

POWERING
the **BLUE ECONOMY**

**Marine Energy
Collegiate
Competition**

U.S. DEPARTMENT OF ENERGY

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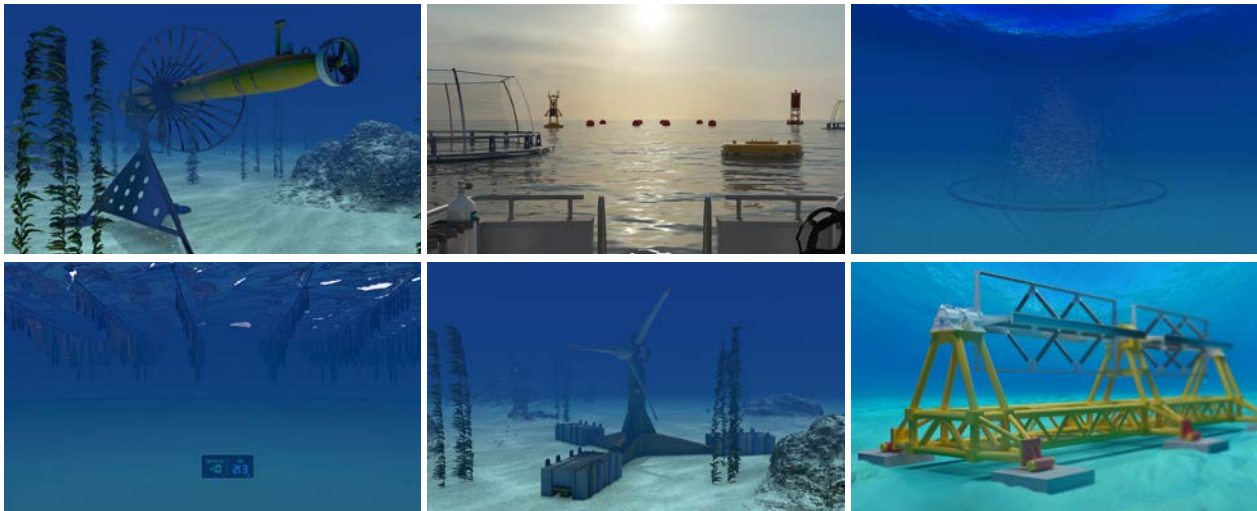
VIRTUAL MARINE ENERGY COLLEGIATE COMPETITION

2021 Program: **Powering the Blue Economy**

About the 2021 Virtual Marine Energy Collegiate Competition

The U.S. Department of Energy's (DOE) Water Power Technologies Office will virtually host the second Marine Energy Collegiate Competition (MECC), challenging interdisciplinary teams of undergraduate and graduate students to propose unique solutions for the burgeoning marine energy industry that can help power the blue economy.

Seventeen teams, comprising undergraduate and graduate students, answered the call to participate, putting their heads together to develop innovative marine energy solutions to benefit other existing maritime industries via real-world concept development experiences. Now, fifteen teams are heading into the 2021 MECC virtual pitches to showcase their marine energy innovations!



These groundbreaking competitors will put their creativity and know-how to the test, developing marine energy solutions for next-generation technologies such as autonomous vehicles to advance ocean exploration, battery and fuel cell technology for marine transportation, desalination to serve coastal and island communities, offshore renewable energy and alternative fuels, and more.

This year, competitors created a market research-supported business plan and conceptual-level design of a marketable device that powers a sector of the blue economy, as well as PowerPoint presentation and a poster summarizing the technical and business plans. New to the 2021 competition is the optional Build and Test Challenge, where teams built an effective prototype and tested their device for performance at model scale.

This year's teams include:

- Boise State University
- Institute of Engineering, National Autonomous University of Mexico, partnering with Thayer School of Engineering at Dartmouth, Dartmouth College, Autonomous University of Baja California, University of Caribe, National Polytechnic Institute, Autonomous University of Mexico State and Faculty of Accounting and Administration
- Manhattan College
- New Mexico State University
- North Carolina Agricultural and Technical University, partnering with University of North Carolina Wilmington–Center for Innovation and Entrepreneurship
- Oregon State University
- Purdue University
- University of California, Berkeley
- University of California, Riverside
- University of California, Santa Barbara
- University of Massachusetts Dartmouth
- University of Massachusetts Dartmouth, partnering with St. Bonaventure University
- University of North Florida
- University of Plymouth
- University of Washington
- Virginia Polytechnic Institute and State University
- Virginia Tech Center for Energy Harvesting Materials and Systems, partnering with University of California, Los Angeles

Pitch Schedule | [Award Ceremony Schedule](#)

Times (ET)	Monday, April 26th	Tuesday April 27th
8:45 - 9:00 AM	MECC Organizer Kickoff	MECC Organizer Kickoff
9:00 - 10:00 AM	University of Massachusetts Dartmouth	University of North Florida
10:00 - 11:00 AM	Manhattan College	University of Massachusetts Dartmouth and St. Bonaventure University
30 Minute Break		
11:30 AM - 12:30 PM	North Carolina A&T State University and University of North Carolina Wilmington	Virginia Tech Center for Energy Harvesting Materials and Systems and UCLA
12:30 - 1:30 PM	Virginia Polytechnic Institute and State University	New Mexico State University
30 Minute Break		
2:00 - 3:00 PM	Institute of Engineering, National Autonomous University of Mexico and Dartmouth College	Purdue University
3:00 - 4:00 PM	University of California, Berkeley	Boise State University
30 Minute Break		
4:30 - 5:30 PM	University of Washington	
5:30 - 6:30 PM	University of California, Santa Barbara	Oregon State University

Pitch Schedule | Award Ceremony Schedule

Times (ET)	Topic	Speaker
5:30pm – 5:35pm	Brief Introduction to the attendees Remarks from Judges	Arielle Cardinal: Competition Manager/MC, NREL Judges: <ul style="list-style-type: none">• Chris Cencula• Maha Haji• Jarett Goldsmith• Michela Grunebaum• Leslie-Ann McGee• Emily Morris
5:35pm – 5:40pm	MECC All-Team Video Introduction to Allison Johnson	Arielle Cardinal: Competition Manager/MC, NREL
5:40pm – 5:45pm	Welcome Remarks	Allison Johnson: Engagement & Outreach Lead, U.S. Department of Energy's Water Power Technologies Office
5:45pm – 6:15pm	Team Concept Elevator Pitches and Brief Summary of MECC Experience	Arielle Cardinal: Competition Manager/MC, NREL
6:15pm – 6:25pm	Introduction to Jenn Garson Awards Presentation	Arielle Cardinal: Competition Manager/MC, NREL Jenn Garson: Senior Advisor, U.S. Department of Energy's Water Power Technologies Office
6:25pm – 6:30pm	Final remarks	Arielle Cardinal: Competition Manager/MC, NREL

Page One | Page Two**Chris Cencula****SENIOR ELECTRICAL ENGINEER AT LIQUID ROBOTICS**

Chris Cencula's interest in electronics and mechanics started at a young age. With 30 years of experience in engineering, he now designs low-power, high-reliability electronic components for Liquid Robotics' Wave Glider. Among his many contributions as a senior electrical engineer, Chris developed a winch to use on the Wave Glider platform that provides power and communications to device payloads at up to 150-meter depths, enabling the device to collect water samples and perform acoustic communications in remote ocean locations. He received a Bachelor of Science in Electrical Engineering at Ohio State University. In his free time, Chris enjoys metal working, woodworking, windsurfing, flying, and experimenting with aircraft construction. He also earned his private pilot's license in 1987.

**Jarett Goldsmith****SENIOR MANAGER, OFFSHORE PROCUREMENT & CONTRACTS AT EDF RENEWABLES NORTH AMERICA**

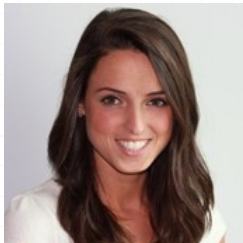
In his current role as Sr. Manager of Offshore Procurement and Contracts, Jarett Goldsmith is responsible for offshore wind technology strategy and managing, negotiating, and supporting the execution of equipment and logistics contracts for EDF Renewables' utility-scale offshore wind projects. Jarett has a background in mechanical engineering, project engineering and management, and sustainable energy systems, with specialized expertise in wind energy and offshore renewable energy projects. Prior to joining EDF, Jarett worked as a Senior Project Manager at DNV GL and received his master's degree under a full Erasmus Mundus Scholarship through the European Joint Masters in Management and Engineering of Environment and Energy ME3.

**Maha Haji****ASSISTANT PROFESSOR, SIBLEY SCHOOL OF MECHANICAL AND AEROSPACE ENGINEERING AT CORNELL UNIVERSITY**

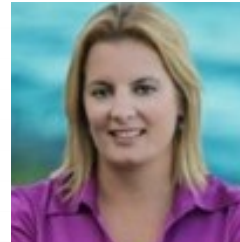
Dr. Maha Haji is a joint researcher in the Sibley School of Mechanical and Aerospace Engineering at Cornell and the Engineering Systems Laboratory at the Massachusetts Institute of Technology (MIT). She will join Cornell in July 2021 as an Assistant Professor of Mechanical and Systems Engineering and lead the Symbiotic Engineering and Analysis Lab to develop designs for symbiotic offshore systems to sustainably extract resources from the ocean, such as power, water, and food, as well as mineral resources key to the progress of clean energy. Dr. Haji previously worked in industry as an engineering consultant at ATA Engineering, where she used analysis-driven design to solve problems in topics ranging from aircraft and rockets to robotics and rollercoasters. Her current research focuses on utilizing multidisciplinary design optimization to develop a floating platform to provide recharging and data offloading capacity for autonomous underwater vehicles. Dr. Haji received her Ph.D. in Mechanical and Oceanographic Engineering in 2017 from the MIT-Woods Hole Oceanographic Institution Joint Program, where she focused on the design and prototyping of a symbiotic system to harvest uranium from seawater.

Page One | **Page Two****Michela Grunebaum****STRATEGIC PARTNERSHIPS MANAGER AT GREENTOWN LABS**

Michela Grunebaum is passionate about tackling one of the most significant challenges of our generation, climate change, through new and innovative strategies. Focusing on systemic impacts and transformative change in climate and energy systems, Michela has found Greentown Labs to be an ideal venue to collaborate on climate change solutions by driving the advancement, deployment, and commercialization of climate tech. As Strategic Partnerships Manager, Michela is responsible for managing the day-to-day execution of the 'Greentown Launch' program, Greentown Labs' flagship corporate partnerships accelerator program. As a Massachusetts native, Michela enjoys the proximity to Cape Cod, Vermont's Green Mountains, and New Hampshire's White Mountains where she enjoys spending time in nature, hiking, and skiing.

**Emily Morris****FOUNDER & CEO, EMRGY INC.**

Emily Morris is the Founder & CEO of Emrgy Inc., an energy technology company that is disrupting distributed power generation using modular hydropower systems. In 2017, she led Emrgy to install the first distributed hydropower array in the United States with the City of Denver and the US Bureau of Reclamation. That same year Emrgy was named Georgia's Top Startup. Before founding Emrgy in 2014, Emily managed over \$10 million in research contracts to build new technologies for energy, military and transportation innovation over 6 years. She graduated with a Bachelor of Science in Human and Organizational Development with a minor in Corporate Strategy from Vanderbilt University. In her community, Emily serves on the Board of Directors for Blue Skies Ministries, Inc. as well as a Childcare Volunteer Coordinator for the City of Refuge women's homeless shelter. Emily has been active in a range of entrepreneurial activities and has founded, advised, and/or led multiple startup for-profit and non-profit ventures totaling over \$1 million in annual proceeds.

**Leslie-Ann McGee****ASSISTANT DIRECTOR OF THE CENTER FOR MARINE ROBOTICS AT THE WOODS HOLE OCEANOGRAPHIC INSTITUTE**

At the Woods Hole Oceanographic Institute (WHOI), Leslie-Ann McGee develops strategic vision and leadership, manages external relations and partnerships, and retains primary responsibility for organizational and program management at the Center for Marine Robotics (CMR). Leslie-Ann provides leadership on customer relationship management for industrial clients and government sponsors, supports the CMR Director in the incubation of WHOI's robotics program, and manages the Robots to the Sea project, a partnership to drive innovation in marine robotics between WHOI and the Commonwealth of Massachusetts. Leslie-Ann attended University of Colorado at Boulder and Duke University's Nicholas School of the Environment, where she conducted her graduate research on the bluefin tuna at the New England Aquarium, and has held various positions at the World Ocean Council, Battelle Memorial Institute, National Oceanic & Atmospheric Administration, New England Fishery Management Council, and the Massachusetts Department of Fish and Game. Outside of WHOI, she runs Full Sail Consulting, a marine energy consulting firm.

Teams

Click on each team name to learn more about these young innovators participating in this year's pitches.

This year's MECC teams hail from all over the world, representing twelve states and several universities from Mexico.

From this diverse collection of teams comes some fascinating backstories and cutting-edge concepts that just might change the world.



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SCHOOLS

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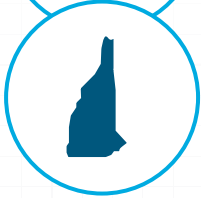
Boise State University

Team Tiamat Cultivation was drawn to the MECC because of their passion for the environment and the desire to develop solutions that have the potential to protect it. The team's aquaculture system design relies on marine energy and focuses on sustainability.



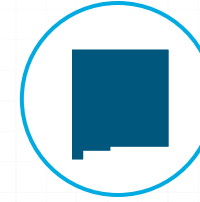
Manhattan College

To the Manhattan College Blue Energy team, the MECC not only allowed them to interact with many individuals and institutions with similar goals but also helped them improve their own concepts through peer review and shared resources. The team aims to develop a system capable of providing instrumented buoys with an energy solution that would allow them to function remotely and independently for the operational life of the system.



Institute of Engineering, National Autonomous University of Mexico, partnering with Thayer School of Engineering at Dartmouth, Dartmouth College, Autonomous University of Baja California, University of Caribe, National Polytechnic Institute, Autonomous University of Mexico State and Faculty of Accounting and Administration

The MECC serves as a real-life case study that leverages OTEC Internacional's academic knowledge and professional experience to realize the commercial development of ocean thermal energy conversion (OTEC) and provides the team a diverse and broad platform to share their knowledge and commitment to the development of marine renewable energy at a local, regional, and even global scale.



New Mexico State University

New Mexico State University engineering places a high value on student-led activities, making the MECC an ideal competition. Participation in the MECC provides team Wave-induced Ocean Work (WOW) the opportunity to align capstone design projects in cooperation with their college of engineering, while satisfying competition requirements.



North Carolina Agricultural and Technical University, partnering with University of North Carolina Wilmington–Center for Innovation and Entrepreneurship

Motivated by the largely untapped ocean resources, team Aggiehawk Energy joined the MECC with the goal to develop renewable marine energy devices to satisfy our food and energy needs and help drive the world to net-zero carbon emissions through blue economy innovation.

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Oregon State University

The MECC offers the Oregon State University team a valuable opportunity to work on real-world issues in an emerging technology area. Two specific team objectives are to develop a wave energy converter (WEC) that provides power to oceanographic sensors and to create a comprehensive market plan that incorporates industry needs and addresses community concerns. The team hopes to achieve these competition objectives through team and stakeholder collaboration.



University of California, Berkeley

Studying at a university next to the Pacific Ocean, team Golden Wave is fascinated by the power of waves and tides and sees potential in the ocean. Members of their team wish to learn about how marine energy, as a sustainable solution to the ongoing environmental crisis, can benefit our planet, and enjoy developing blue economy solutions alongside like-minded people. As participants in the MECC, we strive to learn about the different engineering applications and challenges in marine environments.



Purdue University

By competing in the MECC, The Batchelors team gains prototyping and testing experience in hopes of laying the groundwork for the development of wave energy-powered desalination. Passionate about pioneering solutions in the blue economy, the team looks forward to presenting their results and networking with industry and academic stakeholders at the upcoming MECC pitches.



University of California, Santa Barbara

Originally a senior capstone project for University of California, Santa Barbara mechanical engineering students, team Remote-at-Sea Power UCSB found that the MECC closely aligned with their capstone goals. The team entered the competition because the resources provided by the competition are extremely valuable and will offer a great opportunity to learn from industry professionals.

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University of Massachusetts Dartmouth

The University of Massachusetts (UMass) Dartmouth MADWEC 2.0 team entered the MECC to continue the work of last year's team. The COVID-19 pandemic forced the 2020 UMass competitors to halt development on their initial project and conclude the competition with an unfinished product.

With a passion for ocean sustainability, our team hopes to educate a wide audience with our finished product.



University of Massachusetts Dartmouth, partnering with St. Bonaventure University

Members of the Green Lobstah team share a passion for renewable energy and view the MECC as a chance to contribute to a sustainable future and the blue economy, reinventing the way the world thinks about energy while building professional experience. The competition exposes the team members to the renewable energy industry and the opportunity to bridge fields of study through work on multifunctional teams



University of North Florida

Drawn to the competition by its interdisciplinary nature and its grounding in marketplace realities, the Osprey CREW joined the MECC at the prospect of contributing to a clean energy future through the development of an affordable, durable, rapidly deployable, and environmentally friendly WEC.



University of Washington

Washington Wave team members see the MECC as a great opportunity for passionate individuals to work together to contribute to the expansion of marine energy and blue economy opportunities. The team harnesses the unique perspectives and experiences of twenty students from eight departments at the University of Washington to strengthen collaboration and innovation.



Virginia Polytechnic Institute and State University

Cleaning up the ocean is not a simple task and often requires expensive equipment and manpower, which may lead to even greater pollution. The MECC provides the Virginia Polytechnic Institute and State University team with an opportunity to contribute to green, renewable, and area-efficient marine energy technology development that could provide a sustainable method to power the ocean cleanup effort.



Virginia Tech Center for Energy Harvesting Materials and Systems, partnering with University of California, Los Angeles

The Ocean Energy Club utilizes the MECC as a catalyst to drive technological innovation and explore the business side of product development in marine energy. The team hopes this competition teaches them the importance of customer discovery to successfully develop a real-world product.

To the 2021 Marine Energy Collegiate Competition Participants

To say that the second Marine Energy Collegiate Competition will be a memorable one is certainly an understatement. We want to extend our sincere thanks and appreciation to our talented and resilient student innovators participating in this year's event. You stepped up to the plate in challenging times, undaunted, channeling your creativity to hatch the marine energy tech of tomorrow.

We realize that over the course of the past year, nearly everything about your lives have changed, from how you learn, to how you socialize, to how you collaborate. Life has become colored by uncertainty and that, in itself, is a challenge. Thank you for continuing to work diligently and flexibly. You have confronted many unforeseen obstacles, in ways that no other group of students in recent history have been expected to do. Your ability to adapt and thrive during this period of "new normal" has been nothing short of awe-inspiring.

Through the course of your work developing and fine tuning your concepts, you will undoubtedly gain knowledge of marine energy technologies and the industry itself. However, you will also walk away from this experience with attributes you perhaps never thought you would acquire from a simple competition – you will all be able to proudly point at this moment in time as an illustration of your ability to persevere.

Inherent to its design, the MECC is forward-looking, reminding us of the promise and potential of science, innovation, and, ultimately, the exploration of the unknown.

We look to the future with hope.

Sincerely,

The MECC Organizing Team

