



2006 MATE Center/MTS ROV Committee ROV Competition For High School & College Students

www.marinetech.org/rov_competition/index.php

*Challenging Teams to Design & Build Vehicles for the Next Generation of
Ocean Observing Systems*



General Information



OVERVIEW

The MATE Center and the Marine Technology Society's ROV Committee are partnering with Ocean.US and the Ocean Research Interactive Observatory Networks (ORION) Program to organize our 5th annual international student ROV design and building competition. The Neutral Buoyancy Laboratory (NBL) at the NASA Johnson Space Center is planning to host the event, which will be held in June 2006. Employers – industry, businesses, government agencies, and research organizations – and working professionals are contributing to the event by donating funds, building supplies, equipment, and facilities and volunteering their time and technical expertise as mentors, technical assistants, and judges to support the competing teams.

Goals:

- To increase the awareness and visibility of marine technical fields, educational and career opportunities, and potential employers.
- To help students develop the skills necessary to enter careers in technical fields. These skills include the ability to work as a team, problem solve, think critically, troubleshoot, communicate effectively, and manage projects.
- To connect students and educators with employers and working professionals. These connections result in collaborations where professionals mentor the students, complementing what they are learning in the classroom, and employers have the opportunity to evaluate the students as potential employees.
- To highlight the technological and operational aspects of ocean observing systems and promote understanding of the impact that they have on science, society, and the economy.

Eligibility – General:

(See below for eligibility as it applies to specific competition classes)

- Open to middle school, high school, college, and university students. Home-schooled students of comparable grade levels are also welcome.*
- Students can design and build the vehicles as an entire class project or school group activity. The group must be affiliated with a school or a home-school network and/or demonstrate that 1) the participating students are currently enrolled in a high school,

college, university, or home-school network and 2) the students are working under the supervision of an adult mentor.

- Teams must have at least three students with at least one faculty member or adult advisor involved in the process. One student should be designated as the team spokesperson.
- Teams are discouraged from using complete, commercially available, off-the-shelf, plug-and-play systems. Teams will not be disqualified from competing for using these types of systems, but the engineering evaluation and technical report score sheets will reflect MATE's effort to discourage the use of these systems. See the general rules section of the **Design & Building Specifications and Competition Rules** document for specific information.
- The role of the faculty member or adult advisor must be limited to educational and inspirational support. Actual construction of the vehicle, particularly in the complex electrical and software areas, must be completed by the students. Students will be questioned extensively by the judges on their role in designing and building the ROV.
- Individuals from industry, businesses, research organizations, and/or government can act as mentors during the design and building process. The role of these individuals must be limited to technical guidance. Industry mentors should not participate in the actual construction of the vehicle.
- All teams are required to register on the MATE AlumniWeb site (www.marinetech.org/alumni) as a condition of participating in the competition. See the **Technical Report** section within the **Engineering and Communication** document for more information.

*Middle schools are eligible to compete in RANGER class only.

The competition organizers will review the registration forms and make the final decisions about participation. Students and/or instructors may be asked to verify that students are registered at a school, college, or university, or that the team is working under the supervision of an adult mentor.

COMPETITION CLASSES

There are two classes in which teams can compete – **EXPLORER** and **RANGER**. Teams can register to compete in **one** (but not both) competition class. Two teams per instructor will be considered as long as one team represents a high school or home school and the other a college or university. Institutions/instructors interested in entering one team per competition class will also be considered provided that they meet the eligibility requirements for both classes listed below.

EXPLORER class eligibility:

- Participation in the EXPLORER class is open to community colleges, technical colleges, and universities.
- High schools that previously placed first in the regional contest in their area are eligible to participate in the EXPLORER class.

- High school teams that do not have a regional event in their area are eligible to compete in the EXPLORER class if they previously finished within the top five RANGER teams at the international competition.
- High school teams that previously competed in the EXPLORER class without placing first in a regional or finishing within the top five RANGER teams at the international competition can continue to compete in the EXPLORER class provided that they finished within the top ten EXPLORER teams at the international competition.

RANGER class eligibility:

- Participation in the RANGER class is open to high schools, middle schools, and home schools.
- Community colleges, technical colleges, and universities competing for the first time are also eligible to participate in the RANGER class.
- Schools in the vicinity of one of the 13 regional contests must participate in the regional in their area before moving on to the national competition. (See below for information about the 13 regional contests.)

Please see the [Competition Scenarios & Mission Tasks](#), [Mission Task Specifications](#), and [Design & Building Specifications and Competition Rules](#) documents for detailed information about the competition classes. You can also visit the competition’s web site at www.marinetech.org/rov_competition/index.php.

RANGER REGIONAL CONTESTS

The MATE Center’s goal is to encourage and enable as many students as possible to participate in ROV design and building projects, learning key skills and connecting with employers and mentors. Regional events are a way to accomplish this goal.

In 2006, the MATE Center is supporting and helping to organize 13 regional contests across the U.S. and Canada. These regionals serve as feeders into the international competition’s **RANGER** class, with the top one or two teams from each regional contest advancing to the international competition. (A final decision on how many teams from each regional advance to the international event will be announced by March 1st.)

Schools within the vicinity of a regional contest must participate in the regional in their area in order to move on to the international competition. If you are uncertain about which, if any, regional your school should participate in, contact Jill Zande, MATE’s Competition Coordinator, at jzande@marinetech.org or (831) 646-3082.

For information about the **RANGER** regional contest nearest you, contact:

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KEY MILESTONES AND SCHEDULE OF EVENTS

Key milestones:*

- December 22nd – mission tasks, design specs, competition rules, and general information posted
- January 2nd – on-line registration form posted
- **February 1st – on-line registration deadline**
- June – technical reports due 3 weeks prior to international competition
- June – competition, held at the NASA Johnson Space Center's NBL, date TBD
 - Falls over a weekend; events take place over the course of 3 days
 - Engineering & poster presentations due

*Note: These are milestones that apply to the international only. Regional contests will be held prior to the international event and may have their own sets of key milestones.

Schedule of events:

*****Example*****

- Thursday – teams arrive & check-in
 - Vehicles shipped or hand-carried to competition venue
- Friday – set-up & pool practice day
 - Welcome & introductions in morning
 - Set-up team workstations & posters, competition arena, and repair station
 - Practice time available
 - Optional workshops, presentations
 - Evening social mixer/reception
- Saturday – engineering presentations & underwater missions
 - Engineering evaluation interviews
 - Optional social/free time, possible tours of local subsea company facility, aquarium, or other marine-related point of interest
 - Underwater mission challenges begin
 - Teams have scheduled time slots
 - Optional social activities/free time when not competing
- Sunday – underwater missions & awards
 - Underwater mission challenges continue
 - Teams have scheduled time slots
 - Optional social activities/free time when not competing
 - Evening awards ceremony
- Monday – teams depart

FUNDING AND BUDGET

There is no limit to the amount of money, time, and technical expertise that can go into building your team's vehicle. However, keep in mind that a costlier vehicle does not necessarily mean that the vehicle will perform better or will be better able to successfully accomplish the mission tasks.

The MATE Center **WILL NOT** provide teams with funds for building supplies and materials. The MATE Center **WILL** provide each team with the following support:

- **Travel stipends (up to \$1,500).**
Teams competing in the international competition and within driving distance (~300 miles) to the event venue will receive roundtrip mileage reimbursement funds based on \$0.375 per mile. Teams competing in the international competition outside of driving distance will receive a travel stipend of up to \$1,500. Travel stipends may be available for teams competing in regional events; teams should contact the regional contest coordinator in their area for more information.
- **Housing stipends (up to \$500).**
Each team competing in the international competition will receive a housing stipend of up to \$500. Teams are responsible for covering the cost of any additional housing needs. Housing may be available for teams competing in regional events; regional teams should contact the regional contest coordinator in their area for more information.
- **Meals – kick-off reception, lunches, and awards banquet.**
A kick-off reception, lunches each day of the event, and an awards banquet will be provided to student team members, instructors, and mentors attending the international competition. Parents, spouses, siblings, cheerleaders, etc. will be able to purchase tickets for the reception and awards banquet (but **NOT** the lunches) in advance. Meals will be provided to teams competing in regional events; regional teams should contact the regional contest coordinator in their area for more information.
- **Special offers from competition sponsors.**
Several companies offer their products, materials, supplies, and/or access to equipment and facilities to competition teams at no or reduced costs.

For example, VideoRay’s “MATE ROV Competition Store” is available to competition teams **only**. This on-line store offers discounts on cameras, tethers, and, possibly, thrusters, among other items. Carrillo Underwater Systems (CUS) offers a scholarship for free and/or discounted products, and Sound Ocean Systems, Inc. offers free umbilical cable provided teams cover shipping costs. Igus, Inc., offers a range of its products at no-cost, while both VANTEC and Lights Camera Action LLC offer discounts on certain products.

Information about these offers and others is included within the “teams’ only” section of the competition web site (see the bullet below for more information on how to access this site).

- **Resources and “teams’ only” sections of the ROV competition web site.**
The resources section of the ROV competition web site located at www.marinetech.org/rov_competition/resources.php contains information on where to

purchase building supplies, lists of helpful web site and books, and a teams' only, password protected area, among other resources.

The URL for VideoRay's on-line store, CUS scholarship program, etc., and other information and support available only to MATE competition teams are posted within the "teams only" section. Information on potential funding sources at both the international and regional level (e.g., local Rotary Clubs, American Association of University Women, etc.) is also included there. You will receive the username and password to access the teams' only section after you submit your registration form.

- **Access to industry mentors.**

The MATE Center and the regional coordinators work to connect students with industry professionals willing to donate their time and technical expertise as team mentors. Several regionals have developed extensive mentor networks utilizing members of their local MTS section, for example. Contact the Center or the regional coordinator in your area if you are interested in connecting with an industry mentor.

- **Additional costs.**

Teams are encouraged to organize their own fundraising activities to cover building supplies and travel, housing, and meal costs above and beyond what the MATE Center provides. The "teams' only" section of the ROV competition web site includes a letter from MATE's competition coordinator that teams can use to approach local businesses (e.g., Home Depot) for donations of funds, building materials, equipment, etc.

In addition, the following items are your team's responsibility:

- Shipping your ROV system and tools to competition venue.
- Costs associated with fundraising or presentations to community.
- Miscellaneous expenses for photocopying, phone calls, shipping costs associated with ordering ROV components, mailings, courier, etc.