

UMass Dartmouth's Research Enterprise

Research is at the core of the University of Massachusetts Dartmouth's educational mission. As one of only 93 public universities in the country to achieve the R2 designation for high research activity, the discoveries at UMass Dartmouth directly impact the local knowledge economy and have implications that matter on the global stage. But what makes research at UMass Dartmouth even more remarkable is how it affects students. Public research universities like UMass Dartmouth are society's most powerful engine of opportunity and the research conducted creates new insights and solutions that translate into a brighter future for society.

A \$1.2M



Biodegradability Laboratory

officially opened in 2022. Jointly funded by the Massachusetts Technology Collaborative and advanced material company PrimaLoft, the lab supports the development of biodegradable and ocean-safe plastics and other materials. Researchers will use the equipment to measure the biodegradation of products in simulated environmental systems like landfills, oceans, wastewater, soil, and compost.



A Micro-OxyMax respirometer used to measure concentration of carbon dioxide and methane produced during biodegradation process

EMPOWERING STEM SKILLS



Associate Professor Tracie Ferreira working with graduate students to improve STEM and leadership skills

The University received a \$1.5M NSF grant to address the urgent need to develop initiatives that support the graduation of diverse populations of students in STEM to fulfill workforce demands and prepare graduate students to advance research discoveries into practice. "Our students are invested in their community and have the skills to advance discoveries here on the SouthCoast," said Associate Professor Tracie Ferreira of Bioengineering, and PI on the grant. The project aims to increase the STEM degree completion of low-income, high-achieving graduate students with demonstrated financial need.

In December 2022, UMass Dartmouth received a **\$3.4M grant from the Office of Naval Research** for research through the Marine and UnderSea Technology research program (MUST). This most recent award follows a \$4.3M grant in February 2022, \$4.6M in February 2020 (the largest research award in the university's history), and a \$4.2M grant in October 2020 to improve workforce development and research advances in critical areas of marine technology and offshore wind.

\$82M



Active Research Portfolio

Over the past three years, UMass Dartmouth received nearly **\$23M in external funding** to study the environment, sustainability, and clean energy.

\$26M

in new research grants in FY22

34% growth

in new awards from FY21 to FY22

Prominent Research Areas

- Artificial Intelligence
- Cybersecurity
- Data Science
- Fisheries & Oceanography
- High-Performance Computing
- Life Sciences
- Marine Science and Technology
- Portuguese Studies
- Renewable Energy
- STEM Education

\$2.7M grant to harness Big Data to improve diet & nutrition



The award for Associate Professor Hua Fang (Computer & Information Science) is the first National Institutes of Health Research Project Grant (R01) in university history and Fang's second such honor. Fang's project will leverage large longitudinal dietary data from chronic disease datasets like diabetes, cardiovascular disease, and obesity. The goal is to develop further intelligent diet quality pattern analysis that will help people visualize distinctions among complex diet patterns, shed light on how patterns evolve in relationship to health outcomes and clarify how well a diet pattern works in various subgroups.

Select Research Highlights

- Chancellor Professor of Mathematics Sigal Gottlieb was awarded \$600K grant to develop and implement robust and scalable numerical algorithms for U.S. Air Force.
- Associate Professor of Fisheries Oceanography Gavin Fay was awarded \$149,000 NSF planning grant to host collaborative research workshops to examine coastal resiliency holistically.
- Assistant Professor of Mechanical Engineering Banafsheh Seyed-Aghazadeh received more than \$1M in grants to support research efforts in fluid structure interactions and aerodynamics.
- Assistant Professor of Civil & Environmental Engineering Ryan Beemer was funded by NSF to research deployable underground geosystems to support offshore structures.

NURSING FACULTY AWARDED \$595,500 GRANT TO DEVELOP TRAINING IN THE TREATMENT OF OPIOID USE DISORDER

College of Nursing & Health Sciences Professor Mary McCurry, Associate Professor Monika Schuler, Associate Professor Jennifer Viveiros, Assistant Professor Shannon Avery-Desmarais, and Assistant Professor Mirinda Tyo were part of a research team that was awarded the two-year grant from the Foundation for Opioid Response Efforts (FORE). Their project, "Novel Organizational Simulation Training to Improve Graduate's Mastery & Attitudes (NO STIGMA)," aims to develop an evidence-based toolkit of high-fidelity simulations for undergraduate, masters, and doctoral nursing students to address stigma towards populations with opioid use disorder.

EXPLORING THE MYSTERIES OF SPACE

NASA awarded Professor of Physics Robert Fisher a \$550K grant to discover breakthroughs in supernovae exploding star simulations created via a supercomputer to shed light on the universe's origins. Associate Professor of Mathematics Scott Field and a group of graduate students discovered the first evidence of a large recoil velocity from a black hole merger moving at roughly 3 million miles per hour.



Professor Robert Fisher and Physics student McKenzie Ferrari are exploring the mysteries of the cosmos

INDUSTRY PARTNERSHIPS

Professor Pingguo He and Commonwealth Professor Kevin Stokesbury collaborate with offshore wind companies Vineyard Wind and Mayflower Wind to document changes in the marine habitat associated with offshore wind farm development. Projects in the wind farm areas include trawl surveys to assess commercially important fish species and drop camera surveys to study the ocean floor ecosystem.

