VOL. 3, ISSUE 1 - THE NAVAL SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS NEWSLETTER

STEM 2 Stern

2015 SPRING NEWSLETTER

DIVERSITY

Inside:

Success Story

Follow a first-generation student on his journey through an NPS internship and master's degree.

HBCU/MI Spotlight

Meet the new director of the HBCU/MI program and learn about a new program aimed at strengthening the cybersecurity pipeline.

Diverse Future

Find out how SSC Atlantic is building a broader, more diverse workforce of the future.

THE DIVERSITY ISSUE

Promoting diversity in STEM outreach, education and workforce initiatives is a cornerstone of naval STEM. Our individual perspectives and life experiences—spanning ethnicity, gender, religion, age, sexual orientation, disabilities, socioeconomics and beyond—make the naval science and engineering community richer, better-rounded and ultimately more cognitively diverse. We recognize the value of a diverse STEM workforce, and are working hard to develop one that leads to greater innovation and more scientific breakthroughs for our Sailors and Marines. This edition is dedicated to highlighting some of the STEM diversity initiatives across the Department of the Navy. The pictures included on the cover of this newsletter illustrate the diverse people, jobs, environments and opportunities that comprise our exceptional naval community. See page 10 for details on the images.

MESSAGE FROM THE NAVAL STEM EXECUTIVE

An important part of my job here at the Office of Naval Research (ONR) is serving as the naval STEM executive—and it is a responsibility I take extremely seriously. I'm honored to support the vital efforts of the STEM community. Your dedicated work to advance and promote STEM education and careers will help ensure our nation maintains its leadership in the world of science and technology innovation.

The U.S. Navy and Marine Corps are absolutely dedicated to your success. We are here to partner with you, and to support you. Ongoing efforts are taking place across the Navy and Marine Corps to promote STEM. As the naval STEM executive, we sponsor and support events like Maritime Robot X Challenge in Singapore; RoboSub competitions in San Diego; and RoboBoat races in Virginia and Maryland. We sponsor student internships, and recently announced a new partnership effort with community colleges to advance our cyber workforce. Across other commands, Navy and Marine Corps program managers and subject matter experts regularly appear in school classrooms and host STEM events, like Girls' Day Out, STEAM (STEM with Arts) academies and various other camps and programs. Reservists also can frequently be found serving as judges for STEM-related contests.

Through these efforts we hope to incite, inspire and motive our elementary, middle, high school and college students; we want to get them interested in and exposed to the value of engineering and science disciplines. After all, the key to a successful science and technology organization centers on our people, organization and mission. Notice that the first component of that vision is people. Our current scientists and engineers are building the fleet of tomorrow, but to be a successful organization, we will need a talent pool to follow in their footsteps. To do that, we must ensure that the youth of today are ready to join the pipeline as the next generation of STEM professionals.

One of the essential components in growing our STEM workforce pipeline—and ensuring the nation's and our military's ability to maintain our technological edge—is recognizing the importance of diversity in the STEM, Navy, Marine Corps and national workforce. One of my top priorities is to encourage a diverse student community committed to science-related college majors and subsequent careers. We need contributions and intellectual inputs from this nation's entire vibrant population to help ensure and develop breakthroughs in our technological future. I rely on good inputs from a wide array of talented people and perspectives, every day. Within the Navy STEM community, we will continue to focus on diversity as an essential component of success.

Thank you for the work you are doing to encourage our nation's youth, young adults and educators to engage with STEM topics and potential careers. We are proud to stand with you as you help our students see that through STEM, the world is limitless and theirs to own.

Sincerely,

M. W. Winter
Rear Admiral, U.S. Navy
Chief of Naval Research
Naval STEM Executive

In December 2014, Rear Adm. Mathias W. Winter became the Office of Naval Research's 25th Chief of Naval Research with concurrent flag responsibilities as Director, Innovation Technology Requirements, and Test & Evaluation.

ROLLING TO VICTORY: Rear Adm. Lorin Selby, Commander, Naval Surface Warfare Center, congratulates the the Orange County High School Robotics Team on their state championship win. (Photo by Page Dowdy)

RURAL NAVSEA-SPONSORED ROBOTICS TEAM TAKES VIRGINIA STATE CHAMPIONSHIP

BY KERRY CONNELLY, NAVAL SEA SYSTEMS COMMAND

The Orange County High School Hornets Robotics Team knows how to perform under pressure. The 17-member team, hailing from Orange County, Virginia, didn't just design, build and test their very own robot, they also went head-to-head with 51 teams from across the state to take home the top prize in the ultimate test of engineering and teamwork skills—the FIRST Tech Challenge (FTC) Virginia State Championship.

Widely recognized as the premier high school engineering challenge, the FTC gives students just three months to conceptualize, design, build, program, modify and test robots to compete in a competition that changes annually. This year's challenge, the "Cascade Effect," grouped teams into temporary alliances to use their robots to collect plastic balls and place them into rolling goals on a 12'x12' field.

Under the tutelage of mentor Simon Gray, the Hornets blew away the competition at two qualifying tournaments before advancing to the state level, where they allied with Herndon and Albemarle High Schools to take the championship. Gray, who serves as the Naval Sea Systems Command (NAVSEA) headquarters STEM Assistant Program Manager, couldn't be more proud.

"Coming from a rural location, the team has overcome significant challenges to access engineering resources," he said. "Not only have NAVSEA guidance and the NDEP (National Defense Education Program) grant increased our team's awareness of Navy engineering, but the personal interaction with Navy civilians has promoted an understanding of engineering fundamentals."

The team advanced to the FTC East Super-Regional Championships in Scranton, Pennsylvania. There they competed with 72 teams for chances to participate in the 2015 FTC World Championship in St. Louis, Missouri.

Kerry Connelly is a contractor for NAVSEA.

DIVERSITY IN THE NAVAL WORKFORCE

How do you solve complicated problems? Do you think about the whole problem, or maybe the parts of the problem, rolling things over in your mind to see them from different angles? The Romans had a term for this: "diversus", i.e., turned different ways.

It is the mission of ONR's Education and Workforce office to ensure access to workers with diverse and agile STEM competencies—where and when needed—using approaches with measurable positive benefits.

This edition of STEM2Stern highlights the importance of diversity in the naval workforce in solving complicated global security problems; celebrates the incorporation of diversity into our culture and operations; and challenges us to scrutinize issues from different angles to develop optimal solutions.

Thank you for being an integral part of our diverse and agile problem-solving team.

Dr. Michael Simpson has been the Director of Education and Workforce at the Office of Naval Research since December 2014. In this role, he leads the Naval STEM Coordination Office, ONRs STEM grants portfolio and other diversity education and workforce initiatives for the Department of the Navy.

GIRL POWER: Girls Day Out participants pause for a photo op on the stairs at the College of Charleston. (Photo by Joe Bullinger)

SSC ATLANTIC STEM OUTREACH ENSURES DIVERSITY OF THE FUTURE WORKFORCE

BY SUSAN PIEDFORT, SSC ATLANTIC CORPORATE COMMUNICATIONS AND PUBLIC AFFAIRS

Space and Naval Warfare Systems Center Atlantic's (SSC Atlantic) STEM outreach is helping to generate a broader, more diversified base of future scientists and engineers by working with underserved and underrepresented groups through a variety of volunteer outreach efforts.

SSC Atlantic is partnered with the College of Charleston and Trident Technical College to get girls excited about STEM at this year's Girls Day Out Summer Camp in Charleston, South Carolina.

More than 60 Charleston-area students participated in the two-day event, which included a technology expo, interactive computer science and cybersecurity activities, business etiquette training, a tour of the College of Charleston campus and meetings with college admissions. They also spent the night in a campus dorm. The Honorable LaDoris (Dot) Harris, U.S. Department of Energy, Director of the Office of Economic Impact and Diversity, kicked off day two of the camp with an inspirational keynote speech.

"You are amazing," Harris said to the girls. "It's important for you to know that as we take our journey—dreaming big makes it happen."

Students said their favorite part of the event was the technology expo, which included hands-on activities and science experiments with representatives from six colleges and nine local businesses.

While the girls participated in the expo, parents learned about admissions requirements from colleges and universities and the importance of taking the proper courses in middle school and high school to prepare for STEM majors in college.

"This event is a wonderful opportunity for the girls," said Barbara Grigsby, high school teacher and grandmother of two students who participated in the camp. "I especially liked the cybersecurity activity because children today really don't realize the impact that social networking has on their future."

Female engineers from SSC Atlantic and local industry partners shared their backgrounds, explained their work and encouraged the girls to think about STEM careers.

Cmdr. Marcia Ziemba, SSC Atlantic's executive officer, participated on a Women In STEM panel with other female professionals in the STEM field.

THE SSC ATLANTIC IMPACT

(Charleston, South Carolina; Hampton Roads, Virginia and New Orleans, Louisiana)

400 volunteers with more than **10,500** hours served at:

34 Elementary schools
37 Middle schools
37 High schools
8 Magnet schools
46 Robotic teams

Other SSC Atlantic Diversity Efforts

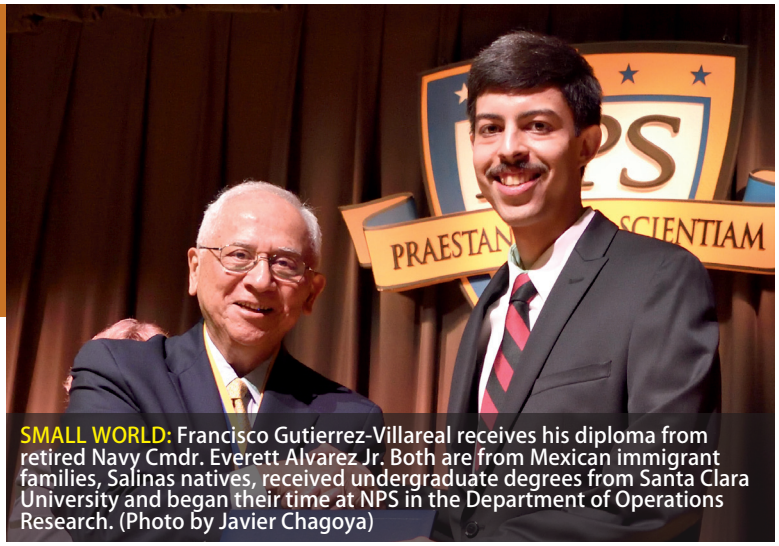
SSC Atlantic also engages in STEM efforts with the National Society of Black Engineers (NSBE), Society of Women Engineers (SWE) and the South Carolina Historically Black Colleges and Universities (HBCU) Consortium.

SSC Atlantic instituted the first professional NSBE chapter in Charleston, which in turn initiated several junior chapters, including one at R. B. Stall High School. Through NSBE, volunteers stress the importance of STEM and higher education to students. At a "Walk for Education" event, held at a Goose Creek High School football game, volunteers and students from the NSBE Junior chapter walked the football field to promote STEM education. More than 200 students pledged to pursue higher education. Working with NSBE, HBCU, SWE and Women in Defense, SSC Atlantic is ensuring it recruits a diverse and capable workforce of the future.

WALKING FOR HIGHER EDUCATION: NSBE participants at the "Walk for Education" at Goose Creek High School signed up 200 students who pledged to pursue higher education. (Photo by Joe Bullinger)

3C and MONARCH: A NAVAL INTERNSHIP SUCCESS STORY

BY FRANCISCO GUTIERREZ-VILLARREAL



SMALL WORLD: Francisco Gutierrez-Villareal receives his diploma from retired Navy Cmdr. Everett Alvarez Jr. Both are from Mexican immigrant families, Salinas natives, received undergraduate degrees from Santa Clara University and began their time at NPS in the Department of Operations Research. (Photo by Javier Chagoya)

I am a first-generation college student and the son of immigrant parents from Mexico. I began my college education by taking summer classes at Hartnell Community College while still in high school; I enrolled full-time after graduation. With the financial support of a Matsui Foundation Scholarship, I transferred to Santa Clara University, where I graduated with a Bachelor of Science in economics. To be a competitive applicant for an economics Ph.D. program, which was my goal, I needed to have an exceptional mathematics background, so I returned to Hartnell to complete additional math courses.

Upon my return, I began engaging with the Hartnell STEM community. I interacted with highly intelligent, motivated students who were studying to become scientists and engineers, and with faculty who were passionate about teaching the skill sets necessary to compete in today's global economy. As a result, I began to see my career goals change.

The Hartnell STEM program partners with Community College Catalyst (3C) at the Naval Postgraduate School (NPS) for summer internships. As part of a spring internship prep course at Hartnell, I was able to secure an internship in the NPS Operations Research department. The primary objective of this project was to understand the way in which individual decision makers used and shared information, and how this information led to collective action by the group. My role was to take raw data collected from experiments and convert it into information using Python, a programming language. This was my first time working with code and I was instantly hooked!

While interning, I met a Scholarship for Service (SFS) student. He told me how anyone with a bachelor's degree, in any subject, could apply for the NPS Monarch Master's program in computer security. During a 3C event, I received more information and spoke with the SFS coordinator. This, along with my growing interest in programming, made me consider a career in computer security.

I applied to the NPS SFS Monarch program that fall and was accepted into the January 2013 cohort. In addition to my course work, an internship was required. Last summer, I secured an internship as a computer network defense analyst for an organization in Washington, D.C. Upon receiving my Master's in Computer Science, I will begin my new position at the same organization.

None of this would have happened without my 3C internship and exposure to new opportunities at NPS. The education and experiences I received will soon contribute to our country's national security.

For nine years, the Naval Postgraduate School (NPS) has partnered with Hartnell Community College, a Hispanic-Serving Institution in Salinas, California. During that time, more than 150 Hartnell STEM students, the majority of whom are first-generation Americans and college attendees, have interned at NPS and worked with world-class faculty and graduate military students.

Francisco's story is one of many—a shining example of how opening up opportunities to diverse populations benefits both the Department of Defense and America's security. Francisco's work during his NPS internship resulted in his co-authorship of a peer-reviewed paper and a feature on Udacity, a website offering interactive online courses. You can read both via the links below.

Peer-review paper: http://ow.ly/M1rOf
Udacity feature article: http://ow.ly/M1s7N

HISTORICALLY BLACK COLLEGES and UNIVERSITIES / MINORITY INSTITUTIONS

WHAT IS HBCU/MI?

The Department of the Navy's Historically Black Colleges and Universities/Minority Institutions (HBCU/MI) program is designed to increase participation of HBCU/MIs in the Navy's research, development, test and evaluation programs and activities.

As part of its mission, the program strengthens the capabilities of the institutions to conduct basic and applied research, and increases the quality and quantity of STEM programs with a focus on minority researchers and graduates.

These objectives are achieved through the implementation and performance of three program goals:

- Expanding opportunities for schools to successfully compete for grants and contracts for basic and applied research
- Offering scholarships, fellowships and internships to students pursuing degrees in STEM studies
- Leveraging existing relationships between HBCU/MI school sytems to inspire and engage diverse students in STEM studies

MEET THE HBCU/MI LEADER: **TONY SMITH**

Over the course of my civilian career, I have had the pleasure of working with phenomenal people at a variety of exciting, cutting-edge agencies. I have spent the majority of my naval civilian career assigned to science and technology (S&T) efforts through the Program Executive Office, Littoral Combat Ships program office. I have also managed S&T projects for the Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology).

As a naval officer with more than 20 years' experience, I visited exotic places while serving with extraordinary Navy leaders. Yet I must admit my new position as the Department of the Navy's Historically Black Colleges and University/Minority Institutions (HBCU/MI) program manager has so far proven to be my most rewarding position.

Working with the smartest minds in academia, as well as with extraordinary university and college administrators and faculty, has been extremely humbling and gratifying. Upon accepting my current position, I made it my goal to share with those inside and outside of the HBCU/MI community the core philosophy I believe will best advance our program: communicate, coordinate and cultivate the involvement of research, internships, fellowships and scholarships in STEM disciplines for HBCU/MI's.

I look forward to advancing the Navy's opportunities for HBCU/MIs while also encouraging successful collaborations with these important institutions.

MEETING OF THE MINDS: Anthony Smith, HBCU/MI program manager, met with faculty members of the San Diego State University (SDSU) Research Foundation to share information on programs and opportunities available to students and faculty. SDSU is designated a Hispanic-Serving Institution. (Photo by Eric Anderson)

Tony Smith has been the HBCU/MI program manager at the Office of Naval Research since October 2014.

THE FACES OF CYBER SECURITY: Vice Adm. Jan Tighe, commander, U.S. Fleet Cyber Command/U.S. 10th Fleet, joins AGORA high school students during Fayetteville State University's Cybersecurity Symposium. (Photo by Ivan Watkins)

FAYETTEVILLE'S AGORA PROJECT STRENGTHENS PIPELINE FOR CYBER-STEM PROFESSIONALS

BY DR. CURTIS B. CHARLES AND STEVE HUNTER, AGORA PROJECT

From its beginnings, the U.S. Navy has been a leader in leveraging STEM technology and developing science-based solutions to defend U.S. interests. Today's investments in STEM will help the Navy maintain its edge as the high-tech service of the future.

To help with that goal, the Center for Defense and Homeland Security (CDHS) at Fayetteville State University (FSU) launched its AGORA (nAvy next-Generation Outreach and Recruitment initiAtive) Project. This three-year grant, provided by the Office of Naval Research, is designed to strengthen the pipeline of U.S. citizens—especially female, underserved populations and students with disabilities—with the Cyber-STEM knowledge and skills required to operate in cyberspace.

"The AGORA project could serve a cornerstone for attracting future cyber warriors," said Vice Adm. Jan E. Tighe, commander, U.S. Fleet Cyber Command/U.S. 10th Fleet, who visited with AGORA Executive Director Dr. Curtis Charles and students while participating in FSU's recent Cybersecurity Symposium. "The program is helping ensure that the next generation of cyber experts are well informed and motivated to address the ever-evolving threat in cyberspace from a very early age."

CDHS has partnered with Cumberland County Schools in North Carolina to provide 150 exceptional 9th grade students access to this program. Starting in the 2014-2015 school year, a cohort of 50 students will be selected to participate in Cyber-Saturday Academy sessions each year.

Forty-five FSU students will serve as peer mentors during the academy and will guide students through a variety of topics, including:

- Secure Chat Server with an Intelligent Bot
- HTML5/CSS through page scraping and hosting the site from Node.js
- Password Cracking and Code Breaking with an Introduction to Databases
- WIFI / RF Cracking
- Spoofed Electronic Communications
- Steganography, Digital Water Marking, Visual Cryptography and Compression
- Data Fusion of Geospatial/ Temporal Analysis and Social Forensics with Google Earth, Facebook, Twitter, Foursquare and other popular websites APIs
- "CICADA 3301" Style Puzzle with a Capture the Flag Objective

Each summer, 25 of the top Cyber-Saturday Academy students will be selected to participate in a four-week Summer Cyber Boot Camp. Each of these students will receive a stipend of $500 for their participation and compete in the AGORA "Hackaton Competition," with first place receiving a $10,000 scholarship, second place a $5,000 scholarship and third place a $2,500 scholarship.

FSU is a historically black, regional university and is part of the University of North Carolina system. FSU is the second-oldest public institution of higher education in the state. FSU offers nearly 60 degrees at the bachelor, master and doctoral levels. With nearly 5,000 students, FSU is among the most diverse institutions in the nation.

STUDENT SPOTLIGHT

Jennifer Pendleton

School: United States Naval Academy, Annapolis, Maryland **Grade:** Senior (First Class)

Major: Systems Engineering **Hometown:** Huntland, Tennessee

How did you become interested in STEM? My involvement in an after-school robotics program in middle school sparked my interest in computers and engineering. This interest led me to choose math and science courses in high school. Upon graduation, I decided to attend USNA to study systems engineering. I soon learned about the USNA STEM Center and all of its volunteer programs for young students. Naturally, I was very excited to participate, and my first event was an all-girls day focused on introducing STEM to middle-school girls. The impact I was able to make in just a few short hours with the girls was such a rewarding experience that I became hooked on STEM!

What has been the best part of the USNA experience for you? The camaraderie at USNA is unlike any other college in the United States. There is a culture of helping one another and building each other up. We operate under the motto, "One team, one fight," which is exhibited in the dorm, on the athletic field and in the classroom. The bonds I have made with my classmates are lifelong, and I wouldn't have been able to make it without them.

What's next for you? When I graduate, I will become a nuclear surface warfare officer aboard USS Shiloh (CG 67), stationed in Yokosuka, Japan. After my first tour, I'll return stateside to be trained as a nuclear power officer and serve on an aircraft carrier.

Ali Olinger

School: Virginia Tech, Blacksburg, Virginia

Location of Internship: Marine Corps Systems Command (MCSC), Quantico, Virginia

Branch: PdM Engineer Systems, PM Combat Support Systems

Mentor's Name: Nicholas Sifer

How did you become interested in STEM? I always enjoyed math and science classes growing up, which led me to major in engineering. I wasn't really exposed to STEM-focused activities as a child, but was fortunate to have opportunities to engage with children and young adults in STEM activities while in college. As a member of the Society of Women Engineers, I organized outreach days for local Girl Scout troops to spark their interest in STEM. I've been able to continue my involvement with STEM outreach as an MCSC employee by serving as an engineering mentor at the STEM Camp at Quantico Middle/High School and volunteering at the Science & Engineering Festival at the Washington D.C. Convention Center. I truly enjoy getting the next generation excited about STEM and opening their eyes to careers they may not have known about or considered.

What was the best part of your internship? Getting to work on a variety of projects and knowing the end products support the warfighter. Each project has unique and often unpredictable challenges—I enjoy getting to solve those problems with other engineers, logisticians and project officers. Everyone's ultimate goal is to get the best product possible in the Marines' hands.

What's next for you? I plan to continue developing my leadership and technical skills and pursue my master's degree in engineering while continuing to support MCSC.

GIRLS-ONLY STEM DAY AT USNA SPARKS INTEREST IN STEM CAREERS

BY SARAH DURKIN, U.S. NAVAL ACADEMY

BUILDING A NEW ENVIRONMENT: Middle-school girls engineer aquaculture habitats during Girls Day Only STEM Day at the U.S. Naval Academy. (Photo by MCSN Nathan Wilkes)

A group of middle-school girls gathered around a long wave tank, watching to find out if the coming wave would destroy the small cardboard houses they had built on wooden stilts and placed in the sand at the end of the tank. The girls were in the coastal lab at the U.S. Naval Academy (USNA), learning about the science of tsunamis and how engineers design structures.

The tsunami simulation was one of 10 hands-on modules offered to middle-school girls attending the Girls Only STEM Day, held at the USNA's campus in Annapolis, Maryland. Coming from Maryland, Virginia, New York, Pennsylvania, New Jersey and Washington, D.C., 225 girls from diverse backgrounds participated in activities designed to showcase a range of STEM-related careers.

Featured exercises included launching straw rockets, exploring biometrics technology, investigating signs of life in "Martian" soil, detecting a "smallpox" outbreak, designing aquaculture habitats and programming robots. Through presentation of real-life applications of STEM, students saw the significance of studying these fields.

Parents also were invited to attend discussions on the importance of STEM education, preparing for college and nutrition, while students attended the workshop.

This event was part of an on going effort to encourage young women to pursue education and careers in STEM. Activities, led by 15 USNA faculty and 47 midshipmen, were not only engaging, but also gave students an opportunity to interact with women leading and mentoring in these fields.

"Every girl I talked to was enjoying herself and seemed to be genuinely excited about STEM and what she was learning throughout the day," said MIDN 2/C Kayla Coleman, lead midshipman for the event.

At the end of the day, students teamed up for the engineering design challenge, "Operation Rescue," in which they built a self-propelled vehicle to cross a zip line and carry small toy animals to safety. Using readily available materials such as balloons, cardboard and tape, the girls learned first hand the engineering design process.

MAKING WAVES: Instructor Jennifer da Rosa assists middle school girls as they test structures in tsunami simulation during Girls Day Only STEM Day at the U.S. Naval Academy. (Photo by CDR Janice Rice)

The event also served as a valuable leadership experience for the midshipmen volunteers. "My role was to test, model, present and oversee the afternoon design challenge, and I couldn't have asked for a more rewarding and hands-on leadership experience," said MIDN2/C Keely Simonson, lead midshipman for the design challenge.

In the end, student-participants became scientists, engineers and technologists for the day. Motivated by their active engagement in activities, and inspired by the women they met, each girl finished the statement, "I want to be..." and imagined a future where anything is possible.

The USNA STEM Center offers STEM programs for girls several times annually, with no cost for participation. The events are supported by the Office of Naval Research and the Naval Academy Foundation. For more information on this program, please visit: http://www.usna.edu/STEM/index.html.

PARTNERING FOR THE FUTURE

BY EMILY ESCALANTE, SSC PACIFIC INTERN AND DOMINGA SANCHEZ, UCSD CREATE

Space and Naval Warfare Systems Center Pacific (SSC Pacific) piloted the first "Noche de Ciencia e Ingenieria en Español" (translation: Science and Engineering Night in Spanish) event in San Diego, California, in August 2012. The event, conducted entirely in Spanish, was designed to celebrate the STEM potential of Spanish-speaking middle school students and their families. Since that initial kickoff, teachers, administrators, college students and STEM professionals have come together multiple times throughout the year to volunteer their time—sharing demonstrations, presentations and personal experiences centered on the pursuit of STEM degrees and careers with schools and organizations in the community.

To promote future sustainability, SSC Pacific has partnered with the University of California, San Diego's (UCSD) Center for Research on Educational Equity, Assessment and Teaching Excellence (CREATE) to transition the coordination of these events, now called "Ciencia Con La Familia" (translation: Science with the Family). CREATE's ability to leverage local student organizations through their academic network allows for increased participation and awareness. The lasting ties developed with San Diego's college organizations, including the Society of Hispanic Professional Engineers and MAES (Mexican American Engineers and Scientists) Latinos in Science and Engineering, will continue to evolve and provide a volunteer pool for future events. As these events continue to grow, SSC Pacific employees will keep working with the local community to inspire future Hispanic STEM innovators.

CAN YOU HEAR THIS? Bilingual volunteers interact with students and parents to showcase hands-on acoustic resonance concepts. (Photo by Sandra Medina)

FROM THE FRONT COVER

1. Aviation Machinist's Mate 2nd Class Mike Mabry, from Houston, Texas, performs maintenance on an MH-60S Sea Hawk helicopter attached to the Tridents of Helicopter Sea Combat Squadron (HSC) 9 aboard the aircraft carrier USS George H.W. Bush (CVN 77). (Photo by MC3 Brian Stephens)

2. Lt. Cmdr. Ben Wainwright, commanding officer of Underwater Construction Team One, conducts a surface supplied dive using the Kirby Morgan 37 dive helmet during diver training aboard the U.S. Army large landing craft USAV Matamoros (LCU-2026). (Photo by MC3 Tyler N. Thompson)

3. Ship's Serviceman 3rd class T'quila Williams reports a contact as the amphibious transport dock ship USS Green Bay (LPD 20) pulls into San Diego. (Photo by MC1 Class Elizabeth Merriam)

4. Cryptologic Technician 2nd Class Thomas Helsel, from Lordstown, Ohio, downloads anti-ship missile defense CHAFF rounds aboard the guided-missile destroyer USS Donald Cook (DDG 75). (Photo by MC2 Karolina A. Oseguera)

5. Naval Aircrewman 1st Class Joseph Jiardina, assigned to Helicopter Maritime Strike Squadron (HSM) 35, searches for debris in support of the Indonesian-led AirAsia flight QZ8501 search efforts. (Photo by MC1 Brett Cote)

6. Lt. William Becker examines a patient during a Pacific Partnership 2014 medical community service project at Diit District Medical Center in Tacloban, Philippines. (Photo by MCC Greg Badger)

7. Boatswain's Mate 1st Class Kathy Tonnah, from Troy, North Carolina, assigned to the amphibious assault ship USS Iwo Jima (LHD 7), prepares for a replenishment-at-sea with the Military Sealift Command fleet replenishment oiler USNS Charles Drew (T-AKE 10). (Photo by MC2 Yolonda Williams)

8. Sonar Technician 1st Class Daniel Lynch, from Annapolis, Maryland, left, assists Sonar Technician 3rd Class Darron Thomas, from Akron, Ohio, as he stands watch in the sonar control room aboard the Ticonderoga-class guided-missile cruiser USS Antietam (CG 54). (Photo by MCSN David Flewellyn)

9. Quartermaster Seaman Kylie Haake, from Wailuku, Hawaii, marks changes on a chart aboard the guided-missile destroyer USS Arleigh Burke (DDG 51). (Photo by MC2 Carlos M. Vazquez II)

10. Master-at-Arms 3rd Class Jessie Robinson takes Mirko (R 492) through his rounds on an obstacle course. The military working dogs are a key component to security at Naval Station Mayport. (Photo by MC1 Michael Wiss)

11. Aviation Machinist's Mate Airman Nathaniel Christerson, assigned to the Mighty Shrikes of Strike Fighter Squadron (VFA) 94, performs maintenance on an F/A-18C Hornet aboard the Nimitz-class aircraft carrier USS Carl Vinson (CVN 70). (Photo by MC2 John Philip Wagner Jr.)

12. Navy fullback Noah Copeland, center, celebrates the Navy victory in the 115th Army-Navy game in Baltimore. Navy beat Army 17-10. (Photo by EJ Hersom)

13. Hull Maintenance Technician 3rd Class Maya Gengenbacher, from Foley, Missouri, grinds a weld on a pump vent pipe aboard the Nimitz-class aircraft carrier USS John C. Stennis (CVN 74). (Photo by MCSN Ignacio D. Perez)

14. Aviation Boatswain's Mate (Equipment) Airman Robert Taylor, from Pensacola, Florida, lowers a catapult power cylinder on the flight deck of the Nimitz-class aircraft carrier USS Ronald Reagan (CVN 76). (Photo by MC3 Timothy Schumaker)

15. Aviation Electrician's Mate 3rd Class Maria Pandolpho, from Orlando, Florida, salutes a shipmate ashore on an elevator of the aircraft carrier USS Ronald Reagan (CVN 76). (Photo by MC3 Timothy Schumaker)

16. Boatswain's Mate Seaman Amaris Gracian cuts a stopper on a sponson aboard the aircraft carrier USS Carl Vinson (CVN 70) during a replenishment-at-sea with Military Sealift Command fleet replenishment oiler USNS Walter S. Diehl (T-AO 193). (Photo by MC2 Scott Fenaroli)

17. Aviation Structural Mechanic 3rd Class Donald Taylor, from Fort Worth, Texas, assigned to the Stingers of Strike Fighter Squadron (VFA) 113, inspects a brake line schematic drawing for an F/A-18C Hornet on the flight deck aboard the aircraft carrier USS Carl Vinson (CVN 70). (Photo by MC2 John Philip Wagner Jr.)

18. Chief Aviation Maintenance Administrationman Lonesh Ashley trains hose team members during a general quarters drill aboard the Nimitz-class aircraft Carrier USS Carl Vinson (CVN 70). (Photo by MC2 John Philip Wagner Jr.)

19. Cmdr. Raymond Barnes, executive officer of Strike Fighter Squadron 87, holds his daughter during the squadron's homecoming at Naval Air Station Oceana. (Photo by MC2 Alysia R. Hernandez)

20. Explosive Ordnance Disposal Technician 1st Class Derek Souza, assigned to Explosive Ordnance Disposal Mobile Unit 1, climbs up a ladder during helicopter rope suspension training with Explosive Ordnance Disposal Training Evaluation Unit 1. (Photo by MC3 Christopher Gordon)

21. Sailors and Marines man the rails aboard the amphibious transport dock ship USS San Diego (LPD 22) as the ship arrives at Joint Base Pearl Harbor-Hickam. (Photo by MC3 Gerald Dudley Reynolds)

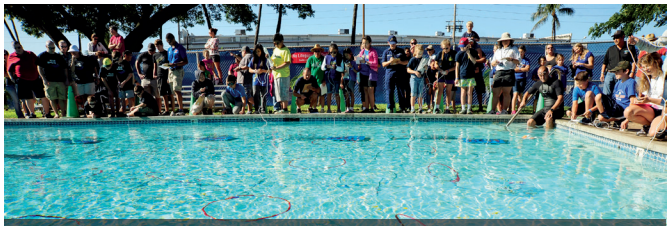
THE NAVAL STEM NEWS ROUNDUP

Naval Sea Systems Command (NAVSEA) employees partnered with the American Society of Naval Engineers (ASNE) to create a "Girls in STEM" event. Seventy girls, 6th to 12th grade, from Maryland, Virginia and the District of Columbia attended. Here, Robin White, director for surface ship design and systems engineering at NAVSEA, speaks about the importance of education and finding your way through challenging times. (Photo by Frankie Hamme)

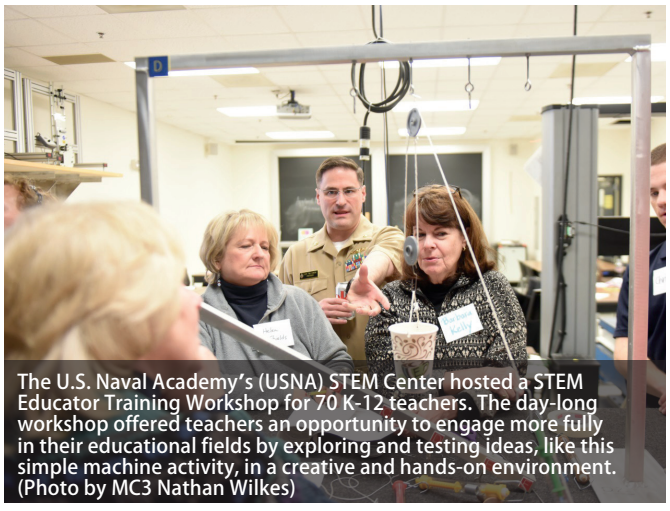
In a cooperative effort between the Naval Undersea Museum in Keyport, Washington, and the Puget Sound Navy Museum in Bremerton, Washington, more than 100 students from three Puget Sound elementary schools participated in events built around the concept of STEM. This event was made possible with help from Naval Base Kitsap-Bangor, Naval Undersea Warfare Center Keyport, Intermediate Maintenance Facility and the Puget Sound Naval Shipyard. Steve Mastel, a marine technician at Puget Sound Naval Shipyard, was one of many volunteers that helped students with protracting a correct angle to launch their paper tube rockets and other STEM projects. (Photo by MC2 Justin A. Johndro)

The Naval STEM Coordination Office hosted a collaborative naval STEM session at the Naval Future Force S&T Expo. This event aimed to reengage the broad STEM community and highlighted ways to get involved. The session included presentations and panels from naval STEM stakeholders, students who have participated in naval STEM internships and programs, and current ONR STEM grant performers. Dr. Bob Ballard, oceanographer and explorer, was one of the guest presenters. (Photo by John F. Williams)

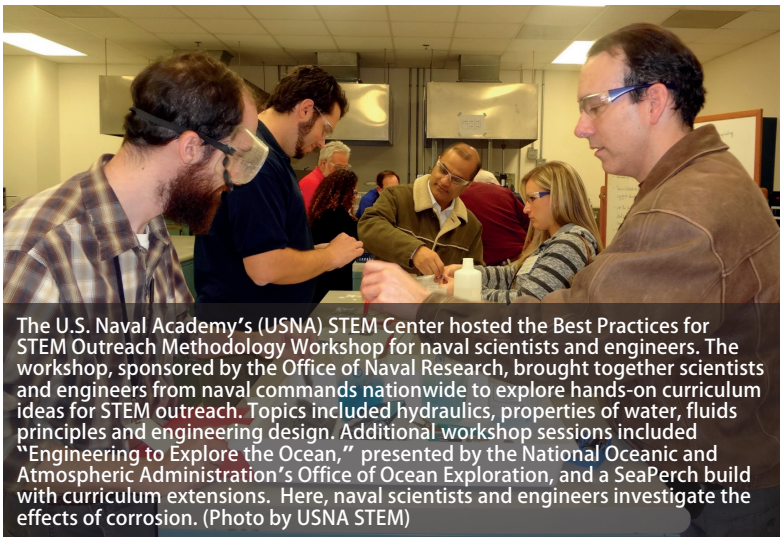
In advance of the 50th annual Sea-Air-Space Exposition, Washington, D.C.-area students participated in a Naval STEM Expo, co-sponsored by the Office of Naval Research and the Navy League.The STEM event focused on highlighting the importance of a STEM careers in the naval workforce for sixth to 12th graders. Students engaged in hands-on activities and career discussions with naval professionals to learn about opportunities within naval STEM. Henry Pickard, Naval Research Laboratory, was one of those naval professionals who was on-hand to explain Vanguard 1, the first satellite to be solar-powered. (Photo by John F. Williams)



Students from elementary, middle and high schools around Hawaii recently participated in the 2015 Hawaii Regional SeaPerch Underwater Robotics for Youth competition at U.S. Coast Guard Base Honolulu. To read about the event go to: http://www.navy.mil/submit/display.asp?storyid=85737. (Photo by MC3 Gabrielle Joyner)



The U.S. Naval Academy's (USNA) STEM Center hosted a STEM Educator Training Workshop for 70 K-12 teachers. The day-long workshop offered teachers an opportunity to engage more fully in their educational fields by exploring and testing ideas, like this simple machine activity, in a creative and hands-on environment. (Photo by MC3 Nathan Wilkes)



The U.S. Naval Academy's (USNA) STEM Center hosted the Best Practices for STEM Outreach Methodology Workshop for naval scientists and engineers. The workshop, sponsored by the Office of Naval Research, brought together scientists and engineers from naval commands nationwide to explore hands-on curriculum ideas for STEM outreach. Topics included hydraulics, properties of water, fluids principles and engineering design. Additional workshop sessions included "Engineering to Explore the Ocean," presented by the National Oceanic and Atmospheric Administration's Office of Ocean Exploration, and a SeaPerch build with curriculum extensions. Here, naval scientists and engineers investigate the effects of corrosion. (Photo by USNA STEM)

STEM2Stern

ABOUT STEM2STERN

STEM2Stern is the Department of the Navy's science, technology, engineering and mathematics (STEM) initiative. Under the leadership of the chief of naval research, who serves as the naval STEM executive, STEM2Stern works with the naval system commands, laboratories, warfare centers and other research and education institutions to leverage resources and maximize the impact of the department's STEM investments.

These investments support a wide variety of STEM educational programs, ranging from activities designed to spark younger students' interest in STEM careers, to more in-depth, hands-on learning opportunities for middle and high school students, internships and research fellowships for older high school and post-secondary students and professional development opportunities for naval STEM professionals and faculty.

Please visit STEM2Stern.org for more information about naval STEM or contact the STEM2Stern office at STEM2Stern@navy.mil