

# RoboSub 2023 Event Guide

RoboSub 2023

[www.robosub.org](http://www.robosub.org)



## I. THE EVENT

**Dates** – August 1 – 6, 2023

**Hours** – 7:00 am – 6:00 pm

### Competition Venue

Transducer Evaluation Center (TRANSDEC)

420 Transdec Road

San Diego, CA 92152

**Competition Organizers** - The competition is hosted by RoboNation, in collaboration with Naval Information Warfare Center (NIWC) Pacific and the U.S. Office of Naval Research (ONR).

## II. MEET THE TEAMS

**Who are the Teams?** RoboSub 2023 includes 35 teams representing five countries.

Meet the Teams	
<ol style="list-style-type: none"> <li>1. Advancing Science Technology &amp; Art (USA)</li> <li>2. Amador Valley High School (USA)</li> <li>3. Autonomous Marine Robotics Association at Embry-Riddle Aeronautical University (USA)</li> <li>4. Beaver Country Day (USA)</li> <li>5. BRAC University (Bangladesh)</li> <li>6. California State University, Los Angeles (USA)</li> <li>7. Carnegie Mellon University (USA)</li> <li>8. Cornell University (USA)</li> <li>9. Duke University (USA)</li> <li>10. École de Technologie Supérieure (Canada)</li> <li>11. Harvey Mudd College (USA)</li> <li>12. *Helix Charter High School (USA)</li> <li>13. Indian Institute of Technology Bombay (India)</li> <li>14. Lehigh University (USA)</li> <li>15. McGill University (Canada)</li> <li>16. *Memorial University of Newfoundland (Canada)</li> <li>17. Montana State University (USA)</li> <li>18. National University of Singapore (Singapore)</li> </ol>	<ol style="list-style-type: none"> <li>19. North Carolina State University (USA)</li> <li>20. *Peninsula Youth Robotics (USA)</li> <li>21. San Diego State University (USA)</li> <li>22. Si Se Puede Foundation (USA)</li> <li>23. Team Simplicity (USA)</li> <li>24. Texas A&amp;M Women in Engineering (USA)</li> <li>25. The Ohio State University (USA)</li> <li>26. Troy High School NJROTC (USA)</li> <li>27. Université du Québec à Trois-Rivières (Canada)</li> <li>28. University of Alberta (Canada)</li> <li>29. University of British Columbia (Canada)</li> <li>30. University of California, San Diego (USA)</li> <li>31. University of Florida (USA)</li> <li>32. University of Maryland (USA)</li> <li>33. University of Michigan (USA)</li> <li>34. University of Southern California (USA)</li> <li>35. University of Victoria (Canada)</li> </ol> <p>* New Teams</p>

### III. EVENT INFORMATION

#### Parking

Guests must park in General Public Parking and ride the shuttle to TRANSDEC. The shuttle will be running between all parking lots. By entering NIWC property, all attendees agree to:

- 1) follow security personnel instructions.
- 2) a vehicle or person search at any time.
- 3) a baggage search and a hand-wand sweep prior to entering shuttle bus.
- 4) wear an event wrist band while at the event.

#### Shuttle

A 50-passenger shuttle with cargo space will run between General Public Parking (across the street from the Holiday Inn Bayside) and TRANSDEC in continuous loops. The loop takes approximately 40 minutes. Please reference the Shuttle Schedule to plan arrival at each stop.



#### Shuttle Schedule

	Loop #1	Loop #2	Loop #3	Loop #4	Loop #5	Loop #6	Loop #7	Loop #8	Loop #9 (Last Bus for Public)
Stop #1 – Public Parking	0615	0730	0900	1015	1215	1330	1445	1615	1730
Stop #2 - TRANSDEC	0640	0755	0925	1040	1240	1355	1510	1640	1755
Stop #3 – Team Parking	0650	0805	0935	1050	1250	1405	1520	1650	1800
Stop #2 - TRANSDEC	0700	0815	0945	1100	1300	1415	1530	1700	1810
Stop #1 – Public Parking	0725	0840	1010	1125	1325	1440	1555	1725	1835

## Event Map



## Food

Local food trucks will be on-site to provide a fresh variety of foods each day. Check out our trucks and menus [HERE](#).

## Merchandise for Sale

Apparel	Color	Price
2023 RoboSub T-Shirt	Olive Green	\$15.00
RoboSub Baseball Cap	Grey	\$25.00
RoboNation Boonie Cap	Khaki	\$30.00

## Community

### Social Media: JOIN the Conversation.

- **#robosub** (RoboSub Competition)
- **#robonation** (RoboNation)
- **#wearerobonation** (*encourage community to share their story/pathway, including students, teachers, team members, advisors, sponsors, alumni, etc.*)
- **#stem** (Science. Technology. Engineering. Math)
- **#robotics**



## IV. EVENT SCHEDULE

DATE	TIME	EVENT	LOCATION
<b>Sunday, July 30</b>		Team Travel Day	
<b>Monday, July 31</b>	4:00 pm – 5:00 pm	Team Check-in	The Dana on Mission Bay
	5:00 pm – 6:00 pm	Team Orientation	
	10:00 pm – 6:00 am 11:00 pm – 6:00 am	Overnight Pool Testing	The Dana on Mission Bay Holiday Inn Bayside
<b>Tuesday, August 1</b>	6:30 am – 10:00 am	Breakfast Available for Purchase	TRANSDEC – Food Truck
	7:00 am – 6:00 pm	Autonomy Challenge Practice / Qualifying	TRANSDEC
	9:00 am – 5:00 pm	Presentations / Assessments – Day 1	TRANSDEC – Classroom / Team Village
	11:00 am – 2:00 pm	Lunch Available for Purchase	TRANSDEC – Food Truck
	7:00 pm	Venue Closed	TRANSDEC
	10:00 pm – 6:00 am 11:00 pm – 6:00 am	Overnight Pool Testing	The Dana on Mission Bay Holiday Inn Bayside
<b>Wednesday, August 2</b>	6:30 am – 10:00 am	Breakfast Available for Purchase	TRANSDEC – Food Truck
	7:00 am – 6:00 pm	Autonomy Challenge Practice / Qualifying	TRANSDEC
	8:00 am – 11:00 am	VEHICLE STOP – no vehicles at TRANSDEC (Team/Staff parking open, pedestrians allowed / Shuttle running)	TRANSDEC
	8:00 am – 5:00 pm	Presentations / Assessments – Day 2	TRANSDEC – Classroom / Team Village
	11:00 am – 2:00 pm	Lunch Available for Purchase	TRANSDEC – Food Truck
	12:15 pm	Group Photo	
	7:00 pm	Venue Closed	TRANSDEC
	10:00 pm – 6:00 am 11:00 pm – 6:00 am	Overnight Pool Testing	The Dana on Mission Bay Holiday Inn Bayside
<b>Thursday, August 3</b>	6:30 am – 10:00 am	Breakfast Available for Purchase	TRANSDEC – Food Truck
	7:00 am – 6:00 pm	Autonomy Challenge Practice / Qualifying	TRANSDEC
	8:00 am – 2:00 pm	Presentations / Assessments – Day 3	TRANSDEC – Classroom / Team Village
	10:00 am – 2:00 pm	Media Day	TRANSDEC
	10:00 am – 2:00 pm	SeaPerch Demo	RoboNation Booth
	11:00 am – 2:00 pm	Lunch Available for Purchase	TRANSDEC – Food Truck

DATE	TIME	EVENT	LOCATION
	4:00 pm – 5:30 pm	Course Judge Training	TRANSDEC – Classroom
	6:00 pm	Team Meeting	TRANSDEC
	7:00 pm	Venue Closed	TRANSDEC
	10:00 pm – 6:00 am 11:00 pm – 6:00 am	Overnight Pool Testing	The Dana on Mission Bay Holiday Inn Bayside
<b>Friday, August 4</b>	6:30 am – 10:00 am	Breakfast Available for Purchase	TRANSDEC – Food Truck
	7:00 am – 6:00 pm	Autonomy Challenge Semi-Finals – Day 1	TRANSDEC
	11:00 am – 2:00 pm	Lunch Available for Purchase	TRANSDEC – Food Truck
	6:00 pm	Team Meeting	Team Village
	7:00 pm	Venue Closed	TRANSDEC
	10:00 pm – 6:00 am 11:00 pm – 6:00 am	Overnight Pool Testing	The Dana on Mission Bay Holiday Inn Bayside
<b>Saturday, August 5</b>	6:30 am – 10:00 am	Breakfast Available for Purchase	TRANSDEC – Food Truck
	7:00 am – 6:00 pm	Autonomy Challenge Semi-Finals – Day 2	TRANSDEC
	10:00 am – 2:00 pm	SeaPerch Demo	Team Village – RoboNation Booth
	11:00 am – 2:00 pm	Lunch Available for Purchase	TRANSDEC – Food Truck
	6:30 pm	Team Meeting	TRANSDEC
	7:00 pm	Venue Closed	TRANSDEC
	10:00 pm – 6:00 am 11:00 pm – 6:00 am	Overnight Pool Testing	The Dana on Mission Bay Holiday Inn Bayside
<b>Sunday, August 6</b>	6:30 am – 10:00 am	Breakfast Available for Purchase	TRANSDEC – Food Truck
	8:00 am – 11:00 am	Third Chance / Finalist Practice Runs	TRANSDEC
	11:00 am – 2:00 pm	Lunch Available for Purchase	TRANSDEC – Food Truck
	12:00 pm – 4:00 pm	Autonomy Challenge Finals	TRANSDEC
	5:00 pm – 6:30 pm	Awards	TRANSDEC
	7:00 pm	Venue Closed	TRANSDEC
	10:00 pm – 12:00 am	Pool Party <i>Teams Only</i>	Holiday Inn Bayside
<b>Monday, August 7</b>		Team Travel Day (or Fun Day in San Diego!)	

## V. THE COMPETITION (Full competition rules/information: <https://robosub.org/programs/2023/>)

RoboSub was established in 1998 and is an international competition that invites participants to tackle autonomy challenges facing the modern maritime industry. Teams from around the world design, build, and test robotic submarines, otherwise known as Autonomous Underwater Vehicles (AUV). The behaviors demonstrated by these experimental AUVs mimic those of real-world systems, currently deployed for underwater exploration, seafloor mapping, and sonar localization, among many others.

### COMPETITION STRUCTURE

During the competition, teams are evaluated on-site during in-water Autonomy Challenge tasks, team presentations, and system assessments as well as through pre-event design documentation submissions.

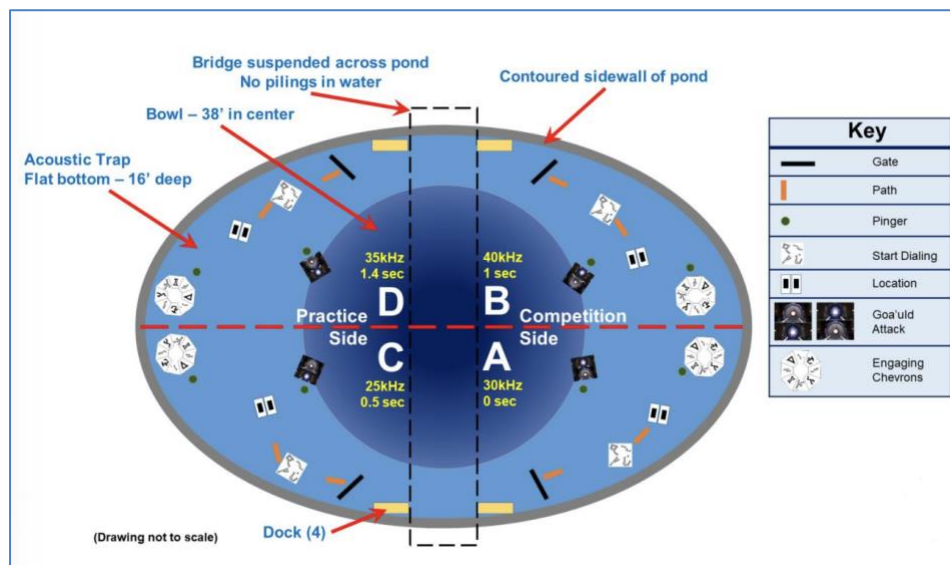
**Team Presentations & System Assessments:** Teams interact with judges during these sessions.

- *Design Presentations:* Teams present to a panel of judges their strategy for the autonomy challenge and how those plans influenced their design decisions.
- *System Assessments:* Judges inspect teams' vehicles and assess technical design, craftsmanship, technical innovation, and visual impact.

**Design Documentation:** Prior to arriving on-site, teams submit a variety of documentation for judge evaluation.

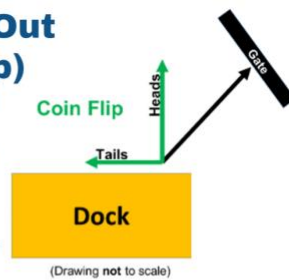
- *Technical Design Reports* describe the team's AUV design and strategies for their approach.
- *Team Websites* document the team, vehicle design, and competition approach.
- *Introduction Videos* introduce the team and what makes them unique.

**Autonomy Challenge Tasks:** Teams earn points in the Autonomy Challenge using their AUV to interact with various tasks. Path markers help direct AUVs to beginning tasks and acoustic pingers guide AUVs to the remaining tasks. An overview of the tasks is included below.



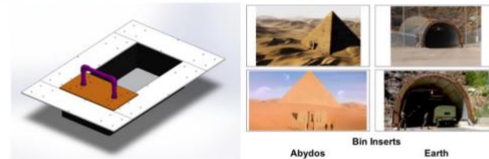
# 1 Oh for Crying Out Loud (Coin Flip)

At the start of the run, teams may request a coin flip (for additional points) to determine orientation of their Autonomous Underwater Vehicle (AUV). Those that do not exercise this option can point their vehicle in the direction of Task 2.



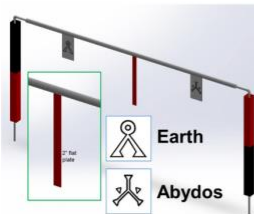
# 4 Location (Bins)

The Autonomous Underwater Vehicle (AUV) must drop a marker in either bin. Points are awarded for lifting off the cover. Additional points are awarded for dropping markers in the appropriate bin based on the AUV's passing through Earth or Abydos in Task 1 – Destination (Gate).



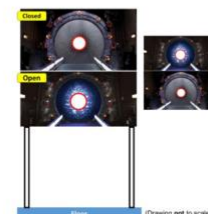
# 2 Destination (Gate)

The AUV must navigate through the gate (upside down U) which is comprised of two sections. Teams may choose a side to navigate through to receive additional points.



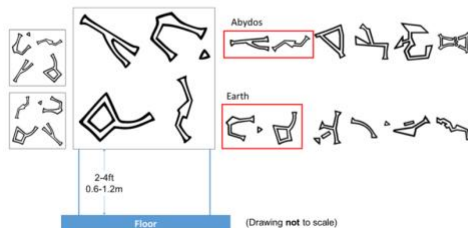
# 5 Goa'uld Attack (Torpedoes)

AUV must fire a torpedo through either opening. Additional points may be awarded for firing torpedoes first through the open Stargate and then through the closed Stargate.



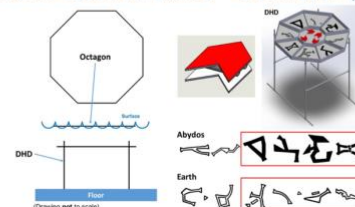
# 3 Start Dialing (Buoys)

The AUV must touch a buoy to earn points. Touching multiple buoys in a particular sequence, earns more points.



# 6 Engaging Chevrons / DHD (Octagon)

The AUV may maneuver to this task using one of the acoustic pingers. AUV must surface inside the floating octagon, additional points are awarded for surfacing with picked up chevrons. Points are awarded for moving chevrons to the eight bins. Maximum points awarded for placing the chevrons in the correct bins based on Task 1 – Destination (Gate).



## VI. ROBOTATION

**Who is RoboNation?** RoboNation is a non-profit community of robot enthusiasts whose mission is to grow students and solve global challenges one robot at a time through hands-on educational experiences. RoboNation's portfolio includes five student competitions and nine programs and have grown to engage more than 250,000 students per year.

**RoboNation Staff are here to help you while you are on-site at the competition. We look forward to answering any of your questions – visit us at the RoboNation booth at the entrance!**