NAVAL POSTGRADUATE SCHOOL

IN REVIEW MAGAZINE

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OUR LEGACY IN SPACE

As the space shuttle program comes to an end, we look back at NPS' place in America's journey into space.

INSIDE:

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

Our impact in space flight represents a proud heritage for our institution indeed. And although it is a highly visible one to the general populace, it is but one mark our institution makes on the fabric of the Navy, defense and national security establishments.

President's Message

The Space Shuttle *Endeavour* is soon scheduled to blast-off into space from Launch Pad 39A at Kennedy Space Center in Florida – it will be the final mission for the *Endeavour* and one of just two remaining missions for the Space Transportation Systems (STS) program – a remarkable feat of human engineering and determination that has resulted in 30 years of continuous exploration into the frontier of space.

In command of *Endeavour* will be Capt. Mark Kelly, a 1994 aeronautical engineering graduate of the Naval Postgraduate School. Following *Endeavour*, the final Space Shuttle mission, STS-135, will propel *Atlantis* into orbit commanded by retired Capt. Christopher Ferguson, a 1991 NPS aeronautical engineering graduate. As a matter of fact, when the shuttle program comes to an end, four out of the final five shuttle missions will have been led by graduates of the Naval Postgraduate School.

It's a truly honorable distinction, and one that compels me to think about legacies. In this edition of "In Review," you will read about this university's amazing legacy in America's manned space flight programs. From the Mercury Seven through the close of the space shuttle program, NPS graduate astronauts have been key players in some of the most impactful moments in American history.

Our impact in space flight represents a proud heritage for our institution indeed. And although it is a highly visible one to the general populace, it is but one mark our institution makes on the fabric of the Navy, defense and national security establishments. Our graduates go on to senior positions of leadership across our uniformed services – a Chairman of the Joint Chiefs, a Commandant of the Marine Corps, Combatant Commanders and four star leaders across our Armed Forces – these alumni guide their organizations and leave tremendous marks on the security of our nation.

Even out of the service, our alumni are forging legacies in fields they are passionate about, and you can also read about some of them in this edition. Marshall Carter is Chairman of the Board of Directors for the New York Stock Exchange, and is a driven leader and teacher on ethical leadership in a financial profession that needs it. Walt Havenstein, Chief Executive Officer at Science Applications International Corporation, dedicates his free time as Chairman of the Board of FIRST, or For Inspiration and Recognition of Science and Technology – an effort that inspires youth into exploring careers in the science and technology disciplines. These are graduates that will leave amazing legacies.

These are wonderful stories, spotlighting individuals in senior leadership positions across American society. But perhaps our greatest achievement – our greatest legacy – comes in the form of a collective of the approximate 1,200 students we graduate every year. They are provided with an impactful, relevant, quality education, and I can proudly say that it is not just me offering these exalting praises, for our university recently made history. For the second straight term, NPS has received the maximum 10-year reaccreditation from the Western Association of Schools and Colleges.

This uncommon recognition is nothing short of definitive proof that we are providing all of our students with an education that is second to none. And that is the proudest legacy of the Naval Postgraduate School.

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Imagery used in the Legacy in Space article courtesy NASA.

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ON THE COVER
The Space Shuttle Discovery rockets into the deep blue sky on Independence Day, July 4, 2006 – the only manned space flight ever to launch on the day we celebrate our nation's freedom. Piloting Discovery on that mission is Naval Postgraduate School aeronautical engineering graduate Capt. Mark Kelly, actually one of two alumni on board. NPS' place in manned space flight is stunning – at the peak of the shuttle program, 2000–2010, two out of every three flights had an NPS graduate on board. With only two missions remaining in the space shuttle program, we dedicate this issue to a proud review of our graduates' impact on manned space flight.

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University Welcomes New Dean of Students

When NPS welcomed its new Dean of Students early this year, it was a face the campus had seen many times before. Capt. Alan Poindexter is not only an alumnus,

Capt. Alan Poindexter

earning a Master of Science degree in aeronautical engineering in 1995, he has also visited the campus on several occasions. With a couple of months now under his belt, he has settled into his new role, and looks forward to providing leadership to the 1,500 plus students on campus.

"I'm very glad to be back serving in this position," said Poindexter. "I think it's a great opportunity for me to lead and influence officers as they're going to school here. I think I have a lot to offer them and I hope I can serve them and help them make their way through the school."

A veteran NASA astronaut with two previous space shuttle flights, one as commander of STS-131 in early 2010, Poindexter attributed part of his success to the technical education he received at NPS.

"The technical knowledge and the technical education certainly assisted me," said Poindexter. "I think a large part, though, was that I broadened my knowledge base. I learned about systems management, systems engineering and it allowed me to be more analytical in my thought process … My NPS education was instrumental in my follow-on tours."

It's no surprise that an NPS Dean of Students considers education to be an important part of an officer's career path – in fact, Poindexter sums it up with one word.

"Critical," he stated. "Whether it be in engineering, management, business or one of the many other great degrees we offer here, it will serve the individual and the Navy or their service very well to have that capability and that background."

Poindexter affirmed that his goal is to continue to serve the student population. "I'm really honored to be back here in this job working for the school and working for the students," he concluded. "I have an open door policy and I would be glad to talk with or counsel anyone, and I hope that I can influence them in some small way."

NPS Prepping for Massive Online Wargame

Everyone at NPS and far beyond will soon be able to participate in an exciting new massive-multi-player online wargame designed to tap the collective intellectual capital of the entire Navy in coming up with breakthrough solutions to a "wicked" realworld problem – defeating Somali pirates.

The goal of the game – called MMOWGLI for Massive Multiplayer Online Wargame Leveraging the Internet – is to reach beyond the experts to build the critical mass of players needed to catalyze "knowledge accidents" and trigger the "outlier" ideas needed to crack really hard problems.

On February 17, NPS Modeling, Virtual Environments and Simulation Institute Associate Professor Don Brutzman, project partners from the Bay Area-based Institute for the Study of the Future and representatives from the sponsoring Office of Naval Research Office of Innovation, held two briefs for faculty, students and staff on the overall vision and methodology of the interactive and collaborative web-based game.

"Our goal is a diverse audience of everyone in the Navy plus anyone who's interested beyond the military, to build group insight leading to breakthroughs for Navy technology investments," said Brutzman. "We'll then test the best new ideas that come out of the pilot through modeling and simulation, so you'll know if your great new idea will really work."

Dates for the interactive online game are still tentative. It runs on both PCs and Macs, and no prior installations on your computer are required. For more information, go to http://mmowgli.nps.edu.

Field Project Uses UUVs to Map Tidal Inlet Flows

As future Navy SEALs swim silently toward shore, they will be armed with validated 3D maps of the tides, waves and currents between their location and the target thanks to cutting-edge research by a Naval Postgraduate School faculty-student team led by Assistant Professor of Oceanography Jamie MacMahan.

Seven students in MacMahan's Littoral Field Studies course participated in a 10-day capstone field experiment collecting tidal inlet measurements using portable unmanned underwater vehicles (UUVs). They programmed NPS' EcoMapper UUV to collect real-time data on waves, currents, temperature, salinity, sediments, pollutants and bathymetry in the highly energetic Bear Cut tidal inlet near Miami, Fla.; and learned how to input the data into the Navy's nearshore Delft3D model and output the resulting maps using Google Earth Matlab.

Oceanography Assistant Professor Jamie MacMahan, center, gathers with officer students and teaching assistants from his Littoral Field Studies course around NPS' EcoMapper Unmanned Underwater Vehicle.

"Tidal inlets are important to the Navy's littoral focus, because when you move from the deep ocean to any land water body, you have to go through an inlet, and spatially mapping the velocity field is critical for many expeditionary warfare exercises, particularly involving human swimmers such as Navy SEALs," MacMahan explained. "And this is the first time smaller UUVs have been used in fast-flow inlet or riverine environments.

"This is a unique exploration and educational opportunity for students that simultaneously tests transformative ideas that can be integrated into future naval operations," MacMahan noted

Participants in the study were doctoral students Lt. Cmdr. Bill Swick and Jenna Brown; and Lts. David Paul Smith, Mark Hebert, Chris Tuggle, Stephanie Johnson, Chris Beuligmann and Will Ashley. Partnering in the exercise were

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NPS Expands STEM Programs for Area Students of All Ages

More than 50 young women from Monterey-area high schools and middle schools descended upon the Naval Postgraduate School campus, Mar. 11, as part of the "Girls Day In" pilot program. Girls Day In is a new K-12 outreach program that aims to introduce science and technology disciplines to children in the local Monterey community by providing opportunities for female students from local schools to explore the fields of science, technology, engineering and math (STEM).

During the day-long event, the girls were exposed to a variety of events, presentations and activities which included opening remarks by university president Dan Oliver, a keynote address by Dr. Alana Sherman of the Monterey Bay Aquarium Research Institute (MBARI), and the opportunity to build, program and operate robots under the tutelage of NPS Professor Timothy Chung.

Sherman shared in vivid detail her adventurous career as an engineer studying ice caps in Antarctica, mapping the ocean floor inside the submersible capsule "Alvin," and piloting remotely operated vehicles. Sherman also shared her feelings on the study of math and science early in her scholastic endeavors.

"I had some tough math and science teachers in high school. In my first year of college I took an astronomy class and was relieved that it would be my last exposure to science and math," Sherman noted. "Down the road I took another math course and the teacher was great. I really started enjoying my math and science courses. I realized math was fun."

Earlier that same month, approximately 60 high school students from the Monterey Academy of Oceanographic Science (MAOS) visited NPS for an extended tour, Mar. 4.

MAOS is a college preparatory academy located at Monterey High School that helps high school students from Monterey County by exposing them to additional science classes and volunteer work. Some of the volunteer work takes place at institutions like the Monterey Bay Aquarium and NPS, where the students do internships within the science and research departments.

Dr. Alana Sherman of the Monterey Bay Aquarium Research Institute provides the keynote address for NPS' first Girls Day In.

The students started the day with an acoustics presentation from Associate Professors of Physics Andres Larraza and Bruce Denardo, where they witnessed the effects of the interaction between heat, cold and sound and the different research approaches that are being explored at NPS to take advantage of these effects.

And finally, students from Hartnell College converged onto campus to take part in an internship program coordinated by the Cebrowski Institute. The initial 'meet and greet' with campus professors and researchers for the 2011 Hartnell-NPS STEM internship program took place Mar. 23, as 15 college students discussed research projects and opportunities in a round robin with potential NPS mentors.

The Hartnell College STEM (Science, Technology, Engineering and Mathematics) internship program began in 2006 with the placement of six students at the Fremont Peak Observatory and two students at NPS. Since then, the internship program and placement has expanded substantially.

The Cebrowski Institute took a leadership role in the program, expanding and recruiting more NPS mentors for the Hartnell students to be engaged in research with. Over the past five years, more than 50 Hartnell students have participated in STEM related research internships at NPS.

The strong relationship which has been established between NPS and Hartnell in mentoring students towards STEM majors has been tremendously effective, and several initiatives have now been institutionalized or blended into campus-wide professional development opportunities at the valley college. The program was also the key ingredient in NPS' selection for the Hartnell President's Partnership of Excellence Award in 2008.

Delft3D expert Prof. Ad Reiners of the University of Miami and Naval Undersea Warfare Center (NUWC) AUV experts Mike Inzce and Scott Sideleau. NUWC also provided AUVs in addition to the NPS EcoMapper.

"Professor MacMahan is a great teacher. He's energetic, hands on and passionate, and cares very deeply about helping students get the most out of the learning experience," said Tuggle, who wirelessly loaded the EcoMapper's programs. "This is an incomparable class in the amount of hands-on experience you get and in taking you through all the steps for your thesis, and should really be the first class in the oceanography program."

The tidal inlet exercise was sponsored by N4/N7 Assistant Chief of Staff for Readiness, Training and Education, Mr. Rich Jeffries, and funded by Dr. Tom Drake of the Office of Naval Research Coastal GeoSciences.

NPS Participates in Navy-wide Solid Curtain/Citadel Shield

A postal worker has accidentally come into contact with a suspicious package which has spilled a powdery, white residue. He complains to his supervisor of cramps and nausea. The supervisor calls for help and the police are first on the scene. Two officers immediately evacuate the area and alert their superiors. Within minutes, medical and hazardous materials units are dispatched to NPS' post office building.

This scenario-driven episode is part of the Solid Curtain/Citadel Shield Exercise, which ran from Feb. 22-24 at Navy shore installations and activities across the continental United States. Coordinated by U.S. Fleet Forces Command, the security exercise is designed to enhance the training and readiness of Naval Security Force personnel to respond to threats to installations and units, using all processes security forces would implement in the event of an actual emergency.

SOUTHCOM Deputy Engages NPS Foreign Area Officer Community

Army Lt. Gen. P. K. Keen, Military Deputy Commander of United States Southern Command, center, meets with a small group of Foreign Area Officers prior to his class-wide presentation.

Army Lt. Gen. P. K. Keen, Military Deputy Commander of the United States Southern Command, addressed members of the Joint Foreign Area Officer Skill Sustainment Pilot Program (JFSSPP) at NPS, Feb. 24. Keen spoke for nearly an hour to more than 35 students participating in the residence course for Latin America Foreign Area Officers (FAO).

Keen's military experience in Latin America includes assignments as a Special Forces Officer in the Republic of Panama, Military Group Training Officer in Honduras, FAO and student at the Brazilian Command and General Staff College, Commander of U.S. Military Group in Colombia, and as Commander of U.S. Army South.

The JFSSPP is an advanced education and skill sustainment initiative for Foreign Area Officers from all services – Army, Air Force, Navy and Marines. Recognizing foreign language ability and specialized regional knowledge as mission critical skills, the JFSSPP fulfills a Department of Defense mandate to provide resources and opportunities for FAO skill sustainment and professional education.

The JFSSPP partners with the Defense Language Institute Foreign Language Center (DLIFLC) to provide customized language training and sustainment support to Foreign Area Officers. The DLIFLC, also based in Monterey, is the largest language institute in the United States with an educational mandate for all Department of Defense personnel.

Sea Service Leadership Association Establishes Monterey Bay Chapter

The newly-formed Sea Service Leadership Association (SSLA) Monterey Bay Chapter held its first social event on campus in early February under the direction of Lt. Heather Hornick, Chapter President, and retired Navy Capt. Carol O'Neal, Faculty Advisor.

"There are over 150 female students at NPS and a wonderful cadre of senior female mentors on the staff and faculty, so this organization is the perfect venue to provide a forum for networking, mentorship and volunteer work in the community," said O'Neal.

The SSLA was established in 1978, and is the only non-profit organization in the United States dedicated to providing professional development through networking, education and mentorship of women from all three of the maritime armed forces – the United States Navy, Marine Corps and Coast Guard. To date, there are six chapters in SSLA with the Monterey Bay Chapter being the seventh.

International Terrorism Expert Speaks at NPS

International terrorism expert Judge Jean-Louis Bruguière lectured on the "Radicalization of Europe" during a Center for Homeland Defense and Security (CHDS) sponsored brownbag lunch session in the Glasgow auditorium, Jan. 26.

NPS faculty, staff and students had the opportunity to listen to one of the world's most renowned experts on international terrorism and also the man who was instrumental in the capture of international terrorist Ilich Ramírez Sánchez, "Carlos the Jackal."

Judge Bruguière was the French leading magistrate for investigating counter-terrorism, responsible for hundreds of important arrests and convictions including the infamous Jackal. He was also appointed by the European Union to the U.S. Department of Treasury to oversee the Terrorist Finance Tracking Program. Bruguière condensed his more than 25 years of experience into the hour-long session at NPS

Judge Jean-Louis Bruguière

and gave an interesting perspective on the strategies of terrorist cells and the patterns he learned to read that build up to major incidents such as hijackings, car-bomb plots, and even the Sept. 11 attacks.

Aerospace Veteran Turned Physics Prof. Wins 2011 Hamming

The Naval Postgraduate School presented the 2011 Richard W. Hamming Annual Faculty Award for Interdisciplinary Achievement to Dr. Ronald E. Brown, Research Professor of Physics in the Graduate School of Engineering and Applied Sciences (GSEAS), during a ceremony, Mar. 15.

Brown began work at NPS in 2002 after retiring from a 40-year career in the aerospace industry as a way to fulfill his lifelong dream

Dr. Ronald E. Brown

of teaching. His work is focused on modeling explosive detonation processes, shaped-charge jet formation, and high-velocity impact phenomena.

"Dr. Brown's contributions to the success and reputation of NPS go beyond his teaching and research contributions," said NPS Executive Vice President and Provost Dr. Leonard Ferrari. "A true leader in his field, Research Professor Brown exemplifies Professor Hamming's commitment to interdisciplinary scholarship."

"I am overjoyed with the acknowledgement of my work," said Brown. "I'm very grateful for the opportunities provided here at the Naval Postgraduate School to follow a lifelong dream of teaching and, recently in life, a desire for contributing to the education and critical decision-making of our fine armed forces members."

Brown noted that working with students was one of many valued aspects of his work at NPS. "The contributions cited in this award," said Brown, "resulted from close working relationships with dedicated and well-motivated student researchers and very rewarding collaborations here and abroad, and by the continuous support from the Office of Naval Research."

He continues to do research on shaped charges and other projects that have a significant impact on explosive behavior.

Faculty Provide Diverse Offerings as E-Week Continues to Expand

Students at NPS are afforded just a few breaks during the course

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CRUSER Joins Robotics and Unmanned Systems Research, Education at NPS

Chartered by Under Secretary of the Navy Robert Work, NPS has commissioned the Consortium for Robotics and Unmanned Systems Education and Research (CRUSER). CRUSER is a wide base community of interest that offers a collaborative environment for researchers, industry, students and defense personnel interested in all aspects of employing unmanned systems in an operational environment now and in the future.

NPS is a hotbed for robotics and unmanned systems research with students and faculty across departments working on different components of concepts, research and development. Where one group of researchers might be exploring how to best develop sensing capabilities to help unmanned systems navigate the battlefield, for example, another department across campus might be exploring the ethical implications of using unmanned systems in combat. CRUSER will facilitate connecting the two and others in their fields, utilizing each group's findings to contribute to the bigger picture.

CRUSER Program Director retired Navy Capt. and OR Senior Lecturer Jeff Kline, notes the value of the program in support of the DoD's mission.

"CRUSER's overall goal is to capture NPS' unique synergy between operationally-experienced students and a diverse faculty who focus on defense related issues," explained Kline. "The innovation, technical talent and concept generation potential at NPS provides an excellent foundation for a Department of Defense venue to cooperatively engage in all aspects of unmanned system education and research."

Robots and unmanned systems are increasingly being developed and utilized within the Navy to handle tasks that are too dull, dirty or dangerous for humans to perform. NPS students studying unmanned capabilities are encouraged to work with faculty, government laboratories, other universities and Navy experimentation programs to fully explore the potential of these systems to support the warfighter.

Developing a generation of officers ready to employ unmanned systems is an important CRUSER objective. Other goals include inspiring concept generation for new unmanned technologies, offering and aligning education programs, conducting and participating in at-sea experimentations, and conducting cooperative research in all aspects of unmanned systems. Together, the unmanned systems and robotics communities can look at some of the pressing questions to make the technology as efficient as possible, notes Dr. Timothy Chung, Director of Research and Education for CRUSER.

Dr. Timothy Chung, Director of Research and Education for CRUSER, and the RMP 400 Robot.

"CRUSER has the opportunity to align a lot of different people and bring them together in conversation," said Chung. "Conversation leads to collaboration, and that collaboration is what's going to make things happen. There needs to be some understanding, some translation that occurs when people talk with one another, and CRUSER can help bring those people together. And even if they just have coffee together on a regular basis, that's already more than they are doing now, and that's helpful in the longer term when they try to do collaborative research."

of their studies. In an effort to make the most of that time, Executive Vice President and Provost Leonard Ferrari developed Enrichment Week (E-Week) in 2009, where in between each academic quarter students and faculty are afforded the opportunity to participate in a diverse collection of academic enrichment activities now several dozen strong.

A few of this past quarter's offerings include a Cyber Effects Short Course – led by Professor John McEachen, Director of the NPS Center for Cyber Warfare (CCW) – which began with a presentation on "Cyber in National Security Today." The course was hosted by the CCW in Glasgow Hall on campus, Mar. 21-25.

Through the course, more than 35 participants were provided an overview of the science, technology, structure and operation of systems relevant to the pursuit of information dominance. Their participation in the course provided them an understanding of the graduate level study that provides a foundation for developing competencies and creatively solving problems related to achieving cyber effects in wired and wireless systems.

In addition to the cyber short course, the Future Unmanned Naval Systems (FUNS) Wargame Competition was held during E-Week, March 21-24. Three student teams representing different schools on campus received subject matter expert briefings on a wide variety of topics in unmanned systems, from ethics to capabilities to future threats. They then went head-to-head in a wargame competition with the winning team announced at the game's conclusion on Thursday, Mar. 24.

FUNS was designed to challenge and showcase the abilities of NPS students and faculty by working through problems of critical interest to the Navy. It explored current and expected capabilities of unmanned systems to conduct coordinated operations, with minimal human supervision, in a naval conflict that is set five years in the future.

During another offering, members of the Information Dominance (ID) Center of Excellence held a Junior Officer Course, also during E-Week, Mar. 21-25. The junior officer course focused on how the ID Corps can develop leadership qualities in its young officers as they move into increasingly important roles in the future of the corps.

The weeklong course featured discussions and exercises on a variety of topics aimed at the professional development of junior officers in the IDC community, including polarity management, social networking, higher order thought and team building. The Information Dominance Center of Excellence exists to ignite a culture of innovation and learning by teaching ideas that are compelling, relevant, sustainable and enable a competitive advantage.

NPS Faculty Share Their Expertise on the Crisis in Egypt

National Security Affairs (NSA) Professor Robert Springborg is a nationally-recognized expert on Egypt, and the protests leading to President Hosni Mubarak's resignation as President of the North African nation made Springborg a popular resource for major media outlets across the world. Over the course of a single week, he was interviewed by "The New York Times," the BBC, "TIME magazine" and National Public Radio (NPR) to name just a few.

But he was not the only faculty expert contributing to the subject. Defense Analysis Professor and Director of the Information Operations Center, Dr. John Arquilla, was interviewed by "Wired magazine" and NSA Associate Professor James Russell was interviewed for a piece on MSNBC.

Dr. Robert Springborg

Center for Stabilization and Reconstruction Studies Hosts Ag Workshop

The NPS Center for Stabilization and Reconstruction Studies (CSRS) hosted an annual workshop titled "Agriculture: Promoting Livelihoods in Conflict-Affected Environments" at Casa Munras Hotel in Monterey from Jan. 31- Feb. 3.

The workshop brought together military, government and non-government representatives from the U.S. and abroad to discuss the role of agricultural development in achieving political and socio-economic stabilization. Participants were able to network with others in their field and to share insight and program ideas to help promote agricultural recovery in conflict-affected environments.

The discussions ranged from property rights in conflict-affected environments to security and stabilization. As one participant noted, "Without security, there will be no peace. Without peace, there will be no development."

Workshop Seeks Collaboration on Military Use of Wireless Comms Technology

Computer Science Associate Professor Dennis M. Volpano presented his research during the Military Wireless Communications Research Group Invitational Workshop, Jan. 12. Volpano explains the architecture of his project that is used to detect and recognize voices in order to maintain active communication with a user through any wireless device.

The workshop focused on emerging technologies in the world of military wireless communications such as the 'Real Caller ID' project lead by Volpano. Real Caller ID is a system that recognizes a caller's voice and allows the caller to access the network from any phone and be called to that same phone using a designated number for the user.

Workshops such as this one allow researchers to put forward their projects and get feedback and support from their peers in the field.

Directed Energy Professional Society Holds Symposium at NPS

The Directed Energy Professional Society (DEPS) held its weeklong Systems Symposium, with support by the NPS Physics Department, in King Auditorium and the nearby Hyatt Hotel from Mar. 28 to Apr. 1. The conference, held every year, brings the DEPS user community together to discuss new technologies and opportunities, research and problem solving. This year's conference drew more than 400 attendees, including Chief of Naval Research and NPS alumnus Rear Adm. Nevin P. Carr, Jr.

Carr was provided a tour of the Beam Control Facility in Halligan Hall by Distinguished Professor of Mechanical and Aerospace Engineering, Dr. Brij Agrawal, and Vice President and Dean of Research, Dr. Karl van Bibber. Carr listened to an extensive explanation and demonstration of the Jitter Control Testbed, the Adaptive Optics Testbed, and the High Energy Laser Beam Control Testbed.

Following the demonstrations, Carr toured the Segmented Mirror Space Telescope and was provided an overview of the telescope by Agrawal. While viewing the telescope, Carr signed a Memorandum of Agreement (MOA) establishing an Adaptive Optics Center of Excellence for National Security at NPS for education and research in Adaptive Optics and related technologies for applications in national security. The MOA is between the Office of Naval Research, National Reconnaissance Office, Air Force Research Laboratory and the Naval Postgraduate School.

ID Leaders, NPS Faculty Discuss Corps' Educational Needs

As part of a return visit to his alma mater, NPS alumnus and Corporate Director for the Deputy Chief of Naval Operations for Information Dominance Rear Adm. David Simpson met with a small group of faculty from across disciplines to discuss the Navy's needs and the expectations that the Chief of Naval Operations (CNO) has for members of the Information Dominance Corps (IDC). One particular area of opportunity within the IDC expressed by Simpson during his Feb. 11 visit to NPS was in cyber systems and operations, and he noted that extra attention should be paid to fully incorporate the cyber domain into the IDC curriculum.

"The technology curve is asymptotic," Simpson explained. "Our investments in information technology used to be right on that technology curve. The DoD was really pushing that technology curve. We were defining it. But the adversary can pick and choose where he wants to be on that technology curve to achieve the desired affect. We are not going to be able to defend everywhere on that technology curve at all times, so we have to be more agile in our ability to respond to the adversaries' movements in cyberspace."

Corporate Director for Information Dominance, Rear Adm. David Simpson meets with a group of NPS faculty from across departments for discussion about the Information Dominance curricula. Simpson graduated from the Space Systems Operations program in 1982.

The Navy announced the establishment of the IDC in Oct. 2009, in an effort to streamline and unite the information communities with a common goal: dominance. The IDC looks to keep the Navy on the forefront of the information domain, in areas such as intelligence, electronic warfare, command and control, meteorology and cyber – the fields that secure information against and retrieve information regarding potential adversaries.

"We initially had difficulty cross-communicating and defining the cyber battle space," said Simpson. "When you get to the details of describing the boundaries of cyberspace, and who has responsibilities for cyberspace, that's not easy. Bringing the IDC together for the Navy has really allowed us to get past a lot of that. But now we need to ensure that our officers see that battle space, understand it, and are able to communicate it in terms that the larger command structure understands."

During his visit, Simpson spoke to NPS faculty about the kind of curricula that will best fulfill those goals. Given the broad spectrum covered under the IDC, including Information Professionals, Information Warfare Officers, Intelligence Officers, Oceanography Officers and the Space Cadre, NPS leadership strives to keep the most current and relevant curriculum possible.

In Memorium, Distinguished Professor Emeritus Peter Lewis

Distinguished Professor Emeritus Peter Lewis

With great sadness, the NPS community bid a fond farewell to Operations Research Distinguished Professor Emeritus Peter Lewis who passed away on Friday, April 8, at the age of 78.

Lewis joined the OR Department as a Professor in 1971, became Distinguished Professor in 1986, and retired in 1998 due to his battle with Parkinson's disease. Among his many honors, he was appointed Fellow of the International Statistical Institute in 1973, Fellow of the Institute of Mathematical Statistics in 1977, and Fellow of the American Statistical Association in 1979.

"Peter Lewis attracted superb statisticians from around the world to visit NPS, this helped to present NPS to the statistical community as a top-notch center of statistical research," noted Distinguished Professor Kevin Wood. "He advised postdoctoral researchers who have moved on to influential positions in the research community.

"He was an early promoter of statistical computing and getting those tools into the hands of students," noted Wood. "There was some controversy about which computational tools we should be using, but without Peter's instigation, the NPS OR Department might have been behind the power curve on these important tools."

NPS' CENETIX a Leader in Network-Controlled, Stand-Off Maritime Nuclear Radiological Detection

Professor Alex Bordetsky, front, and German partners prepare for experimentation with an onboard stand-off nuclear radiological detection device used in high-speed drive-bys of potential small boat targets.

By Barbara Honegger

For five years, a Naval Postgraduate School team led by Principal Investigator Prof. Alex Bordetsky has pushed the envelope of network-controlled, stand-off nuclear radiological threat detection through a unique program of Tactical Network Topology Maritime Interdiction Operations (MIO) field experiments jointly conducted by the NPS Center for Network Innovation and Experimentation (CENETIX) and Lawrence Livermore National Laboratory (LLNL).

The goal of the NPS-LLNL MIO program is a layered, wirelessly-networked, globally-integrated nuclear radiological detection, warning and interdiction system in which remote radiation source experts and biometric data analysts at geographically distributed command centers can actively see, hear and evaluate data online in near real time from tagged and tracked small maritime targets, including video feeds and text messaging, to guide further surveillance and collection by decision makers.

"This is a high priority international counterterrorism effort that purposefully pushes the limits of synergistic communication and collaboration among sea, air and land sensors; remote operators and subject matter experts; front-line first responders; special operations forces; homeland security and maritime personnel; and information fusion Tactical Operation Centers," said Bordetsky, an associate professor of Information Sciences and CENETIX director. "It is supported by, amongst others, the U.S. Department of Energy, Special Operations Command, Coast Guard, San Francisco Bay Area first responders, the Port Authority of New York and New Jersey and numerous overseas partners including NATO's Maritime Interdiction Training Center. We also have active participation by overseas partners from Sweden, Germany, Greece, Denmark and Singapore.

"Historically, MIO experimentation emerged out of collaboration among geographically distributed Special Forces ISR [intelligence, surveillance and reconnaissance] units using cyberspace to track high-value targets," Bordetsky explained. "It's evolved to the point that today, NPS Dean of Research Karl van Bibber has called our unique campaign of experimental studies in man-machine integration using cyberspace collaboration a new direction in science."

The heart of CENETIX's experimental program is its interdisciplinary NPS faculty-student team.

"We have the enthusiastic participation of NPS master's and doctoral students from Information Systems, Information Operations, C4I, and Defense Analysis/Special Operations who help integrate the MIO detection and expert reachback network, design experimental tasks, play operational roles, capture data, and do post-experiment analysis," Bordetsky said. "In 2004, the first German, Swedish, Greek and Singapore officer students focused on nuclear threat detection MIO for their thesis research here at NPS, and then set it up in their countries when they returned. We wouldn't have been nearly so successful in developing the international portion of the program if we hadn't had these student ambassadors."

"The strongest facet of this research is that it brings researchers together with actual operators," said Ph.D. student and Research Associate Sean Kragelund, who worked with the team's first surface robot, the Sea Fox, and has been a mock combat swimmer for experiments. "Operator participation adds value to the research results, and they learn how to operate and leverage new technology including unmanned vehicles, biometric identification devices and nuclear detection equipment."

The team's 2007 to 2009 experiments focused on network-enabled early detection and warning of nuclear related material at multiple overseas locations, tracking the contraband to its onloading onto small boats, and detecting and interdicting the craft at multiple U.S. entry points. A 2008 scenario was detecting, searching for and interdicting nuclear radiological material hidden in a large cargo ship, carried out jointly with the Port Authority of New York and New Jersey.

"The high priority the New York-New Jersey Port Authority places on maritime situational awareness for nuclear radiological material, including improvised nuclear devices, emerged out of their experiences surrounding September 11th," Bordetsky noted.

Recent experimental scenarios include using fast boats equipped with Adaptable Radiation Area Monitor detectors for drive-by stand-off screening, detection and pursuit; feeding live reports and video from network-enabled swimmers and sensor data from unmanned robotic boats and unmanned aerial vehicles (UAVs) to remote experts who send back guidance to front line responders; collaboration between U.S. experts and overseas operators in Germany and Greece on network-controlled choke point set up; open water tracking of a source transfer to a sea port point of entry near an overseas NATO-U.S. installation; and patrol crews from multiple countries collaborating in targeting small craft tracking, screening, pursuit and interdiction incorporating UAVs.

"Our swimmers and autonomous vehicles are now fully-integrated network nodes," stressed Senior Researcher Eugene Bourakov. "Our goal is for all of our gear to have not just tactical networking reach, but true global reach in near real time."

"What I like best is that we've shown how to integrate swimmers and autonomous vehicles into the system so they become network nodes, feeding video to distant experts," seconded Mike Clement, a doctoral student and research associate.

In late April, the team will integrate real-time reachback to radiological experts into the daily patrols of San Francisco Bay Marine Police and Coast Guard vessel crews. "This will be a bring-your-own-boat, plug-and-play, real-world testbed where we'll set up virtual private networks [VPNs] in just a few hours," Bordetsky said. In June, he then plans to augment the network with pico [less than 1 kg] satellite-based ad hoc mobile orbital nodes assembled and launched by CENETIX in cooperation with the NPS Space Systems Academic Group's Cube Satellite team "to add the testbed capability to track covertly tagged targets and share detection findings via 'private' orbital nodes.

"In addition to the students, our success is due to the talent and dedication of CENETIX researchers," Bordetsky stressed. "Eugene Bourakov provides invaluable contributions to swimmer networking, adaptive antennas, voice control, electronic tagging and maintaining the test bed infrastructure. Other key participants are Michael Clement, Marianna Verett, John Looney, Sue Hutchins and Peter Guest; Ph.D. students Steve Mullins, Bryan Hudgens and Richard Bergin; and partner faculty from a number of NPS departments."

In addition to NPS and Lawrence Livermore, participants in the MIO program are Lockheed Martin's Center for Innovation, the Army Research Center at Picattiny Arsenal, the University of Bundeswehr in Germany, the Swedish Naval Warfare Center jointly with the Swedish Defense Research Agency, and NATO's MIO Training Center in Souda Bay.

CENETIX Team Advances Networked Medicine

A Special Forces Medic simulates activating a nano patch on a 'wounded soldier' played by an advanced manikin during Battlefield Medical experimentation at Camp Roberts, Calif., late last year.

NPS Associate Professor Alex Bordetsky and his CENETIX team are also leading research into advanced battlefield medicine. Part of NPS' Tactical Network Topology test-bed (TNT), upon the request of the Air Force Special Operations Chief Surgeon and in collaboration with Salinas Valley Memorial Healthcare System (SVMHS), field tests continue in hopes of developing network-controlled, unmanned systems to assist medics in delivering remote medical assistance to casualties in the battlefield.

"We started battlefield medical networking experimentation upon the request from the Air Force," said Bordetsky. "They wanted to explore how to benefit from network-controlled systems to assist medics in delivering medication to a casualty site under fire or otherwise hazardous conditions."

In a recent experiment at Camp Roberts, Bordetsky simulated a casualty in a remote location and established a network link to a medic on the ground then to a UAV flying over the casualty site. Finally, these readings were transmitted to an operations center, then to an advanced SVMHS manikin where it simulated the vital signs of the casualty.

The research scenario has future soldiers donned in advanced battlesuits that would send a soldier's vital signals and could administer medicine if he or she were injured in battle. A medic or an unmanned vehicle would get close enough to the soldier to establish a network link that would send the data to a Tactical Operations Center where it could then be sent to any location in the world. Doctors monitoring the patient's vitals live can make medical decisions and take action by controlling the nano patch remotely.

Sounds like it all should be part of a science fiction novel, but with the NPS' CENETIX team and the TNT field experimentation effort, it is slowly becoming a reality.

OUR LEGACY IN SPACE

With more alumni astronauts than any graduate university in the world, we reflect on the Naval Postgraduate School's mark on the American space program as the space shuttle era comes to a close.

By Amanda D. Stein

"From our orbital vantage point, we observe an earth without borders, full of peace, beauty and magnificence, and we pray that humanity as a whole can imagine a borderless world as we see it and strive to live as one in peace.

It is hard to imagine a world undivided. To envision mankind working as one for the greater good seems like little more than a utopian dream. But 200 miles above earth, astronauts from partner nations around the world are routinely demonstrating that perhaps this ideal may not be so unthinkable.

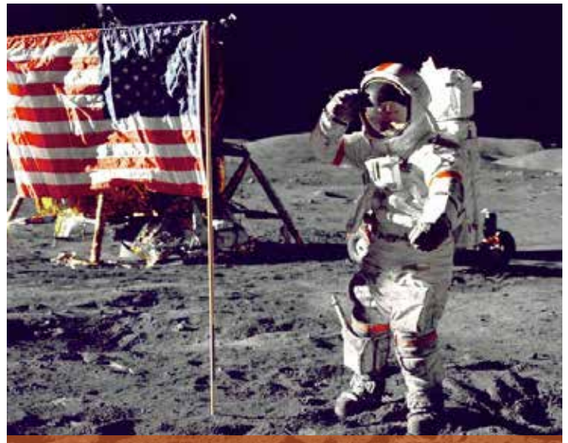
On January 28, 2003, aboard the Space Shuttle *Columbia* with John Lennon's "Imagine" playing in the background, Cmdr. William McCool stated those words during a broadcast back to earth – a perspective of our home that few will ever experience. He saw no borders or conflict. Only potential.

Tragically, three days later, February 1, McCool and the crew of STS-107 perished upon re-entry into earth's atmosphere when *Columbia* broke apart over Texas, a tragic end to a 15-day space mission so full of hope.

McCool was a Navy pilot, an outdoorsman, a dedicated family man. His mission in becoming an astronaut was to inspire future generations to achieve great things through science – something that his memory, and the continuing efforts in space exploration have no doubt accomplished.

Following the disaster, then President George W. Bush made the following statement about the crew. "These astronauts knew the dangers, and they faced them willingly, knowing they had a high and noble purpose in life. Because of their courage, and daring, and idealism, we will miss them all the more … The cause in which they died will continue … Our journey into space will go on."

The loss of the *Columbia* crew hit close to home for the Naval Postgraduate School (NPS) community. McCool, a 1992 graduate of the aeronautical engineering program, was one of 39 astronauts who has studied at NPS, more than any other institution in the world at the graduate level. His quote lives forever on a panel in the NPS Centennial Timeline, stretching the length of Root Hall on campus, a reminder to his legacy, and to the university's place in manned space flight.



Astronaut Eugene Cernan salutes the American flag on the surface of the moon during the Apollo 17 moonwalk in 1972. Cernan was the most recent man to walk the moon's surface.

NPS' legacy in American space flight begins when the effort itself began, when Navy pilot Scott Carpenter (Navy General Line School) walked the campus in 1959. Carpenter was selected in the first round of astronauts to lead the U.S. in the space race with the Soviet Union. His astronaut class, known as the Mercury Seven, were the first Americans in space, and paved the way for the 332 astronauts to date that have followed in their footsteps.

The Mercury Seven were part of an unforgettable era, and a series of historic firsts that proved the U.S. to be a leading contender in the quest to explore the vastness of space. NPS Professor and former astronaut John Phillips (DRMI, 1977) recalled being a child in the thick of the space race, and the beginning of a lifelong goal that would take him on four space missions, and ultimately, to the Naval Postgraduate School.

"It was just before my tenth birthday that the first human space flight happened. It was Yuri Gagarin, the Russian cosmonaut," explained Phillips, one of four former astronauts currently serving as faculty at NPS. "He flew in space in 1961, and I decided that's what I wanted to do. To me, it's about exploration. If I had been born a hundred years earlier, maybe I would have wanted to be a polar explorer or a jungle explorer. But in my particular period of history, space was the beckoning field of exploration.

"It's human nature to want to explore and learn about your environment," he continued. "As soon as a culture stops doing that and starts looking only inward, they stagnate. I think that exploring the unknown keeps our culture and our society viable and dynamic."

That exploration has taken shape through the National Aeronautics and Space Administration, NASA, and the space programs they oversaw: Mercury, Gemini, Apollo, Skylab and Space Transportation System (STS), also known as the shuttle program. With the early programs' astronauts commonly selected from a pool of military candidates, NPS had an opportunity to provide NASA with highly-qualified young pilots fit for spaceflight. In the years since Carpenter, that involvement has developed tenfold, and NPS has maintained a commitment to furthering the U.S.' role in space exploration.

Retired astronaut and 1963 aeronautical engineering graduate Eugene Cernan is most noted for being the latest man to set foot on the moon. He served as Commander of *Apollo 17*, which launched December 7, 1972, alongside fellow NPS alumnus, Command Module Pilot Ronald Evans (Aeronautical Engineering, 1964). He was one of four NPS astronauts to serve in the Apollo program.

"I think in the Mercury through Apollo and early shuttle days, we were really taking some risk in space exploration," explained astronaut and NPS alumnus Capt. Kenneth Ham (Aeronautical Engineering, 1996). "Shuttle missions today are still risky, however our engineers, flight controllers, and maintainers have had the luxury of working on the same vehicles over and over again to learn how to hammer the risk out of the flights."

After 30 years and 133 missions, the space shuttle fleet is scheduled to retire this year, with NPS alums Capt. Mark Kelly (Aeronautical Engineering, 1994) and Chris Ferguson (Aeronautical Engineering, 1991) commanding the final two missions, STS-134 *Endeavour* and STS-135 *Atlantis* respectively. NPS' new Dean of Students, Capt. Alan Poindexter (Aeronautical Engineering, 1995), and Ham also commanded two of the program's five final shuttle missions aboard STS-131 *Discovery* and STS-132 *Atlantis* in 2010.

Most recently, STS-133 *Discovery* retired after her final mission on March 9. It was a bittersweet moment for former astronaut and current

Continued on page 16

Capt. Michael Smith, USN
April 30, 1945 - January 28, 1986

Smith graduated from the Naval Academy in 1967, and went on to receive his Master of Science degree in Aeronautical Engineering from NPS in 1968. He served a tour in Vietnam as a pilot aboard the USS Kitty Hawk. He was selected to the astronaut program in 1980, and completed a year-long training program for the shuttle missions. Smith was posthumously awarded the Congressional Space Medal of Honor and the Defense Distinguished Service Medal. He is survived by his wife and three children.

"Sometimes when we reach for the stars, we fall short, but we must pick ourselves up again and press on despite the pain."
President Ronald Reagan
January 28, 1986

Cmdr. William McCool, USN
September 23, 1961 - February 1, 2003

McCool graduated from the Naval Academy in 1983, and went on to receive his Master of Science degree in Aeronautical Engineering from NPS in 1992. He flew 24 different aircrafts during his time in the Navy, and was a seasoned pilot before he was selected to the astronaut program in 1996. Before the launch of STS-107, McCool noted the importance of their mission to helping future generations through discoveries in science and technology. McCool was posthumously awarded the Congressional Space Medal of Honor and the Defense Distinguished Service Medal. He is survived by his wife and three children.

"Mankind is led into the darkness beyond our world by the inspiration of discovery and the longing to understand. Our journey into space will go on."
President George W. Bush
February 1, 2003

Four of the Final Five Shuttle Missions are Commanded by NPS Graduates

Poindexter (‘95)
Commander STS-131

Ham (‘96)
Commander STS-132

STS-133

Kelly (‘94)
Commander STS-134

Ferguson (‘91)
Commander STS-135

Scott Carpenter (‘59)
Launched on Aurora 7,
First American to Eat Solid
Food in Space

Edgar Mitchell (‘60)
Launched on Apollo 14,
Lunar Module Pilot,
First NPS Graduate on the Moon

Mike Coats (‘79)
STS-41-D
Piloted First Flight of Shuttle
Discovery, Became Director of the
Johnson Space Center in 2005

Carpenter (‘59)
First Future Astronaut
to Graduate from NPS

Cosmonaut Gagarin
First Human to Enter Space

Shepard
Launched on Freedom 7,
First American in Space

Cernan (‘63)
Piloted Gemini 9

Gordon (‘64)
Piloted Gemini 11

Carpenter (‘59)
After 28 Days in Navy SeaLab,
Became First Astronaut/Aquanaut

Gordon (‘64)
Launched on Apollo 12,
Command Module Pilot,
Second Mission to
Land on the Moon

Cernan (‘63)
Launched on Apollo 10,
Lunar Module Pilot,
Dry Run for Apollo 11

Apollo 11
First Men to Land
on the Moon

Evans (‘64)
Launched on Apollo 17,
Command Module Pilot

Weitz (‘64)
Pilot Skylab 2

Lousma (‘65)
Pilot Skylab 3

Carr (‘61)
Commander Skylab 4

Eugene Cernan (‘63)
Launched on Apollo 17,
Last Man to Step Foot on Moon

Jack Lousma (‘65)
Received the Distress Transmission
from Apollo 13 -
“Houston, we’ve had a problem.”

Weitz (‘64)
Commander STS-6

Lousma (‘65)
Commander STS-3

Overmyer (‘64)
Pilot STS-5

Hauck (‘64)
Pilot STS-7

McBride (‘71)
Pilot STS-41-G
Leestma (‘72)
Mission Specialist STS-41-G

Hauck (‘64)
Commander STS-51-A

Hilmers (‘78)
Mission Specialist STS-51-J

Overmyer (‘64)
Commander STS-51-B

Leestma (‘72)
Mission Specialist STS-28

Coats (‘79)
Commander STS-29
Springer (‘71)
Mission Specialist STS-29

Hauck (‘64)
Commander STS-26
Hilmers (‘78)
Mission Specialist STS-26

Overmyer (‘64)
NASA Lead Investigator
for the Challenger
Disaster

Hilmers (‘78)
Mission Specialist STS-36

Springer (‘71)
Mission Specialist STS-38

Hilmers (‘78)
Mission Specialist STS-42

Leestma (‘72)
Mission Specialist STS-45

Reightler (‘84)
Pilot STS-60

Bursch (‘91)
Mission Specialist STS-68

Jett (‘89)
Pilot STS-72
Scott (‘80)
Mission Specialist STS-72

Bursch (‘91)
Mission Specialist STS-77

Rominger (‘87)
Pilot STS-80

Reightler (‘84)
Pilot STS-48

Coats (‘79)
Commander
STS-39

Bursch (‘91)
Mission Specialist STS-51

Rominger (‘87)
Pilot STS-73
Lopez-Alegria (‘88)
Mission Specialist STS-73

Jett (‘89)
Pilot STS-81

Noriega (‘90)
Mission Specialist STS-84

Rominger (‘87)
Pilot STS-85

Scott (‘80)
Mission Specialist STS-87

Altman (‘90)
Pilot STS-90

Rominger (‘87)
Commander STS-96

Williams (‘87)
Mission Specialist
STS-101

Altman (‘90)
Pilot STS-106

Lopez-Alegria (‘88)
Mission Specialist
STS-92

Jett (‘89)
Commander STS-97
Noriega (‘90)
Mission Specialist STS-97

Dan Bursch (‘91)
Returned from the ISS
Aboard STS-111,
Set Record for Time in Space

Curbeam (‘90)
Mission Specialist STS-98

Rominger (‘87)
Commander STS-100
Phillips (‘77)
Mission Specialist
STS-100

Bursch (‘91)
Mission Specialist, to
the ISS on STS-108
Kelly (‘94)
Pilot STS-108

Altman (‘90)
Commander STS-109

Frick (‘94)
Pilot STS-110

Lopez-Alegria (‘88)
Mission Specialist STS-113
Herrington (‘95)
Mission Specialist STS-113

Williams (‘87)
Flight Engineer
Soyuz TMA-8

Kelly (‘94)
Pilot STS-121
Nowak (‘92)
Pilot STS-121

Jett (‘89)
Commander
STS-115
Ferguson (‘91)
Pilot STS-115

Lopez-Alegria (‘88)
Flight Engineer
Soyuz TMA-9
Stayed on the ISS

Ferguson (‘91)
Commander STS-126

Kelly (‘94)
Commander STS-124
Ham (‘96)
Pilot STS-124

Foreman (‘86)
Mission Specialist
STS-123

Frick (‘94)
Commander STS-122
Poindexter (‘95)
Pilot STS-122

Lopez-Alegria (‘88)
Returns from ISS,
Broke Bursch’s
Record of Time
in Space

Phillips (‘77)
Mission Specialist
STS-119

Altman (‘90)
Commander STS-125

Foreman (‘86)
Mission Specialist STS-129

Robert Curbeam (‘90)
Launched on STS-116,
Set Record for Most Spacewalks
During a Single Flight

1960 1970 1980 1990 2000 2010

MERCURY GEMINI & APOLLO SKYLAB SPACE TRANSPORTATION SYSTEMS

STS-129 *Atlantis* awaits launch to the International Space Station on Nov. 15, 2009 at Kennedy Space Center in Cape Canaveral, Fla. NPS Alumnus Mike Foreman served as Mission Specialist for the 10-day mission.

Director of Johnson Space Center, Mike Coats (Aeronautical Engineering, 1979). A retired Navy flight instructor, Coats piloted STS-41-D, the maiden voyage of the Shuttle *Discovery*, on Aug. 30, 1984. He piloted the *Discovery* again on two subsequent missions in 1989 and 1991, and watched proudly as she touched down at Kennedy Space Center for the last time.

The *Discovery* was one of six shuttles built at the program's genesis: *Enterprise*, *Columbia*, *Challenger*, *Discovery*, *Atlantis* and *Endeavour*. The *Enterprise*, used as a test flight orbiter, was retired early into the program, and parts were repurposed for other shuttles. Having been restored for display, the shuttle is currently on loan to the Smithsonian Institute. The *Columbia* and *Challenger* were lost in two separate accidents in 1986 and 2003.

The shuttle program allowed NASA to master the science of living and working in Low Earth Orbit (LEO), but it has not come about without a cost. In the course of the U.S. space program, 13 crew members have lost their lives in spaceflight missions, with two shuttle disasters that shook the nation and the space community. Before the *Columbia* disaster, STS-51-L *Challenger* was lost on January 28, 1986, when a faulty O-ring caused the shuttle to break apart 73 seconds after liftoff. NPS alum Capt. Michael Smith was among those killed in the *Challenger* disaster.

"If you die before your time, you want people to remember you with a smile. And that is certainly the case with both Mike Smith and Willie McCool," said Coats.

In their memory, NPS established the Astronaut Michael J. Smith, CAPT, USN and Astronaut William C. McCool, CDR, USN Astronautics Award. The award was established to recognize outstanding graduates of NPS' Space Systems curricula.

Eligible candidates continue to emerge from the halls of NPS, eager to help fulfill the U.S.' commitment to space exploration in the long term. The question lies in funding to develop the necessary technologies to make those missions happen.

The 2010 NASA Authorization Act outlines the future goals and expectations, with new areas of focus for the coming years including manned spaceflight to asteroids and Mars. Upon signing the Act, President Barack Obama noted that the U.S. space program has inspired generations, and will continue to do so well into the future.

"To me, the space program has always captured an essential part of what it means to be an American—reaching for new heights. Stretching beyond what previously did not seem possible," said Obama in a speech at Kennedy Space Center on April 15, 2010. "And so, as President, I believe that space exploration is not a luxury. It's not an afterthought in America's quest for a brighter future. It is an essential part of that quest."

So for the NASA astronaut corps, the opportunities that have come with space exploration have certainly been memorable ones. Their efforts have resulted in invaluable scientific discoveries and human achievements in an environment that, even still, holds more questions than answers.

The technologies being explored onboard the International Space Station (ISS), and at research centers around the world, are key to enabling astronauts to safely leave LEO, which extends from 100-1,240 miles (160-2,000 km) above earth's surface, for the vastness of outer space. Technologies to recycle air, water and resources are being developed to help astronauts achieve an unprecedented distance flight to Mars.

Based on the earth's orbit around the sun, the distance between Earth and Mars varies, but even at their closest point, the two are still millions of miles apart. This presents a unique challenge when considering manned spaceflights to Earth's neighbor planet.

"When we finally leave earth orbit to go to Mars or an asteroid, you are on your own for the first time in human history," said Coats. "You are really on your own. Even when you are walking around on the moon, you are two and a half days away from home if there is an emergency.

"When you are on the Space Station," he continued, "you are an hour from home. But when you fire those engines to leave earth orbit, you are two years from home."

> *To me, the space program has always captured an essential part of what it means to be an American—reaching for new heights. Stretching beyond what previously did not seem possible … I believe that space exploration is not a luxury. It's not an afterthought in America's quest for a brighter future. It is an essential part of that quest.*
>
> President Barack Obama
> April 15, 2010

The Authorization Act outlines the plan to maintain a U.S. presence on the ISS through 2020, with astronaut transport aboard Russian spacecrafts for the short term until the growing commercial spaceflight industry develops those capabilities. This is a growing field, with companies like Space Exploration Technologies Corp. and Boeing exploring manned spaceflight technology.

Retired astronaut and current Dean of the College of Aeronautics at the Florida Institute of Technology, Winston Scott (Aeronautical Engineering, 1980) notes that the uncertainty for aspiring astronauts is obvious, but shouldn't deter anyone from the field. Scott retired from NASA and the Navy in 1999, with two shuttle missions, STS-72 and STS-87, under his belt. He now works with students who aspire to a career in space.

Retired Navy Capt. Winston Scott conducts a pre-flight check of NASA's T-38 aircraft before taking off for Kennedy Space Center for the launch of STS-72 *Endeavour*.

"Even though the NASA programs are scaling down and it's questionable how quickly the private programs are going to come along," said Scott, "I really believe that the pendulum will swing back the other way, and in the coming years, we will see an increase in support and funding for space exploration. I tell students to prepare themselves for what they want, because the opportunities will come."

Even with the uncertainty of the space program looming, there is no doubt that the U.S. remains committed to greatness in space. No longer a race, the collaboration with 15 partner nations on the ISS has opened doors to a promising, collaborative future in space exploration, perhaps not so distant from those inspired words by Willie McCool.

In his final words before leaving the moon, Cernan expressed confidence that history would see man on the moon again. His hopeful message is one echoed by the space community as NASA prepares to bid farewell to *Atlantis* and *Endeavour*.

"As I take man's last step from the surface, back home for some time to come … I'd just like to say what I believe history will record – that America's challenge of today has forged man's destiny of tomorrow," said Cernan. "And as we leave the moon at Taurus-Littrow, we leave as we came and, God willing, as we shall return, with peace and hope for all mankind. Godspeed the crew of Apollo 17."

STS-131 Discovery Commander, Capt. Alan Poindexter, poses in the Cupola of the International Space Station when Discovery docked with the ISS in early 2010. Following this mission, Poindexter retired from NASA and now serves as NPS' Dean of Students.

Space Systems Academic Group

Education Beyond a Reach for the Stars

While supporting NASA with exceptionally qualified candidates for the astronaut corps is a high and noble calling, NPS' Space Systems Academic Group educates far more officers in preparation to lead and manage operations in the space domain. Working extensively on a variety of satellite and other space technologies, the education program offers students two paths – Space Systems Operations or Space Systems Engineering – both of which prepare military officers and Department of Defense civilians for developing and implementing space capabilities for the Navy and DoD. Satellites are critical to defense, used for communication, mapping, and gathering information on adversaries. The SSAG has Chair Professorships with NASA, the National Reconnaissance Office, and the Navy's Program Executive Office for Space Systems, to ensure that the curricula and opportunities for students fulfill the needs of the DoN, DoD and the U.S. Space Program.

Naval Postgraduate School Alumni Astronauts

Graduate	Program	Year
Scott Carpenter	General Line School	'59
Edgar Mitchell	Aeronautical Engineering	'60
Gerald Carr	Aeronautical Engineering	'61
Eugene Cernan	Aeronautical Engineering	'63
Dick Gordon	Operations Research	'64
Ronald Evans	Aeronautical Engineering	'64
Paul Weitz	Aeronautical Engineering	'64
Bob Overmyer	Aeronautical Engineering	'64
Rick Hauck	Mathematics, Physics	'64
Jack Lousma	Aeronautical Engineering	'65
Michael Smith	Aeronautical Engineering	'68
Bob Springer	OR, Systems Analysis	'71
Jon McBride	Aeronautical Engineering	'71
Dave Leestma	Aeronautical Engineering	'72
John Phillips	DRMI	'77
Dave Hilmers	Electrical Engineering	'78
Mike Coats	Aeronautical Engineering	'79
Winston Scott	Aeronautical Engineering	'80
Ken Reightler	Aeronautical Engineering	'84
Mike Foreman	Aeronautical Engineering	'86
Kent Rominger	Aeronautical Engineering	'87
Jeff Williams	Aeronautical Engineering	'87
Mike Lopez-Alegria	Aeronautical Engineering	'88
Brent Jett	Aeronautical Engineering	'89
Scott Altman	Aeronautical Engineering	'90
Carlos Noriega	Space Systems Operations	'90
Bob Curbeam	Aeronautical Engineering	'90
Dan Bursch	Engineering Science	'91
Chris Ferguson	Aeronautical Engineering	'91
William McCool	Aeronautical Engineering	'92
Lisa Nowak	Astro and Aeronautical Engineering	'92
Steve Frick	Aeronautical Engineering	'94
Mark Kelly	Aeronautical Engineering	'94
John Herrington	Aeronautical Engineering	'95
Alan Poindexter	Aeronautical Engineering	'95
Ken Ham	Aeronautical Engineering	'96
Marcos Pontes	Systems Engineering	'98
Scott Tingle	Aviation Safety School	'03
G. Reid Wiseman	Space Systems Certificate	'08

CNO Roughead Keynotes Winter Graduation Ceremonies

By Barbara Honegger

Chief of Naval Operations Admiral Gary Roughead inspired graduates from all the military services and nine allied and coalition partner nations during his keynote address at the Naval Postgraduate School's Winter 2011 commencement ceremonies, Mar. 25.

NPS President Dan Oliver, who introduced the 29th CNO as "my boss," thanked Roughead for his leadership "that has had an extraordinary impact on the Naval Service."

"For those of us who believe in the mission of NPS, Admiral Roughead has been especially supportive," Oliver said. "He is the first CNO in decades to commit resources to the Naval Postgraduate School at a level befitting a flagship institution. He re-energized our governance and oversight mechanisms, set standards for our support, and directed the dollars to meet those standards. The palpable facility improvements from which we are all benefitting are the result of this CNO's commitment to graduate education for the officer corps. This is his second [NPS] graduation as CNO, which is also a first in decades, and I could not be more proud to have him with us again."

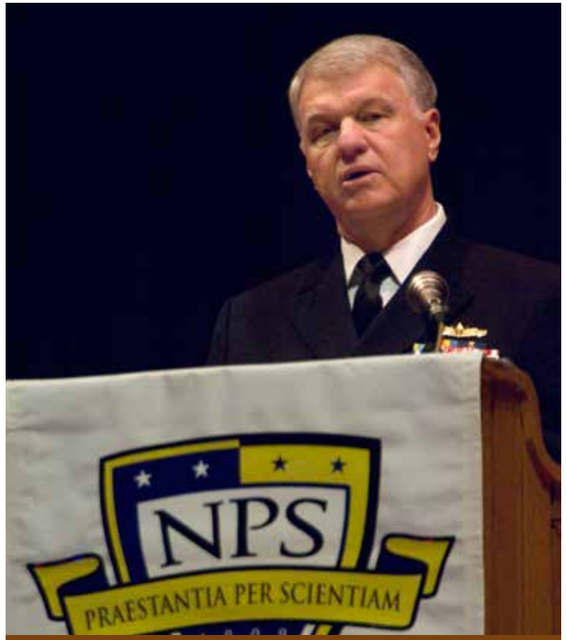
The CNO who recently stood up the Navy's Cyber Command was quick to return the compliment, and seemed equally proud to address the nearly 200 officer students along with their friends and family members in King Auditorium.

"The Naval Postgraduate School is a unique institution among our elite schools whose twin objectives of cutting-edge, actionable research and pertinent instruction by a renowned faculty stand as a challenge to other great institutions. President Oliver's dedication to building its strength has just been aptly demonstrated by his having led the school as a whole to a highly-uncommon, 10-year accreditation," Roughead said to sustained applause, and then turned to the graduates.

"Today is a very special day of great achievement for each one of you nearly 200 accomplished students and future leaders who will play a major role in institutions of great importance to your nations," the CNO said. "You have benefitted from the rigorous and comprehensive education you have received here at the Naval Postgraduate School, where you have had time to reflect, to think analytically, to question assumptions, and benefit from exposure to one another's ideas as much as from your challenging and relevant degree programs.

"All of you here today, with your various professional backgrounds and the knowledge and relationships you now have, make me confident that we will chart a safe course through some challenging times and successfully shape tomorrow for future generations," Roughead continued. "Those who have earned an MBA geared towards public sector finance will be singularly equipped to tackle the juxtaposition of national security requirements and pressurized defense budgets. Those now steeped in defense acquisition and resource management will be asked to lead our charge to improve the speed at which we field cost-effective and integrated warfighting capabilities for those who go into harm's way. We will look to those who have earned advanced degrees in engineering and applied sciences to develop tomorrow's Navy at the confluence of cyber and directed energy technologies. And we will rely on regional security studies experts in our approach to strengthen bilateral and multilateral relationships for the broad challenges we face in common.

"I see great opportunity in your future careers to shape and lead, opportunity to bring to bear the benefits of an NPS education for the complexities of our time. Be confident that you are well equipped for what lies ahead of you as military leaders and defense and security experts, and don't forget that few, if any, are better equipped than you," Roughead added.



Chief of Naval Operations Adm. Gary Roughead rallied nearly 200 graduates from all the military services and nine allied and coalition nations at the Naval Postgraduate School's Winter 2011 commencement ceremonies, Mar. 25, his second graduation keynote in three years. NPS President Dan Oliver thanked Roughead for his unwavering support "as the first CNO in decades to commit resources to the Naval Postgraduate School at a level befitting a flagship institution."

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>
> Adm. Gary Roughead
> Chief of Naval Operations

"Congratulations on your accomplishments today," he concluded, "and thank you for everything you will do in the interests of our common security and prosperity in the years ahead."

Following the ceremony, the newly-minted graduates and their family members gathered in the Barbara McNitt Ballroom in Herrmann Hall for the ceremonial cutting of the Winter 2011 class cake. Sharing the honors with the CNO, Oliver and Executive Vice President and Provost Leonard Ferrari was top student award winner Marine Corps Maj. Jacob Reynolds, who collectively sliced through the frosting layers with precision.

"I can't express strongly enough how wonderful it's been to be a student here at NPS. As an officer matures into the senior ranks, critical thinking skills become invaluable in both staff and command assignments, and the NPS faculty and curricula hone these priceless skills of thinking and writing critically," Reynolds said. "You learn how the academic world integrates with military operations and strategy, and because of the joint and multinational nature of the student body, you get to know a broad demographic of U.S. military officers from across the services, foreign officers and civilians you would never otherwise meet."

On Mar. 15, top faculty and students were recognized for outstanding achievement at the Winter Quarter Awards ceremony. Highlighting the honors was the presentation of the Bronze Star Medal to Air Force Special Agent 1st Lt. Kevin Burleson for meritorious achievement and exemplary leadership in intelligence operations while assigned to Air Force Special Investigations in Baghram, Afghanistan. Reynolds received the Navy League Award for Highest Academic Achievement and the Chief of Naval Personnel Award for Academic Excellence in Manpower Systems Analysis; and distance learning student, Susan LaShomb, Technical Manager for Maritime Surveillance Systems at the Naval Undersea Warfare Center, won the Outstanding Academic Achievement Award for a Department of Defense student.

"Though I undertook an NPS master's program in Program Management to increase my knowledge of Department of Defense acquisition, I acquired far more value than just an increase in my knowledge base," LaShomb said. "In addition to broadening my understanding of logistics, software, manufacturing, finance and systems engineering and advancing my program management and team skills, my research project was extremely rewarding and important to the Department of the Navy. My NPS degree in combination with on-the-job assignments resulted in advancement at work to Naval Undersea Warfare Center Technical Program Manager for the Maritime Surveillance Systems Program and NAVSEA Acting Distributed Undersea Sensor Systems Technical Warrant Holder."

The outstanding faculty awards went to Professor of Physics Ronald Brown, who won the Richard W. Hamming Faculty Award for Interdisciplinary Achievement; Professor Anders Strindberg of the Center for Homeland Defense and Security who received the Lieutenant Commander David L. Williams Outstanding Professor Award; and Dr. Donald Muehlbach, Jr. who won the Meyer Award for Teaching Excellence in Systems Engineering (Distance Learning).

"I'm overjoyed with the acknowledgement of my work," said Brown, an expert in modeling explosive detonations who came to NPS in 2002 after retiring from four decades in the aerospace industry. "I'm very grateful for the opportunities provided here at the Naval Postgraduate School to follow a lifelong dream of teaching and, more recently, a desire to contribute to the education and critical decision-making of our fine armed forces members."

Of the 262 graduates, 139 came from the Navy, 22 Marine Corps, 11 Air Force, three Army, one Air National Guard, and one Coast Guard. The class also included 72 Department of Defense civilians and 13 international students from nine allied and coalition nations. Degrees awarded were three Ph.D.s, 95 Masters of Science, 110 Masters of Arts, 51 Executive Masters of Business Administration, seven Masters of Business Administration, two Mechanical Engineering, and five dual degrees. Seventy-five graduates also earned Joint Professional Military Education (JPME) certification from the Naval War College. Sixty-five degrees were awarded in absentia to students unable to attend due to operational commitments.

Chief of Naval Operations Adm. Gary Roughead met with a select group of students during his visit to the university. The new graduates held an in depth discussion with the CNO on their educational experiences and research at NPS over breakfast in the El Prado Room.

Alumnus Marshall Carter Brings Ethics, Leadership to Guiding the New York Stock Exchange

From the halls of NPS to the Chief Executive Officer of the New York Stock Exchange, the comprehensive Operations Research program at NPS helped prepare alumnus Marshall Carter for over 30 years in finance.

By Amanda D. Stein

From the Purple Heart to the New York Stock Exchange, NPS alumnus Marshall Carter has had quite a career. He has worked for some of the most powerful companies in banking, and now serves as Chairman of the Board of Directors of the NYSE Group, also known as the New York Stock Exchange. He also regularly lectures on leadership and management to graduate students for the Sloan School of Management at the Massachusetts Institute of Technology (MIT) and Harvard's Kennedy School of Government.

But before he became the head of one of Wall Street's most powerful organizations, and a speaker on ethical leadership, Carter served two tours in Vietnam with the United States Marine Corps, where he was awarded the Navy Cross and Purple Heart.

He was well educated through the services, receiving his Bachelor of Science degree in Civil Engineering from the U.S. Military Academy at West Point, and his Master of Science degree in Operations Research (OR) and Systems Analysis from the Naval Postgraduate School in 1970.

He transitioned to the Reserves in 1975, and looked for a fresh start in the private sector. That time in America was a difficult one, however, and the heated debate over the Vietnam War had left employers wary of hiring vets.

"At the end of the Vietnam War, if you were a heavy combat vet, you couldn't get a job. Because at that time, people hated the war, and the public seemed to also hate the service people. I got rejected by 85 companies. It was very tough for vets to get a job."

Despite the difficulties he found in transitioning his career out of the public sector, he was always confident that some of the biggest lessons he learned in the services, such as ethics, leadership and the value of education, would translate seamlessly to the private sector.

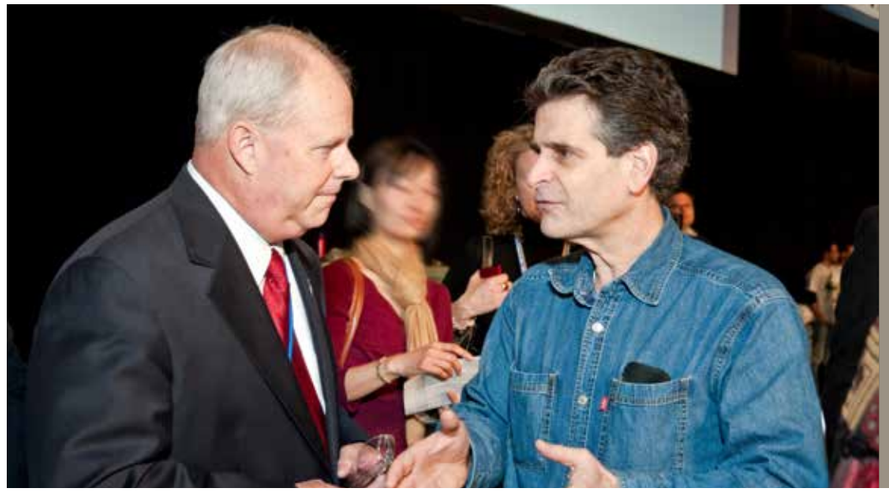
Relying on his experiences from years in the service, Carter secured a position at the Chase Manhattan Bank, working towards establishing a system similar to the Defense Department's planning, programming and budgeting system.

"There was a direct application of the skills I had learned in the graduate program at NPS, and in working at the Marine Corps headquarters in the Pentagon."

Banking ultimately proved to be something that Carter was very good at, and was a place where his skill set and values were both needed and applicable. "I think that a graduate education really gives you the intellectual knowledge that you need to progress upward in your career.

Continued on page 22

SAIC CEO and NPS Alumnus Walt Havenstein Brings Passion to Promoting STEM Fields to America's Youth



Walt Havenstein, left, meets with FIRST Founder Dean Kamen, right, before opening ceremonies of the Washington, D.C. Regional FIRST Robotics Competition, Mar. 23. Havenstein serves as the Chief Executive Officer of SAIC, as well as the Chairman of the Board of Directors for FIRST.

By Amanda D. Stein

The Naval Postgraduate School has long been vested in the STEM – or Science, Technology, Engineering and Mathematics – disciplines, not only for the thousands of military officers and DoD civilians who have crossed the stage in King Auditorium, but also for the dozens of young adults interning across campus at any given time. NPS alumni see first-hand the value of education in these technical arenas.

For graduate Walt Havenstein, however, promoting the sciences is both his day job, and his free time. Havenstein is the Chief Executive Officer of Science Applications International Corporation (SAIC), which uses scientific, engineering and technology applications to solve real-world problems. He also serves as the Chairman of the Board of Directors of For Inspiration and Recognition of Science and Technology (FIRST), a not-for-profit organization founded to inspire young people's interest and participation in science and technology.

"Many of the solutions to national problems, and ways to improve our lifestyles here in the United States and around the world, come from science, technology, engineering and mathematics," explained Havenstein, who received his master's degree in electrical engineering from NPS in 1977. "Virtually all of our standards of living are based on invention and innovation that start with a fundamental understanding of science, the application of science through engineering, and inevitably, mathematics. Whether it's the house you live in, the water you drink, the energy you use, or the healthcare that we take for granted, all are based on solutions or inventions that came from the application of basic science and mathematics."

Naturally, as the STEM workforce ages, the need for fresh young faces is constant. For the past 15 years, Havenstein has worked closely with FIRST to help inspire new generations of scientists and engineers through programs and competitions for young people around the world.

FIRST provides mentor-based STEM programs and support to children K-12, emphasizing the value of their achievements and providing opportunities for college scholarships. Havenstein has a noticeable passion for FIRST, noting that there should be an emphasis on the STEM fields in much the same way sports are encouraged at an early age.

"If you are going to inspire young people to want to deal with the rigors of these academic disciplines, you have to capture their imaginations relatively early in life, and reinforce that imagination by making what I will call heroes out of scientists and engineers, the way we do out of athletes."

When Havenstein took his position at SAIC in 2009, he brought his excitement for FIRST with him, garnering support throughout the company, and adding new volunteers and mentors to the roster. The collaboration allows SAIC to give back to their community by providing young people with an academic coach to help in their projects.

"The future generation of our nation … frankly the people who are going to find a cure for cancer, and the people who are going to find better ways to protect our environment and be good stewards of our natural resources … are going to be building upon a firm understanding of science, mathematics and technology," said Havenstein.

One of FIRST's widely-recognized projects, First Lego League (FLL),

Continued on page 22

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>
> Walt Havenstein
> CEO, Science Applications International Corp.
> Electrical Engineering, '77

Alumnus Carter Continued

And I think it gives you a certain level of maturity."

Carter continued working for Chase for 16 years before relocating to Boston to serve as Chairman and Chief Executive Officer of the State Street Bank and Trust Company, from which he retired almost 10 years later. In an industry recently plagued by self-interest and a sense of public distrust, Carter has maintained the same values instilled in him at a young age, and earned him a reputation as an honest and fair leader.

"I think there's been a degradation of ethics in the country for the last 25 years or more. Solid ethics used to be a cornerstone of American business," he said. "The example of leadership really starts at the top. A company can't have a good ethical foundation if the CEO isn't walking the talk, and setting the example.

"The military has a real edge up in ethics, and there are a few reasons for that," he added. "The first is that in the service academies, you get ethics training very early on, starting at 18 or 19 years old. And the second reason, and perhaps the most important – poor ethics in the military can get people killed or wounded.

"In the civilian world," Carter continued, "like finance for example, no one is dying, but there are still major consequences. When leaders focus too much on making money for the corporation, as opposed to making contributions that benefit society, the result is people are broke or they lose their homes."

In his lectures at Harvard and MIT, Carter notes the qualities that an effective leader possesses – traits that are necessary everywhere from the battlefield to the floor of the stock exchange.

"To me, as someone who has been in the workforce going on 50 years now, effective leadership all boils down to three essential skill sets: the first is technical competence in your job; the second is adaptability, because things change every six to 18 months in both the military and civilian world.

"And the third," Carter continued, "is the ability to communicate with people that work for you, around you, and above you. After 50 years of practicing those, they seem to me to be the most important, and ones that you really learn in the military."

"Those skills, regardless of your job or position, are still the core of leadership."

While ethical and effective leadership are key, Carter also notes that one has to have balance in order to be successful. Reflecting upon his own time at NPS, Carter knows the pressure facing young officers working on their graduate education. He recalled that he and his peers used to joke that attending NPS was like serving an overseas deployment in your living room because the workload was unforgiving, and the rest was a luxury. Balance comes in the form of a blend of work and family time, and a hobby to turn to when the pressure of either begins to mount.

"Life is like a three-legged stool, you have your work, family and religion, and a third outside interest that is about you as a person. And you can't have a two-legged stool. It falls over. So you have to have this – whatever it is, running marathons, coaching your kids' soccer team – this is an activity or event that treats you as an individual."

As for Carter, he spends his free time flying his seaplane over New England, an activity he says allows him to clear his head of work challenges and focus on his hobby.

"As all military pilots know, you don't take a problem with you when you are going to fly an airplane," he said, "You have to leave that on the ground."

A view of the FIRST Robotics Competition in Washington, D.C. on Mar. 23 shows all 65 teams competing in the event. FIRST competitions like these offer scholarship opportunities to get young people involved in the STEM fields.

Alumnus Havenstein Continued

allows kids to build Lego-based robots to perform specific tasks in competition. Paired with a mentor, each team gets the chance to apply math and science to the task of designing, building, testing and programming the robots. The challenge encourages the teams to think like scientists and engineers while boosting their confidence in their own technical abilities.

Through programs like the FLL and the First Tech Challenge, students can compete for one of over 900 scholarship opportunities available. Many of the competitors have even met with President Barack Obama, whose Educate to Innovate campaign, launched in 2009, has the same goal as FIRST. A few FIRST teams were invited to attend the White House Science Fair late last year, representing the program with a robot that plays soccer, and a steering wheel cover that monitors safe hand positions while driving.

"Reaffirming and strengthening America's role as the world's engine of scientific discovery and technological innovation is essential to meeting the challenges of this century," announced Obama upon debuting the campaign in 2009. "That's why I am committed to making the improvement of STEM education over the next decade a national priority."

The goal, Havenstein explained, is to make children and young adults aware of the opportunities available in the STEM fields, and to give them a chance to excel and be recognized for their efforts and abilities. In his work with scientists and engineers through SAIC, and from his own experience in the field, Havenstein understands the potential in having so many fresh, new perspectives, and in shifting the way young people view the sciences.

"We don't solve our problems in the media, or in the entertainment world, or in sports and leisure," said Havenstein. "The vast majority of issues that we face everyday get solved by the application of science, mathematics, engineering and the adoption of technology."

Naval Postgraduate School Earns Landmark Second Consecutive Ten-Year WASC Reaccreditation

NPS' Western Association of Schools and Colleges Planning Group celebrates the university's receipt of the maximum ten-year reaccreditation, for the second consecutive term. The group, from left to right, are: Co-Chair and Operations Research department Chair, Dr. Rob Dell; Co-Chair and Vice President for Academic Affairs, Dr. Doug Moses; Vice President for Information Resources and Chief Information Officer, Dr. Christine Haska; Executive Director of Institutional Planning and Communications and Accreditation Liaison Officer, Dr. Fran Horvath; Professor of Systems Engineering, Dr. Dave Olwell; and University Librarian Eleanor Uhlinger. Not shown: Vice President for Finance and Administration Colleen Nickles. Also, Professor of National Security Affairs, Dr. Dan Moran served as faculty co-chair in the early phases of the review.

By Barbara Honegger

The Naval Postgraduate School has just received the highest possible ten-year reaccreditation from the Western Association of Schools and Colleges (WASC), for the second consecutive term.

In a March 7 letter notifying NPS President Dan Oliver of the maximum reaccreditation, WASC President Ralph A. Wolff said the visiting team remarked the school was "a model for others" in mapping coursework to program learning outcomes, conducting and supporting rigorous and robust program and curriculum reviews, and utilizing direct measures of student learning. The letter noted that "NPS has been energized under strong leadership," from the offices of Oliver and Executive Vice President and Provost Leonard Ferrari to every academic department and research institute on campus.

"NPS' leadership, especially the President and Provost, should be praised for setting the tone that this is an important campus-wide effort," said Vice President for Academic Affairs Dr. Doug Moses, co-chair of the WASC Planning Group. "This second consecutive ten-year reaccreditation is a strong endorsement for the high quality of our academic programs and the dedication and effectiveness of our faculty."

Oliver, in turn, thanked and praised the entire NPS community.

"I want everyone to know how proud I am to be here and to have been part of the team that worked so hard to earn this highest possible ten-year WASC reaccreditation," Oliver said. "It was a true all hands effort – an all-inclusive win – involving all of the campus community. It's both a great achievement and recognition that we've met the exacting WASC accreditation criteria with flying colors."

That external peer review process included in depth visits and assessments by a Capacity and Preparatory Review team and an Educational Effectiveness Review team, together consisting of two university presidents, two experts on educational effectiveness, a professor of electrical engineering, and a university vice president for finance and administration. Overseeing and shepherding the four-year reaccreditation effort was the WASC Planning Group with input from select faculty, campus leaders.

"The WASC Planning Group was the heart and soul of the process, a team of immensely dedicated individuals who kept a continuous, rigorous and systematic self-review process moving for four years, on top of their regular duties," said Dr. Fran Horvath, Executive Director of Institutional Planning and Communications, and member of the group.

"This is a tremendous achievement for the Naval Postgraduate School – not many schools get the full ten years," Horvath stressed. "It's a strong reaffirmation that we have been and are on the right track, that we truly have been dedicated to continuous improvement, and that this has been recognized by our regional reviewing agency who are top professionals in their fields."

"We should be very proud of this ten-year accreditation," agreed Planning Group Co-Chair, and Operations Research department Chair Rob Dell. "It's a recognition, after an external review process by a group of our peers, that we really care about providing high-quality academic programs and instruction to our students and that we have the robust means to provide that."

Members of the Planning Group reflected on why the outcome was so successful.

"The major reason for the success, in my opinion, is the degree to which NPS embraced and leveraged the WASC reaccreditation process as a framework to encourage real change across campus," noted Moses. "We were also successful because of the special culture here at NPS. We had a strong culture of self-evaluation, even before the process began, where we're highly attuned to our sponsors. Our natural way of operating is that we're continually asking if we're providing high-quality, military-relevant programs for our Navy and broader defense community sponsors."

As for the future, Moses emphasized that the ten-year reaccreditation "is not an ending, it's the beginning of the next phase of a continuous process. The process has already set expectations by both WASC and ourselves that we can strive to meet in the next decade, and that provides the motivation to continue and even better this outstanding track record of improvement."

Security Experts, NATO Leadership Headline Quarter's Lecture Series

IA Staff Report

Several experienced leaders and security experts took the stage in King Auditorium throughout the Winter quarter as part of the Secretary of the Navy Guest Lecture (SGL) series. NPS Executive Vice President and Provost, Dr. Leonard Ferrari, began the quarter with the State of NPS address on Jan. 18 to a packed auditorium of students, staff, faculty and guests.

He offered a brief overview of some of NPS' noteworthy departments, projects and faculty accomplishments from 2010. As exciting as the past achievements have been, he noted, there are only more to come for 2011.

As an institution known as the nation's premier national security research institution, Ferrari explained, NPS offers an entirely unique learning environment, rich with research opportunities that directly impact the Navy. Some examples that he gave included small satellites being developed in the Space Systems Academic Group under the direction of Jim Newman, research in modeling ice melt in the Arctic Ocean, and the advancement of weather processing capabilities.

"Our greatest asset is definitely our students," said Ferrari. "And I say that not because you outnumber me terribly in this audience, but because I haven't been at an institution where faculty consider students to be colleagues. You truly are colleagues to our faculty. You bring so much to the table. So much more than in civilian universities, and I am speaking from 35 years of experience in civilian universities."

Later in the quarter, Dr. Peter W. Singer, Foreign Policy Senior Fellow and Director of the 21st Century Defense Initiative at the Brookings Institution, presented on the topic of his latest book, "Wired for War: The Robotics Revolution and Conflict in the 21st Century" (Penguin, 2009). The book, which made "The New York Times" bestseller list in its first week of release and has been named Book of the Year by "The Financial Times," is official reading at the National Defense University and a wide range of U.S. Air Force and Navy and Royal Australian Navy organizations.

Dr. Peter W. Singer, Foreign Policy Senior Fellow and Director of the 21st Century Initiative at the Brookings Institution, discussed the revolution in unmanned military systems and its far-reaching implications at the Naval Postgraduate School's Secretary of the Navy Guest Lecture, Feb. 15 in King Auditorium.

"We're in the 'game changer' that we've been saying was coming," Singer stressed, "a new experience of war in which robots and unmanned systems operated at distances of thousands of miles are being deployed at an exponential rate and changing the face of warfare. Just a few years ago, images like these were still science fiction, but today they're science fact," he noted as a metal menagerie of land, sea and air robots flashed on the screen behind him. "These unmanned vehicles aren't future visions. They're an integral reality on today's battlefields."

The following week, NATO's Supreme Allied Commander Transformation, French Air Force General Stéphane Abrial, strongly defended the post-Cold War relevance of "the most successful alliance in history" on Feb. 24.

The first European to be permanently appointed to head a strategic NATO command in the Alliance's 60-year history, Abrial was in Monterey to keynote the second NATO Building Integrity Conference (see sidebar) on the theme of reducing corruption and building integrity, transparency and accountability in defense ministries.

Abrial was introduced by NPS Dean of Students, Capt. Alan Poindexter, who noted that the two had flown together in Operation Desert Storm in the early 1990s when the speaker commanded the French Air Force's 5th Fighter Squadron.

"Thank you very much, Captain Poindexter, for the opportunity to address such a vibrant audience of Naval Postgraduate School faculty and students. I am all the more grateful, as I don't believe visits by NATO commanders to this school are all that frequent. NATO has become almost synonymous with the concept of 'Atlanticism' and we don't have a very strong presence on the Pacific Coast.

"Physical distances aside, the most important message I have for you today is that NATO is as relevant to the whole of its member nations' territories and the whole of their forces as it was when it was founded six decades ago," said Abrial. "It is often described – rightly I believe – as the most successful [mutual defense] alliance in history. If we look back to its record during the Cold War, NATO epitomized Sun Tzu's observation that the best victory is winning without battle."

To wrap up the SGLs for the quarter, Mary Ann Davidson, the Chief Security Officer at Oracle Corporation, one of the largest software companies in the world, spoke about the future of cyber defense.

The former U.S. Navy civil engineer spoke about the importance of cybersecurity, the challenges involved in promoting it, as well as the importance of implementing concepts from different fields into the cyber defense arena. She praised the military mindset and said that many aspects of military life and military history influence the way she looks at cybersecurity.

Davidson spoke about how the military has become more dependent on Information Technology (IT) and therefore more vulnerable to it.

"Warfighting now relies on an IT backbone," said Davidson. "Information has become your force multiplier and now the network itself has become the battlefield."

She cautioned, however, that while technology can give a great advantage, it can also be an Achilles' heel and although the U.S. has a powerful military, a weaker opponent could cause serious problems by attacking U.S. networks and stealing technology. She assured that technology could not be an advantage if current and potential enemies can easily have access to it.

"I'm here mostly to thank you," concluded Davidson. "I want to thank each and everyone of you for your service. I know that seems to be a trite phrase but I truly mean it. If I could do something that makes our systems better for the people who work in defense and intelligence I have earned my salary and I've justified my existence."

NATO Supreme Allied Commander Transformation, Gen. Stéphane Abrial, addresses attendees at the Building Integrity conference in Monterey.

Abrial Keynotes USPTC, NATO Conference on Combating Corruption

By Amanda D. Stein

As the designated United States Partnership for Peace Training and Education Center (USPTC), the Naval Postgraduate School works closely with other Partnership for Peace Training and Education Centers and other related institutions on long-term capacity building programs and opportunities to coordinate on important initiatives. One such initiative, Building Integrity (BI), aims to reduce the risk of corruption in the security sector by promoting accountability and transparency.

In support of that initiative, the North Atlantic Treaty Organization (NATO) coordinated with the USPTC to host the 2011 NATO Building Integrity Conference from Feb. 23-25, held at the nearby Monterey Plaza Hotel.

"The consequences of corruption are the deepening effects of organized crime, and public distrust," explained Dr. Huguette Labelle, Chair of the Board of Directors for Transparency International. "The BI initiative has been a tremendous success in delivering world-class tools to tackle a problem that many have believed in the past to be too difficult or too sensitive to tackle."

The conference brought together military and civilian leaders from NATO allied and partner nations and the public and private sectors to share ideas and tools for BI. The various panels throughout the week looked at the impact of corruption on development in Afghanistan, and understanding corruption in conflict environments. The conference fostered collaboration, and really brought to light the importance of supporting partner nations in BI efforts.

"Building integrity is not about NATO giving lessons to everyone else on how to combat corruption," explained NATO Supreme Allied Commander Transformation, Gen. Stéphane Abrial. "It is about partners coming together on an equal footing to advise concrete ways to enhance transparency and accountability to reduce the risk of corruption in defense establishments."

Executive Vice President and Provost Leonard Ferrari began the conference noting the opportunities that NPS has had in serving as the USPTC, and in supporting various NATO programs and initiatives. NPS regularly collaborates with institutions in partner countries to help in their path to NATO membership, and that support continues as members and partners come together to promote global peace and stability.

"This is a cooperative endeavor in which everyone stands to learn from best practices and to fill in where there are gaps," echoed Abrial. "Fighting corruption is a very complex endeavor, which requires a wide array of tools and different perspectives. Building Integrity brings just that to the table, once again, in a true partnership setting. It does so in an even more phenomenal way than by just bringing together NATO members and partner nations. The BI initiative has integrated a wide array of organizations, prominent among which are our co-hosts today, the Naval Postgraduate School and Transparency International … We are stronger when we are cooperative."

Committee on the Future Continues Process of Discovery

Committee on the Future members (top left to right): retired Rear Adm. Jerry Ellis, Vice Adm. Jody Breckenridge, retired Capt. Karl Hasslinger, NPS Executive Vice President and Provost Leonard Ferrari, Mr. Mark Garenflo and Dr. Karl van Bibber; (lower left to right) Prof. Frank Giraldo, Ms. Colleen Nickles, Dr. Christine Haska, Dr. Sunder Ramaswamy, Dr. Doug Moses, retired Rear Adm. James McGarrah and retired Capt. James Durham.

By Joan Ackerman

The Naval Postgraduate School is used to challenging the status quo. Whether it's new inventions, tools, discoveries or academic programs, NPS is home to experimentation and innovation, an institution with academic quality and a commitment to academic excellence as its enduring values.

Leadership say this is precisely why imagining the future of NPS is an exciting opportunity for the Committee on the Future (CoF) as it continues its discovery process, helping shape a vision of what is possible and what is imperative as the committee forges ahead in support of the school's strategic planning process.

"The Committee on the Future is using the springboard of the school's legacy to support, in a persuasive and compelling way, the continuation of our mission of exceptional education and research programs," said NPS President Dan Oliver.

In January, the committee and its 10 working groups met to assess their progress in collecting and evaluating research, benchmarking data, consultations with peer organizations, and personal interviews. The results were impressive, according to committee leadership, a rich mix of internal and external information that provoked thought and invoked lively discussions that will form the basis for the committee's final report to campus leadership in August 2011.

"I'm honored and pleased to be working with such a dynamic group," said CoF Chair retired Rear Adm. Jerry Ellis, "all of whom understand the value of NPS, and are committed to demonstrating the school's value and impact to those it serves."

In early February, Ellis and Dr. Christine Haska, Vice President of Information Resources and Chief Information Officer, traveled to Washington, D.C. to conduct interviews with 21 key leaders of the Departments of Defense and Navy including the Chairman of the Joint Chiefs of Staff, the Chief of Naval Operations, the Under Secretary of the Navy, Vice Chief of Naval Operations, Director of the Naval Staff, Director of the National Security Agency, Chief of Naval Research, and the Commander of the Naval Sea Systems Command, among others. The interviews provided vital information for the committee's efforts and helped to frame DoD/DoN priorities and expectations.

Recommendations for NPS priorities in the future included establishing cyber, energy and climate change education and research; marketing the "value" of NPS; developing unmanned systems; continuing leadership development; expanding international relations, classified facilities, investment by other military services, civilian agencies, and international sectors; and using budget reductions to focus mission priorities.

NPS was noted as a high-quality institution, both in terms of education and research programs. The value of an NPS education was emphasized as the distinction between training and education, and the school's "value" was recognized as fundamentally the intersection of young, joint, international future leaders with the latest science and technology.

Future global trends that were consistently mentioned as an important factor in DoD/DoN planning include cyber competency, climate change, unmanned systems, energy, budget reductions and international relations, topics noted by Executive Vice President and Provost Leonard Ferrari in January when he told the committee that "because NPS is a demand-driven institution, our educational mission must expand to include global partnerships, and our research efforts must remain responsive to DoD/DoN priorities as we advance into another century of serving our nation's security."

In late April, Ellis will present an update on the Committee to the NPS Board of Advisors. In May, Ellis and Haska will travel to the Air Force Institute of Technology, the Naval War College and again to Washington, D.C., to further interview institutional leaders and directors of federal agencies as the committee's discovery process continues.

A More Common Sight on Campus

Jaclyn Clement Kinney is captured here following the successful defense of her doctoral dissertation entitled, "The Bering Sea: Communication with the Western Subarctic Gyre, Mesoscale Activity, Shelf-Basin Exchange, and the Flow Through Bering Strait."

Kinney received her Doctor of Philosophy this past quarter as a civilian oceanography student at the Naval Postgraduate School. Her work, supervised by world-renown Arctic expert Research Professor Wieslaw Maslowski, advances understanding of the exchange of water between the Bering Sea and the North Pacific, at the surface and at depth, via the western Aleutian Island passes.

Understanding the physical oceanography of the Bering Sea is of clear importance to the U.S. Navy due to the increase in ship traffic and exploration of natural resources that will likely coincide with the ongoing retreat of sea ice in the Western Arctic.

Chief of Naval Operations Adm. Gary Roughead adorned Kinney with the academic regalia that come with a doctoral degree during Winter quarter graduation ceremonies, but it wasn't too long ago that students like Jaclyn would have been a much rarer sight on campus.

Doctoral programs at NPS have been in existence for several years, but the university has made a concerted effort to increase its number of doctoral candidates. In fact, this past 2010 academic year saw a total of 89 doctoral candidates engaged in studies across campus – just a few years prior, in 2006, that figure was less than half of that. It's an effort that continues to the day.

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