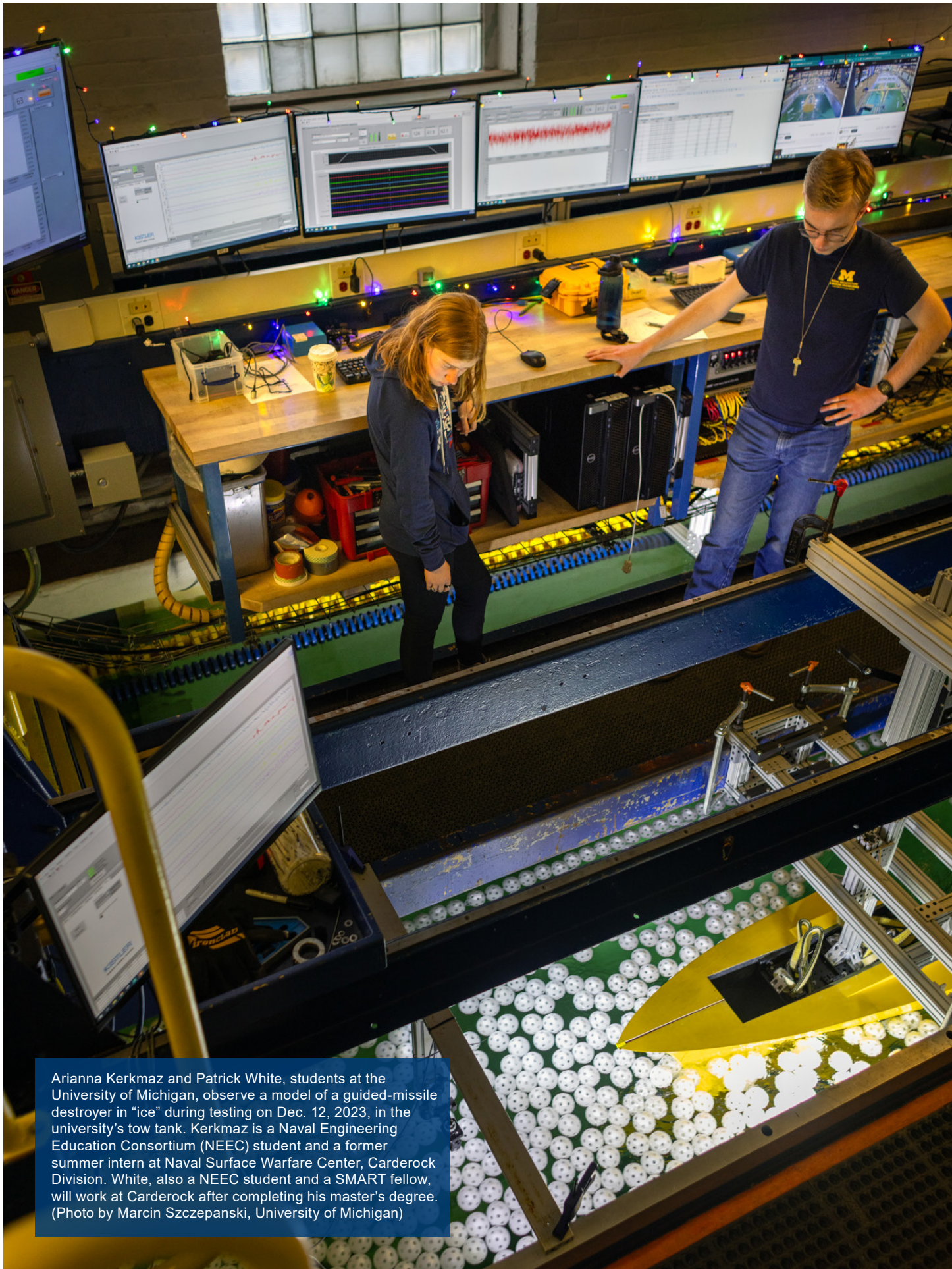


WAVES

2024 Year in Review





Arianna Kerkmaz and Patrick White, students at the University of Michigan, observe a model of a guided-missile destroyer in "ice" during testing on Dec. 12, 2023, in the university's tow tank. Kerkmaz is a Naval Engineering Education Consortium (NEEC) student and a former summer intern at Naval Surface Warfare Center, Carderock Division. White, also a NEEC student and a SMART fellow, will work at Carderock after completing his master's degree. (Photo by Marcin Szczepanski, University of Michigan)

WAVES

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Edvin Hernandez
Tamari Perrineau-Palmer

Capt. Matthew L. Tardy
Commanding Officer
May 2023 - July 2024

Capt. Christopher K. Matassa
Commanding Officer
July 2024

Mr. Larry Tarasek, SES
Technical Director

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ON THE COVER:

Naval Surface Warfare Center, Carderock Division engineer shows off ice covered eyebrows and lashes as they support signature testing for Operation Ice Camp (formerly Ice Exercise or ICEx) near the frigid North Pole.

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Carderock Engineers Complete Sea Trials on OUSV4

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



Naval Surface Warfare Center, Carderock Division engineers and containerized tethered elevated mast (C-TEM) vendors test the C-TEM system off the coast of Port Hueneme, California on May 20, 2024. The C-TEM system measures all three components of unsteady flow generated from the deckhouse bridge and mast, as well as, the wind speed and direction.

Naval Surface Warfare Center, Carderock Division engineers from the Sea-Based Aviation and Aeromechanics Branch and the Surface Ship Hydromechanics Division recently completed two sea trials on Overlord Unmanned Surface Vessel Mariner (OUSV4) from April 22, 2024 to May 24, 2024. Two test events were performed concurrently during the sea trial: Containerized Tethered Elevated Mast (C-TEM) performance verification and OUSV4 flow field survey.

“This is a perfect example of how our branch collaborates with the naval architect groups and full-scale trials groups to bring a new capability to the fleet,” Engineer Jared Soltis said. “Having all these experts in one place shows the support for future unmanned system efforts. Also, Carderock played a huge role in the totality of the Containerized Tethered Elevated Mast (C-TEM) program and its ability to integrate onto USV’s.”

The topside flow survey of the OUSV4 Marine conducted in April used the installation of ultrasonics anemometers to measure wind speed and direction. The teams also installed inertial measurement units around the ship’s center of gravity to measure motion, location and heading.

“The test setup was taken from a previous test,” Aerospace Engineer Ian Bahr said. “So, to fully encapsulate the test, we added capabilities to capture the topside airflow that the ship generates as it moves in the water and the air. To do this, we doubled and upgraded our equipment to handle that amount of data.”

The data gathered tests the conditions and compensates for ship motion-induced flow, which is important because the data set for the Mariner will be the base to generate future ships’ topside flow field baselines.

This trial involved using a tethered multi-rotor C-TEM, which consists of a series of containers that can be attached and detached from a ship. C-TEM in an elevated antenna developed to extend the communications range of USVs. When not in use, the UAS is stowed in its hangar box on the USV deck and emerges from the box prior to launch. Once launched, the system can remain aloft at 500 ft altitude almost indefinitely. After recovery it is lowered back into the hangar box for protection. The Pre-Delivery Trial (PDT) was the final trial used to evaluate the aircraft-TEM’s flight performance (i.e. cruise, launch and recovery) at different wind and wave conditions and maximum communication range to verify it could meet the requirements of the contract and determine the operational limits of the system.

Operating a tethered elevated system in the maritime environment is very challenging. The government and contractor teams collaborated extensively to develop a test plan that would generate data for requirements verification and reduce the operational risks (e.g. tethered entanglement during cruise and impacts to the ship during recovery).

“It was a very dynamic environment,” Soltis said. “These USVs are relatively small, operating in the deep blue ocean so, there is a lot of ship motion generated from the wave action. The aircraft, and the tether management system needs to compensate for all of that motion so it can land safely.”

“This was a contractor lead test and we’re government test leads,” Aerospace Engineer Chloe Johnson said. “It was a lot of communication to ensure all the test points are hit while safely applying the system and finding out the trouble areas.”

“We’re hoping to increase the Navy’s capabilities,” Bahr said. “Especially those small USV’s that do not have classic aviation capabilities. The second thing is to ensure the topside airflow is modeled correctly in the design phase for ships so we can reduce the risk of any downstream issues during construction phase of new Navy vessels. We are hoping we can prevent repeating mistakes from the past by having a good background of capturing these effects correctly.”

The C-TEM will be delivered later this summer after completing the required environmental, electromagnetic interference, and additional land-based flight performance tests. The contract will be concluded by the end of the summer, but due to



Naval Surface Warfare Center, Carderock Division engineers from the Sea-based Aviation and Aeromechanics Branch and Surface Ship Hydromechanics Division participates in a Pre-Delivery Trial (PDT) event at Port Hueneme, California on May 25, 2024.

the remaining tests that need to be done, there is a possibility of an extension.

The Carderock team members who participated in the trial include Jared Soltis, Chloe Johnson, Ian Bahr, Andrew Busa, Kevin Kimmel, Doug Griggs, Samantha Lee, and Andrew McCoy.

Carderock Team Recognized with the SECNAV Energy Excellence Award

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



Naval Surface Warfare Center, Carderock Division Commanding Officer Capt. Matthew Tardy and Technical Director Larry Tarasek, SES, award the Lithium Battery Safety Certification Team with the Secretary of the Navy (SECNAV) Energy Excellence Award in West Bethesda, Md., on April 30, 2024. Carderock received the SECNAV Energy Excellence flag and added it to its flagpole where it will be flown for a year to recognize the Division's technical excellence in energy security. (U.S. Navy photo by Corum Byers)

Naval Surface Warfare Center, Carderock Division earned the fiscal year 2023 Secretary of the Navy (SECNAV) Energy Excellence Award for Technology Development and Acquisition for its work with lithium battery safety certification on Navy Ships.

The SECNAV Excellence Award Program annually recognizes excellence in the areas of energy security, energy resilience, innovation, combat effectiveness and program management across the Department of the Navy. For energy technologies to be considered for this award, they must have a functional prototype that has a significant impact on the lethality or operational range of a platform or weapon system and be capable of being tested in a field-operating environment.

The Carderock team consisted of Julie Simmons; Tracey Cheek; Toby Cole; Josh Garvin; Keegan Symon; Carolyn Flores; James Mulford; Robert Caliri; Michael Wartelsky; Jessica Schwartz; and Jonathan Ko, as well as former Carderock employees Madelaine Hernandez-Mora and Matthew Daniel.

"It was an honor for me and our whole team to receive recognition," Senior Test Engineer Carolyn Flores said. "We work very hard and we really enjoy our work. We spent years getting the project to this point, working long days together as a team to support the mission. The warfighter has enough hazards to deal with every day, we take our work very seriously and are dedicated

to the mission to ensure their safety as it pertains to battery use. There were logistical challenges involved with this testing as we partnered with the Fire Protection Branch and the Naval Research Laboratory Chesapeake Bay Detachment to utilize their expertise, capabilities and facilities for test execution. We are grateful for their support."

The team collaborated with Carderock's Battery Certification and Integration Branch and its Expeditionary and Developmental Power and Energy Branch. They also used partnered with Navy test facilities to conduct a lithium battery safety certification supporting the Joint Light Tactical Vehicle (JLTV) Program Office, which is a joint-led Army and Marine Corps Program Office that supports the acquisition of tactical vehicles that transport soldiers and Marines to and from the battlefield.

It took an estimated three years from the initiated request for the battery's safety certification to be completed. During that time, the team verified test requirements with the Certification and Technical Authorities at the Naval Sea Systems Command (NAVSEA), and then tested the batteries at Carderock labs and partnering facilities, culminating in a six-month evaluation period.

The heat release rate test was the biggest challenge due to the size of the battery. That specific test evaluates the rate of total heat generated by the battery during a thermal runaway battery casualty. This characterization allows the NAVSEA Technical Authorities, who have expertise in fire science, to assess the impact of the battery casualty on nearby critical systems or host platforms, like the naval ships that will be used to transport the JLTV.

The safety certification enables the use of a superior battery technology in the JLTV for all concepts of operations and deployment, including supporting the



Navy reservists lift the SECNAV Energy Excellence Flag in front of Building 2 at Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., on April 30, 2024. Commanding Officer Capt. Matthew Tardy and Technical Director Larry Tarasek, SES, present the Lithium Battery Safety Certification Team with the Secretary of the Navy Energy Excellence Award for their research and contribution to the Joint Light Tactical Vehicle, including the testing of lithium battery safety usage on the vehicle. (U.S. Navy photo by Corum Byers)

warfighters. This achievement sets the precedent that large format lithium-ion and lithium batteries can safely be employed in large systems, and that those systems can be safely transported on naval ships, according to Simmons, the designated Technical Agent for the Navy's Lithium Battery Safety Program who led the JLTV lithium battery safety evaluation.

This effort required inter-department collaboration to ensure the full compilation of relevant data to support the safety evaluation resulting in the recommendation made to NAVSEA to issue the safety certification.

This is not the first time Carderock supports a lithium battery safety evaluation for the JLTV Program Office. In 2012, the Division began working on battery testing to support safe integration of lithium-ion batteries into the JLTV design, and they completed that testing in 2016. In the end, the contractor decided not to go with the lithium battery for that JLTV variant, but when the program office moved on to their next variant, they contacted Carderock again.

"We ended up compiling testing from previous projects, so the Joint Program Office did not have to fund new testing," Simmons said. "We started discussing what the new test requirements would be for this variant and coordinated with NAVSEA technical warrant holders to ensure the correct test data were generated."

A lithium battery is one of the most energy dense electrochemical systems for storing energy and, according to Simmons, is superior technology that replaces the lead-acid battery.

"It's an improvement on the existing technology," Simmons said. "By implementing these enhanced and cost-effective batteries, not only do they offer additional and improved capabilities, but they also deliver an extended lifespan and superior performance. As a result, the overall cost of owning the system throughout its lifespan is significantly reduced, leading to substantial cost savings."

By validating that the lithium battery can safely be deployed on naval assets such as aircraft and surface ships, the Carderock team has changed the perception on large-format lithium batteries, proving that the battery can safely be transported on mission critical platforms.

After obtaining the initial safety certification, the team is currently in the process of updating the calculations to represent the potential for deploying additional JLTV systems on the designated host platforms in the upcoming years.



Naval Surface Warfare Center, Carderock Division Commanding Officer Capt. Matthew Tardy reads a letter from senior Navy officials to the Lithium Battery Safety Certification Team on April 30, 2024, in West Bethesda, Md., for their innovative support in energy security. The team was awarded the SECNAV Energy Excellence Award for their research and contribution to the Joint Light Tactical Vehicle, including the testing of lithium battery safety usage on the vehicle. (U.S. Navy photo by Corum Byers)

One of World's Largest Water Pressure Tunnels Provides Unique Opportunity for Researchers at Carderock

By Edwin Hernandez, NSWC Carderock Division Public Affairs

Matthew Brantz, the Site Director of Naval Surface Warfare Center, Carderock Division's Large Cavitation Channel (LCC) in Memphis, Tennessee, led a tour of the detachment's unique and powerful testing capabilities to key researchers and scientists from multiple government and academic institutions on July 25, 2024.

The LCC, which is one of the world's largest and most advanced high-speed, variable-pressure water tunnel facilities, is being used for cavitation erosion prevention testing. Several samples of metal coatings are being evaluated inside the detachment's closed loop water tunnel using a controlled current that is generating a speed of about 25 knots, which is equivalent to about 28 miles per hour. In the coming days, the Carderock team will generate an even stronger current, closer to 35 knots, to better understand the fundamental hydrodynamics that lead to flows that create erosion. According to Brantz, testing will occur at night to optimize energy efficacy.



An exterior view of Naval Surface Warfare Center, Carderock Division's Large Cavitation Channel in Memphis, Tenn., on July 25, 2024. The LCC is one of the world's largest and most advanced high-speed, variable-pressure water tunnel facilities and is currently being used for cavitation erosion prevention testing. Site Director Matt Brantz led a tour of the facility as part of the Cavitation-Resistant Materials and Coating Workshop, which featured several Carderock partners from academia and government institutions.

Researchers from the University of Michigan, University of Memphis, Office of Naval Research, Carderock and the Bureau of Reclamation had the opportunity to see the underwater current, which used millions of gallons of water, through the facility's tightly bolted windows while on the tour. Naval Architect Dr. Thad Michael explained the testing process, including an overview of materials and samples used, and emphasized the lab's significance to the visitors.

"This is a cavitation erosion test almost at full-scale; it really is the first of its kind," Michael said. "The LCC is one of the only places in the world where you can do testing like this. We needed to find a test facility where you could achieve close to full-scale speed and somewhere to install something large. In this case, we have a foil that is 2.1 meters long, which is roughly the size of a rudder on a [U.S. Navy] destroyer."

The visiting researchers and scientists were part of the Cavitation-Resistant Materials and Coating Workshop, which was hosted by the FedEx Institute of Technology at the U of M in Tennessee. The one-day workshop served as a conduit for knowledge, transferring information on state-of-the-art materials, coatings and their manufacture, to improve cavitation erosion resistance.

Carderock, which has maintained an academic partnership with the U of M since 2021, is collaborating with its partners to not only advance Navy research in cavitation, but to also develop solutions that could result in countless cost-saving dollars to the fleet.

"The University of Memphis and the University of Michigan have contributed valuable pieces to this testing," Michael said. "It was a real team effort and we each have our own strengths. The University of Memphis and Carderock conducted preliminary materials testing while the University of Michigan executed some scaled testing in their unique facility."



Memphis Site Director Matt Brantz explains the history of Naval Surface Warfare Center, Carderock Division's Large Cavitation Channel to visiting researchers and scientists participating in the Cavitation-Resistant Materials and Coating workshop on July 25, 2024, in Memphis, Tenn. The group had the opportunity to watch live erosion testing inside the site's advanced high-speed, variable-pressure water tunnel.

That was important for us because it identified different types of loads we needed to consider. This was a unique and beneficial opportunity for us all."

Before the tour ended, Brantz discussed Carderock's plan to add an unmanned capabilities lab to the detachment. Although it is not yet operational, Carderock's Naval Architecture and Engineering Department believes it will become a critical space for future design and testing capabilities for unmanned systems for the Navy.



Matt Brantz, the Site Director for Naval Surface Warfare Center, Carderock Division's Memphis Detachment, leads a tour of the command's Large Cavitation Channel in Memphis, Tenn., on July 25, 2024. The group, which featured Carderock partners from academia and government institutions, visited the LCC as part of the Cavitation-Resistant Materials and Coating workshop and watched live erosion testing at the facility.

Carderock Engineers Support Signature Testing in the Arctic

By Edwin Hernandez, NSWC Carderock Division Public Affairs

For the second consecutive time, Naval Surface Warfare Center, Carderock Division engineers supported signature testing for Operation Ice Camp (formerly Ice Exercise or ICEX) near the frigid North Pole.

Operation Ice Camp, which is conducted in partnership with the Arctic Submarine Laboratory (ASL), is a biennial event that aims to maintain expertise in Arctic-specific knowledge, equipment and procedures to enable submarine forces to safely and effectively operate in the Arctic Ocean.

When Naval Sea Systems Command (NAVSEA) required assistance for acoustic testing in 2022, they contacted the Signatures Characterization and Analysis Division at Carderock for support. James “Jim” Sracic, a mechanical engineer within the Submarine Onboard Signatures Branch, took lead in



organizing the Division’s test plan for their first-ever involvement with operations in the Arctic.

“We routinely conduct acoustic trials and fleet support efforts to maintain the acoustic health of all U.S. submarines, and the logistics and planning process for those events is well established,” Sracic said. “Ice Camp is much different than our typical testing for acoustic trials because of the massive overall scope of the event, and because it involves collaboration with multiple commands in order to plan, coordinate and execute a successful test. The remote and harsh environment presents a number of challenges such as procuring and transporting special cold-weather clothing, getting necessary test equipment to Ice Camp and more.”

One of the biggest challenges about the planning process was how the team would execute Carderock’s “cradle-to-grave” approach with a small group.

“We defined required measurements, selected and installed our own instrumentation, and coordinated with the ship, sponsor, and ASL to define test conditions that were safe and achievable under the ice,” Sracic said. “We prioritized when we could execute specific phases of our evaluations around the myriad of other Arctic testing and laid out a plan for analysis and reporting to ensure we would be able to answer the fundamental questions our sponsor was asking. Overall, that amounted to a tremendous amount of effort from the team before we ever set foot on the ice or the boat.”

Now, to get to a floating ice sheet in the Arctic is no easy feat. Test directors Rod Grogan and Emmerson Jueco not only had to plan the detailed logistics of the trip for each event, but also had to coordinate with ASL before the Carderock team arrived on the ice.

“For both years, 2022 and 2024, ASL decided that the best way for Carderock to execute this NAVSEA sponsored testing was to fly to Prudhoe Bay, Alaska,” Submarine Onboard Signatures Branch Head Brett Weisgerber said. “That is very north Alaska and the



Naval Surface Warfare Center, Carderock Division engineers in the Signatures Department support Operation Ice Camp (ICEX) in the Arctic Ocean in March 2024. ICEX is a biennial event that aims to maintain expertise in Arctic-specific knowledge, equipment and procedures to enable submarine forces to safely and effectively operate in the Arctic Ocean. This was the second consecutive ICEX Carderock supported in partnership with the Arctic Submarine Laboratory. (U.S. Navy photos provided by Brett Weisgerber)

team had to wait for a day or two for the right time to board a small plane that could take them to Ice Camp, and then a helicopter to take them to the boat.”

Once the team arrived to their first Ice Camp in 2022, a temporary center that serves as the hub for conducting operations and research in the Arctic region, they boarded a fast attack submarine to embark on their weeks-long mission. To operate in this uniquely cold environment, the team was required to wear seven layers of safety clothing to protect against the subzero temperatures.

“They inspected our group before leaving Alaska and would not let them board the plane until they had enough protective layers on,” Weisgerber said. “You could have

minus 30 degrees at Ice Camp. Minus 40 sometimes. It’s a good safety measure to follow, especially when entering a new, blisteringly cold climate.”

In 2022, the Carderock team focused on collecting and analyzing acoustic data from USS Illinois (SSN 786), a Virginia class fast attack submarine, while under the ice canopy and during a follow-on acoustic trial at Carderock’s Southeast Alaska Acoustic Measurement Facility.

“There are certain challenges that come with the territory when you test in the Arctic,” Weisgerber said. “Test conditions are not always favorable, which forces our team to adjust their timeline and wait until the right opportunity arises.”

After being briefed on the team's detailed analysis of test results and recommendations from 2022, NAVSEA contacted Carderock's experts again to support this year's event. The priority was placed on understanding if the test results from the previous Arctic measurements were representative.

"When the team embarks on a submarine to execute testing, they are physically on the sub for weeks," Weisgerber said. "They try to integrate with the crew not just to collect data, but to better understand how Sailors do their job differently in this colder environment. Being there with the crew and being involved with their day-to-day operation gives our team a unique advantage in identifying more differences and correlating it with the data Carderock collects."

One team member, Eric Spiegel, served aboard a submarine underway at ICEX in 1998. His experience as a service member, he said, was completely different from supporting this year's event as a civilian.

"My experience as a service member was entirely different from my experience this year," Spiegel said. "During my two Operation Ice Camp deployments onboard USS HAWKBILL (SSN 666), we spent a lot of time mapping the Arctic Ocean floor. Those endless days 'mowing the lawn' provided the sea bottom detail, which I think is vital to our current submarine Arctic deployments. Every day I served presented a new challenge as the boat had limited parts onboard and we had to make do with the parts we had to repair electrical systems nearing then end of their designed lifecycle. Supporting this event in uniform was cool, though, because we had the chance to hear the ice crashing and moving above the submarine as we surfaced."



In March 2024, the Carderock team arrived at Ice Camp in the Beaufort Sea to board USS Indiana (SSN 789), another Virginia-class fast attack submarine. Upon arrival, they saw the vessel's black metal sail piercing through the thick blanket of ice in front of them, exposing only a fraction of its true size. While submarines like USS Indiana are large in scale, it presented a challenge when traversing through the Arctic, especially when the ocean depth becomes shallow and ice keels – large chunks of ice pointing downward – hang from the frozen surface above.

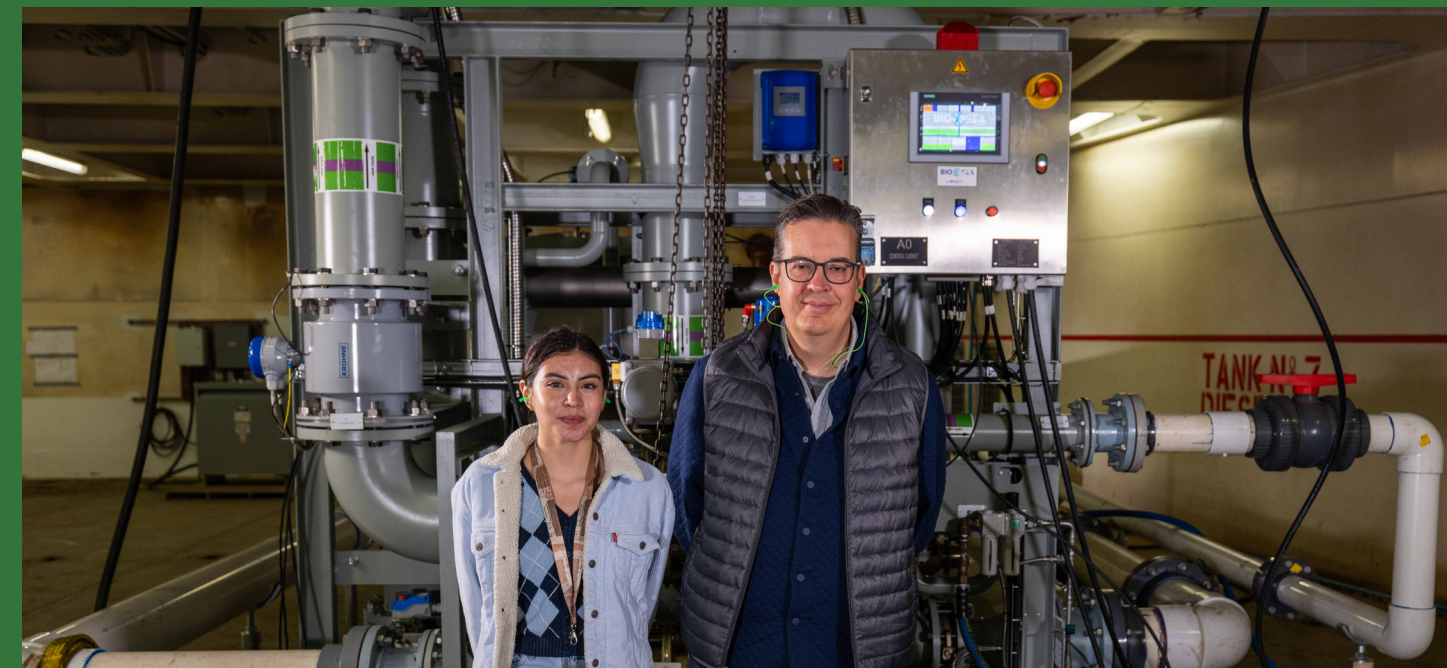
According to Sracic, events like Operation Ice Camp are critical to empowering the warfighter.

"Carderock is a major scientific and research asset for the Navy; NAVSEA uses us to help inform both operational guidance and future submarine design," he said. "We often do that using dedicated test ranges, but the more we can be involved in understanding real-world submarine operations in collaboration with other Navy organizations through events like ICEX 2022 and Operation Ice Camp 2024, the more we can empower the warfighter with the right equipment and decision-making capabilities. Maintaining a strong and proficient naval presence in the Arctic is critical to the overall interests of the U.S. and

our allies. The fact that we have been able to support that goal is a huge achievement for our command, and it is our hope that we can continue to support efforts like this in the future."

The Division's Operation Ice Camp teams in 2022 and 2024 included: Jim Sracic, Matt Medzegian, Rod Grogan, Jason Martin, Eric Spiegel, Emmerson Jueco, and Robert Vanover.

Ballast Water Treatment System



Naval Surface Warfare Center, Carderock Division Scientists Jovanna Pineda Ochoa (left) and Jeffrey Vandall (right) stand in front of a Ballast Water Treatment System (BWTS) installed aboard M/V Cape Washington (MARAD vessel) at the Baltimore harbor on April 24, 2024. This compact BWTS was manufactured by BIO-UV group for the U.S. Navy and set up to run mandatory operational testing for a total of 700 hours. The BWTS is used to improve the effectiveness and safety of shipping operations by removing and destroying biological organisms from the ballast water. (U.S. Navy photo by Aaron Thomas)



Winter 2024 SUBTLE Cohort – Submarine Concept Designers, Leading the Way in Innovation!

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

Naval Surface Warfare Center, Carderock Division's Submarine Design Integration Branch, is home to the Submarine Training, Leadership and Education (SUBTLE) Cohort. The SUBTLE cohort represents a training pipeline for submarine concept designers focusing on training, leadership and education. In winter 2024, three engineers were selected for a six-month SUBTLE cohort program to learn submarine concept design with an in depth education on submarine systems, technology and design considerations.

The winter 2024 team consisted of Team Lead Danielle Kolber, Engineer Sana Noor, Engineer Matthew Wozniak and Engineer James Newman.

The mission of the SUBTLE Cohort program is to provide a development pipeline sustaining the Navy's submarine concept designers with advanced training in areas related to submarine systems and technology excursion impacts. This program also trains the Navy's future engineers in knowledge of submarine concept design.

"This rotation has helped me gain leadership skills and increase my network of subject matter experts at Carderock," Newman said. "And understand

more of the work accomplished at Carderock regarding submarines."

As the engineers proceeded through the program, they participated in hands-on concept design experiences while receiving mentorship and guidance from the submarine and related technical communities across Carderock's technical codes.

"The main challenge in this process was achieving a balanced design," Wozniak said. "I learned quickly how sensitive submarine stability became when shifting weight locations and values by adding compartment lengths or volumes to the design. Most of the rework conducted came down to small changes in locations of volumes."

Cohorts were tasked with developing a clean-sheet innovative submarine concept design based on seawolf class weights, Virginia class components and meet requirements provided by SEA 05U6. By developing a clean-sheet submarine concept design, the SUBTLE engineers developed a strong base foundation for submarine concept design, naval architecture and technology assessment while gaining on-the-job training from subject matter experts.



After the completion of a feasible clean sheet concept design that met all requirements was preformed and reviewed, the team then performed an excursion design where new requirements were developed supporting onboarding eight unmanned underwater vehicles and two arrangement options supporting an advanced launchers technology assessment.

"The design process was a circular iterative process," Newman said. "We'd focus on different aspects of our designs (the outer shape of the non-pressure hull, then the length of the pressure hull, and the size of the Main Ballast Tanks) one at a time and work to understand the impacts of how they all interact. They had to iterate through this process repeatedly until the submarine was balanced."

During the initial phase of the project, engineers used qualification cards for submarine concept design fundamentals training to identify prescribed readings, subject matter expert lectures and submarine systems training. Cohorts also received on-the-job training experiences to support the skills and abilities required for submarine concept design.

The primary purpose of this study is the workforce development of naval architects and engineers. This

project will provide these engineers with experience in the fundamentals of submarine naval architecture, concept design and technology assessment, as part of a systems engineering process.

"This experience has highlighted the importance of meticulous design and weight distribution in submarines," Noor said. "By applying these principles, future submarine designs can achieve better balance, efficiency and functionality that will lead to more effective and innovative designs."

The winter 2024 cohort members have finished their submarine concept design excursions in June. All cohorts are participating in the upcoming summer 2024 SUBTLE Cohort as project team leads. Two of the cohorts engineering teammates will be co-leading the summer 2024 Cohort in Submarine Concept Design. The remaining teammate will be leading the Naval Research Enterprise Internship Program summer interns within Design Integration Branch on a submersible concept design study.

JPEM Hosts Tech Discovery Event for New Capabilities



Carderock Engineer Assists in PAWDS Repair of USS Gerald R. Ford

By Edwin Hernandez, NSWC Carderock Division Public Affairs

James “Jim” Mann, a mechanical engineer in Naval Surface Warfare Center, Carderock Division’s Environmental Engineering, Science and Technology Branch supported the maintenance of the Plasma Arc Waste Destruction System (PAWDS) aboard the deployed USS Gerald R. Ford (CVN 78) in September 2023.

PAWDS is a new solid waste processing system that breaks down trash using a plasma torch. Once the solid waste is converted into smaller fibers, resembling pocket lint, it is mixed with the discharge plume from the plasma torch and gasified into a combustible gas. The combustible gas is burned with additional air until it becomes vapor and ash. The vapor is then purified,

before being released back into the atmosphere. The U.S. Navy adheres to OPNAVINST 5090.1, which incorporates the International Marine Organization’s Maritime Pollution Regulations, and provides guidance to shipboard incinerators including what ships can and cannot discharge.

This system is critical to the Navy’s mission because it allows ships like the Ford to remain at sea without having to frequently offload waste at piers or support ships. Unlike cruise ships, U.S. Navy vessels are underway for months at a time before arriving to their next pier. The introduction of PAWDS has made long-term waste management aboard the Ford-class

aircraft carriers easier for Sailors to manage.

“It requires cleaning everyday – it’s got ash in it – like your wood stove or your fireplace, so you have to clean it out,” Mann said. “Beyond that, you have to change the filters and take care of other maintenance requirements. Any time you have a waste system there is a chance of clogging. We have solved most of the clogging problems at this point, but there are two left that will be fixed by 2025.”

Mann has been involved with PAWDS since 2001, when Carderock and their contractor, PyroGenesis Canada Inc., built the initial prototypes. In 2015, PAWDS testing on the Ford began in Newport News, Virginia – and Carderock has been the PAWDS In-Service Engineering Agent (ISEA) since 2020.

“Our team varies between three to five people – three permanent members and two that help out occasionally,” he said. “When the ship goes out, we’ll ride with the crew sometimes, but not always. Our goal is to help

the Sailors be self-sufficient; and when they have problems, that is when they contact us. That’s the general goal for ISEAs.”

Apart from helping Sailors repair and maintain PAWDS aboard the Ford, Mann is also involved in the revision of the technical parts manual. This includes the breakdown of parts that make up the waste management system, as well as inventory of the spare parts aboard the ship. If Sailors have further questions, however, they contact the experts at Carderock.

“We know who made every part and who the distributors are,” Mann said. “This equipment is unique, so the parts need to be added to the stock system. We are reviewing the provisioning technical documentation to get the parts into the stock system. We are also able to find parts in stock that are not in the stock system or have a long lead time from the stock system distributor; to allow the ship to quickly repair the system.”

In late September, Mann traveled to the East Mediterranean to support the crew’s mill alignment issue. Although the problem was not entirely fixed, it was repaired enough to keep the ship’s system operating properly while on deployment. Mann and his team will execute a permanent fix when Ford returns to port in 2024.

“There was a wear part that needed to be replaced, so I went out and worked with a Machinist’s Mate First Class to investigate,” he said. “The system was milling incorrectly and the mill alignment made it difficult to access the worn part. Eventually, we were able to reach it and made a temporary adjustment that allowed the system to mill the waste correctly.”

The ISEA team has also reviewed modifications to the design of the separator section of the PAWDS, adding a new cooling coil and screen to prevent particles from clogging the separator. The modified separator is planned to be installed in 2025.

Carderock’s Environmental Engineering, Science and Technology Branch supports all PAWDS on the Ford-class aircraft carriers, as well as other waste management research and development projects for all other classes.



An engineering development model of the Plasma Arc Waste Destruction System (PAWDS) sits in a Naval Surface Warfare Center, Carderock Division facility. The unit was designed to fit into four compartments aboard USS Gerald R. Ford (CVN 78).

Carderock Engineers Bring Attritable Design and Manufacturing to Light in WalrUSV Project

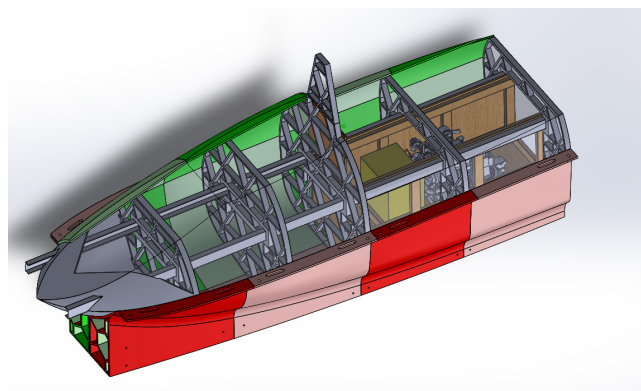
By Brittney Odoms, NSWC Carderock Division Public Affairs

Mechanical engineers from the Additive Manufacturing Branch at Naval Surface Warfare Center, Carderock Division Jeremy Chang, Joshua Duck, Zach Heinkel, Nauman Funyas, Dr. William Anderson and Cobie Bondoc have been working on a project for the past five years that helps design and manufacture attritable systems for the warfighters.

The Manufacturing of Attritable Systems at Scale (MASS) began in 2019, when the project started as a part of a naval warfare scenario exercise called “Keep Summer Safe.” Since then, it has grown into an area of research and development and, eventually, evolved into the MASS project as it is today.

The goal of the MASS project is to design and manufacture mission-ready platforms with attritability at the forefront of the design. Attritable is defined as a design trait that trades reliability and maintainability for low-cost, and eventually expendable weapons. According to the engineers and stakeholders partaking in this project, it is important to bring manufacturing close to the fight. Attritable manufacturing provides a means to adapt to the constantly changing state of modern naval combat due to the increasing prevalence of swarming tactics, unmanned capabilities and rapid build and deployment.

The “Keep Summer Safe Exercise” was a force-on-force autonomous attack versus autonomous defense warfare scenario. Engineers in the project were attempting to understand how they could use autonomy



on low-profile vehicles that are attritable and began design scaled-down models of attritable craft.

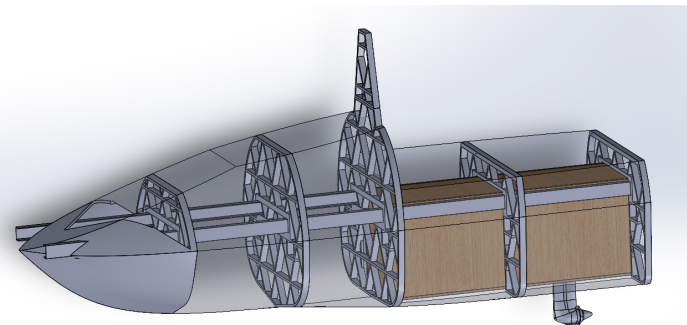
The models of the craft they began designing were two-feet long; however, the team would eventually move to manufacture attritable crafts that would measure 16-feet in total length.

WalrUSV is a test article for manufacturing and material practices, using additive manufacturing to create low-cost autonomous vehicles. The design provided to the warfighters would include the option for local material sourcing and give active-duty personnel the ability to manufacture the craft within one day.

Throughout this innovative project, the team has inevitably encountered several challenges like scheduling communications with and instilling confidence into their overseas stakeholders.

“Attritable design is tricky for some people to grasp because as engineers we want to create really nice things that are going to last; and attritable design throws that out the window,” Heinkel said.

Currently, the team is finishing selecting what manufacturing processes works best before applying them to their attritable design concept. The team is beginning to transition their design work into application after acquiring lab space in Buildings 201 and 4E in West Bethesda, Maryland. The group has



The WalrUSV team stands together in their lab space at Naval Surface Warfare Center, Carderock Division in West Bethesda, Maryland in April 2024. WalrUSV is a test article for manufacturing and material practices, using additive manufacturing to create low-cost autonomous vehicles.

From left: Jacob Aljundi, Mechanical Engineer; Aditya Pulipaka, Mechanical Engineer; Dr. Jenn Wolk, Project Sponsor (ONR); Nauman Funyas, Mechanical Engineer; Sam Pratt, Mechanical Engineer; Eric Kubina, Program Manager Engineer; Jeremy Chang, Mechanical Engineer; David Nuttall, Mechanical Engineer (Oak Ridge National Labs); Emma Delosreyes, Mechanical/Systems Engineer; Richard Ditty, Electrical and Test Engineer; Zach Heinkel, Program Manager Engineer; Grady Delp, Controls and Automation Engineer; Dr. William Anderson, Robotics Engineer; Ryan Faber, Mechanical and Testing Engineer; and Josh Duck, Mechanical Engineer. Not pictured: Cobie Bondoc, Mechanical Engineer and Blase Cornett, Naval Architect.

also started selecting and procuring manufacturing equipment they want to use as part of a larger forward deployed foundry effort.

Although most of the design and manufacturing of WalrUSV has occurred in West Bethesda, Maryland, there has been collaboration with the command's Combatant Craft Division in Norfolk to help with testing on the water.

Next, the team will attempt to establish lab spaces outside the contiguous United States for further testing and they will develop their standard operating procedures by the end of FY 25. The team hopes to support training exercises and eventually deliver their manufacturing designs to the warfighters on the frontlines.

“Being able to adapt at the speed of the fight is one of the advantages we want to give our warfighters,” Chang said. “Taking those punches, rolling with them and hitting back is something we want to be able to provide them by being able to give them the capability to manufacture and design what they need in a short period of time.”



2024 Patent Awards

By Brittney Odoms, NSWC Carderock Division Public Affairs

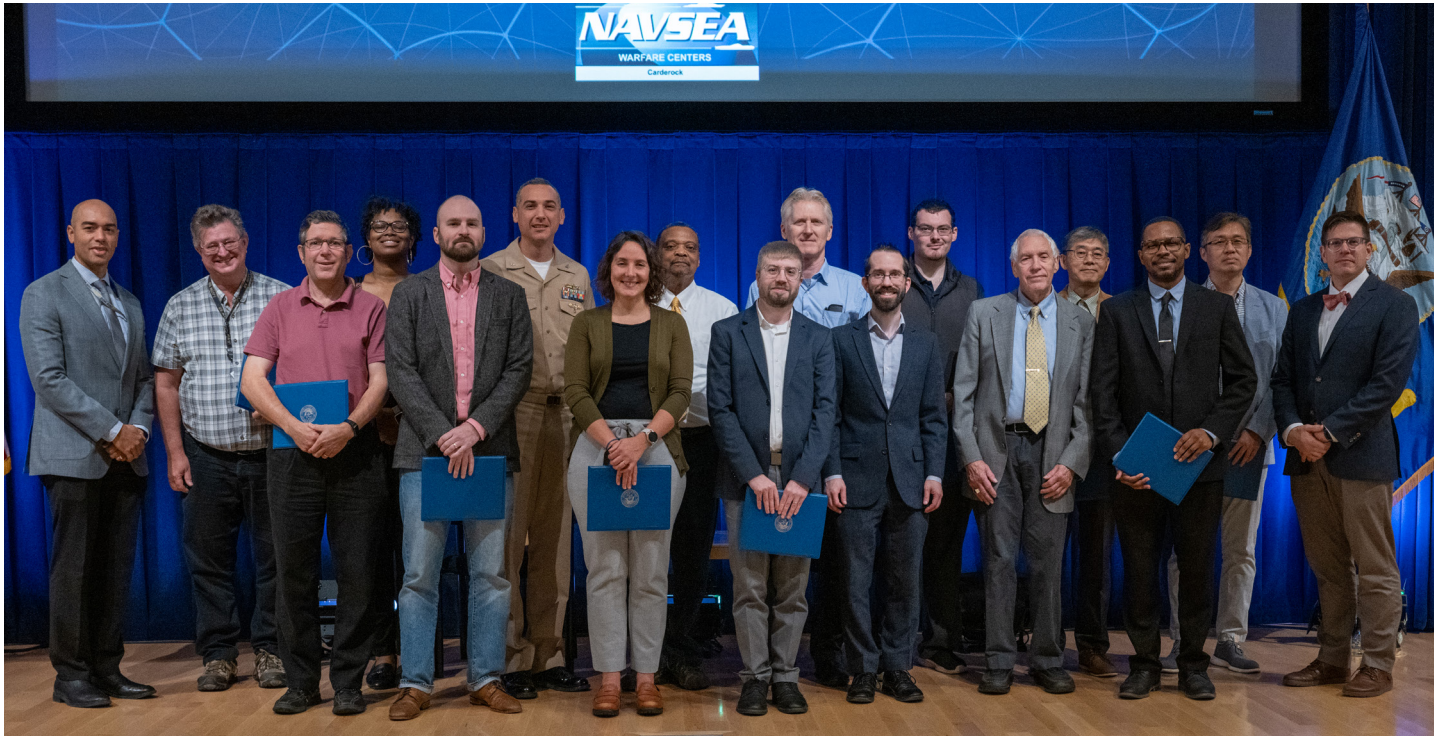
Naval Surface Warfare Center, Carderock Division, recognized employees who were issued FY24 patents at a ceremony at the Raye Montague Center for Maritime Technology on Thursday, November 7, 2024, in West Bethesda, Md.

Two different awards were presented at the ceremony: The Carderock Division Patent Award and

the Carderock Division Inventors Club Certificate. The Carderock Division Patent Award honors the inventors named in patents issued by the U.S. Patent and Trademark Office and the Carderock Division Inventors Club Certificate honors inventors who, for the first time as Carderock Division employees, were named in patents issued by the U.S. Patent and Trademark Office.



“Today we will recognize some of our most innovative individuals and teams, whose work continues to make Carderock a world leader in science, technology and engineering for the Navy, the Marine Corps, and the nation.”



Carderock Patents and Inventors

System for In-Situ Monitoring for Additive Manufacturing Using Ultrasonic Testing	Charles Nguyen and Scott Ziv
Method of Predicting a Ship Resistance by Designing and Implementing a Momentum Thickness Similarity Simulator	Young T. Shen, Michael J. Hughes, and David E. Hess
Personal Armor Resistant To Pointed Or Sharp Weaponry	James Gregory Pinsky, Philip J. Dudt, and Devin P. Murph
Luminescence-Based Method For Precise Delivery Of Ion Beam Therapy	Noel A. Guardala
Method For Generating A Balance Sheet That Includes Operating Materials And Supplies Costs	Gilbert F. Lee, Ruth A. Maticic, and Tami L. Ellinger
Auxiliary Propulsive Control For Enhanced Taxiing Performance Of Seaplanes	Robert Henry Brown
Supercoupling Waveguides, And Methods For Making And Using Same	Matthew S. Byrne, Andrea Alu, and Hussein Esfahlani
Asymmetrical Industrial Manufacturing Rapid Prototyping System and Method For Producing Articles	Garry E. Shields
Apparatus, Systems, And Methods For Measurement Using Magneto-Optical Kerr Effect	Nicholas J. Jones, Emily L. Guzas, Matthew T. Roberts, and Wayne C. Tucker
Sandwich Cable Fairing Apparatus and Method with a Central Damping Layer	David B. Coakley
Magnon Excitation and Detection Systems, Apparatus, and Method	Chidubem A. Nwokoye, JinHyeong Yoo, and Nicholas J. Jones
Granular Magnetically Strengthened Structures	Philip J. Dudt, H. John Nasrin, and Hiren D. Balsara
Composite Materials, Armor Formed Therefrom, And Methods For Making Same	William A. Ferrando and Philip J. Dudt
Implosion-Resistant Lightweight Membrane Shell Devices For High-Pressure Applications	Philip J. Dudt
Apparatus, Methods And Systems For Treating Oil-In-Water Emulsions	Gordon H. Waller and Danielle M. Paynter
High-Strength and High-Toughness Austenitic Steel	Matthew Draper, Matthew Sinfield, and Daniel Bechetti
Hard Magnetic Properties Of High Entropy Alloys (HEAs), Methods For Making HEAs, And Uses Thereof	Suok-Min Na and Nicholas J. Jones
Passivation Of Copper-Nickel Alloy Conduits For Marine Use	Elissa M. Trueman, Jacob R. Steiner, and Peter K. Todoroff
Temperature Sensing Arrayal For Freeboard Detection	David A. Mellick and Steven O. Troxel
Offset Propeller Controlled Rotor	David J. Haas

Lann Sann Grand Opening

NSWC Carderock Division Public Affairs



Carderock celebrated the grand opening of Lann Sann restaurant inside Carderock cafeteria, located inside the Ray Montague Center for Maritime Technology (Bldg 40), on Wednesday, October 30, 2024. Employees across the command showed up to support and get a taste of the delicious food offered at Lann Sann. Lann Sann treated Carderock employees to free sushi, noodle and soup samples, as well as discounts on all noodle dishes.



Carderock Host Annual Daylong Math Contest

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

On April 19, Naval Surface Warfare Center, Carderock Division organized their annual Carderock Math Contest (CMC) in West Bethesda, Maryland. The event, which happens every year, was different this time around, as it featured a big experiment.

“Math Counts is a national program that we love to support,” Charlotte George, STEM and Outreach Program Director, said. “Although we are not part of the competitive series, we allow 200 students to improve their skills and create a community with other mathletes. It’s fun to showcase not only math tests and speed rounds, but also the practical applications of it in careers where a strong foundation in math and science is vital.”



The annual CMC event is a math competition designed for middle school students in grades 6-8 to test their mathematical skills in terms of speed, critical thinking and teamwork. The competition is based on a MATHCOUNTS-style format with a keynote presentation and is accompanied by interactive tours of Carderock’s facilities, all while fostering the student’s interest in science, mathematics, engineering, and technology (STEM) career fields.

“We’re ecstatic to have so many bright young minds, who are excited about math here!” Capt. Matthew Tardy, Commanding Officer of the Division said. “Carderock is a place where science, math and engineering come to life, where people with disciplined backgrounds join forces to solve real-world problems and develop new ideas. We use math every day across the base and we have some tough math tests prepared for you all. We also have some wonderful tours scheduled for you.”

After opening remarks from Capt. Tardy, the students were escorted to different rooms to take their math competition tests. Following the tests, the children were pleasantly surprised with a cool treat.

Keynote speaker, Camille Schrier, the 2020 Miss America winner, spoke to the children about her love of science; being celebrated for her unique interest; and encouraging them to embrace their individuality instead of trying to fit in. Then, Schrier showcased her unique scientific talent, which she used to win the Miss America competition, to the competitors inside the Raye Montague Center for Maritime Technology Auditorium. Schrier was the first contestant to win Miss America with a science demonstration using water, oxygen gas and heat.

“I have always been the little science nerd,” Schrier said. “As we grow up, we go through different phases of understanding ourselves. Sometimes, we can feel a bit out of place when our interests differ from our friends. I remember feeling disconnected from my peers because I felt different from them. However, as an adult, when I decided to pursue a career in science and brought my passion for STEM into Miss America, I was finally able to be celebrated for my unique interest. It’s important to me to share how STEM has made my life better and more successful.”

After her presentation, Schrier demonstrated the catalytic decomposition of hydrogen peroxide experiment she performed for Miss America, captivating the students with the exothermic reaction.



The students also engaged in interactive tours at the David Taylor Model Basin, Magnetics Lab and the Wind Tunnel. The hands-on activities and knockout competition the students participated in challenged them to showcase their skills. Leo Su from the COME math club, a club not tied to a specific school, won and was offered the opportunity to shadow a Carderock engineer within the next year. The event closed out with an award ceremony presented by Capt. Tardy.

The team awards are given to the team of four students who achieve the highest overall score across all half of the written tests from any of the participating schools/clubs in their respective divisions. Two teams emerged as winners in the math contest. The Clarksville Middle School in Clarksville, Maryland,



Naval Surface Warfare Center, Carderock Division hosted its annual Carderock Math contest on Friday April 19, 2024 in West Bethesda. Over 150 students from middle schools throughout Maryland participated in the contest which included solo timed math competitions, team competitions and a final speed competition. The students were also able to tour the base as well as sit through a live science experiment given by guest speaker Camille Schrier, Miss America 2020. (U.S. Navy Photos by Brittney Odoms)



won the Port Division award, which has the hardest level of math problems and the highest level of competitors. Alpha STEM from McLean, Virginia, won the Starboard Division award, designed for students who do not have the necessary support structure to compete at the highest levels of middle school math.

Srinandasai Ari from Eagle Ridge Middle School in Ashburn, Virginia, won the Port Division award for the individual written contest by scoring the highest on the two individual test rounds. Ian Cheng from Colvin Run Middle School in Vienna, Virginia won the Starboard Division written test award.

Carderock’s planning committee who helped prepare the CMC are: Charles Fisher, Erica Scates, Nick Jones, Kristin Behrle, Kariann Vander Pol, Andy Loh, Art Elefante, Ben Medina, Kevin Augustyn, Ashlee Floyd, Charlotte George, and Kavi Dotson.



Carderock Welcomes New CO

By Daniel Troy and Hiep Nguyen, NSWC Carderock Division Public Affairs

Capt. Christopher K. Matassa relieved Capt. Matthew L. Tardy during a change of command ceremony at Naval Surface Warfare Center, Carderock Division in West Bethesda, Maryland, July 17, 2024.

Carderock's outgoing commanding officer, Tardy, and Rear Adm. Todd Evans, Commander, Naval Surface Warfare Center/Naval Undersea Warfare Center, welcomed Matassa into the new position at Carderock's Raye Montague Center for Maritime Technology.

"In spite of the turmoil created by these unprecedented times, our Navy's mission continues uninterrupted," Evans said. "We have been very fortunate to have had leaders like Matt at the helm. Throughout his command tour here, he has displayed exemplary leadership and superb foresight as he has seized several opportunities to steer a high visibility organization of thousands of employees through significant and dynamic changes while fulfilling our Navy's mission."

Before passing the baton to Matassa, Tardy reflected on his time in West Bethesda and thanked the Division's personnel for their dedication to the Carderock mission.

"We've accomplished so much, but there is always more to do," Tardy said. "The world is unpredictable,



and we're doing the right things here at Carderock to support our fleets. Thank you for your dedication and service. The team is getting an amazing leader in Chris. Stay focused, stay positive and keep on executing."

Tardy assumed command at Carderock on May 12, 2023. One of his first experiences as commanding officer included the International Human-Powered Submarine Races (ISR), a biennial Science, Technology, Engineering and Mathematics (STEM) event held at the Division's David Taylor Model Basin. The 2023 ISR was the first in-person event to occur at West Bethesda since the COVID pandemic. Since then, Tardy has

been a loud advocate for the Division's STEM and Outreach Program.

In his closing remarks, Tardy said he takes pride in all of the accomplishments the workforce achieved during his tenure.

"I'm proud of our advancements in warfighting readiness, establishing a crisis response center and a watch bill," he said "To do this, you must have great people leading the way. What really made these programs function were the selfless volunteers who stepped up to make this work."

Tardy was awarded the Legion of Merit for his superior accomplishments, and departed Carderock to replace former Carderock commanding officer Capt. Cedric McNeal at the Navy's Amphibious Warfare Program Office (PMS 377).

Matassa joins the Division as a decorated naval officer. For the past several years, he has served at the Pentagon, working in the Chief of Naval Operations Surface Warfare Division (OPNAV N96) as a Future Ships Requirement Officer.

"I'm grateful and humbled by this opportunity," Matassa said. "I keep thinking to myself 'Wow! This place is so cool.' The facilities and technologies here are so unique, truly unlike anything in the world. I am excited to take



Former Commanding Officer Capt. Matthew Tardy (right) sits with New Commanding Officer Capt. Christopher Matassa during the Change of Command Ceremony at Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., on July 17, 2024. (U.S. Navy photo by Lena Simmons)

command at Carderock, and I cannot wait to advance American sea models at a critical time for our national security."

Matassa most recently served as the Chief of Staff for the Deputy Assistant Secretary of the Navy for Ship Programs before assuming command as Carderock's 41st Commanding Officer.

NSWC/NUWC Commander Rear Adm. Todd Evans (right), former NSWC Carderock Commanding Officer Capt. Matthew Tardy (center), and the new NSWC Carderock Commanding Officer Christopher Matassa (left) stand together during the playing of the national anthem at the Change of Command Ceremony in West Bethesda, Md., on July 17, 2024. (U.S. Navy photo by Hiep Nguyen)



Capt. Tardy Takes a Two Day Visit to San Diego's Naval Base

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

Naval Surface Warfare Center, Carderock Division's Commanding Officer Capt. Matthew Tardy took a trip to Naval Base San Diego and had the opportunity to meet command staff, hand out awards and tour the facility.

The visit started with a meet and greet where Capt. Tardy met Carderock employees from the Naval Architecture and Engineering Department and Platform Integrity Department. It is worth noting that many people are not aware that the San Diego Naval base is an available office space option for Carderock



employees. Specifically, employees from the Combat Craft Division, Platform Integrity Department, Signature Department and Naval Architecture and Engineering Department frequently work there.

The office space contains an area of 14 desks with RDTE and NCMI drops, a conference room and a kitchen. The San Diego space currently has 32 federal civilian employees and is open to all Carderock employees to work out of if needed.

Capt. Tardy continued day one of his visit touring the Overlord Unmanned Surface Vessel Vanguard and the Jordan Patrol Boat, which is an aluminum boat designed for coastal and in-shore operations and is being built at the Marine Group Boat Works. He also met with the team responsible for the unmanned surface vessel (USV) of the Combatant Craft and Structures and Composites Division and the Combatant Craft Naval Architecture team, which is overseeing the construction of the Jordan boat.

The day wrapped with Combatant Craft Division employees showing Capt. Tardy the Surface Force, Pacific (SURFPAC) ship boats and the Navy Expeditionary Combat Command (NECC) facility.

On the second day, Capt. Tardy visited the Signature Department in Point Loma, San Diego, to meet with the Signature Trainers Branch and Fleet Support and Program Office Branch. He also visited the Submarine Force, Pacific (SUBPAC) and (SURFPAC) Acoustic Transducer Evaluation Center (TRANSDEC). Capt. Tardy also had the

opportunity to visit the Magnetics Silencing Range, which determines if a ship may be vulnerable to detection by magnetic mines.

At Nielsen Beaumont Marine on Shelter, located on Naval Base San Diego, Capt. Tardy and Carderock team members had the opportunity to tour a combatant craft medium that was undergoing renovation. Following the tour, he met a team of employees that are supporting special warfare.

Finally, before ending the tours for the day, he visited personnel from the Structures and Composites Division to tour the Littoral Combat Ship.

When the tours concluded, everyone gathered for a social event.

While in San Diego, Tardy recognized two employees with length of service awards and 21 San Diego government civilian employees with command coins and certificates of appreciation.



The Carderock employees that received the Command Coin include Andrew G. Quillin, Brian G. Sah, John M. Hollis, James T. Kennery, Chadd Jordan Artaud, Nathaniel Dean Corcoran, Thomas Christopher Daubert, Victor Manuel Esparragoza, Kristina Smith Fortner, Michael Scott Gemberling, Sage Elizabeth-Lee Hicks-Fredenburg, Adam Keith Kirchner, Tung D. Le, Carlos T. Maristela, Benjamin Philip Mckinley, David M. Newhouse, Tybur Thomas Reed, Duane Lamont Solomon, Zoey George Weisz, Sarah Kirsten Wine, and Steven C. Yaconi.



Carderock Leadership Visits Combatant Craft Division



Commanding Officer Capt. Matthew Tardy and Technical Director Larry Tarasek visit Carderock's Combatant Craft Division in Norfolk with Chief of Staff Stephanie Feulner, Division Head Michael Lowdermilk, Naval Architecture and Engineering Department Head Kate Terwilliger and Site Director Kip Davis in April 2024. The group stands in front of the site's V-47 Waterfront facility at Naval Base Norfolk before starting their tour.

The Combatant Craft Division (CCD) employs more than 150 naval architects, engineers, technicians, logisticians and support personnel working in a synergistic Integrated Product Team Environment providing the core of U.S. Government high performance boats/craft expertise and experience.

Established in 1967, CCD is the DoD's technical support center and primary source for watercraft design and system engineering. CCD's main administrative and engineering offices are located at the Joint Expeditionary Base Little Creek - Fort Story, Virginia. CCD conducts waterfront operations in support of engineering, test and evaluation on demonstration and in-service (fielded) watercraft from a facility at Naval Station Norfolk, V47. Together, these facilities provide synergistic integration of all watercraft design, engineering, and test and evaluation functions in one geographical area (Hampton Roads, VA) enabling a specialized design and test center with optimal test and evaluation conditions, and in close proximity to its primary military clients enabling rapid fleet interface. (U.S. Navy photo by Steve Ouimette)

Carderock's MSF Team Holds Ribbon-Cutting Ceremony at Newly Recognized Guam Facility



The Naval Surface Warfare Center, Carderock Division Code 75 Magnetic Silencing Facility (MSF) team installed a new underwater electromagnetic measurement system (UEMMS) at Naval Base Guam.

The Guam UEMMS enables more timely measurement and maintenance of platform signature levels for maritime forces and regional partners and allies in the Western Pacific by saving transit time to and from US West Coast MSFs. A ribbon-cutting ceremony was held to recognize the addition of the Guam facility to the MSF portfolio on Dec. 11, 2024.

Jessica McElman, Division Head, Underwater Electromagnetic Signatures & Technology Division, Naval Surface Warfare Center, Carderock Division, center, Capt. Matt Pianetta, Deputy for Operational Readiness, Submarine Squadron 15, right from center, and Cmdr. Phil Smith, Executive Officer, Naval Base Guam, left from center, prepare to cut the ribbon for Naval Base Guam's Magnetic Silencing Facility (MSF), Dec. 11, 2024. Guam's MSF is designed to provide operational and logistics support to maritime forces and regional partners and allies in the Western Pacific. (U.S. Navy photo by Lt. James Caliva)

Earth Day Activities Draw Support at Carderock

By Edwin Hernandez, NSWC Carderock Division Public Affairs



Each year on April 22, the world observes a day dedicated to, and in support of environmental protection. At Naval Surface Warfare Center, Carderock Division in West Bethesda, Maryland, several activities were hosted to promote environmental education and awareness to command employees.

The Division's Morale, Welfare and Recreation team organized four Earth Day activities, including a 5k Run/Walk, Guided Mindfulness and Meditation, Multicultural Food Tasting and Storm Drain Clean Up effort. Each event drew support from Carderock employees, all of whom were eager to do their part in reducing the human footprint.

To kick off, employees lined up bright and early for the 5k Run/Walk around the base. Unlike previous 5K Runs/Walks, the event's coordinator and Environmental Engineer Mike Phillips chose a new route that took employees through some of the Division's green spaces on campus, including a small garden surrounding some of the base's solar panels. After the race was completed, some employees took to their mats and enjoyed the opportunity to relax and

bask in the sun during the command's Guided Mindfulness and Meditation at the lawn in front of Building 2.

Near lunchtime, the MWR team laid out a spread of diverse food to welcome employees to its Multicultural Food Tasting inside the Annapolis Room, Building 60. Sweet treats, light beverages and small entrée samples were all on display and up for grabs. While attendees enjoyed a plate full of samples, representatives from Naval Facilities Engineering Systems Command

(NAVFAC) spoke to Carderock employees about the significance of storm water pollution and its prevention.

"We have been looking for ways to bring people together and expose our workforce to different religions, historical backgrounds – you name it," Community Outreach and Student Engagement Coordinator Ashlee Floyd said. "For this event, we wanted to collaborate with our environmental group and partners to raise awareness about ways we can protect our Earth and to learn more about each other. It is our responsibility to create a better world for ourselves and to protect the place we inhabit."

The Earth Day activities concluded with a Storm Drain Clean Up around the West Bethesda campus. NAVFAC representatives, who led the event, taught Carderock employees how replace storm drain caps and handed out supplies to pick up debris and trash occupying the grounds on base. Each activity was well supported and attended by the Carderock community, including one of its key leaders Commanding Officer Capt. Matthew Tardy.



The Countdown to Maryland Fleet Week Kicks Off With Fox 45 Baltimore Visit to Carderock

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

Naval Surface Warfare Center, Carderock Division welcomed WBFF Fox 45 News Baltimore to its headquarters in West Bethesda, Maryland, on June 10, 2024, to promote Maryland Fleet Week. The Division's Chief of Staff Stephanie Feulner and Einstein Fellow Melissa Thompson served as ambassadors for the command and its growing science, technology, engineering and mathematics (STEM) program, which was highlighted during Fleet Week in Baltimore, June 12-16.

"It's an exciting morning here at Carderock," Chief of Staff Stephanie Feulner said. "Fox 45 Baltimore is here and we are excited to be a part of getting the word out about Carderock. We want to spread information about our hands-on STEM activities that are readily available to kids and educators."

The visit began with opening remarks from Feulner about Carderock's robust STEM program and how it translates to the research and development

employees do for ships and submarines to support the Navy's sailors. She hopes Maryland Fleet Week will inspire children to become interested in STEM and potentially pursue a career at Carderock in the future.

After Feulner, the first demonstration was a drag test led by Einstein Fellow Melissa Thompson. The activity, which featured a drag test, is an experiment for children that mimics some of the tests executed at the David Taylor Model Basin. Two small boats raced against each other. One boat had little resistance while the other carried magnetic pebbles and cotton balls on its bow and stern to represent barnacles attached on a ship. Thompson and Stewart raced their small boats and observed how the barnacle-filled boat moved slower to the finish line. Thompson explained, this is only one of the factors – resistance and drag – Carderock scientists and engineers have to test to ensure naval submarines and ships perform optimally.

"Giving a demonstration pre-fleet week was amazing," Thompson said. "It was an opportunity of a lifetime to show people in Baltimore and the surrounding areas the work we do at Carderock in the STEM office. I hope the exposure from the visit will help us intrigue more local school districts to come visit Carderock and increase the foot traffic for our lab tours."

Thompson, who is also an educator for Baltimore City Public Schools, informed the public that formal and informal educators can sign up for on-site training at the command which includes training for age-appropriate STEM lessons, a tour of the command's labs and STEM-in-a-box toolkit to teach their students in the classroom.

The last segment featured a military working dog demonstration on the lawn of the Raye



Fox 45 Baltimore's Taylor Stewart reports on visiting U.S. Navy K9 unit while wearing a bite suit for a working dog demonstration at Naval Surface Warfare Center, Carderock Division on June 11, 2024. (U.S. Navy photo by Brittney Odoms)



Josh Whitaker, a dog handler for a U.S. Navy K9 unit, prepares for a working dog demonstration with military working dog Rayah on June 11, 2024 at NSWC Carderock Division. (U.S. Navy photo by Brittney Odoms)

Montague Center for Maritime Technology, Building 40. Stewart threw on a bite suit and worked with military working dog (MWD) Rayah. The dog handler, Josh Whitaker and talked about ways MWD dogs like Rayah keep the general public and the fleet safe by using their heightened senses to detect narcotics and explosives. Stewart and Rayah simulated a run and chase drill to demonstrate the capabilities of MWD serving in the Navy.

"I had an amazing experience at Carderock," Stewart said. "I love the drag test because it is so important to get kids into STEM early, especially when you think about all the things that go into naval architecture. So, bringing that significance on screen to our viewers is essential to me and that people know about Fleet Week and Carderock. I had no idea about the David Taylor Model Basin, so today it was an eye-opening experience to see how critical it is to honor our military and celebrate what they do."

Maryland Fleet week and Flyover occurred in Baltimore and presented an opportunity for civilians to learn about and interact with active duty Sailors and Mariners.



Fox 45 Baltimore's Taylor Stewart suits up for a working dog demonstration for U.S. Navy K9 unit at Naval Surface Warfare Center, Carderock Division on June 11, 2024. (U.S. Navy photo by Brittney Odoms)



Albert Einstein Fellow Melissa Thompson and Fox 45 Baltimore's Taylor Stewart highlight the importance of the STEM program and how it can make an impact on young minds before entering the workforce. (U.S. Navy photo by Brittney Odoms)

Carderock's Small Business Office Supports Naval Science and Technology Community

By Edwin Hernandez, NSWC Carderock Division Public Affairs

Naval Surface Warfare Center, Carderock Division in West Bethesda, Maryland, is one of the Navy's premier research and development facilities for surface ships and submarines. Its workforce provides critical test and evaluation support capabilities that enable naval warfighters to operate and maintain state-of-the-art equipment at sea. To advance the Warfare Center's mission, the Division's Small Business Office frequently engages with vendors and companies to identify new opportunities and meaningful ways to better support Carderock's mission.

Small Business Deputy Carlos Duran is the chief architect behind identifying such companies and plays a key role in fulfilling resource requisitions for the entire command.

"Small businesses are a critical pillar to our economy," Duran said. "They are a crucial piece to providing support to the warfighter. They bring innovation to the requirements that we have and provide solutions to our needs. Small businesses offer us new ideas

and technologies; at the same time, they benefit our economy at a local level by creating jobs."

Duran meets regularly with small business representatives to learn more about their services, evaluating which companies are best suited to support Carderock and its mission. In his role, he evaluates and promotes procurement opportunities for small businesses and advocates for their services.

"Outreach events are a conduit for me to understand companies and their capabilities; and for those companies to understand our mission," he said. "So long as they can provide a solution to our mission, my job is to help them navigate the government contracting arena."

Receiving a contract from the government, however, is not so simple. Any company interested in doing business with the government must register, be vetted and approved first by the General Services Administration via the System for Awards

Management. Then, the U.S. Small Business Administration determines the size of the company – large or small – based on its standards/requirements. An additional screening is executed on eligible companies to ensure they are not controlled, directed or managed by a country that is restricted by the U.S. Another scrutiny is conducted to ensure companies are not on the Excluded Parties List.

Once companies have successfully passed all screening requirements, federal small business representatives like Duran can engage in dialogue with company representatives to learn more about each other's needs and capabilities.

"If a company can appropriately support our needs and offer the best quote or value to the government, then that company could get a contract, assuming all other contracting matters are in order," Duran said. "We have to make sure we evaluate them and that they are capable of supporting our mission."

Recently, Duran held a conversation with a construction company that maintains a key presence around the country. Carderock, which is headquartered in Maryland, has eight detachments scattered across the U.S. with unique labs to support surface ship and underwater craft testing. Duran used this interaction to understand how this construction company might be able to support Carderock's detachments from coast-to-coast.

"We have a small presence in Idaho and we sometimes have a hard time finding small businesses that can offer support in that area," he said. "South Florida is another example of a place where finding the right support for simple construction jobs can be challenging. In this instance, I was able to recommend this company to our contracting officer to repair an HVAC unit in our Idaho location."

Duran organizes industry days in collaboration with Carderock's Contracting and Acquisition Department for specific, technical requirements. To understand what is needed from the Division's technical codes, he meets with Subject Matter Experts before the event is advertised to eligible companies. During these industry days, SMEs have the opportunity to ask questions and gain input on how a company may support critical needs and, as a result, assist Carderock in providing modern and innovative equipment to the warfighter.

"After I meet with companies, they want to meet with the technical experts – the people they know have a need," he said. "They want to explain their capabilities to the end users. So, what I do is facilitate that connection while also educating these companies on how they can do business with government organizations like Carderock."

Throughout his tenure at the Division, Duran has ensured small businesses have a fair and equitable opportunity to compete for supply and service contracts advertised by Carderock. He has been an advocate to the small business community; and, under his guidance, the command has issued more than \$767 million in awards to small businesses. Duran's advocacy, recommendation and knowledge of small business operations has supported the Warfare Center's ability to empower the Navy and its Sailors.



**SMALL BUSINESSES
OFFER US NEW IDEAS AND
TECHNOLOGIES; AT THE SAME
TIME, THEY BENEFIT OUR
ECONOMY AT A LOCAL LEVEL
BY CREATING JOBS.**

Halloween Fun Run

Carderock employees showed up in their “not-so-spooky” Halloween costumes to participate in the Halloween fun run/ walk on Wednesday, October 30, 2024 in West Bethesda, Md. Employees chose to either run four laps or walk two laps around the route and enjoyed some healthy snacks and refreshments following their run or walk. (U.S. Navy photos by Kristin Behrle and Lena Simmons)



Ice Cream Social

Naval Surface Warfare Center, Carderock Division's workforce turns out for some summer fun at the Raye Montague Center for Maritime Technology in West Bethesda, Md., on Aug. 1, 2024. The Division hosted an ice cream social which featured yard games and music for all to enjoy. (U.S. Navy photos by Edwin Hernandez)





Carderock Employees Meet the Fleet

By Brittney Odoms, NSWC Carderock Division Public Affairs

In the early morning, before the birds began to chirp, Naval Surface Warfare Center, Carderock Division employees boarded a bus and made their way down to Naval Station Norfolk to Meet-the-Fleet.

Meet-the-Fleet is an opportunity for employees to grasp a better understanding of the mission and customers they are serving. It provides the civilian workforce with a glimpse of how their work, including the parts they invent, manufacture or test, is applied in real-world scenarios aboard a ship or submarine.

“Being able to see the different ships helped me get a better understanding of what we need to do as Carderock employees to maintain a safe work environment for the active duty personnel,” Battery Testing Engineer Maggie Kurdle said. “As an engineer, I was able to see the spaces and understand more of the safety protocols put into place for battery integration on a naval ship.”

28 Carderock employees, along with Carderock's Chief Engineer Dr. Paul Lara and Administrative Tech Specialist Olamidayo Odusanya, had the opportunity to board two surface ships and one submarine stationed at Norfolk. The group walked on the flight decks of USS Gerald R. Ford (CVN 78) and USS Stout (DDG 55), overlooking the pier which leads to the Atlantic Ocean. While aboard USS Stout, Carderock employees experienced a unique military event: a promotion ceremony of one of the ship's Sailors.

“My favorite part was being able to see the promotion ceremony,” Kurdle said. “It was something that not a lot of people outside of the military get to see. I also saw how the crew was so supportive of one another, which was nice.”

Apart from the flight deck and the promotion ceremony, Carderock employees passed through

the ships' living quarters, mess hall and command center, where all major functions and capabilities are controlled. According to employees like Kurdle and Multimedia Specialist Aaron Thomas, the trip presented them with a new appreciation for the work they perform on a daily basis.

“The trip put the work we are doing here on base into perspective,” Thomas said. “When you see something on a screen, it can be hard to understand the impact it has on the people using it every day. Seeing the products we make inside the space they were intended for makes the work worth the effort.”

While most of the work that occurs at Carderock is small-scale ship design, Meet-the-Fleet provided an exclusive tour of the sheer size of ships and crews the Warfare Center supports. Trips like these present Carderock's workforce with a new outlook about life aboard Navy ships.



Memorial Day Ceremony

*By Brittney Odoms,
NSWC Carderock Division Public Affairs*

Naval Surface Warfare Center, Carderock Division held a Memorial Day Ceremony on May 23, 2024 in West Bethesda, Md. Capt. Matthew Tardy, alongside Acting Deputy Technical Director Todd Cheek gave speeches honoring those who have made the ultimate sacrifice to uphold U.S. values and interests.

During Capt. Tardy's speech, he recognized the family members of those who have lost a loved one in service and spoke about the privilege we, as Americans, enjoy on a daily basis. Tardy reminded the Carderock workforce about the importance of remembrance and paid tribute to those who courageously executed the oath to protect this country and her freedoms.

"Although the sacrifices of our service members are at the forefront of our minds, we must also remember and honor the dedicated family members who embraced their loved ones one last time," Capt. Tardy said. "Our sentiment and courage continues to be embodied by every American who stands on the frontlines and here at home defending our values as a people. We are one nation, united; and we thank all of our fallen, retired and active duty service members who risked their lives to protect the land we love and cherish."

Acting Deputy Technical Director Todd Cheek delivered closing remarks and highlighted the history and importance of "Taps". Taps is traditionally played at military funerals, memorial services and every evening at Arlington National Cemetery. Tardy and Cheek pointed out that the flags placed in every cemetery across American towns and cities represent a silent testimony of those who gave their lives for the U.S. (U.S. Navy photos by Brittney Odoms)





MWR Book Exchange

The Morale, Welfare and Recreation team at Naval Surface Warfare Center, Carderock Division host a book exchange for command employees in West Bethesda, Md., on Feb. 21, 2024. Employees had the option to recommend some of their favorite novels to their fellow co-workers or pick new book to read. The MWR team also included a Do It Yourself bookmark table for anyone interested in designing a new placeholder for their reading. (U.S. Navy photos by Aaron Thomas)

New Locker Rooms Open in West Bethesda

By Brittney Odoms and Edwin Hernandez, NSWC Carderock Division Public Affairs

With recent new upgrades made to Naval Surface Warfare Center, Carderock Division's Fitness Center in West Bethesda, Maryland, the command's most impactful additions to the fitness center opened its doors on Feb. 1, 2024. The Carderock Fitness Center, which recently was upgraded with new equipment, HVAC, a fresh coat of paint and signage, opened its locker rooms for the first time since a devastating flood struck the Washington metropolitan area in the summer 2019. The new and improved locker rooms feature showers and bathrooms for gym goers to use and marks the completion of a long-awaited renovation project for the workforce.

The locker room facilities, which were condemned from use after irreparable water damage, have been out of commission for more than five years. During that time, three separate commanding officers – Capt. Cedric McNeal, Capt. Todd Hutchison and Capt. Matthew Tardy – have played a critical part in helping restore the command's locker room facilities at its West Bethesda headquarters.

To ensure safety and appropriate health conditions, Carderock's Infrastructure Division hired a contractor to gut and remove all water-damaged drywall and

fixtures, thereby kick starting the restoration project several years ago.

In 2021, Carderock's Infrastructure Division hired an architectural and engineering firm to complete a design package for the new locker rooms; and in 2022, former Commanding Officer Capt. Hutchison directed the use of Strategic Alignment Workshop funds to finance the construction. When the contract was awarded in March 2023 for more than a million dollars, it signaled the start of the building phase for the new space.

"Since making the new improvements to the gym, we have seen an increase in foot traffic," Contract Office Representative Henry Mordica said.

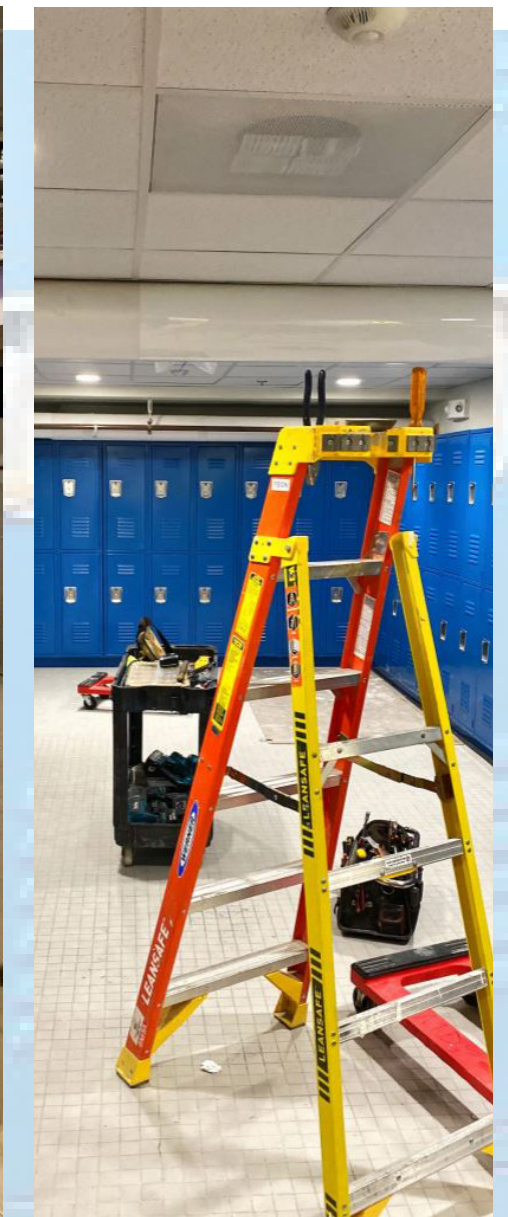
The Infrastructure Division, who coordinated the restoration efforts, hope the new facility will positively contribute to the work experience of Carderock employees.

"We want to enhance the morale and quality of life for Carderock employees," Infrastructure Deputy Adam Scates said. "Hopefully this new facility can provide our employees the motivation to start or continue their fitness and wellness pursuits by providing them with accessible locker, shower and gym facilities."

The Infrastructure Division encountered several challenges along the way to make the locker rooms a reality, including unforeseen site conditions that impacted the overall construction schedule.

"We faced a variety of design and construction challenges during this project," Mordica said. "From a design and historical drawing perspective, the existing utility running in the field were not fully in sync with the layouts provided. This can often be the case once walls are actually opened up. Due to this, additional analysis had to be performed to determine active versus abandoned utility lines. There was also work performed several years ago to gut the restrooms that was outside this renovation contract. The previous demolition work lowered the floor, which resulted in a modification to raise the floor to the appropriate height. Another challenge throughout the job was to accommodate appropriate height clearances and make the necessary utility runs."

For Carderock's senior leaders and the infrastructure team, the opening of the locker room is a massive win that required tons of patience, coordination and cooperation. Those involved in this restoration project said they



are proud to have reopened these facilities for the entire West Bethesda community.

"This is a big win for not only the command, but specifically MWR because it provides modern locker, shower and restroom facilities for patrons of the gym, intramural sports, runners and all other wellness activities that may require these facilities," Scates said. "We are thrilled to finally have pushed this project across the finish line."

As part of the new locker rooms, patrons will have the ability to utilize daily lockers or request a reservation eligible locker on a first come, first served basis. To do this, Mordica said employees should visit and review the reservation eligible lockers. If one is available, he recommends employees claim it by putting a pad lock on it. After doing so, employees must send an email with the claimed locker number to Adam Scates at adam.r.scates.civ@us.navy.mil. Employees who do not follow these instructions

and leave their pad lock on an unregistered locker without a name will have their locks cut. Reserved lockers will be reviewed monthly to ensure proper usage and are subject to adjustment based on demand.

As a reminder, the Carderock Fitness Center is now a CAC access-controlled facility. Access will be granted upon completion of the Accident Waiver and Release of Liability Form.



MWR Hike/Walk

Carderock employees take a break from their desk and enjoy the sunny November weather on Wednesday, Nov. 6 in West Bethesda, Md. Employees joined Commanding Officer Capt. Chris Matassa and Chief of Staff Stephanie Feulner for an outdoor hike along the Billy Goat C Trail in the C&O Canal National Historic Park. The hike was sponsored by Carderock's Civilian Morale, Welfare and Recreation (CMWR) team, and is part of an effort to increase the frequency and variety of morale-boosting events offered to employees. Walking has powerful health benefits—many studies show that just five minutes of walking in nature improves mood, self-esteem, and reduces stress. (U.S. Navy photos by Kristin Behrle)



Carderock MWR Leaders Revamp Holiday Party to New Level

By Edwin Hernandez, NSWC Carderock Division Public Affairs

Morale, Welfare and Recreation (MWR) leaders at Naval Surface Warfare Center, Carderock Division revived and revamped the command's traditional holiday party in December 2023. The event, which was disrupted by the COVID-19 pandemic in years past, offered Carderock employees the opportunity to celebrate the winter holidays amongst their peers and fellow co-workers in West Bethesda, Maryland.

After a 4-year hiatus and with support from Carderock's senior leadership, MWR leaders Dianna Pleasants, Anna Rucker and Jessica Williamson began coordinating the winter festivities.

"We really kind of started with a clean slate," Williamson said. "We did not have a lot of turnover information of how it was done in the past, so this was a chance to start fresh. After talking with Carderock leadership and hearing about some of the feedback in the command

climate survey, we knew our workforce was looking for something different, new and vibrant, and that was our initial challenge."

While attending Carderock's Turkey Trot Fun Run in November 2023, Williamson became inspired to shake things up. She wanted to take a new approach to ringing in the winter holidays and promote an event that allowed multiple themes and ways for personnel to interact. After sharing her ideas with her fellow coordinators, Rucker, Williamson and Pleasants aimed to make it a reality in a short, three-week turnaround.

"We wanted to ensure that there was a Teams hybrid component for our detachments and offsite personnel, as well as an in-person option," Williamson said. "That was one of our priorities. Then we started thinking about activities like raffles, bingo and a door decorating competition that would be available to our workforce, regardless if you were at headquarters, teleworking or at a detachment."

The door decorating competition, in particular, brought out tons of creativity and employees were encouraged to vote for their favorite design.

Unlike previous holiday parties, which were held in the Taylor room, Building 2, this year's event changed venues and was hosted at the Raye Montague Center, Building 40, to accommodate more employees. MWR staff

introduced game rooms – bingo being the most popular – for employees who preferred a calmer social environment. While inside the cafeteria, the party rocked boomed with music, sweet treats from local vendors, and a craft table where people could design their own personalized ornament. The cafeteria also featured a winter wonderland theme consisting of blue, white and silver colored decorations, as well as conversation starters at nearby table stations.

In the auditorium, MWR volunteer Nancy Adler, Deputy Department Head oversaw the paper airplane competition.

"I didn't think that one would actually be as popular as it was," Williamson said. "I stopped in there for a minute and there were people smiling and laughing with each other, and that was the intent. It was to have that wholesome competition between our workforce, but also having people participate and watch."

The MWR team teamed up with the Inclusion, Diversity, Equity and Accessibility (IDEA) Employee Resource Group (ERG) and introduced a culture room. Employees could learn about different holiday cultures and customs, as well as share their own traditions. Some of the holiday cultures represented were Christmas, Hanukkah, Kwanzaa and Chinese New Year.

"This was a great opportunity for the command to learn about different cultures and holidays that are celebrated around the world," Williamson said.

Another new addition to the Command Holiday party was the table top game room. This allowed employees to enjoy a quieter environment while partaking in some friendly competition with their co-workers.

Though the party was planned rather quickly, it required immense teamwork and collaboration between MWR volunteers. After working with a tight budget – hindered by the loss of Carderock's cafeteria, a main revenue source for MWR – the event took off and excited several employees.

"Our budget for the year is tight," Williamson said. "A lot of our workforce might not know that the MWR yearly budget is determined by food and vending sales commission. By buying at Foda, purchasing a snack at the vending machine or getting your food at the food trucks, you are really supporting future events for the command."

The MWR team hopes to acquire more volunteers to help plan MWR activities in the future. According to Williamson, all that is needed to be a MWR volunteer is passion to make the MWR benefits soar.

Rucker, Williamson and Pleasants extend a special thank you to all of the volunteers and support personnel that contributed to the Holiday Party. Without each of you it would not have been a success.



Carderock Renames its Information Center in Honor of Raye Montague

*By Edvin Hernandez and Kelley Stirling,
NSWC Carderock Division Public Affairs*

Naval Surface Warfare Center (NSWC), Carderock Division honored one of its own with the renaming of its Maritime Technology Information Center in West Bethesda, Maryland, after a naval icon, Raye Montague. Carderock marked this historic event by hosting a ceremony on Feb. 15, 2024, unveiling the new name as the Raye Montague Center for Maritime Technology.

Montague, who was the first person ever to design a ship using a computer, posthumously received this dedication for her contributions to the U.S. Navy. Dr. David Montague, Raye's son, attended the event with his family. Other speakers included Carderock Commanding Officer Capt. Matthew Tardy, Carderock Technical Director Larry Tarasek and Warfare Centers Executive Director Dr. Marty Irvine.

"This building is a conference center, built in 2007 for the purpose of accommodating the members of this command in their mission, which is to conduct world-class ship design and engineering," Tardy said. "Carderock is Where the Fleet Begins and Raye Montague is where computer ship design begins. It's an honor for us to have this building named after her."

Prior to making the renaming official, Tardy penned a letter to Montague's son, David, to inform him of the approval and ask for his permission to proceed with the renaming.

Dr. Montague, the Associate Vice Chancellor for Academic Affairs and Student Success at the University of Arkansas at Little Rock, accepted both the proposal and invitation to speak at the event.

"This is an emotional moment for me because I spent a significant amount of my youth at this facility, running around and learning how to program computers," Dr. Montague said. "The sheer time and effort that everyone put in to turn this idea into reality – just like ship design – is incredible. I grew up as a child of Naval Sea Systems Command – NAVSEA runs in my blood. To be here and see this building dedicated in her honor is overwhelming."



Naval Surface Warfare Center, Carderock Division Commanding Officer Capt. Matthew Tardy (left) and Technical Director Lawrence Tarasek, SES, (center right) take a photo with former Carderock Commanding Officer, Capt. Todd Hutchison (center left); Associate Vice Chancellor for Academic Affairs and Student Success at the University of Arkansas at Little Rock, Dr. David Montague (center); and Naval Sea Systems Command Warfare Centers Director, Marty Irvine, after unveiling the new name for the Division's Building 40.

Dr. Montague co-wrote a biography about his mother with Paige Bowers, who was unable to attend the ceremony. He followed the ceremony with a book discussion about his mother's life.

"I think it is a fitting tribute to her, and I think this is something that will be educational for anyone who visits this building," he said. "My mother started in the Applied Mathematics Lab at Carderock, and she did a lot of her formative, early career opportunities when she moved from Arkansas to Maryland, and the Navy gave her that opportunity. She built a trusting network at Carderock, which is important because that team building and that effort to make a difference is what laid the groundwork for her success."

In the 1950s, Montague had wanted to study engineering, but that was not available to her based on the laws at the time. Instead, she studied business and graduated Arkansas Agricultural, Mechanical

and Normal College – now the University of Arkansas at Pine Bluff – with a Bachelor's of Science in business in 1956. During her time in college, however, Montague also took night courses in computer programming; and upon graduation, she began her civilian career as a clerk typist at the David Taylor Model Basin, now known as NSWC Carderock Division, in Bethesda, Maryland.

Montague quickly showed her aptitude in science and math, which would eventually lead her to be reassigned to work with the new Universal Automatic Computer I (UNIVAC I) system, the world's first commercially available computer.

A few years later, she would take on a new position as a digital computer systems operator at the Naval Ship Engineering Center in Hyattsville, Maryland. While there, she was charged with modifying and reconfiguring the massive ship specifications

automation system known as Computer-Aided Ship Design and Construction (CASDAC).

When she completed this "impossible task" within her deadline, Montague was eventually asked to design a ship, again with what her bosses thought to be an impossible deadline of one month, after President Richard Nixon said the Navy had two months instead of two years to get it done.

Montague is credited with designing the first draft of the Oliver Hazard Perry-class frigate in 1971 in less than 19 hours, earning her a Meritorious Civilian Service Award and revolutionizing ship design from that day forward. Montague's dream of becoming an engineer was realized later in her career, ultimately becoming the program director for Naval Sea Systems Command's Integrated Design, Manufacturing and Maintenance Program.

"The work that is being done here at Carderock could not be achieved without pioneers like Raye Montague who went before us," Irvine said during the ceremony. "Ms. Montague not only made computer-aided ship design a commonplace, but paved the way for people that followed in her footsteps, including those who are driven to get things done, deliver solutions, and serve our country, as she did."

Tarasek talked about Carderock's role in ship design and the creation of new design tools such as the computational Research and Engineering Acquisition Tools and Environments for ship design, also known as CREATE Ships.

"We owe a lot in the way we design ships to Raye Montague," Tarasek said. "The least we can do is name a building after her."



Photo courtesy of the Montague family

**18 HOURS +
26 MINUTES**



Ms. Montague designed the first draft of the Oliver Hazard Perry-class frigate in 1971. She completed the two-year process in 18 hours and 26 minutes, earning her a Meritorious Civilian Service Award and revolutionizing ship design.



Photo courtesy of The Harry Connick, Jr. Show

MAKING WAVES

**1984
US NAVY PROGRAM
MANAGER OF SHIPS
(PMS-309)**

**DO THE
IMPOSSIBLE**

"CHANGE OBSTACLES INTO
CHALLENGES. YOU MIGHT
HAVE TO STEP BACK AND GO
A DIFFERENT DIRECTION,
BUT YOU CAN ACHIEVE."

**A LEGACY THAT : ::
IMPACTS**



Photo courtesy of the Montague family

Director for Corporate Communications Kelley Stirling (left) and Multimedia Specialist Chalene “Lena” Simmons (right) stand next to a timeline highlighting the career of Navy “hidden figure” Raye Montague. Stirling and Simmons were the head coordinators for creative media involved in the unveiling of Naval Surface Warfare Center, Carderock Division’s Building 40.



Naval Surface Warfare Center, Carderock Division Commanding Officer Capt. Matthew Tardy (right) speaks to Dr. David Montague, the son of Navy icon Raye Montague.



Dr. Montague, Capt. Tardy, Mr. Tarasek, Capt. Hutchison, and Dr. Irvine unveil the new name of Building 40, proudly revealing its transformation into the Raye Montague Center for Maritime Technology – a lasting tribute to Montague’s pioneering legacy in naval innovation.



Mr. Ouimette, Mrs. Cummings, and Dr. Irvine join in the celebration, sharing in the joy and excitement of this unforgettable moment during the festivities.



Associate Vice Chancellor for Academic Affairs and Student Success at the University of Arkansas at Little Rock, Dr. David Montague, speaks about his mother’s career.



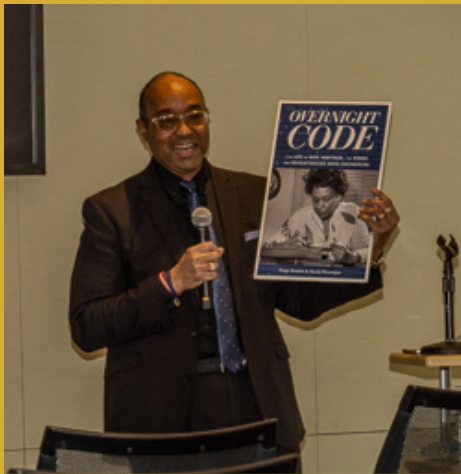
Dr. Martin Irvine, Jr. addresses the attendees, reflecting on the life and lasting legacy of Ms. Raye Montague.



Naval Surface Warfare Center, Carderock Division Commanding Officer Matthew Tardy (left) and former Carderock Commanding Officer Capt. Todd Hutchison stand together next to a banner paying homage to the Navy’s own “hidden figure” Raye Montague.



Dr. Montague autographs a copy of his book, Overnight Code, co-authored with Paige Bowers for Kelley Stirling.



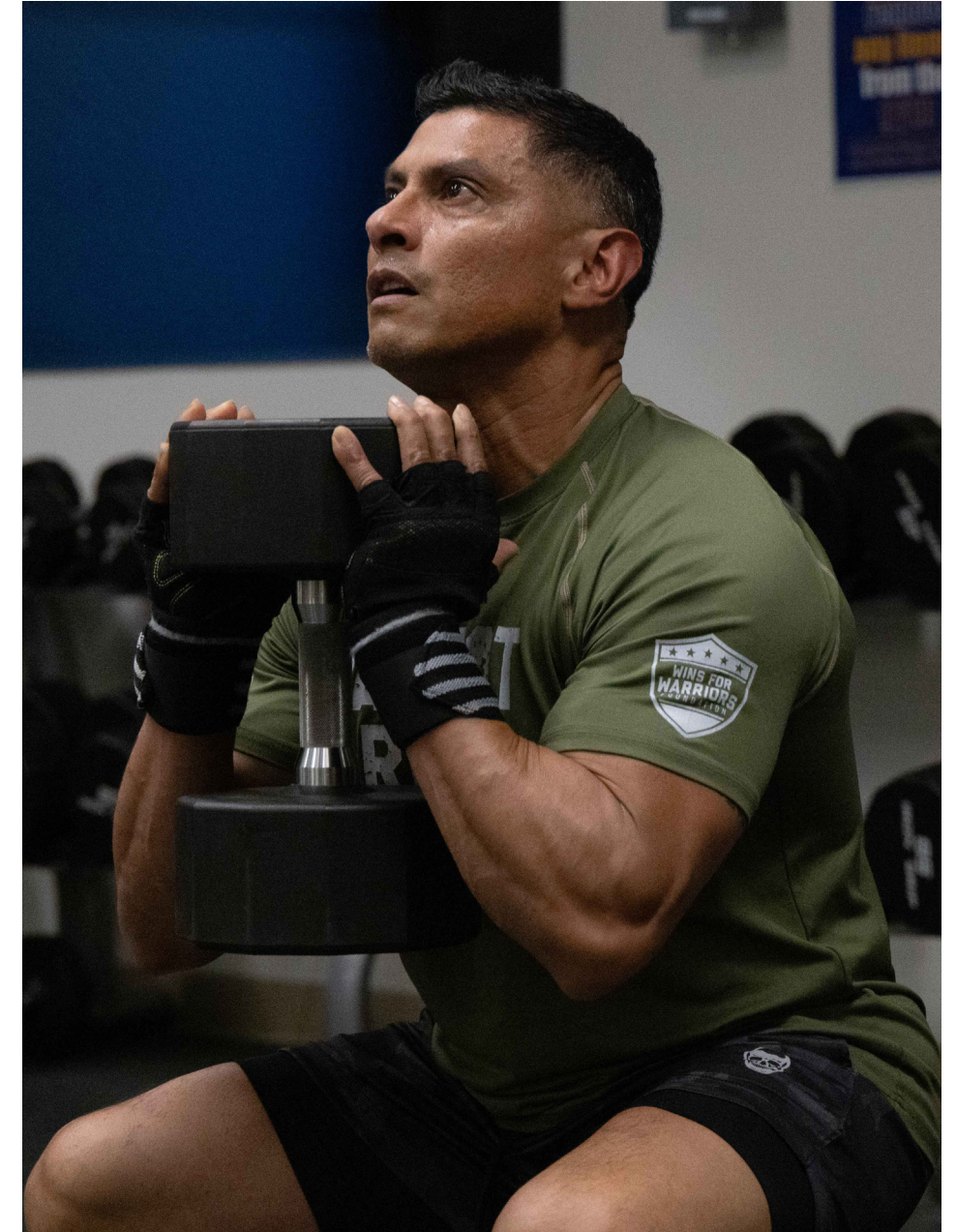
Dr. David Montague, Raye’s son, accepted an invitation to speak at the event and followed the ceremony with a book discussion about his mother’s life.



Honoring the legacy of Raye Montague: Guests gather for the renaming ceremony of the Raye Montague Center for Maritime Technology, celebrating her groundbreaking contributions to ship design for the U.S. Navy. A well-deserved tribute to a trailblazer who reshaped maritime innovation.

Relative Strength Challenge

The Morale, Welfare and Fitness team at Naval Surface Warfare Center, Carderock Division host a relative strength competition in the Fitness Center, Building 2, in West Bethesda, Md., on May 8, 2024. The strength challenge included push-ups, pull-ups and goblet squats. Each employee participating was scored based on reps completed. Commanding Officer Capt. Matthew Tardy and Chief of Staff Stephanie Feulner observed the competition, cheering for employees. (U.S. Navy photos by Corum Byers)



Carderock's Bring a Child to Work Day Features More Than 200 Mini Explorers

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



Naval Surface Warfare Center, Carderock Division was flooded with young, curious minds for National Bring a Child to Work Day on April 26, 2024, in West Bethesda, Maryland.

"Hey, aren't you all supposed to be in school today," Capt. Tardy, the Commanding Officer of the Division jokingly asked the kids. "Well, you can tell your teachers tomorrow about all the great things you learned today. Later, you will get to see all the fantastic work that your parents and guardians do for our Navy and country. The Carderock facilities you will see today are some of the nation's most advanced research and development and testing and evaluation centers, providing us with an unequivocal advantage in maintaining the best Navy in the world. The work your parents and guardians do help us maintain that advantage."

The planning committee, which included Carderock employees Jennifer Brewster, Ashlee Floyd, Mackenzie Perry and Charlotte George, curated a schedule with interactive tours, demonstrations and indoor activities around the base to show children the different career opportunities available in the science, technology, engineering and mathematics (STEM) field. More so, it was a chance for children to see all the unique work that goes into supporting the Navy. "I hope that by providing these experiences to the children, they will develop an interest in working here in the future," Floyd said. "I hope that the memories they create during these experiences will guide them in making decisions about their career paths when they grow up."



The day started with more than 300 parents, guardians and children assigned to their interactive tour loops. The loops were separated by different colors, with the red loop group going to the Explosive Test Pond, Fatigue and Grillage Test Facility and the Advanced Manufacturing Prototyping Lab. The yellow loop tour went to the High-Energy Battery Testing Facility, Fire Safety Lab and Magnetic Field Lab. The blue loop visited the Subsonic Wind Tunnel, Rubber Lab and Addictive Manufacturing Research Lab.

At each location, a Carderock employee was there to give a demonstration and description of how their work contributes to supporting naval operations. During a demonstration at the Rubber Lab, led by Non-metallic and Low Observable Materials Engineer Jay Del Rosario and Junior Engineer Marielle Buchy, children observed how the laboratory tested rubber



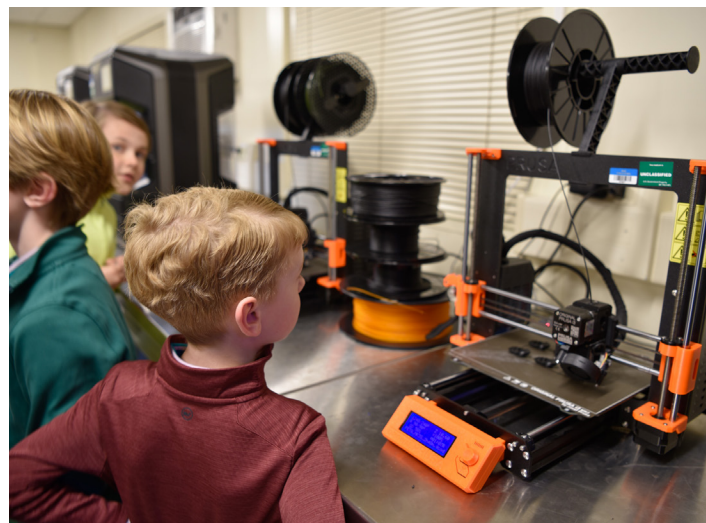


materials and made polymers. Toward the end of the demonstration, each child received rubber souvenirs in the shapes of gummy bears, worms and boats to take home.

Amongst the group was an enterprising child, Patrick Gerstner, who knew he wanted to follow the steps of his mother, Materials for Hypersonic and Advanced Systems Branch Head Danielle Gerstner.

"I think I want to join the Navy and do what my mom does, making the parts and testing bombs," he said.

Outside of the tours, children, parents and guardians were given the option to visit different sites at the command such as the Maneuvering and Seakeeping Basin (MASK), the David Taylor Model Basin, the Curator Model Shop, the Rotating Arm and the Circulating Water Channel.



At the MASK, carriage rides on the rotating arm were provided for visitors, as well as a live demonstration of unique waves from inside the Navy's indoor ocean.

For multimedia specialist Chalene Simmons, this was an opportunity to show her children the base she supports on a daily basis.

"They were very inquisitive and curious about how things worked," Simmons said. "Their favorite part of the day was the Rotating Arm. I think the experience of spinning around the water was cool and seeing them in action rather than reading about it was different and inspired them."

Near Building 40, the fire and police department on base occupied the parking lot to show children and guardians safety protocols, uniforms and equipment. The firefighters opened some of the fire hydrants to release water, inspiring each child to sprint in line for a turn holding the hose. Once the demonstrations were over, kids walked away with a colored plastic firefighter helmet for their volunteerism.

In the Raye Montague Center for Maritime Technology, there were various indoor activities in rooms focused on STEM, as well as quiet rooms for children to recharge their energy. The activities inside included a book exchange, mark making, coloring, reading and crossword puzzles. In addition, two of the rooms were focused toward career exploration using Seaworthy STEM guidebooks. In those particular rooms, children learned how to write, communicate and solve Morse code through different stations in 15 minutes. The other exercises in the Seaworthy STEM room included guessing the density of objects; learning how engineers solve drag and resistance issues from barnacles attaching to boats; and understanding how sound travels in through water.

"We are growing new talent," David McAfee, an acquisition manager said. "It is important for all of us to give back to the next generation, especially in math and science."

In the security, computers, and information technology room, the kids were allowed to design their own Common Access Cards. Other activities included

a game called "Pin the Confidential Stamp on the Envelope," which was similar to "Pin the Tail on the Donkey," and a scavenger hunt. Parents and kids also engaged in a paper airplane contest in the auditorium.

At the end of the day, the mini explorers walked away with an idea of the career they may want to pursue.



From the Eyes of a Parent: The Journey of an Olympic Champion Torri Huske

By Edwin Hernandez, NSWC Carderock Division Public Affairs



Team USA Olympic swimmer Torri Huske poses with her mother, Carderock IT Specialist Ying Huske, during a "Meet & Greet" in the Raye Montague Center lobby at Naval Surface Warfare Center, Carderock Division, Monday, Aug. 26, 2024.

On your mark. Beep.

Those are the sounds Ying Huske, an information technology specialist at Naval Surface Warfare Center, Carderock Division, is all too familiar hearing at her daughter's swim meets.

Torri Huske, a two-time Olympian, kick-started Team USA's quest for gold at the 2024 Paris Olympic Games by winning the 100-meter butterfly race on July 28, 2024. Torri, who narrowly missed out on the podium in the 2020 Tokyo Olympic Games by a single one-hundredth of a second, edged out some of the world's best swimmers and claimed her first gold medal in Paris.

"It was a surreal moment," Torri said in a room full of Carderock employees and their children in West Bethesda, Maryland, on Aug. 26, 2024. "I feel like it's one of those things where you've wanted it for so long; it's not really a surprise, but you just can't believe it finally happened."

However, up in the stands of the Paris La Defense Arena, her mother – Ying – could barely watch.

"You always hope that your kid can perform to their potential," Ying said. "But you are also worried and afraid that she would be disappointed or not happy because she didn't meet her own expectations for some reason. At these games, Torri was not just representing herself; she was representing the United States. We were hoping that she could represent the country well and make Team USA shine. We were over the moon to see her perform so exceptionally well. She swam her heart out."

Ying emigrated from China to the U.S. in search for a better future and new opportunities. As a first-generation migrant, she had to overcome a language barrier and financial difficulties until she finally found her niche in this country. She attended graduate school at Virginia Tech in Blacksburg, Virginia. After she graduated, she took a job in the Washington, D.C., area and settled in northern Virginia. In her spare time, and whenever she wanted to exercise, she went to the pool.

"I never swam competitively, but swimming has been a thing to keep me in shape," Ying said. "I swam even when I was pregnant with Torri – up until two days before I gave birth."



She was keen on having her daughter learn how to swim, although not competitively. Instead, Ying was focused on teaching Torri how to be comfortable with the water when she was a young kid so she could enjoy water sports and the ocean as she grew up.

"I always tried to take her to the pool when she was young to try to get her familiar with it," she said. "I asked her quite a few times – when we were at the community pool – if she would like to take swimming classes and many times she said no; but eventually



one day – when Torri was around 5 – she said yes." In that moment, a future Olympian was born. Ying enrolled her daughter in the Arlington Aquatic Center in Virginia, where Torri learned a variety of swimming strokes for the first time. Nowadays, she trains with her college coaches, but when she returns home to the Washington metropolitan area, she always goes back to the place where it all started.

“Every time summer or winter break occurs, she comes home and trains with AAC,” Ying said. “She’s been with them her whole life up until she moved to college.”

Torri is currently attending Stanford University in California. She took this past year off school to prepare for the Paris games and emerged from the iconic sporting competition with three gold medals and two silver medals. Now, she will return to school to finish her bachelor’s degree in product design.

“For me, I get goosebumps all over,” Ying said. “When I think about my daughter competing at this level – I am so happy. This country has openly accepted us and seeing Torri be able to represent the U.S. makes me feel so proud, it is just an incredible feeling all around.”

Ying shared the challenges Torri encountered as not only a student-athlete, but an Olympian too.

“In 2023, her course load was so heavy,” Ying said. “She was basically working and studying 50 hours a week, and that doesn’t include the 20 hours a week she had to commit to training. She was always tired, but she performed really well in school. Unfortunately, though, she did not do her best at the 2023 World Championship. It was a tough year. That was one of the reasons Torri took a year off from school leading to the Paris Olympic Games, so she could focus on training and resting. Her decision has paid off. Kids like Torri have to go through the rigorous academic courses and athletic training and that is a lot to balance. Luckily, Torri tells me her friends and teammates are driven and hardworking people, and that they inspire, motivate and lift her up. That’s why she thanks them so much in her interviews.”

While Torri was racing during the 100-meter butterfly race, her mother pointed something out that may have been missed.

“Torri has a huge determination to win,” Ying said. “After the Tokyo Games, she made it her personal goal to go for gold at the next games in Paris. I am not sure if anyone noticed this, but in the last five meters or so – usually when you do butterfly you take a breath per stroke, maybe one per two strokes. But Torri did not breathe for five strokes and that’s how she got her hand to the wall first.”

Both Torri and Ying thanked everyone at the Carderock Division for their overwhelming support.

“Even when I’m thousands of miles away, I can feel your support and your love and I really appreciate it,” Torri said to a full house of Carderock employees at the Raye Montague Center.



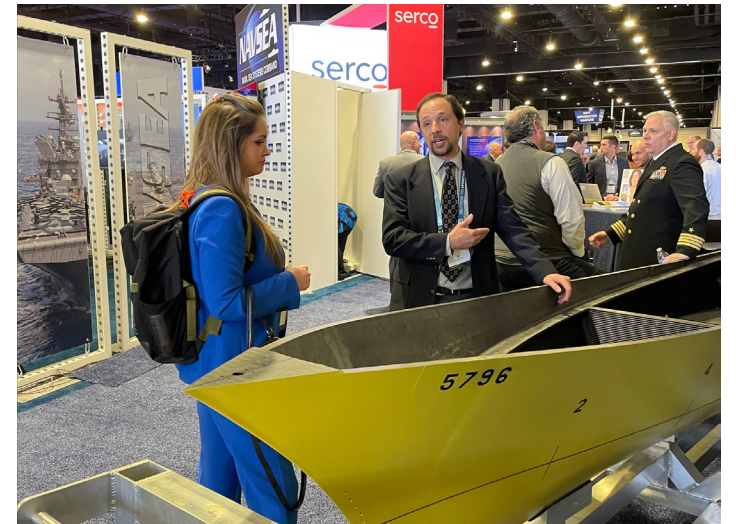
Ying added, “After I arrived back at work, I was surprised to hear that so many of you had been watching her and cheering her on. Your support and positive energy helped make a difference. I received so many congratulatory emails with kind words regarding her success. I cannot tell you how much each of these have meant to my family and me. I especially want to thank the leadership and my coworkers here at Carderock and at Naval Sea Systems

Command for all their support throughout the years of this journey. As they say, ‘It takes a village.’ Torri would not have had the success she has had without your support. I am proud to be a part of the Navy team, NAVSEA and Carderock and even more proud to be an American.”

Since the Paris Games concluded last month, Torri has become a swimming icon and inspiration. She departed the states as an Olympic hopeful, but returned as a local and national hero. The next summer Olympic Games will be held in Los Angeles in 2028. Torri will be aiming to compete on home turf with the support of a roaring nation behind her.

Carderock Showcases LSAM at Sea Air Space

Naval Surface Warfare Center, Carderock Division displays its Large-Scale Additive Manufacturing (LSAM) model at the Gaylord National Convention Center by the National Harbor, Md., on April 8, 2024. The DDG ship hull model was designed at Carderock and is 20.23 feet in overall length with a beam of 2.49 feet. Carderock’s LSAM feasibility study will determine if AM models can withstand the typical stresses of a carriage test and match the results from the same hull design manufactured from fiberglass material. Lead Engineer Kyle Mosqueda and his team plan to conduct seakeeping and loads experiment in FY25. The Chief of Naval Operations, Lisa Franchetti, visited the NAVSEA booth at the event which was supported by Carderock engineers. (U.S. Navy photos by Brittney Odoms and Aaron Thomas)



Carderock's Technical Director Inducted into Alumni Hall of Fame

Naval Surface Warfare Center, Carderock Division Technical Director Larry Tarasek is inducted into the Cardinal O'Hara High School Alumni Hall of Fame in Tonawanda, N.Y., on April 20, 2024. Tarasek, who is a Buffalo, N.Y., native, is a member of the Senior Executive Service and has been serving as the command's technical director for more than five years, overseeing the research, development and test and evaluation of complex naval warfare systems related to ship design, combatant craft and Marine Corps vehicles for the Division. Tarasek graduated from the University of Buffalo with his Bachelor of Science in mechanical engineering and began his federal career in Carderock's Signatures Department in 1985. Since then, he has led the Division and earned the Department of the Navy Meritorious Civilian Service Award in 2013. (Photo provided by David Lovering)



Carlos Duran Wins Carderock Excellence Award for Small Business

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

Naval Surface Warfare Center, Carderock Division recognizes Division Deputy of Small Business Programs Carlos Duran with the fiscal 2023 Naval Sea Systems Command (NAVSEA) Excellence Award in Small Business for his effort to lead a diversity of procurements actions in government and small business. Duran's performance also contributed to improvements in the small business ecosystem in the Navy and Marine Corps.

"It is simply an honor to be recognized at this level," Duran said. "And it feels great to know that Carderock's leaders appreciate my efforts. However, this would not be possible without the support of our contracting professionals."

The NAVSEA Excellence Award in Small Business spotlights professionals who excel in small business programs. According to the award package, these individuals used advocacy, mentorship, support and outreach to increase small business participation and improve the commands' small business goals.

As the command's small business programs representative, Duran communicates with the small business companies interested in working with Carderock. He also advocates and assists small businesses with government contracting. His objectives are to increase small business participation and awareness while offering knowledge about Carderock's mission by organizing, hosting and attending outreach events for small businesses.

"Small businesses are a critical pillar to our economy," Duran said. "They are a crucial piece to providing support to the warfighter. They bring innovation to our requirements and provide solutions to our needs. Small businesses offer new ideas and technologies while benefiting our economy at a local level by creating jobs. Therefore, ensuring that small business companies are considered in the contracting process is significant to NAVSEA and Carderock."

Every year, Carderock sets small business goals, and Duran insists on fulfilling these goals.

"Collaboration and close engagement with the different departments especially in the Contracting and Acquisition Department, make it possible to promote small business participation while ensuring that our mission is accomplished," Duran said.

The NAVSEA Excellence Award winners will be recognized at the Washington Navy Yard on Aug. 14, 2024.

"Small businesses offer new ideas and technologies while benefiting our economy at a local level by creating jobs."

The Target Damage Cards Team Receives the Dr. Delores M. Etter Award

By Brittney Odoms, NSWC Carderock Division Public Affairs



The Target Damage Cards Team accepts the 2024 Dr. Delores M. Etter Award for Top Scientists and Engineers at The Pentagon in Washington, DC., on June 12, 2024. The team won the award for their contribution, knowledge, and methods in the Navy's fleet of ships and submarines. (U.S. Navy photo by Lena Simmons)

The Assistant Secretary of the Navy Research, Development and Acquisition Dr. Delores M. Etter Top Scientists and Engineers Awards are recognized yearly to highlight the highest performing scientists and engineers in support of the Department of the Navy.

This year, the Target Damage Cards (TDC) Team, from Naval Surface Warfare Center, Carderock Division's Vulnerability Assessment Branch, is being recognized with an Etter Award for the team's work pertaining to naval research and development. The team consists of Luke Brownlow, Greta Ouimette, Ben Adam and Grant Giftos, and one Naval Aviation Warfare Development Command (NAWDC) Naval Air Station Fallon employee, Francisco Rivera.

The TDC team made a significant contribution to the Platform Integrity Department by expanding the departments' capacity to support the warfighter. The team developed an innovative software tool that takes complex weapons effects assessment data generated in the Vulnerability Assessment Branch's

Advanced Survivability Assessment Program and puts it directly into the hands of weaponeers, targeteers and combatant commanders in the fleet. The team's dedication to the mission, warfighter needs, and to providing the most accurate weapons effects assessment data rooted in live fire testing, is one of the many reasons for the receiving of this award.

"It makes me proud because I have seen them all work extremely hard, individually and as a team, on this tool," Christopher Perich, the Vulnerability Assessment Branch Head said. "They know it's going to help the fleet and the warfighters and assist them to make good decisions. It's evident, through their hard work, that the team has taken a lot of pride in making sure that they develop a good product."

TDC, a classified software, provides combatant commanders with improved capability to execute naval strike missions in a contested maritime environment and provides input to optimize lethal effects of limited inventory weapons against high-

value maritime targets. Prior to TDC, strike authorities in communication denied environments were limited to static look-up damage tables based on fixed aim points for maritime strikes. TDC enables the interactive 3D exploration of lethality data with variable aim point selection, target system deactivation diagrams, and visual weapon effects results for target ship compartments in a stand-alone decision aid tool.

The idea was initially developed by a multi-disciplinary team of computer scientists and engineers at Carderock. They developed an initial prototype within six months, which was briefed to operational weaponeers and received glowing feedback. The Joint Technical Coordinating Group for Munition Effectiveness (JTTCG/ME) funded the team to develop an initial capability, which they delivered within ten months of funding.

TDC was briefed by Carderock personnel at Nellis Air Force Base, in Clark County, Nevada, to naval weaponeers and others on April 4, 2023. After this briefing, the Commander of Carrier Air Wing Five (CVW-5) requested that Carderock provide the damage cards that Brownlow had been briefing at no cost to their Targeting Officers to aid in their analysis. It was observed that the TDC will bolster CVW-5's overall ability as the only permanently forward-deployed Carrier Air Wing in the U.S. Navy to execute missions in an increasingly complicated environment. As each new piece of software was ready to be deployed, Carderock personnel quickly worked through the Authority To Operate software approval process to deliver the software to CVW-5. Carderock personnel flew to San Diego to deliver and train the CVW-2 targeteers in October 2023. Similar requests followed by fellow Carrier Air Wing groups.

The damage cards have made an operational impact to targeteers, and word of TDC has continued to spread from one air wing to another. The new analytical tool is a major improvement over the existing technology that is available to the warfighter. This new capability allows for a dynamic, 3D visual inspection of the target damage, which is an improvement over the legacy look up table, which only gives a numeric probability of damage.

Designed, built and deployed in only two years, the Carderock team demonstrated technical excellence in developing this new tool.

Currently, the damage cards are supporting Carrier Air Groups at sea and is demonstrating how critical it is to the U.S. Navy's success in a high-end maritime conflict.

"Whether it's target damage cards or all the other types of work that we have done here and that we continue to do in the branch, our job, when you boil it all down, is to help protect people and save lives," Perich said. "We're trying to make more survivable ship designs and provide the best weapons effects assessment information to the Navy and the warfighter. I hope an award like this demonstrates to other branches that working at Carderock truly does have an effect on the fleet and the warfighter. I hope it helps motivate people to realize that Carderock and the warfare centers are making an impact."

“We’re trying to make more survivable ship designs and provide the best weapons effects assessment information to the Navy and the warfighter.”

Submarine Industrial Base Additive Manufacturing Team Wins Etter Award

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



The Submarine Industrial Base Additive Manufacturing Team accepts the 2024 Dr. Delores M. Etter Award for Top Scientists and Engineers at The Pentagon in Washington, DC., on June 12, 2024. The team won the award for their contribution, knowledge, and methods in the Navy's fleet of ships and submarines. (U.S. Navy photo by Lena Simmons)

The Navy Submarine Industrial Base (SIB) Additive Manufacturing (AM) Team was recognized with the 2024 Dr. Delores M. Etter Award for Top Scientists and Engineers for their contribution in enabling the growth of AM as an alternative manufacturing method to build and sustain the Navy's fleet of ships and submarines.

"It is an honor and a privilege to be nominated for this highly competitive award," Submarine Industrial Base (SIB) Deputy Director Jesse Geisbert said. "There are many other key performers and stakeholders who made this award possible."

The team recognized with the Etter Award included representatives from Carderock, NAVSEA 05 and NAVSEA 08, but the broader SIB AM team also encompassed efforts at other Warfare Centers, as well as with critical partners in industry and academia.

The team worked to launch the Additive Manufacturing Center of Excellence (AM COE) as a focal point for activating vendors in the AM industrial base. They also embarked on significant material maturity efforts aimed at establishing a critical understanding of metal

AM materials to enable wide-scale adoption and procurement of metal AM components.

"This award speaks not only to our team's efforts, but to the leadership support and emphasis on the mission to activate the AM industrial base," Erica Scates said, Carderock's Program Manager for Metal AM Insertion. "Having that support and recognition is hugely motivating to continue the marathon of technical work that we've undertaken."

The current phase of the material maturity program involves the team testing materials to inform the development of material specifications and certification specific to metal AM, aiming for interchangeability with traditional product forms in the long-term. The team is also focused on supporting the SIB's "Moonshot" program, championed by Aaron Wiest, Manager for Enterprise Technology Advancement within the SIB team.

The Moonshot program is aimed toward maturing the Navy's material understanding of AM alternatives for top new construction alloys by targeting AM production

of large, complex, Submarine Safety Program (SUBSAFE) Level 1 components that are driving production delays at the shipbuilder. The Moonshot program intends to pave the way for adoption of AM, also referred to as 3D printing, as an alternative manufacturing method, culminating with the delivery of AM battle ready spares for certain critical components. Wiest emphasizes the need to test different failure modes of AM materials with the help of engineering experts like Matt Sinfield and Jennifer Gaies.

"It's exciting to be on the cusp of certifying a 3D-printed SUBSAFE part," Wiest said. "You have to consider so many different ways that a material can fail, but we are developing the test plan that we need to execute to build confidence in the material and if we execute that plan and are successful, that will help unlock AM as a critical alternative in our constrained supply chain."

The team is still working through phases for material maturity that will take years to complete and they are taking the necessary steps, conducting tests and securing approvals to get to the next stage of the program.

"There is more work that needs to be done and hopefully this award signals the beginning of a culture change rather than the culmination of a hard-worked effort," Geisbert said.

This effort supports the command's mission by advancing naval technology to ensure the effectiveness and safety of naval vessels and systems. It serves a dual role in support of both our U.S. naval forces and the maritime industry.

The SIB AM team has encountered some challenges along the way, including differences in work culture, policy and process between the different Warfare Centers, NAVSEA commands, shipyards and shipbuilders. They are continuing to work those challenges to accomplish the goal of operationalizing AM and convincing the community to embrace it in the supply chain.

The following Carderock employees were part of the Navy SIB AM team: Whitney Jones, Jesse Geisbert, Aaron Wiest, Erica Scates, Jennifer Gaies, and Matthew Sinfield.

"This award speaks not only to our team's efforts, but to the leadership support and emphasis on the mission to activate the AM industrial base"

Engineer Christopher J. DiBiasio Wins Etter Award for Emergent Engineers

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



Engineer Christopher J. DiBiasio, accepts 2024 Dr. Delores M. Etter Award for Top Scientists and Engineers at The Pentagon in Washington, D.C., on June 12, 2024. He won the award for his ideas and refinement of underwater infrastructure at the Naval Surface Warfare Center, Carderock Division's South Florida Ocean Measurement Facility. (U.S. Navy photo by Lena Simmons)

Ocean Engineer Christopher J. DiBiasio was recognized with the 2024 Dr. Delores M. Etter Award for Top Scientists and Engineers for his contribution to the design and refinement of the underwater infrastructure at The Naval Surface Warfare Center, Carderock Division's South Florida Ocean Measurement Facility in Fort Lauderdale, Florida.

His efforts resulted in significant cost avoidance while securing the fleet's underwater electromagnetic advantage and knowledge of ocean physics for the Navy.

According to DiBiasios' nomination packet, critical thinking, sound decision-making and mechanical design skills were keys to the success of multiple projects. Specifically, a three-month metocean and underwater electromagnetic data collection event

project spanning four square nautical miles in the challenging Gulf Stream environment.

His inventive and time-critical designs of a novel connector and pressure housing resulted in \$400,000 cost avoidance and allowed the timely execution of the measurement event.

Carderock Wrap Team Wins Excellence Award in Test and Evaluation

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



U.S. Navy photo of research and development vessel R/V Sea Fighter.

Naval Surface Warfare Center, Carderock Division's Wrap Test Team was recognized with the Naval Sea Systems Command (NAVSEA) Award for Excellence in Test and Evaluation for their contributions and collaboration on the first-ever concept of an electric-optic signature solution against a remote sensing platform. The team also created a cost-saving option for altering the color of surface vessels to improve ship survivability.

The Wrap Team developed in-situ modifications to key Unmanned Aerial Vehicles (UAV) while maintaining UAV operations in dynamic conditions and completing NSWC Carderock Division test objectives.

According to the team's nomination packet, they led the planning, execution, and data analysis of an operationally challenging 10-day, at-sea test event

aboard R/V Sea Fighter (FSF-1). The test consisted of two test objectives: to evaluate ship survivability improvements utilizing black wrap material and to use unmanned aerial vehicles as a test platform to serve as a low-cost option for remote sensor testing.

The following Carderock employees were part of the Wrap Test Team: Julie K. Bothell, Benjamin J. Jeffers, Matthew S. Mills, Patrick M. Mulliken, and Hazen W. White.

Carderock's Patrick Crowley Recognized with DON Civilian Service Award

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



Naval Surface Warfare Center, Carderock Division Commanding Officer Capt. Matthew Tardy (right) and Technical Director Lawrence Tarasek (left) present Naval Architect Patrick Crowley (center) with the Department of Navy Civilian Service Achievement Medal in the Rotunda, Building 2, in West Bethesda, Md., on Jan. 24, 2024. This award recognizes an individual whose performance or achievement within the Navy and Marine Corps goes above the degree of excellence. Crowley received this award for his contribution to the Expeditionary Fast Transport Unmanned Autonomous Prototype. (U.S. Navy photo by Kristin Behrle)

Naval Surface Warfare Center (NSWC), Carderock Division recognized Patrick Crowley with the Department of Navy Civilian Service Achievement Medal in West Bethesda, Maryland, on Jan. 24, 2024, for his contributions as the engineering lead for the Expeditionary Fast Transport (EPF) Unmanned Autonomous Prototype project.

The award recognizes an individual whose performance or achievement within the Navy and Marine Corps goes above the degree of excellence.

"This is an incredible honor and is extremely overwhelming," Crowley said. "I wish that a lot of the other folks that worked on this project with me could be recognized at the same level because this was a massive undertaking for a lot of people."

Crowley credits the success of the prototype to his teammates on the Ship Design Team whom consist of EPF Ship Design Manager Steve Kantz, Deputy Ship Design Manager John Mitchell and Design Integration

Manager Sean Van Loan. Grady Delp, a subject matter expert on unmanned surface vessel perception systems from the command's Combatant Craft Division in Little Creek, Virginia, also assisted in this project.

After receiving his bachelor's degree from the University of Michigan, Ann Arbor in naval architecture and marine engineering in 2019, Crowley started his civilian career at Carderock with the Future Concepts and Design Integration Division. After a couple years doing platform integration and concept design work for different programs, a colleague called Crowley about the EPF program and, after he worked on rotational assignments with the ship design team, he transferred to the Naval Architecture and Engineering Division to be the full-time design integration manager.

Crowley provides support for both Carderock and the Washington Navy Yard in the District of Columbia, but says the major difference between the two government organizations is the work style.

"The congressional funding came six months prior to me joining, while I was managing day-to-day tasks with each group and reviewing design deliverables," he said. "The Ship Design Manager Steve Kantz was there executing tasks with me every step of the way while providing senior experience on how to manage the design, acquisition and testing program."

The project was a \$50 million congressional appropriation for an EPF unmanned logistics autonomous prototype and Crowley joined the team in July 2021 while the project was already underway. During that time, the team was in the requirement-planning phase that consisted of development, test and execution and by June 2022, the team was out on the water testing and certifying the system.

"My favorite part working on the project was the sea time," Crowley said. "The time out on sea is valuable and the longest individual trial we did on the platform lasted a full week, at sea testing and tuning the system. Being out there was fantastic as was being able to work on the bridge and working with the ship's master, senior navy staff and senior shipyard staff to make it happen."

The Naval Sea Systems Command (NAVSEA) team on the project consisted of NAVSEA 05, Carderock's Combatant Craft Division, NSWC Philadelphia Division, NSWC Dahlgren Division and Navy contractors. The most challenging part for Crowley was the scheduling, which he said made the timeline for designing, testing and acquiring systems a lot faster than expected.

The EPF project helped the Navy's mission by demonstrating the scalability of the technology and demonstrated the viability of the technology in larger surface vessels. According to Crowley, there were reasonable doubts that the technology would work with large-scale machinery plants and steering systems, but the tests Crowley and his team conducted demonstrated that modifying and tuning these systems could lead to a successful deployment on larger naval assets.

Although there are no immediate next steps for the project, the Ship Design Team are working with other

organizations in the naval enterprise to fully utilize the data that was gathered from their experience.

"The EPF Ship Design Team is continuing our work delivering EPF's to Military Sealift Command," Crowley said. "We're currently working on delivering the new Flight Two variants, as well as refining the design of the Expeditionary Medical Ship variants that were recently awarded."

When asked about upcoming collaboration work, he said the team is involved with several other autonomy efforts to leverage the data that was collected and standards they developed. They want to ensure the lessons learned from the EPF project would inform future autonomy programs.



Naval Surface Warfare Center, Carderock Division Commanding Officer Capt. Matthew Tardy (right) pins Naval Architect Patrick Crowley (left) with the Department of Navy Civilian Service Achievement Medal in the Rotunda, Building 2, in West Bethesda, Md., on Jan. 24, 2024. Crowley was honored for his contribution and success with the Expeditionary Fast Transport Unmanned Autonomous Prototype. (U.S. Navy photo by Kristin Behrle)

Awards



General Engineer Jimmy Jin (center) receives a Naval Sea Systems Command Certificate of Appreciation from Naval Surface Warfare Center, Carderock Division Commanding Officer Capt. Matthew Tardy (right) and Deputy Technical Director Steve Ouimette (left) in West Bethesda, Md., on Feb. 15, 2024. Jin was recognized for his contributions during the past two years as an auditor in support of the Navy's Submarine Safety, Deep Submergence System and Fly-By-Wire Ship Control Systems Program. (U.S. Navy photo by Corum Byers)

Capital Tech Bridge Director Lauren Hanyok receives a letter of appreciation at Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., on Feb. 15, 2024, for her participation in the 2023 Naval Innovative Science and Engineering (NISE) Technical Exchange Meeting (TEM). Hanyok played a critical role in sustaining and developing an important conversation in the Warfighter Driven Challenges and Human Centered Design panel. Deputy Assistant Secretary of the Navy for Research, Development, Test and Engineering Dr. Brett Seidle said the NISE TEM event was a success due to technical experts like Hanyok contributing to the Navy's warfighter readiness. (U.S. Navy photo by Corum Byers)



Defense Travel System Analyst Theresa Kiefer (left) receives a Command Certificate of Recognition from Naval Surface Warfare Center, Carderock Division Commanding Officer Capt. Matthew Tardy (right) on Feb. 1, 2024 in West Bethesda, Md. Kiefer was recognized for her outstanding customer service and for supporting the needs of Warfare Center Headquarters personnel. (U.S. Navy photo by Corum Byers)



Carderock Commanding Officer Capt. Matthew Tardy (left) and Chief of Staff Stephanie Feulner (right) recognize Teresa Beale (left photo) and Rebekah Knodel (right photo) on Dec. 14, 2023, for spearheading efforts to bring Video Relay Service (VRS) Apps to users within the command. The VRS apps enable Deaf and Hard of Hearing employees to make and receive business-related calls on their government-issued devices. Since Deaf and Hard of Hearing users cannot make calls in the traditional fashion, the Federal Communications Commission provides free VRS services to any Deaf or Hard of Hearing individual in the United States, and this software is available Navy-wide, on any Flank Speed-managed device.



Two Naval Surface Warfare Center, Carderock Division employees, Dr. Brian Glover and Keegan Delaney, are recognized in West Bethesda, Md., on Feb. 14, 2024, for supporting the development of Underwater Electromagnetic and non-traditional signature capabilities for the New Attack Submarine (SSN(X)) Project. Carderock's Commanding Officer Capt. Matthew Tardy, Technical Director Larry Tarasek, SES, and Signatures Department Head Dr. Paul Shang present a Letter of Appreciation, signed by Project Manager of SSN(X) Capt. Peter Small, to Glover (center) and Delaney (center left) inside the Command Briefing Room. (U.S. Navy photo by Corum Byers)



Carderock's Guam Signatures Support Team Earns Rear Adm. Benjamin F. Isherwood Award for Exceptional Fleet Support



By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

The Guam Signatures Support Team from Naval Surface Warfare Center, Carderock Division earned this year's Rear Adm. Benjamin F. Isherwood Award for their collaboration on the installation of an Underwater Electromagnetic Measurement (UEM) system at Naval Base Guam. The Isherwood Award recognizes teams or individuals for innovation and expertise in the effective assessment, development, execution or deployment of technical solutions for operational fleet needs.

This year's support team earned the award for their outstanding leadership in improving the operational readiness of U.S. Navy vessels deployed in the Pacific Theatre, ensuring their preparedness for wartime missions.

"It means a lot to the team," Electric Engineer Hermanzo J. Moreno said. "The recognition is a culmination of a 14-year concerted effort to install a UEM system in the Pacific. We faced many design changes and conducted numerous habitat surveys to meet environmental requirements, but what made this special was despite numerous challenges during installation, we still ensured environmental requirements were met and kept the installation on schedule."

The newly installed underwater sensor system enables Naval Base Guam to measure, monitor, assess and mitigate the underwater electromagnetic signature levels of U.S. Navy assets.

"The project went from concept to delivery thanks to the collaborative effort of program leadership,

team leads, engineers and technicians from the Underwater Electromagnetic Signatures and Technology Division," said Moreno said. "I credit every team member for their dedication, attention to detail and hard work. We even coined a phrase to make light of the challenges, 'Guam is Guam'."

The Guam Signatures Support Team featured employees from Carderock's Signatures Department, including: Nana T. Asare, Ibraam N. Fahmy, Michael J. Felder, Daniel S. Lenko, Edward C. Morai, Hermanzo J. Moreno, Jonathan C. Reynon, Bennett M. Spence, Andy E. Wen, and Kodjovi Wome.



Director of Fleet Engagement, John T. Phillips, is this year's Benjamin F. Isherwood Award recipient for his work aligning Warfare Center output with fleet needs, ensuring the Navy of today and tomorrow is postured to address the complex challenges of the future.

The Benjamin F. Isherwood Award recognizes individuals who demonstrate exceptional innovation and expertise in effectively implementing technical solutions to meet the operational requirements of the fleet.

"Since I learned what the fleet needs, I've been consumed with ways to contribute," Phillips said. "I started learning about the threat and understood that we all have to contribute if we are going to maintain what the United States is today. I hope that through this



The Rear Adm. Benjamin F. Isherwood Award for Exceptional Fleet Support

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

recognition, the importance and urgency of our work will be seen throughout our command. We must have the urgency to support fleet needs."

Phillips' work directly supports Carderock's mission by working with the Chief Technology Officer, Dr. David Drazen, to ensure the fleet is always up-to-date to address potential issues. The fleet, while contributing to the broader efforts of the Navy, also benefits from his unique capabilities. He played a crucial role in coordinating the involvement of Carderock engineers, scientists and their programs in events such as the United States Pacific Fleet Integrated Battle Problem, Fleet Forces Fleet Battle Problem, and Force Fleet Hybrid Fleet Campaign. The Guam fielding project heavily relies on his support, particularly in terms of combat graph division

assistance, as well as Naval Architecture and Engineering Department support. Additionally, he oversees a small Unmanned Surface Vehicle (USV) dedicated to the Pacific Fleet.

The award he received was for his technical expertise and strategic contributions. His role primarily involves ensuring that they are working on the right projects and providing timely capability to the fleet. He focuses on connecting the dots between their work at Carderock and meeting fleet needs, both now and in the future.

According to Phillips' nomination package, this award recognizes the importance of his contributions in providing Carderock capabilities directly to Naval warfighters and ensuring that their efforts align with strategic objectives.



The Rear Adm. Grace Hopper Award for Excellence in Organizational Support

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

Corporate Business Office Division Head Christine Mitchell is this year's Hopper Award recipient for her direct contributions resulting in a major process change that has reduced the overall cost of initiating, processing and approving conference attendance.

"I am truly humbled and profoundly honored," Mitchell said. "To me, winning this award just shows the command is focused on innovative ways to change."

The Hopper Award recognizes an individual's outstanding accomplishment for a significant project resulting in the development or improvement of a process. Mitchell earned her award by re-envisioning the internal method for conference system approval with techniques from the Model-Based Systems engineering tool. The

new techniques allowed Mitchell and her team to undertake the cost and time of the conference without changing the operation by leveraging data analytics capabilities. As the team continued utilizing the tools at the Warfare Center level, they found outdated conference policies and after remodeling and removing the outdated policies, millions of dollars were retained.

Before Mitchell redesigned the conference process, it took longer to be approved. First, employees had to inform their supervisor and fill out a spreadsheet. After completion, the spreadsheet would be sent back to their absent over leave and then back and forth to the correct department. The process took longer depending on the amount of people attending.

Now, Carderock and other Warfare Centers have access to the new tool. The team, however, is currently in the process of getting the tool used on a Navy and Department of Defense (DoD) level.

"We were able to take a capability used on the technical engineering side and apply it to the business side to make significant lasting change across departments," Mitchell said. "And this was only possible because Rob Iannuzzi had the courage to show and teach me the techniques. I hope this encourages others to cross those departmental boundaries to find new innovative approaches."



Douglas Noll Receives Dr. Murray Strasberg Lifetime Achievement Award

By Brittney Odoms, NSWC Carderock Division Public Affairs

After nearly 40 years at Carderock, Douglas Noll, a former mechanical engineer at Naval Surface Warfare Center, Carderock Division, is receiving the Dr. Murray Strasberg Lifetime Achievement Award, which recognizes commitment to the highest standards for more than 25 years of federal service.

During his time at Carderock, Noll was branch head for the hydroacoustics and propulsor development branch for 16 years from 2001 to 2016. In 2017, he became the signatures task lead for the Columbia Propulsor and Shafting Program.

Noll has spent his entire career ensuring that U.S. Navy submarines achieve and maintain an acoustic advantage over current and emerging threats. He has contributed to the development and integration of flow noise and advanced propulsor technologies into ship and submarine platform designs for more than 30 years. In 2021, he received the National Defense Industrial Association Bronze Medal for Technical Merit and was recognized by the National Society of Professional Engineers as the Agency Winner of Federal Engineer of the Year. According to his nomination

package, he been instrumental in significantly advancing the field of undersea warfare through his programmatic leadership and extensive technical expertise.

Noll has led completion of the final Large Scale Vehicle (LSV2) tests for design risk assessments for the Columbia acquisition program, with a focus on analyzing the program's database that was collected during the past 10 years. Under his leadership, the Columbia Propulsor and Shafting Program have advanced a state-of-the-art propulsor design, and have created a vast database that can be mined for years to come in support of future submarine propulsor designs.

He has authored the important FY22 Columbia Propulsor Signature Achievability Assessment, now used by the Program Office as a key reference document for next generation submarine development, and is considered a model process for achievability assessment in other program areas.

Noll credits the success of his career to the opportunities he had throughout the years to work with world-renowned experts in his field.

"I'd like to give credit to the people that worked with me over the years," Noll said. "Not just the ones who were older than me, but also the younger engineers who are talented and learning new things in college that we older engineers may not necessarily get connected to because we're kind of stuck in what we do."

He is humbled to be the recipient of an award that is dedicated to the memory of Dr. Strasberg, who was a pioneer in the field of propeller and propulsor acoustics.

"My career isn't just about all my individual accomplishments," Noll said. "It also encompasses the accomplishments of so many talented people around me too."

His hope for the future is that the Navy may continue to advance the designs of propulsion systems that are affordable and can continue to keep warfighters safe.

"My hope is that we continue to attract the talents that we need to help advance the field to continue making a difference not only for the Navy, but also for the Sailors," Noll said.



Dr. William Golumbskie Wins Rear Adm. George W. Melville Award for Engineering Excellence

By Brittny Odoms, NSWC Carderock Division Public Affairs

Dr. William Golumbskie, recipient of the Rear Adm. George W. Melville Award for Engineering Excellence, is being recognized for his efforts in developing and fostering enabling capabilities to address the issue of aluminum cracking across multiple surface ship platforms. Additionally, he worked to identify, evaluate and certify a clad aluminum alloy capable of sensitization, which provides another alternative for ship designers.

Golumbskie developed and implemented the in-situ metallography procedure as the primary non-destructive detection method for sensitized aluminum and set up laboratory sensitization test capabilities at four regional maintenance centers. This effort resulted in significant cost-savings, more than \$10 million, for the U.S. Navy in aluminum cracking repairs. Golumbskie led this initiative in predicting sensitization, understanding the mechanisms, and engaging in the aluminum producer community, which culminated in commercial specification changes that will save

the Navy more than \$100 million in future aluminum cracking repairs.

Apart from aluminum crack repairs, he identified, tested, evaluated, and certified a clad aluminum alternative to conventional alloys.

"It's great, it feels really good to be recognized by Carderock for the work that was done," Golumbskie said. "Honestly, in a lot of ways, this was one of those things where so many folks were involved it's hard to feel like I should be the one taking sole credit. I certainly have spent a career on this and have done a lot to push this forward, but it was truly a team effort. It's been great to be recognized for the work because I think it's a great example of what we can do here at Carderock when we have good teams and resources behind us to solve relevant problems."

Aside from his Carderock responsibilities, Golumbskie serves as one of the project managers for an Office of Naval Research future naval capabilities program for aluminum alloy corrosion control and prevention.

He and his team have previously partnered with industry and academia to develop tools to predict, mitigate and repair aluminum cracking.

"From the technical standpoint, I'm hopeful that the work we have done can show that we can build quality ships out of aluminum, and while this cracking issue was pervasive, we have the means to solve the problem," he said. "We understand the mechanisms, we know that suppliers can provide good material and we have an opportunity to continue to build ships out of aluminum if we're able to adjust our specs and standards accordingly based on the new information that we've discovered. From a broader standpoint, I think it's a great example on how we can work in teams and solve complicated, pervasive issues."

These achievements, resulting in significant operation and maintenance cost-savings, will have a lasting impact on the Navy's affordability of light-weighting future ship designs.



Kenneth Weems Earns Rear Adm. David W. Taylor Award for Outstanding Scientific Achievement

By Brittny Odoms, NSWC Carderock Division Public Affairs

Kenneth Weems, a senior simulation hydrodynamicist in the Simulations and Analysis Branch, was awarded with the Rear Adm. David W. Taylor Award for Outstanding Scientific Achievement. He earned this recognition for his research and development in utilizing numerical hydrodynamic methods for seakeeping, maneuvering, resistance, and extreme motions and seaway loads.

Weems carries 37 years of experience in numerical hydrodynamics, 10 of which was accrued at Naval Surface Warfare Center, Carderock Division. Along with his significant contributions to the field of surface ship hydrodynamics for the development and maintenance of several hydrodynamic tools, he also contributed to the field of extreme ship response prediction. His work included combining advanced numerical hydrodynamic methods with probabilistic methods, evaluating events such as parametric roll, capsizing, surf riding and broaching.

"To me it's very gratifying," Weems said. "Doing numerical simulations for ships and getting the applications has been a challenge;

it's not an easy calculation to do. Building a computational capability that can be trusted is difficult and what it really does to me is it validates, to some degree, that this approach that we've been working on for many years has reached a level of maturity and acceptability. It has become regularly used within the Navy community both in ship design and operations."

His research has resulted in the development of simulation programs such as the Large Amplitude Motion Program (LAMP), SimpleCode, and Ship Lift and Wave (SLAW). This has not only advanced numerical hydrodynamics, but has also resulted in more accurate and robust software that has become the primary method of predicting nonlinear seakeeping and seaway loads for all major surface ship programs.

"I want to make sure that we have a sustainable capability that can continue to be expanded and applied," Weems said. "I believe with the effort that Carderock is putting into bringing in younger engineers, getting them involved in these programs and creating a culture where people are learning how to use these codes, they can also continue the development. I hope to leave behind a set of tools

and approaches that will continue to be used and sustained."

In addition to research in the development of numerical hydrodynamic tools, Weems has also contributed to the application of the developed tools toward dynamic stability phenomena. He did this to not only better understand the fundamental of their respective mechanisms, but also their statistical quantification.

"Code development is not so much a road to a door, but a path leading ever onward to the horizon," Weems said. "Writing code and these capabilities is a continuous thing. It's a never-ending process and I think that's what we're trying to do organizationally in our hydrodynamics and ship work."

Weems' contribution to the field of ship hydrodynamics and the U.S. Navy have been integral in pushing the boundaries of the status quo. According to his nomination package, his innovative research has been pivotal to the safety and success of U.S. Fleets and warfighters at sea.



Brian A. Beechener Earns Capt. Harold E. Saunders Award for Exemplary Technical Management

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

Branch Head Brian Beechener is this year's recipient of the Capt. Harold E. Saunders Award for leading the Joint Technical Coordinating Group for Munitions Effectiveness (JTCE/ME) project to develop the next generation of weaponing tools for the warfighter.

"I wish this were a team award," Beechener said. "The success is due to the hard work of the team from different organizations collaborating and working on things. The award is great recognition for the great work the team does here."

The Saunders Award recognizes individuals who display exceptional achievement in leadership in a technical area or management of a multiplex technical project.

"The success I've seen is because of team building amongst organizations," Beechener said "Seeing different

communities' team up to support the warfighters, tackling a hard problem and getting capabilities out into the hands of the fleet in such a short time frame is incredible. They work together no matter the time of day, night or weekend."

After drafting a paper to address gaps and deficiencies in maritime weapon capabilities, Beechener was approached by JTCE to help with their issue paper. Upon completion, the paper was selected for funding for the 2023 fiscal year. The program office then requested his assistance in the army-led JTCE/ME project due to his naval experience. Since joining the team, new software capabilities have been developed to target damage cards deployed on five active carrier wings. This is crucial for the warfighting effort, ensuring inventory availability and point selection capability.

"This award enables Carderock to continue to build on their reputation of being experts in ship vulnerability and lethality," Beechener said. "It allows us to get funding to overhaul several different software tools we've used over the decades."

The team consisted of employees from different Warfare Centers such as NSWC Dahlgren, Newport, Indian Head and other Army and Air Force entities.

Beechener is currently working on restructuring things for Carderock in a modern software framework and improving different damage algorithms amongst other projects such as the blue weapons survivability community.



Multi-Material Propulsor Prototype (M2P2) Hydrodynamic Testing Team Wins Vice Adm. Emory S. Land Award for Collaboration Excellence



William B. Hussong



Michael R. Johnson



Jerod W. Ketcham



Matthew N. Egeland



Daniel A. Kowalyshyn



Mario E. Rodriguez



Nicholas D. Schwarzenberg



Brian M. Feaga

(Description not approved for public release.)

Deputy Assistant Secretary of Defense Visits Carderock

Deputy Assistant Secretary of Defense, Arctic and Resilience Iris Ferguson (second right) takes a tour of the Maneuvering and Seakeeping Basin with her staff at Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., on Feb. 9, 2024. Carderock's Full-Scale Trials Team Lead Stephen Minnich briefed Ferguson on the command's ongoing efforts to support the Coast Guard. (U.S. Navy photo by Jennifer Brewster)



Maryland Staffdel Visits Carderock

Delegates from the state house of Maryland took a trip to West Bethesda, Md., to visit some of the Navy's state-of-the-art facilities on Aug. 16, 2024. Carderock experts shared the Division's unique mission to support the fleet, and its warfighters, before touring delegates through the campus.

Indian Navy Visits Carderock

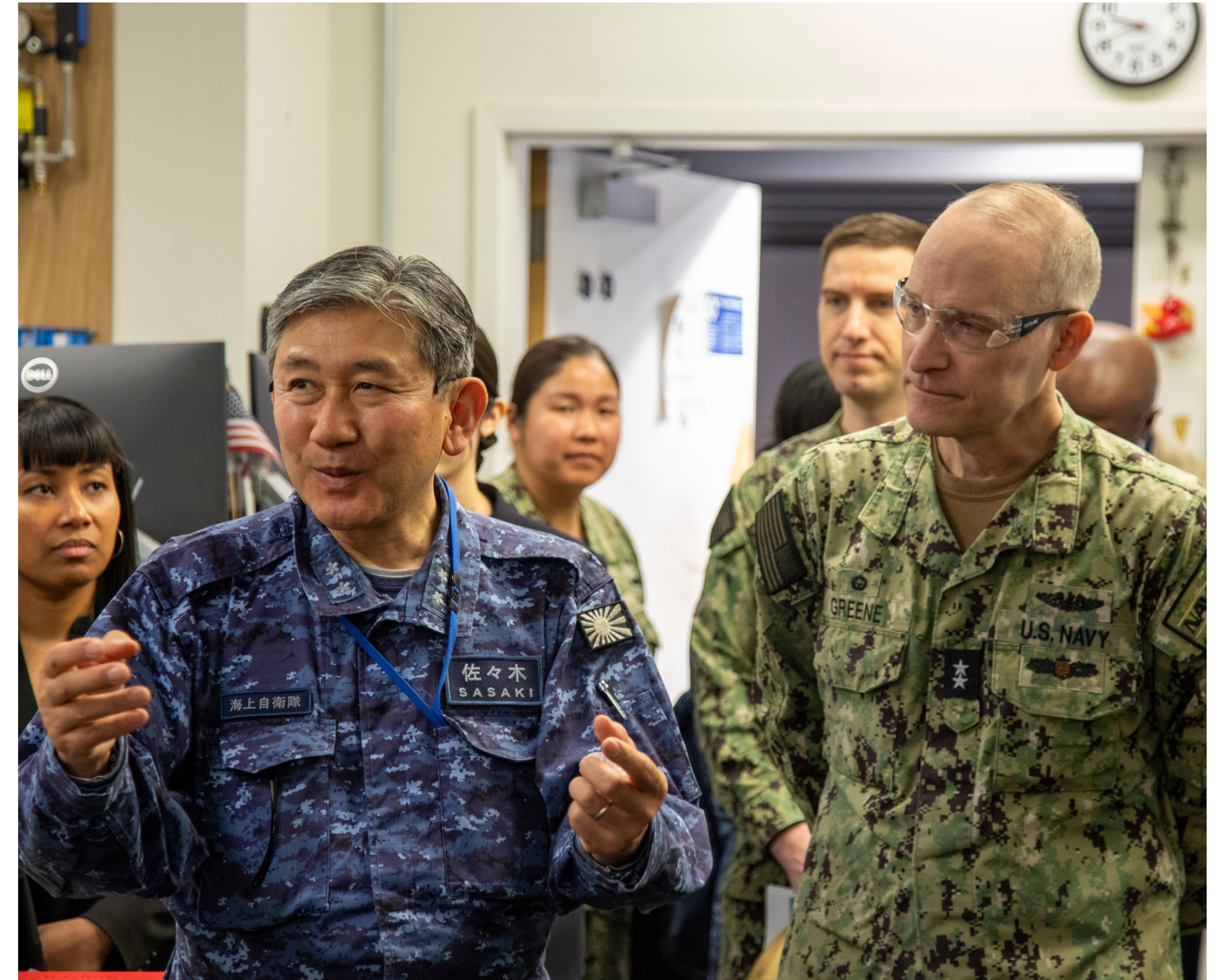
Rear Adm. Sandeep Mehta, Assistant Controller of Carrier Projects and Assistant Controller of Warship Production and Acquisition for the Indian Navy, along with other members of the Indian Navy visited Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., with Capt. Brian Metcalf, Program Manager for CVN 78 Class Program Office on April 10, 2024. The Joint Working Group on Aircraft Carrier Technology Cooperation (JWGACTC) are bi-lateral sessions launched in August 2015, as part of a U.S. - India Defense Technology and Trade Initiative, facilitating an exchange of information and best practices in the areas of ship construction and maintenance. The working group is co-chaired by the Program Executive Officer for Aircraft Carriers, representing the United States.

The delegation toured the David Taylor Model Basin, the Maneuvering and Seakeeping Facility and the Grillage Bay.



Carderock Employee Supports Japanese Interpretation for Distinguished Visitor

Naval Surface Warfare Center, Carderock Division Corporate Budget Analyst LaToya Lamb serves as a Japanese interpreter for Japanese Navy officials during a visit to Naval Sea Systems Command (NAVSEA) shipyards in February 2024. Lamb, who has interpreted for Japanese foreign officials in the past, joined the tour of NAVSEA facilities in Mobile, Ala., Pascagoula, Miss., and Norfolk, supporting Rear Adm. Sasaki, Rear Adm. Ito and Rear Adm. Hoshi.

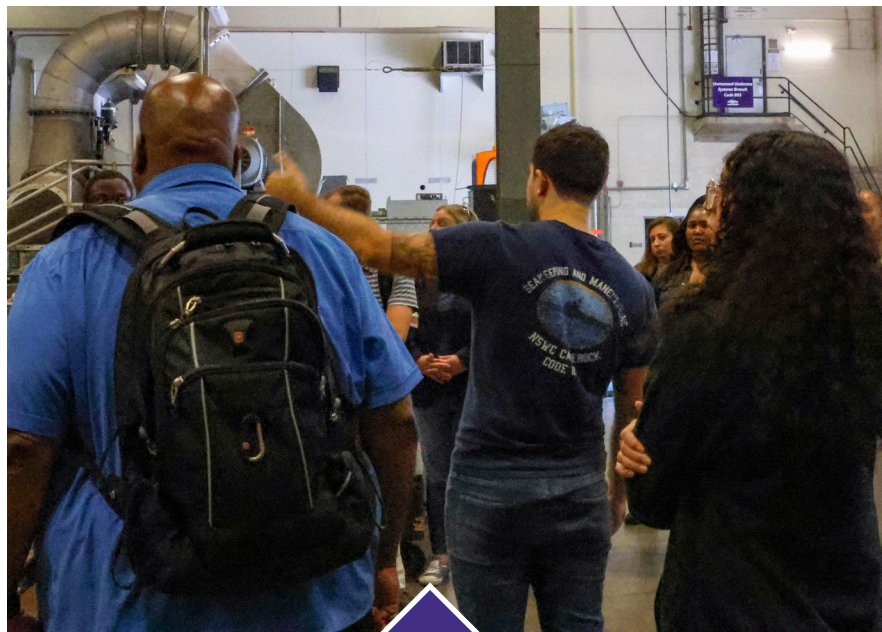


Navy Logistics Tour

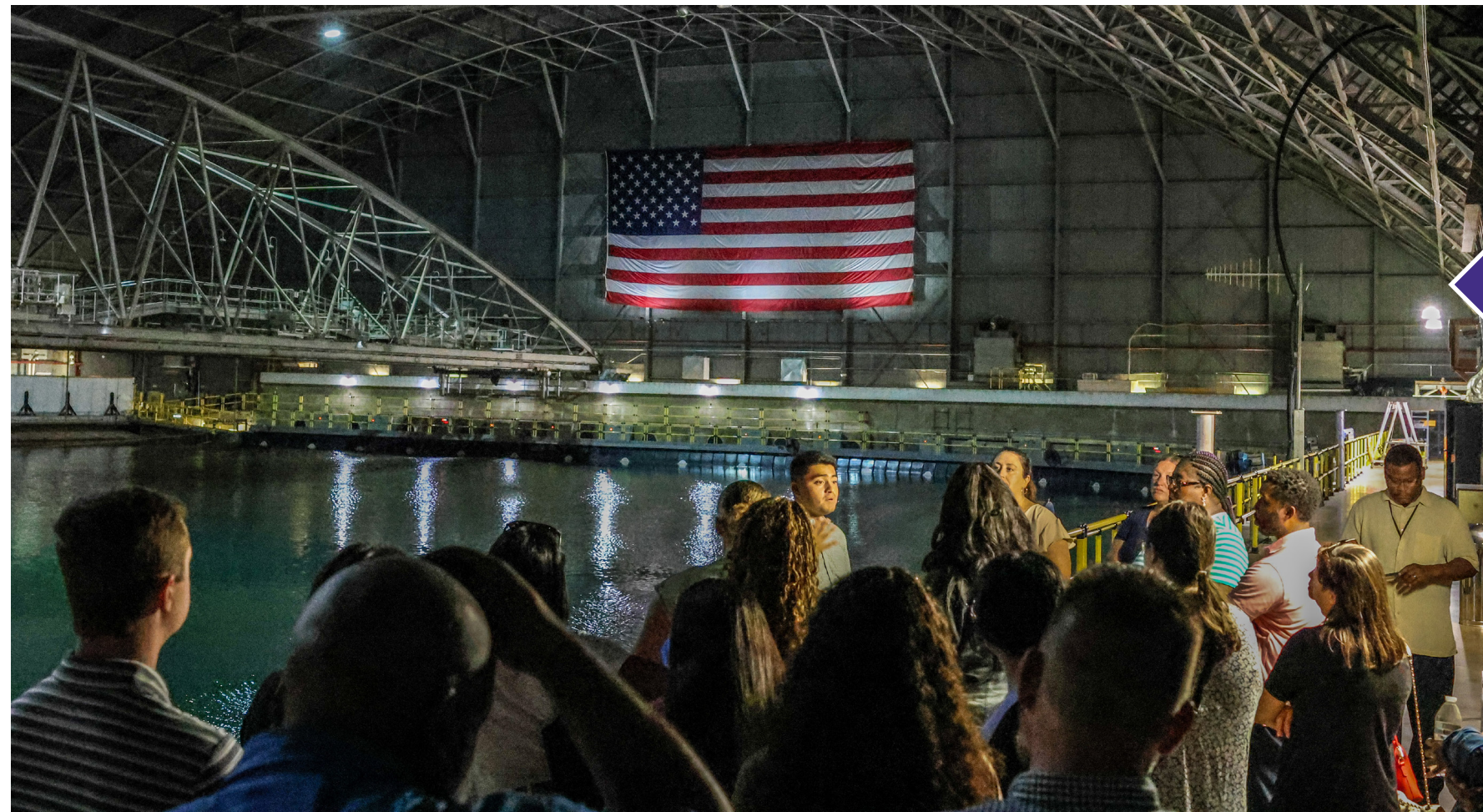
Employees from Navy Engineering Logistics Office in Arlington, Va., visit Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., on July 16, 2024. Curator Jennifer Marland (furthest right) gave a tour of the command's curator model shop. Carderock is home to the Navy's ship models and the Division plays a critical role in preserving each ship and its history. Apart from surface ship models, visitors also browsed through models of naval aircrafts. (U.S. Navy photo by Hiep Nguyen)



Curator Jennifer Marland answers the questions of employees from the Navy Engineering Logistics Office, located in Arlington, Va., on a tour of the Curator Model Shop in West Bethesda, Md., on July 16, 2024. Visitors had the opportunity to learn about how model ships, including some aircraft models, are maintained and preserved at the Division. Some of the models on display were constructed in the 19th century and are frequently maintained and sealed in a glass case by Carderock's curators. (U.S. Navy photo by Hiep Nguyen)



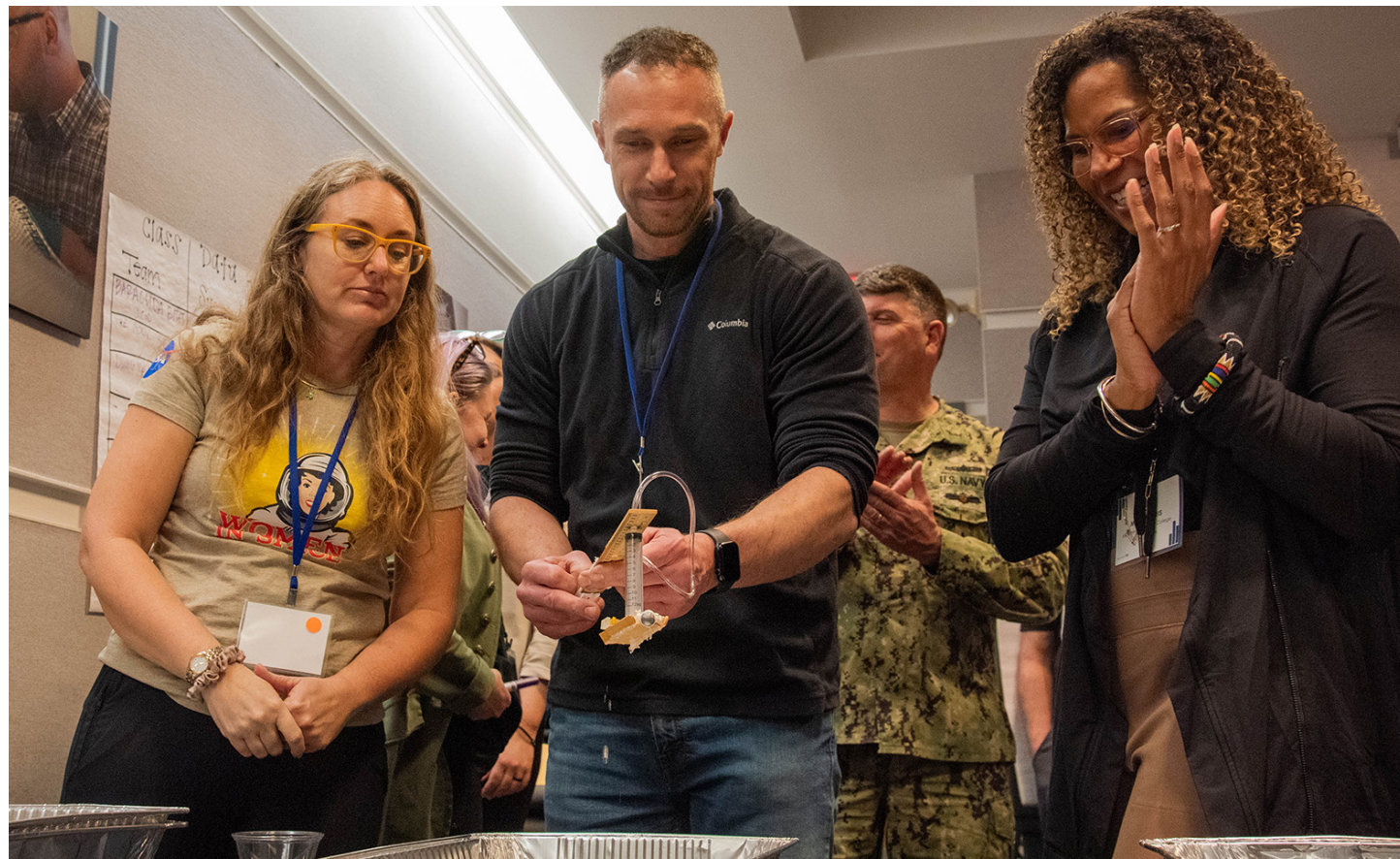
Engineer Kyle Mosqueda (center) leads a tour of the David Taylor Model Basin at Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., on July 16, 2024. Employees from the Navy Engineering Logistics Office in Arlington, Va., visited Carderock's facilities to learn about the Division's capabilities and how it supports the greater Navy. Mosqueda answered questions from the crowd, providing visitors with a greater understanding of how Carderock completes model testing and supports the warfighter. (U.S. Navy photo by Daniel Troy)



Edvin Hernandez, Public Affairs Action Officer, leads a tour of the Maneuvering Seakeeping Basin at Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., on July 16, 2024. The tour offered employees from the Navy Engineering Logistics Office an opportunity to learn about the model testing Carderock conducts in support of the U.S. Navy. (U.S. Navy photo by Hiep Nguyen)

Carderock Welcomes DoD STEM Ambassadors to West Bethesda

By Edwin Hernandez, NSWC Carderock Division Public Affairs



A team of DoD STEM Ambassadors tests their homemade rescue device in West Bethesda, Md., on Feb. 22, 2024. Educators were given low-cost supplies such as rubber bands, paperclips, plastic cups and more to build a fish mouth-like contraption to rescue a LEGO figure from a container filled of water. (U.S. Navy photo by Edwin Hernandez)

Naval Surface Warfare Center, Carderock Division opened its gates in West Bethesda, Maryland, to Department of Defense (DoD) science, technology, engineering and mathematic (STEM) Ambassadors on Feb. 22, 2024. The DoD STEM Ambassadors Program consists of high-performing educators around the country and provides them with a unique, enriching opportunity to create and curate new STEM learning resources for students nationwide. Additionally, the program is executed by the TGR Foundation, a DoD STEM

Education Consortium Partner, with emphasis on supporting committed educators working with students who have been historically underrepresented in STEM.

"These teachers are influencers in their communities and with their students," Kathleen Miranda said, a program officer in the Naval STEM Coordination Office. "We want to teach them more about our resources and programs that are available to them, and have them bring that home to their local communities."

This year's cohort, which includes more than 20 educators, toured some of Carderock's state-of-the-art facilities for the first time ever in the program's history, including the Waste Water Management Lab, Additive Manufacturing Research Lab and the David Taylor Model Basin. This is also the first time the cohort meets each other in person.

"Carderock arranged a tour of their unique labs and we are all pretty proud of bringing them onboard to see this naval facility," Miranda said. "The teachers are getting an exclusive peek behind the

Navy and Marine Corps curtain by visiting this base and we are committed to helping them improve their curriculum for all students."

The command's STEM and Outreach Program, which is spearheaded by STEM and Outreach Coordinator Charlotte George and Community Outreach and Student Engagement Coordinator Ashlee Floyd, shared Carderock's Seaworthy STEM-In-a-Box initiative to DoD STEM Ambassadors. STEM-In-a-Box provides enhanced, naval-relevant hands-on activities to K-12 teachers and students. Its purpose is to guide students through the engineering design process and support teachers as they select content, acquire materials and implement engaging activities in their classrooms.

Although the STEM-In-a-Box kits have mainly catered to elementary and middle school students, George and Floyd have recently ramped up their efforts to develop the curriculum for high school students. Carderock, which proudly sponsors and supports DoD Einstein Fellows, has created a new STEM activity for high school students with the help of its former Einstein Fellow Tom Jenkins and its current Fellow Melissa Thompson.

"Tom had all these wonderful high school ideas and I took those ideas and flew out to another Warfare Center in Port Hueneme, California, with Ashlee," Thompson said. "Ashlee, Tom and I all collaborated and we came up with a quarter-worth of material. From that, we created 10 lessons – week long lessons – that not only provided an engineering challenge for the students, but also gave

them an opportunity to tie it all back to the real world."

Part of this joint effort led to the development of the command's newest high school lesson called "Fish Mouth." The activity was used as a hands-on demonstration for visiting DoD STEM Ambassadors. The objective was to create a fish mouth-like contraption to rescue a LEGO figure from a container filled of water. Educators were given low-cost supplies such as rubber bands, paperclips, plastic cups and more to build their device. Thompson and Floyd encouraged educators to be creative in their design and shared their tips for motivating students to do the same.

Thompson, who is also an educator for Baltimore City Public Schools, said her vision for these Carderock STEM initiatives is to inspire kids to pursue a technical career and understand the educational requirements needed to succeed in the field. To help capture interest in STEM among younger students, Thompson created 52 Career Workforce Trading Cards that are specific to the Navy and include position salaries, academic degrees and photos on the job.

"My vision for this is to create some excitement about this world," she said. "If they're excited about this – just like Pokémon – they'll jump into it and really become engaged. We have added one-paged career portfolios that are age appropriate, too. Students can read about a career at their level and answer guided questions. We want to spread this material to as many teachers as we can and increase

engagement. We always welcome feedback because we want to keep making these resources better."

Carderock's Technical Director Lawrence Tarasek praised the cohort for the impact they are making on the next generation of technical professionals.

"Our goal is to have more students experience what it is like to work for a government facility, that's incredibly important," Tarasek said. "It's top to bottom. Without the work that you folks do, it would be increasingly challenging to solve the Navy's problems. We do not want to wake up one day and realize we don't have the workforce or talent to meet demands. That is why we appreciate the difference you all are making around the country."

Commanding Officer (CO) Capt. Matthew Tardy watched DoD STEM Ambassadors test their device and delivered closing remarks.

"I am deeply appreciative of your careers and what you do for the children," Tardy said. "My wife is an elementary school teacher for Fairfax County and I fully understand all the things you all have to do – with lesson planning and everything – to prepare for the next day. Today's teachers are preparing tomorrow's engineers who will help protect our Sailors and improve our naval capabilities. Sometimes it is hard to think about the future generations and how your actions are going to affect them. But what you all are doing now, will ripple on for decades. Thank you for visiting our Warfare Center and, more importantly, thank you for all you do in service of our students."

Meet Carderock's Newest Einstein Fellow: Melissa Thompson

By Tamari Perrineau Palmer, NSWC Carderock Division Public Affairs



As an active leader in education, Melissa accepted a distinguished visitor invitation for an overnight, at-sea stay on USS Abraham Lincoln (CVN 72)! She experienced a first-hand glimpse at life aboard an aircraft carrier and was able to see flight operations at sea. Participating in an embark aboard opportunity aims to provide unique experiences to foster awareness and understanding of carrier aviation.

Naval Surface Warfare Center Carderock Division's newest Albert Einstein Fellow Melissa Thompson is on a mission to improve the education of students in Baltimore County, Maryland.

"I just love working with the students," Thompson said. "My favorite part of being a fellow for Carderock is being in all of the school districts, providing the materials and showing them the curriculum we've developed to support STEM programs."

The Albert Einstein Distinguished Educator Fellowship (AEF) Program provides a unique opportunity for accomplished K-12 educators in the fields of science, technology, engineering and mathematics (STEM) to serve in the national education arena.

Fellows spend 11 months working in federal agencies or in U.S. congressional offices, applying their

extensive knowledge and classroom experiences to national education programs and/or education policy efforts. At the end of the fellowship, educators are equipped with access to a national network of education leaders and programs; a better understanding of the challenges and possibilities in STEM education; and a renewed passion for teaching, ready to make significant contributions to the educational community.

As a native to the Maryland area, Thompson's goal is to become a bigger voice in education and help students in Maryland thrive in STEM opportunities. Thompson previously taught at Arlington Elementary school covering multiple topics across the STEM field. She has also led Baltimore City Public Schools in administrative roles. Early in her educational career, she taught high school chemistry and biology for six years before teaching middle school science for eight years. Shortly after that, she taught elementary school students about using modern technology along with robotics and engineering. Last year, Thompson spent her time participating in the Baltimore City Mentorship Program as a model teacher, assisting fellow STEM teachers in the city with support in the classrooms. She has a long-standing relationship with Maryland communities, which helps her to foster school-community partnerships.

Thompson's motivation for education started when her grandfather, who was a Coast Guardsman, told her that education was the thing that held him grounded in World War II, and it helped him remember to do the right thing. He bought Thompson an overhead projector and told her to use her imagination. From there she pretended to teach a room full of students in her grandparents' home as her passion for education grew.

Shortly after working on the National Board Certification Program, she won the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) and was recognized by President Joe Biden in 2020. The PAEMST award is the highest award an educator can receive for teaching science. She was then designated the Maryland Science

Teacher of the Year. After that recognition, Thompson was presented with an opportunity at Carderock through the AEF Program to expand her knowledge and skillset. Up to this point in her career, Thompson has been recognized with mayoral, senatorial and state-level salutes for her innovative work in STEM.

"It's been our task to get information out to local schools and personalizing the experience to each school so we can give them the best fit for their district," Thompson said. "We've been in classrooms, co-teaching throughout Maryland and the Washington metropolitan area. We have scheduled a dozen field trips and we're holding professional development for educators virtually and in-person – based on the SeaWorthy STEM curriculum and workforce opportunities within the DoD."

Thompson is midway through completion of her fellowship and the first half of her experience was spent creating a 12-week, 12 lesson engineering curriculum geared for high school students.

Shortly after completing the 12 lesson-engineering course, she updated the STEM materials of 25 lesson plans for pre-kindergarten to eighth graders; and she created one-pagers that focused on job positions within the DoD and technical fields that the students can read, ask questions and collaborate on. The full curriculum, which is pre-k to 12th grade, contains 35 lessons. In addition to the curriculum, Thompson and her team are adding workforce trading cards and short stories that bring naval careers to life.

"We redesigned 52 workplace trading cards for the students," she said. "They are trading cards that showcase these wonderful careers that places like Carderock, other bases and DoD entities have."

Later this year in March, Thompson will be keynoting the 14th IEEE International STEM Education Conference at Princeton University in New Jersey. She will be collaborating within the naval community to present a workshop called "Aircrafts to Anchors: A NAVAIR and NAVSEA STEM Outreach Workshop."

"I've been really passionate about showing the community that collaboration with education is important and I started to do that through collaboration between our own naval commands," Thompson said. "We're coming out with a fantastic collaboration between Naval Sea Systems Command (NAVSEA) and Naval Air Station Patuxent River

(NAVAIR), where we created a lesson together called Harmonious Hues: LIDAR, RADAR and SONAR-OH MY! We are going to present that at the IEEE conference together to an audience of students, parents, educators and beyond."

Thompson's involvement in the AEF program is scheduled to last until July 15, 2024. She knows she wants to continue growing the STEM collaboration in Maryland and give back to the community after completing her program.

Recently, Thompson was given the opportunity to go on an embark aboard trip on USS Abraham Lincoln (CVN 72) with representatives from naval aviation to tour and learn about life on an aircraft carrier. Thompson said as an educator the experience was eye opening and helpful for her when reaching out to various communities. She added that it helped her understand the many options and career paths to support the Navy.

"Most students are advised to go directly into colleges, whereas the Navy and other armed forces have these hidden gem opportunities," Thompson said. "It is a different educational pathway that not only supports educational growth, but also serves our great country. The barrier is communication and misconceptions – some people just don't know that they exist or do not have enough information to make informed decision."

Thompson hopes that her work this year will resonate within Carderock and the greater D.C., Maryland and Virginia community.

"If I can help to change the path of one student for the better, cliché as it sounds, I have done my job as an educator," Thompson said. "It's about creating an educational community that shares resources and promotes the amazing STEM opportunities we have right in our backyard."



I've been really passionate about showing the community that collaboration with education is important...



Naval Surface Warfare Center Carderock Division employees Dominic Portolese (Left), Ari Bard (Middle), and Eric Miller (Right) attends social gathering in downtown Stuttgart, Germany on June 7, 2024 after presenting their project at the hackathon. A hackathon is an event for teams with technical backgrounds to use data sets to get proof of concept on a project.

Data Bytes

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

Naval Surface Warfare Center, Carderock Division's Chief Digital Officer, Trish Shields, and the Data Science and Analytics Lab had the opportunity to send three Carderock employees to Stuttgart, Germany to participate in the Department of the Navy Chief Digital and Artificial Intelligence Office (CDAO) BRAVO 101 Hackathon.

The purpose of the hackathon is to gather data and computer scientists, engineers and individuals with a technical background to

an event to work on various sets of data projects to get proof of concept, essentially hacking with an outcome with a prototype.

The first day consists of companies pitching their projects, teammates bonding and figuring out which project will be assigned. Throughout the week, teammates worked on the project up until the final day, when the teams pitched their project to stakeholders and high-level leadership while also showing what was happening in the Department

of the Navy, Air Force, or Military. Projects that may need funding or additional resources were reviewed.

The Hackathon participants Eric Miller, Ari Bard, and Dominic Portolese worked on a condition-based maintenance project that would predict when equipment needed to be maintained or undergo maintenance with an Airforce civilian and lieutenant of the Navy. According to Miller, the idea of the project was to predict when a gas turbine engine of a



From my experience with data science having manageable and organized formatted data to work with cascades the workflow. This is essential for wartime readiness because the data must be ready and stored correctly, so it can be picked up at a moment's notice.

-Ari Bard

DDD ship would fail so they could perform maintenance before it failed or needed to undergo maintenance.

"Hackathons are a great opportunity for Carderock and the Hull Response and Protection Branch," Bard said. "The prototype exploratory project is useful and the most important thing I learned about this project was the value of clean data. From my experience with data science having manageable and organized formatted data to work with cascades the workflow. This is essential for wartime readiness because the data must be ready and stored correctly, so it can be picked up at a moment's notice."

Miller used the knowledge he learned from working with Carderock's machine-learning

framework alongside Bard to complete the machine-learning work for the project. The machine learning framework allows users to load the data sets to a framework and perform without having to do much coding.

In the end, the team discovered three different ways to represent the project and presented the one which was the best for them, answering the questions of will this engine fail at the end of 10 days, how long until the next time it needs to undergo maintenance and what can the Navy get from this.

"It was a great opportunity to improve my team and leadership skills," Miller said. "I worked with acquaintances from different perspectives whom I had just met, and we had to figure out how

to create a useful outlook. One of the most valuable things we learned was wartime readiness. We had three days to create something usable with relatively good performance that would help predict engine failure."

The team was also informed by a representative that this was the first time participants had applied machine learning to system-level condition-based maintenance.

Although the next hackathon date is unknown, Miller hopes the event will be reoccurring so qualifying participants can experience the skills, collaboration efforts and networking opportunities at the event, as well as the chance to showcase the commands data science capabilities.

Carderock's Bayview Detachment Host Annual SeaPerch Regional Competition

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

Naval Surface Warfare Center (NSWC), Carderock Division's Acoustic Research Detachment in Idaho hosted their annual Sea Perch regional competition at Eastern Washington University in Cheney, Washington, on Feb. 26, 2024. The integrated educational program is an opportunity to get kids involved in learning engineering principles behind remotely operated vehicles.

"We're kind of at a deficit in this country for engineers and scientists," Patrick Molvik, a project engineer and competition lead said. "The Navy encounters challenges in filling some billets with technical and engineering personnel. So an event like this helps spark the interest among younger kids in STEM and, hopefully, they might apply to work with the Navy in the future."

The Sea Perch program is run by the Office of Naval Research through its National Naval Responsibility for Naval Engineering program and is a hands-on, project-based engineering program that allows students to build their own remotely operated underwater vehicle called "Sea Perch." During the construction of their Sea Perch, students learn to use a variety of tools and equipment, including

PVC pipe cutters, wire strippers, soldering irons and multi-meters. Molvik, who has been running the Sea Perch program in ARD since 2011, is actively working toward expanding the program in the coming years.

"I have a meeting with Tammie Schrader, my former teacher who is now an administrator with the Educational Service District in the Greater Spokane Area," he said. "We are working together to expand the Sea Perch program in more schools in the area and to encourage more students to participate in related events."

Molvik, teachers and mentors assisted the students through all the stages of the construction process, including wiring and waterproofing their motors, guiding them to wire the switches and power cables in their control box, and supporting them troubleshoot their Sea Perch. Student volunteers from the American Society of Mechanical Engineers were also present to help when needed at the event.

"In most cases, it's the science teacher at the school or an after-school program that presents this construction project to the kids," Molvik said. "The students

who show up for the event have been working on their Sea Perch anywhere from a few weeks to a few months, preparing for the competition. It all depends on how much the teacher or advisor puts into teaching the kids this program."

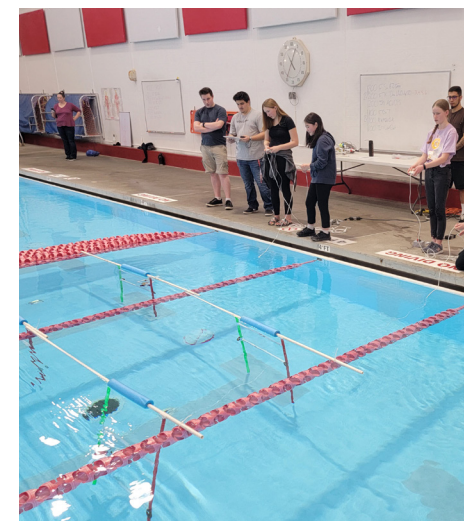
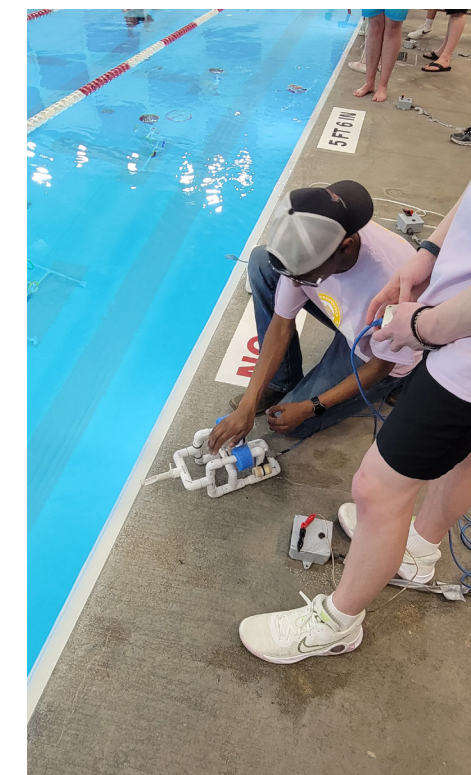
Typically, the yearly competition drew in 100 children from 10 to 12 schools pre-COVID, however, this year 28 kids from four different schools in Washington State and an alliance club participated in the competition, knowing there was an opportunity to go to Nationals.

Molvik mentioned that although the competition does not offer any tangible rewards, he makes ribbons out of duct tape for the winners and presents official Sea Perch certificates.

The winner of the Sea Perch regional earns an opportunity to compete at Nationals, which will be held at the University of Maryland in College Park from May 31 – June 1, 2024. This year, however, Molvik was granted an additional slot to recommend a student for Nationals; however, due to new middle school regulations on overnight travel restrictions, one of the winning contestants will be unable to make the trip. On the other hand, a student from Cheney

High School is still competing. Molvik said he hopes he can continue to send two winning contestants to Nationals each year and added that he is already looking forward to next year's regional competition.

Although there were no tours at ARD this time around due to the distance from the college to the base, students wrapped up this year's regional competition with a tour of the robotics lab at Eastern Washington University.



Katherine Thomas School Students Become Engineers for A Day

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs

The Katherine Thomas School (KTS) in Rockville, Maryland, spent the day at the Naval Surface Warfare Center, Carderock Division, on May 16, 2024, for a day of tours and science, technology, engineering and mathematics (STEM) activities.

KTS, which is a treatment and learning center, provides an educational experience for children with language and learning disabilities, autism, intellectual disabilities and/or other health impairments. They serve students from preschool through 12th grade.

"We have teams of scientists, engineers and many others who work together to make our projects successful," Capt. Matthew Tardy, the Commanding Officer of the Division said. "Each Carderock employee brings special skills and ideas to the command that we put together to accomplish incredible things."

Carderock's Einstein Fellow, Melissa Thompson, led the activities and started the day with a density challenge where the kids had to choose which soda would float or sink. The three options were Coke, Root Beer and Diet Coke. The goal was to highlight the importance of density for ships and submarines in the Navy, and Carderock's STEM team demonstrated that by showing how sugar affects the density of the sodas.



The students also completed another density challenge with sand and containers. After that activity, Carderock employees Dr. Maureen Foley, Brandon Newsome and William (Bill) Manning from the Non-Metallic and Low Observable Materials Branch, talked about their roles as engineers and showcased the different tools used on ships and submarines, such as plugs, sound power phone boxes, deck drain and cease-fire alarm horns.

Before the next activity, Community Outreach and Student Engagement Coordinator, Ashlee Floyd (00T2) shifted the students to different groups to show them how teams constantly change in the life of an engineer. In this activity, students learned how to communicate and

decode messages in Morse code. There was a competition among the group to decode messages such as "You being in STEM," "Seaworthy STEM" and "Anchor Aweigh." The winners had the opportunity to present the winning code in front of their peers, which was "I am the champion."

"Seeing how things float or sink with the water was interesting," KTS student Daniel Vane said. "Today has inspired me to research how the Navy test boats and maybe be an engineer one day."

When the students returned from lunch, they toured two of Carderock's state-of-the-art facilities: the David Taylor Model Basin and the Maneuvering and Seakeeping Basin. Before departing for the day, Capt. Tardy left the students with a key message.

"I want you all to know that no matter what your dreams are, big or small, you have the power to make them come true," he said. "All it takes is a little curiosity, hard work and a little help from your friends."



Science and Engineering Apprenticeship Program SEAP



Science and Engineering Apprenticeship Program (SEAP) interns present their experiences and summer projects during final presentations at Naval Surface Warfare Center, Carderock Division in West Bethesda, Md., on Aug. 8, 2024. SEAP is a paid naval internship program that matches high school students interested in STEM to a Department of Navy laboratory. Over the course of their internship, students engaged in various naval research projects during the summer. (U.S. Navy photos by Kristin Behrle)



Carderock Partners with Pike District to Further Get Real Get Better Initiative

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



Naval Surface Warfare Center, Carderock Division's former Commanding Officer Capt. Matthew Tardy and Pike District Partnership announce a collaboration through a Partner Intermediary Agreement during a signing ceremony at the Canopy Hotel in North Bethesda, Md. on July 2, 2024. This agreement improves the local economy by allowing businesses and organizations in Montgomery County to work with the Navy to expand opportunities and resources in the region. The collaboration also supports Carderock events geared toward engaging small businesses and solving key operational problems. (U.S. Navy photo provided by Lauren "Tink" Hanyok)

Naval Surface Warfare Center, Carderock Division recently announced a collaboration with Pike District Partnership that will improve the local economy in Montgomery County with a signage ceremony at the Canopy Hotel in North Bethesda, Maryland, on July 2, 2024.

"This collaboration allows us to dig into the Get Real Get Better initiative," Capital Tech Bridge Director Lauren "Tink" Hanyok said. "By engaging with our local ecosystem, we open the aperture for smaller, less well-connected innovators and entrepreneurs to engage with the Navy. This helps us solve our tough problems and leverage the many non-Federal Acquisition Regulation (FAR) contract opportunities available for government to non-government collaboration, shortening timelines and increasing innovative solutions."

The signage ceremony highlighted the Partner Intermediary Agreement between Carderock and the Pike District Partnership. Which according to their website, is an agreement with a non-profit partnership intermediary to engage academia and industry on behalf of the government to accelerate tech transfer and licensing. That allow organizations in Montgomery County to support Carderock's events to potentially expand network opportunities in the region by hosting virtual and in-person events offsite such as industry days, pitch days, demonstrations, STEM events and workshops using the PIA's networks and partner's networks.

The collaboration furthers Carderock's Technology and Innovation Office by expanding on the Navy's Get Real Get Better Initiative. According to Hanyok, collaboration and partnership with small businesses, entrepreneurs



and innovators provide a new opportunity to solve key operational problems.

The Get Real Get Better Initiative is a call to action from Navy leadership to provide guidance and problem-solving practices to empower people working for and in the Navy to achieve improved performances. Hanyok has two different roles in the initiative as Capital Tech Bridge Director, engaging with the local community and tech bridge community in connecting small businesses with resources in the governments. As a lead facilitator in Carderock, Hanyok also works with teams to promotes collaboration, solves issues and provides tools to help them work efficiently and effectively to build a flexible workforce that will be able to pivot in a time of crisis.

The Capital Tech Bridge Innovation Office has planned a series of upcoming events for small businesses in coordination with the recent partnership. On Aug. 22, 2024, they will host a technology-specific industry day (SIDE) 2024, at the Bethesda North Marriott and Conference Center in Rockville, Maryland. Carderock will also support Industry Day at the same venue on Oct. 9, 2024. Additionally, Carderock's Small Business Innovation Research



Engagement event will be held on Oct. 10, 2024, and will feature two days of learning and networking across government, industry and small businesses.

Carderock Hosts Small Business Industry Day and Navy Small Business Symposium with Capital Tech Bridge

By NSWC Carderock Division Public Affairs

WEST BETHESDA, Md. – Naval Surface Warfare Center Carderock Division hosted its annual Industry Day virtually on Oct. 9, 2024. This was followed by the in-person Navy Small Business Symposium, facilitated by the NavalX Capital Tech Bridge and the Pike District Partnership, at the Bethesda North Marriott Hotel and Conference Center on Oct. 10.

Industry Day provided a virtual platform for Carderock's technical experts to connect with industry members and showcase Carderock's mission, focus areas, and technical capabilities. The goal was to expand the pool of small business partners to foster innovation between the Navy and the private sector.

Carlos Duran, Carderock's Deputy of Small Business Programs, facilitated the virtual program in collaboration with the Capital Tech Bridge. Duran was also the 2024 recipient of Naval Sea Systems Command's Excellence Award in Small Business.

"The intent of Carderock's Annual Industry Day is to share technical information with industry, so they have a better understanding of our mission and needs. This approach augments the ecosystem of technically available small business concerns that can compete for our contracts," said Duran.

The Navy Small Business Symposium, coordinated by Capital Tech Bridge, offered an in-person forum for small businesses to connect with the Navy, specifically Naval Sea Systems Command (NAVSEA), Naval Air Systems Command (NAVAIR), and Naval Information Warfare Systems Command (NAVWAR). The Department of the Navy Office of Small Business Programs (OSBP) provided information for participants explaining how to do business with the Navy. Presenters included Maryland APEX Accelerators and Montgomery County Economic Development Corporation (MCEDC).

The Department of the Navy Office of Small Business Programs is "bringing more players to the field," by

inclusion of new businesses from atypical sources through its Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.

"Annually the Navy includes 21% of businesses [that] are owned by socially or economically disadvantaged persons and 41% of the businesses that participate in SBIR and STTR programs are new to the program and to the Navy. The Navy is responsible for 50% of all transitions to the commercialization phase out of the entire DoD," said Susie Drummond, Naval Sea Systems Command SBIR/STTR Outreach.

Capital Tech Bridge facilitated the event and continues to seek new venues to provide these connecting opportunities. This effort has expanded since the July announcement of a Partnership Intermediary Agreement between Carderock and the Pike District Partnership.

Increased local economic development is a shared goal of Naval Surface Warfare Center Carderock Division, Capital Tech Bridge and the Pike District Partnership. By creating a welcoming business environment and new avenues for collaboration, the hope is for Montgomery County to remain a strong economic base that will support the Navy and Marine Corps mission for years to come.

Eugene Cornelius, Director of Pike District Partnership, shared the objective of the partnership. "We are the advocate for economic development here in the North Bethesda area. One of the things that we have learned when it comes to small businesses and government contracting is that a lot of those in this city and [at this symposium] will need technical assistance...We're learning as we go and we are providing information that we think is valuable to [them] as we go," said Cornelius.

The symposium also provided opportunities to network, share ideas and challenges, and connect

directly with technical experts during the "Ask Me Anything" panel. The panel included Lauren Hanyok, Carderock's Capital Tech Bridge director, Eugene Cornelius, Director of Pike District Partnership, and Susie Drummond, Naval Sea Systems Command SBIR/STTR Outreach, who provided keen insight into new applications, emerging technologies and ways to leverage existing capabilities.

Hanyok provides the logistical glue and serves as a facilitator for connecting efforts like the Navy's Small Business Symposium. In her role at Capital Tech Bridge, she also understands the value of creating Partnering Intermediary Agreements with organizations like the Pike District Partnership and Navy labs under Carderock.

"All Navy labs have the ability to enter into Partner Intermediary Agreements with non-profits like the Pike District Partnership. They have access to county resources to help Capital Tech Bridge host its events outside of the Carderock fence line so that we can reach a bigger audience with less barriers to entry," said Hanyok.

"Not a lot of people in Montgomery County know what Carderock is, so partnering with a hyper-local PIA helps us better engage with the community and learn that a Navy organization is right in their backyard with not only small business opportunities, but a fantastic STEM program and there are job opportunities in all fields."

By fostering innovation and technological advancement, the Capital Tech Bridge aims to strengthen this partnership to driving progress that benefits both the Navy and the region. The Capital Tech Bridge encompasses a vibrant innovation ecosystem for the Navy and Marine Corps, partnering with naval warfare centers and national labs to solve complex problems for Sailors and Marines.



STEM Boot Camp Empowers the Next Generation of Navy Professionals at Carderock

By Daniel Troy, NSWC Carderock Division Public Affairs Intern



For the second year in a row, students from four different schools in Maryland visited Naval Surface Warfare Center, Carderock Division to participate in a Science, Technology, Engineering and Mathematics (STEM) boot camp in West Bethesda, Maryland, July 8-12, 2024.

The boot camp, which featured academia partners such as Teaching Institute for Excellence in STEM and Building, Engineering and Science Talent, provided students a learning opportunity to problem-solve engineering challenges, work as a team, network and learn about careers supporting the U.S. Navy. Students received resources and tips about internship opportunities hosted at the command and were guided through the application process. The boot camp also welcomed educators from schools in the Washington metropolitan area such as Friendship Collegiate Academy, Friendship Technology Preparatory High school, Charles Herbert Flowers High School, Oxon Hill High School and Mckinley Technology High School, exposing them to STEM resources and activities they could bring back to the classroom and share with their students.

Each day, after lunchtime, students pulled on their gloves and safety glasses to begin building their own SeaGlide, an autonomous underwater vehicle.

Charlotte George, the STEM Outreach Coordinator and Program Director, and Jeff Campana, an oceanographer in the Seakeeping and Maneuvering Branch, led the students and educators on how to create their vehicle. Campana, who was in a robotics team in high school and a submarine team at the University of San Diego, said he is a big fan of how the program helps introduce students to the engineering process.



“This program points them in the direction of how to get started in STEM careers, how to write a resume, how to look for an internship, or even just to let them know that having an internship is a good way to look for what’s out there,” he said. “That looks great on your resume and getting them started early is beneficial for everyone.”

Although boot camps carry a certain connotation to labor intensive and physical work, students inside the Raye Montague Center for Maritime Technology put their minds to the test to assemble this unique robotic capability.

The SeaGlide works by changing its buoyancy, taking in or expelling water. The change in buoyancy causes the glider to rise or sink and the propellers move the glider forward. Students had to solder metal, tighten screws and implement coding to make their SeaGlide function properly. This project, according to George, helps these aspiring, future Navy professionals build their fine motor skills and develop their engineering capabilities. Apart from the engineering process, students were also able to network and meet new friends who have a common interest in STEM.

“This portion is so unique compared to what you learn in a classroom,” Compana said. “What you learn in a classroom doesn’t quite reach to what

you’re going to be seeing in the real world with jobs. So these guys are looking for internships and they can walk in the door and say ‘yeah, I’ve taken these classes and I have good grades, but look I also know how to solder, and I’ve gone through the process.’ You learn a lot more from doing that than having someone talk to you.”

Students were not the only ones building SeaGlides. Karen Shelton, a science and technology teacher at Charles Herbert Flowers High School spoke highly

about the experience not just for the students, but also for the teachers.

“This has been a great experience to have,” she said. “To be able to do a hands-on engineering project like this and showing and teaching students what it’s like to be an engineer is helpful toward their development; I really appreciate that. For me, as an engineer who’s been out of it for a while, I’m just loving doing the hands-on work.”

On the last day of the STEM boot camp, both educators and students took their completed SeaGlides and tested them in a pool of water in the courtyard of the Raye Montague Center.

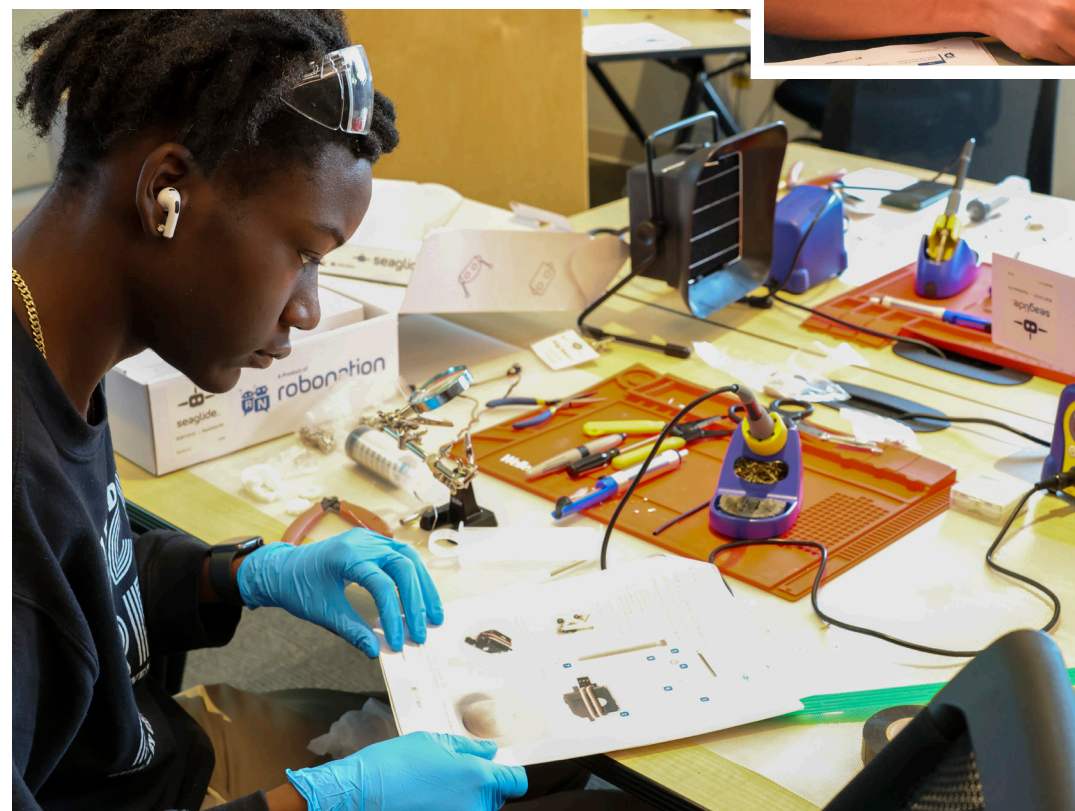
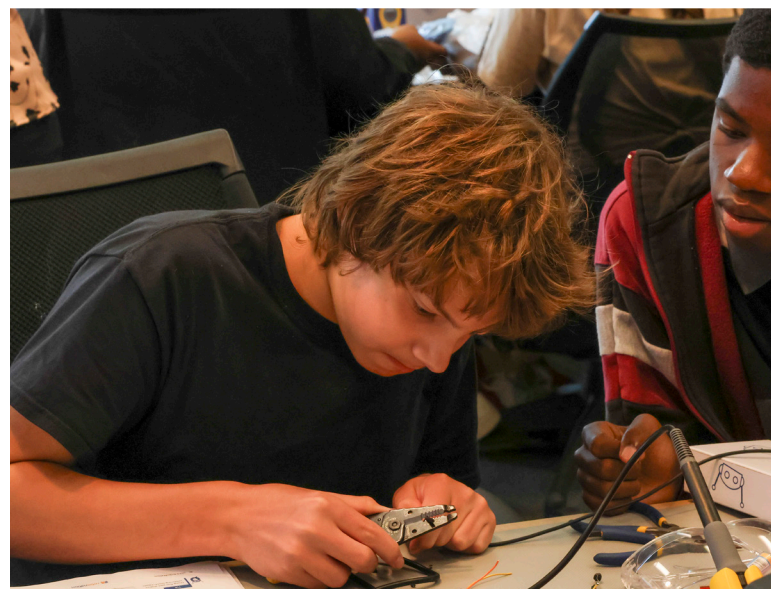
Two students, Corde Shaw and Sarah Wright, put their SeaGlide in the water and began their test and evaluation. Their SeaGlide stopped at the bottom of the pool, but rather than being discouraged, Shaw and Wright questioned how to fix the glider. The duo brought the glider back to their table to make repairs.

After making some tweaks, their glider began to function correctly and completed the circuit.

“The engineering process is kind of like a cycle,” Wright said. “We keep making changes and we keep improving. It is always possible to achieve a better outcome. Failure is part of the process, so it is important to persevere.”

Shaw credited his success with SeaGlide down to teamwork.

“I started the project by myself and that wasn’t working,” he said. “When Sarah came in, it all clicked and we were able to easily construct this glider.”



James Bennet High School Visits Carderock as Part of Seaworthy STEM Initiative

By Brittney Odoms, NSWC Carderock Division Public Affairs

Naval Surface Warfare Center Carderock Division welcomed James Bennet High School from Salisbury, Md., on Feb. 29, 2024. 27 students along with three teachers had the opportunity to tour the facility in West Bethesda, Maryland, and participated in one of the command's Seaworthy STEM in-a-box activities. The visit, which was coordinated by Carderock's STEM and Outreach Office, introduced students and teachers to a new way of STEM learning and exposed them to some of the Navy's premier labs.

Carderock's Seaworthy STEM is a Navy initiative to provide enhanced, naval-relevant hands-on activities to K-12 teachers and students. Seaworthy STEM components include free lessons and professional development opportunities for informal and formal educators. The activities were designed for the grades bands mentioned for use by Naval STEM stakeholders, informal educators, and formal educators. Each Seaworthy STEM series was intentionally curated to allow for accessible, engaging DIY STEM-in-a-Box kits. The Seaworthy STEM-in-a-Box kits are designed to guide students through scientific inquiry-based theory and the engineering design process. The kits also support teachers in selecting content, acquiring materials and discovering new STEM activities they can apply to their curriculum in the classroom. The materials needed for each kit are open-source, to help educators across the Nation adopt the activities in diverse learning environments (e.g. after-school programs, in-classroom instruction, home school programs, etc.).

Carderock's Community Outreach and Student Engagement Coordinator, Ashlee Floyd, and Albert Einstein Distinguished Educator Fellow, Melissa Thompson, worked together to develop transdisciplinary lessons that include both workforce readiness initiatives and extensive engineering principles. The newest activities are being piloted in Naval STEM stakeholder communities across the nation, facilitating intentional collaborations with the ultimate goal of fostering a future Naval workforce.

"Naval STEM strategy, as well as the DoD STEM strategy, is looking to inspire, engage and educate both students and educators," STEM and Outreach Program Director Charlotte George said. "An event like this not only brings students in to our Bethesda campus, but it also shows them the sites and introduces them to engineers and other folks that work at Carderock. These visits help students engage in STEM fundamentals and stimulates them to think of careers they can have in this discipline. They may or may not choose to do so, but at least it gets them thinking about it."

During the field trip, students toured Carderock's Maneuvering and Seakeeping Basin, model shop and David Taylor Model Basin. After the tour, students began designing, building and testing their own hovercrafts with the objective to find out which teams' design could hold the most weight.

"I could see some of these activities being utilized by our physical science teachers," Environmental Science Teacher Carrie Bell said. "I think it would fit really well with their curriculum."

According to George, the James Bennet High School field trip is the first of many in 2024. Prior to the pandemic, Carderock regularly hosted field trips from schools in the Washington, Virginia and Maryland area. The STEM and Outreach team look forward to increasing school involvement and participation at the base; and they hope their Seaworthy STEM initiative will inspire educators nationwide to adopt some of the STEM activities into their own curriculum.



Carderock Introduces Summer Faculty Lecture Series

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



Associate Professor of Environmental Engineering Dr. Erick Butler from the West Texas A and M University in Canyon, Texas, presented a lecture on the results of two projects worked on at Naval Surface Warfare Center, Carderock Division on July 16, 2024, in West Bethesda, Maryland.

During the lecture, Butler presented the results of a three-year joint collaboration between Carderock and the University of Maryland in College Park, Maryland that investigated how efficient two portable turnkey devices were in determining suitability for shipboard uses to track the SARS-CoV-2 virus and other pathogens. In his presentation, he shared how the information found can help the Navy with future water surveillance testing and how the results will be used for ongoing collaboration efforts between the command and partnering researchers.

The presentation is part of a summer faculty lecture series where experts and professionals from different universities come to Carderock to discuss a scientific or technical topic or issue researched throughout the summer. The two projects in the lecture explored the selection of wastewater monitoring tools and

tests to target agents of concern in wastewater such as viruses and bacteria. Each project supports the Navy's objective to maintain mission preparedness by ensuring the tools are sailor-friendly and can be implemented in a shipboard environment.

"This experience over the past three years has been great," Butler said. "We have taken small incremental steps each year to progress towards our objective and it's been exciting to see what has developed in that time. I look forward to continuing this relationship with Carderock in the future."

Every summer, Carderock invites academic faculty to conduct navy-relevant research alongside the command's scientists and engineer through the Office of Naval Research (ONR) or Summer Faculty Research Program (SFRP).

Although the Carderock Summer program guidelines limit participants to three years on the projects, Butler will continue to work with his colleagues in SAN ANTONIO, Texas and hopes to return to Carderock in 2026.

Carderock Interns Celebrated at Montgomery County Public School's Summer RISE Ceremony

By Tamari Perrineau-Palmer, NSWC Carderock Division Public Affairs



Carderock's interns from Montgomery County Public Schools' 2024 Summer RISE (Reimagining an Innovative Student Experience) Program were celebrated for their hard work at Naval Surface Warfare Center, Carderock Division at the Bethesda North Marriott Hotel and Conference Center in Rockville, Maryland, July 25, 2024.

The closing ceremony opened with a career fair for participating students of the program to facilitate networking opportunities with the local businesses, government agencies, educational institutions and nonprofit organizations. Carderock partnered with MCPS to provide students to hands-on learning opportunities in STEM-related fields and other areas of study during the summer months.

The Carderock Summer RISE interns consisted of 10 high school students from Bethesda-Chevy Chase High School, Walt Whitman High School and Walter Johnson High School – all located in Bethesda, Maryland – and Northwood High School in Silver Spring, Maryland. The interns completed the program with different divisions across Carderock to include: the Submarine Maneuvering and Control Division, Future Ship Concepts Division, Corporate Communications Division, and Information Technology Division.

"This internship was a perfect fit for me," rising junior Daniel T., from Bethesda-Chevy Chase High School said. "The people in the communication department were so helpful and it felt like one big family by the end of the program. They taught me the importance of having an open mind and helped shape my goals for my future career in communications."

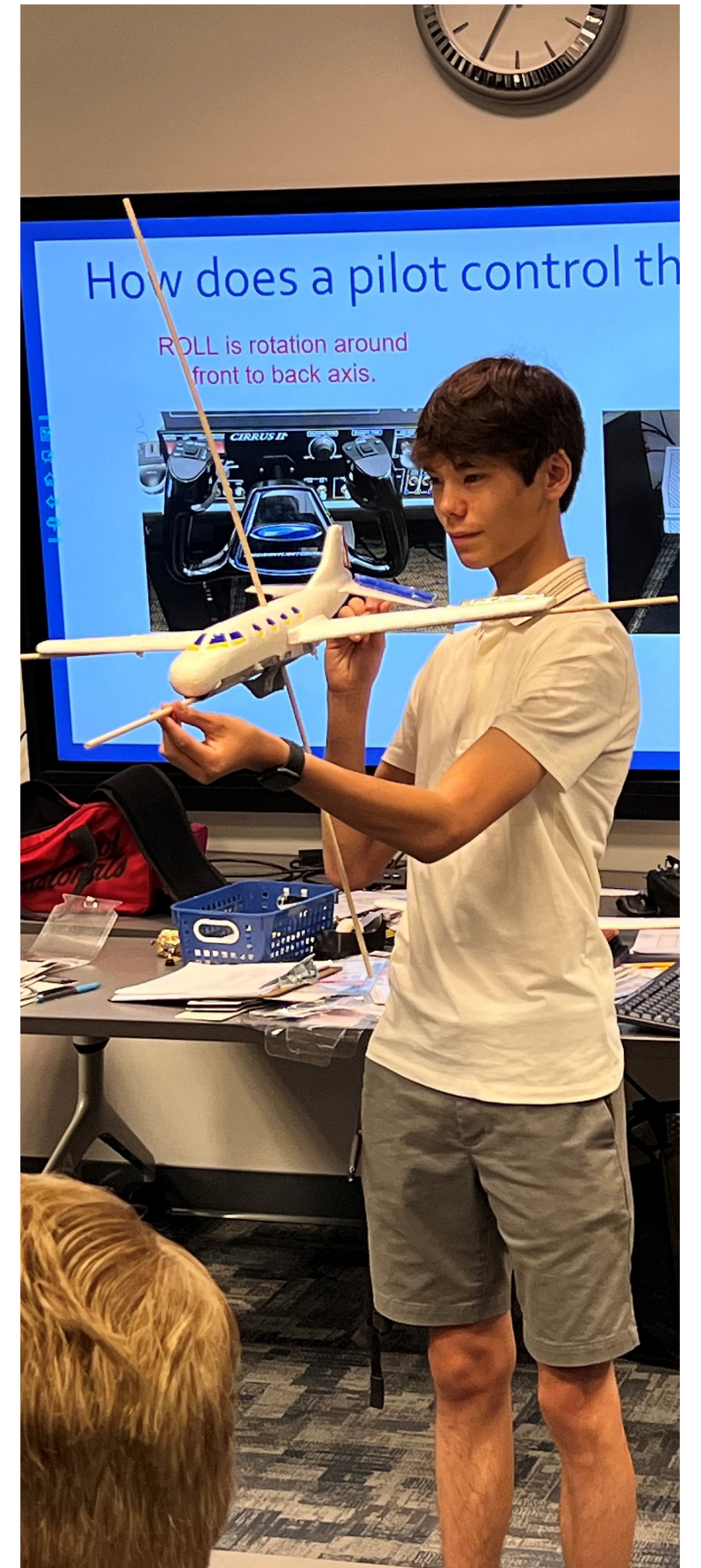
After the career fair, students, faculty and organizations gathered for the general session. The session opened with remarks from Montgomery Councilman Will Jawando, followed by a speech from Paint Branch High School student Sophia Kalaki on her experience in the Summer RISE program. The general session ended with a career panel led by Maryland's Department of Labor Secretary, Portia Y. Wu, Cava founder and CEO Ted Xenohristos and Vice President of Branding for the Kaiser Permanente Mid-Atlantic Region's Cynthia Cifuentes.

"My biggest takeaway from the program is to build relationships," rising senior Hiep N., from Walter Johnson High School said. "In the future those relationships will help you and leave a good impression on people. My experience at Carderock was informative and I even tried new things I never thought I would do."



Summer Interns Visit Museum

Summer RISE and Science Engineering Apprenticeship Program student interns tour the Air and Space Museum in Washington, D.C. on July 9, 2024. Ashlee Floyd coordinated a unique visit for interns, which included a flight simulator experience, a scavenger hunt and a tour of a restored hanger. (U.S. Navy photo by Ashlee Floyd)





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