

# NPS Students Accelerate Innovative Over-The-Horizon Technology Solution

MONTEREY, CALIFORNIA, USA, February 6, 2024 /EINPresswire.com/ -- Since Secretary of the Navy Carlos Del Toro announced the establishment of the [Naval Innovation Center](#) at the Naval Postgraduate School (NPS) in 2022, the institution has worked to establish the processes needed to support and empower student ideas and align them to defense critical technological areas, as well as force design imperatives outlined in the Chief of Naval Operations Navigation Plan (CNO NAVPLAN).

Nowhere is that alignment more evident than with the Naval Innovation Exchange (NIX) program – a multidisciplinary approach to solving some of the most complex problems that the Navy faces today.

In one of the first research projects under the NIX Intelligent Autonomous Systems (IAS) team, U.S. Navy Lt. Austin Dumas and Lt. Cmdr. Hans Lauzen and U.S. Marine Corps Capt. Daniel Lim conceived an autonomous over-the-horizon (OTH) maritime solution – a capability that has the potential to be in the hands of warfighters as early as next year.

“It’s been exciting to work with this team,” said NPS Research Assistant Professor Dr. Sean Kragelund, who served as the primary advisor for Dumas, Lauzen and Lim. “The students and their advisors all bring a diverse set of skills and experiences to bear on this problem. It’s been especially remarkable to watch these students, in a very short time, coordinate with so many different stakeholders, from Navy S&T and acquisition personnel to operational forces, and work with our industry partners to develop this capability.”

The NIX construct, used in tandem with the Interdisciplinary Transition Team (ITT) as part of the



An autonomous over-the-horizon communications solution conceived by student researchers at the Naval Postgraduate School was successfully demonstrated by the Navy and industry partners during the summer and fall of 2023.

NPS innovation process, allowed Dumas, Lauzen and Lim to quickly apply their research on a prototype that was successfully demonstrated in field exercises during the summer and fall. The three students were then able to brief the test results to major stakeholders such as the office of the Assistant Secretary of the Navy for Research, Development and Acquisition (ASN RD&A) and the Chief of Naval Research, among others.

Dumas, a student dual-enrolled in the Space Systems Operations and Space Systems Engineering curricula at NPS, noticed a capability gap in his operational experience before coming to Monterey. To leverage the NIX program, Dumas was paired with Lauzen, a Surface Warfare and Information Professional Officer studying in the Space Systems Operations program, and Lim, a communications officer who is dual-enrolled in the Space Systems Operations and Systems Acquisition Management curricula.

“When you come to NPS with operational knowledge and background, you are able to view the education through that lens, which is unique,” said Dumas. “Furthermore, NPS provides the ability to partner with students with different operational experience and expertise, and with government organizations to accelerate that effort and do something highly relevant.”

Dumas added, “(NIX) allowed us to bring together multiple students from various curriculums and different backgrounds, which enabled us to utilize experience from operations and engineering to acquisitions. Most importantly, it helped us form a team of multi-disciplinary students and advisors to broaden the scope of our research, view the solution as a system of systems, and address the full scope of the desired capability.”

The core of NIX lies in its dedication to accelerating project development for students, from mere ideation to prototype deployment and completion.

Under the NIX construct, Dumas, Lauzen and Lim were able to rapidly conceptualize, prototype and experiment by utilizing new and pre-existing agreements with industry known as Cooperative Research and Development Agreements (CRADAs). One of these CRADAs is with Saronic Technologies, a Texas-based company consisting of veterans, technologists, and world-class engineers who specialize in autonomous and unmanned vehicle technology.

The three students leveraged NPS’ CRADA with Saronic and were able to successfully demonstrate prototype low-observable unmanned surface vehicles (USVs) that enable over-the-horizon communications via resilient space-based architecture such as Starlink, Iridium and SATPAQ.

“Within 14 months, we were able to accomplish something I had never seen before,” Lauzen said. “With the tools that NPS has allowed us to have, the CRADA partnerships with industry, the hands-on fleet experiment and operational testing that we’re able to participate in, we now have a product that is able to be delivered to the warfighter faster than it would take any other program office to create.”

The technology was successfully demonstrated during Navy exercises in the summer of 2023, as well as at NPS' own [Joint Interagency Field Experimentation \(JIFX\)](#) event in October.

Following their demonstrations, Dumas, Lauzen and Lim were able to provide an in-depth brief on the results of their work to senior representatives from resource sponsors and stakeholders. Among those briefed on the students' work were Vice Adm. Francis Morley, Principal Military Deputy, ASN RD&A, and Rear Adm. Kurt Rothenhaus, Chief of Naval Research.

Future experimentation utilizing the OTH autonomous system will take place during a U.S. Pacific Fleet exercise in early 2024. As a result, the potential exists for Dumas, Lauzen and Lim to see their innovative NPS research transition from concept to capability in less than a year.

"The NIX structure facilitates first-rate mentorship, offering us consistent and quality access to guidance from the school, warfare centers, and operational forces," noted Dumas. "With an array of workshops and campus events, we've gained firsthand experience and interactions with industry, academia, and operational force representatives."

NPS' NIX IAS team is funded by the Office of Naval Research (ONR) through the [Consortium for Robotics and Unmanned Systems Education & Research \(CRUSER\)](#). It not only provides financial support for student and faculty researchers, covering travel, conferences, equipment, and professorial support, but also ensures a holistic research experience.

"As part of the Naval Innovation Exchange, we're able to bring a multidisciplinary approach to provide a solution," said Lim. "We brought engineers, we brought operations, and we brought (Defense Management) students to come together to be able to not only curate on the idea, but to develop a capability."

Dumas noted that the best thing about the NIX is its ability to not only design and accelerate a capability that is missing in the joint force, but also the ability to rapidly procure that capability and get it in the hands of the warfighter.

"It's an entirely different thing to know that when I go back to a unit, there could be a whole new capability that I helped propel," said Dumas. "I think that's the real, tangible difference that NPS is able to provide as far as relevance for warfighters."

The Cooperative Research and Development Agreement (CRADA) does not constitute endorsement of Saronic Technologies or its products and services by the Naval Postgraduate School, the Department of the Navy, or the Department of Defense.

Lt. Cmdr. Ed Early  
Naval Postgraduate School

+1 831-656-3567

PAO@nps.edu

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