

2021 YEAR-END REVIEW

MESSAGE FROM THE DEAN

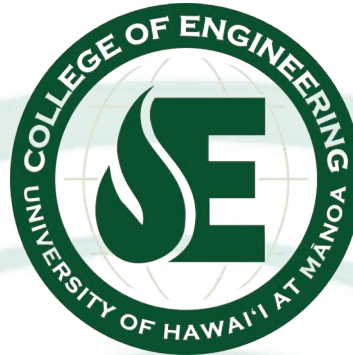
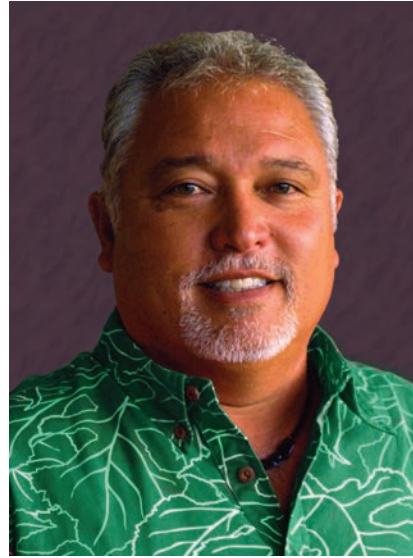
Aloha kākou,

From new student programs to awards & accolades and research discoveries, we kept it moving in 2021. We couldn't be prouder of our students, faculty, staff, and community partners for all of their achievements despite the continued challenges of the global pandemic. Read on for some of the highlights from this past year, and here's to the next chapter!

Mahalo,



Brennon Morioka, PhD, PE
Dean, College of Engineering



\$8.2M in research awards

with \$8.2M in expenditures for AY 20-21

17% growth

in new graduate enrollment

30 initiates

in the first year of our BAM
(Bachelor and Master) Program

16 VIPs and 12 clubs

Vertically Integrated Projects and
professional organizations

Follow us on social media
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2ND PLACE FINISH IN NATIONAL ROCKET COMPETITION FOR UH MĀNOA STUDENTS

University of Hawai'i at Mānoa's Team Hōkūlele won second place in the Friends of Amateur Rocketry (FAR) 1030 Competition on June 5. The team members from the College of Engineering successfully launched their 15-foot rocket and payload in the national competition in Mojave, Calif.

The students launched their rocket called Kuamo'o (Milky Way) in the competition's 30,000-foot category, a cruising altitude for some commercial airplanes. Seven other teams competed in the 30,000-foot division.

"Absolute chicken-skin moment that has me both nervous and excited. When I saw the rocket gain altitude, I knew that all of our hard work had paid off," said Kailer Okura, Team Hōkūlele member.

Kuamo'o was the first two-stage/motor rocket for Team Hōkūlele, which was established in 2019. The rocket reached a height of approximately 30,000 feet and protected its components from liftoff to touchdown. The team also created a radio-controlled rover capable of traveling a distance of at least 10 feet after touchdown.

The students ran into several issues with their rocket leading up to the competition, however, they were able to solve all of them before the launch.

"I was relieved that everything fired as expected, the two stages separated as expected, and all the recovery systems deployed as expected," said Leah Toma, Team Hōkūlele member. "I'm really glad that everything else went much better than we had expected and was recovered in really good condition."



UH COMPETES IN FIRST EVER INTERNATIONAL DRIVERLESS CAR RACING EVENT

The University of Hawai'i made history competing in the Indy Autonomous Challenge competition—the first ever autonomous race car event. The team, UH AI Racing Tech, achieved its fastest speed ever and placed 6th in the competition.

TUM Autonomous Motorsport from Germany won the final round shootout and \$1 million. Nine teams representing 21 universities in nine countries qualified for the competition on October 23 at the Indianapolis Motor Speedway, the home of the Indianapolis 500.

"On race day, we pushed our car, our code and ourselves to the limits, achieving 115 miles per hour, the fastest our car has ever gone and within 25 miles per hour of the winning speeds," said Chris Battista, UH AI Racing Tech team member and former UH Mānoa research scientist. "It was a wild ride as we came together as a team this last week and put in the final changes and upgrades needed for the race. While we are all saddened by the car's spinout, it was caused by hardware issues outside of our control, and we have high hopes for the next run."

Battista added, "I'm tremendously proud of everything we've learned and what the team has achieved, and can't wait to see AI Racing Tech back on the track and faster than ever, sometime in the next year."



PACIFIC REGION HS STUDENTS EXPERIENCE TRANSPORTATION, STEM CAREERS

A new summer engineering program provided 20 high school students from across the Pacific with an immersive learning experience in STEM (science, technology, engineering and mathematics). Hosted by the University of Hawai'i at Mānoa College of Engineering, the inaugural Pacific Summer Transportation Education Program, June 7–30, welcomed students from Hawai'i in-person, and from American Samoa and the Commonwealth of the Northern Mariana Islands virtually.

Despite COVID-19 restrictions, Department of Civil and Environmental Engineering Assistant Professor Roger Chen and his team were able to offer the students activities that introduced them to careers in transportation and STEM fields. Activities included a combination of educational field trips throughout Honolulu, and in-class modules with UH faculty and transportation professionals. Students learned about problems in transportation and how engineering solutions require a strong vision, careful measurement and data collection through first-hand observations/ experience, and knowing the end-user well.

"The feedback was overwhelmingly positive from students across all jurisdictions," Chen said. "Many students indicated they were not certain of what to expect coming into the camp, but left with a greater appreciation of STEM and transportation as a career path, an understanding of engineering design problems, and, overall, a fun experience! Many of them consider UH Mānoa as a serious option for pursuing a degree in engineering or other STEM fields."



UH ENGINEERING STUDENTS PROVIDING TUTORING AND MENTORSHIP TO CASTLE HIGH SCHOOL

The UH Mānoa College of Engineering launched a new intensive program in partnership with James B. Castle High School in Kāneʻohe to create a bridge between high school and college students, allowing high-performing undergraduates to connect with and mentor high schoolers needing extra assistance in math and science classes on a nearly peer-to-peer level.

EngineeringHI, a pilot project made possible by a \$26,912 Harold K.L. Castle Foundation grant, has employed a select group of outstanding engineering students from the University of Hawai'i at Mānoa's College of Engineering will provide one-to-one tutoring sessions via Zoom to high school students from Castle High School in STEM subjects including algebra, trigonometry, pre-calculus, physics, chemistry, and more. The College leveraged its group of top-performing engineering students who are trained to provide outreach to our local schools and mentor/advise fellow students, as well as students from its student engineering organizations and other qualified individuals, to provide tutoring and mentorship. Through resources available via UH's Online Learning Academy (OLA) Program, mentors were trained in building relationships with students and in teaching relevant content in a way that is accessible.



ENGINEERING STUDENTS RELEASE DRIVERLESS DELIVERY VEHICLE PROTOTYPE

Autonomous delivery vehicles are quickly becoming a reality worldwide, and, due to their touchless capability, their need has only escalated during the COVID-19 pandemic. One example is autonomous pizza delivery vehicles. Earlier this year, Domino's partnered with Nuro to offer the service in Houston, Texas. Nuro's R2 robot is the first completely autonomous, occupantless on-road delivery vehicle with regulatory approval by the U.S. Department of Transportation.

Soon, the University of Hawai'i at Mānoa may have its own fully-autonomous delivery vehicle thanks to a project by College of Engineering students. Members of UH Parcel Service (UHPS) have created a wireless prototype delivery vehicle capable of traveling up to four miles per hour, carrying a load of up to 300 pounds, traversing up inclines of 15 degrees (more than most wheelchair ramps) and delivering and receiving packages. While the prototype is able to travel in straight lines and make turns autonomously, programming it to travel across the UH Mānoa campus will be the task for next year's team.

Daryll Suyat, a spring 2021 mechanical engineering graduate, served as the 2020–21 UHPS project manager. He oversaw the four subsystem teams: structure, powertrain/steering, autonomy and electrical.

"You have a bunch of different metals you welded into a frame, and a bunch of wires, a bunch of different components and being able to see it run and run fairly well was a great experience for me," Suyat said.

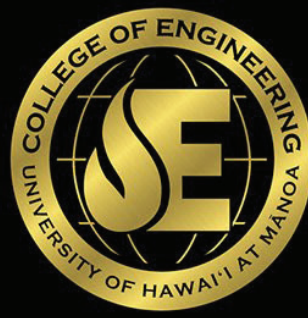


HACKING FOR DEFENSE (H4D) STARTS AT UH MĀNOA

As the U.S. Department of Defense (DoD) faces new and complex issues involving national security, a new generation of solution providers are needed to face this oncoming threat.

The University of Hawaiʻi (UH) kicked off its Hacking for Defense (H4D) program in spring 2021 as part of its partnership with the National Security Innovation Network (NSIN), a program office within the DoD. The UH Office of Innovation and Commercialization (OIC) and the UH Mānoa College of Engineering collaborated to bring H4D to its ME 491 course. Students teamed up to develop innovative solutions to problem sets identified by sponsors the U.S. Marine Corps Forces, Pacific (MARFORPAC) and the U.S. Air force at Joint Base Pearl Harbor-Hickam (JBPHH).

Collaborating with MARFORPAC, students Tyler Bagnall, Bryson Doan, Joshua James Fernandez, Russell Kiyono, Jr. and Mike Polivany created a dashboard that provides information on airports, seaports and tunnels throughout Hawaiʻi to quickly collect information on modes of travel prior to a mission.



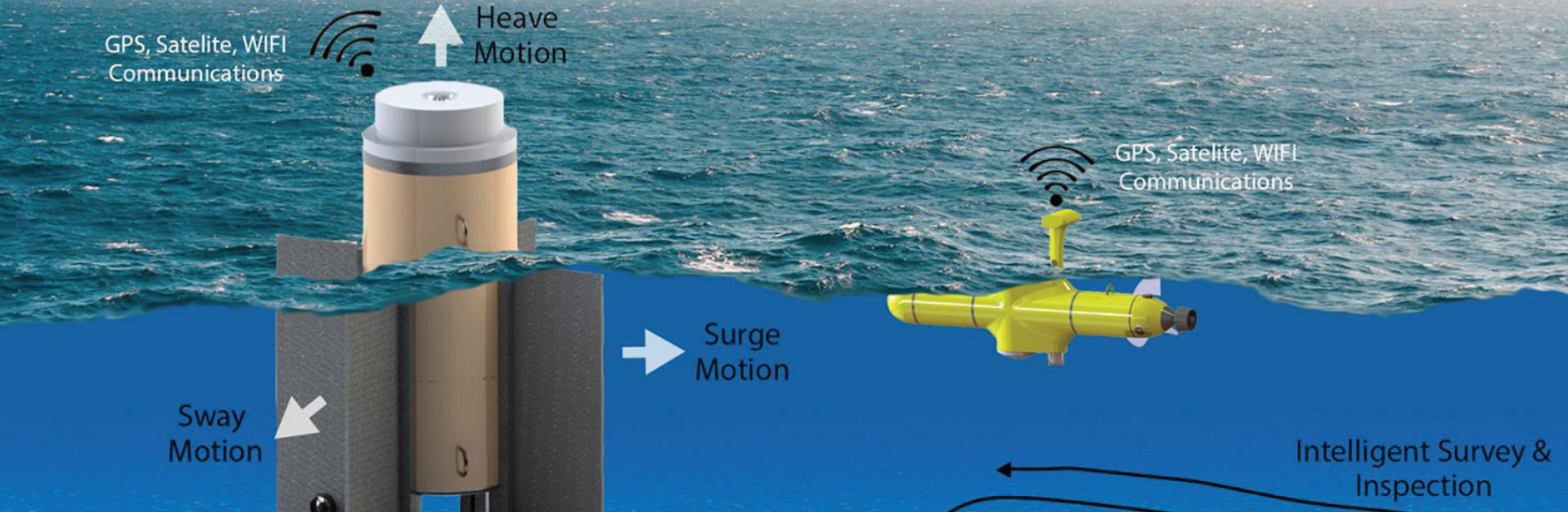
LEADERSHIP SEMINAR SERIES

Presented by the Hayashida Family

COLLEGE LAUNCHES NEW PROGRAM FOCUSING ON LEADERSHIP

Recognizing that 'leadership' is an important component of an engineering education, the College launched its new Leadership Seminar Series, last February. Each month, the College invited local leaders to share their wisdom with our students. The Series kicked off with a talk by local developer Stanford Carr. He was followed by Honolulu Mayor Rick Blangiardi who regaled students with stories of his time as a TV station manager and UH football coach. Glen Kaneshige (Nordic PCL) and Lance Wilhelm (The Wilhelm Group) spoke about being entrusted with big decisions early on in their careers and how they handled them. Meanwhile, Susan Eichor (aio) and Susan Yamada (UH Ventures) encouraged the students to take chances in their careers. Micah Kāne spoke about his time working for the Lingle gubernatorial campaign and how he learned that every single voter/person counts. Keiki Pua Dancil (Pūlama Lāna'i) and Ka'iu Kimura ('Imiloa Astronomy Center) spoke about the challenges of being "outsiders" in their field(s) and encouraged young female engineers to stay confident and believe in themselves. Lori Kahikina (HART) and Ed Sniffen (State Dept. of Transportation) spoke about the pressures of their high-profile jobs and shared how some tips on how to cope with stress. Jennifer Sabas (Daniel K. Inouye Institute) and Donn Murakami (U.S. Navy) encouraged students to dream big and stand firm in their convictions.

A common theme among all the speakers was to motivate students to strive high and reach back to their Hawai'i roots and values as they find success in their careers.

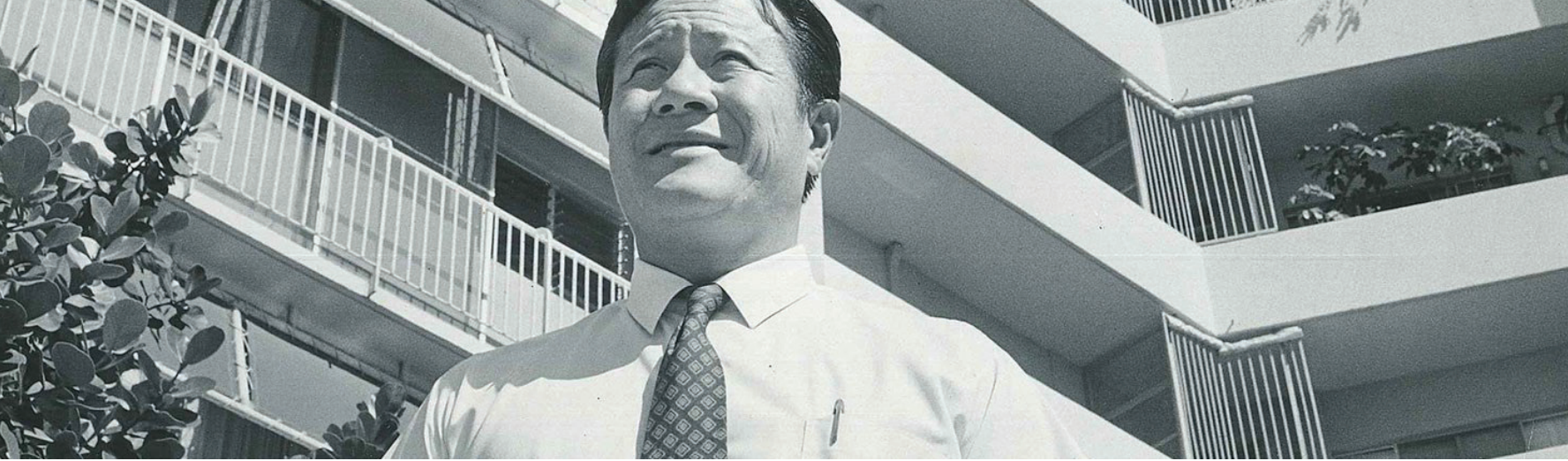


UH TEAM WINS OCEAN OBSERVING PRIZE!

University of Hawai'i at Mānoa's Team Hālonā was selected as one of seven winners in the joint U.S. Department of Energy and NOAA Ocean Observing Prize: Design Contest, for an exceptionally innovative wave-powered autonomous underwater vehicle (AUV) charging station capable of providing continuous power to resident AUVs for monitoring and predicting hurricanes.

Team Hālonā is led by PhD students Nicholas Ulm of the Department of Ocean and Resources Engineering in the School of Ocean and Earth Science and Technology, and Jonathan Wallen of the College of Engineering (COE). Substantial contributions to the team's success came from PhD student Allison Chua of Dalhousie University in Halifax, who brings extensive AUV expertise, and COE Masters student Maddyson Jeske with important contributions to the AUV docking design. Faculty advisors for the team are Pat Cross (Program Manager at the Hawai'i Natural Energy Institute for marine energy, including support to the Navy's Wave Energy Test Site), Kumar Rajagopalan (WEC hydrodynamics), and Kevin Davies (power management) from HNEI, and Zhuoyuan Song (AUV docking) from COE.

The Ocean Observing Prize began with the DISCOVER Competition, where the UH team won an award in July 2020, along with ten other teams in the competition. Team Hālonā's design integrates a wave energy converter (WEC) with docking and charging capabilities to host an AUV. The WEC design is based on wave action entering a chamber and forcing air through a turbine to generate electricity. The AUV is equipped with sensing equipment to measure key ocean parameters and upload its data after docking at the base of the WEC. Sensing devices include an acoustic Doppler current profiler, using the frequency of sound waves to measure ocean current velocities, and a conductivity, temperature, and depth sensor, collecting data that is critical to forecasting intensity changes ahead of tropical storm systems.



\$2M IN GIFTS FUND COLLEGE OF ENGINEERING ENDOWED CHAIR, HONOR HAWAI'I ENGINEER

A pair of anonymous \$1 million gifts from the same donor to the University of Hawai'i at Mānoa's College of Engineering establishes the college's first endowed chair in honor of world-renowned Hawai'i engineer Alfred A. Yee. Yee helped design some of Honolulu's most complex structures, from Alfred Preis's floating Arizona Memorial to Ossipoff's Diamond Head Apartments, the first precast, prestressed concrete tower in the country.

UH President David Lassner said, "We deeply appreciate this remarkable acknowledgment and expression of support from the community for the critical role the University of Hawai'i and our College of Engineering play every day in advancing the sustainability of our islands and the world beyond. There is no greater challenge to our future, and solutions will take all of us working together as exemplified by this gift."

Housed in the Department of Civil and Environmental Engineering, the Dr. Alfred A. Yee Chair of Sustainability and Resilience will provide ongoing funding to recruit and retain outstanding faculty with expertise in sustainability and resilience, fueling competitive research, engineering -sector resiliency solutions and teaching in these critical areas.

College of Engineering Dean Brennon Morioka said, "This is an amazing opportunity for the college and our faculty to continue to step up as a state and international leader in sustainability and resiliency in response to climate change and its impacts like sea-level rise. We are forever grateful for this financial support, which we view as a vote of confidence by our local community that the University of Hawai'i can and should lead on many fronts related to the challenges our state faces."



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Hau'oli Makahiki Hou!
Happy New Year!