Report to the

BOARD

OF TRUSTEES

November 2020
On October 28, 2020, UMass Dartmouth announced a $4.2 million grant from the Office of Naval Research (ONR) to fund new research projects through the Marine and UnderSea Technology research program (MUST) in partnership with the Naval Undersea Warfare Center Division Newport (NUWC). This latest award follows a $4.6 million grant from the Office of Naval Research in February 2020 - the largest research award in the university’s history.

This second award from the United States Navy will create new opportunities for regional collaborations across academia, industry, and the military. New projects look to address problems of naval relevance in the areas of batteries, acoustics, modeling of ocean dynamics, bio-fouling, composite materials, autonomy, machine learning, and marine robotics. The grant will be administered by the Marine and UnderSea Technology research program (MUST), which was formed to address the needs of the Navy and the defense industry by developing innovative faculty research and a pipeline of highly trained workers.

“With this latest award from the U.S. Navy, UMass Dartmouth has once again proven its leadership in research and development for the marine technology sector. I am proud that our faculty use their research expertise to foster regional industry collaborations that continuously build a blue economy business and innovation ecosystem,” said UMass Dartmouth Acting Chancellor Mark Preble. “A special thanks to Congressman Bill Keating, who understands the practical importance of UMass Dartmouth’s marine science and technology research to our region’s economic health and our country’s defense needs. I want to thank Congressman Keating and the entire Massachusetts Congressional Delegation for supporting our university’s blue economy ambitions.”

“Southeastern Massachusetts is well-positioned to be the national leader on blue economy projects, and this $4.25 million grant from the Office of Naval Research reaffirms what we already know: that UMass Dartmouth is uniquely positioned to lead the region forward as a blue economy hub,” said Congressman Bill Keating. “I was proud to work to secure an increase in the Navy’s Research, Development, Testing, & Evaluation budget, and it’s great to see some of that money coming back to the district. The cutting-edge research undertaken at UMass Dartmouth will assist the Navy and sailors stationed throughout the world, and that is something our region should be proud of.”

“With this grant award from the Office of Naval Research, UMass Dartmouth is once again demonstrating its excellence in marine science technology and engineering, an economic sector that will be critical to the future of the region,” said UMass President Marty Meehan. “I want to thank Congressman Keating for his support of this initiative and congratulate the outstanding faculty whose research expertise attracted this investment.”

To respond to the needs of the Navy, MUST has focused on areas that can both address short-term concerns and long-term goals. These areas of study include autonomous underwater vehicles and increasing their battery life, bio-fouling, composite materials, machine learning with marine robotics, modeling of ocean dynamics, and the use of undersea acoustics for communications and sensing technologies.

“UMass Dartmouth is the public research university for the South Coast of Massachusetts and a crucial driver of the state’s blue economy. The $4.2M grant from the Office of Naval Research will fund new marine science projects and help to cement the region and state as an international hub for advanced marine technology. This robust and consistent federal investment in UMass Dartmouth’s MUST Research Program is a testament to the strong partnerships and future collaborations being developed between the Navy and the UMass Dartmouth community,” said Senator Edward Markey.

“This grant is a testament to the students and faculty at UMass Dartmouth and their essential research in marine technology,” said Senator Elizabeth Warren. “The Navy’s investment in the Marine and UnderSea Technology research program will help UMass Dartmouth and the South Coast continue to lead, innovate, and advance the Commonwealth’s Blue Economy.”

“Building a Blue Economy that creates jobs, protects our environment and strengthens our region for generations requires investments in the students and researchers leading our way. Empowered by this historic grant, the UMass Dartmouth MUST Research Program will continue to chart a path towards establishing an international hub for advanced marine technology throughout Southeastern New England,” said Congressman Joseph P. Kennedy III.

This latest award showcases UMass Dartmouth’s continued leadership in marine science and technology education and research. Since 2015, the Navy has awarded the university with 21 grants worth nearly $14 million in investment.

“This investment builds off of UMass Dartmouth’s longstanding specialization in marine science and technology fields by connecting our students and researchers to emerging technological challenges of regional and national significance,” said Associate Provost Ramprasad Balasubramanian, who leads the Marine and UnderSea Technology (MUST) research program. “MUST provides a well-spring of talent and technologies to the U.S. Navy and the companies they partner with, while further cementing the university’s role in the regional marine science and technology innovation economy.”
UMass Dartmouth recently announced that the National Security Agency and the Department of Homeland Security have designated the university as a National Center of Academic Excellence in Cybersecurity - Cyber Research (CAE-R) through academic year 2025.

UMass Dartmouth named a National Center of Academic Excellence in Cybersecurity

UMass Dartmouth received this prestigious classification through the demonstrated success and commitment to prepare students to address national challenges related to cybersecurity as well as advanced faculty research in the field.

“I am proud that UMass Dartmouth has received such a prestigious designation and it is yet another example of how our University is achieving new academic heights,” said UMass Dartmouth Acting Chancellor Mark Preble. “This recognition showcases the incredible work being conducted by our faculty, opportunities for our students, and commitment to the greater good.”

In recent years, UMass Dartmouth has poised itself to be a leader in cybersecurity education and research. In 2019, UMass Dartmouth signed an agreement with the 102nd Intelligence Wing of the Air National Guard stationed at Joint Base Cape Cod to develop education and workforce training in cybersecurity for personnel at the base and university students. The partnership has allowed 102nd Intelligence Wing staff and UMass Dartmouth faculty to collaborate on the development of cybersecurity undergraduate and graduate programs, certificates, and concentrations. Base staff engaged in cybersecurity efforts serve as mentors for university students and create awareness of cybersecurity career opportunities with the Air National Guard.

“The designation of UMass Dartmouth as a National Center of Academic Excellence in Cyber Research (CAE-R) is the culmination of a tremendous amount of work on the part of our faculty, particularly Professor Lance Fiordella who led the effort that resulted in this designation,” noted UMass Dartmouth Acting Provost and Vice Chancellor for Academic Affairs, Michael Goodman. “This recognition reflects the emergence of our College of Engineering as a major player in the critically important field of Cyber Research.”

Identifying the growing federal, state, and local needs, the University established a Cybersecurity Center for cybersecurity education, training, and research. The Center’s mission is to support the needs of industry and government partners by establishing long-term partnerships and collaboration among industry, academia, and government. The Center is composed of faculty who research a variety of areas alongside graduate and undergraduate students.

“The university has made significant investments to become a leader in education and scholarship in cybersecurity. Since 2018, the College of Engineering has hired six new faculty to become part of a team of approximately one dozen faculty overall who are working collaboratively to address challenges in the security engineering of complex systems. This designation recognizes our commitment to research and education in cybersecurity,” said Jean VanderGheynst, Dean of the UMass Dartmouth College of Engineering and Interim Dean of the School for Marine Science and Technology.

UMass Dartmouth programs earn high national rankings

As the reputation of the University grows, its programs have consistently earned high rankings in national lists that help influence prospective student decisions. Recently, the Department of Political Science and its online political science bachelor’s program was ranked 9th in the nation by Learn.org. The program was selected for its academic and career resources, the quality of education, faculty research, and more. The Healthcare Management program offered at the Charlton College of Business ranked #10 among “Best Online Master’s Healthcare Management Degrees” by College Choice. Rankings are based on affordability, reputation, and retention, according to College Choice’s methodology for rankings. Animation Career Review has ranked the Illustration Program at the College of Visual & Performing Arts (CVPA) #2 in Massachusetts. The rankings are based on academic reputation, admission selectivity, depth of the program, and value as it relates to tuition and indebtedness as well as geographic location. The CVPA’s Illustration Program includes BFA and MFA options.
A National Science Foundation (NSF) grant that will prepare students for the nation’s high-quality STEM workforce was awarded to Associate Professor of Mathematics Yanlai Chen and colleagues from the Colleges of Arts and Sciences and Engineering. The $650,000 grant will provide awards averaging $5,000 to 80 promising low-income students while ensuring computer-aided problem-solving in authentic settings is taught in core STEM courses. The S-STEM scholars will be selected from the departments of biology, chemistry, computer science, engineering, mathematics, and physics. The grant, Implementation of a Contextualized Computing Pedagogy in STEM Core Courses and its Impact on Undergraduate Student Academic Success, Retention, and Graduation, is also known as the ACCOMPLISH grant. In addition to financial assistance, the grant aims to provide multi-faceted and near-peer mentoring, social support, and a contextualized computing-centered education framework for eligible STEM students to prepare them to compete successfully in graduate school and careers in high-demand fields.

“The grant will provide financial scholarships directly to qualified students who have an unmet need following the regular aid provided by UMass Dartmouth,” said Chen. “This gap is currently close to $5,000; the grant can assist 80 students over five years.

In addition to providing this extra layer of financial aid, the project features a comprehensive support system encompassing mentoring and career enrichment, and a state-of-the-art pedagogy integrating contextualized computing, data analysis, and authentic problem solving across the STEM disciplines. Lastly, these STEM scholars will be admitted in cohorts which will enhance their social belonging and aid retention.”

Mathematics Professor earns $650K grant to support and prepare students for STEM workforce

Physics Professor awarded $75K for black hole research

Gravitational waves, predicted by Albert Einstein’s general relativity theory 100 years ago, are “ripples” in the fabric of space-time that travel at the speed of light. LIGO made the first-ever direct detection of a gravitational-wave signal from a binary system of two, near 30-solar-mass black holes located over a billion light-years away. In 2016, gravitational waves became directly observable due to the enormous investment in hardware, theory, and data analysis methods, into the National Science Foundation’s LIGO laboratory. The founders of LIGO were awarded the 2017 Nobel Prize in Physics. Since then several other detections have been made, more detectors have become operational, and the future space-borne observatory plans may be accelerated. The strongest sources of this radiation are the mergers of highly massive and compact astrophysical objects, such as black holes and neutron stars. Khanna’s research makes use of Einstein’s general relativity theory to estimate properties of the gravitational waves produced by one of their strongest sources—the collision and merger of two black holes. “This is very important to the success of the above-mentioned observatories because theory-based, waveform templates are required to develop a matched-filter for successful detection of these waves,” says Khanna.

A black hole merger is an extremely complex process, even from the point of view of numerical simulations on the largest supercomputers, therefore Dr. Khanna uses various approximation techniques (black hole perturbation theory) to simplify this problem significantly and make it more tractable. Khanna works closely with collaborators at the Max Planck Institute for Gravitational Physics and MIT, and locally with Dr. Scott Field and Dr. Sigal Gottlieb at UMass Dartmouth and contributes to this major modeling effort.
Professors receive $200K from the National Science Foundation to study the physics of droplets

Research interest in understanding the wetting and spreading phenomena of a droplet landing on a complex shape surface through numerical simulations has risen dramatically since the start of the era of scientific computing and high-speed/definition video camera. This topic has attracted applied mathematicians, physicists, engineers, and computational scientists working together in a multidisciplinary environment due to its broad applications in industry, medicine, and biology. Many publications are related to this topic, ranging from laboratory experiments, mathematical and physical modeling to numerical simulations and visualizations. The hope is that the computer simulations based on the best mathematical model can closely match the flow behavior recorded with the high-speed camera.

Alfa Heryudono, associate professor of Mathematics, and Mehdi Raessi, associate professor of Mechanical Engineering, are the recipients of a $200,000 award from the National Science Foundation (NSF) for their three-year project "PUMA-VOF: Partition of Unity Multivariate Approximation for the Volume of Fluid Method." An essential focus of the application is in understanding the process of administering an eye drop on top of the tear film on the human cornea.

Computers (from "mini" to "super" version) used for these scientific simulations have become more advanced and faster year after year. Unfortunately, most number-crunching codes that are driving them still rely on legacy methods with lower accuracy. "Our goal is to utilize mathematical and numerical techniques to significantly improve accuracy without adding computational resources," says Heryudono. Having highly-accurate simulations may unravel features that cannot be captured with the low-order method.

"This project lies at the intersection of mathematical modeling, multiphase flow, and ophthalmology, which makes it particularly exciting," says Raessi. "Through advanced computational simulations, this project will, hopefully, lead to eye drop administering protocols that enable enhanced and targeted drug delivery, and avoid drug overdosage."

The project has a strong component on research training and integrated education of students in an interdisciplinary setting. "Because the Volume-of-Fluid method is commonly used in studies of multiphase flow, this research will be extremely useful to researchers in academia, industry, and national labs for a wide variety of scientific and engineering applications," says Heryudono.
U.S. News & World Report announced their 2021 College Rankings, and UMass Dartmouth again ranked high for its impact on the upward social mobility of its students. UMass Dartmouth, the only nationally ranked Massachusetts doctoral research university located south of Boston, ranked #76 nationwide and #2 in Massachusetts on the social mobility ranking list. Moving up twelve spots from its 2020 ranking, UMass Dartmouth ranked #3 among the thirty-one national universities in New England. This ranking measures a school’s success at graduating students that receive federal Pell Grants compared to non-Pell Grant recipients. The university was tied in the national rankings with the University of Arizona and UC-Berkeley.

Achieving National University status for the fifth straight year, UMass Dartmouth ranked #217 among national universities, making it the third highest-ranked public university in Massachusetts. The U.S. News National University designation is reserved for universities offering undergraduate, master’s, and doctoral programs, and are committed to producing groundbreaking research.

“These rankings are a perfect example of the hard work of the faculty and staff at UMass Dartmouth and their commitment to student learning and success,” said Acting Chancellor Mark Preble. “These rankings also represent the ambitious drive of our students who use our University as the foundation for their future.”

UMass Dartmouth climbs in national student social mobility ranking by U.S. News & World Report

Mathematics Professor chosen for prestigious Association for Women in Mathematics Fellowship

“I am very happy to announce the 2021 list of new AWM fellows. We recognize these individuals for their exceptional dedication to increasing the success and visibility of women in mathematics,” said Ruth Haas, President of the Association for Women in Mathematics.

Gottlieb was chosen for this prestigious fellowship for her exemplary and lasting work in forging an active and positive research environment, proactive outreach, effective mentoring, and promoting the success of women in mathematical and computational sciences.

“My dedication to fostering a positive research environment at UMass Dartmouth led to the creation of the Center for Scientific Computing and Visualization Research. The CSCVR supports over 30 faculty and their students who use and/or develop computational tools in their research. Through the CSCVR, I am able to engage in proactive outreach and mentoring of colleagues at UMassD and in other universities,” said Gottlieb.

Established in 2012, the CSCVR aims to promote and conduct high-level interdisciplinary and multidisciplinary research in scientific computing and to mentor students — undergraduate and graduate — with interests in scientific computing in a supportive, broad, and deep interdisciplinary research environment.

The AWM fellow status, and especially the citation, is deeply meaningful to me because it recognizes my efforts in promoting the success of colleagues in the mathematical and computational sciences,” Sigal Gottlieb, Professor of Mathematics and founding Director of the Center for Scientific Computing and Visualization Research (CSCVR), said.

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Jumpstart—a national early education organization—believes that all children have the potential to succeed. Jumpstart’s work advances equitable learning outcomes for young children in underserved communities through a combination of high-quality programming, advocacy, and leadership.

“In the face of COVID-19 and extended out-of-school time,” said Jumpstart CEO Naila Bolus, “Jumpstart is proud to be able to partner with UMass Dartmouth to support local children and communities hit hardest by gaps in access to critical early learning opportunities.”

Teams of 5-7 Jumpstart Corps Members will spend between 200 and 300 hours during the school year with PACE Head Start, ensuring children develop key kindergarten readiness skills. Jumpstart Corps Members reduce the student-to-teacher ratio to 3:1 in every Jumpstart classroom, allowing children to receive an individualized learning experience and develop nurturing relationships with caring adults.

“I am excited that UMass Dartmouth is continuing to partner with regional organizations to strengthen the economic, cultural, and most importantly, educational aspirations of the SouthCoast,” said UMass Dartmouth Acting Chancellor Mark Preble. “With Jumpstart, our students are learning valuable skills for their future while making a difference in the lives of young children in the region.”

“Jumpstart is a great resource for PACE’s Head Start program. For many months, we have been unable to have any volunteers work with our programs due to COVID-19. This program allows these dedicated volunteers an opportunity to virtually contribute to the success of our students during this time and beyond,” said Pam Kuechler, Executive Director of PACE, Inc, a private, non-profit, community based, anti-poverty agency serving the Greater New Bedford area.

Jumpstart Corps Members receive up to sixty hours of high-quality pre-service training and ongoing coaching. In a typical year, Jumpstart’s training help college students develop key workforce readiness skills, such as leadership, time management, and teamwork. Training also focuses on early education topics, such as early language development, positive classroom management, and impactful adult-child interactions, as well as successful program implementation.

Each element of Jumpstart’s program and evidence-based curriculum is intentionally designed to meet the needs of the community being served. Jumpstart monitors a child’s progress towards kindergarten readiness throughout their participation and uses the data to continuously improve the program. On average, 90% of Jumpstart children make gains in the language and literacy skills determined to be predictors of kindergarten readiness and school success. Many Corps Members also choose to pursue a career in teaching after Jumpstart, allowing more experienced and passionate teachers to enter the field.
UMassD holds 2020 Election Events to foster civil dialogue

Leading up to the 2020 presidential election, the UMassD Votes Coalition held numerous voter registration informational events to help students with their 2020 voting plan. A cross-collaboration of groups then planned pre- and post-election events to allow students to discuss their thoughts, analyze the results, and interact with civility.

In a letter to the campus community, Acting Chancellor Preble stated “So as the votes are tallied on election night, and potentially beyond, I ask that you keep it civil when engaging with others on what are very contentious topics for many of us. We must all be mindful as we express our views of the need to take the time to listen, especially during these challenging times. It is only through a greater understanding of each other that progress can be made. We can disagree without being disagreeable. As the philosopher, Aristotle famously noted, “It is the mark of an educated mind to be able to entertain a thought without accepting it.” As college students in pursuit of knowledge and great ambitions, you are equipped with the skills to connect with your peers and to engage with those with whom you disagree respectfully and thoughtfully. I look to you to employ these skills as we navigate the election together.”

University places in top 20 Engineering schools nationwide for the percentage of women Ph.D.’s

The American Society for Engineering Education recently released a report that places the UMassD College of Engineering in the top 20 out of 422 engineering schools and colleges for the percentage of Ph.D.’s awarded to women. Over the past few years, the University has placed a strong emphasis on increasing the representation and success of women in our Ph.D. programs. The University is also in the top 25 for the percentage of women in tenure/tenure track positions for engineering.
For the 9th year in a row, UMass Dartmouth named one of the nation’s most environmentally responsible colleges

UMass Dartmouth is once again of the nation’s most environmentally responsible colleges according to the recently published，《The Princeton Review Guide to Green Colleges: 2021 Edition》. The Princeton Review surveyed administrators at 695 colleges in 2019-20 about their institutions’ commitments to the environment and sustainability. Editors analyzed more than 25 survey data points in the process of choosing schools for the guide.

UMass Dartmouth has made the prestigious list for nine straight years.

“UMass Dartmouth continues our efforts to support a broad portfolio of sustainable activities across the campus. We are honored to be recognized for the 9th year running and invite any prospective student who wants to attend a campus that is leading by example on sustainability, to check us out,” said Jamie Jacquart, Assistant Director of Campus Sustainability and Residential Initiatives.

UMass Dartmouth has increased its focus on making campus a more sustainable place.

“In 2020, the University was awarded a $100,000 grant from the Massachusetts Department of Energy (DOER) through its Leading by Example (LBE) program. The grant will fund the development of a Comprehensive Energy Master Plan to help understand the investment and implementation requirements to reach a greenhouse gas emissions reduction target of 80% by 2050 and pursue a more aggressive implementation strategy that targets carbon neutrality by 2030.

UMass Dartmouth also announced a partnership with the Climate Mayors Electric Vehicle Purchasing Collaborative and has committed to purchase 2 electric vehicles by 2021. In doing so, the University joined nearly a dozen universities and colleges and 225 fleets around the country pledging to purchase almost 3,800 electric vehicles.

“We strongly recommend UMass Dartmouth to students who want to study and live at a green college,” said Rob Franek, The Princeton Review’s Editor-in-Chief.

“Each and every one of the outstanding colleges in this edition of our guide offers both excellent academics and exemplary evidence of environmental commitment.”

In 2019, UMass Dartmouth signed the “Commitment Towards a goal of Zero Carbon Emissions” compact. This aspirational commitment sets a goal of achieving zero carbon emissions by 2030, or alternatively 2050 (the standard now being considered for Massachusetts), and preparing students to live and work sustainably, conducting research that encourages climate sustainability and resilience, and keeping the University community fully informed regarding progress related to environmental sustainability and climate resilience.

The university also launched the largest public battery storage system in Massachusetts at that time. The 520-kW system, in combination with other measures, will reduce the electrical load from the grid during peak usage times. The new battery was the latest in a series of campus sustainability infrastructure upgrades, including a 1.6MWh Co-generation plant and 369 kW of solar photovoltaic panels.

In 2018, the U.S. Environmental Protection Agency (EPA) named UMass Dartmouth as the “College/University Partner of the Year” for the 2018 national WasteWise awards. The UMass Dartmouth Dining Services team was recognized for its proper management of purchasing and food production to minimize leftovers. Dining Services also donates unsold, prepared packaged foods weekly during the school year to local liturgical ministries serving the homeless. In 2017, Dining Services unveiled a new program called Meals with Dignity, in which student volunteers work to package meals made with wholesome, leftover food from the dining hall on a biweekly basis and to deliver meals to the on-campus food pantry.