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INTERNATIONAL CHALLENGE

UNIVERSITY OF MARYLAND | JUNE 4, 2022

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</Where tomorrow's innovators can start taking risks, making breakthroughs, & building robots today.>

2,600+ TEAMS
FROM 6 CONTINENTS

</ACROSS 10 PROGRAMS>

250,000+
STUDENTS SERVED ANNUALLY

</MIDDLE SCHOOL TO POSTGRADUATE SCHOOL>

AERIAL **GROUND** **MARITIME**

OUR MISSION

RoboNation is a nonprofit organization whose mission is to provide a pathway of hands-on educational experiences that empower students to find innovative solutions to global challenges.

OUR VISION

We envision a world where technology unites people to learn, share, and create.

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What does RoboNation Do?

STEM KITS

AUTONOMY PROGRAMS

ROBOTICS COMPETITIONS

COMMUNITY OUTREACH

QUICK LINKS

Mail: www.robonation.org/mailing-list
Partner: www.robonation.org/partner-with-robonation
Donate: www.robonation.org/donate

Scan me

60K ROBOTICS KITS PURCHASED & 26K ROBOTICS KITS DONATED

robonation.org

OUR SPONSORS & PARTNERS

The SeaPerch community does amazing work. But it wouldn't be possible without robust support through local and national partnerships. Partners play a critical role supporting SeaPerch, enhancing the experiences and resources available to students, teachers and the community.

Office of Naval Research Science & Technology

BlueRobotics

Department of Defense DoDSTEM Science · Technology · Engineering · Mathematics

MathWorks

eod engineers on deck

Ocean Exploration Cooperative Institute oeci Exploring the Nation's Blue Frontier

Walter Munk Foundation for the Oceans

University of Maryland

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Dear SeaPerchers,

I'd like to personally welcome you all to the 2022 International SeaPerch Challenge! We have been looking forward to this day since we last convened in 2019 and we are thrilled to be back in-person with you!

In the true spirit of SeaPerch, the 138 teams competing at this 11th annual International SeaPerch Challenge have navigated a lot of challenges to be here. As the top-performing teams in the 2021-2022 SeaPerch season, you should each be proud to represent your communities today at the University of Maryland.

I hope your participation inspires you to keep exploring the many opportunities that exist in the fields of Science, Technology, Engineering and Mathematics (STEM). The skills you are gaining through this experience will serve you well in any career path!

I would also like to recognize the committed champions - parents, teachers, administrators, coaches, mentors, volunteers, and SeaPerch regional advocates - who generously devote their time to supporting our amazing students as they "build a bot and change the world". The dedication, energy, and enthusiasm you freely give are the only way programs like SeaPerch can happen. Thank you!

I trust you will have a memorable time today and that you will learn from and with your peers as you encourage and motivate each other.

I wish you the best of luck today and in all your future endeavors. I know we will continue to hear great things about all of you!

Cheryl Hedeen
Program Manager, SeaPerch & GoSense
RoboNation Inc.

Why SeaPerch?

The SeaPerch program began as an engaging, hands-on introduction to basic engineering and marine robotics. While other robotics programs available then focused on ground and air robotics, there was a distinct gap in the underwater environment that SeaPerch filled.

The program's growth over the last two decades has shown that SeaPerch is so much more than educational kits and program resources. This program has evolved into a robust community through competitions such as the annual SeaPerch Challenge, exhibitions hosted by local advocates, and other forms of active regional and global engagement.

This community includes individuals ranging from elementary school students to professionals working in a variety of STEM fields. Through active participation occurring across all levels of the SeaPerch community, we constantly learn and grow, thereby enhancing the program for future participants. We enthusiastically encourage each of you to develop more innovative SeaPerch designs and novel approaches, sharing your experiences with us all.

The challenges and opportunities that await you in your future careers are ever-evolving and require professionals with the knowledge, skills, and creativity to develop unique solutions. My hope is that your participation in the SeaPerch program has given you an introduction to some of these skills you will need to successfully navigate the future. In the meantime, we are delighted you have joined the SeaPerch community. Your contributions strengthen the community. The relationships you build through the SeaPerch program will serve you well far into that future.

Kelly Cooper
Program Officer
Office of Naval Research

UMD CAMPUS MAP

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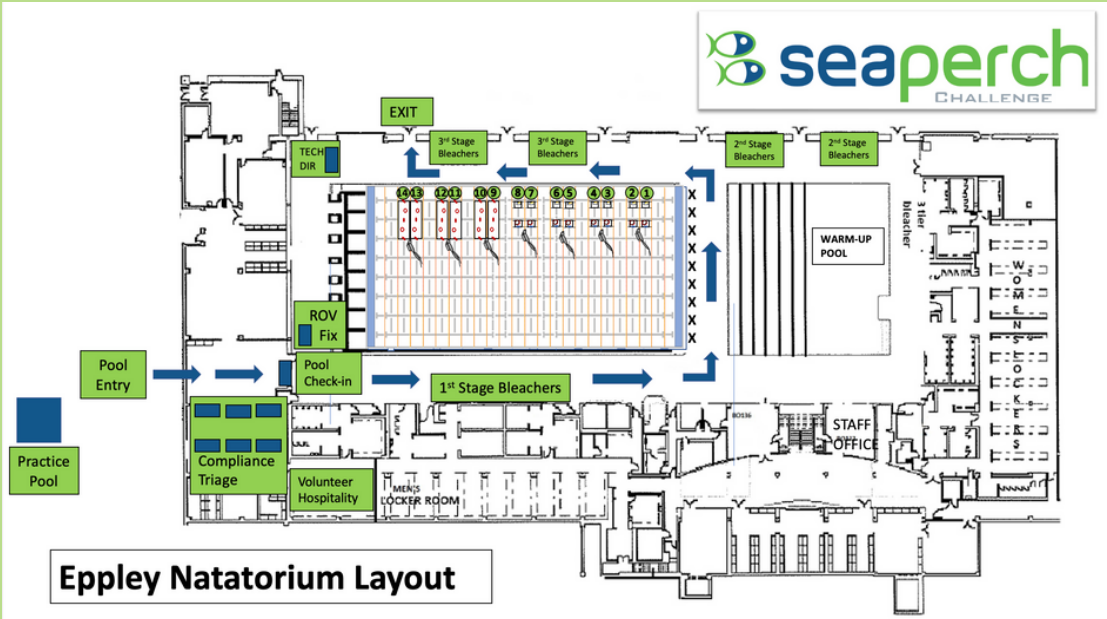
EPPLEY NATATORIUM



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CHALLENGE

FRIDAY JUNE 3, 2022

• **5:00 PM - 11:59 PM** *DORM RESIDENTS ONLY*	**DORM CHECK-IN** CENTERVILLE HALL
• **5:30 PM - 7:30 PM**	**DINNER** NORTH DINING HALL
• **7:30 PM**	**WELCOME VIDEO LIVE** VIRTUAL

SATURDAY JUNE 4, 2022

• **6:30 AM - 8:30 AM** *DORM RESIDENTS ONLY*	**BREAKFAST** NORTH DINING HALL
• **7:30 AM | GROUP 1**	**TEAM CHECK-IN** (GYM - 7:30AM) **COMPLIANCE CHECK** (POOL DECK ENTRANCE - 8:00AM) **POOL CHECK-IN** (POOL CHECK-IN - 9:00AM)
• **8:00 AM | GROUP 2**	**TEAM CHECK-IN** (GYM - 8:00AM) **COMPLIANCE CHECK** (POOL DECK ENTRANCE - 8:30AM) **POOL CHECK-IN** (POOL CHECK- IN 9:30AM)
• **9:00 AM | GROUP 3**	**TEAM CHECK-IN** (GYM - 9:00AM) **COMPLIANCE CHECK** (POOL DECK ENTRANCE - 9:30AM) **POOL CHECK-IN** (POOL CHECK- IN 10:15AM)
• **9:30 AM - 5:30 PM**	**POOL COMPETITION** EPPLEY NATATORIUM
• **9:30 AM - GROUP 4**	**TEAM CHECK-IN** (GYM - 9:30 AM) **COMPLIANCE CHECK** (POOL DECK ENTRANCE - 10:00 AM) **POOL CHECK-IN** (POOL CHECK-IN -11:00 AM)
• **10:00 AM - 4:00 PM**	**TEAM PRESENTATIONS** CAMBRIDGE COMMUNITY CENTER CLASSROOMS 1100, 1111, 1205
• **11: 30 AM - 1:30 PM** *ALL REGISTERED ATTENDEES*	**LUNCH** NORTH DINING HALL

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SATURDAY JUNE 4, 2022

• **11: 30 AM - 1:30 PM**	**VOLUNTEER LUNCH** HOSPITALITY ROOM
• **10:15 AM - GROUP 5**	**TEAM CHECK-IN** (GYM - 10:15 AM) **COMPLIANCE CHECK** (POOL DECK ENTRANCE - 10:45 PM) **POOL CHECK-IN** (POOL CHECK- IN 12:45 PM)
• **12:15 PM - GROUP 6**	**TEAM CHECK-IN** (GYM - 12:00 PM) **COMPLIANCE CHECK** (POOL DECK ENTRANCE - 12:30 PM) **POOL CHECK-IN** (POOL CHECK- IN 1:30 PM)
• **12:45 PM - GROUP 7**	**TEAM CHECK-IN** (GYM - 12:45 PM) **COMPLIANCE CHECK** (POOL DECK ENTRANCE - 1:15 PM) **POOL CHECK-IN** (POOL CHECK- IN 2:15 PM)
• **1:15 PM - GROUP 8**	**TEAM CHECK-IN** (GYM - 1:15 PM) **COMPLIANCE CHECK** (POOL DECK ENTRANCE - 1:45 PM) **POOL CHECK-IN** (POOL CHECK- IN 2:45 PM)
• **3:00 PM** *ONE DAY DORM RESIDENTS MUST CHECK OUT BY 3:00PM*	**DORM CHECK OUT**
• **5:30 PM - 7:30 PM** *TWO DAY DORM RESIDENTS ONLY*	**DINNER** NORTH DINING HALL
• **7:00 PM**	**AWARDS CEREMONY** EPPLEY NATATORIUM & VIRTUAL

SUNDAY JUNE 5, 2022

• **6:30 AM - 9:30 AM** *DORM RESIDENTS ONLY*	**BREAKFAST** NORTH DINING HALL
• **3:00 PM** *DORM RESIDENTS MUST CHECK OUT BY 3:00PM*	**DORM CHECK OUT**

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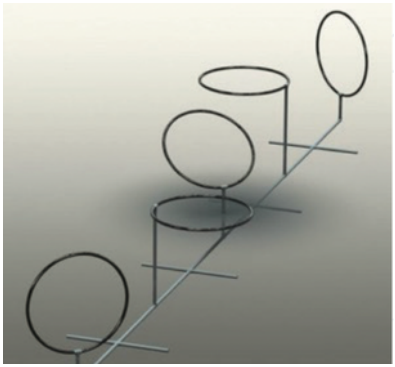
Pool Competition
Mission: Space

Welcome to Space Exploration!

Much like the vacuum of space, the underwater environment presents many technical challenges teams will be expected to face. Underwater environments are used to replicate space during astronaut training and mission testing. Robots are becoming more common on the International Space Station (ISS) and astronauts perform a variety of tasks while aboard the ISS that are well suited for remotely operated and robotic support.

The ISS Extravehicular Activity (EVA) Mission is a simulation of the tasks and environment that an ROV might encounter while assisting astronauts on an EVA outside the ISS. Teams will be tasked with upgrading the ISS's battery system and moving tools for astronauts.



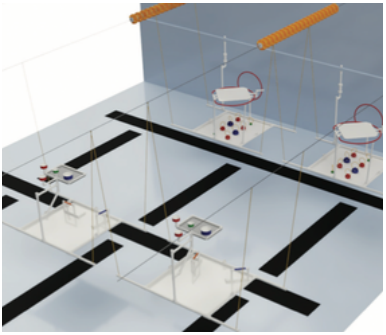
Obstacle Course:
An underwater remotely operated vehicle (ROV) must be able to maneuver successfully and perform its task. The submerged obstacle course involves large rings oriented at various angles, through which the ROVs must travel. Teams must navigate their ROV through the obstacle course, surface, then re-submerge and return through the course to the end. Scores for this round will be based on the fastest time for successfully navigating the obstacle course.

Mission Tasks:

1. Battery Panel Access: A latch must be rotated to gain access to the battery compartment.

2. Power Cable Disconnect: Power cables must be disconnected from batteries.

3. Battery Replacement: Used batteries must be replaced with new batteries. This includes:
   a. Remove Used Batteries: Move batteries from the Battery Compartment to the Battery Pallet
   b. Position New Batteries: Move batteries from the Battery Pallet to the Battery Compartment.



4. Tool Transport: Tools must be transported from the EVA Tool Tray to the Tool Caddy.

The Engineering Process
Presentations

The Engineering Design Process (EDP) is a cycle of steps that are used in engineering projects. Documenting and clearly communicating the EDP used during the SeaPerch build provides insight into why and how the final ROV design was developed. Recording this iterative design process and the data collected along the way results in a better ROV design.

This year, teams were required to submit a Technical Design Report to succinctly synthesize and communicate the EDP and their unique SeaPerch ROV.

Teams have been invited to present their processes in open presentation sessions to share their SeaPerch experience while practicing their academic presentation skills. Presentations will be facilitated by a volunteer who will ask questions and moderate discussions and will be open to attendance by teams, mentors, and spectators (virtually and in-person).

Networking and open dialogue to share perspective and ask other teams questions during the discussion period in each session is strongly encouraged.

Join the discussion at the Engineering Process Presentations at the Cambridge Community Center!

Scan the QR Code below for a list of session times and teams presenting during each block.

SCAN ME

2022 AWARDS

Team will be competing for the following awards:

Middle School Stock

- Class Champion
- Obstacle Course
  (1st, 2nd, 3rd)
- Mission Course
  (1st, 2nd, 3rd)
- Technical Design Report
  (1st, 2nd, 3rd)
- Team Video
  (1st, 2nd, 3rd)

Open Class

- Class Champion
- Obstacle Course
  (1st, 2nd, 3rd)
- Mission Course
  (1st, 2nd, 3rd)
- Technical Design Report
  (1st, 2nd, 3rd)
- Team Video
  (1st, 2nd, 3rd)

High School Stock

- Class Champion
- Obstacle Course
  (1st, 2nd, 3rd)
- Mission Course
  (1st, 2nd, 3rd)
- Technical Design Report
  (1st, 2nd, 3rd)
- Team Video
  (1st, 2nd, 3rd)

Special Awards

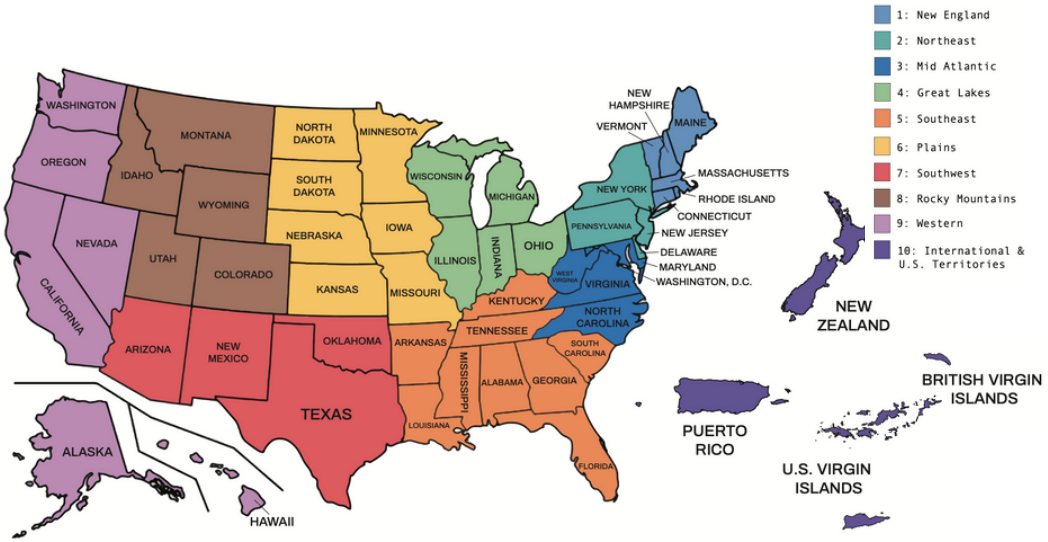
- Sportsmanship
- Resiliency and Grit
- Spirit of SeaPerch
- Real-World Innovation
  (1st, 2nd, 3rd)
- Fan Favorite - Real World Innovation
  - (Middle School)
  - (High School)

Check seaperch.org after the competition for the final results!

SCAN ME

2022 REGIONAL COMPETITIONS

- Al Alameen City, El Alamein, Egypt
- Albuquerque, New Mexico, USA
- Ann Arbor, Michigan, USA
- Annapolis, Maryland, USA
- Auckland, New Zealand
- Bath, Maine, USA
- Beijing, China
- Biloxi, Mississippi, USA
- Boca Raton, Florida, USA
- Boca Raton, Florida, USA
- Boca Raton, Florida, USA
- Boston, Massachusetts, USA
- Camana Bay, Cayman Islands
- Cathlamet, Washington, USA
- Colorado Springs, Colorado, USA
- Colorado Springs, Colorado, USA
- Denver, Colorado, USA
- Doha, Qatar
- Dubai, United Arab Emirates
- Durham, New Hampshire, USA
- Franklin Springs, Georgia, USA
- Fredericksburg, Virginia, USA
- Fullerton, California, USA
- Galveston, Texas, USA
- Georgetown, Texas, USA
- Green Bay, Wisconsin, USA
- Honolulu, Hawaii, USA
- Jacksonville, Florida, USA
- Jacksonville, Florida, USA
- Kanagawa, Japan
- La Joya, Texas, USA
- Lake Forest, Illinois, USA
- Little Rock, Arkansas, USA
- Los Angeles, California, USA
- Macau Island, Macao
- Manassas, Virginia, USA
- Manassas, Virginia, USA
- Manvel, Texas, USA
- Milwaukee, Wisconsin, USA
- Mobile, Alabama, USA
- Neptune City, New Jersey, USA
- North Charleston, South Carolina, USA
- Ogden, Utah, USA
- Pensacola, Florida, USA
- Philadelphia, Pennsylvania, USA
- Philadelphia, Pennsylvania, USA
- Riverside, California, USA
- San Diego, California, USA
- San Luis Obispo, California, USA
- Simsbury, Connecticut, USA
- Stone Mountain, Georgia, USA
- Temecula, California, USA
- Temecula, California, USA
- Temecula, California, USA
- Tulsa, Oklahoma, USA
- Upland, California, USA
- Verona, Wisconsin, USA
- Visakhapatnam, Andhra Pradesh, India
- Waldorf, Maryland, USA



SEAPERCH CHALLENGE TEAM REGIONS

TELL US SOMETHING SPECIAL ABOUT YOUR TEAM!
CHECK OUT THE REGION MAP IN THE TEAM LOUNGE
IN THE EPPLEY GYM.

THANK YOU

The 2022 International SeaPerch Challenge would not have been possible without the incredible support and efforts of the broad SeaPerch Community. In particular, we express our sincere gratitude to:

- Regional Coordinators who steward their local SeaPerch efforts and host regional competitions.
- Local advocates, parents, and educators who support student engagement in the SeaPerch program.
- Onsite volunteers who help give our students and visitors a great experience.
- Virtual volunteers who reviewed Technical Design Reports and Team Videos and provided invaluable feedback to our teams.
- Sponsors and partners who provided financial and in-kind support to make this event possible

2022 TEAMS

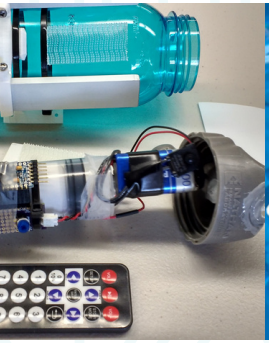
MS-602	Adelson Kraken Kontrollers (Las Vegas, NV)
MS-719	AlphaZero (Baton Rouge, LA)
MS-304	AMS Pantherbots (Oak Hill, VA)
HS-101	Andover High School Orcas (Andover, MA)
MS-602	Aquanauts (Temecula, CA)
HS-530	Aquarius (Jacksonville, FL)
MS-602	Aquatic Birds (Temecula, CA)
HS-724	Aquatic Tigers (Mercedes, TX)
HS-715	Astronauticals (Navarre, FL)
MS-013	Atlantis (Andhra Pradesh, India)
HS-305	Axolotls (Nokesville, VA)
MS-104	Baby Yoda (Talladega, Alabama)
HS-410	Bazooka Space Sharks (Clinton, MI)
HS-915	BishBoat (La Jolla, CA)
OC-003	Blue Tech (Kuwait, Kuwait)
HS-103	Boston Sea Cadets' Atlas (Franklin, MA)
HS-109	Boston Sea Cadets' Voyager (Franklin, MA)
OC-105	Boston Sea Cadets' X-Wing (Franklin, MA)
HS-920	BOX (Temecula, CA)
HS-514	Bread Bank (Summerville, SC)
OC-803	Bubbleheads (Nacelle, WA)
OC-508	BZBot 2 (Fayetteville, AR)
HS-912	CHS Platinum (Temecula, CA)
MS-721	Circuit Breakers 1 (Tulsa, OK)
MS-722	Circuit Breakers 2 (Tulsa, OK)
MS-517	Codebots (McDonough, GA)
MS-723	Cool Cats Club (Chouteau, OK)
HS-301	Cucumber Mint (Lorton, VA)
MS-313	Diggs Mighty Animals (Waldorf, MD)
MS-521	Discovery Academy of Science Sea Bois (Dunedin, FL)
MS-812	Discovery Canyon Campus MS #1 (Colorado Springs, CO)
MS-801	Discovery Canyon Campus MS #2 (Colorado Springs, CO)
HS-610	Dragon Dynamix (Paoli, PA)
OC-807	Eat My Bubbles 4.0 (Sunset, UT)
MS-601	ECH Science (Asotin, WA)
HS-808	Ganguns (Centerville, UT)
MS-921	Goldfish (Temecula, CA)
MS-211	Haddonfield Naval Engineers (Haddonfield, NJ)
MS-608	Hawaii Dream Team (Ewa Beach, HI)
MS-509	HMS SeaBots: AquaStars (Mt. Laurel, NJ)
MS-203	HMS SeaBots: Team Avisa (Mt. Laurel, NJ)
MS-717	Hook Ninja's (Albuquerque, NM)
HS-702	Hybrid Wildcats (Brownsville, TX)
HS-107	Hype Ninjas (Morganton, NC)
MS-703	If It Works, It Works (Georgetown, TX)
MS-303	JG (Glen Burnie, MD)
OC-523	Kali-Maury Franks (Boca Raton, FL)

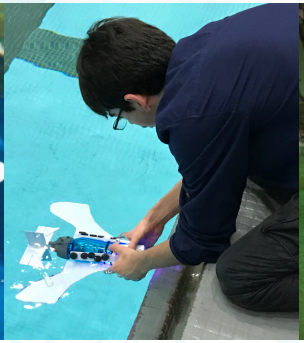
2022 TEAMS

HS-312	Kappas (Nokesville, VA)
HS-711	Kraken (Jacksonville, FL)
HS-311	Le Fishe (Nokesville, VA)
OC-531	Leatherbacks (Atlantic Beach, FL)
MS-710	Lily Pads (Jacksonville)
HS-701	Lobos 24 (Mission, TX)
MS-005	Majan Oman (Muscat, Oman)
HS-906	Maranatha Seaperch (Pasadena, CA)
HS-307	Marlins (Manassas, VA)
MS-708	Mayport Lionfish (Atlantic Beach, FL)
HS-805	Messinators (Plain City, Utah)
MS-910	Mililani 2 (Mililani, HI)
MS-911	Mililani 3 (Mililani, HI)
OC-913	Miramargineers (Temecula, CA)
MS-401	MMS Shipwreck (Marinette, WI)
MS-404	My Little Pony (Kenosha, WI)
MS-316	Naiads (Richmond, VA)
MS-705	Nautilis (Georgetown, TX)
MS-534	Nautilus (Atlantic Beach, FL)
HS-511	Navarre Raider FOUR (Navarre, FL)
MS-924	Neptune 3D (Auckland, New Zealand)
MS-919	NSCC Team #1 (Temecula, CA)
HS-314	OCHS SEA HORNETS (Orange, VA)
MS-709	Odyssey (Galveston, TX)
HS-409	On Porpoise (Clinton, MI)
HS-306	Patriot Stingrays (Nokesville, VA)
MS-014	PCMSROV
OC-806	PHG (Sunset, UT)
HS-411	Pirates of the Caribbean (Hillsboro, WI)
HS-106	Positively Buoyant Penguins (Limestone, ME)
HS-909	ProtoKnights Team 1 (Kaneohe, HI)
HS-908	ProtoKnights Team 3 (Kaneohe, HI)
HS-412	PVC Space Pirates (Union Grove, WI)
HS-016	Qatar Falcons (Doha, Qatar)
MS-015	Qatar Oryx (Doha, Qatar)
MS-923	R.E. Marine (Suez, Egypt)
MS-009	Reeths-Puffer Robotics (HS) (Muskegon, MI)
MS-010	Reeths-Puffer Robotics (MS) (Muskegon, MI)
HS-713	Remoras (Bryan, TX)
MS-408	Robertsdale High School Navy JROTC (Roberstdale, AL)
MS-704	Rong Zhen Kai Wu (Haidian District, China)
HS-518	Rotorua H20 - HIJKLMNO (Rotorua, New Zealand)
OC-515	ROV (North Charleston, SC)
HS-612	Royals (West Palm Beach, FL)
HS-528	Saint 1 (Jacksonville, FL)
HS-201	Sea Challenger (Danville, PA)
MS-707	Sea Cobras (Pearland, TX)

2022 TEAMS

MS-916	Sea Grass (Temecula, CA)
HS-202	SEA Hawks Robotics (Manchester, NJ)
MS-524	Sea Owlstronauts (Boca Rotan, FL)
HS-102	Sea Shrimp (Franklin, NH)
MS-718	Sea Wolf (Albuquerque, NM)
MS-519	SeaOwls GoFish (Boca Rotan, FL)
MS-520	SeaOwls Team Buddy (Boca Rotan, FL)
HS-614	Sinister Sea (Manassas, VA)
HS-205	SITHS Special Operations Team (Staten Island, NY)
MS-513	SJM Team Navis (Myrtle Beach, SC)
MS-407	Soaring Narwhals (Petoskey, MI)
MS-907	Soggy Crackers (Beaumont, CA)
HS-315	Spotsy Space Cadets (Spotsylvania, VA)
HS-510	Starkville High School Robojackets (Starkville, MS)
MS-611	Taco Storm (Pearland, TX)
MS-402	Team Dory (Washington Island, WI)
HS-905	Team Flash (Rialto, CA)
HS-413	Team Leviathan (Union Grove, WI)
MS-406	Team SeaBASS (Melrose Park, IL)
MS-008	Team X of Beihang University Experimental School (Primary School) (Beijing, China)
HS-302	Terra (Leesburg, VA)
MS-605	The Citizen SeaPerchers (Pittsburgh, PA)
HS-716	The Destroyers (Leesburg, VA)
HS-403	The Dolphins (Chicago, IL)
HS-204	The Flinkers (Lanoka Harbor,NJ)
HS-310	The OctoPirates (Nokesville, VA)
MS-405	The Otters (Melrose Park, IL)
MS-529	The Strawberries (Jacksonville, FL)
HS-714	The Titans (Navarre, FL)
MS-506	The Wave Shockers (Sheridan, AK)
MS-007	The Wings of Time (Beijing, China)
MS-904	Threshers (Beaumont, CA)
MS-210	Tiger Sharks (Blue Bell, PA)
MS-914	Tri-Hard For-Ever (San Diego, CA)
HS-902	Troy 3 Sea Otters (Fullerton, CA)
HS-507	Trumpinator (Huntsville, AK)
OC-006	UAE Team (Alsalama, UAE)
OC-901	Wahkiakum Mecha Mules (Cathlamet, WA)
HS-804	Water Cubed (Manassas, VA)
HS-309	Water Striders (Manassas, VA)
OC-017	Wavez (San Juan, PR)
HS-108	WPSD Daddy Sharks (Edgewood, PA)
HS-512	WYBB - Navarre High School (Navarre, FL)



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ROBONATION
2022 PROGRAMS & COMPETITIONS

INTERNATIONAL SEAPERCH CHALLENGE

- University of Maryland College Park, Maryland
- June 4, 2022
- Middle School / High School

INTELLIGENT GROUND VEHICLE COMPETITION

- University of Oakland Oakland, Michigan
- June 3-6, 2022
- University / Graduate School

STUDENT UNMANNED AERIAL SYSTEMS COMPETITION

- AeroPark Innovation District California, Maryland
- June 15-18, 2022
- University / Graduate School

2022 ROBOBOAT COMPETITION

- Nathan Benderson Park Sarasota, Florida
- June 20-25, 2022
- University / High School

2022 ROBOSUB COMPETITION

- University of Maryland College Park, Maryland
- July 27 - August 2, 2022
- University / High School

2022 MARITIME ROBOTX CHALLENGE

- Sydney International Regatta Centre | Sydney, Australia
- November 11-17, 2022
- University / Graduate School

OTHER PROGRAMS

robotx VIRTUAL — Virtual 2023 Dates TBA

seaglide, seaperch, gosense — Kit & Workshop Based Programs for Citizen Science

IARC — Mission 9: Various Locations

seaperch™

INTERNATIONAL CHALLENGE

UNIVERSITY OF MARYLAND | JUNE 4, 2022

FOLLOW OUR LIVE EVENTS PAGE

For exclusive livestreams, links to our social media, and robotics content from the International SeaPerch Challenge!

SCAN ME

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seaperch seaglide gosense roboboat robosub vehobs IGVC SVS