraft maneuvering during the TRACE Optimum Maneuver Flight Experiment effort.

“We feel very honored to receive this award,” said Ross. “It is a very prestigious award in NASA, and

a very competitive one. Our team did a fantastic job in executing the historic experiment. It is quite rewarding to know that all our efforts paid off and that NASA feels the same in giving us this award.”

The experiments were conducted on a soon-to-be decommissioned satellite called the Transition Region and Coronal Explorer (TRACE), and included a series of slew maneuvers over a period of four weeks that would test the fastest and most fuel-efficient way to maneuver a spacecraft from point A to point B. The tests were widely regarded as successful, and have the potential to drastically change conventional spacecraft maneuvering procedures.

“Having the opportunity to test our ideas on the TRACE spacecraft was a reward in itself but it is even more exciting to be recognized for our work by NASA,” noted Karpenko. “Our algorithms for spacecraft maneuver design have a broad spectrum of application.

For example, the same kinds of maneuvers we implemented on TRACE can be used to significantly increase the productivity and profitability of commercial earth



Research Associate Mark Karpenko

observing satellites. I am grateful for having the opportunity to work with an outstanding team of engineers on this project and I am delighted that NASA has recognized the value in what we accomplished.

FACULTY SHOWCASE

This award is yet another reminder of the world-class research that we are doing at NPS.”

For a detailed report on the team’s research, check out the January 2011 edition of “In Review” magazine.

NPS Alumnus, Faculty Continue a Long Navy-Family Tradition

When NPS alumnus, Cmdr. Brian Mutty (National Security Affairs, 2001), took command of the *USS Fitzgerald* in late July, his father, NPS Senior Lecturer John Mutty — himself a retired Navy captain — could not make the ceremony with the ship at sea at the end of a major joint exercise with the Royal Australian Navy.

“Even though I didn’t make it to his ceremony, it’s rather satisfying to see that Brian had outgoing skipper, Cmdr. Dennis Velez, pin on my old Command-at-Sea pin. So, in that way, a part of me was with him,” said Mutty.

John and Brian Mutty follow in a long line of men from their family whom have left their marks in naval history. Brian’s maternal great-grandfather, Lt. Thomas Eadie, was a highly-decorated diver during the Momsen-era of pioneering deep-sea salvage operations. And his grandfather, Lt. Cmdr. John



GSBPP Senior Lecturer John Mutty

B. Mutty, was there when then Congressman John F. Kennedy re-commissioned *USS Cony*, and he was the ship’s new commander.

Quick Hits



Dr. David H. Olwell

NPS Professor of Systems Engineering, Dr. David H. Olwell, was recently named a Fellow of the American Council on Education (ACE). The ACE Fellowship Program is a year-long higher education professional development program that prepares academic leaders to transition into senior leadership positions in American colleges and universities.

“This is a great honor for me,” said Olwell who was nominated to the ACE Fellowship Program by NPS Executive Vice President and Provost Dr. Leonard

Ferrari, with support from NPS President Dan Oliver. “I am extremely grateful for the confidence and support of Provost Ferrari and President Oliver and of my references from campus, who were key to the award of this fellowship,” Olwell continued.

Olwell will be working with the president and senior leadership at the university, participating in critical meetings, key events and undertaking projects under the tutelage of these prestigious academics.



Dr. Dan Nussbaum

Naval Postgraduate School Visiting Professor of Operations Research, Dr. Dan Nussbaum, was recently honored with the Society of Cost Estimating and Analysis’ (SCEA) 2011 Service to the Society National Award.

Nussbaum has been instrumental in the development of cost estimation programs such as the new Distance Learning Master’s Degree in Cost Estimating and Analysis program that started early this year. The program, developed in collaboration with the

Air Force Institute of Technology, has the distinction of being the only distance learning master’s degree program in cost estimation in the world.

“I’ve been a member of SCEA for a long time ... SCEA provides a body of knowledge in cost estimating to all of the government and commercial world,” said Nussbaum. “It’s really gratifying to receive this award.”



Dr. Luke Brewer

Mechanical and Aerospace Engineering Associate Professor, Dr. Luke Brewer, has been awarded the 2011 Microanalysis Society (MAS) K.F.J. Heinrich Award. The award, chosen annually by the MAS President, honors a scientist under the age of 40 for distinguished technical contributions to the field of microanalysis.

“I was caught by surprise. There are so many outstanding scientists deserving of this award ... I am honored and humbled by the selection,” he said.

Brewer is part of a larger group of young faculty recently hired to fulfill an immediate need in the field of materials science. As Brewer noted, “You really can’t do innovation, especially in DoD, without a strong presence in materials science,” he explained. “The Provost, Dean of Research, and others recognized this need, and I am just one of a number of new faculty hired in this discipline.”

Longtime Defense Analysis department Chair, Dr. Gordon McCormick, was presented the Superior Civilian Service Medal by NPS President Dan Oliver and Executive Vice President and Provost Leonard Ferrari during a special luncheon in honor of McCormick’s 20 years of service to the university. A humble McCormick, well known for his resistance to show or pomp, noted, “I would have never let you guys do this if I had known” to colleagues Brian Greenshields and Col. Robert Burks as they shared a good laugh.

McCormick played a critical role in redesigning the Special Operations curriculum in 1996, building a truly interdisciplinary and warfighter-relevant program drawing on seven different departments and academic groups across NPS. This effort led to the creation of the Department of Defense Analysis with McCormick appointed as its chairman, a position he held until this year.

The success of this effort led the Deputy Secretary of Defense to select NPS as home of the Defense Information Operations Center of Excellence, in addition to the creation of a second curriculum in Information Operations. McCormick’s “Diamond” Model on understanding insurgencies, and how to counter them, developed while with the RAND Corporation remains one of the most respected counterinsurgency models in existence.



WELCOME

FRESH OFF HIS CONFIRMATION AS SECRETARY OF DEFENSE, THE HONORABLE LEON PANETTA RETURNS TO HIS HOMETOWN TO INSPIRE AND INFORM THE NPS COMMUNITY. *By Amanda D. Stein*

HOME

Secretary of Defense Leon Panetta returned to his native Central Coast to deliver a Secretary of the Navy Guest Lecture to NPS students, faculty and staff packed into King Auditorium, Aug 23. When longtime local Congressman Sam Farr took the stage to welcome the secretary, he introduced the hometown hero of sorts as “our friend, our neighbor, our Secretary of Defense.”

“This is a special place for me. And in many ways, it’s coming home,” said Panetta. “I am very proud of the Naval Postgraduate School ... proud of its mission and proud of its dedication to protecting this country.”

In his address, Panetta touched on the current budget challenges facing the Department of Defense, the value of NPS to national security, and the invaluable roles of the men and women in uniform to DoD’s mission. Panetta recalled his days growing up in Carmel, Calif., as a son of Italian immigrants who had dreams

of creating better lives for their children. He also spoke about the realization of that dream through his own story — a ‘small town guy’ who would become Secretary of Defense — and the path the U.S. must maintain so that dream can be possible for future generations.

“As Secretary of Defense, obviously I look at the myriad challenges that face this country — a range of security challenges that come from a lot of different directions,” he continued. “As a result, [we] require the kind of leaders who are knowledgeable, who are creative, who are strategic, who understand the steps that have to be taken if we are to protect this country.”

Panetta was sworn in as the 23rd Secretary of Defense on July 1, after serving as the Director of the Central Intelligence Agency, and before that, Chief of Staff for former President Bill Clinton. Panetta has also been active locally, with ten years as co-director of the Leon and Sylvia Panetta Institute for Public Policy at

nearby California State University, Monterey Bay. With his decades of experience in public policy and government service, Panetta understands the challenges facing the country and the defense department, which he spoke about in his address to the NPS community.

“We now are dealing with cyber threats, another challenge that confronts us. In many ways — I’ve said and I believe — this is the battlefield of the future,” he said. “We are now the target of literally hundreds of thousands of attacks every day ... and I truly believe that, as that technology increases, as that capability increases, the ability to paralyze this country is very real. To take down our power grid, to take down our financial system, to take down our government, to create the kind of paralysis that would indeed be comparable to a Pearl Harbor kind of attack — we have got to be ready. Not only to defend ourselves, but to be offensive in being able to go act when people threaten our country.”

Panetta also addressed current budget concerns, and what Congress is discussing as a solution to the deficit that threatens the defense budget. Several questions posed by students and faculty addressed these same concerns, and their impact on defense capabilities in the future.

“Having worked on budgets for a good part of my career, I am not one who believes you have to choose between fiscal responsibility and national security,” he said. “I think we can implement fiscal discipline in a way that protects national defense. And that’s what we are working to do.”

Panetta emphasized the pride he felt for the success of the mission to take down Osama Bin Laden, which he noted was a joint effort by the military and intelligence communities. But, he warned, Al Qaida continues to threaten the security of the United States, and its troops. He spoke about the importance of being ready to fight for our national security, and to continue the mission that so many members of the Armed Forces have given their lives for.

“Just over the last few weeks that I’ve been Secretary of Defense, I’ve gone out to the war zones, [and] looked the troops in the eye. I’ve been to Walter Reed and seen those who have been terribly wounded as a result of those wars,” he explained. “I’ve been to Dover to greet the bodies of those who were killed in the helicopter crash in Afghanistan, and I’ve been to Arlington.

“The greatest inspiration to me has been that, when greeting the families of those who have died in service to their country,” he continued, “there isn’t a family member who hasn’t come up to me and said, ‘If you really care about what happened to my son, my daughter, my brother, my sister, my husband, my wife ... If you really care, you will carry on the mission that they gave their life for.’”

In his time as co-director of the Panetta Institute, the secretary has been a frequent visitor to NPS, and has been a longtime supporter of the mission of the university in educating military

officers at the graduate level. He noted that, as he settles into his new role, there will be no question that NPS has support in Washington.

“I think NPS is absolutely essential to our national defense,” Panetta explained. “We’re dealing with incredibly complicated new technologies in war — new weapons, new cyber

world, is that the country has a volunteer force with men and women who know they have the support of defense leadership. Panetta stressed that in his role as Secretary of Defense, he is ‘100 percent’ behind the troops and their families as they sacrifice for the freedoms afforded in this country.



During his visit, Panetta, far right, was briefed on several current educational and research initiatives underway at the university. Pictured with the secretary, from right to left, are NPS President Dan Oliver, Executive Vice President and Provost Dr. Leonard Ferrari, Chief of Staff Air Force Col. Zöe Hale, Dean of the Graduate School of Operational and Information Sciences Dr. Peter Purdue, and Vice President and Dean of Research Dr. Karl van Bibber.

threats, some of the most remarkable stuff that we’ve ever seen. And our ability to have young men and women who are smart, who have the skills, the creativity, and the strategic thinking necessary to be able to use those kinds of new technologies is what’s going to make the difference in terms of whether or not we’re on the cutting edge, or the back edge in the future.”

In closing, Panetta reiterated the importance of a free country, and the willingness to protect it from potential adversaries. He noted that one of the strengths of the United States military, which he proudly regarded as the best in the

“We bless ourselves with the hope that everything is going to be fine in this country,” he said. “But very frankly, it doesn’t mean a damn thing if we’re not willing to fight. You, by your presence here, makes very clear that you are willing to fight for that American dream that brought my parents to this country, for the dream of making sure that our children have a safer, better life in the future, for the dream of making sure that we always keep in our hearts, the sacrifices of those who gave their lives for this country. But most of all, that we always fight to ensure a strong government of, by and for, all people.” **IR**



“This is a special place for me. And in many ways, it’s coming home. I am very proud of the Naval Postgraduate School ... proud of its mission and proud of its dedication to protecting this country.”
*The Honorable Leon Panetta
U.S. Secretary of Defense*



Secretary of Defense Leon Panetta delivers his Secretary of the Navy Guest Lecture to NPS students, faculty and staff packed into a standing-room-only King Auditorium, Aug 23.



Lt. Omari Buckley, right, a student in the Mechanical Engineering curriculum, demonstrates the capabilities of NPS' Biofuels Testing Facility to Secretary of the Navy Ray Mabus, left, during a visit to campus, Aug. 29. In his address to campus, Mabus announced the creation of several new educational programs dedicated to energy technology, policy and management.

Energy Security Is National Security

Secretary of the Navy Ray Mabus has announced an aggressive plan to create an energy independent Navy and Marine Corps. He turns to NPS to help provide the future leaders to achieve these goals.

By Amanda D. Stein

U.S. SECRETARY OF the Navy Ray Mabus took to the stage in King Auditorium, Aug. 29, to discuss the Navy's aggressive energy initiatives, and to announce NPS' contributions to those efforts through the establishment of new, groundbreaking educational programs dedicated to energy technology and policy. Mabus, the 75th Secretary of the Navy, is known for being a strong supporter of education — both military and civilian — and tapped the expertise at NPS to assist in creating the necessary leaders to achieve his goals for an energy-independent Navy and Marine Corps.

"Let me give you the headline of why I'm here today," Mabus said. "Starting this fall, the Naval Postgraduate School will offer ... energy graduate degree program[s], the first military educational institution to do so. And beginning early next year, NPS will launch the SecNav Executive Energy Series — catchy title — a two-week program designed to tackle specific energy challenges."

As Mabus noted during his address, the energy programs began in the fall quarter, with an initial offering of energy-focused existing degree programs, to be followed next year by two new dedicated degree

programs with concentrations in energy technology and policy.

"This energy-focused master's degree program, and the Executive Energy series, will target both the current and future leadership of the Navy and Marine Corps," he continued. "Energy is not just an issue for the future — and not just for the present either — nor just the young officers and policy experts that make up NPS' student population. It is an issue for all the levels, every level of the Navy and Marine Corps, uniform and civilian."

NPS Executive Vice President and Provost Dr. Leonard Ferrari noted the importance of having Mabus not only spearheading defense energy initiatives, but also in looking to NPS to help accomplish his objectives.

The Honorable Ray Mabus
U.S. Secretary of the Navy

"Throughout his career, Secretary Mabus has demonstrated a keen ability to lead in times of change, to take on incredibly challenging tasks in the face of great adversity. He has now been asked to lead in another era of great change. He has stepped to the forefront of our Department of Defense, and committed the U.S. Navy to achieve great things in times when energy dependence is a vulnerability, when environmental stewardship is a priority, and when defense budgets are restricted," Ferrari said.

"On behalf of President Oliver, I can tell with you great certainty that we are very proud that he has committed to these ideals," Ferrari noted in welcoming the Secretary to campus, "that he has made bold promises to the people of the United States, and, mostly, that he has seen a role for all of us here at the Naval Postgraduate School in achieving these goals."

In his presentation to the NPS community, Mabus noted that the university is a vehicle for change for the Navy as it works to adopt cleaner, safer energies. He noted that the new degree program will help prepare young military officers and civilian leaders to help the Navy and Marine Corps pave the way to the future in energy independence.

Upon taking over his current role in 2009, Mabus announced five aggressive energy initiatives that would change the way the Navy and Marine Corps get and use energy. Among his goals is to have 50 percent of the fuel consumed in the fleet and ashore come from non-fossil fuel sources by 2020. In order to achieve this and other aggressive goals, he explained that the Navy and Marine Corps would have to set a new standard for both current and future ways of operating.

"Through the master's program and the executive energy series, NPS will ensure that energy is a fully-integrated awareness into strategy, tactics and operations. As a result, NPS students will guide the Navy and the nation toward a better, more secure energy future."

Mabus explained that his ambitious energy initiatives were not just important to reduce the amount of oil acquired from unstable or dangerous countries, but also to protect the men and women in theater. Fuel convoys are frequently targeted on the battlefield, and as Mabus noted, the cost of one marine injured or killed for every 50 fuel convoys is far too high.

President Barack Obama has also joined in the emerging discussion of energy independence, tasking the Departments of the Navy, Agriculture and Energy to work together in advancing the biofuel industry. During the Secretary of the Navy's visit to NPS, he stopped by the school's Biofuels Testing Facility to visit with students and see how the facility is in line to help further the Navy's goals in biofuel research.

"In the two years since I came to the department, we have made a vigorous commitment to change how we get and how we use energy," noted Mabus. "We also now put an energy dimension in everything the Department of the Navy does. The reason is as clear as it is compelling. Energy security is national security. Too much of our oil comes from potentially, or actually, volatile places on earth. We would never allow these countries to build the ships or aircraft that we use. But through our dependence on oil, we give them a vote in whether those ships can sail or those planes fly.

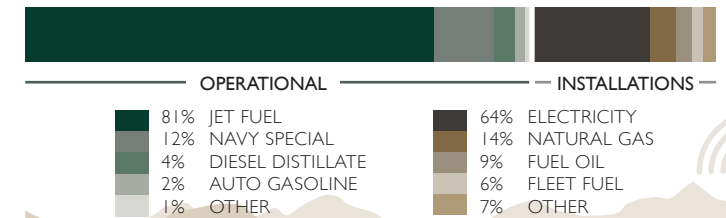
"Seeking alternative fuels and seeking to use fuel more efficiently makes us better warfighters," he continued. "That's our principal mission, and that's the main reason we're doing this. Most importantly, it's going to save the lives of marines, of sailors, of soldiers, and of airmen."

Following meetings on campus between NPS leadership and the secretary to discuss the current and future degree programs, and how the university will help further the Navy's energy initiatives, Vice Provost of Academic Affairs, Dr. Doug Moses, noted the value of educating young military officers and civilian leaders in energy technology and policy.

"NPS is energized — pun intended — to spearhead the SecNav's efforts to extend energy education to the fleet," said Moses. "We're excited about the opportunity to develop and offer both energy master's degree programs for Naval officers and energy executive education to senior Navy leaders." IR



\$15.2B 2010 DoD ENERGY COSTS



NPS Energy Education — at a Glance

Beginning this fall quarter, an initial nucleus group of Navy and Marine Corps students in existing NPS degree programs will additionally enter into a deep-track core group of energy-focused courses. Beginning the 2012–2013 academic year, NPS will implement its newly-developing full energy master's degree programs.

MASTER OF SCIENCE – ENERGY SCIENCE AND TECHNOLOGY FALL 2012

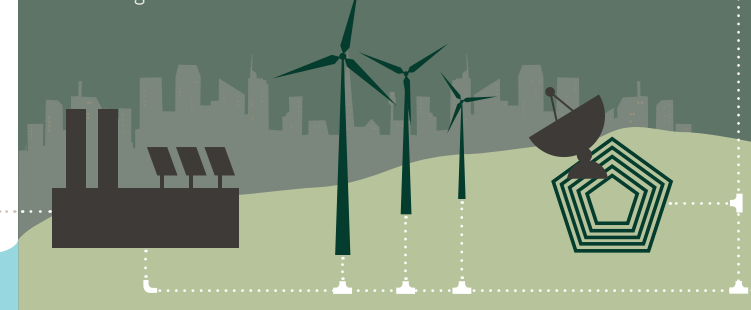
After a core program in the economics, analysis, and basic science and technology of energy, students in this degree program will begin an aggressive series of engineering and applied science courses in the fields of energy, delivery systems, alternative energy science and technology and more.

MASTER OF SCIENCE – ENERGY POLICY AND ANALYSIS / ENERGY POLICY AND MANAGEMENT FALL 2012

After the same core program in the economics, analysis, and basic science and technology of energy, students in the policy and analysis or management tracks will delve into a curriculum focused on energy economics, cost/benefit analyses, regulatory issues, energy strategy, policy development, infrastructure management, acquisition and more.

SECRETARY OF THE NAVY EXECUTIVE ENERGY SERIES SPRING 2012

Designed for senior officers and high-level government professionals, the Secretary of the Navy Executive Energy Series will provide an intensive executive level education course on a diverse selection of energy-related topics. Designed to educate the Navy's future energy leaders, multiple offerings will provide a range of opportunities for energy considerations to be integrated into all core Naval mission areas.



9/11 TEN YEARS LATER

A DECADE OF EVOLVING HOMELAND SECURITY THROUGH EDUCATION

“We present the narrative of this report and the recommendations that flow from it to the President of the United States, the United States Congress, and the American People for their consideration. Ten Commissioners — five Republicans and five Democrats chosen by elected leaders from our nation’s capital at a time of great partisan division — have come together to present this report without dissent.

We have come together with a unity of purpose because our nation demands it. September 11, 2001, was a day of unprecedented shock and suffering in the history of the United States. The nation was unprepared.”

So begins the final report submitted by the National Commission on Terrorist Attacks Upon the United States — widely known as the 9/11 Commission.

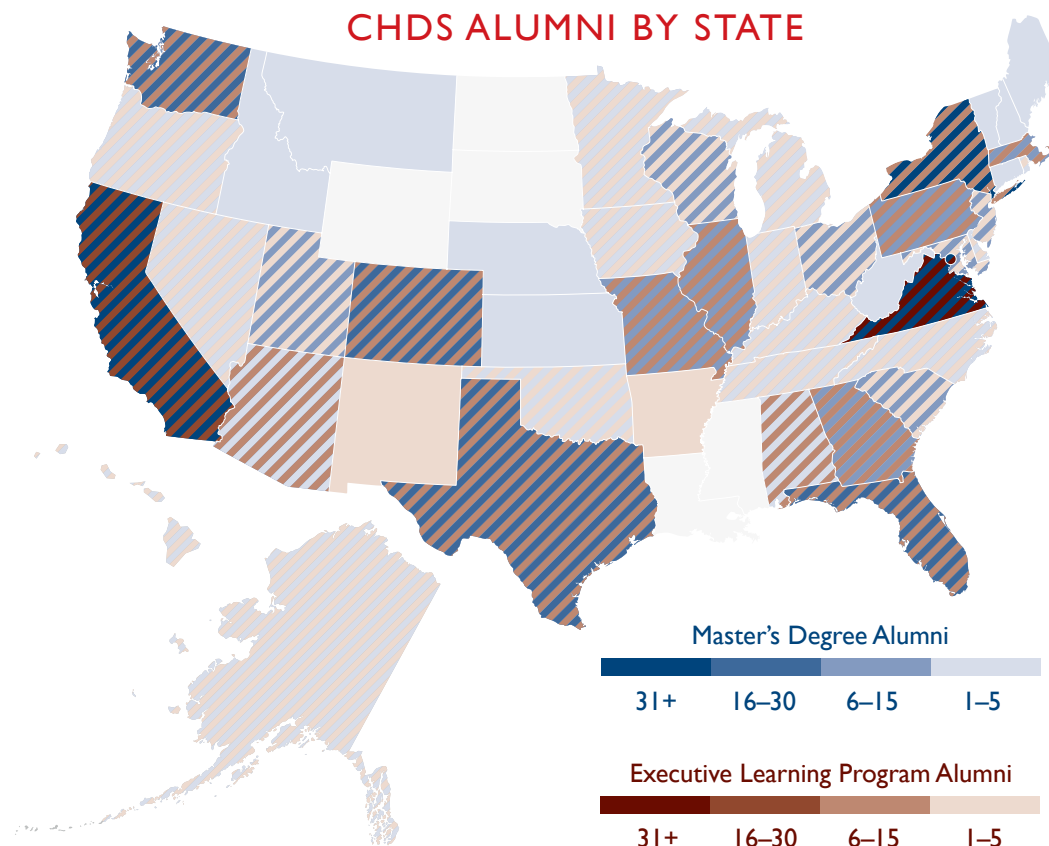
Throughout that 450-page report, a theme of preparedness, unity and resolve resonates with constant emphasis. The Honorable Paul Stockton, Assistant Secretary of Homeland Defense and Americas’ Security Affairs, was a member of the Naval Postgraduate School faculty during the time of those attacks, and Stockton saw the very same need for an emphasis on preparedness and unity. He also saw a role for education to help bring us closer to these ideals.

Stockton would work with several other visionary leaders to create the Naval Postgraduate School’s Center for Homeland Defense and Security, and serve as its director from 2002–2006. CHDS innovated homeland security educational programs before any other university in the world, and has made a remarkably unifying impact on a diverse community of professionals

As Stockton notes in his essay, “Ten Years After 9/11: Challenges for the Decade to Come,” “One of the best ways to honor those who perished on 9/11 is to rededicate ourselves to finding, and fixing, the gaps in preparedness that still confront our nation. Over

the past decade, the Department of Defense has greatly improved its ability to support the federal departments and agencies that lead U.S. preparedness against terrorism and natural hazards. Yet, significant challenges remain ...”

With the 10-year anniversary of September 11 now behind the nation, the United States continues moving forward from the most devastating terrorist attack the country has ever seen, and hopefully, will ever see. We take a moment to review the progress of CHDS’ efforts — programs that continue today to build our unity, improve our preparedness, and evolve the function of securing our homeland.



NPS, NSA MONTEREY DEDICATE WORLD TRADE CENTER MEMORIAL

By MCI Leonardo Carrillo

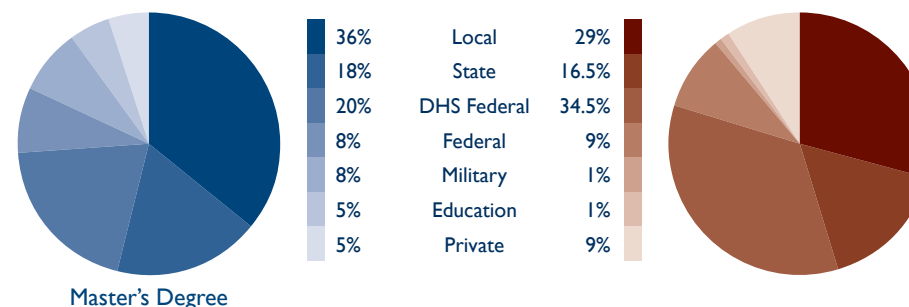
THE NAVAL POSTGRADUATE School and Naval Support Activity Monterey (NSAM) formally dedicated a piece of steel from the World Trade Center at Centennial Park as a permanent memorial to those lost on 9/11. In a special moment, three members of the New York Fire and Police Departments studying through NPS’ Center for Homeland Defense and Security, also participated in the ceremony, Sept. 15.

Capt. Gerral David, NSAM’s Commanding Officer, opened the ceremony quoting both Presidents Bush and Obama. “Terrorists are no match for our resilience. Today our country is more secure and our enemies are weaker, we must never waiver in the task of protecting our nation. We will not tire, we will not falter, we will not fail, and we will never forget.”

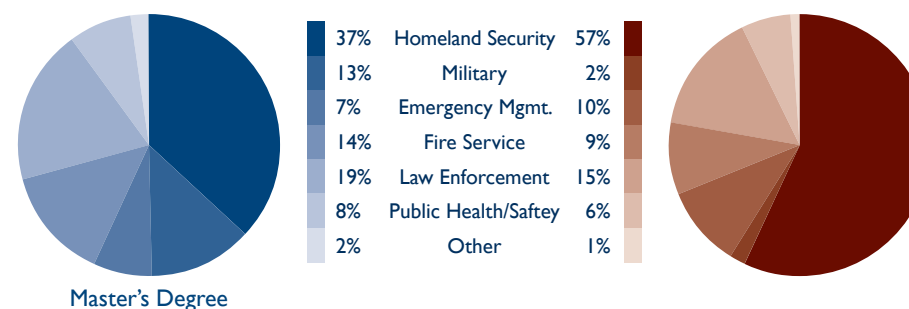
David was followed by NPS President Dan Oliver, who spoke about the resilience of the American people and the power of American ideals. He also spoke about the importance of having the memorial at NPS. Oliver said that while 9/11 changed the way America worked it did not change America’s principles.

“We have faced this challenge and we have championed our resolve while honoring our founding ideals of liberty and freedom,” said Oliver. “I believe these principles are respected across the world more than they ever have before. We are witnessing events in North Africa and the Middle East in which the people are fighting for these same ideals ... I am proud to say that America stands as an example of these ideals and we will always stand for them in the face of whatever adversity we encounter.”

CHDS ALUMNI BY JURISDICTION



CHDS ALUMNI BY DISCIPLINE



7,200

Top-level municipal and state executives educated during more than 200 Executive Education Seminars conducted by NPS’ CHDS.

257

The number of universities, colleges and agencies that have integrated part of CHDS’ curriculum into their own educational and development programs.





The NPS Committee on the Future gathers for a group photo following one of several meetings over the course of the past year. The committee delivered its final report to NPS President Dan Oliver and Executive Vice President and Provost Dr. Leonard Ferrari during their final meeting, Sept. 13, providing leadership with a detailed, calculated foundation for the university's upcoming strategic planning process.

Committee on the Future Final Report 'Sets the Stage' for University's Next Strategic Plan

By Amanda D. Stein

AS AN INSTITUTION grounded in providing future military and civilian leaders to the Navy and defense communities, the Naval Postgraduate School is consistently looking for ways to improve and adapt to meet the challenges facing the warfighter.

It was that mission that inspired NPS President Dan Oliver to assemble a committee of NPS faculty, administration and diverse external visionaries to assess the university's goals and objectives, and how to best prepare for the future. The NPS Committee on the Future presented the culmination of their efforts to university leadership during the group's final meeting, Sept. 13.

Chartered to explore how NPS has and will continue to meet the needs of the Navy and Department of Defense, the committee was assembled in August 2010. The group's efforts to provide a framework for the evolution of school's next strategic plan were summarized in a 74-page document examining various aspects of the university, future trends in defense and national security, and offered specific recommendations for opportunity and growth.

At their final meeting, the committee presented this final document to Oliver and Executive Vice President and Provost Dr. Leonard Ferrari, both noting the value of having members of institutions outside of NPS assembled to discuss ways the school can expand its scope and influence in the future.

"Each of you were chosen for the unique perspective that you brought to the committee, and I was amazed at your productivity, knowledge and fidelity to the task," Oliver said to the committee members. "It doesn't happen often in volunteer organizations, and it happened here thanks to your commitment. And I can't thank you enough."

"The value came because we had a hybrid group," added retired Rear Adm. James McGarrah, Director of the Information Technology and Telecommunications Laboratory at Georgia Tech Research Institute. "We had a number of inside folks who were intimately familiar with different parts of NPS, but then we had some outside folks like myself and others who brought different perspectives, both military and civilian. I think that blend of perspectives gave us an ability to collect and assimilate and assess information in a way that you probably couldn't if you did it on an isolated, internal basis."

One aspect of the committee's process that was a source of pride for the group was the extensive number of interviews conducted with NPS stakeholders, including faculty members, defense leaders in Washington, D.C., and military and civilian personnel from across the country. Their recommendations will be considered in the development of the school's next strategic plan, and ultimately, help focus the areas of opportunity

and growth for years to come.

Committee Chair, retired Rear Adm. Winfred "Jerry" Ellis, explained that the interviews, over 100 in total, brought about some unintended results. He noticed that, as fortunate as the committee felt to be able to meet with top-ranking defense leaders, the interviewees had also done their homework and were well prepared to answer the questions presented to them. The thought that went into their responses made it clear that those interviewed had not only learned about NPS in the process, but were also able to envision the university's place in the larger defense community.

"In getting access to some of the senior-most leadership in the Department of Defense and other government agencies, we were able to hear their comments and thoughts," explained Ellis, "but we were also able to give them our thoughts and comments on the Naval Postgraduate School — what we are working on, what we see as important, and what we think we need to work on in the future. So there was a good exchange of information and I think it was a great thing.

"And another positive outcome of the process," he continued, "was that it truly showed, I think, to the leadership that we interviewed, that we really care about this school, and we are looking to the future."

Committee member Mark Gorenflo, Principal Deputy and Senior Director for Future Capabilities for the Department of the Navy for Plans, Policy, Oversight and Integration, echoed Ellis' sentiment, noting that keeping the stakeholders involved in the future of NPS is key. The value of NPS lies in cutting-edge research and defense-based education, and that it is all aligned to meet the ever-changing needs of the Departments of the Navy and Defense.

"What's important about the committee's work and the strategic planning process ... is not so much about the plan, but the planning," said Gorenflo. "I think it's important for organizations not to grade their own homework, so to speak. The opportunity to get insight from outside organizations and entities, to visit key stakeholders to see what things that the Naval Postgraduate School does — the capabilities and qualities that it has — all add value to the Department of the Navy and Department of Defense ... that has been extraordinarily important.

"And if you get the fundamentals right," he

added, "and keep engaging with your stakeholders, and the key leaders of the fleet and Marine Corps, then you will have the resilience to adapt to any of the changes that come down the road, whether technological, social, financial or political."

Committee Vice Chair, Dr. Christine Haska, Vice President of Information Resources and Chief Information Officer, noted that the success of the committee was not only due to the quality of the experience represented, but also to the exceptional leadership of Ellis. He was specifically selected by Oliver to head the committee because of his commitment to the NPS mission, and his understanding of the needs of the school, and the Navy, in educating young officers and civilian leaders.

"The composition of any committee is the single most [critical] driver for predicting success and outcome," she said. "And the caliber of people represented on this committee, I think, is really very impressive. It has been an honor to work with all of them.

"Jerry [Ellis] has this uncanny combination of being extremely forward thinking as a leader, and grounded in important historical context for the Navy," Haska continued. "The high regard that was so clear to me in every meeting we attended [is] why so many doors were opened to us."

Ultimately, the committee's final report will, as the title notes, set the stage for the school's upcoming strategic planning process, providing a foundation for the university's core goals and objectives over the coming years. It's an effort that committee member retired Navy Capt. Karl Hasslinger, Director of Washington Operations for General Dynamics Electric Boat, is quite familiar with both in his current position, and as a former member of the Chief of Naval Operations Strategic Studies Group.

"I think, as in all things strategic, the press of daily business often brings us into the tactical and there are certainly enough things that go on every day to keep us busy," said Hasslinger. "And it's incumbent upon the leadership in an organization to step back from that every now and then, look at the landscape and say, 'Are the things that we are applying our time and resources to, are they the right things? Are they going to help us in the longer term?' That's often hard to carve out the time to do that, but I believe it's vital, and that's something that I take away from this." ■

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Committee on the Future Membership

COMMITTEE CHAIR
Rear Adm. Winford G. "Jerry" Ellis, (ret.)
Chair, NPS Undersea Warfare

COMMITTEE VICE CHAIR
Dr. Christine Haska
NPS Vice President of Information Resources and Chief Information Officer

Michael Bayer
President and CEO of Dumbarton Strategies

Mark Breckenridge
Deputy Director of the Defense Manpower Data Center

Capt. James Durham, (ret.)
Chief Operating Officer for Strategic Analysis, Inc.

Prof. Frank Giraldo
Associate Professor, NPS Faculty Council Chair

Mark Gorenflo
Principal Deputy and Senior Director for Future Capabilities for the Department of the Navy for Plans, Policy, Oversight and Integration

Capt. Karl Hasslinger, (ret.)
Director of Washington Operations for General Dynamics Electric Boat

Rear Adm. James McGarrah, (ret.)
Director of the Information Technology and Telecommunications Laboratory at the Georgia Tech Research Institute

Dr. Doug Moses
NPS Vice Provost for Academic Affairs

Colleen Nickles
NPS Vice President for Finance and Administration

Dr. Sunder Ramaswamy
President of the Monterey Institute of International Studies

Dr. Karl van Bibber
NPS Vice President and Dean of Research

Maj. Randy Staab
Former Chair, NPS President's Student Council

Lt. Matthew Yokeley
Current Chair, NPS President's Student Council



U. S. Marine Corps Capt. Derek Snyder prepares to hand-launch the FQM-151 Pointer Small Unmanned Air System, armed with a non-lethal payload, while conducting experiments at Camp Roberts, Calif.

Students Explore the Full Potential of Unmanned Air Systems

By Amanda D. Stein

IN RECENT YEARS, the Department of Defense has increasingly integrated the use of Unmanned Air Systems (UAS) into a number of missions, from aerial surveillance to data collection. For men and women in theater, specially-designed UAS are lightweight, portable and capable of saving lives.

In the growing field of unmanned systems, NPS researchers continue to explore ways to maximize the efficiency and capabilities of UAS, and use them to give the warfighter a leg up over the adversary.

For Systems Engineering students Marine Corps Captains Derek Snyder and Dino Cooper, the mission is to make a back-packable UAS a multi-dimensional tool, capable of fulfilling more than intelligence, surveillance and reconnaissance operations (ISR). Their research focuses on equipping the UAS with retrofitted, consumable kits that could assist in a variety of missions, from enemy tracking to carrying small arms to counter snipers.

“Concealment provides opportunities for adversaries to coordinate attacks,” explained Cooper. “New technologies must be utilized to improve the current ISR capabilities to ascertain combatants in unfamiliar environments. Effective systems to tag, track, locate and identify non-state adversaries must be developed and employed.”

Although both men have completed separate theses projects, they began to converge when Snyder realized that, although his intention was to develop a UAS small-arms kit, the same concept could be applied to delivering chemical tags, which paralleled Cooper’s project.

In both projects, the use of air vehicles to deliver taggants meant the warfighter can keep a safe distance from the adversary, and leave little trace of having ever been there — a component critical to many operations in theater.

“The goal is that the adversary won’t know that you’ve been there,” explained Snyder. “The airplane doesn’t touch the ground. There won’t be any footprints. You don’t want there to be any convoy activity, because whenever anyone goes out, there is a lot of activity and the adversary can see that. So, if a small, battery powered airplane delivers taggant, they really won’t know that it happened.”

Taggants can take many forms, so the delivery methods, particularly for combat scenarios, are generally not something that companies focus on during development. There, both students saw potential to adapt tools that the Armed Forces already have readily available — UAS — to deliver these taggants.

Cooper explored methods to quietly and safely deliver Perfluorocarbon Tracer pellets, a form of taggant, from UAS. The chemical tags are odorless, colorless, and virtually undetectable without the appropriate equipment, but were light enough to be delivered by a RQ-11 Raven B. Cooper enlisted the help of his co-advisor, Mechanical and Aerospace Engineering Professor Dr. Kevin Jones, who built a prototype of the pocket delivery system to be attached to the Raven.

Once deployed, the Raven would release the payload, creating a

boundary with the pellets that, if crossed, would mark an individual with the taggant, leaving little question that the person had been somewhere that they should not have been — such as setting a roadside IED or tampering with equipment. That taggant could then be detected at checkpoints or inspections using special detecting equipment.

For Snyder’s thesis, testing included attaching a modified paintball gun to the UAS and testing its capabilities as a system for countering snipers. After hearing a story about a Navy SEAL who had lost two men, pinned down by enemy sniper fire, Snyder saw an opportunity for a small UAS to, at the very least, fire non-lethal rounds that would serve as a distraction to the adversary. Although his project only went as far as to deliver non-lethal force, he hopes that the lethal concept will be explored further by future students.

“Right now the smallest operational weaponized UAS is the Hunter, which is still around 2,000 lbs. and requires a protected runway for launch and recovery,” said Snyder. “No others are operational yet. So I wanted to see if there was a way to get something that had an ISR capability, the ability to be back packable, and could be affordably weaponized.”

After ironing out the logistics of getting a three-pound paintball gun down to a single pound, Snyder tested the attachment on the Quadrotor and Raven UASs. As the project progressed, he began to look at how his thesis intersected with Cooper’s.

“I think the main purpose for gaining autonomy is to have the ability to multi-task in situations where it is definitely needed,” explained Cooper. “There is always that situation where there is a convoy pinned down and you are trying to track down your adversary, which has the ability to blend right in to the environment.

“You need the ability to covertly fulfill your mission, to tag or to take out the sniper, and you need to be able to do this in such a way that you avoid collateral damage ... the more collateral damage that you get, that’s more fuel for the adversary to kind of turn that against young men out there.”

One of the complexities of working with UAS is the number of restrictions placed on testing them. Because of airspace and safety regulations, they can only be tested in designated locations. Through NPS’ Field Experimentation Program, directed by Information Sciences Professor Ray Buettner, both students were able to utilize the Tactical Network Testbed (TNT) at Camp Roberts, Calif., to test their projects in a controlled environment.

“If you didn’t have a place like Camp Roberts and TNT to go and test these things, you really are just stuck. I don’t know where else you could go,” Buettner said.

The combination of FX support and the expertise of NPS’ students and faculty helped Snyder and Cooper not only test their projects, but receive invaluable feedback on the applications of their designs.

“From the companies that develop these products, you’ve got engineers who are right out of school, never been in the military, and don’t have the experience to understand the real world applications,” explained Snyder. “And they are really begging for valuable feedback.

“We had Army operators provide feedback to us,” he continued. “I am a pilot but not a UAV guy, and these guys may not be UAV guys either, but they have been under enemy fire. So the feedback from active duty operators who have experience with things like this is huge for us.”

Buettner praised the efforts of both students, noting that their projects represent just a fraction of the valuable, hands-on research being done through the FX programs. Between the resources of the program and the

interest of sponsors, the technologies being developed at NPS have incredible potential to make it to the battlefield and into the hands of the warfighter.

“We are very excited about their work,” explained Buettner. “Snyder and Cooper are very good examples of NPS thesis work that has

“Snyder and Cooper are very good examples of NPS thesis work that has immediate payoff. In terms of their individual capabilities, they will be more likely to get to the battlefield rapidly because they are at NPS and we cooperate with the U.S. Special Operations Command in evaluating and exploring new technologies. So not only is it a good idea, it’s a good idea in the right place.”

Associate Professor Ray Buettner
Director, NPS Field Experimentation Program

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Snyder and Cooper have completed their theses and graduated in September. But they hope that the research on UAS will continue, giving the warfighter the option to utilize UAS for more than just ISR capabilities.

“With the technology available to us, we have to be equally as innovative as our adversaries. They are adapting car alarms to set off IEDs,” explained Cooper. “They have the ability to look at technology in such a simple way and use it to their advantage.

“With our investments in technology, we should be able to do that on our end as well,” he continued. “We can look at what’s readily available. Rather than reinventing the wheel and developing a UAS from the ground up for a specific task, why can’t we capitalize on what we have already and make slight modifications to adapt to new situations.”



The Skate small UAS performs a taggant payload dispersal test in flight during a series of experiments conducted at Camp Roberts, Calif. The project is part of Marine Corps Capt. Dino Cooper’s thesis project on UAS taggant delivery.



Distinguished Professor of Physics Bill Colson is captured in the Free Electron Laser lab while explaining the innovation behind the Mark I, a one-of-a-kind electron beam source and accelerator cavity that faculty will use to advance research into high-energy shipboard laser defense systems.

Faculty Innovation Provides New Platform for Shipboard Laser Defense Research

By Amanda D. Stein

FOR THE UNITED STATES Navy, the Free Electron Laser (FEL) is a potential game changer — a weapon that delivers a high-intensity laser beam capable of stopping incoming missiles in seconds. Since 1989, the Naval Postgraduate School has been actively involved in developing the

FEL, with the support of the Office of Naval Research, capitalizing on the expertise of NPS students and faculty through active discovery in FEL theory and simulation, and since 2007, experimentation.

“Right now, ships basically have to stay away from missiles and have

to stay out at sea so they can’t be attacked by missiles,” explained NPS Distinguished Professor of Physics Bill Colson, a world-renown expert in free electron laser technology. “This would give, if successful — and we think it will be successful — the ship the ability to stay near shore, stay in harm’s way, and basically shoot down the missiles as they approach the ship. We think we could defend a ship with high reliability.”

And now, with recent breakthroughs in sourcing high-energy electron beams spearheaded by NPS faculty Dr. John Lewellen, the experimentation effort is moving full-speed ahead.

“What we are doing here initially is developing a new source of electron beams — a new way of making the beams, of accelerating the beams, controlling them and focusing them,” said Lewellen, an Associate Professor of Physics. “You have to make the beam very quickly, accelerate it very quickly, and then guide and focus it properly to keep it in good shape until you can get it to the free electron laser. So what we’re studying here is how to do that.”

After receiving an electron beam accelerator from Stanford in 2008, the FEL team knew that its 200kV beam source would need an upgrade. In collaboration with Niowave Inc., the University of Wisconsin and the Massachusetts Institute of Technology, the team embarked on developing a beam source and energy booster combined into one superconducting cavity — a concept that had never before been built using the type of accelerator structure employed in what became known as the “Mark I.”

“The Mark I had its first operational test at Niowave’s facility about a year ago. I should mention, it’s the first of its kind in the world,” said Lewellen. “It’s the first time the Navy has fully-funded a super-conducting electron beam source. And the first time that one has been brought to a naval facility. So this is a very unique piece of hardware.

“In terms of acceleration, we take an electron beam off the cathode, and we accelerate it to 700,000 volts in a distance of about two or three inches — 700 kilovolts is about the transmission that some of the high-voltage power lines run on,” explained Lewellen. “The only other place in the universe you find that kind of acceleration is around black holes, in terms of gravity. So these truly are extreme machines.”

Lewellen carried out the design process for the Mark I RF (radio

frequency) cavity and electron beam simulations, with the help of an NPS Ph.D. student who has since graduated. Their contributions were combined with the engineering development of Niowave to create a chamber capable of containing temperatures four degrees above absolute zero — colder than the far side of Pluto.

“The systems that we work with really truly are extreme,” explained Lewellen. “And if you think about the scale of the Mark I, you’ve got one of the coldest places in the solar system, inches from the room outside. Within the space of one hand, if you could reach in, you’d be touching places you just cannot get to any place else.”

One of the unique benefits of having the FEL is the chance for NPS students to get hands-on education and research. Physics student Lt. Amanda Baxter is working on the design for a cooling system for the cathode stock of the Mark I.

“To me, the best part is just knowing that this is a system that’s going to be able to protect our ships better,” explained Baxter. “It’s pretty amazing that you have something that’s at the speed of light to protect you from missiles that are coming inbound.” **IR**



NPS Research Associate and Professor Richard Swent stands with the Mark I as the team prepares for a test on the structure. The Mark I is one of the Free Electron Laser laboratory’s newest additions in providing students hands-on experience for their thesis research.



NPS student Lt. j.g. Deward Cummings holds a piece of the lightweight, fibrous concrete used in his thesis research during the latest RELIEF experimentation program in August. Cummings and Lt. Paul Mahoney are looking at developing a low-cost, fibrous concrete construction kit that can be used to safely dispose of and detonate dangerous, explosive remnants of war.

RELIEF Program Supports Military, NGO, Industry Collaboration to Benefit Homeland and Security, First Responders

By Amanda D. Stein

NPS RESEARCHERS ARE frequently involved in emergency response and homeland security research projects, looking to assist in disaster response and prevention efforts worldwide. One such program gives students an actual testbed for these research theses, as well as a chance to connect directly with diverse emergency response personnel.

The Research and Experimentation for Local and International Emergency and First Responders (RELIEF) program, held its latest experimentation program in August, with more than 90 participants from 46 organizations and branches of government participating. RELIEF uses NPS’ Tactical Network Testbed (TNT) at Camp Roberts, Calif., to explore humanitarian assistance and disaster response (HA/DR) experiments.

“Projects are selected for RELIEF based on the context of the issues they aim to address,” explained NPS Research Assistant Tristan Allen. “RELIEF does not seek to identify any single set of solutions, rather, we accept most applicants who seek to address a broad set of issues that deal

with humanitarian assistance and disaster response.”

“The idea is that we bring government, academic, non-government organizations and commercial entities together in an environment that encourages exploration and tolerates failure to try new ideas that will enhance our ability to respond to crises around the world,” added TNT RELIEF Director, NPS Information Sciences Associate Professor Dr. Ray Buettner.

One of the experiments represented at Camp Roberts for RELIEF 11-4 was a thesis project by NPS students Lt. j.g. Deward Cummings and Lt. Paul Mahoney titled the Explosive Remnants of War Collection Points (ERW-CPs). Their project explored the potential to design small structures of readily available materials, which serve as a collection box for explosive remnants of war.

“ERW is an issue in any country or region in which an armed conflict has occurred on its soil,” wrote Cummings in his thesis proposal. “In Afghanistan alone, over 2,000 communities or 1,303,553 people remain affected by landmines, ERW, and abandoned Improvised Explosive Devices with an average of 40 Afghans killed or injured every month by

unexploded ordnance.”

The students are looking at developing a low-cost, fibrous concrete construction kit that can be used to safely dispose and potentially detonate these dangerous materials.

“The design methods are intended to be very simple. The entire kit for this cost \$500, yet you can also build walls, buildings, structures using this fibrous concrete,” added Buettner.

Innovation and collaboration is the bottom line with RELIEF, as individual groups and organizations discuss components of their research that could use the expertise of other groups. While one project might be looking to build a structure for a specific purpose, another team might be able to provide their expertise on how to power the tools needed to build such structures in third world countries. Research Assistant Rosa Akbari explained that the innovation and collaboration that is fostered by RELIEF is one of the driving forces behind the program’s success.

“All efforts aim to improve first responders’ and humanitarian workers’ abilities to assist affected populations,” said Akbari. “Whether bolstering communication capabilities or facilitating social connections with fellow practitioners, RELIEF allows individuals to build cross organizational trust before disaster strikes. These relationships are what facilitate better responses in the field — people know who to call, when to call them, and what to call them for.” **IR**



Landing Signal Officers aboard the *USS Eisenhower* test the pilot performance tracking system developed by researchers in NPS' MOVES Institute. The prototype system, called iPARTS, would be used to gather data on pilot carrier landing performance into a fleet-wide data collection system. Currently, a manual-entry logbook is used to track that data.

MOVES Faculty, Student Team Helps Landing Signal Officers Track Pilot Performance

By Amanda D. Stein

RESEARCHERS AT THE Naval Postgraduate School's Modeling, Virtual Environments and Simulation (MOVES) Institute have developed a prototype system to support Landing Signal Officers (LSOs), the men and women responsible for the safe and expeditious landing of aircrafts on the Navy's fleet of carriers.

In a research and development project funded by the Office of Naval Research, the MOVES team of Drs. Michael McCauley and Mathias Kolsch, and Systems Engineering student Lt. Michael Ross, has spent the last year developing the four components of the LSO's pilot performance tracking system, called iPARTS, that will gather data on pilot carrier landing performance into a fleet-wide data collection system. Currently, a manual-entry logbook is used to track that data.

"iPARTS is superior to the current pilot performance tracking system in that it aggregates data from across the fleet to provide top-down visibility to carrier aviation safety across all carrier wings and squadrons

in the Navy, enabling resource allocation decisions to be made using quantitative data instead of intuition," explained Ross. "Additionally, we provide enhanced trend analysis tools which help LSOs to identify pilot performance deficiencies earlier than is possible with the current software in use."

The iPARTS system includes a handheld computer, which LSOs can use to collect landing data on the carrier flight deck, a laptop application to analyze pilot trends, a video-recording module to document landings, and a database to accumulate the pilot performance records from all aircraft carriers and practice landing fields.

Part of the excitement surrounding iPARTS comes from the custom graphic user interface that MOVES Institute has developed for the flight deck handheld device. Especially during high workload evolutions such as Carrier Qualifications for new pilots, LSOs have their hands full providing timely and accurate feedback to pilots in order to prevent catastrophe.

In addition to this critical safety task, in the training environment, the LSOs must also track pilot performance, calculate real-time grade point averages and boarding rates, and make quick decisions as to whether or not to halt a student's progress based on their trends. Currently, all of these tasks are being done by hand.

"The system we developed directly supports Naval Aviation, one of the Navy's core capabilities, in particular, the safe recovery of pilots

"I'm extremely grateful for the opportunity to work alongside some exceptional faculty members at NPS to help develop a solution to a problem I saw as a Landing Signal Officer in the fleet. It has been a tremendous experience to take what I am learning as a Systems Engineering student and apply it in real-time to an ONR-funded development project that has the potential to have a significant impact on the LSO community."

Lt. Michael Ross
Systems Engineering

and aircraft onboard aircraft carriers," explained Kolsch. "It improves the workflow of the LSOs and automates several mundane and repetitive tasks during recovery and debriefing. It also gives LSOs more information at hand and eliminates the need for error-prone calculations by hand. The collected data is the basis for many decisions affecting pilot qualifications and air wing readiness and safety, ultimately helping safer and more expedient aircraft recovery.

"We carefully selected available technologies to have the flexibility to custom-tailor our solution specifically for the LSOs and for the difficult working environment on the flight deck of an aircraft carrier" Kolsch continued. "These technologies also permitted rapid development and the integration of state-of-the-art methods for video processing."

The iPARTS handheld device streamlines the LSOs tasks by automatically providing them with the information they need to make real-time decisions on the flight deck and then automatically archives the data they collect to a centralized server along with similar data from across the fleet.

"We have developed an innovative tablet-based interface allowing collection of pilot performance data directly from the LSO platform on the flight deck," Ross continued. "Aside from removing the need to transcribe this data from a paper logbook in a separate step, the tablet provides LSOs a real-time tracking and analysis capability that will enhance the safety and success rate of Carrier Qualification operations."

The MOVES team recently spent four days aboard the *USS Eisenhower* to test their software and accompanying hardware, during Carrier Qualification Operations for Fleet Replacement Squadron pilots. For Ross, this endeavor has been an extracurricular research project, and he noted the value of being able to apply his experience as an LSO

and a research student to finding solutions to current challenges.

"I'm extremely grateful for the opportunity to work alongside some exceptional faculty members at NPS to help develop a solution to a problem I saw as a Landing Signal Officer in the fleet," explained Ross. "It has been a tremendous experience to take what I am learning as a Systems Engineering student and apply it in real-time to an ONR-funded development project that has the potential to have a significant impact on the LSO community"

According to McCauley, one of the key elements in this project was the principle of "user-centered design." LSOs from Naval Air Station (NAS) Lemoore, NAS Oceana, NAS Norfolk, and other locations participated in evaluation of prototypes in an iterative design and review process. Ross served not only as a subject matter expert, but also as a point of contact and communication link with the LSO community. The close relationship

between the NPS design team and the user community was essential for the success of the MOVES project.

"Lt. Ross exceeded normal expectations in investigating, and more importantly, delivering second and third iterations of the iPARTS program," noted Cmdr. Robert Wedertz, the Officer in Charge of the LSO School. "The capabilities of the program expanded beyond those that were delineated in the Request for Proposal. Lt. Ross and the NPS team accomplished this, not because it was required technically, but because they recognized that those capabilities would benefit the end user — the fleet." IR



The MOVES Institute's Dr. Michael McCauley, far left, stands beside Stephanie Everett of the Office of Naval Research, and Dr. Mathias Kolsch, also of MOVES, during their visit to the *USS Eisenhower* to test the iPARTS software in the fleet.



Commencement speaker Norman R. Augustine, center, is awarded an honorary doctorate in military science degree during the Naval Postgraduate School's summer graduation ceremony in King Auditorium, Sept. 23. Augustine has held numerous leadership positions across public and private sectors, including several years as Chairman and CEO of Lockheed Martin Corporation.

Respected Leader in Public, Private Sector Keynotes Summer Graduation Ceremony

By MCI Leonardo Carrillo

THE NAVAL POSTGRADUATE School held its summer graduation ceremony to a packed auditorium of friends, family, faculty, and a large class of 376 graduates, in King Auditorium, Sept. 23.

The ceremony opened with NPS President Dan Oliver taking the opportunity to acknowledge the faculty and staff for their hard work in creating NPS' challenging learning environment — paramount to the quality of the graduates' education, and something Oliver noted the class should take great pride in.

"NPS graduates, you should be justly proud of what you have accomplished here," said Oliver. "We are proud to call you NPS alumni and we look forward to hearing great things from you in the future."

Oliver then proceeded to introduce the guest speaker, Norman R. Augustine, who was also presented with an honorary doctorate degree during the ceremony (see back cover).

"The power of an NPS education is its impact on our students' and graduates' effectiveness to lead," Oliver added. "Today we have the special honor of welcoming an iconic leader to our ranks as an NPS alumnus. He is a friend of NPS whom I would proudly suggest to you or anyone else as a mentor."

With the assistance of NPS Executive Vice President and Provost Dr. Leonard Ferrari and the Dean of the Graduate School of Operational and Information Sciences Dr. Peter Perdue, Oliver formally presented the honorary doctorate to Augustine. In addition to serving as the former Chairman and CEO of Lockheed Martin Corporation, Augustine is a renowned author, has served as Chairman of such organizations as the American Red Cross, National Academy of Engineering, and the Boy Scouts of America.

In the public sector, Augustine has served as Assistant Secretary of the Army, Under Secretary of the Army, and Acting Secretary of the Army.

Augustine gave an interesting perspective on the reasons for the

day's celebration. He said that a graduation is commonly referred to as a "commencement," or a beginning, not an ending. The focus for the graduates will be on what they do next, he said, not what they have done in the past.

"You will be expected to be part of the answer to the problems now confronting our nation," he emphasized.

Augustine noted that the U.S. had to learn to adapt to the challenges

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"In my experience, you exemplify the very best about America. Speaking as a civilian, and as a private citizen, I thank each and every one of you for what you do for our country ... May you always enjoy fair winds and following seas."

Norman R. Augustine
NPS Honorary Doctorate Awardee

Frequent Guest Lecturers Provide Students With Diverse Perspectives on Today's Issues

Institutional Advancement Staff Report

IT WAS A busy quarter in King Auditorium with a high number of Secretary of the Navy Guest Lecturers (SGL) providing NPS students, faculty and staff keen insights into everything from how the 'architect of the surge' views counterinsurgency operations to an alumnus offering a narrative vision to our U.S. national security strategy.

The quarter's SGL series began with a discussion of strategic communications efforts in Afghanistan by long-time military Public Affairs Officer and current Deputy Chief of Staff for Communications for the NATO International Security Assistance Force and U.S. Forces Afghanistan, Rear Adm. Gregory Smith who took the stage July 12.

Smith spoke about efforts in Afghanistan, and the progress being made in improving communications in theater. Smith brought his four years of communications experience in Iraq and Afghanistan to his presentation, noting the value of communication comes in a number of ways, from giving the people a voice, to helping uncover the impact of insurgent activity on the local communities.

He encouraged the students to do their job to the best of their abilities, no matter the length of their tours, and recalled a remark from retired Gen. Stanley McCrystal, former Commander, U.S. Forces Afghanistan, on the value of seeing a job through to the end.

"General McCrystal used to say, in one of the most telling points of leadership I've ever heard in my life, if you were to go to war knowing you would not come home until you finished the job, how would you approach your job differently?"

A short two weeks later, NPS alumnus Capt. Wayne Porter, Special Assistant for Strategic Synchronization to the Chairman of the Joint Chiefs of Staff (CJCS), returned to his alma mater to discuss his recently published paper, "A National Strategic Narrative," which he co-authored with Marine Corps Col. Mark Mykleby. Porter explained how the document looks to frame the United States' primary interests, both current and future, to help create a contextual narrative to guide U.S. policy for the future.

"I think the nation is ready to re-seize our own destiny," Porter explained. "To recognize who we are as Americans and our leadership role in a complex strategic environment.



Rear Adm. Gregory Smith, Deputy Chief of Staff for Communications for the NATO International Security Assistance Force and U.S. Forces Afghanistan.

Naval Postgraduate School

Porter explained that it was a chance lunch meeting with former Secretary of Defense Robert Gates and CJCS Adm. Mike Mullen that gave him the opportunity to suggest the country lacked a "grand strategy." As Porter explained, "We came to the realization that it really wasn't a grand strategy that was needed. It was a story. A strategic context."

"This narrative advocates for America to pursue her enduring interests of prosperity and security through a strategy of sustainability that is built upon the solid foundation of our national values," wrote Porter and Mykleby. "Our domestic and foreign policies will reflect unity and effort, coherency and constancy of purpose."

Several months after completing the narrative, Mykleby and Porter received permission to publish the paper — with appropriate disclaimers — through the Woodrow Wilson International Center for Scholars, and to let the document gain its own momentum.

"Our sense was that if we could get this to kind of spread virally in a positive way, socialize it if you will, it could open a dialogue among Americans," he noted. "We are hoping that this can be a call for unity to bring parties and people together, so that they can find the momentum to take us in the positive direction the country really needs to go."

The quarter's SGL series shifted then to focus on defense research and education on Aug. 9, with a visit from the Honorable Zachary Lemnios, Assistant Secretary of Defense for Research and Engineering.

During the SGL, Lemnios addressed students, faculty and staff in King Auditorium, where he talked about not only current investments in technology and research, but also the areas that will likely be paid extra attention in the future. He expressed interest in how NPS fits into the bigger picture of DoD research, and the unique interactions that NPS researchers have with industry.

"This morning I was down at Camp Roberts, and I saw a remarkable set of experiments and a remarkable coupling of first-rate research concepts out of NPS, with first-rate users providing feedback on the utility of those concepts and how those could be fielded in future mission sets," explained Lemnios. "I also saw a strong engagement with industry, in particular the

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NPS alumnus Capt. Wayne Porter, Special Assistant for Strategic Synchronization to the Chairman of the Joint Chiefs of Staff.

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of today's fighting environment. That even with the nation's might in conventional warfare, enemies were shifting their tactics and that future leaders needed to adapt to this shift.

He mentioned the emergence of globalization and its implications and how critical effective leadership is in this new world.

Augustine offered insight on what characteristics he has observed in exceptional leaders — such as Adm. Arleigh Burke, Gen. Omar Bradley and Gen. Jimmy Doolittle — who helped shape his career. Augustine listed core principles that make a strong leader, including an uncompromising moral compass, selflessness, courage and demanding standards.

He added that, while participating in over 500 meetings with leadership from Fortune 100 companies, he was struck by how many of them he met who did not have abnormally high IQ's or come from millionaire families. Rather, in his experience, the key characteristic they shared was motivation. "Motivation will beat mere talent almost every time."

He noted the value in focusing on the present — in doing your best, right now, to prepare for the future. Augustine quoted Sir William Osler, who he noted is "recognized by many to be the father of modern Western

medicine" in saying "I have had ... personal ideals. One is to do the day's work well and not to bother about tomorrow ... To it, more than to anything else, I owe whatever success I have had — to this power of settling down to the day's work and trying to do it well to the best of one's ability, and letting the future take care of itself"

To conclude, Augustine turned his focus on the members of the military, giving praise to the men and women of the armed services.

"In my experience, you exemplify the very best about America," he said. "Speaking as a civilian, and as a private citizen, I thank each and every one of you for what you do for our country ... May you always enjoy fair winds and following seas."

A total of 376 graduates earned 393 degrees, with 246 crossing the stage during the ceremony. Of the 376 graduates, 134 came from the Navy, 30 Marines, eight Army, three Coast Guard, 18 Air Force, 147 DoD civilians, two Air National Guard, one NOAA, and 23 were international students. There were five Ph.D.s, excluding Augustine, 61 Masters of Arts, three Masters of Business Administration, 279 Masters of Science, 30 Executive Masters of Business Administration, two Bachelors of Science, and 17 dual degrees. **IR**



Dr. David Kilcullen, former Senior Counterinsurgency Advisor to General David Petraeus in Iraq and noted 'architect of the surge.'



Honorable Zachary Lemnios, far right, Assistant Secretary of Defense for Research and Engineering meets with NPS students.

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small business community. So that's the environment that we really want to start shaping, and you folks are leading the charge on that."

Bringing the SGL series full-circle back to efforts in the Middle East, former Senior Counterinsurgency Advisor to General David Petraeus in Iraq and noted 'architect of the surge,' Dr. David Kilcullen, spoke about counterinsurgency — from its historical background to its current state.

Kilcullen pointed out that insurgencies have been a part of war since ancient times. He said that the evolution of states has been shaped by their abilities to control internal populations while at the same time dealing with external threats. This role of insurgency and counterinsurgency, said Kilcullen, has probably been more recurrent than what is known as 'regular' warfare.

"The majority of conflicts on the planet," he said, "are, and probably always have been, between states and non-state actors."

Kilcullen continued, "The exercise of a counterinsurgency function is not only endemic to human society as we know it ... it probably actually is the defining feature of government."

In spite of the historical presence that counterinsurgency has held, said Kilcullen, the term used today was born as a result of the Cold War when U.S. and Soviet strategists realized that, to avoid an all-out nuclear war and still defeat their rivals, they would have to engage in a series of proxy wars that would involve non-state actors, insurgencies, and counterinsurgency tactics.

This gave way to the birth of many schools of thought that were revived during the incursions in Iraq and Afghanistan, Kilcullen said, but strategists and soldiers on the ground found that Cold War tactics didn't always work in the 21st century.

Kilcullen noted that many theorist and experts debated on what exactly makes a counterinsurgency but that in practice, governments and militaries should be adaptive to what the realities are on the ground rather than sticking with a more dogmatic approach.

He noted that in Iraq they reconciled with local leaders that were initially opposed to, and even fighting, coalition forces. Kilcullen said that a government has to be built by its own people, from within; otherwise it's legitimacy will breakdown and fail. **IR**

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First in His Class

Norman R. Augustine is, in a single word, a leader. He has stood at the helm of a long, diverse list of institutions throughout his distinguished career in public and private service, and been lauded as one of our nation's finest craftsmen in the art of leadership.

Augustine is a former Under, Assistant, and Acting Secretary of the Army; he is a past Chairman and Chief Executive Officer of Lockheed Martin Corporation; he has served as President of the American Institute of Aeronautics and Astronautics, Chairman of the American Red Cross, President of the Boy Scouts of America, and Chairman of the National Academy of Engineering.

He is also an accomplished author, well known for his lighthearted approach to success in the 'Beltway' with his book, *Managing to Survive in Washington* — just one of Augustine's many titles on effective leadership.

And now, Augustine is also an alumnus of the Naval Postgraduate School, receiving an honorary doctorate of military science at the beginning of the Summer quarter graduation ceremony in late September.

"I am deeply honored to receive a degree from this great institution," Augustine noted upon receiving the degree. "Throughout my career I have worked with many of your faculty and graduates, and on occasion spent brief periods of time here participating in various government committees. I am acutely aware of the standard of excellence that you maintain and the demands placed upon each individual who is affiliated with the school."

And in spite of all of his prominent positions and onerous responsibilities, it would seem that Augustine has kept a firm hold on his good sense of humor. Upon receiving his degree from NPS President Dan Oliver, he turned to the packed house in King Auditorium stating, "I should also note that I am particularly pleased the sequence of today's ceremony is such that honorary degrees are presented *before* your degrees. I can hardly wait to get home to tell my family that I graduated first in my class!"

