



DEPARTMENT OF THE NAVY
**TECHNOLOGY
TRANSFER**
ANNUAL REPORT

ADVANCING THE MISSION / FISCAL YEAR 2021



Prepared by:
Department of the Navy Technology Transfer
Program Office
Arlington, Virginia
April 2022

“

Innovation is the engine that powers faster technology transfer and accelerates greater naval capabilities.”

WELCOME

Innovation is the engine that powers faster technology transfer and accelerates greater naval capabilities. The Department of the Navy's (DoN) Technology Transfer (T2) Program Office is vital to keeping this engine running at a high tempo. As Chief of Naval Research, I'm proud to collaborate with them to strengthen the innovation ecosystems that fuel the cutting-edge work across the Navy and Marine Corps.



Much of the research, development, testing and evaluation performed at DoN laboratories involve leading-edge technologies in a wide array of technical disciplines. Moreover, the equipment and facilities available for this work are often unique and cannot be replicated in the commercial workplace.

That's where DoN T2 can help. Thanks to a variety of T2-enabled agreements, private industry and academia can engage in mutually beneficial partnerships with naval labs, or license Navy-patented technologies.

Fiscal year 2021 highlights include the execution of 317 Cooperative Research and Development Agreements, 74 Educational Partnership Agreements, and 14 Partnership Intermediary Agreements. In addition, there are 4,292 active patents for technologies developed across the naval laboratory enterprise.

I know you will enjoy reading this annual report and learning about the game-changing initiatives that DoN T2 cultivates, in order to advance disruptive technology and always ensure U.S. warfighters have an unfair advantage in a fight — while lowering entry barriers for our small business and non-traditional partners.

A handwritten signature in black ink, appearing to read "Lorin C. Selby". The signature is stylized and includes a long horizontal stroke at the end.

Rear Admiral Lorin C. Selby
Chief of Naval Research



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NAVAL T2 ENTERPRISE

DoN T2-DESIGNATED LABS AND CENTERS AVAILABLE *for* PARTNERSHIP

WASHINGTON

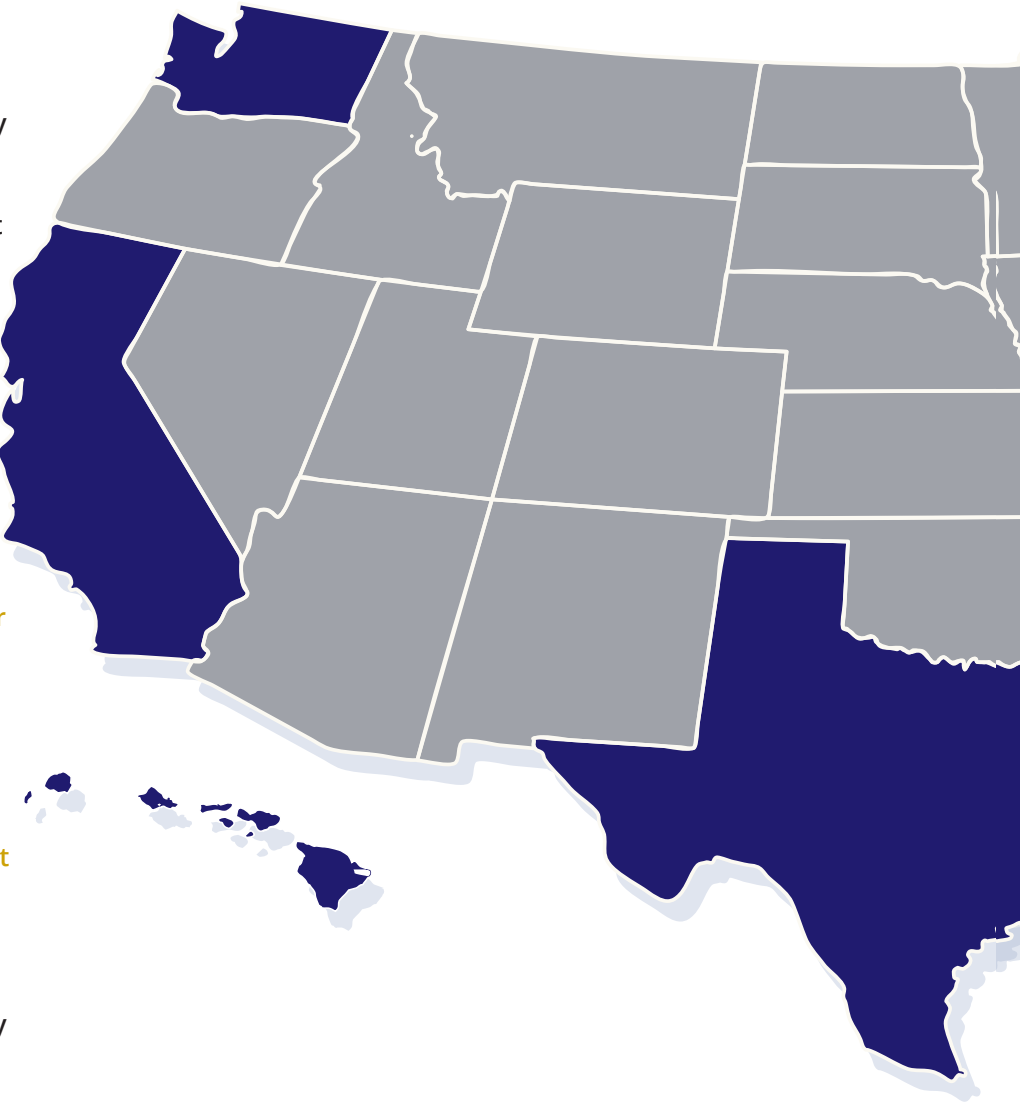
- Naval Undersea Warfare Center
Division Keyport
- Puget Sound Naval Shipyard and
Intermediate Maintenance Facility

CALIFORNIA

- Fleet Readiness Center Southwest
- Marine Corps Tactical Systems
Support Activity
- Naval Air Warfare Center
Weapons Division China Lake
- Naval Air Warfare Center
Weapons Division Point Mugu
- Naval Facilities Engineering and
Expeditionary Warfare Center
- Naval Health Research Center
- Naval Information Warfare Center
Pacific
- Naval Medical Center San Diego
- Naval Postgraduate School
- Naval Surface Warfare Center
Corona Division
- Naval Surface Warfare Center Port
Hueneme Division

HAWAII

- Pearl Harbor Naval Shipyard &
Intermediate Maintenance Facility



Navy ORTA Directory website

<https://www.navytechtransfer.navy.mil/orta-resources/designated-laboratories-and-pocs>

■ = Member of Tech Bridge Network

★ = DON T2 Headquarters

TEXAS

- Naval Medical Research
Unit San Antonio

OHIO

- Naval Medical Research
Unit Dayton

INDIANA

- Naval Surface Warfare
Center Crane Division

MISSISSIPPI

- Naval Meteorology
and Oceanography
Command

MAINE

- Portsmouth Naval Shipyard

MASSACHUSETTS

- Navy Clothing and Textile Research Facility

CONNECTICUT

- Naval Submarine Medical Research Laboratory

RHODE ISLAND

- Naval Undersea Warfare Center Division Newport
- Naval War College

NEW JERSEY

- Naval Air Warfare Center Aircraft Division Lakehurst

PENNSYLVANIA

- Naval Surface Warfare Center Philadelphia Division

MARYLAND

- Naval Air Warfare Center Aircraft Division Patuxent River
- Naval Medical Research Center
- Naval Surface Warfare Center Carderock Division
- Naval Surface Warfare Center Indian Head Division
- U.S. Naval Academy
- U.S. Marine Corps Forces Cyberspace Command

WASHINGTON, DC

- Naval History and Heritage Command
- Naval Research Laboratory
- U.S. Naval Observatory

VIRGINIA

- ★ DoN T2 Program Office (located at the Office of Naval Research)
- Headquarters Marine Corps Deputy Commandant for Information War Room Division
- Marine Corps Cyberspace Operations Group
- Marine Corps Systems Command
- Marine Corps Warfighting Laboratory
- Mid-Atlantic Regional Maintenance Center
- Naval Medical Center Portsmouth
- Naval Surface Warfare Center Dahlgren Division
- Navy Warfare Development Command
- Norfolk Naval Shipyard

NORTH CAROLINA

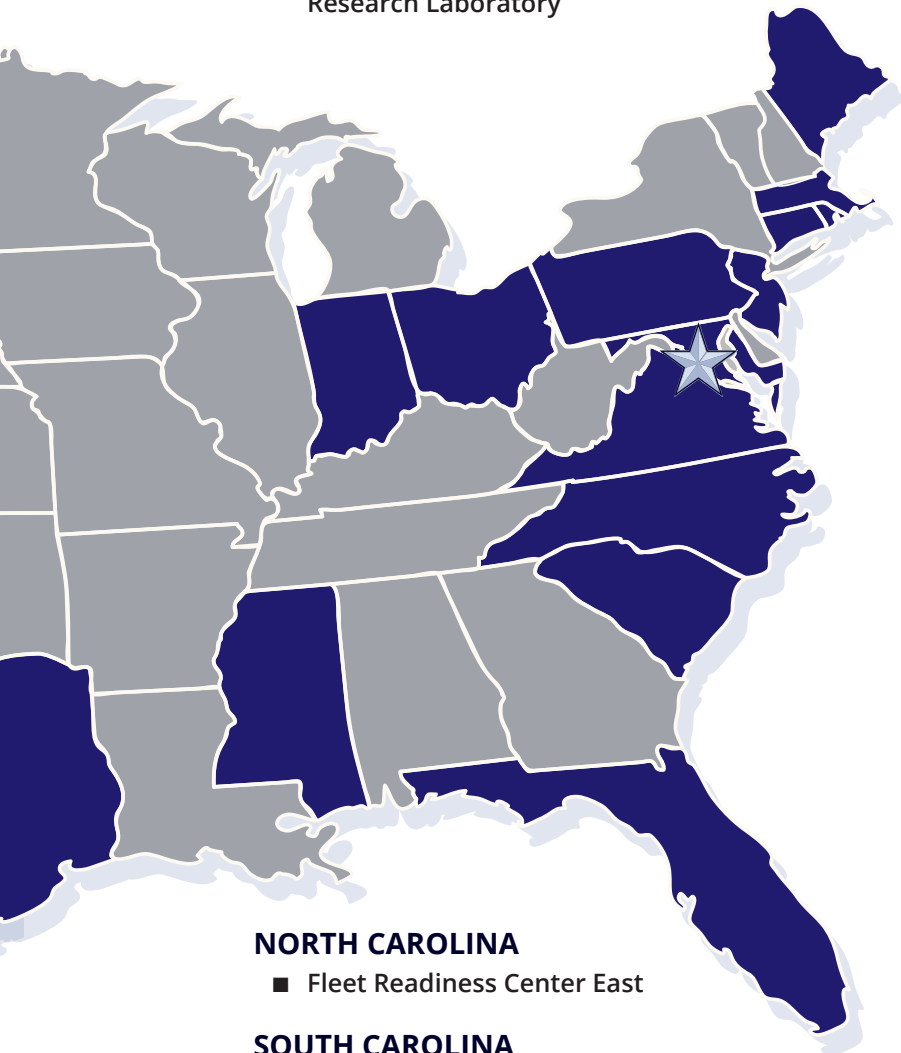
- Fleet Readiness Center East

SOUTH CAROLINA

- Naval Information Warfare Center Atlantic

FLORIDA

- Fleet Readiness Center Southeast
- Naval Air Warfare Center Training Systems Division
- Naval Entomology Center of Excellence
- Naval Surface Warfare Center Panama City Division





ROLES & RESPONSIBILITIES OF THE DoN T2 PROGRAM OFFICE

The secretary of the Navy, through the authorities delegated in the SECNAV Instruction (SECNAVINST) 5700.17A Domestic Technology Transfer, authorizes the DoN T2 Program Office to establish policy and assign responsibility for DoN domestic technology transfer (T2).

Specific roles and responsibilities include:

- Manage and execute DoN T2 based on authorized and delegated authorities.
- Communicate and represent DoN T2 to the chief of naval research, Department of Defense senior leadership and interagency councils as required.
- Encourage participation and promote results of DoN T2.
- Maintain comprehensive record of all DoN T2 agreements.
- Develop and publish a DoN T2 handbook that establishes T2 practices within the DoN.
- Manage laboratory and Office of Research and Technology Applications (ORTA) representative-designation procedures.
- Cultivate collaboration between DoN science and technology communities, industry and academia to promote DoN T2 efforts.



ROLES & RESPONSIBILITIES OF THE ORTA REPRESENTATIVE

The SECNAVINST 5700.17A identifies the following roles and responsibilities for the ORTA representative at all DoN T2-designated laboratories:

- Coordinate, manage and direct all DoN domestic T2 within the laboratory.
- Coordinate with laboratory leadership to provide annual business plans, training presentations/outlines, statistical data and other information as requested by the DoN T2 program manager (PM), or otherwise required by statute, regulation, directive, executive order and instruction.
- Offer at least two hours of T2-related training to laboratory personnel annually.
- Receive at least eight hours of T2-related training annually and submit a summary of the annual training to the DoN T2 PM at the end of each calendar year.
- Encourage participation in, and promote the results of, DoN domestic T2.
- Comply with all policies and procedures to ensure that all T2 agreements have received proper legal, security, foreign ownership, control or influence, and public affairs office reviews.



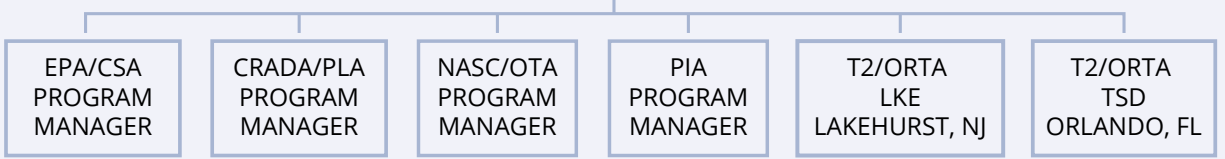
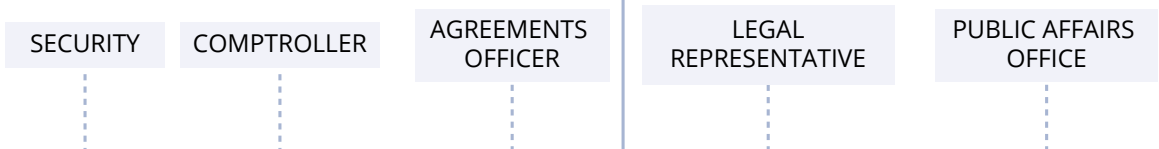
WHAT SUCCESS LOOKS LIKE: **NAWCAD WARRANTED AGREEMENTS OFFICER TEAMS WITH T2 OFFICE**

The Naval Air Warfare Center Aircraft Division (NAWCAD) Patuxent T2 office is the command's ORTA representative. This office is organized under the NAWCAD Chief Technology and Strategic Operations Office (CTSO). The T2 office manages the command's non-Federal Acquisition Regulation (FAR) agreements with a team that includes legal counsel, an agreements officer and security. The non-FAR agreements include Cooperative Research and Development Agreements, Partnership Intermediary Agreements (PIAs), Work for Private Party Agreements, Educational Partnership Agreements, and Other Transaction Authority agreements, including the Naval Aviation Systems Consortium. The office also leads NAWCAD regional PIA partners, Georgia Tech Research Institute and the Patuxent Partnership. The alignment within the CTSO facilitates relationships with the Small Business Innovation Research office, Naval Innovative Science and Engineering program, and science and technology leads. This collaboration promotes partnerships with industry, non-traditional firms and academia to transition new technologies to the warfighter.

NAWCAD T2 Organizational Chart

T2 ECOSYSTEM

- State
- Local Government
- Congress
- Industry
- Academia



WHAT SUCCESS LOOKS LIKE:

NSWC CRANE LEVERAGES DEPARTMENT T2 CHAMPIONS TO EXPAND T2 IN-REACH

The Naval Surface Warfare Center (NSWC), Crane Division T2 office is a model within the DoN T2 community. It performs the T2 functions with excellence and exemplifies how to engage internal and external stakeholders.

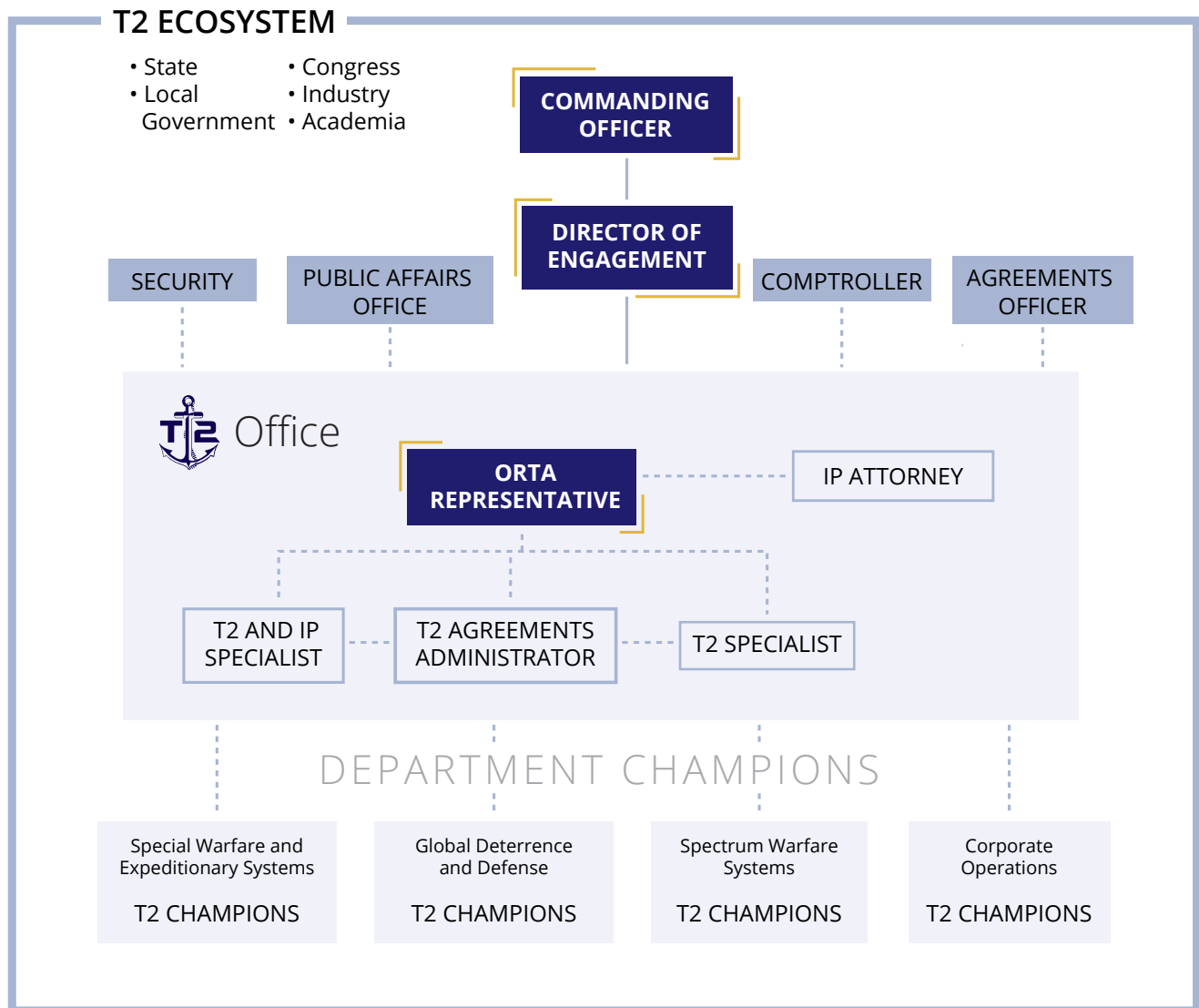
The NSWC Crane T2 office's organization structure (see organization chart on next page) provides the foundation for success. The ORTA representative is the central figure, orchestrating all T2 activities within the command. The agreements manager oversees development and tracking of T2 agreements. A legal representative ensures legal compliance. Since security and public affairs are critical to ensuring T2 agreements are cleared for release, the T2 office coordinates with designated contacts in each of those offices. The T2 Champions are informal in nature — they are not directly associated with the T2 office from an organizational standpoint, nor are they necessarily a set group of individuals. They are a small contingent of individuals who have utilized the T2 program, who are active in sharing their successes with their colleagues and thus help to communicate the value of T2 and encourage others to engage with the program.

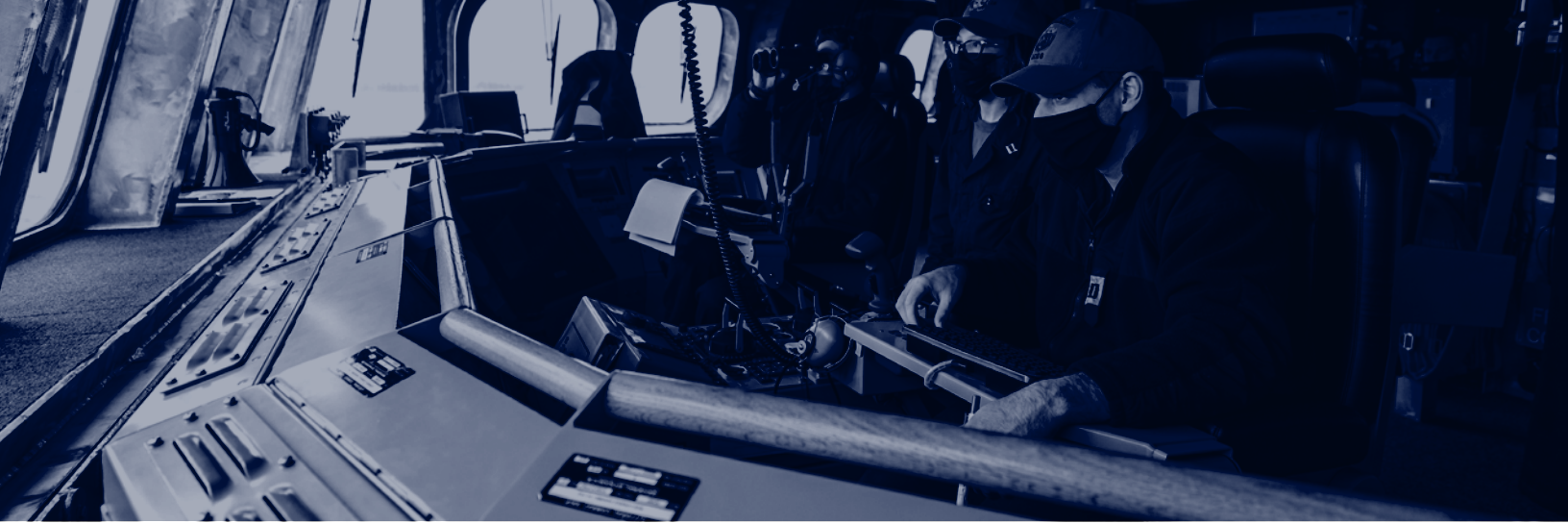
NSWC Crane has established an efficient, effective model for internal outreach. The ORTA representative spends time educating scientists and engineers about the value of T2 mechanisms and how they can be utilized to enhance research and development efforts and expedite the delivery of technical solutions to the warfighter. Such efforts are multiplied by scientists and engineers who have experienced T2 and tell their colleagues about the value of T2 and how to participate. These individuals hold a lot of sway with their colleagues, since they work shoulder to shoulder with them in NSWC's engineering departments and share a common technical background.

NSWC Crane also excels in external outreach. For many years, it has cultivated relationships with regional start-ups, universities (e.g., Purdue University, University of Notre Dame, Indiana University), corporations, small businesses, nonprofits, private-capital organizations and government entities. Since 2019, it has also led the NavalX-supported, Indiana-based Midwest Tech Bridge, which builds on those efforts. Dr. Kyle Werner, director of Engagement at NSWC Crane, is responsible for outside engagement and works closely with NSWC Crane's ORTA representative. In 2019, the Massachusetts Institute of Technology validated the ecosystem that NSWC Crane has helped create and the White House recognized it as a best practice across the federal government.



NSWC Crane T2 Organizational Chart





NAVALX TECH BRIDGES

NavalX serves the Navy and Marine Corps as an innovation and agility cell, supporting and connecting initiatives across the Department of Defense (DoD). It is under the operational guidance of the assistant secretary of the Navy for Research, Development and Acquisition, and receives administrative support from the Office of Naval Research.

Mission:

1. Guide naval stakeholders to rapidly deliver capabilities to the warfighter.
2. Serve as the platform that connects naval needs and challenges with expert solution providers across industry, academia and the DoD.
3. Encourage and foster culture change across the Department of the Navy (DoN) to make the U.S. Navy a more agile, learning and adaptable organization.

Vision:

To inspire and empower the naval workforce, in connection with defense ecosystem partners, to rapidly deliver high-impact capabilities on time, every time.

A component within NavalX is the Tech Bridge network, which connects, reinforces and sustains existing efforts that make the DoN more agile, capable and efficient. The Tech Bridges are a connected network that enhance collaboration among naval labs and warfare centers, industry, academia and other branches of the military.



As of FY2021, there were 14 domestic Tech Bridges active across the country:

- **Capital** in the National Capital Region, affiliated with Naval Surface Warfare Center (NSWC) Carderock Division, NSWC Dahlgren Division, NSWC Indian Head Division, the Naval Research Laboratory and the Marine Corps Warfighting Laboratory.
- **Central Coast** in California, affiliated with the Naval Postgraduate School.
- **Central Florida**, affiliated with Naval Air Warfare Center Training Systems Division.
- **Gulf Coast** in Florida, affiliated with the NSWC Panama City Division, the Naval Research Laboratory Stennis, and the Naval Meteorology and Oceanography Command.
- **Hawaii**, affiliated with Naval Undersea Warfare Center (NUWC), Keyport Detachment Pacific.
- **Inland Empire** in California, affiliated with NSWC Corona Division.
- **Mid-Atlantic** in Virginia, affiliated with commander, 2nd Fleet; Naval Information Warfare Center Atlantic Hampton Roads Detachment; NSWC Dahlgren Division Dam Neck Activity; and NSWC Carderock Division Norfolk Detachment.
- **Midwest** in Indiana, affiliated with NSWC Crane Division.
- **Northeast** in Rhode Island, affiliated with NUWC Division Newport.
- **Northwest** in Washington State, affiliated with NUWC Division Keyport.
- **Palmetto** in South Carolina, affiliated with Naval Information Warfare Center (NIWC) Atlantic.
- **SoCal** in California, affiliated with NIWC Pacific.
- **Southern Maryland**, affiliated with Naval Air Warfare Center Aircraft Division.
- **Ventura** in California, affiliated with Naval Base Ventura County.



COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS (CRADAs)

CRADAs

A Cooperative Research and Development Agreement (CRADA) formalizes a collaboration between a naval laboratory and a non-federal entity that can be from academia, state and local governments, nonprofit organizations, private sector organizations, or individuals to work toward a shared research and development (R&D) effort. The statutory authority for CRADAs is 15 U.S.C. § 3710a.

Any naval laboratory can commit non-monetary contributions such as world-class personnel, services, facilities, equipment, intellectual property or other resources, with or without reimbursement to the R&D effort. The non-federal entity collaborator can provide similar resources as mentioned above, and, additionally, they can contribute funding toward the shared R&D effort.

CRADAs create long-term value and high returns on R&D investments that accelerate technology development toward advancing the mission for Sailors and Marines.

BENEFITS TO THE NAVY AND MARINE CORPS:

- Provide a joint approach to solving specific naval challenges by applying diverse innovative applications.
- Reduce costs, time and risk of R&D to achieve naval mission or naval commercial goals by leveraging external expertise, ideas, investments and resources.
- Add external funding and resources into the naval technology ecosystem to create new products, processes and intellectual property applicable to advancing the naval mission.

USE CASES FOR NON-FEDERAL ENTITIES:

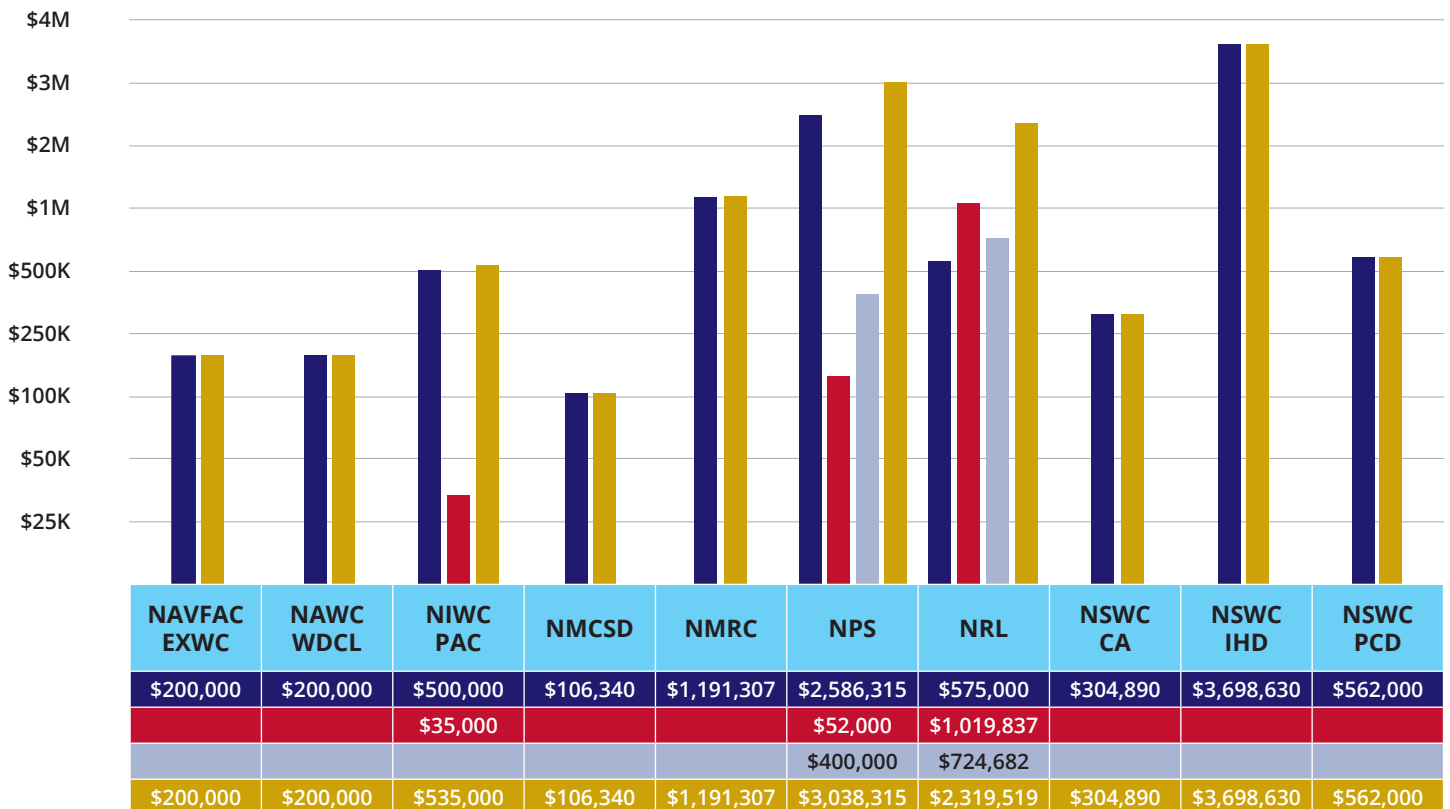
- Access unique world-class facilities, equipment and personnel in a wide range of research fields to advance technologies to the next level.
- Ease of entering arrangements to engage in naval R&D activities.
- Test, characterize and evaluate materials, research tools and products for commercial-use capability in a controlled or simulated environment across all scientific areas.

DoN CRADAs executed in FY2021 are listed in Appendix A.

| DoN CRADA Metrics | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|--------------|--------------|--------------|--------------|--------------|
| EXECUTED CRADAs | 366 | 403 | 388 | 361 | 317 |
| EXECUTED CRADA AMENDMENTS | 123 | 131 | 112 | 142 | 164 |
| ACTIVE CRADAs | 1105 | 1227 | 1271 | 1296 | 1281 |
| INCOME FROM INDUSTRY/NON-FEDERAL FUNDS | \$3,520,230 | \$8,575,441 | \$6,321,778 | \$10,189,496 | \$6,706,683 |
| INCOME FROM SBIR/STTR FUNDS | \$1,193,826 | \$464,300 | \$1,011,454 | \$832,000 | \$676,987 |
| INCOME FROM OTHER GOV'T AGENCY FUNDS | \$666,254 | \$2,666,115 | \$685,313 | \$1,637,039 | \$550,000 |
| INCOME FROM EXECUTED AMENDMENTS | \$5,054,985 | \$5,227,101 | \$5,043,761 | \$1,710,832 | \$4,217,331 |
| TOTAL CRADA INCOME | \$10,435,295 | \$16,932,957 | \$13,062,306 | \$14,369,367 | \$12,151,001 |

FY21 CRADA FUNDING BY SOURCE OF INCOME

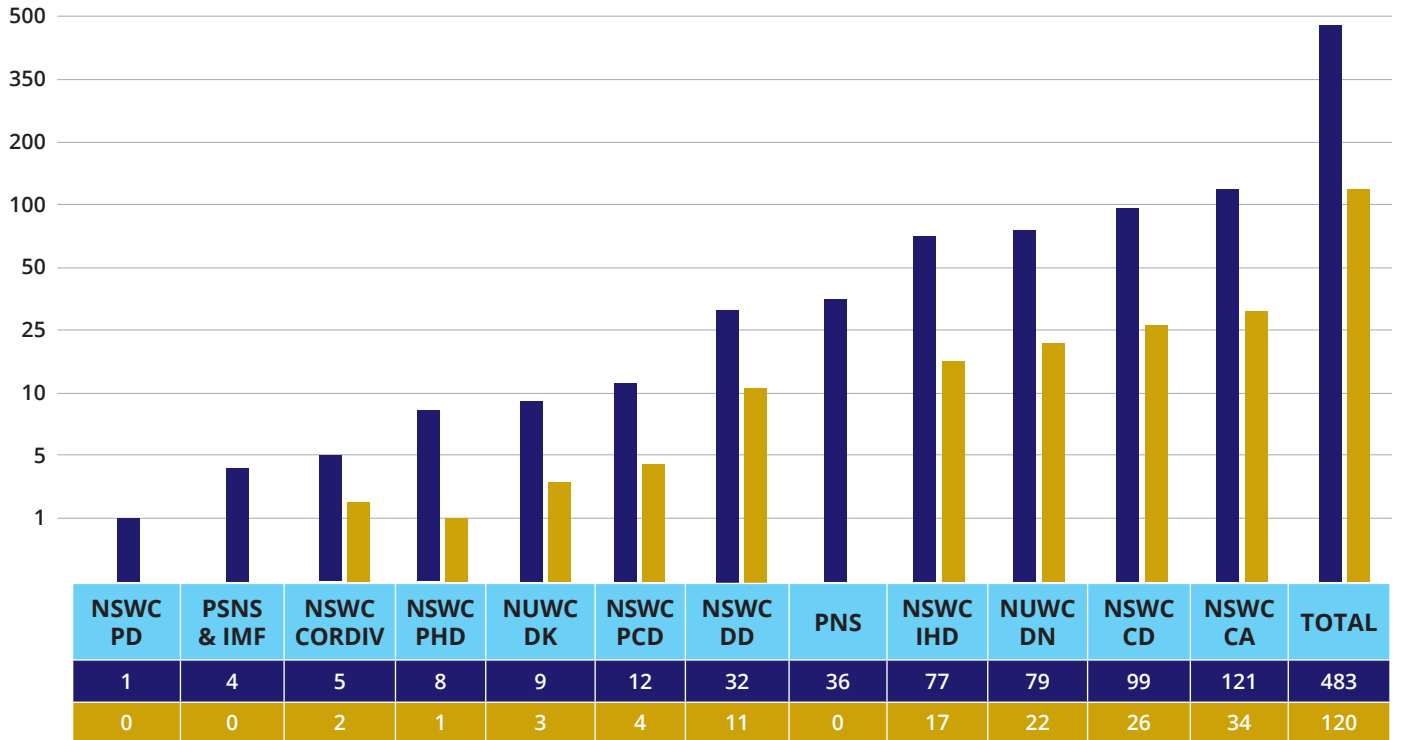
■ Industry/Non-Federal Funding ■ SBIR/STTR ■ Other Gov't Agencies ■ Total Income



Laboratories with income

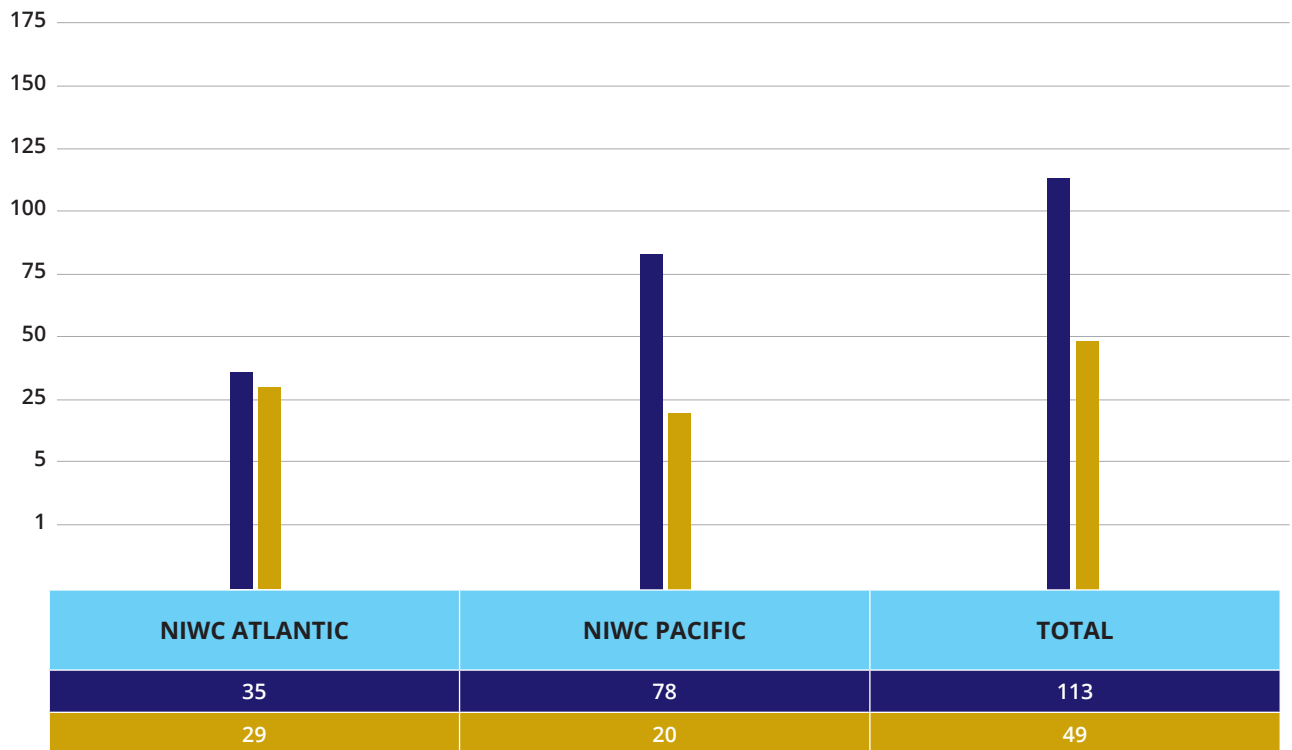
FY21 CRADAs - NAVSEA

■ Active CRADAs (Includes New CRADAs) ■ New CRADAs

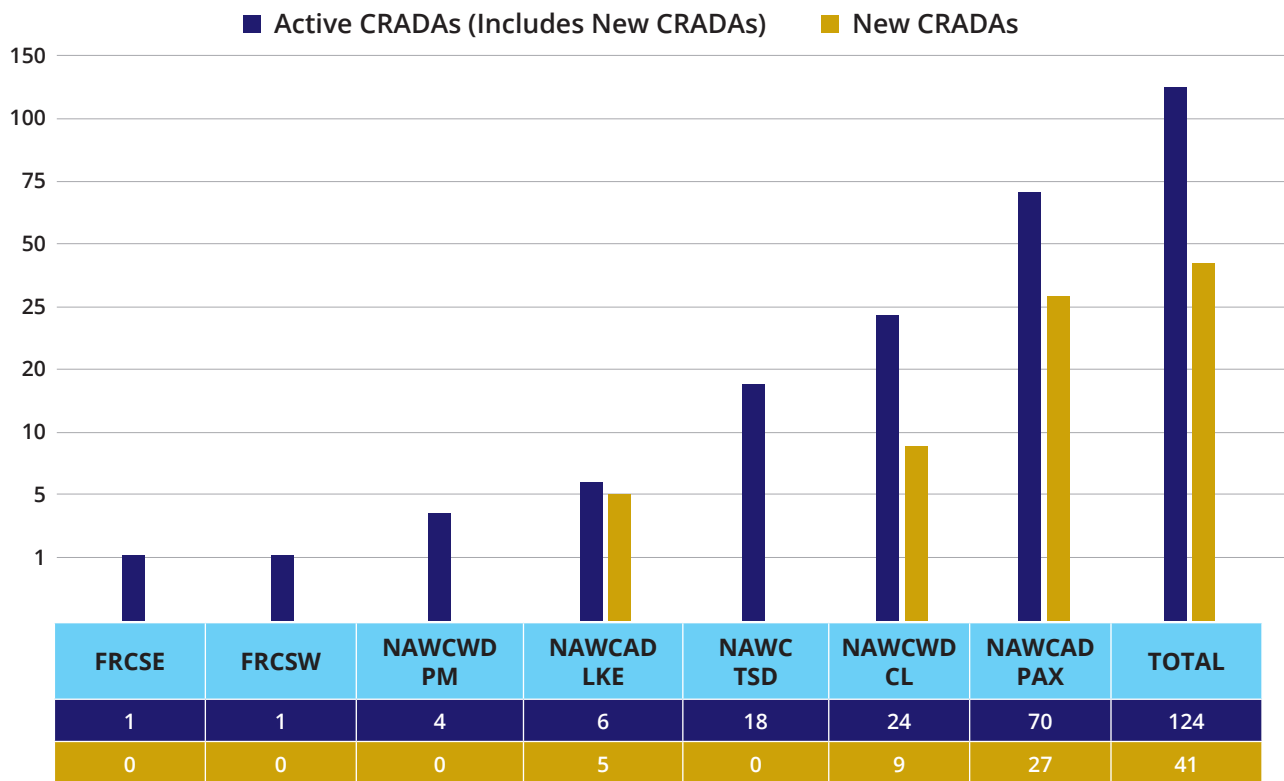


FY21 CRADAs - NAVWAR

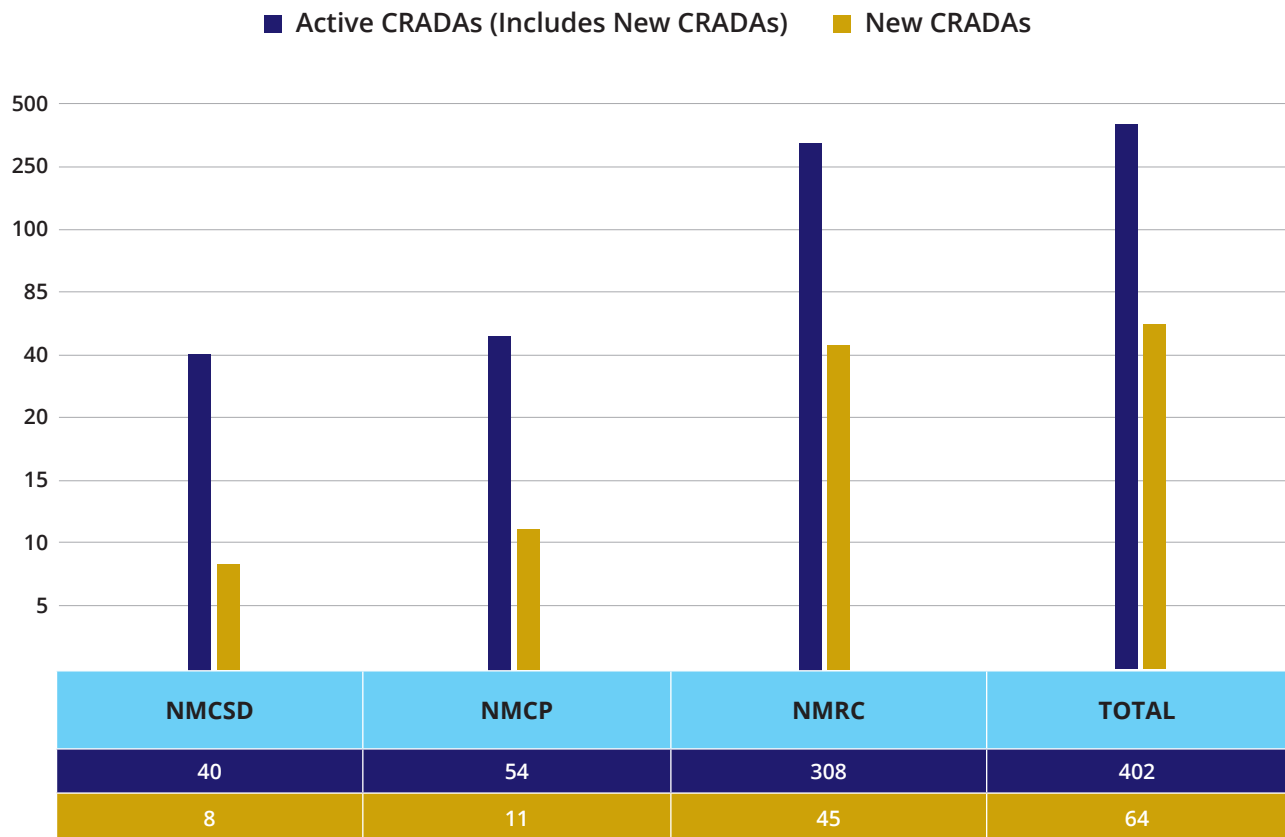
■ Active CRADAs (Includes New CRADAs) ■ New CRADAs



FY21 CRADAs - NAVAIR

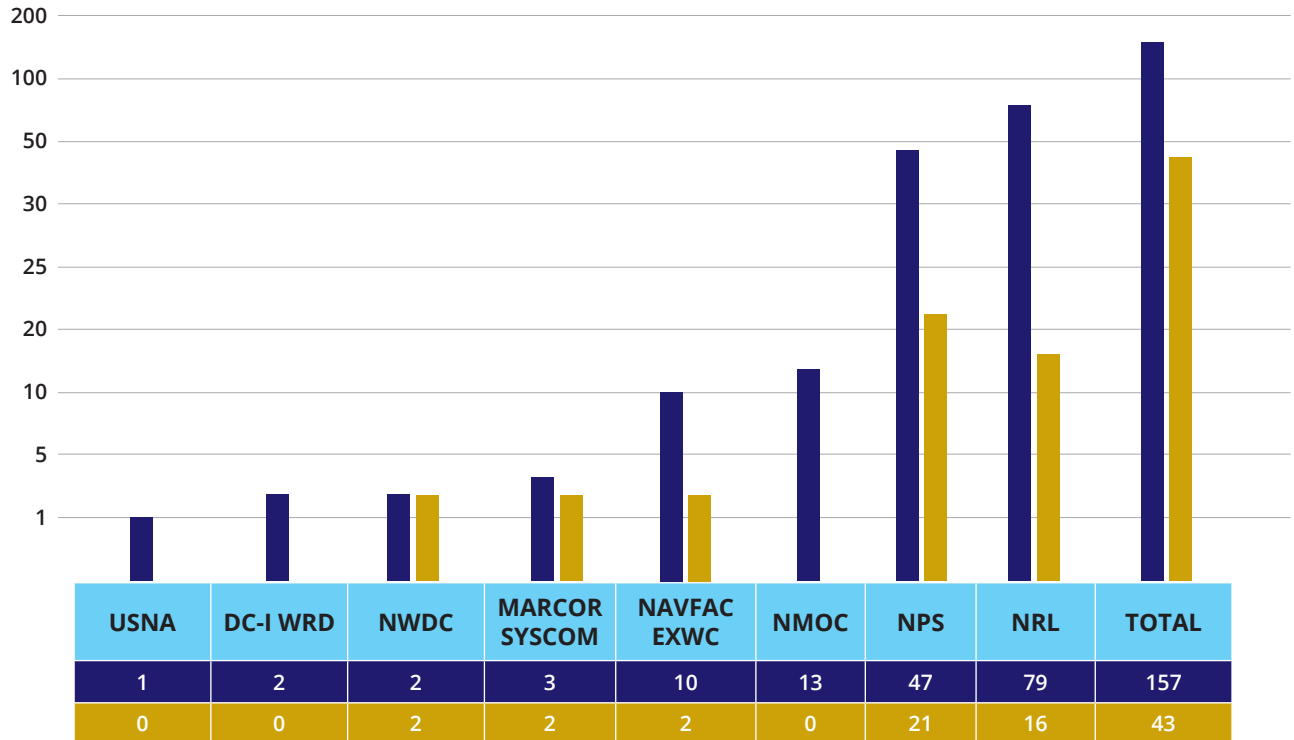


FY21 CRADAs - BUMED

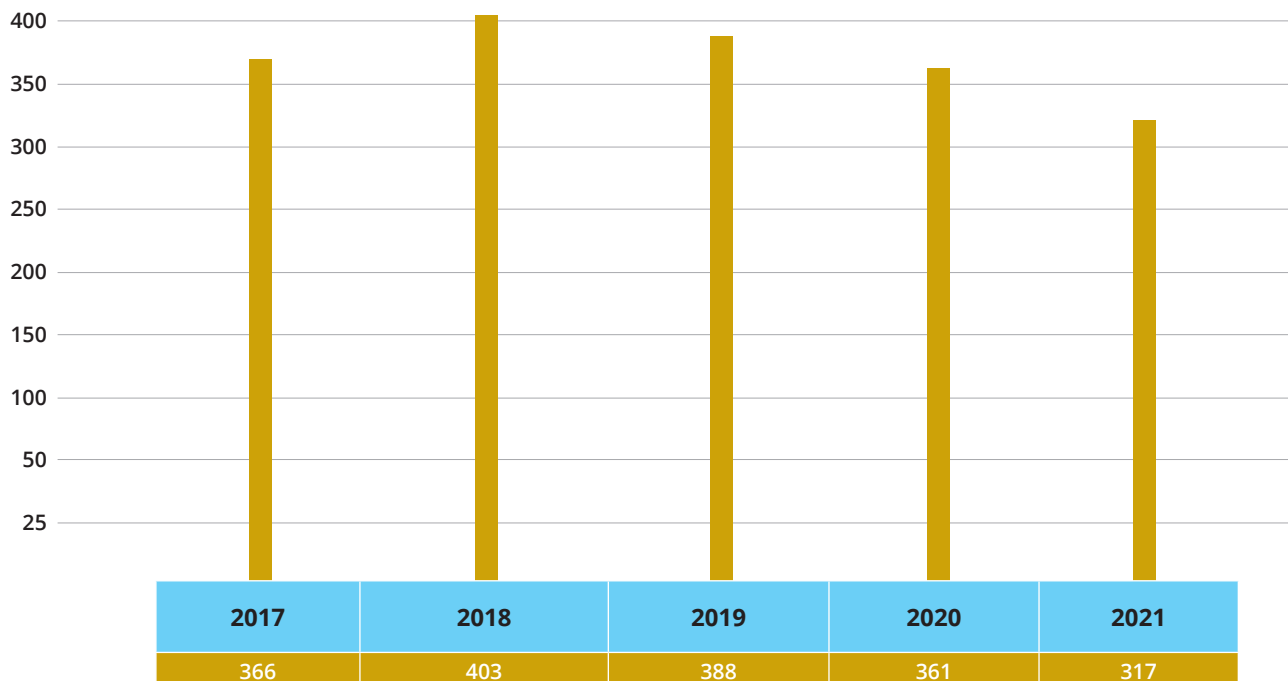


FY21 CRADAs - OTHER LABS

■ Active CRADAs (Includes New CRADAs) ■ New CRADAs



DON EXECUTED CRADAs BY FY



NSWC CARDEROCK, TCG ENTER CRADA TO SHRINK SHIPBOARD WASTE VOLUME

Naval Surface Warfare Center Carderock Division (NSWCCD) entered a Cooperative Research and Development Agreement (CRADA) with the Thermal Compaction Group (TCG). The CRADA will leverage TCG's intellectual property, lessons learned and technical capability with their MASSMELT general waste processor to develop a continuous-feed plastics waste processor (PWP) that meets U.S. Navy shipboard requirements. The processor lessens total waste volume at an improved processing rate, compared to existing solid waste-management systems.

The objective of the CRADA is for NSWCCD to build a next-generation (NextGen) PWP prototype where the engineering drawings and process software are Navy-owned and content-controlled—advancing the state-of-the-art of the MASSMELT technology for potential commercial applications.

NSWCCD and TCG will co-develop initial test plans; share knowledge about the MASSMELT and NextGen PWP; analyze test results and identify engineering solutions to issues; and improve risk mitigation, system productivity, operability, maintainability and reliability of the design—as well as produce a final product that will meet the Navy's fleet needs. This could potentially be shared with the North Atlantic Treaty Organization and other ally foreign navies.

Individually, NSWCCD has agreed to perform several tasks under the CRADA. These include a laboratory evaluation using the TCG prototype and MASSMELT, modifying the MASSMELT to meet U.S. Navy requirements, and sharing with TCG all subject data produced in assessing the TCG prototype and in developing a Navy shipboard version of the MASSMELT-based NextGen PWP.

As for TCG, they have agreed to perform six tasks. Among these are providing NSWCCD with all available MASSMELT technical manuals, installations drawings, training materials and software; permitting NSWCCD to modify MASSMELT, as required to meet Navy requirements; and offering NSWCCD technical support and know-how regarding MASSMELT.

“With the CRADA in place, we can come up with an improved design that both the Navy and TCG will own, while allowing TCG to keep their original design, and give them manufacturing and selling rights to the Navy and other potential customers. It's a win-win,” said Peter Cheung, engineer for the Environmental Engineering, Science and Technology Branch and NSWCCD's principal investigator in this CRADA.

Original article: <https://www.navsea.navy.mil/Media/News/SavedNewsModule/Article/2603390/nswc-carderock-partners-with-tcg-to-develop-and-advance-the-massmelt-technology/>



U.S. Navy photo by Harry Friedman

NAWCAD ARMY, AIR FORCE SHIFT5 FOR CYBER RESILIENCY

Shift5, Inc., a transportation data company, announced it has entered into a Cooperative Research and Development Agreement (CRADA) with the Naval Air Warfare Center Aircraft Division (NAWCAD). NAWCAD is headquartered at Patuxent River Naval Air Station in Maryland. The NAWCAD CRADA enables joint research and development in cyber resiliency to bring innovation to legacy systems.

“This CRADA is Shift5’s first partnership with the Navy, adding to its portfolio of successful partnerships with the Air Force and Army. This engagement will extend Shift5’s capabilities across the Naval Air Enterprise as we find innovative new approaches to cyber resiliency and mission readiness through collaborative research and development with the NAVAIR team,” said Josh Lospinoso, co-founder and chief executive officer of Shift5.

The CRADA between NAWCAD and Shift5 will focus on leveraging Shift5’s commercial defensive cybersecurity and operational intelligence solution to bring value to current and emerging naval innovations. The work will take place at Shift5 facilities in Arlington, Virginia, and at Patuxent River Naval Air Station in Patuxent River, Maryland. Through this collaboration, both NAWCAD and Shift5 will deepen their understanding of cyber resiliency for critical legacy systems and how to commercialize and deliver those innovations to the warfighter.

NAWCAD is one of two warfare centers supporting the Naval Air Systems Command. Advancing capability and operational readiness for naval aviation and our warfighters, the combat support command is a Major Range and Test Facility Base and home to the Navy’s intellectual capital with national ranges, labs and other assets. Its diverse force of military, civilians and contractors helps naval aviation take flight through research, development, test and evaluation of both fielded and not-yet-fielded military platforms that ensure America’s Sailors and Marines always go into conflict with significant advantage.

Shift5 is a transportation data company based in Arlington, Virginia. Shift5 customers run smarter, safer and more efficiently by unlocking their fleet’s data. Their data-driven solutions integrate directly onto existing platforms, collecting and enriching data from all their electronic components. Shift5 customers employ this data to improve cybersecurity, safety and resilience as well as automate menial tasks, improve reliability and make smarter business decisions.

Original article: https://www.shift5.io/shift5-crada-naval-air-warfare-center/?utm_campaign=-Continuing%20Engagement%20Campaign&utm_medium=email&_hsmi=108966900&hsenc=p2ANqtz-9AwEmuVT71WxrJMe_XdML-v%E2%80%A6

NPS, BNNANO CRADA TO INCREASE ACCESS TO NANOMATERIALS WHILE SAVING MONEY

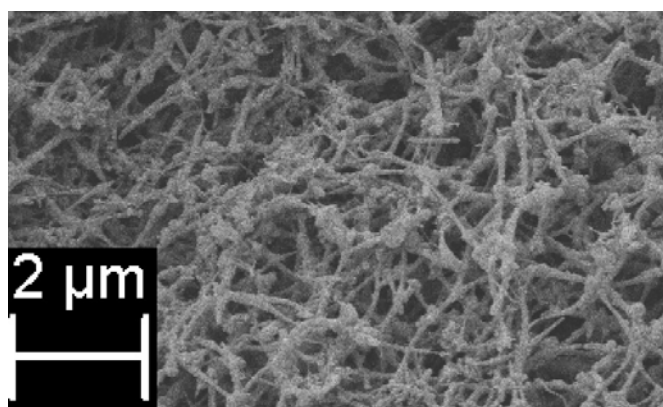
Coupling applied research with defense-focused education, the Naval Postgraduate School (NPS) has entered into a Cooperative Research and Development Agreement (CRADA) with BNNano, an advanced manufacturing company known for producing boron nitride nanotubes to test and evaluate boron nitride nanomaterials for potential defense applications.

Boron nitride nanotubes are a revolutionary nanomaterial exhibiting a desirable combination of exceptional physical and chemical properties to include high thermal conductivity, electrical resistivity, superhydrophobicity and high thermal stability, strength and stiffness. Applications may include electric insulation, fire retardants, radiation shielding, metal lightning and corrosion resistance.

The CRADA will allow faculty and students from the NPS Mechanical and Aerospace Engineering (MAE) Department to test BNNano's proprietary Nanobarb™, a boron nitride nanotube embedded with mechanical barbs designed to enhance reinforcing properties.

MAE faculty will incorporate the Nanobarb™ into their research, which tailors materials' properties, resulting in nanomaterials with a wide range of applications (e.g., supercapacitors, impact-resistant structural components, microelectronics, high-temperature systems and conductive aerospace composite structures). The researchers plan to investigate enhancing the thermal conductivity of lightweight carbon composites used by the aerospace industry, as well as phase change materials to optimize temperature regulation systems in living and storage spaces.

Nanomaterials are not necessarily an inexpensive resource, but due to the CRADA, the NPS students now have more access to them for research. The NPS research will be focused on defense or naval purposes, and, ideally, the students will take what they learn and apply it to challenges facing the fleet and force.



NPS photo

Original article: <https://nps.edu/-/new-crada-between-nps-and-bnnano-to-research-nanomaterial-applications>

NPS, XEROX CRADA EXPANDS OPERATIONAL 3D-PRINTING CAPABILITIES WITH LIQUID METAL

The Naval Postgraduate School (NPS) and Xerox entered a strategic collaboration focused on advancing additive manufacturing research, specifically 3D printing, which has the potential to dramatically transform the way the military supplies its forward-deployed forces.

As part of a Collaborative Research and Development Agreement (CRADA), NPS was the first to receive an installation of the Xerox ElemX Liquid Metal Printer on the university campus. The Xerox solution will provide NPS faculty and students with hands-on exploration of new ways the technology can deliver on-demand 3D printing of metal parts and equipment.

“The military supply chain is among the most complex in the world, and NPS understands first-hand the challenges manufacturers must address,” said Xerox Chief Technology Officer Naresh Shanker. “This collaboration will aid NPS in pushing adoption of 3D printing throughout the U.S. Navy and will provide Xerox valuable information to help deliver supply chain flexibility and resiliency to future customers.”

The Xerox ElemX printer uses cost-effective aluminum wire to fabricate end-use parts that can withstand the rigors of operational demands. This ability to produce reliable replacement parts on-demand reduces the dependency on complex global supply chains for deployed forces and addresses the hidden costs of traditional manufacturing.

“As the Department of the Navy’s applied research university, NPS combines student operational experience with education and research to deliver innovative capabilities and develop innovative leaders with the know-how to use them,” said retired Vice Adm. Ann Rondeau, NPS president.



NPS photo

“This collaborative research effort with Xerox and the use of their 3D printing innovations is a great example of how NPS uniquely prepares our military students to examine novel approaches to create, make, prototype and manufacture capability wherever they are.”

Original article: <https://nps.edu/-/naval-postgraduate-school-and-xerox-collaborate-to-advance-additive-manufacturing-solutions>

NSWC PHD, AERIAL ALCHEMY FLY DRONES TO SCOUR SHIPS FOR CORROSION

The Naval Surface Warfare Center Port Hueneme Division (NSWC PHD) is working with a local company to scan vessels with video and lidar, and then process the data to look for signs of corrosion.

Several companies in the commercial maritime sector have developed similar technology based on image processing, and the Navy's own Office of Naval Research previously sponsored the creation of a similar tool, dubbed Topside Drone.



Aerial Alchemy photo

NSWC PHD started from a clean slate, working with remote-sensing tech company Aerial Alchemy to develop a new approach. Aerial Alchemy designs medium- and heavy-lift unmanned aerial vehicles (UAVs) that use sensors equipped with lidar and imaging technology to scan a physical asset and create a 3D digital representation.

The partnership's goal is to explore how to use the company's UAVs, its processing system and the visual data collected in order to detect areas that may have corrosion, according to Alan Jaeger, the applications manager for NSWC PHD's Office of Research and Technology Applications.

"The idea is whether we can use various sensors to identify that information without having to put human eyeballs on it," said Jaeger. "If we can, then the next step is putting that on drones or unmanned aircraft, so we don't have to send a Sailor on a ship. We can send a drone, and it can scan equipment and identify corrosion or undersurface damage. If we can get that data, then we can start pre-planning for maintenance, preventative maintenance and repair."

This is Aerial Alchemy's second project with NSWC PHD. The first focused on proving the stability, reliability and accuracy of the company's UAVs to successfully create an "as-built" digital model of USS Independence (LCS 2), which is used as a baseline digital twin.

With the new second project, the team is drawing on the red, blue and green sensor data that a visible camera yields, as well as a more sophisticated scanning system that finely parses different wave lengths of light. This aids remote detection and identification of the chemicals generated during corrosion.

Original article: <https://www.maritime-executive.com/article/u-s-navy-explores-drone-tech-to-scan-ships-for-corrosion>



EDUCATIONAL PARTNERSHIP AGREEMENTS (EPAs)



EPAs

An Educational Partnership Agreement (EPA) enables naval laboratories to partner with U.S. educational institutions. The naval laboratory can loan and donate equipment, make laboratory personnel available to teach or assist in developing courses, involve faculty and students in research, and help to train future naval employees by promoting student interest in science, technology, engineering and mathematics (STEM) careers. Educational institutions include local educational agencies, colleges, universities and any other nonprofit institutions that are dedicated to improving science, mathematics, business, law, technology transfer or transition, and engineering education. The statutory authority for EPAs is 10 U.S.C. § 2194.

EPAs encourage and enhance study in scientific disciplines at all levels of education to bring STEM talent to the forefront and into the Navy ecosystem to advance the naval mission.

BENEFITS TO THE NAVY AND MARINE CORPS:

- Cultivate STEM students who can lead the future naval innovation and technology.
- Involve faculty and students as an extension of resources to naval laboratories to solve essential naval research and development (R&D) projects.
- Provide academic teaching opportunities for naval scientists and engineers to recruit talent and leverage academic approach methods to solving naval challenges.

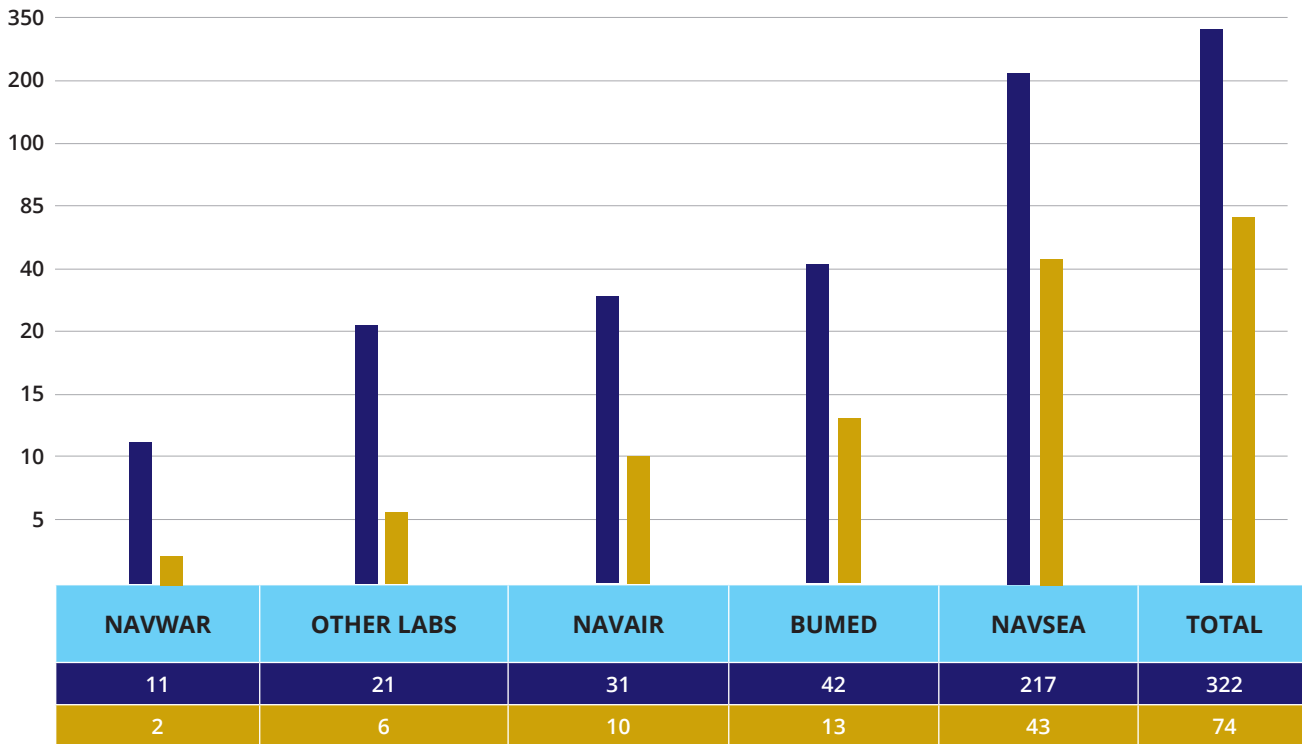
USE CASES FOR NON-FEDERAL ENTITIES:

- Gain academic credits in students' research focus, while receiving valuable experience and synergy working alongside Navy subject matter experts.
- Develop student and faculty career training through naval internships and mentoring opportunities.
- Receive loaned and transferred naval computers or other scientific equipment for student and faculty for academic R&D.

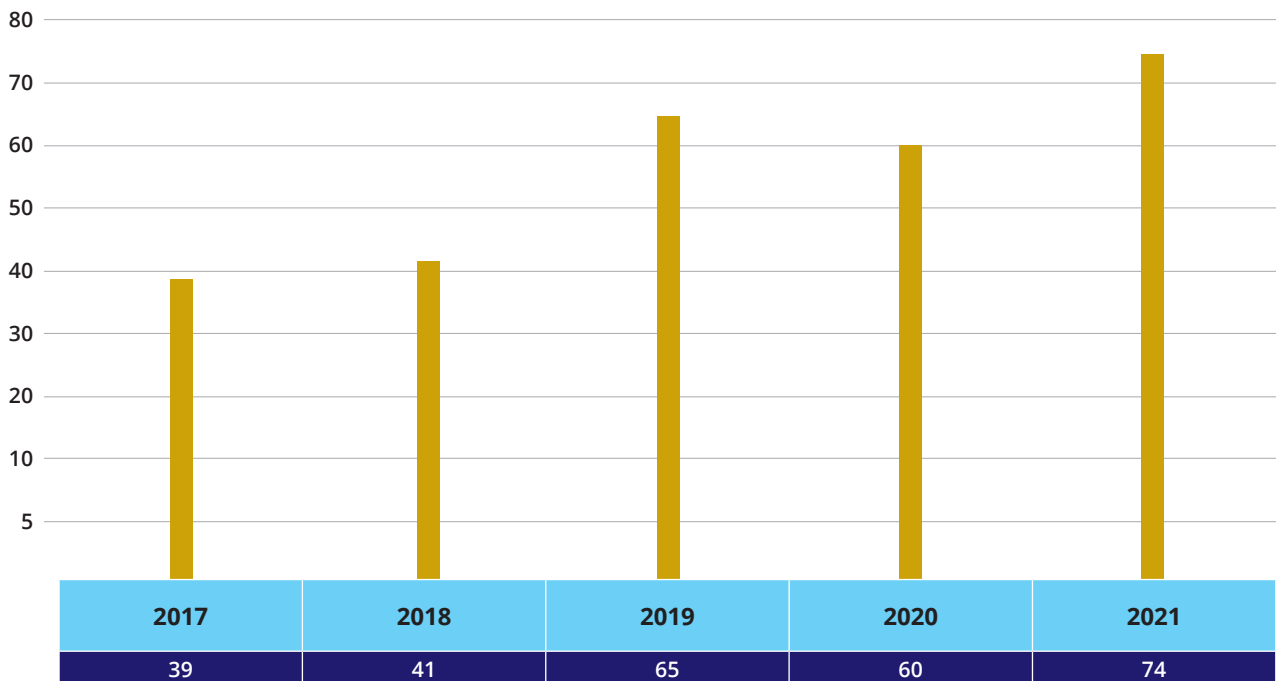
DoN EPAs executed in FY2021 are listed in Appendix B.

DoN FY21 EXECUTED EPAs BY SYSCOM

■ Active EPAs (Includes New EPAs) ■ New EPAs



DoN EXECUTED EPAs BY FY



NUWC DIVISION NEWPORT REINFORCES HBCU EPA WITH CRADA FOR STRONGER NAVAL SIGNAL PROCESSING

Naval Undersea Warfare Center (NUWC) Division Newport and Howard University, a Historically Black College and University (HBCU) in Washington, D.C., entered into an Educational Partnership Agreement (EPA) to enable technical collaboration and student opportunities between the two organizations.

With the EPA in place, a subsequent Cooperative Research and Development Agreement (CRADA) with Howard was facilitated through the collaboration between Dr. Tony Ruffa, the director of transition for NUWC Division Newport's Chief Technology Office, and Dr. Bourama Toni of Howard University.

This CRADA further strengthens the working relationship and commitment to technical excellence between NUWC Division Newport and Howard and will be used to enhance the signal-processing capabilities of naval vessels.

"The work with Howard University supports an ONR [Office of Naval Research] initiative that will impact the next generation of signal processing approaches by developing multivariate non-Gaussian and weighted Gaussian distributions that reflect realistic data sets that are often not Gaussian in nature," said Ruffa.

These enabling technologies will allow the Navy's Sailors and submariners to see or hear farther into the ocean than ever before.

"Division Newport is extremely proud to be a part of this ongoing, cutting-edge research," said NUWC Division Newport Technical Director Ron Vien. "Their work together under this CRADA will extend to research ... to investigate applications for signal processing.

"This will extend to working with others at Division Newport to develop computation techniques for electromagnetics theory and provide the most sophisticated mathematical tools to the research community in signal processing and information theory," Vien continued.

Original article: <https://www.navsea.navy.mil/Media/News/SavedNewsModule/Article/2627546/nuwc-division-newport-howard-university-sign-cooperative-research-and-developme/>



U.S. Navy photo by Dave Stoehr

PEARL HARBOR NAVAL SHIPYARD SECURES FUTURE WORKFORCE THROUGH UNIVERSITY OF HAWAI'I PARTNERSHIPS

A partnership between the Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility (PHNSY & IMF) and the University of Hawai'i (UH) at Mānoa's College of Engineering is yielding promising results for both organizations, creating unique opportunities for collaboration and innovation that have the potential for long-range impact.

The relationship became official in July 2018, when both parties entered into an Educational Partnership Agreement (EPA). Since then, they have signed multiple EPAs for discrete activities.

For starters, two industry-integrated courses have launched with great success.

The first course affords students the chance to gain real-world engineering experience by working alongside Pearl Harbor engineers. It allows budding engineers the unique opportunity to work on a critical project in a classified, secure environment mentored by a supervisor, many of whom are UH graduates.

The second offering is a year-long capstone course that has students tackling non-classified projects put forth by PHNSY & IMF, identifying the problem focus in the first stage and building a prototype in the second. This year's class is divided into two teams, each having selected two projects to complete — one focused on 3D printing and the other working in the robotics space. PHNSY & IMF is providing additional support to students in the way of materials and machinery, producing parts for the project based on drawings the students provide.

Another exciting element of the partnership is the arrival of a cutting-edge, \$250,000 Markforged Metal X 3D printer installed at UH's College of Engineering. The printer, purchased by the Naval Sea Systems Command for educational and research purposes, is part of a three-year, joint-use agreement allowing students and faculty to fabricate custom small metal parts for use in research and senior design projects. It also affords Navy personnel the ability to manufacture replacement parts such as metal flanges, valves, brackets and filter housings.

A final collaboration under development is a three-way partnership involving the University of Guam (UOG). Under the terms of this agreement, students from UOG with a grade-point-average of 3.0 or higher will be able to transfer to UH's mechanical engineering program in their junior year. They will also be eligible to apply for paid work at PHNSY & IMF over summers and holidays, with the hope they will convert to full-time employees. This symbiotic arrangement will help bring more diversity to UH's classrooms and serve as an important recruiting tool for NAVSEA's support of maintenance in Guam.

Original article: <https://www.eng.hawaii.edu/phnsy-coe/>



PARTNERSHIP INTERMEDIARY AGREEMENTS (PIAs)

PIAs

A Partnership Intermediary Agreement (PIA) is between a naval laboratory and an agency of a state or local government, or a nonprofit entity owned, funded and operated in whole or in part by, chartered by, on behalf of a state or local government. Partnership Intermediaries assist, counsel, advise, evaluate or otherwise cooperate with industry or academic institutions that need or can make demonstrably productive use of technology related assistance from a federal laboratory. It enables the intermediary to identify new technologies in the private sector, the local laboratories and the naval ecosystem that can be used by the DoN to accelerate delivery of technological capabilities to the nation and to help identify DoN technologies that can be licensed and commercialized. The statutory authorities for use of partnership intermediaries are 15 U.S.C. § 3715 and 10 U.S.C. § 2368.

PIAs increase successful cooperative and joint activities by facilitating with U.S. small businesses that can accelerate the delivery of new technological capabilities to advance the naval mission.

BENEFITS TO THE NAVY AND MARINE CORPS:

- Increase licensing, prototype creation, testing, manufacturing and commercialization of naval technologies to benefit Sailors and Marines.
- Encourage engagements between the naval ecosystem and industry, academia and non-traditional contributors to create transformative opportunities, while fostering a naval culture of innovation.
- Develop an enhanced naval ecosystem with a knowledge-based workforce by promoting research, innovation, education and technological advancements.

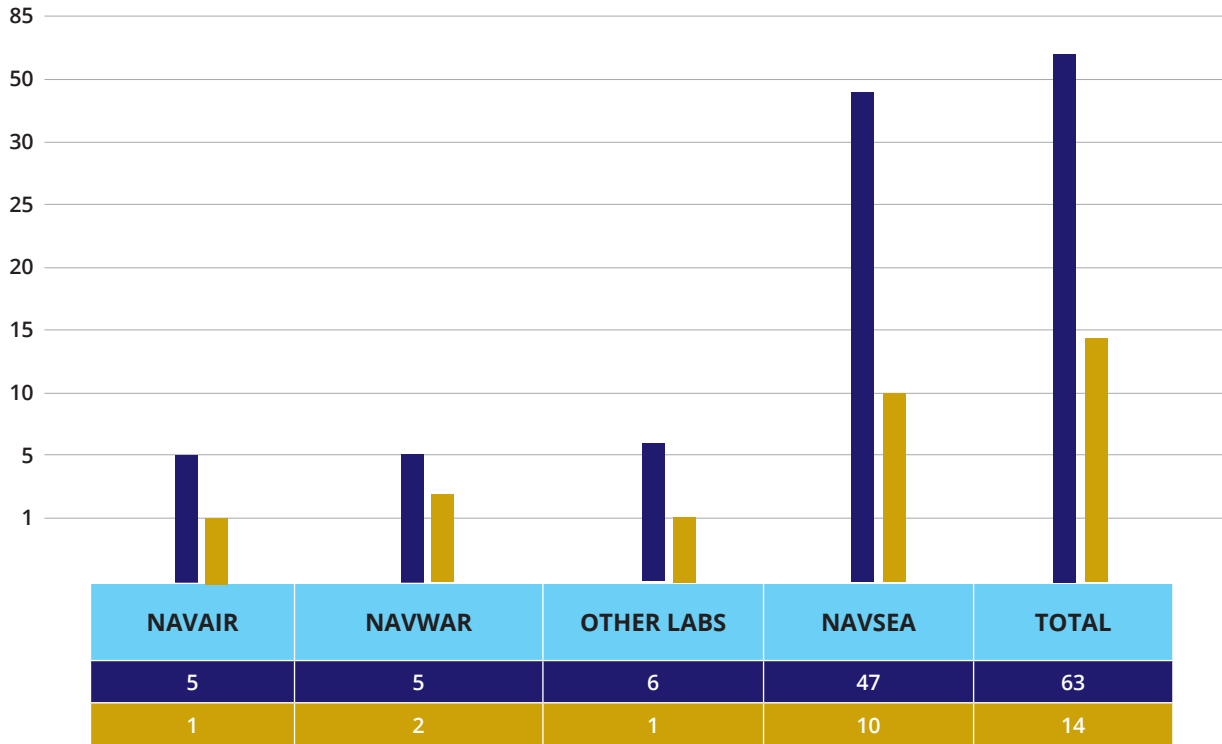
USE CASES FOR NON-FEDERAL ENTITIES:

- Create a collaborative research environment through locations accessible to the Navy, private industry and academic institution to foster strategic alliances.
- Facilitate key partnerships to leverage naval technologies and promote technology licensing and Cooperative Research and Development Agreement opportunities.
- Research and evaluate markets, help create opportunities for designs and prototypes of naval technology, and promote manufacturing capabilities.

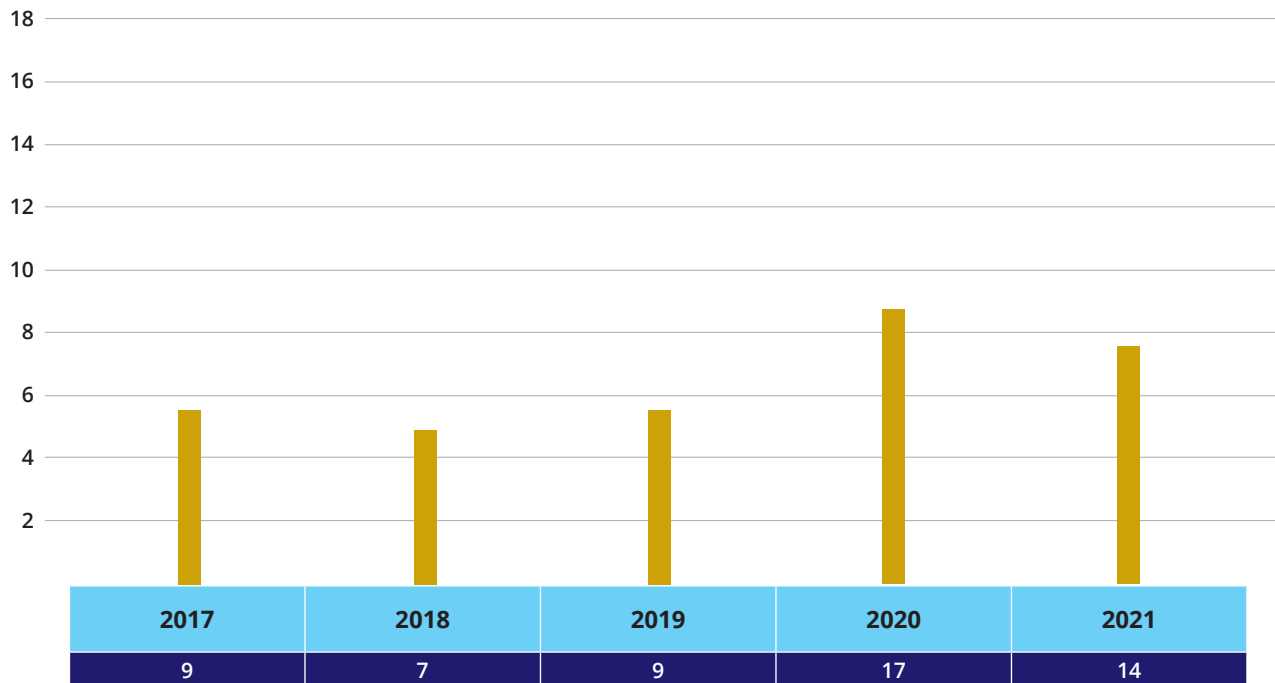
DoN PIAs executed in FY2021 are listed in Appendix C.

DoN FY21 EXECUTED PIAs BY SYSCOM

■ Active PIAs (Includes New PIAs) ■ New PIAs



DoN EXECUTED PIAs BY FY



NSWC INDIAN HEAD DIVISION PIA RESULTS IN NEW BOMB DISPOSAL TRAINING SITE

Through a Partnership Intermediary Agreement (PIA), the Naval Surface Warfare Center Indian Head Division (NSWC IHD) and United States Bomb Technician Association (USBTA) established a multi-use site in Indian Head, Maryland, to be developed into a bomb disposal technology training campus serving military, law enforcement and other entities.

USBTA's mission is to train bomb technicians using technology and a variety of skills exercises and scenarios. The organization does a lot of work at the congressional level in Washington and educates state and local officials about the bomb technician community.

USBTA moved to the town of Indian Head because of the Naval Support Facility's joint explosive ordinance disposal program. The organization is already working on previously agreed upon projects with the Navy.

The new Indian Head campus, one of the largest vacant commercial properties in town, will be outfitted with the latest bomb-disposal technology and equipment. Other industry partners have already reached out to establish their own footprints on and around the campus.

Indian Head Mayor Brandon Paulin said the town is capitalizing on opportunities with science, technology, engineering and mathematics education and is happy to share in the success of the Naval Support Facility-USBTA partnership agreement. According to Paulin, the PIA will help bring more economic development, jobs and opportunities to the area.



Photo by Caleb M. Soptelean

Original article: https://www.somdnews.com/news/local/bomb-tech-association-site-established-in-indian-head/article_4da7c9f9-a9de-50e2-b5f5-2b51c99754b4.html.

NPS EXTENDS REACH TO NON-TRADITIONALS WITH OKLAHOMA PARTNERSHIP INTERMEDIARY

The NavalX Central Coast (C2) Tech Bridge signed a Partnership Intermediary Agreement (PIA) with the Innovation Accelerator Foundation (IAF) to expand collaboration between the Naval Postgraduate School (NPS) and public sector innovation organizations to include small to medium-sized American enterprises and universities.



According to C2 leaders, the IAF, a private 501(c)(3) nonprofit organization in Tulsa, Oklahoma, is an ideal partner for NPS as it tracks current research projects focused on tackling tough problems in areas including artificial intelligence, cyber security, quantum technologies, machine learning and advanced aerial mobility, all research thrusts of the university.

According to C2 Director Chris Manuel, the organization is the front door for entrepreneurs to work with the Navy and Department of Defense on technology solutions and can facilitate growth of public-private partnerships and dual-use technologies.

“The partnership with IAF strengthens the Central Coast Tech Bridge’s ability to connect NPS to start-ups, academia, corporations, small businesses, nonprofits and private capital with a single-entry point,” said Manuel. “Our partnership with the Naval Postgraduate School provides access to expert faculty and experienced military students who understand operational challenges and are eager to work with business to solve research challenges.”

“Our country is the world’s most innovative, and our nonprofit affords a single point of visibility into a broad swathe of it — especially parts generated by non-traditional sources,” said John Pyrovolakis, IAF founder and director. “Whatever country emerges as dominant in quantum information science or in hypersonics or in cybersecurity — there’s a number of these fields — will go a long way in defining what country oversees the future. We are grateful to the George Kaiser Family Foundation and Tulsa Innovation Labs for the support address this opportunity in Tulsa.”

Manuel and Pyrovolakis believe this partnership will lead to new relationships between universities and research enterprises and could permeate to the other Tech Bridges around the nation.

Original article: <https://nps.edu/-/problems-solved-here-central-coast-tech-bridge-innovation-accelerator-foundation-to-collaborate-on-technology-solutions>



INTELLECTUAL PROPERTY/PATENT LICENSE AGREEMENTS (IP/PLAs)

IP/PLAs

An Intellectual Property License Agreement (IPLA) is between a naval laboratory and a non-federal entity in which the naval laboratory owns some form of intellectual property (IP) such as a copyright, trademark or patent and permits a non-federal entity to use the naval laboratory's intellectual property under defined conditions. The naval laboratory retains all ownership to its IP. The DoN Technology Transfer (T2) focuses on patent and software licenses to advance the naval mission.

The statutory authorities for naval patent and software licenses are 10 U.S.C. § 2260; 35 U.S.C. § 209, 37 C.F.R. Part 404; and 37 C.F.R. Part 501.

License agreements facilitate the development, manufacture, commercialization and, ultimately, return of naval technologies back into the naval T2 ecosystem for the benefit of the warfighter.

BENEFITS TO THE NAVY AND MARINE CORPS:

- Benefit from products made by industry — based on technology originally developed by naval scientists and engineers.
- Leverage naval research and development investments to improve or create naval products and systems.
- Contribute to U.S. economic growth and impact new job creation, resulting in a more diverse and competitive marketplace to better serve the Department of the Navy (DoN) and Department of Defense (DoD).

USE CASES FOR NON-FEDERAL ENTITIES:

- Create cutting-edge competitive commercial products that can also benefit the warfighter.
- Access naval software to create commercial products that can be used by the warfighter.
- Design commercial systems and processes that can increase effective execution of warfare activities across the DoD.

For a list of technologies available for license within the DoN, visit https://techlinkcenter.org/?s=Navy&post_type=technologies



| DoN Patent Metrics | FY19 | FY20 | FY21 |
|---|-------------|-------------|-------------|
| NEW INVENTIONS DISCLOSURES RECEIVED | 443 | 440 | 318 |
| TOTAL PATENT APPLICATIONS FILED | 526 | 509 | 489 |
| U.S. PATENT APPLICATIONS FILED | | | 444 |
| FOREIGN PATENT APPLICATIONS FILED | | | 24 |
| TOTAL PATENT COOPERATION TREATY APPLICATIONS FILED | | | 21 |
| TOTAL PATENTS ISSUED | 378 | 338 | 304 |
| U.S. PATENTS ISSUED | | | 287 |
| FOREIGN PATENTS ISSUED | | | 17 |
| TOTAL ACTIVE PATENTS | 4,371 | 4,243 | 4,292 |

| DoN Licensing Metrics | FY19 | FY20 | FY21 |
|--|-------------|-------------|-------------|
| TOTAL ACTIVE INVENTION LICENSES | ND | 116 | 119 |
| NEWLY EXECUTED INVENTION LICENSES | 10 | 23 | 26 |
| NEWLY EXECUTED INVENTION LICENSES TO SMALL BUSINESSES | | | 20 |
| TOTAL ACTIVE INCOME BEARING LICENSES | 65 | 66 | 63 |
| TOTAL ACTIVE INCOME BEARING LICENSES - EXCLUSIVE | 16 | 15 | 16 |
| TOTAL ACTIVE INCOME BEARING LICENSES - PARTIALLY EXCLUSIVE | 20 | 18 | 13 |
| TOTAL ACTIVE INCOME BEARING LICENSES - NON-EXCLUSIVE | 25 | 28 | 28 |
| NEWLY EXECUTED INCOME BEARING LICENSES | | | 17 |
| ACTIVE NON-INCOME BEARING LICENSES | 0 | 50 | 56 |
| TOTAL ACTIVE OTHER LICENSES | 4 | 5 | 3 |
| NEWLY EXECUTED OTHER LICENSES | | | 3 |
| NEWLY EXECUTED OTHER LICENSES TO SMALL BUSINESSES | | | 2 |
| TOTAL ACTIVE LICENSES (INCOME BEARING, NON-INCOME BEARING, & OTHER) | 69 | 120 | 122 |
| AVERAGE ELAPSED AMOUNT TIME TO GRANT LICENSES (MONTHS) | ND | 7.0 | 7.0 |
| MINIMUM ELAPSED AMOUNT TIME TO GRANT LICENSES (MONTHS) | ND | 4.8 | 4.8 |
| MAXIMUM ELAPSED AMOUNT TIME TO GRANT LICENSES (MONTHS) | ND | 12.5 | 18.0 |
| LICENSES TERMINATED FOR CAUSE | 9 | 18 | 7 |

| DoN Software Metrics (First collected in FY2021) | FY19 | FY20 | FY21 |
|---|-------------|-------------|-------------|
| NEW SOFTWARE DISCLOSURES RECEIVED | | | 4 |
| NEW SOFTWARE ASSETS | | | 4 |
| TOTAL SOFTWARE ASSETS | | | 4 |
| NEWLY EXECUTED SOFTWARE LICENSES | | | 2 |
| NEWLY EXECUTED SOFTWARE LICENSES TO SMALL BUSINESSES | | | 2 |
| TOTAL ACTIVE SOFTWARE LICENSES | | | 3 |
| ACTIVE NON-INCOME BEARING SOFTWARE LICENSES | | | 2 |
| NEW NON-INCOME BEARING SOFTWARE LICENSES | | | 2 |
| ACTIVE INCOME BEARING SOFTWARE LICENSES | | | 1 |
| NEWLY EXECUTED INCOME BEARING SOFTWARE LICENSES | | | 1 |
| INCOME FROM SOFTWARE LICENSES | | | \$0 |
| EARNED ROYALTY INCOME, SOFTWARE LICENSES | | | \$0 |

| DoN Licensing Income Metrics | FY19 | FY20 | FY21 |
|--|-------------|-------------|-------------|
| TOTAL INCOME, ALL ACTIVE LICENSES | ND | \$2,760,204 | \$2,873,539 |
| INCOME FROM PATENT/INVENTION LICENSES | ND | \$2,760,204 | \$2,873,539 |
| OTHER LICENSE INCOME | | | \$0 |
| EARNED ROYALTY INCOME, ALL ACTIVE LICENSES | \$1,677,519 | \$2,760,204 | \$2,873,539 |
| EARNED ROYALTY INCOME, DISTRIBUTED TO INVENTORS | \$889,112 | \$734,443 | \$603,956 |

NAVY LICENSES PILOT LOCATOR TO AIR FORCE VETERAN

A small, veteran-owned outdoors company in Ohio has signed a patent license agreement with the U.S. Navy, allowing it to finish the development of the polygonal asymmetric reflector.

Airborne Outfitters and Naval Surface Warfare Center (NSWC), Crane Division finalized the tech transfer deal on Dec. 1, 2020.

The geodesic device can passively transform radio waves from airborne emitters (aircraft, UAVs) as they bounce off using a fractal antenna in such a way that they become a unique signature.

Ejected pilots could assemble the device from their survival pack. Because it is not a powered transmitter — no batteries required — it would be quite difficult for hostile actors to detect. And once searchers receive the returned signature signal, the pilot's position can be geolocated and authenticated in support of the rescue mission.

"I'm excited to leverage the Navy's R&D into new products with military and non-military customers," said Jason Evatt, CEO of Airborne Outfitters and an Air Force retiree. "The technology has been prototyped and tested at the lab and that's a big head start in product development."

The reflector was invented in 2015 by Gerry Miller and James Stewart, who work at the NSWC Crane. U.S. Patent 9,748,643 protected the Navy's intellectual property in 2017.

The license agreement was processed through NSWC Crane's technology transfer office, which works to see the Navy's inventions become useful products through private-sector collaboration. TechLink, the Department of Defense's tech transfer partnership intermediary, supported the deal.

"We have incredible scientists and engineers tackling tough national security problems," said Jenna Dix, technology transfer director at NSWC Crane. "It's exciting to partner with small businesses that match our passion, dedication and drive to get the best technology in the hands of the warfighter."



NSWC Crane photo

Original article: <https://techlinkcenter.org/news/air-force-vet-signs-deal-for-navy-tech-that-covertly-locates-downed-pilots/>

NAVY PATENT “ILLUMINATES” CAMERA QUALITY

Two scientists from the Naval Air Warfare Center Aircraft Division (NAWCAD) recently earned a patent for an instrument and technique that tests the image-capturing sensor in digital cameras, helping buyers determine the quality of the camera before purchase.

“The acquisition and sustainment of capability is a weapon of war and development efforts are an important aspect of what we do to support the fleet,” said NAWCAD Commander Rear Adm. John Lemmon. “This invention is an example of the cutting-edge technology, top-tier capability and intellectual capital NAWCAD brings to both industry and our warfighters.”

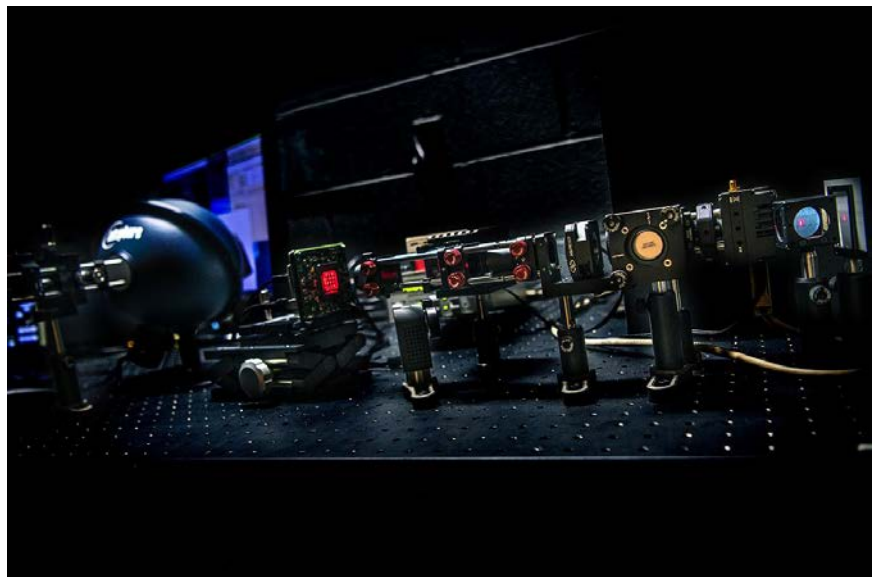
Developed by NAWCAD scientists Aaron Hendrickson and Dr. Gary Lohman, the Focal Plane Illuminator has broad application for imaging systems across the entire military and camera industry.

“A better test technique was needed because manufacturers’ specifications are unreliable and based on outdated methods,” said Hendrickson. “Manufacturers test cameras in different ways, so comparing cameras by their spec sheets is comparing apples to oranges.”

Their first-of-its-kind invention also has applications for testing cameras throughout their lifecycles.

“Until now, there’s been no standard way to test picture degradation over a camera’s lifetime — we assume cameras work until they don’t,” said Lohman. “When the Navy makes weapons-grade decisions on camera systems found in satellites, UAVs, fixed ground instruments and aircraft turrets, it needs to understand and monitor the camera’s quality to ensure systems perform as well as when they were new.”

Additionally, the Focal Plane Illuminator tests an image sensor while still in the camera. Current test methods require users to remove the sensor from the camera body for testing, which can be time-consuming and risks damaging the camera.



U.S. Navy photo by Aaron Hendrickson

Original article: <https://www.navair.navy.mil/news/Navay-scientists-earn-patent-innovative-camera-test-instrument/Wed-02172021-1528>



NON-FAR MEETS FAR: T2 & CONTRACTS

STACKED AUTHORITIES:

OTAs, PIAs & CONSORTIA PROVIDE SOLUTIONS FOR PEOs/PMs

As outlined by 10 U.S.C. § 2371b, the Department of Defense (DoD) has the authority to carry out certain prototype, research and production projects via Other Transaction Authority (OTA).

While this capability has been around for decades, duty contracting officers are using it more frequently nowadays to cut through bureaucracy and expedite contracting — in support of the agility for which the chief of naval research and other military leaders are pushing. The FY2016 National Defense Authorization Act bolstered the use of OTAs by giving the DoD permanent authority to award contracts under 10 U.S.C. § 2371 for research, prototype and production purposes.

Typically, an OTA consortium lead is appointed and given authority to award contracts that meet certain parameters. Part of the push toward OTAs stems from the desire to work with nontraditional companies that have cutting-edge capabilities but do not have systems in place to do business with the DoD, such as Defense Contracting Audit Agency-approved accounting systems.

Some OTA consortiums are organized around technical domains such as composites, cybersecurity or artificial intelligence, while others are organized around the mission of certain military organizations.

Similar to Partnership Intermediary Agreements (PIAs), OTAs allow an intermediary to extend the DoD's reach. While the primary function of OTA consortiums is to bring new technology into the DoD, innovative naval ORTA representatives are using OTA consortiums to collaborate and push naval technology out to the private sector.

For example, in June 2019 Naval Air Warfare Center Aircraft Division (NAWCAD) awarded the Naval Aviation Systems Consortium (NASC) a five-year, no-ceiling OTA agreement. It features a unique structure and operational model, providing privity of contract to the performing member(s). Under the OTA, NASC may award contracts to companies that have capabilities sought by the Naval Air Systems Command (NAVAIR).

In concert, NAWCAD used a PIA to form the Innovation and Modernization Patuxent River (IMPAX), a partnership with the Georgia Tech Research Institute. NAWCAD and NASC have charged IMPAX with bringing new companies into the consortium, pairing up companies with complementary capabilities and educating them about NAVAIR's needs. Many of these companies have not previously done business with the Department of the Navy (DoN).

NAWCAD's ORTA representative sees the potential for this consortium to expand her reach in support of the T2 mission. It represents a whole new set of companies that may be interested in licensing DoN technology or executing Cooperative Research and Development Agreements to partner with the DoN on developing technologies.

HOW CRADAS WITH DON SBIR PARTNERS ADVANCE TECHNOLOGY FOR FLEET NEEDS

Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) is a federal government program, coordinated by the U.S. Small Business Administration to fund early-stage research performed by American small businesses. Federal agencies are required to allocate a percentage of their research and development budgets for these awards.

Small business awardees can utilize part of their SBIR/STTR funding to work with Department of the Navy (DoN) T2 laboratories on a Cooperative Research and Development Agreement (CRADA) to collaborate on their firm's technology. DoN T2 laboratories have conducted various activities to further mature these small business technologies.

In addition, laboratories frequently collaborate with small businesses after they complete their SBIR/STTR awards, to continue technology development and move innovations to the fleet, force and marketplace.

For example, in FY2021:

- A small business utilized part of its DoN SBIR award for a naval laboratory engineer to consult on nanotube technology.
- A small business used part of its DoN STTR award to fund a naval laboratory to develop a testing methodology and test its material.



NSWC CRANE, HYDRONALIX SIGN CRADA TO DEVELOP PLATFORMS FOR ARTIFICIAL INTELLIGENCE

Naval Surface Warfare Center Crane Division (NSWC) Crane and Hydronalix, Inc., signed a Cooperative Research and Development Agreement to develop software for non-proprietary robotic autonomy baseline component architecture.

This collaboration is anticipated to fulfill the need for a developmental platform prototype for demonstrating artificial intelligence (AI) algorithms in support of Small Unit Maneuver and Counter-UAS Autonomy research. The Hydronalix ADAPT UAS platform will be built or modified to support the hardware requirements needed

to demonstrate algorithm development objectives of navigation, mapping and object recognition in enclosed spaces. Algorithm development will encompass AI, navigation, object detection and mapping of enclosed spaces.

The ADAPT UAS will provide a stable flying aircraft that can position-hold (without GPS) with a lost command and control link — and has a sense-and-compute payload that can be used for open-source algorithm development and testing.

The platform was recently operated by the U.S. Marine Corps 1st Explosive Ordnance Disposal Company Littoral Explosive Ordnance Neutralization during the U.S. European Command and U.S. Sixth Fleet Baltic Operations Exercise in June 2021, for vessel-to-shore re-supply missions.

NSWC Crane will provide design requirements and key performance parameters, receive equipment, conduct beta testing, and oversee flight operations and safety.

Hydronalix will be responsible for the integration of a sense-and-compute payload that meets size, weight, power and other requirements, integration of safety measure for safety override during flight, and providing training or training materials for the safe operation of aircraft. Together, NSWC Crane and Hydronalix will collaborate on new techniques and procedures; jointly present, publish and seek associated intellectual property; and design optimization, testing and coordination.



Hydronalix photo

Original article: <https://www.marinelink.com/news/nswc-crane-hydronalix-sign-crada-aisum-489410>



DoN T2 STUDIES

OPPORTUNITIES TO ADVANCE DEPARTMENT OF DEFENSE TECHNOLOGY TRANSFER WITH PARTNERSHIP INTERMEDIARY AGREEMENTS

The Office of Defense Laboratory and Personnel (ODL&P) in the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) commissioned the Institute for Defense Analyses (IDA) Science and Technology Policy Institute (STPI) to analyze and characterize the landscape of the Department of Defense (DoD) Partnership Intermediary Agreements (PIAs).

Published in February 2021, this study analyzed executed PIAs across the DoD, their organizational and funding models, and the DoD's oversight role. The DoD's use of PIAs has grown significantly in recent years, driving ODL&P's need to understand the breadth and scope of this landscape. The study captured the various ways DoD laboratories, including Department of the Navy commands, utilized PIA statutory authority but did not provide commentary on the validity of that usage.

IDA STPI published a two-page infographic that succinctly highlights the study, which is reproduced on the following pages.

The full PDF of the study can be found at: <https://www.ida.org/research-and-publications/publications/all/o/op/opportunities-to-advance-dod-technology-transfer-with-partnership-intermediary-agreements>.

DoD uses PIAs to facilitate T2, private sector engagement, and technology and product development

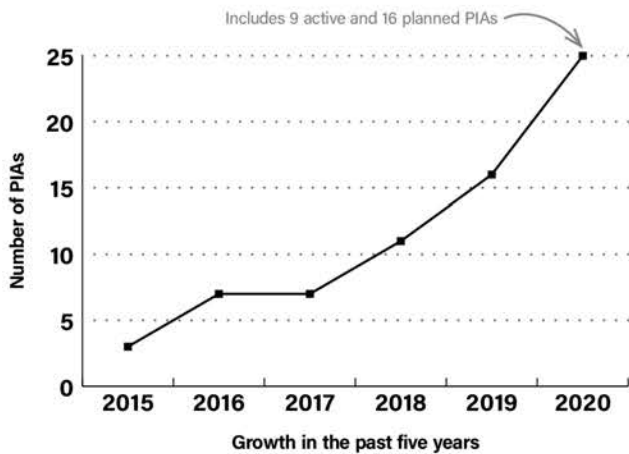
WHAT IS A PIA?

Eligible partnership intermediaries (such as State universities, local nonprofits, and regional economic development agencies) work on behalf of the Federal Government to facilitate partnerships with industry, small businesses, and academic institutions.

MAJOR FINDINGS

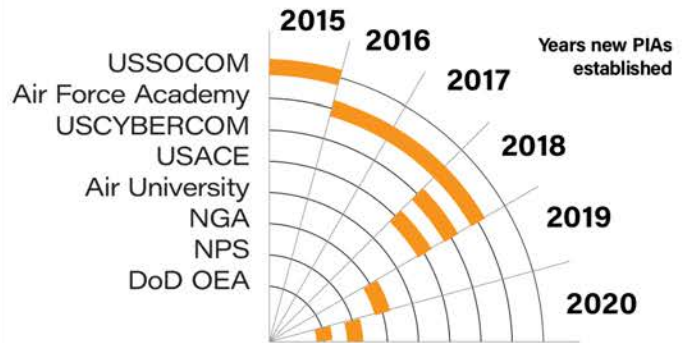
Use of PIAs is growing

79 active PIAs with 28 DoD entities



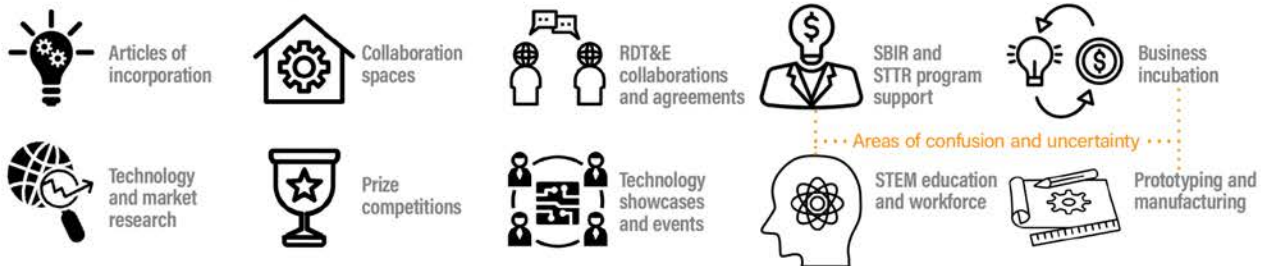
PIAs are flexible

In recent years, PIAs have been established at entities beyond DoD labs, including Combatant Commands, DoD offices, USACE, and military educational institutions



PIAs support broad DoD mission areas

Traditional T2 activities (patenting and licensing), spin-in and dual-use activities (prototyping, business incubation, STEM education, and workforce development)

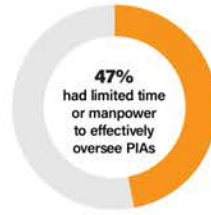
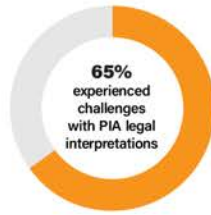
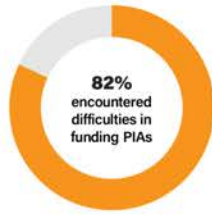
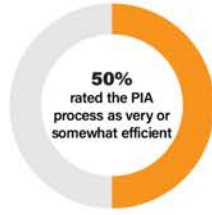


For examples of PIAs in these areas, refer to IDA Paper P-20540, pages 35-47.

DoD = Department of Defense; NGA = National Geospatial-intelligence Agency; NGO = non-government organization; NPS = Naval Postgraduate School; O&M = Operations and Maintenance; OEA = Office of Economic Adjustment; PIA = Partnership Intermediary Agreement; RDT&E = Research, Development, Test, and Evaluation; SBIR = Small Business Innovation Research; STEM = science, technology, engineering, mathematics; STTR = Small Business Technology Transfer; T2 = technology transfer; USACE = U.S. Army Corps of Engineers; USC = U.S. Code; USCYBERCOM = U.S. Cyber Command; USSOCOM = U.S. Special Operations Command

MAJOR FINDINGS

PIAs provide value but their use faces challenges – results of a survey of DoD entities show



Lack of awareness of breadth of activities

No central repository to understand capabilities and share lessons learned

Misperceptions about policy prohibitions

How are PIAs currently funded?

Policy, guidance, and practice conflict about “colors of money” to be used—RDT&E; O&M; licensing, royalties, and other T2 funds

Who can be a partner?



Areas of confusion and uncertainties

CONCLUSIONS AND RECOMMENDATIONS

PIAs pursue robust activities that facilitate the translation of DoD needs to capabilities, but they could be used more efficiently and effectively

Partnership intermediaries provide value through their trust-based relationships, which DoD should continue to cultivate



1. Revise DoD policy to clarify and de-conflict



2. Develop PIA guidance and training, including contracting and legal



3. Encourage funding of expected PIA activities that DoD requests



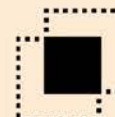
4. Cultivate a trust-based relationship and encourage creativity with appropriate oversight



5. Strengthen the PIA ecosystem through shared information



6. Coordinate relevant DoD initiatives across varied innovation units



7. Harmonize the PIA authorities under 15 USC § 3715 and 10 USC § 2368



PILOT PROJECTS



WHAT ARE PILOT PROJECTS?

Pilot Projects are an initiative run by the DoN T2 Program Office, which offers funding to ORTAs at naval laboratories for innovative approaches to technology transfer. The intent of the initiative is to identify unique, novel projects — once successfully piloted at the T2 lab — that can be instituted across the DoN T2 community. For example, the Innovation Discovery Event (IDE) was initially funded as a Pilot Project and now has grown into an established effort successfully administered at many naval laboratories.

This initiative provides an opportunity for laboratories to apply for, and potentially receive, funding for these novel activities. Past pilot projects have included the following:

- T2 Handbook — Naval Surface Warfare Center (NSWC) Panama City Division
- IP Mining Pilot — NSWC Crane Division
- TechLink collaboration with several laboratories to organize IDEs
- Innography Business Intelligence Software — Participation by multiple naval laboratories
- Environmental Remediation Technologies — NSWC Carderock Division
- K9 Chemical Detection Training Device, later know as Mixed Odor Detection Device — Naval Research Laboratory

WARGAME FOR INNOVATION AND FRONTLINE IMPROVISATION (WIFI)

NAVAL SURFACE WARFARE CENTERS (NSWC) INDIAN HEAD, CARDEROCK AND CRANE DIVISIONS

The three warfare centers jointly proposed, developed and hosted a tabletop wargame on gray zone efforts to support U.S. Marine Corps Expeditionary Advanced Base Operations (EABO) and Stand-In Forces concepts. The gray zone refers to peer-adversarial engagement prior to military engagement and can incorporate a wide variety of tools and technologies ranging from diplomacy to policing actions.

The WIFI event took place over three days, and attendees were divided into three groups, including naval scientists and engineers; active-duty personnel from the Navy, Marine Corps and Coast Guard; and civilian facilitators to capture the notes from the wargame.

Four technology gaps were identified at the conclusion of the WIFI event. While no commercial-off-the-shelf technologies were found to solve these gaps, technologies that accomplish these four promising solutions will be explored with the current Department of Defense (DoD) research and development (R&D) portfolio and potential Small Business Innovation Research topics. The gaps found were:

1. Intercommunication technologies for air-to-undersea and surface-to-undersea communications.
2. Corrosion-inducing technology (man-made or biological) to induce/increase vessel corrosion.
3. Video, imagery and sound backhaul technologies that securely address government needs.
4. Improvised surface vehicle capable of carrying payloads greater than 1,000 pounds in high-sea environments.

NSWC Carderock Division's Disrupted Threat Laboratory (DTL) took action to pursue developing and demonstrating an improvised surface vehicle capable of carrying payloads greater than 1,000 pounds. After a successful demonstration, the DTL was awarded funding from the DoD Rapid Reaction Technology Office.

WARGAME FOR INNOVATION AND FRONTLINE IMPROVISATION



**\$99,800
FUNDING**



PROJECT DESCRIPTION

Tri-warfare center team developed and implemented a wargame to support Marine Corps EABO and Stand-In Forces concepts to identify operational gaps that can be solved by current or future technology.



PROJECT MILESTONES

- Wargame scenario developed and relevant experts invited;
- Facilitated wargame conducted in late July 2021;
- Four promising ideas identified, one of which has become a funded R&D program



PROJECT IMPACT

WIFI event offered a pathway for warfare center scientists and engineers to participate in Title 10 wargames and identify technology gaps and potential solutions within the current and future naval technology portfolio.



PROJECT UPDATE

After successful demonstration, the DTL was awarded funding from the DoD Rapid Reaction Technology Office, establishing a new R&D program for surface vehicles carrying large loads.

SUBSPACE PLANNING AND WORKFLOW MANAGEMENT TOOL DEVELOPMENT

FY2020 | LAB: Portsmouth Naval Shipyard (PNS)

\$95,000 (SBIR funding)

Following the initial pilot project to develop prototype solution for a workflow management tool, PNS continues to develop a ship maintenance planning integration tool to allow for physical subspace planning and workflow management to improve safety and efficiency in submarine maintenance work. SUBSpace is an application offering real-time status updates for various functions, planning capabilities, and notifications. This will allow for a more efficient schedule and increase safety of work practices.



EPA SUPPORT FOR PIPELINE DEVELOPMENT

FY2020 | LAB: Portsmouth Naval Shipyard

\$65,000

Following the initial pilot project effort to enhance the non-destructive testing (NDT) curriculum for the Great Bay Community College in the Community College System of New Hampshire, PNS is continuing to work with the institutions to enhance NDT workforce development. PNS is leveraging its preexisting Educational Partnership Agreement (EPA) and the pilot project to develop a learning center to supplement the in-service NDT program in the colleges, which will allow the NDT curriculum to align with NDT needs at the shipyard.



DoN T2 TRAINING



DoD TECHNOLOGY TRANSFER AND TRANSITION WORKING GROUP

The DoD Technology Transfer and Transition Working Group (T3WG) continues to host virtual training sessions for the DoD T2 community.

Each session covers a relevant topic to the Department of Defense (DoD) T2 community and is hosted on a webinar platform. These webinars are recorded and available for personnel, through the Federal Laboratory Consortium (FLC) on-demand training portal to access on-demand. The FLC has worked with the DoD T3WG to continue to facilitate and host the training webinars in the remote environment. Past webinar topics include:

- Educational Partnership Agreements (EPAs)
- Technology Transition 101: A Part of the T2 Process
- Technology Transition Success Story: Naval Air Warfare Center Aircraft Division
- Alternative Options for Protecting and Licensing Government Inventions
- Overview of the Office of the Secretary of Defense Intellectual Property Cadre

DoD T3WG webinar sessions and other FLC on-demand training materials are available here: <https://federallabs.org/learning-center/on-demand/>



DOMESTIC PREPAREDNESS SUPPORT INITIATIVE (DPSI)

DOMESTIC PREPAREDNESS SUPPORT INITIATIVE (DPSI)

The Domestic Preparedness Support Initiative (DPSI), within the Department of Defense (DoD) Office of the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs, coordinates efforts to identify, evaluate, deploy and transfer technology, items and equipment to federal, state and local first responders. DPSI seeks to protect and to secure the homeland by sharing expertise, equipment and technology, as appropriate, across military and civilian boundaries.

Through these critical partnerships, DPSI bridges the gap between first responder needs and relevant, available DoD technologies, items and equipment. Annually, the Department of the Navy (DoN) T2 program facilitates a DoN DPSI prototype competition. The winner receives approximately \$100,000 in funding to test, evaluate or transfer the technology to the first responder community. The competition also increases DPSI's exposure to DoN laboratories and Office of Research and Technology Applications representatives.

For FY2021, DPSI funding was awarded to the Naval Medical Center Portsmouth to support the Head-Mounted Emergency Responder Operational Sonography (HEROS) technology for domestic first responders. The technology will combine existing handheld ultrasound imaging systems with a head-mounted display to create a novel medical imaging system for both Navy corpsmen and civilian emergency medical service personnel. HEROS will not interfere with helicopter night vision systems. In addition, it will fulfill two critical needs in aerial emergency medicine — usability in small spaces and capability to send diagnostic imaging results to the emergency room destination for diagnosis and patient care.

During FY2021, the DoN T2 program sent a representative to the following conferences in support of the DPSI mission:

- Sea-Air-Space (National Harbor, Maryland)
- Association of the United States Army (Washington, D.C.)
- National Security Innovation Network Homeland Security Startup Studio (virtual)
- NavalX Agility Summit (Alexandria, Virginia)
- Naval Energetics and Systems Technology Collaboration Event (National Harbor, Maryland)



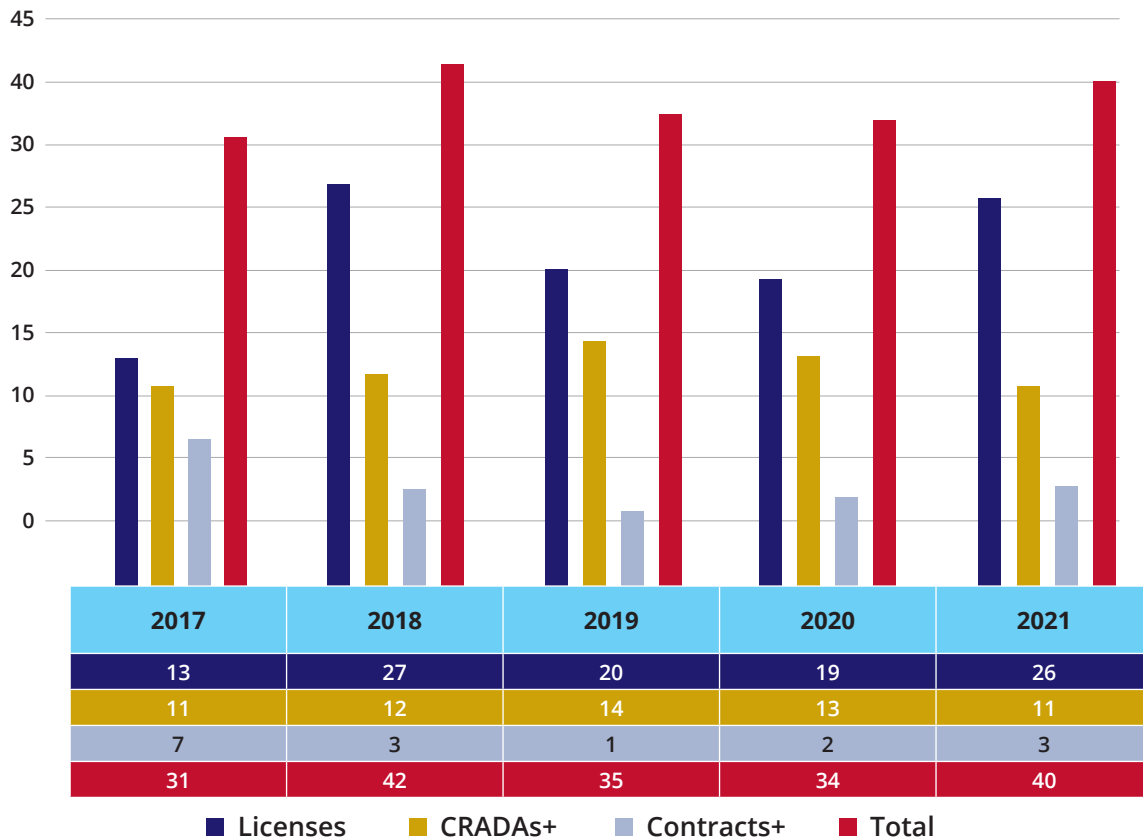
OUR FEDERAL PARTNERS

HOW TECHLINK PARTNERS WITH DoN T2

Established in 1996, TechLink is a center within Montana State University's (MSU's) Office of Research and Economic Development. In 1999, TechLink became the Department of Defense's (DoD) first national partnership intermediary, helping companies nationwide to license DoD inventions.

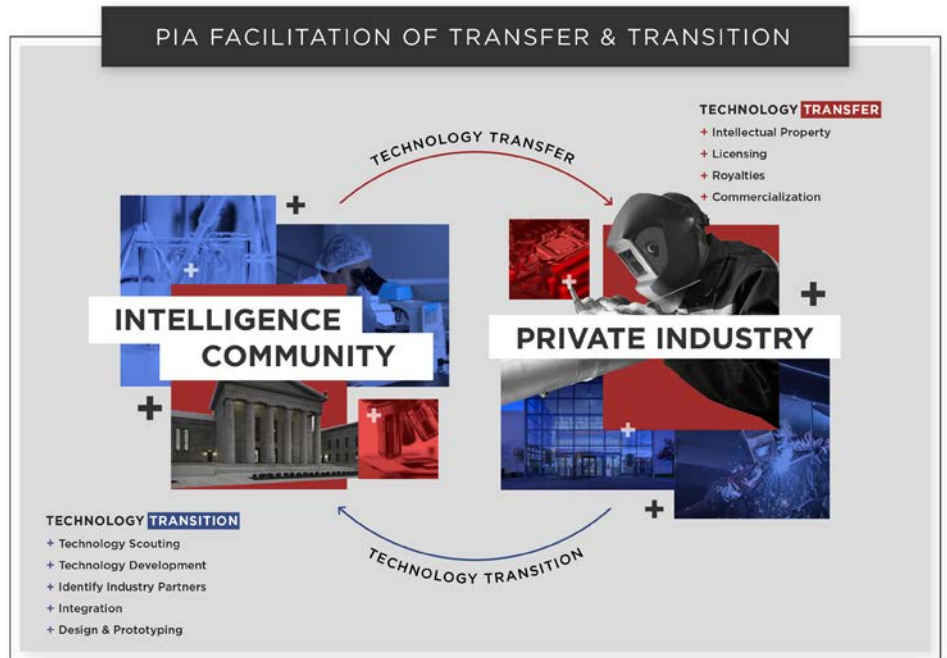
In addition, TechLink manages MSU's Technology Transfer Office, operates the university's Software Engineering and Analysis Laboratory, promotes Small Business Innovation Research, and engages with other MSU entities to advance the state's innovation economy and foster economic development.

Between 2000 and 2017, TechLink helped broker 1,142 technology transfer agreements between the DoD and 728 private companies, with total sales of new products and services resulting from the agreements of \$2.6 billion, with \$1.1 billion to the U.S. military.



MILTECH SUPPORTS MANUFACTURING

MilTech provides hands-on, industry-experienced product design, prototyping and manufacturing expertise to help the Department of Defense (DoD) accelerate the transition of technology to the U.S. warfighter. Since 2004, MilTech has performed over 150 technology acceleration and transition projects for every military service, including joint and special commands.



The DoD T2 national Partnership Intermediary Agreement, established in 2004, focuses on leveraging the National Institute of Standards and Technology Manufacturing Extension Partnership (NISTMEP) for T2 as well as:

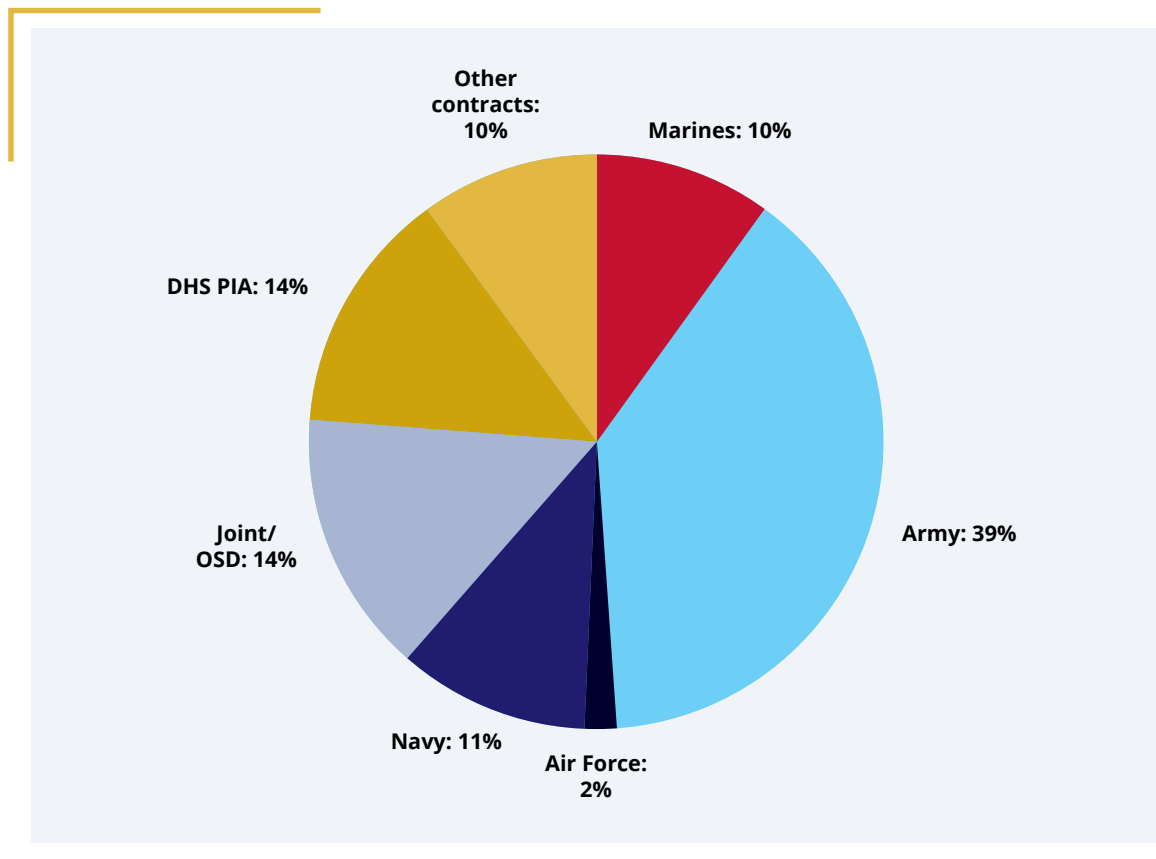
- Information research and analysis, and technology scouting
- Identification of technology gaps and unmet needs to support future operation
- Insight on current and forecast future market landscape for target technologies
- Identification of qualified, nontraditional vendors for procurement and new technology development
- Design, review and prototyping
- Design for manufacturing and assembly
- Technical data package review or ownership
- Prototyping and development assistance
- Manufacturing expertise, process improvement and process management
- Ensure sustainable, quality and cost-effective delivery
- Supply chain and manufacturing process qualification and development
- Improve and support internal processes and projects to enhance technology transition

MilTech also sponsors a Virtual Industry Day as a tech scouting platform that connects government needs to industry solutions — www.virtualindustryday.org.



In FY2021, MilTech assisted the Department of the Navy (DoN) with 20 projects, to add to the roughly two dozen from the previous year. Overall, the DoN represented 11% of MilTech’s customers for the year.

MilTech Customers FY 2021



| FY21 NAVY PROJECTS | |
|---|------------------|
| Lasercom Design and Manufacturability | NRL |
| CBRN Canteen Filler Concept Development | MCSC |
| Small Boat System Development Assistance | USN |
| Fender Design | USN |
| Product Registration Assistance NAVclean Dry | USN |
| Development and Testing TACAD Glider | MCWL |
| Tech Scouting for MCWL | MCWL |
| Sensitive Project | USN |
| PRU-70 Manufacturing and TDP Development Assistance | USN |
| Sensitive Project | USN |
| CBRN Prototyping Design Assistance | MCSC |
| Manufacturability, Design Review, Prototyping Evaluation, Tech Scouting and Supply chain Evaluation | MCSC, MCWL MCRCO |
| Sensitive Project | USN |
| Unmanned Systems Market Research | USN |
| CBRN RDS Design review and manufacturability Assessment | MCSC |
| Laser Communication Manufacturability Supply Chain Assessment | NRL |
| Communication Systems | MCSC |
| Individual Armor Design review and Manufacturability Assessment | MCSC |
| MAAWs Fire Control Enhancement Assessment | MCSC |
| Program Management Weapons Roadmap Study | MCSC |

FEDERAL LABORATORY CONSORTIUM (FLC)

www.federallabs.org

The FLC's purpose is to promote, educate and facilitate federal technology transfer and increase the impact of that transfer to benefit the U.S. economy, national security and society.

The FLC community comprises more than 300 federal laboratories, facilities and research centers, and their parent agencies. Members include world-renowned scientists, engineers, inventors, entrepreneurs, academics, laboratory personnel and T2 professionals.

"This is an exciting time for the FLC. Our members' ability to move technology from the laboratory to the marketplace is ideally positioned to support the new White House priorities," said Paul Zielinski, FLC executive director.

LATEST HAPPENINGS

The FLC outlined several short-term objectives, including:

- Complete the next iteration and build out of the FLC website and FLC Business, the next-generation search tool for federal laboratory resources.
- Collect, develop and maintain an online learning center that will include available T2 training, webinars and related materials.
- Continue to recruit non-involved federal labs.

2021 NATIONAL MEETING

Due to the pandemic, the largest federal technology transfer meeting of the year, the FLC National Meeting, took place in a virtual format from April 6-8, 2021. The meeting included a variety of events, from training sessions on technology transfer and the specifics of Cooperative Research and Development Agreements to networking and professional development sessions where attendees could strengthen their T2 skills while connecting with others in the industry.

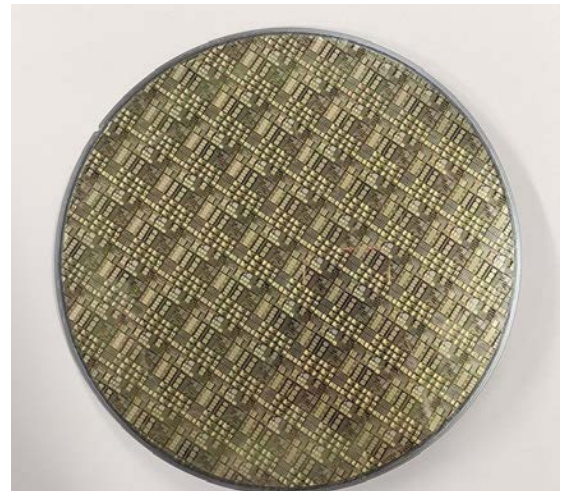
The meeting also included the presentation of more than 30 technology transfer-based awards that highlighted some of the best work done in the industry over the previous 12 months.

The 2022 national meeting will be held virtually and is scheduled for June 21-23.

EXCELLENCE IN TECHNOLOGY TRANSFER AWARD WINNER

Naval Research Laboratory (NRL) — NRL-Qromis Partnership Positions Gallium to Dethrone Silicon in Semiconductor Device Market

Gallium nitride (GaN) is poised to become a less expensive, more efficient commercial replacement for silicon in semiconductor devices, thanks to a partnership between NRL and Silicon Valley-based semiconductor start-up Qromis.



NRL photo

TECHNOLOGY TRANSFER INNOVATION AWARD WINNER



NSWC Crane photo

Naval Surface Warfare Center (NSWC), Crane Division — NSWC Crane Offsets Pandemic's Impact on Health and Economy with Rapid Licensing Program

An accelerated technology licensing program has helped NSWC Crane simultaneously address two seemingly opposing forces that have characterized the COVID-19 pandemic: the need for commercial activity to support economic growth and the equally critical need for health and safety precautions.

FY2021 FLC NAVY OFFICERS

Annually, FLC members voted on several new leadership positions within the organization, including several national and regional positions. These officers began serving two-year terms at the start of the new fiscal year on Oct. 1, 2021.

The DoN T2 community is excited to announce the following teammate was newly elected:



Paige George

Southeast Regional Coordinator

NAVAL SURFACE WARFARE CENTER (NSWC) PANAMA CITY DIVISION

The following teammates are continuing to serve in their elected positions:



Valerie Larkin

Member-At-Large

NAVAL UNDERSEA WARFARE CENTER (NUWC) DIVISION NEWPORT



Jenna Dix

Facilitate Committee Chair

NAVAL SURFACE WARFARE CENTER (NSWC) CRANE DIVISION

The DoN T2 community would also like to extend a congratulations to John Dement, Naval Surface Warfare Center (NSWC) Crane Division, on a successful term as FLC chair.



John Dement

FLC Chair

NAVAL SURFACE WARFARE CENTER (NSWC) CRANE DIVISION

NATIONAL SECURITY INNOVATION NETWORK FOUNDRY

National Security Innovation Network (NSIN) is an unrivaled problem-solving network that adapts to the emerging needs of those who serve in the defense of our national security, and it is dedicated to bringing together defense, academic and entrepreneurial innovators to solve national security problems.

NSIN Foundry, formerly the Defense Innovation Accelerator (DIA), matches cutting-edge Department of Defense (DoD) technologies with teams of entrepreneurs during an intensive 22-week cohort.



Entrepreneurs work closely with lab inventors, mentors, coaches, subject matter experts and DoD end-users to assess market viability and commercialization potential. Successful teams form new companies, license the technologies and develop solutions that impact the DoD and the private sector. The program comprises a multi-phased approach:

- **Phase I:** Entrepreneur teams work with inventors and advisors to identify customers and develop business plans and market analyses, in order to find a technology-market fit for their technologies.
- **Phase II:** Teams further refine their business proposals and commercialization plans as they address developmental milestones to develop the technology into the basis of their newly formed startup.
- **Post Foundry:** Active teams continue working with lab technology transfer offices to secure licensing agreements and continue technology development.

For Foundry 2021, 22 DoD lab-developed technologies, including 12 technologies from six naval labs, participated in the program. At the conclusion of the program, eight teams are continuing to commercialize their technologies.

HOMELAND SECURITY STARTUP STUDIO

This year, Department of Homeland Security Science and Technology Directorate (DHS S&T) launched the Homeland Security Startup Studio, powered by FedTech, to pair defense technologies with those interested in starting a high-tech company to support the mission of DHS and the Homeland Security Enterprise.

For HSSS 2021, 10 technologies, including one technology from a naval lab, participated in the program.

On the following page is a summary of the naval technologies that were selected to participate in the Foundry 2021 and the HSSS 2021, including updates on the company's work on its specific technology.

NAVY TEAMS PARTICIPATING IN FOUNDRY 2021 AND HSSS 2021:

| NAVY LAB | TECHNOLOGY NAME | PROGRAM | TEAM NAME | TEAM STATUS |
|--|--|--------------|--------------------------------------|---|
| NRL | Vascular Heat Exchanger | Foundry 2021 | Liquid Channels | The team continues the commercialization effort. |
| NRL | Novel Material for Flexible Electronics | Foundry 2021 | LOPA | The team continues the commercialization effort and is currently considering a license with lab. |
| NRL | Super Absorbent Foam | Foundry 2021 | Foamme Technologies | The team continues the commercialization effort. |
| NRL | PCB Interface for RF & Microwave Communications | Foundry 2021 | PROTO-COMM | The team incorporated and is currently working with lab to secure a license. The team recently participated in a DoD SBIR Sprint. |
| NSWC Carderock | CLASSIC (Safe Li-ion Battery Transport) | Foundry 2021 | LiBRA | The team incorporated and is currently considering a license with lab. |
| NSWC Crane | Copper Ink for 3D Printing Electronic Circuit | Foundry 2021 | Kupros | The team continues the commercialization effort after securing a license with the lab. |
| NSWC Crane | Data Pre-Processing with Natural Language Processing | Foundry 2021 | Semiring | The team incorporated and secured a license. The team recently participated in a DoD SBIR Sprint. |
| NIWC Pacific | Unmanned Underwater Vehicle (UUV) Launch and Recovery | Foundry 2021 | | The team disbanded during the program due to team dynamics. |
| NIWC Pacific | Unmanned Ground Vehicle (UGV) and Communication Relay | Foundry 2021 | First Contact Communications Company | The team incorporated and is currently considering a license with lab. |
| NUWC Keyport | Modularized Unmanned Underwater Vehicle (UUV) | Foundry 2021 | | The team disbanded during the program after concluding the market need is not strong enough. |
| Puget Sound Naval Shipyard and Intermediate Maintenance Facility | Mercury-free Handheld UV Disinfection | Foundry 2021 | Leuvilume | The team incorporated and continues the commercialization effort. |
| NRL | CT-Analyst for Detection of Chemical and Biological Agents | HSSS 2021 | | The team disbanded during the program after concluding the market need is not strong enough. |

PAST TEAM UPDATES

To date, four NSIN Defense Innovation Accelerator (DIA) entrepreneur teams have successfully secured a licensing agreement with naval laboratories, and 13 teams are assessing or negotiating a potential licensing agreement. The table below showcases successful licenses secured by DIA teams from previous cohorts.

| NAVY LAB | TECHNOLOGY NAME | ACCELERATOR COHORT | TEAM NAME | AGREEMENT STATUS |
|-------------|--|-----------------------------|-------------------------------------|--|
| NRL | Copper Ink for 3D Printing Electronic Circuit | DIA 2021 | Kupros | Executed non-exclusive COVID R&D patent license. |
| NRL | Data Pre-Processing with Natural Language Processing | DIA 2021 | Semiring | Executed non-exclusive COVID R&D patent license. |
| NSWC Crane | Wireless Power System Design Toolbox | DIA 2020 | Forcyte | Executed non-exclusive license. Currently developing a CRADA. |
| NSWC Corona | Amorphous Glass Foam | FedTech Startup Studio 2015 | Microsphere Material Solutions, LLC | Executed a patent license and CRADA. |





@Navy_T2



Navy Technology
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<https://www.navytechtransfer.navy.mil/>

ACRONYMS

| | |
|--------------------|---|
| ANTX | Advanced Naval Technology Exercise |
| AR | Augmented Reality |
| Av-DEC | Aviation Devices and Electronic Components |
| CNR | Chief of Naval Research |
| CRADA | Cooperative Research and Development Agreement |
| CSM | College of Southern Maryland |
| DCI | Deputy Commandant for Information |
| DC-I-WRD | Deputy Commandant for Information War Room Division |
| DoD | Department of Defense |
| DoN | Department of the Navy |
| DPSI | Domestic Preparedness Support Initiative |
| EDC | Economic Development Corporation |
| EDC-VC | Economic Development Corporation-Ventura County |
| EMILY | Emergency Integrated Lifesaving Lanyard |
| EOD | Explosive Ordnance Disposal |
| EPA | Educational Partnership Agreement |
| FAR | Federal Acquisition Regulations |
| FLC | Federal Laboratory Consortium |
| FRC | Fleet Readiness Center |
| FRCE | Fleet Readiness Center East |
| FRCSE | Fleet Readiness Center Southeast |
| FRCSW | Fleet Readiness Center Southwest |
| FY | Fiscal Year |
| HQ | Headquarters |
| HQMC | Headquarters Marine Corps |
| IDE | Innovation Discovery Event |
| IMPAX | Innovation and Modernization Patuxent River |
| IP | Intellectual Property |
| LIDAR | Light Detection and Ranging |
| LP-CRADA | Limited Purpose-CRADA |
| MARFORCYBER | Marine Corps Cyberspace Command |
| MCCOG | Marine Corps Cyberspace Operations Group |
| MCSC | Marine Corps System Command |

ACRONYMS (CONT.)

| | |
|----------------------|---|
| MCAS | Marine Corps Air Station |
| MCICOM | Marine Corps Installations Command |
| MCWL | Marine Corps Warfighter Laboratory |
| MOA | Memorandum of Agreement |
| MOU | Memorandum of Understanding |
| NAMRU | Naval Medical Research Unit |
| NASC | Naval Aviation Systems Consortium |
| NAVAIR | Naval Air Systems Command |
| NAVALX | Naval Expeditions Agility Office |
| NAVFAC EXWC | Naval Facilities Engineering and Expeditionary Warfare Center |
| NAVSEA | Naval Sea Systems Command |
| NAVWAR | Naval Information Warfare Systems Command |
| NAWCAD | Naval Air Warfare Center Aircraft Division |
| NAWCAD LK | Naval Air Warfare Center Aircraft Division, Lakehurst |
| NAWCAD PAX | Naval Air Warfare Center Aircraft Division, Patuxent River |
| NAWC TSD | Naval Air Warfare Center Training Systems Division |
| NAWCWD | Naval Air Warfare Center Weapons Division |
| NAWCWD CL | Naval Air Warfare Center Weapons Division, China Lake |
| NAWCWD PM | Naval Air Warfare Center Weapons Division, Point Mugu |
| NIST | National Institute of Standards and Technology |
| NIWC | Naval Information Warfare Center |
| NIWC ATLANTIC | Naval Information Warfare Center, Atlantic |
| NIWC PACIFIC | Naval Information Warfare Center, Pacific |
| NMC | Naval Medical Center |
| NMCP | Naval Medical Center, Portsmouth |
| NMCS | Naval Medical Center, San Diego |
| NMOC | Naval Meteorology and Oceanography Command |
| NMRC | Naval Medical Research Center |
| NPS | Naval Postgraduate School |
| NRL | Naval Research Laboratory |
| NSWC | Naval Surface Warfare Center |
| NSWC CA | Naval Surface Warfare Center, Carderock Division |
| NSWC CD | Naval Surface Warfare Center, Crane Division |

ACRONYMS (CONT.)

| | |
|-----------------------|---|
| NSWC DD | Naval Surface Warfare Center, Dahlgren Division |
| NSWC CORDIV | Naval Surface Warfare Center, Corona Division |
| NSWC IHD | Naval Surface Warfare Center, Indian Head Division |
| NSWC PCD | Naval Surface Warfare Center, Panama City Division |
| NSWC PHD | Naval Surface Warfare Center, Port Hueneme Division |
| NUWC | Naval Undersea Warfare Center |
| NUWC DK | Naval Undersea Warfare Center, Division Keyport |
| NUWC DN | Naval Undersea Warfare Center, Division Newport |
| NWDC | Naval Warfare Development Command |
| ONR | Office of Naval Research |
| ORTA | Office of Research and Technology Applications |
| OTA | Other Transaction Authority |
| PEO | Program Executive Office |
| PHNS & IMF | Pearl Harbor Naval Shipyard & Intermediate Maintenance Facility |
| PIA | Partnership Intermediary Agreement |
| PLA | Patent License Agreement |
| PM | Program Manager |
| PNSY | Portsmouth Naval Shipyard |
| PO | Program Office |
| POC | Point of Contact |
| PSNS & IMF | Puget Sound Naval Shipyard & Intermediate Maintenance Facility |
| R&D | Research & Development |
| RDT&E | Research, Development, Test & Evaluation |
| S&T | Science and Technology |
| SBIR | Small Business Innovation Research |
| SME | Subject Matter Expert |
| STEM | Science, Technology, Engineering and Mathematics |
| STTR | Small Business Technology Transfer |
| T2 | Technology Transfer |
| UAS | Unmanned Aircraft Systems |
| USMC | United States Marine Corps |
| USV | Unmanned Surface Vehicle |



WHERE TO FIND US

<https://www.navytechtransfer.navy.mil/>