



# 2019 INTERNATIONAL CHAMPIONSHIP

Innovations for Inshore: ROV Operations in Rivers, Lakes, and Dams



JUNE 20-22, 2019 – KINGSFORT, TENNESSEE





## The MATE ROV Competition at a Glance

The MATE ROV competition uses underwater robotics (also known as remotely operated vehicles or ROVs) to inspire and challenge students to learn and creatively apply scientific, engineering, and technical skills to solving real-world problems. Working in partnership with the Marine Technology Society's ROV Committee, the competition was created as a way to:

- ▼ Expose students to careers
- ▼ Provide access to materials and technical expertise that support student learning
- ▼ Strengthen students' critical thinking, collaboration, entrepreneurship, and innovation

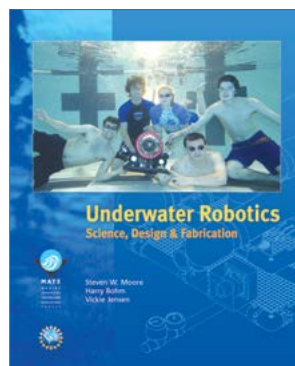
The MATE ROV competition challenges K-12, community college, and university students from all over the world to tackle missions based on scenarios from the workplace. The competition's class structure of beginner, beginner-intermediate, intermediate, and advanced complements the educational pipeline by providing students with the opportunity to build upon their skills as they engineer increasingly more complex ROVs for increasingly more complex mission tasks.

The MATE ROV competition requires students to think of themselves as entrepreneurs and transform their teams into companies that manufacture, market, and sell "products." In addition to engineering their ROVs, the students prepare technical reports, poster displays, and presentations that are delivered to working professionals who serve as competition judges.

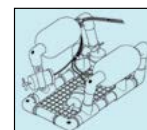
The MATE ROV competition encourages students to work together, network, and learn from technical professionals and each other. MATE's philosophy is that collaborative learning experiences best simulate the real world and will serve students – and their future employers – well in the workplace.

Other MATE underwater robotics educational products include:

- ▼ *Underwater Robotics: Science, Design and Fabrication* [ISBN 978-0-9841737]
- ▼ Knowledge and Skill Guidelines for ROV professionals
- ▼ Curriculum and videos
- ▼ Workshops for teachers and students
- ▼ Internships for college students
- ▼ All levels of DIY Kits and free open source plans
- ▼ Microcontrollers for thrusters and sensors



## The History of the MATE ROV Competition



**2002**

*Rime of the Ancient Buccaneer*  
NASA Kennedy Space Center  
and Brevard Community College  
Cape Canaveral, Florida



**2003**

*Lost on the Titanic: Rusticles or Bust*  
Massachusetts Institute of  
Technology  
Cambridge, Massachusetts



**2004**

*NOAA's National Marine  
Sanctuary Program:  
The Adventure of Mystery Reef*  
University of California Santa Barbara  
Santa Barbara, California



**2005**

*From the Depths of the Oceans  
to the Far Reaches of Outer Space*  
Neutral Buoyancy Laboratory  
@ NASA Johnson Space Center  
Houston, Texas



**2006**

*Ocean Observing Systems: Tools  
for Tomorrow's Science &  
Technology Workforce*  
Neutral Buoyancy Laboratory  
@ NASA Johnson Space Center  
Houston, Texas



**2007**

*Celebrating the International Polar  
Year: Science & Technology  
Under the Ice*  
Memorial University and the  
Institute for Ocean Technology  
St. John's, Newfoundland, Canada



**2008**

*Diving to the Deep: Uncovering  
Mysteries of Mid-Ocean Ridges*  
Scripps Institution of Oceanography-  
University of California, San Diego  
San Diego, California



**2009**

*ROVs: The Next Generation  
of Submarine Rescue Vehicles*  
Massachusetts Maritime Academy  
Buzzards Bay, Massachusetts



**2010**

*ROVs in Treacherous Terrain:  
Science Erupts on Loihi,  
Hawaii's Undersea Volcano*  
University of Hawaii-Hilo  
Hawaii's Big Island



**2011**

*ROVs and the Offshore Oil &  
Gas Industry: Highlighting the  
Challenges that ROVs Faced  
During the Gulf of Mexico  
Oil Spill*  
Neutral Buoyancy Laboratory  
@ NASA Johnson Space Center  
Houston, Texas



**2012**

*Diving into History: The Role of ROVs  
in Exploring WWII Shipwrecks*  
YMCA Aquatic & Family Center  
Orlando, Florida



**2013**

*Ocean Observing Systems:  
Launching a New Era of  
Ocean Science & Discovery*  
Weyerhaeuser King County  
Aquatic Center  
Federal Way, Washington



**2014**

*Exploring the Great Lakes:  
Shipwrecks, Sinkholes, and  
Conservation in the Thunder Bay  
National Marine Sanctuary*  
Alpena, Michigan



**2015**

*ROVs in Extreme Environments:  
Science and Industry in the Arctic*  
Memorial University and the Ocean,  
Coastal, and River Engineering facility  
St. John's, Newfoundland, Canada



**2016**

*From the Gulf of Mexico to  
Jupiter's Moon Europa:  
ROV Encounters in Inner  
and Outer Space*  
NASA's Neutral Buoyancy Lab @  
NASA Johnson Space Center  
Houston, Texas



**2017**

*Port Cities of the Future:  
Commerce, Entertainment,  
Health, and Safety*  
Long Beach City College  
Long Beach, California



**2018**

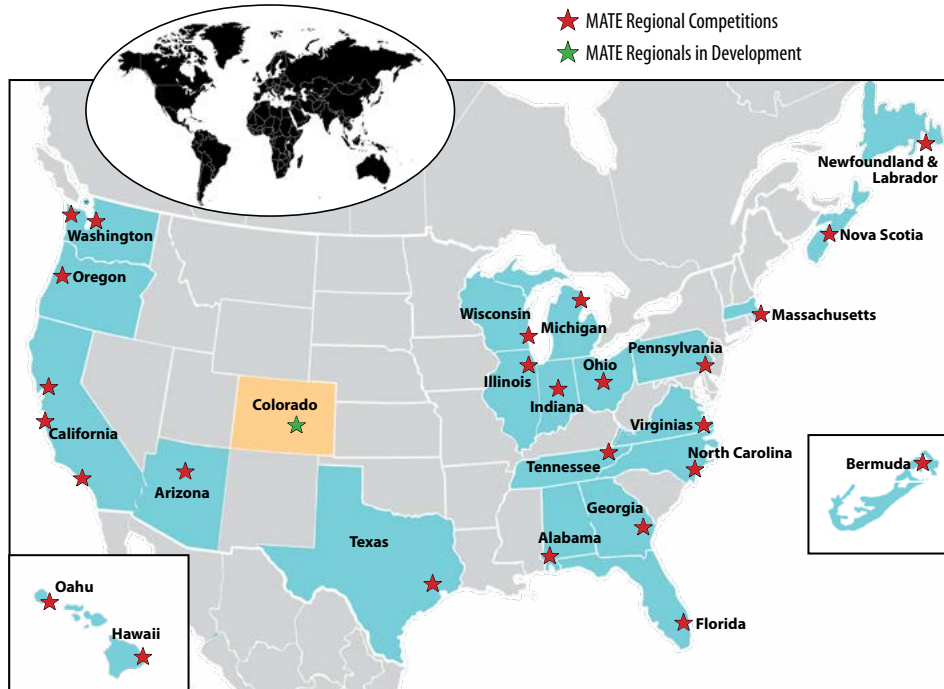
*Jet City: Aircraft  
Earthquakes and Energy*  
Weyerhaeuser King County  
Aquatic Center  
Federal Way, Washington



# MATE Regional ROV Competition Network

The MATE ROV competition Network began in 2001 and currently consists of 36 regional events that take place across the U.S. and around the world. Use this information to find the regional event near you!

- ★ MATE Regional Competitions
- ★ MATE Regionals in Development



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## A Special Thanks to These Organizations and Individuals!

### SPONSORS



### SUPPORTERS



### REGIONAL



## Return on Investments

Your contributions to MATE Inspiration for Innovation (MATE II) to support the MATE ROV Competition help to build a future skilled STEM workforce and ensure that all students have access to this unique learning opportunity.

### Sponsors provide:

- ▼ **Financial and technical support.** Funds cover student travel stipends and meals, while contributions of materials, equipment, mentoring time, and technical expertise support ROV building, promote skill development, and expose students to careers.
- ▼ **Recognition.** Award trophies, plaques, certificates of participation, event t-shirts and patches, gift certificates, and donations of equipment such as cameras, thrusters, and other hardware are ways to highlight both the winning teams and the sponsoring organizations.
- ▼ **Networking opportunities.** Funds cover the closing international competition championship's closing awards ceremony, an event that provides opportunities to build peer and professional networks.

### Sponsors also profit by:

- ▼ Increasing visibility through the MATE web site and conference presentations.
- ▼ Displaying logos on the competition materials, including banners at the events and advertisements in industry journals.
- ▼ Posting and circulating job announcements.
- ▼ Using the competition's Inspiration for Innovation Exhibit Hall to increase exposure and recruit students for technical programs or job openings.
- ▼ Gaining access to a larger pool of talented students through MATE's partner colleges.

MATE II is tax exempt under Internal Revenue Service Code 501(c)(3).  
Tax I.D.: 81-4389131. Contact [jzande@marinetech.org](mailto:jzande@marinetech.org) for more information.



# Here's what people are saying about the MATE ROV competition:

## Students

- ▼ *This program has allowed me to not only expand my creativity, but I've also learned to work as a team member and leader.*
- ▼ *To quote the last line of [our engineering] presentation, "MATE has allowed us to soar to greater heights in our achievements and dive to greater depths in the ocean of life!"*

## Parents

- ▼ *She joined "for a boy" and lack of interest in the other electives...6 weeks ago she told me she wants to lead next year and loves doing this. Thank you!*
- ▼ *...I love getting to see my son apply what he is learning. It makes math and science feel relevant, meaningful, and purposeful, which motivates lifelong learners.*

## Faculty/Mentors

- ▼ *This program has helped develop life skills that will help their futures.*
- ▼ *The competition actually does create the opportunities for learning that we want all of our students to have: collaboration with peers, communication of your work and process, problem solving, overcoming obstacles, dealing with setbacks/failure.*

## Working Professionals

- ▼ *I'll be back!*
- ▼ *I believe the ROV preparation and competition are valuable to the future of the students. I'm a big cheerleader of the MATE program. Congrats on a fine initiative!*
- ▼ *Best opportunity there is for young people!*



**MATE II**

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**MATE**

  
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