

NSWC CRANE

CORPORATE COMMUNICATIONS

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NSWC CRANE DIVISION

2018 YEAR IN REVIEW



NSWC CRANE DIVISION 2018 YEAR IN REVIEW



A CORPORATE COMMUNICATIONS
PRODUCT

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2018 YEAR IN REVIEW: CAPTURING HISTORY BY DOCUMENTING THE PRESENT AND PLANNING FOR THE FUTURE

Welcome to the Naval Surface Warfare Center, Crane Division (NSWC Crane) 2018 Year in Review. This report contains summaries, highlights, and featured stories from each of our mission areas, as well as our efforts to support the NAVSEA Campaign to expand the advantage. NSWC Crane's total focus is to support the Warfighter, and this report proves just how strongly we believe - and implement - that truth.

Located on the third largest naval installation in the world, NSWC Crane leverages its technical capabilities for the rapidly changing combat environment. Anchored by technical expertise, a strong work ethic and total lifecycle leadership, NSWC Crane's personnel and preeminent facilities set the standard for excellence in acquisition, engineering and sustainment. NSWC Crane provides comprehensive support for complex military systems spanning design, development, deployment and sustainment in three mission areas: Electronic Warfare, Strategic Missions and Expeditionary Warfare.

NSWC Crane's skilled professionals put technical solutions directly into the hands of the Warfighter, ensuring safer missions. Our broad customer base includes the Navy, Marine Corps, Army, Air Force, United States Special Operations Command, Coast Guard, NASA, and many other military, civilian, and foreign military organizations.

NSWC Crane is one of Indiana's largest high-tech employers with over 2,000 scientists, engineers and technicians. NSWC Crane's reach is global, and at any given time, hundreds of its more than 3,400 employees are supporting the Warfighter around the world.

Keep reading to discover why NSWC Crane is a National Technical Leader in Electronic Warfare, Strategic Missions and Expeditionary Warfare.



COMMANDING OFFICER

CAPT MARK H. OESTERREICH

Captain Mark H. Oesterreich assumed command of NSWC Crane in July 2017. A native of South Holland, Illinois, Captain Oesterreich received his commission from the United States Naval Academy in May 1991, graduating with a Bachelor of Science degree in Naval Architecture. He completed the nuclear training pipeline and served aboard USS ARCHERFISH (SSN 678), completing his qualification in Submarines.

Throughout 2007 to 2010, he served in several positions including Staff of the Chief of Naval Operations and Chief Engineering Officer aboard the USS Ronald Reagan (CVN-76). In June of 2010, he reported to the staff of Command Naval Air Forces Pacific as the Carrier Force Maintenance Officer. Following selection for Captain, he reported to Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility where he served as the Business and Strategic Planning Officer and Production Resources Manager.

In July of 2014, Captain Oesterreich reported to the staff of Commander Naval Air Forces, Atlantic for duty as the Assistant Chief of Staff for Ship Maintenance and Material. One year later he was transferred to the same position at Commander Naval Air Forces Pacific Fleet. Oesterreich's service decorations include the Legion of Merit, Meritorious Service Medal and various personal, campaign, service and operational awards.



TECHNICAL DIRECTOR

DR. BRETT A. SEIDLE, SES

On Oct. 2, 2016, Dr. Brett Seidle was appointed as a member of the Senior Executive Service and named the Division Technical Director at NSWC Crane. As the Division Technical Director, Dr. Seidle is responsible for an organization of approximately 3,4000 civilian employees focused on providing engineering and technical expertise to the nation's Warfighter.

Seidle began his career in the public sector with NSWC Crane in 2000, working intimately with the Strategic Systems Programs. He continued to take ever-increasing roles of responsibility at NSWC Crane and became Deputy Director of the Mission Support Services Department in 2004. In 2007, he was awarded a fellowship from NSWC Crane to pursue his PhD in Public Policy at Indiana University, which he completed in 2010. From 2010 to 2016, Seidle assumed various senior leadership roles in the Applied Science Department and Mission Support Services Department, responsible for a variety of business operations and support functions that support NSWC Crane Command.

In 2013, Dr. Seidle was selected as NSWC Crane Division's Deputy Technical Director, providing technical leadership and supervision for the entire organization regarding strategy and technical relevance.



DEPUTY TECHNICAL DIRECTOR

MS. JANNA FOXX, SSTM



DEPARTMENT DIRECTOR

GLOBAL DETERRENCE & DEFENSE
MR. BEN HARKNESS, SSTM



DEPARTMENT DIRECTOR

SPECTRUM WARFARE SYSTEMS
MR. ZAHID DIN, SSTM



DEPARTMENT DIRECTOR

SPECIAL WARFARE & EXPEDITIONARY SYSTEMS
MS. PATRICIA HERNDON, SSTM



DEPARTMENT DIRECTOR

CORPORATE OPERATIONS
DR. ANGIE LEWIS



DIRECTOR OF ENGAGEMENT

DR. KYLE WERNER



COMPTROLLER

MR. ROGER CLARK



CHIEF OF CONTRACTING

MR. KELLY SIFFIN

MISSION

To provide acquisition engineering, in-service engineering, and technical support for SENSORS, ELECTRONICS, ELECTRONIC WARFARE, and SPECIAL WARFARE WEAPONS. Apply component and system-level product and industrial engineering to surface sensors, strategic systems, special warfare devices, and electronic warfare/information operations systems. Execute other responsibilities as assigned by the Commander, Naval Surface Warfare Center.

VISION

Combating our nation's greatest threats, NSWC Crane is the indispensable mission expert, leveraging our deep technical heritage to deliver solutions through innovation and strategic partnerships.

VALUES

- HONESTY & INTEGRITY
- SOLUTIONS & EMPOWERMENT
- SERVICE & UNITY

"The work here at Naval Surface Warfare Center Crane is vital to our national security. Simply put, the amazing people here at Crane keep our nation safe with their work in strategic missions, expeditionary and electronic warfare, and through their efforts in rapid innovation and prototyping. They keep us ahead of our competitors by learning fast and keeping our Fleet ready."



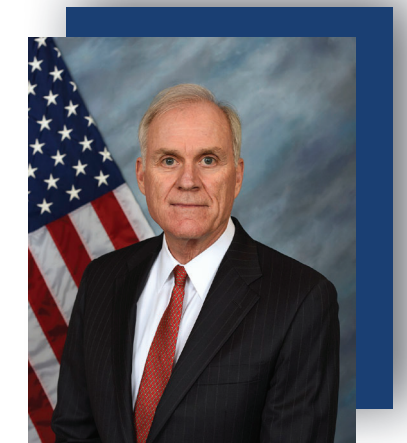
ADMIRAL JOHN RICHARDSON
CHIEF OF NAVAL OPERATIONS
MEMBER, JOINT CHIEFS OF STAFF



VICE ADMIRAL THOMAS MOORE
COMMANDER, NAVAL SEA
SYSTEMS COMMAND

"NAVSEA is doing amazing things out there. What you do at Crane each and every day is critical. You're doing eye-watering stuff, and you've got great leadership."

"It is truly great to be here and see the work you are producing. You are harnessing technology and finding innovative solutions to help Warfighters across our Navy-Marine Corp enterprise. You're making our Navy stronger, and you are helping us increase our capabilities across all domains, which is exactly what our nation needs."



THE HONORABLE RICHARD V. SPENCER
SECRETARY OF THE NAVY



EDUCATION

102 PHDS
616 MASTERS
1595 BACHELORS

STEM OUTREACH

6,000 STUDENTS SERVED
104 TEACHERS
30 SCHOOLS



GROWTH

3,400+ EMPLOYEES
353 NEW HIRES



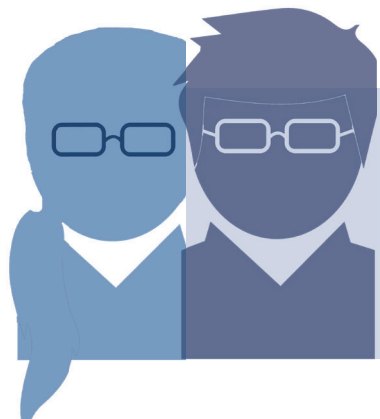
TECHNOLOGY TRANSFER

68 COOPERATIVE RESEARCH & DEVELOPMENT AGREEMENTS
69 EDUCATIONAL PARTNERSHIP AGREEMENTS
24 WORK WITH PRIVATE PARTIES
22 PATENT LICENSE AGREEMENTS



WORKFORCE

73 PERCENT SCIENTISTS,
ENGINEERS, OR TECHNICIANS



INDIANA ECONOMIC IMPACT

\$ 278.7M IN CONTRACTS
\$ 391.5M TOTAL SALARIES



INNOVATION

347 PATENTS
550+ PIECES OF
INTELLECTUAL PROPERTY
15 PARTNERSHIP INTERMEDIARY AGREEMENTS



NATIONAL IMPACT

91 EMPLOYEES
\$ 1.11B IN CONTRACTS
\$7.1M TOTAL SALARIES

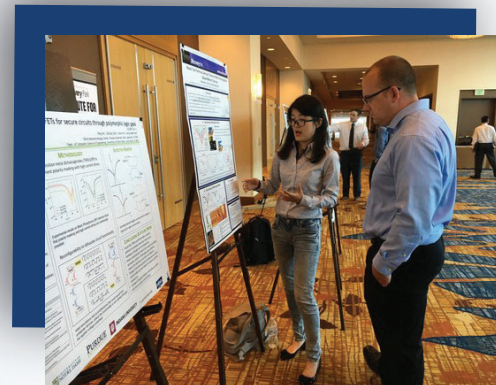


STRATEGIC MISSIONS

NSWC Crane Strategic Missions Center delivers technical solutions to detect threats, provide a layered, integrated missile defense, and offer global strike capability. Strategic Missions professionals work to develop, deploy, and sustain the technologies to ensure that weapons systems are fully reliable and always available to the warfighter.

**DETER
DEFEND
DEFEAT**

NSWC CRANE HOSTS FOURTH ANNUAL MICROELECTRONICS INTEGRITY MEETING



NSWC Crane hosted its fourth annual Microelectronics Integrity Meeting (MIM) at the JW Marriott in downtown Indianapolis Aug. 7-8. Nearly 400 professionals attended this year's event. Registrants included Department of Defense employees and contractors, as well as academia and industry professionals.

"Trust: The Future is Now" was the conference theme, with speakers and panels focusing on the impact that microelectronics have on our lives and as the foundation of United States Defense and Intelligence systems.

"Two real issues we're facing in microelectronics are, one, infiltration of counterfeit electronics that are entering the Department of Defense supply chain, and how do we deal with that?" said Brian Stuffle, Flight Systems Division Manager at NSWC Crane. "Two, what are our national strategies related to ensuring that advanced microelectronics technologies are readily available to our warfighters when they are needed?"

Given the current United States administration's prioritization of modernizing military technology and capabilities, the MIM conference is at the forefront of a growing audience aware of and interested in microelectronics.

NSWC CRANE EMPLOYEE WINS SAMUEL J. HEYMAN SERVICE TO AMERICA MEDALS PEOPLE'S CHOICE AWARD

Dr. Alison Smith, Chief Engineer of Materials Analysis for Microelectronic Component Technologies at NSWC Crane, was awarded the Samuel J. Heyman Service to America Medals (also known as "the Sammies") People's Choice Award on July 19.

The Sammies, known as the "Oscars" of government service, are a highly respected honor with a vigorous selection process. Since the Sammies were first awarded in 2002, there have been a total of 457 finalists – only 12 of whom came from the Department of the Navy. Dr. Smith becomes the first-ever winner of the Sammies People's Choice Award from the entire Department of Defense (DoD).



"I'm so excited and beside myself with appreciation from all of the support," said Smith. "None of this would have been possible without my NSWC Crane work family, my larger NAVSEA family, all of my alumni associations, and of course my family and friends."

Smith's work is about designing nanomaterials that have properties for a specific application. Materials exhibit different properties on the nanoscale than they do in bulk. Scientists, like Smith, can exploit those properties by projecting them into device scale constituents without influencing the host material. The new properties can open doors to entirely new applications.



DONNELLY, YOUNG, HOLLINGSWORTH TOUR CRANE WITH GEN. DAVID GOLDFEIN, AIR FORCE CHIEF OF STAFF

U.S. Senators Joe Donnelly and Todd Young, and Congressman Trey Hollingsworth (IN-09) hosted General David Goldfein, Chief of Staff of the Air Force, at Naval Support Activity Crane in Crane, Indiana. General Goldfein is the highest ranking officer in the Air Force and is a member of the Joint Chiefs of Staff.

During the visit to Crane, Donnelly, Young, Hollingsworth, and Goldfein, accompanied by NSWC Crane Commanding Officer CAPT Mark Oesterreich and Technical Director Dr. Brett Seidle, toured

several labs on base and heard from both uniformed and civilian personnel whose work helps keep Americans safe and ensures our service members maintain a technological advantage over potential adversaries. They also discussed Crane's growing support to the Air Force and potential avenues for an increased Air Force presence at Crane.

NSWC CRANE BUILDS PARTNERSHIP WITH PURDUE UNIVERSITY THROUGH TECHNOLOGY TRANSFER MECHANISMS

In January, NSWC Crane and Purdue signed a cooperative research and development agreement (CRADA) with the purpose to better understand the characterization of polymer properties through ambient sampling and mass spectrometry techniques.

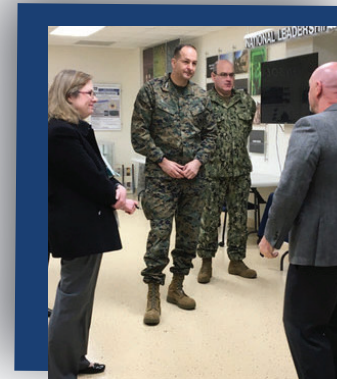
NSWC Crane and Purdue Research Foundation entered a CRADA in April aimed at connecting the Crane's unique, leading-edge technical skills and technology with private Indiana companies. This CRADA fosters collaboration of strategically aligned mission needs with a national research institute that rapidly addresses technology advancements that support the warfighter.



NSWC CRANE HOSTS BLACK HISTORY MONTH LUNCHEON

On Feb. 7, NSWC Crane – in conjunction with the Crane Chapter of Blacks In Government (BIG) and the Hoosier Hills Chapter of Federally Employed Women (FEW) – hosted a luncheon and panel discussion to celebrate Black History Month.

The panel consisted of two Senior Executive Service (SES) members: Donjette Gilmore, Acting Auditor General for the Department of the Navy; and Special Agent Mark Russ, Executive Assistant Directory, National Security Directorate of the Naval Criminal Investigative Service (NCIS).



SENIOR MARINE CORPS LEADER VISITS NSWC CRANE

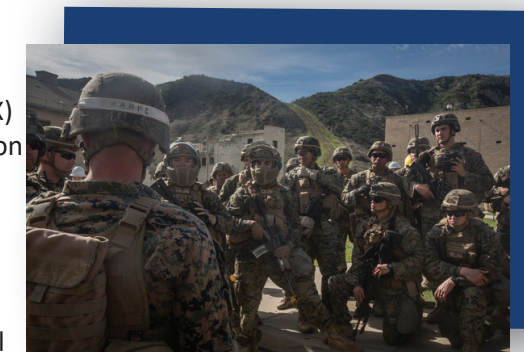
On March 13, Lt. Gen. Daniel O'Donohue, the Marine Corps' Deputy Commandant for Information, and his team visited NSWC Crane to learn more about Crane's work in areas such as cybersecurity, expeditionary warfare, and electronic warfare.

Lt. Gen. O'Donohue's visit came on the heels of Marine Corps Commandant Gen. Robert Neller's trip to Crane last October. Following his visit to NSWC Crane – the first time a Marine Corps Commandant had ever visited Crane – Gen. Neller encouraged Lt. Gen. O'Donohue to make a trip of his own as soon as possible.

NSWC CRANE COLLABORATES WITH MARINE CORPS AT ADVANCED NAVAL TECHNOLOGY EXERCISE

NSWC Crane participated in the Advanced Naval Technology Exercise (ANTX) – 2018 Urban 5th Generation Marine (U5G) Exploration and Experimentation Exercise from March 22-25 at Camp Pendleton in San Diego, California.

The goal of events like U5G ANTX is to reinvigorate warfighter capability in contested urban environments by detecting and identifying capability shortfalls and then rapidly exploiting those gaps with fire and maneuver. U5G demonstrations and exercises will accelerate operational and technical feasibility assessment and inform future investments. The five areas of focus were: Situational Awareness, Counter-Reconnaissance, Fires and Effects, Command and Control (C2), and Maneuver.



CHIEF OF NAVAL RESEARCH VISITS NSWC CRANE FOR FIRST TIME IN CRANE'S HISTORY

The Chief of Naval Research, Rear Adm. David Hahn, visited NSWC Crane on March 6 to learn more about Crane's capabilities in Strategic Missions, Expeditionary Warfare and Electronic Warfare. This was the first time the head of the Office of Naval Research (ONR) has ever made a trip to Crane.

During the visit, NSWC Crane experts highlighted Crane's existing collaboration with the ONR as well as its work in areas such as machine learning, artificial intelligence, and technology transfer. Many NSWC Crane employees also had the opportunity to hear directly from Rear Adm. Hahn about how their work can be applied to critical Navy capability gaps.

NSWC CRANE RECOGNIZED NATIONALLY FOR INNOVATIVE WORKFORCE DEVELOPMENT PROGRAM

The NSWC Crane Crane Division University (CDU) Team was nationally recognized for its innovative approach to workforce development. The CDU Team was selected from across Naval Sea Systems Command (NAVSEA) Warfare Center Divisions for the 2018 Phil Heiler Award. The CDU Team's approach to workforce education is unique in that the program taps into internal NSWC Crane subject matter experts (SMEs) to develop and facilitate tailored technical, business, and leadership courses.

In addition to the impact these efforts have had on employees, they are receiving a high-level of interest from other Navy commands and organizations across the country such as Puget Sound Naval Shipyard, NAVSEA Southwest Regional Maintenance Center, and Naval Air Systems Command (NAVAIR) Putuxent River, U.S. Citizenship and Immigration Services, and NAVSEA SEA05.

EXPEDITIONARY WARFARE

Focused on agility, maneuverability, individual weapons, munitions, and technical training, Crane's Expeditionary Warfare Center equips the most elite warriors for the combat environment. With more than 1 million square feet of offices and laboratories, Crane provides a distinct advantage in sensors and communications, mobility and special munitions, and weapons.

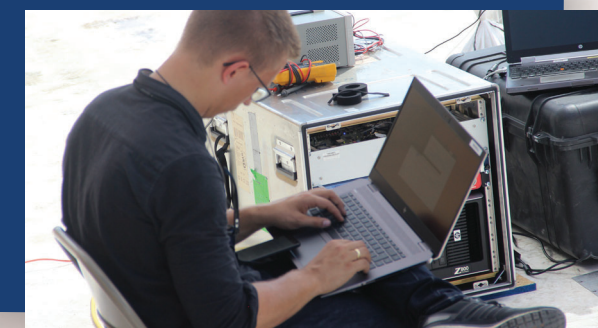
RAPID RESPONSE PROVEN SOLUTIONS



NSWC CRANE MANAGED 2018 BLACK DART EVENT

Black Dart is the largest two week live-fly, live-fire Counter Unmanned Aerial System (C-UAS) Joint testing and demonstration effort headed by the Joint Integrated Air and Missile Defense Organization (JIAMDO, J8) each year.

The NSWC Crane Leadership Team, consisting of diverse personnel across departments and areas of expertise, organized and managed the Black Dart 2018 Test/Tech Demonstration from Sept. 8-12.



NSWC CRANE LED WARFIGHTER DRIVEN CHALLENGE EVENT

NSWC Crane led a Warfighter Driven Challenge event to design and prototype new capabilities for the Marines on 16-20 July at the Rapid Innovation Prototyping Laboratory (RIPL) at NSWC Crane. Technical subject matter experts teamed up with Marines from the Marine Corps Warfighting Laboratory (MCWL) to develop rapid prototype solutions focused on improving ergonomics, urban situational awareness and urban breaching for expeditionary missions. The week-long event resulted in several invention disclosures.

NSWC Crane's Warfighter Driven Challenge is an innovation process that moves the responsibility for success from the management layer to the science, engineering, and technical subject matter experts, empowering the workforce to have direct interactions with, and the ability to work alongside, Warfighters during the process of solving relevant operational challenges.





NEARLY 200 SMALL BUSINESSES PARTICIPATE IN NSWC CRANE'S 21ST ANNUAL BUY INDIANA

The Linton Chamber of Commerce hosted NSWC Crane's 21st annual Buy Indiana Expo at French Lick Resort and Casino on April 10. The event offered companies opportunities to expand their business with government centers, as well as networking with other companies from around the state and country.

Nearly 200 companies from 14 states participated in this year's expo, where NSWC Crane representatives held breakout sessions/workshops to educate vendors on conducting business with the federal government and connected interested parties with key NSWC Crane contacts.

NSWC CRANE EMPLOYEES MENTOR FIRST-EVER CHAMPIONS OF THE 'JIM GRANDORF FIELD CONSULTING PROJECT AWARD'

Two NSWC Crane employees, Keith DeVries and Justin McRoberts — as part of the Office of Secretary of Defense (OSD) Defense-wide Manufacturing Science & Technology (DMS&T) team—mentored a team from Indiana University (IU) that was named the first-ever champions of the Jim Grandorf Field Consulting Project Award.

The Crane/IU Team was recognized at the Indiana University Jim Grandorf Field Consulting Project Awards Dinner at the Bloomington Convention Center in Bloomington, Indiana. There was a total of nineteen project teams of second-year Master's Degree students that partnered in teams of four with local businesses, government agencies, and non-profits. The Awards dinner marked the culmination of a semester's effort by the students to provide consultative solutions and provide relevant experience in meeting customer requirements and solving active business challenges.



NSWC CRANE AND WRIGHT BROTHERS INSTITUTE SIGN NEW PARTNERSHIP INTERMEDIARY AGREEMENT

NSWC Crane and Wright Brothers Institute (WBI) signed a new Partnership Intermediary Agreement (PIA) April 24 at WBI's office in Dayton, Ohio following tours of all three WBI facilities. The signing was part of a day-and-a-half event to solidify a collaborative framework that will allow the two organizations to provide maximum return on commercialization investments for both the Air Force and the Navy.

The agreement will focus on aligning complementary technologies, sourcing commercial markets, connecting technical experts, and engaging manufacturers to further commercialization efforts for all parties. Joint technology showcases, produced in both cities, will help form new collaborations and awareness for technologists, as well as investors.

NSWC CRANE'S NEW BLUE WATER ARMORERS COURSE CUTS COSTS AND INCREASES FLEET READINESS

This new, week-long intensive course provides hands-on technical instruction on maintenance and repair of Navy small arms. Previously, when a fleet weapon broke or experienced a malfunction it was shipped away for repair or replacement. The Blue Water Armorers course aims to equip Sailors and civilian armorers with the skills necessary to maintain and repair their own weapons. These skills will allow small arms to remain in circulation longer, and in turn, will lower overall maintenance costs and increase the fleet's institutional knowledge of small arms.



USE OF CRADA WITH INDIANA UNIVERSITY EXPANDS RESEARCH ON INTERCONVERSION OF MOLECULAR CONFORMER SWITCHES



Utilizing a limited purpose CRADA, Dr. Jonathan Dilger, NSWC Crane's Director of Research, collaborated with Indiana University to expand on the basic research to understand the barriers for interconversion of molecular conformer switches for future sensor applications. These gas-phase techniques can also carefully measure the energetic threshold for decomposition of any molecular ion, including those used as energetic materials. An outcome of this particular partnership was a paper published within the Chemical Communications Journal. This paper discussed the IR melting of proteins within an electrospray nanodroplet, where unfolding transitions are observed as the molecule changes shape prior to droplet desolvation.

NSWC CRANE ANNOUNCES EXPEDITIONARY WARFARE SYSTEMS ENGINEERING MASTER'S DEGREE PROGRAM

NSWC Crane formally announced its Expeditionary Warfare Systems Engineering Master's Degree program at a reception on May 17. NSWC Crane's Special Warfare and Expeditionary Systems Department (SWESD) partnered with Cranfield University of the United Kingdom to host the official unveiling ceremony for the new program.

Leveraging Naval Innovative Science and Engineering (NISE) funds, Crane has worked with Cranfield University to establish an advanced technical degree that will serve the many technologies supported by SWESD and prevalent on today's battlefield. The program will include course modules on electro-optics, weapon systems design, ballistics, ground mobility platforms, communications, electronic warfare, modeling and simulation, and military autonomous vehicles.



USI, NSWC CRANE SIGN AGREEMENT TO CONDUCT RESEARCH ON CHEMICAL REACTIONS

NSWC Crane and the University of Southern Indiana (USI) are strengthening their research and development (R&D) partnership through a Cooperative Research and Development Agreement (CRADA). NSWC Crane and USI will use the CRADA to study chemical reactions. A formal CRADA signing ceremony took place Oct. 22 at Crane. The CRADA between NSWC Crane and USI allows both entities to leverage each other's subject matter experts, laboratory space, and high-tech equipment.

ELECTRONIC WARFARE

As the largest multi-service facility within the Department of Defense for Electronic Warfare (EW), EW sensors and electronics, NSWC Crane's EW Center is critical to the success of many military operations and is designated as the Naval Sea Systems Command Center of Excellence for Electronic Warfare.

**CONTROL THE SPECTRUM
CONTROL THE FIGHT**

NSWC CRANE HOSTS NATIONAL LEADERS FOR 10TH ANNUAL AOC CONFERENCE

NSWC Crane co-hosted the 10th annual Electronic Warfare (EW) Capability Gaps and Enabling Technologies Conference with the Association of Old Crows (AOC) from May 8-10. The goal of this year's event was to provide an interactive forum for EW professionals from the military, government, industry and academic fields to discuss technologies and capabilities related to the requirements of EW programs, platforms and operations within the Electromagnetic Spectrum (EMS).

This three-day event – which featured a number of national leaders – focused on identified fleet gaps and technologies the services require to ensure EW maintains freedom of maneuver through the EMS. Speakers and presenters challenged the attendees with insights into Warfighter needs in the face of advanced threats in the battlespace. NSWC Crane continues to employ the Navy's largest concentration of EW experts and facilities, a big reason why Crane is recognized as a national leader in EW.



"This annual conference provides a tremendous value to our scientists and engineers," said Clint Seyer, NSWC Crane's Chief Strategist for EW and the AOC Conference Chairman. "The discussions within this conference will reiterate and highlight EW gaps and needs while also providing a forum for military, civilians, and industry to talk about exciting technologies and solutions to those gaps at a classified level."

With the DoD's largest concentration of Multi-Spectrum, Multi-Domain (air, land, sea) EW Expertise, NSWC Crane is leading the Navy in electromagnetic capability development. Spanning all branches of the military, NSWC Crane has the largest concentration of technical EW expertise, facilities, and equipment.

NSWC CRANE EMPLOYEE RECOGNIZED ACROSS NAVY FOR BUILDING EFFECTIVE TEAMS

An NSWC Crane EW employee was recognized with a U.S. Navy award for building effective teams. Dr. Julie Shaff won the Art Diaz Memorial Award for Naval Acquisition Development Program (NADP) Entry Level Employees at a ceremony on October 16 in Washington, D.C.

The Art Diaz Award is designed to honor an individual who best exemplifies the spirit, collaboration, and teamwork that Arturo "Art" Diaz lived by throughout his career. Diaz created a list of an effective team's characteristics as a daily reminder of what it takes to succeed. This list, "22 Attributes of a Good Team," quickly spread across Naval Sea Systems Command (NAVSEA) as a benchmark for success.



NSWC CRANE HOSTS NAVAL INNOVATIVE SCIENCE AND ENGINEERING PROGRAM PANEL

NSWC Crane hosted a Naval Innovative Science and Engineering (NISE) program panel to select upcoming research, technology transition, and workforce development programs for 2019.

The Duncan Hunter National Defense Authorization Act, provides research grants to Navy-wide laboratories, NSWC Crane receiving \$14 million annually. This year, 142 proposals were submitted and 47 finalists were selected to present and answer questions on their project at the panel. Each project is judged by a panel of ten leaders based on key factors such as alignment with Navy and base goals, importance, work force impact, and collaboration with existing Crane and Navy divisions and departments.

A few of the programs selected for funding this year include: "Silicon-On-Air Microelectronics Technology," proposed by Dr. Gadlage and Dr. Halstead; "Machine Aided Threat Assessment," proposed by Mark Jenne; and "Upper Spectrum Threat Exploitation and Advanced Countermeasures Development," presented by Tim Bradley.



NSWC CRANE PATHWAYS INTERN DEVELOPS SATELLITE TO LAUNCH ON SPACEX ROCKET FOR NASA RESEARCH



A NSWC Crane Pathways intern, as part of a team of students at the University of Southern Indiana (USI), designed and built a satellite to launch on SpaceX's Falcon 9 rocket from Cape Canaveral Air Force Station in Florida on Dec. 5 as part of an operational cargo delivery flight to the International Space Station (ISS). The satellite will collect data for NASA research until the end of its life-cycle set for January 2020.

UNITE will deploy from ISS one to three months after launching from the SpaceX Falcon 9. It is during this time that UNITE will orbit the Earth for a year collecting data, weather measurements, temperatures, and orbital decay of the spacecraft. The main mission of the satellite is to collect data at the end of its life-cycle in the ionosphere, or during

the final hours the satellite re-enters the Earth's atmosphere just prior to disintegration. A group of USI students have worked on this multi-year, undergraduate Nano Ionospheric Temperature Explorer (UNITE) CubeSat (or nanosatellite) project. A few of the members, including NSWC Crane intern Ryan Loehrlein, have been on the NASA-funded project at USI since its inception over two years ago. Crane employees Bryan Mitchell, Adam Will, and Kegan Miller also worked on

NSWC CRANE SELECTS NEW CHIEF TECHNOLOGY OFFICER

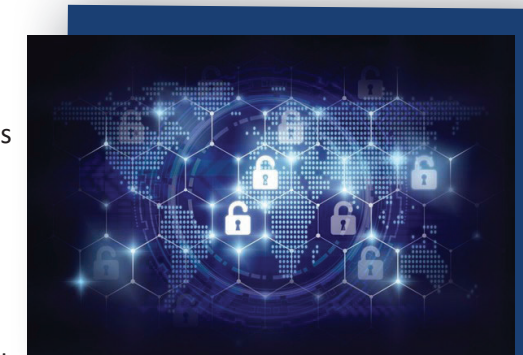
NSWC Crane selected Mr. Rob Walker to serve as the new Chief Technology Officer (CTO). As CTO, Walker is responsible for internal science and technology investments, technology transfer, K-12 and university science, technology, engineering, and math (STEM) outreach programs, PhD Fellowships, and innovation lab pilot programs such as the Crane Artificial Intelligence Development Lab (CrAIDL).



NSWC CRANE IT TEAM NATIONALLY RECOGNIZED FOR ACCOMPLISHMENT IN "FUTURE TRENDS"

A team of information technologists at NSWC Crane received the nationally-recognized Future Trends award for innovative accomplishments in cloud computing at the Government Information Technology Executive Council (GITEC) summit in Annapolis, Maryland.

NSWC Crane's Innovation Network team, which operated under project name "Cumulus," was selected for their ground breaking solution to virtualize traditionally isolated operating systems while implementing micro-segmentation for network security. By securely connecting previously isolated assets to the cloud, this solution provides Warfighters with updated information, increasing their safety and capabilities. The team included Bill Carter, Brandon Callison, Brenda Leighty, Corey Bergsrud, Dan Ireland, Francis Ross, John Vaupel, Norris Reynolds, Ric Litts, Rob Walker, Ryan Johnson, Sean O'Brien, Tim Bliven, and Jim Parsch supervised.



MIT LAUNCHES ACADEMIC STUDY ON NSWC CRANE INNOVATION ECOSYSTEM



Massachusetts Institute for Technology (MIT) will perform an in-depth academic case study of the NSWC Crane Innovation Ecosystem. The Department of Defense (DoD) Laboratories Office within the Office of the Secretary of Defense (OSD) has awarded a competitive contract to MIT to execute this analysis. MIT staff launched this one-year case study Oct. 11 at NSWC Crane.

MIT is a global leader of analysis and study of innovation and entrepreneurial ecosystems. MIT defines innovative ecosystems as an interconnected set of people and resources, including physical environment, that provide the context for innovative-driven enterprises to start, grow and scale. The case study will focus on Crane's growing relationship with external entities and how this community enhances Command's ability to perform its mission. The purpose of this case study is to conduct research that identifies and documents key success factors, lessons learned, best practices, and recommendations to enable innovation that can be shared across the DoD Enterprise.

NSWC CRANE DRIVES ELECTRO-OPTICAL INNOVATION WITH LATEST, HIGH-TECH EQUIPMENT

NSWC Crane accelerated electro-optical innovation by investing in the latest technology for a new, agile lab. This new technology advances the capabilities of NSWC Crane's recently launched Naval Innovative Threat Exploitation and Optical Warfare Laboratory (NITE OWL), ensuring the continued safety of United States service men and women in the field.

This new cutting-edge technology in NITE OWL was funded by the Naval Innovative Science & Engineering (NISE) program. The NISE program provides funding for research and development within Department of Defense laboratories to grow internal technical capabilities of the workforce. The over half-million-dollar investment in NITE OWL cultivates creative Warfighter-driven solutions, maintains the scientific and technical vitality of the Navy and Armed Forces, and facilitates advanced research and development initiatives that support the transition to operational use.



NSWC CRANE T2 TEAM HONORED WITH PRESTIGIOUS DEPARTMENT OF DEFENSE AWARD



NSWC Crane’s Technology Transfer (T2) team won the renowned Department of Defense (DoD) George Linsteadt Technology Transfer Achievement Award. The award celebrates DoD Technology Transfer professionals who have been influential in building and implementing T2 partnerships that transfer technology in or out of the labs, as well as promoting technology commercialization and the licensing of federally developed technology.

NSWC Crane’s T2 team works to leverage the U.S. Navy’s entire suite of partnership capabilities to support the lab’s mission and to interact with academia, commercial entities and state and local governments.

NSWC CRANE OFFERS EXPRESS LICENSING TO BUSINESSES

NSWC Crane now offers express licensing on 59 inventions to businesses in an effort to simplify the patent licensing process, a precursor to the development of technologies into products by industry. This process is made possible by collaboration with TechLink, the Department of Defense’s only national partnership intermediary for technology transfer. NSWC Crane is the first federal laboratory in the Naval Sea Systems Command (NAVSEA) to offer this innovative approach that simplifies and accelerates access for business to patented technology.

NSWC CRANE AND INDIANA INNOVATION INSTITUTE SIGN CRADA WITH PURDUE UNIVERSITY AND INDIANA UNIVERSITY

In June, the Indiana Innovation Institute (IN3) and NSWC Crane joined forces with Purdue University and Indiana University in a CRADA to develop trusted microelectronics that are counterfeit-resistant and immune to a wide variety of attacks. Securing the nation’s semiconductor supply chain has national security implications, and affects many Indiana companies that use microelectronics in their products.

The CRADA allows the four entities to work collaboratively, and ensures open communication of technical requirements, research results, and the sharing of intellectual property among the parties.

“Partnerships like these leverage our state’s strongest assets to help Indiana emerge as a global leader in cutting-edge fields like trusted microelectronics,” stated Gov. Eric Holcomb.

NSWC CRANE AND INDIANA UNIVERSITY’S CENTER FOR APPLIED CYBERSECURITY RESEARCH ADVANCE PARTNERSHIP

NSWC Crane and Indiana University’s Center for Applied Cybersecurity Research (CACR) have re-signed a cooperative research and development agreement (CRADA) on Sept. 13 in a signing event held at Indiana University (IU). The goal is to strive for state of the art technology advancements and grow the collaboration to improve capabilities in the areas of software assurance and trusted artificial intelligence. This CRADA is a follow-on collaboration between NSWC Crane and CACR, which was originally executed two years ago.



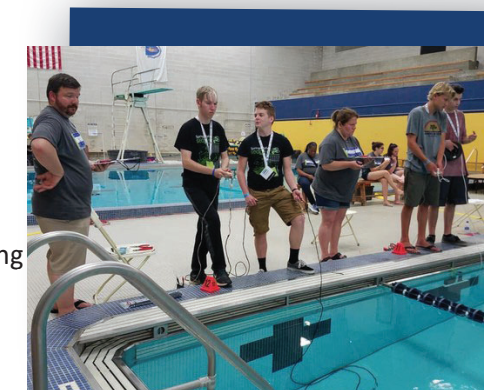
BLOOMFIELD STUDENTS COMPLETE NSWC CRANE-BASED WORKPLACE SIMULATION PROJECTS

On Jan. 26, Bloomfield students had the opportunity to present to teachers, NSWC Crane volunteers, community partners and a special guest, Superintendent of Public Instruction Jennifer McCormick at Bloomfield High School during the final Workplace Simulation Project Day. These presentations served as the culmination of an intense semester-long effort by students. The event was the third of its kind and demonstrated the true value of the program – offering students challenging projects in real-world situations – to provide students, schools and all the partners involved.

INDIANA SCHOOL STUDENTS PARTICIPATE IN INTERNATIONAL SEAPERCH COMPETITION WITH HELP FROM NSWC CRANE MENTORS

Students from Indiana elementary, middle and high schools competed at the International SeaPerch Challenge at the University of Massachusetts in Dartmouth. SeaPerch is a robotics program sponsored by the Office of Naval Research (ONR) that gives students and teachers the resources to build an underwater Remotely Operated Vehicle (ROV).

The program is meant to encourage interest in science, technology, engineering and mathematics (STEM). Students from Springs Valley, Mount Vernon, Bloomfield and Haubstadt Community Schools participated in the event.



LOCAL STUDENTS ENTER RECORD 200 PROJECTS IN 34TH ANNUAL TEAM CRANE SCIENCE FAIR

Students from 11 area school systems entered a record 200 projects to compete for awards and cash prizes in the 34th Annual Team Crane Science Fair held at WestGate Academy Conferencing & Training Center on March 21.

The 200 entries represent an 18 percent increase in participation from 2017, when 165 projects were entered, and an impressive 47 percent increase from 2016, when 106 projects were submitted. Awards were given out in seven Junior Division Categories and seven Senior Division Categories, as well as an overall award for the top Junior and the top Senior projects.

NSWC CRANE STEM PROGRAM HOSTS FIRST VEX IQ CHALLENGE

Naval science, technology, engineering and math (STEM) education program hosted 30 elementary school teams as they competed in a global engineering challenge at WestGate Academy. NSWC Crane Division youth STEM program organizers organized their first VEX IQ Challenge consisting of 30 teams from 16 regional elementary schools. The WestGate Academy VEX IQ engineering challenge is a qualifier for the larger, global tournament consisting of 20,000 teams from more than 40 countries.

INNOVATION EXCELLENCE AWARD PRESENTED TO CRANE EMPLOYEE

Jeff Miller, an electronics technician at NSWC Crane, received a Secretary of the Navy (SECNAV) Innovation Excellence award for his contributions to the Ship to Shore Maneuver Exploration and Experimentation (S2ME2) Advanced Naval Technology Exercise (ANTX). Miller, a 34-year employee of NSWC Crane, was officially recognized during the ANTX - 2018 Urban 5th Generation Marine (U5G) Exploration and Experimentation Exercise that took place from March 22-25 at Camp Pendleton in San Diego, California.

Miller was part of the S2ME2 Task Force, which provided leadership and technical expertise in gathering and showcasing more than 50 Government and industry teams in the first-ever S2ME2 ANTX at Camp Pendleton from April 17-28, 2017. S2ME2 ANTX 2017 was unique because, in less than 7 months, it blended more than 50 systems, 450 scientists and engineers from across the Naval Research and Development Establishment (NRDE), industry, and academia, as well as 200 operators and planners from the Navy and Marine Corps to execute a two-week ANTX. To put those numbers in context, that's three times more – and three times faster – than previous field experimentation events.



NSWC CRANE DIVISION 2018 YEAR IN REVIEW



NSWC CRANE EMPLOYEE SELECTED FOR NAVY-WIDE COMMUNICATIONS AWARD

Lisa Oswald, a Public Affairs Specialist at NSWC Crane, was announced as the 2017 Thompson-Ravitz (T-R) Junior Civilian Public Affairs Specialist of the Year.

The Thompson-Ravitz awards are selected by the Chief of Naval Information and are recognized as premier awards throughout the entire U.S. Navy. The T-R awards recognize the exceptional work in communication program research, planning, execution and evaluation by individuals and communication teams throughout the Navy, and reflect the highest qualities of the communications community. This year's T-R awards featured the largest number of submissions to date.



NSWC CRANE EMPLOYEE AWARDED MEDAL OF VALOR FOR SAVING LIVES IN WAR ZONE

An NSWC Crane employee was awarded one of the highest civilian honors for an act of bravery overseas. William (Bill) Taylor, an AC-130W Weapons Specialist at NSWC Crane, received the Command Civilian Service Medal for Valor and Courage in a combat zone for saving seven lives and extinguishing a fire.

The AC-130W Stinger II is a United States Air Force (USAF) aerial gunship that supports special operations forces in war zones. As a Crane employee, Taylor is currently supporting Combined Joint Task Force - Operation Inherent Resolve (CJTF-OIR). In conjunction with partner forces, CJTF-OIR defeats ISIS in designated areas of Iraq and Syria and sets conditions for follow-on operations to increase regional stability.

Taylor was recognized for his "outstanding performance, professional competence, and ceaseless efforts...in the identification and elimination of a fire inside an AC-130W Stinger II aircraft valued at 193 million dollars.



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