



Office of Naval Research
Corporate Strategic Communications
875 N. Randolph St., #1225-D
Arlington, Va., 22203-1771
Office: (703) 696-5031
Fax: (703) 696-5940
E-mail: onrcsc@onr.navy.mil
Web: www.onr.navy.mil
Facebook: www.facebook.com/officeofnavalresearch

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Students' Robot Submarines Enter the Ring in Gladiator-Themed Competition

ARLINGTON, Va.—Thirty-two teams of high school and college engineering students are putting underwater robots through their paces in gladiator-themed missions at the 15th annual [RoboSub Competition](#), July 17-22, in San Diego.

Co-sponsored by the [Office of Naval Research](#) (ONR) and the [Association for Unmanned Vehicle Systems International Foundation](#), the international competition challenges students to design and build robotic submarines that can perform realistic missions in an underwater environment.

RoboSub joins a lineup of ONR-sponsored activities—including the recent [RoboBoat](#) competition in June—designed to familiarize students with autonomous underwater vehicles (AUVs). These events open opportunities for students to work with AUV-focused technologists, growing their interest in future engineering careers.

“The next generation of Navy and Marine Corps platforms, systems and weapons will be a blend of manned and unmanned,” said Capt. Douglas Marble, assistant chief of naval research. “The skills students learn as they prepare for RoboSub are the same ones we need in our future scientists and engineers: imagining, designing, integrating and building the advanced capabilities warfighters will need in the future.”

This year's event required team AUVs to traverse an obstacle course made of PVC pipes; drop markers within a predetermined “gladiator ring” area; engage in battle, shooting mock torpedoes through a cutout in a piece of plywood; feed grapes to the emperor—essentially, manipulating cylinders suspended vertically and horizontally within cutouts in a board; and collect a laurel wreath to crown the emperor by finding an object emitting a sonar signal, grabbing the object and then moving and releasing it.

The submarine robots must withstand pressure and heat buildup, as well as prevent water leakage—all autonomously. To compete successfully, teams must have a basic understanding of

submarine ballasting, buoyancy and drag; underwater propulsion, including momentum and thrust; and underwater sensing in both visual and acoustic domains.

RoboSub is one of the oldest and most difficult robotics challenges that ONR sponsors, Marble said. “It is entirely possible we have several students who competed in previous RoboSub competitions working for the Navy today.”

Naval engineers and scientists from around the country are available to advise the teams during competition preparation, and numerous organizations loan equipment, such as electronic boards, cameras, compasses, thrusters and depth sensors.

Watch a live webcast of the RoboSub Competition finals July 22 at 1 p.m. PDT:
<http://www.auvsifoundation.org/FOUNDATION/Competitions/CompetitionWebcasts/>.

This year’s competing U.S. teams include: Amador Valley High School; Carl Hayden High School; Cornell University; Embry Riddle Aeronautical University; Montana State University; Mt. San Antonio College; North Carolina State University; Prairie View A&M University; San Diego City Robotics; San Diego Mesa College; Southern Polytechnic State University; University of California, Irvine; University of Central Florida; University of Florida; University of Maryland; University of Southern California; U.S. Naval Academy; Utah State University; Virginia Tech; and Washington State University.

International teams include: Canada’s École de Technologie Supérieure and University of Alberta; China’s Harbin Engineering University; Iceland’s Reykjavik University; India’s IIT Bombay, Bangalore Robotics and Panimalar Institute of Technology; Japan’s Kyushu Institute of Technology; the Russian Federation’s Far-Eastern Federal University, Scientific-Educational Center; Spain’s Escuela Técnica Superior de Ingenieros Navales, FuVe-E; Sweden’s Mälardalen University; and Turkey’s Istanbul Technical University.

The [Association for Unmanned Vehicle Systems International](#), a large nonprofit organization, holds trade shows and events throughout the year. One of its flagship events is the annual Unmanned Systems North America show. Chief of Naval Research Rear Adm. Matthew Klunder will be a speaker Aug. 8 at 1 p.m. at the 2012 event next month in Las Vegas.

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