

2022 Seaperch Summary

On June 4, 2022, Four engineering students from Union Grove High School traveled to the University of Maryland to compete in the Seaperch International Underwater Remotely Operated Vehicle (ROV) Tournament. Attending the tournament were 137 teams from 26 countries and 4 continents. These teams had won regional tournaments earning them an invitation to compete globally. Traveling with the Union Grove teams were five parents and their coach.

Each of two Union Grove teams was composed of engineering and robotics students. On the first team, called The PVC Space Pirates were Kayla Knudtson (senior) and Nataly Schoening (senior). (*Senior Samantha Fleischman was unable to travel to the tournament*). On the second team, called Team Leviathan were Laurel Anderson (sophomore) and Melissa Haigh (junior). These students are the founding members and leaders of the school's new Society of Women Engineers club and the state's lone chapter of the International Robotics Honor Society. Kayla and Nataly had earned an invitation two years ago, but the pandemic canceled that year's international tournament and the subsequent one as well. They were on a mission to compete again this year. The PVC Space Pirates named their ROV "Polly." Team Leviathan named their ROV "Larry." The teams were coached by Erik Wolbach, the district's engineering and robotics instructor.

In the previous March, these two teams from Union Grove earned first and second place at the regional tournament held at Deer Creek Intermediate School in St. Francis. The annual regional tournament is sponsored by the Navy League and Leonardo DRS. This tournament earned these students an invitation to compete internationally. The event was judged by real world engineers from Leonardo DRS and Navy recruiters from Milwaukee and Chicago commands led by Commander Matthew Sass. The tournament was recorded underwater by Ken Welch, a diver from the Civil Air Patrol. The competition was featured on WISN news: [WISN News Video Link](#)

The underwater remotely operated vehicles are constructed using basic materials from a kit created by Seaperch and Robonation. The kits consist of motors and a controller. Students must construct, solder, and waterproof the motors which are connected to a controller via spliced internet cable. The controller has a printed circuit board that must be soldered by the students. The rest of the design is up to the students to use the PVC pipe and pool noodles as they see fit. The competition encourages creativity by allowing students to use up to \$25 worth of unique materials such as 3D printed parts of their own design, unique PVC fittings, alternative methods of buoyancy, etc. The students created their ROVs without the use of a full size pool. Instead they used a large agricultural tank to test for buoyancy and basic maneuverability using some course props.

The international tournament consisted of a timed obstacle course, a point based mission task course, a five minute video presenting the team's engineering design process, and a written engineering design report. This year's theme was space exploration which reflects how NASA

trains astronauts in a large pool to simulate low gravity operations. The competition details can be found at Seaperch.org

These students came in during study halls and before and after school to work on this project. The PVC Space Pirates were one of ten teams invited to present their project that was live streamed globally. They were joined by teams that had competed at the competition for five years straight with the same students. Ninety one of the competitors were graduating seniors.

After a grueling day, the teams felt confident that they had performed their best at the time, but true to being good engineers, they began discussing improvements for next year. The PVC Space Pirates finished 8th overall in the world with Team Leviathan placing 38th. The PVC Space Pirates submitted an engineering video that earned 4th place, one place shy of an international trophy. Their engineering design report placed 9th.

The Milwaukee Chapter of the Navy League and Leonard DRS were the main trip sponsors.

The local Union Grove Robotics Club sponsors are the Wisconsin Army National Guard (Sergeant Travis Patrick), American Metalcraft Industries, First Call Heating and Cooling, Coleman Tool, BSW Electric, and Zoomlion Heavy Industries.

Pictures follow:



PVC Space Pirates From left to right: Senior Kayla Knudtson, Senior Nataly Schoening, Senior Samantha Fleischman.



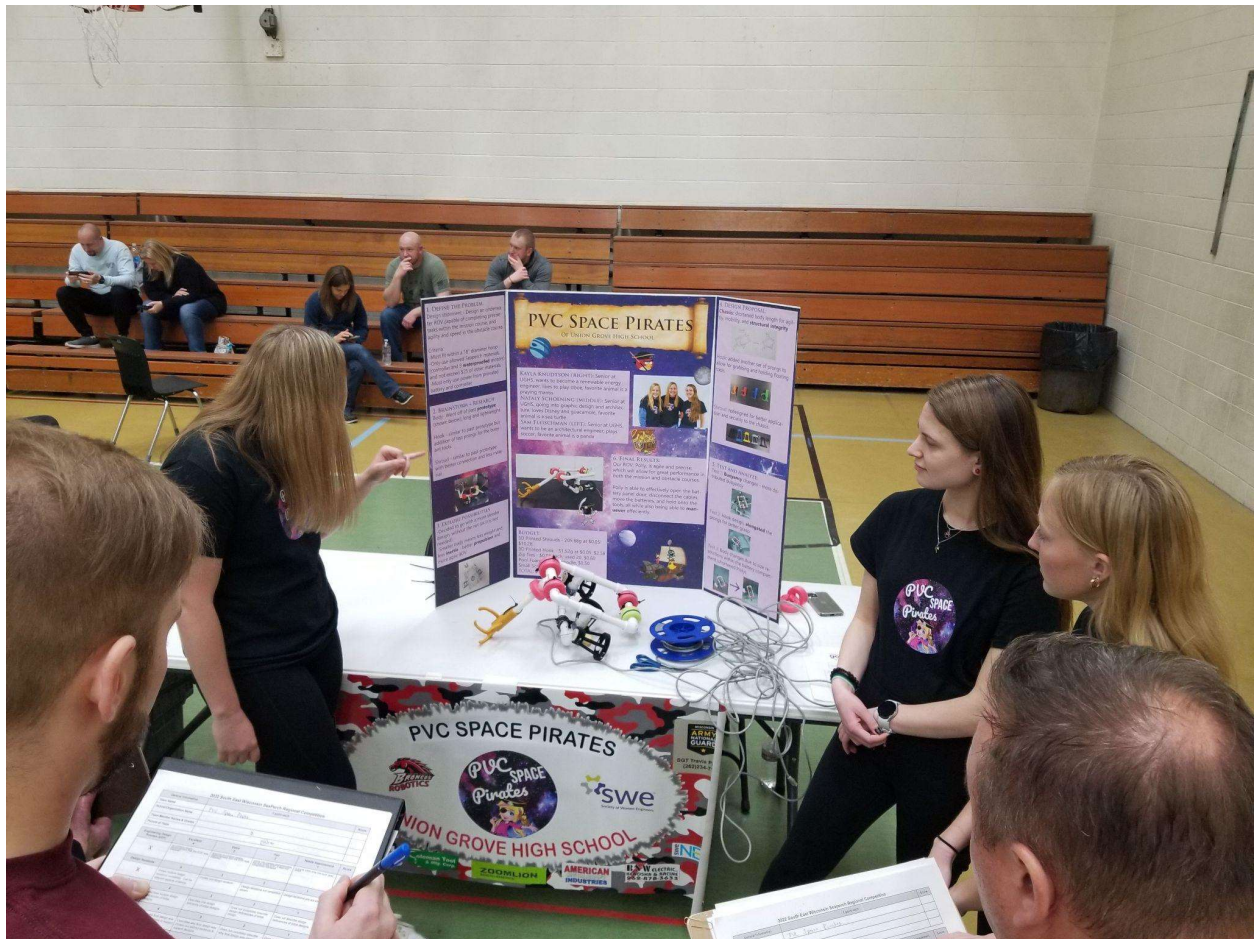
Team Leviathan From left to right: Sophomore Laurel Anderson, Junior Melissa Haigh



International Tournament Teams From left to right: Sophomore Laurel Anderson, Junior Melissa Haigh, Senior Nataly Schoening, and Senior Kayla Knudtson. ROVs named "Larry" and "Polly" are also present.



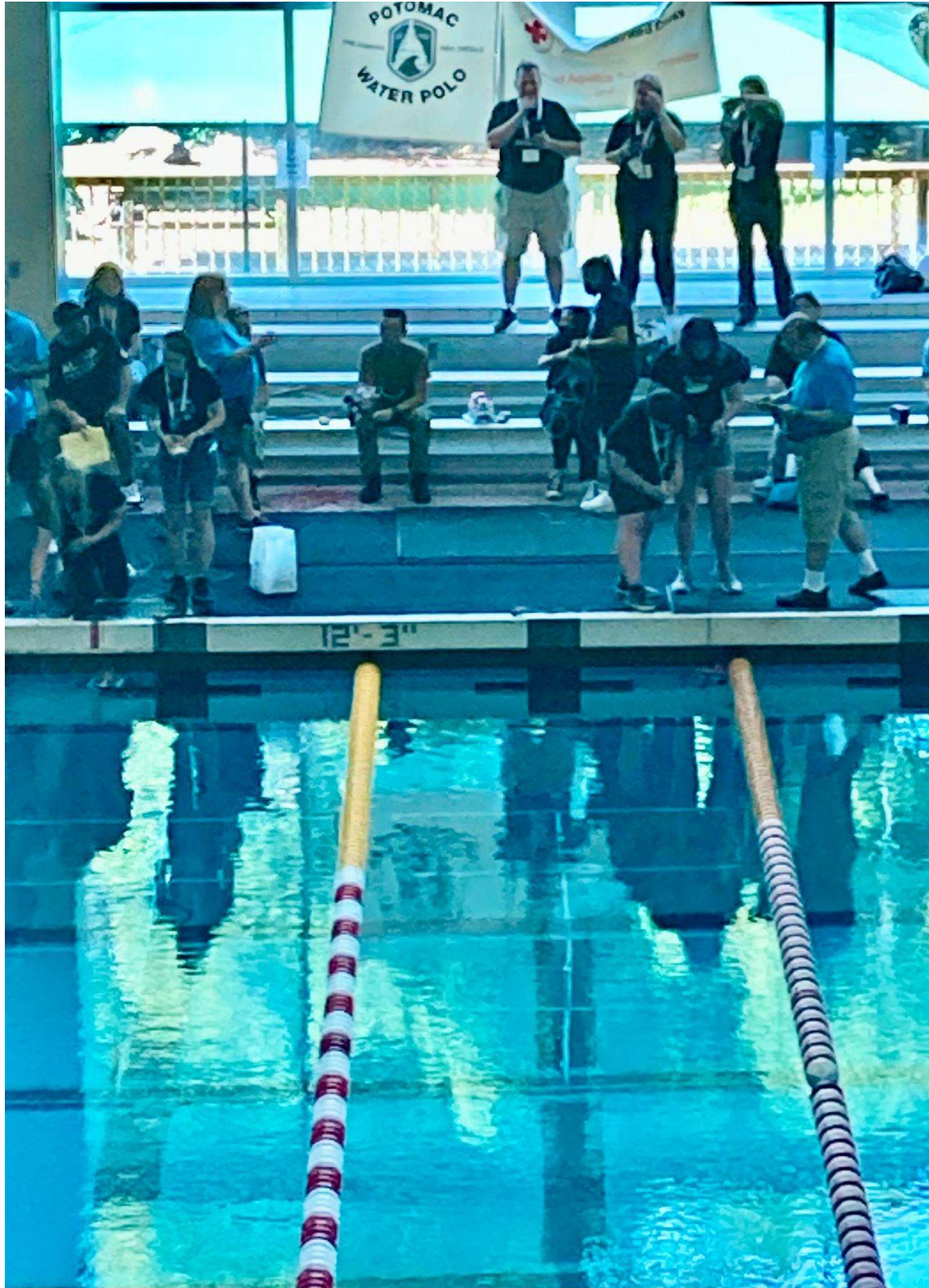
Melissa Haigh and Laurel Anderson prepare their ROV to enter the water at the regional tournament. Navy Recruiters in uniform stand by to judge the team's performance. A diver from the Civil Air Patrol filmed the underwater action.



PVC Space Pirates presenting their engineering design process to engineering judges from Leonardo DRS. From left to right: Nataly Schoening, Kayla Knudtson, and Samantha Fleischman.

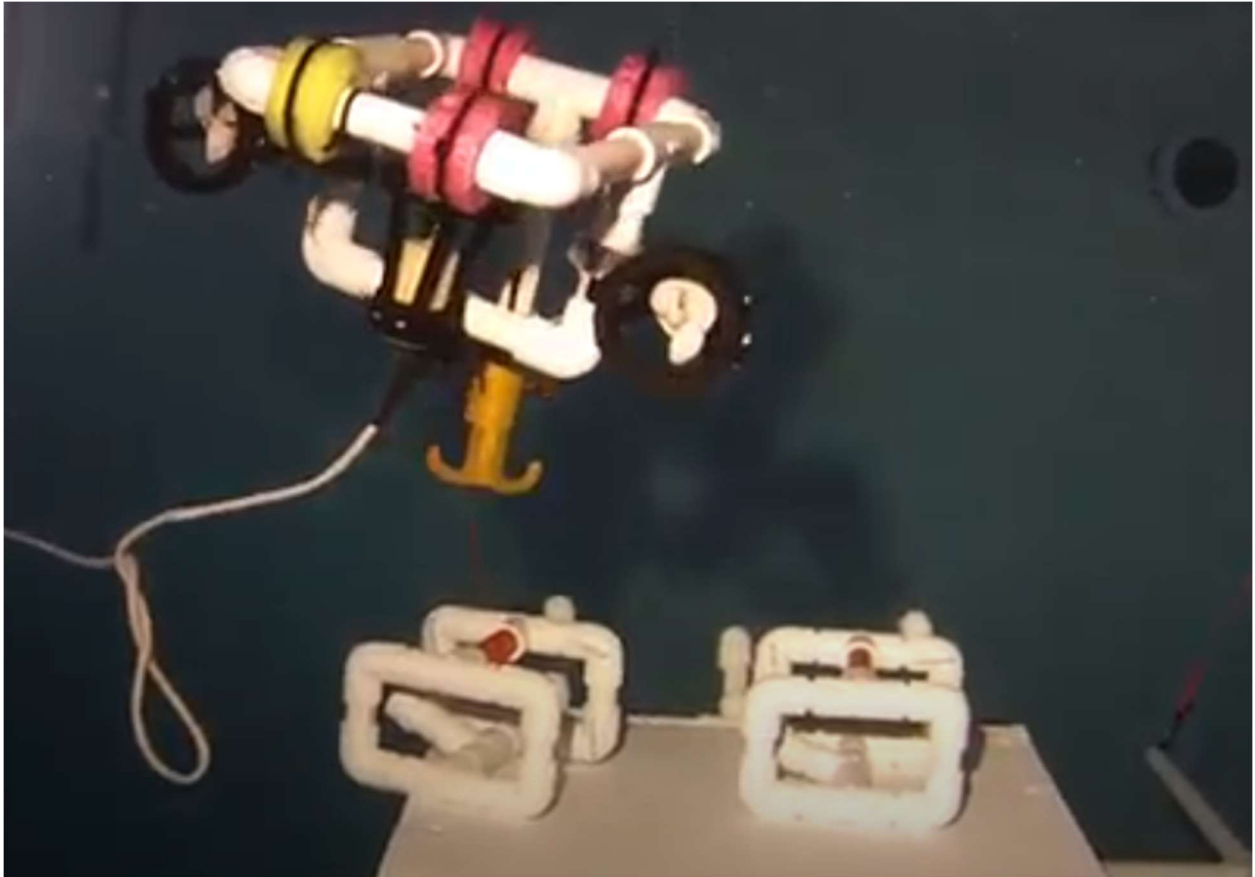


Laurel Anderson standing in front of a map indicating where each team was traveling from. There were teams from 26 different countries on four continents. Note: Not all teams were depicted when the photo was taken.

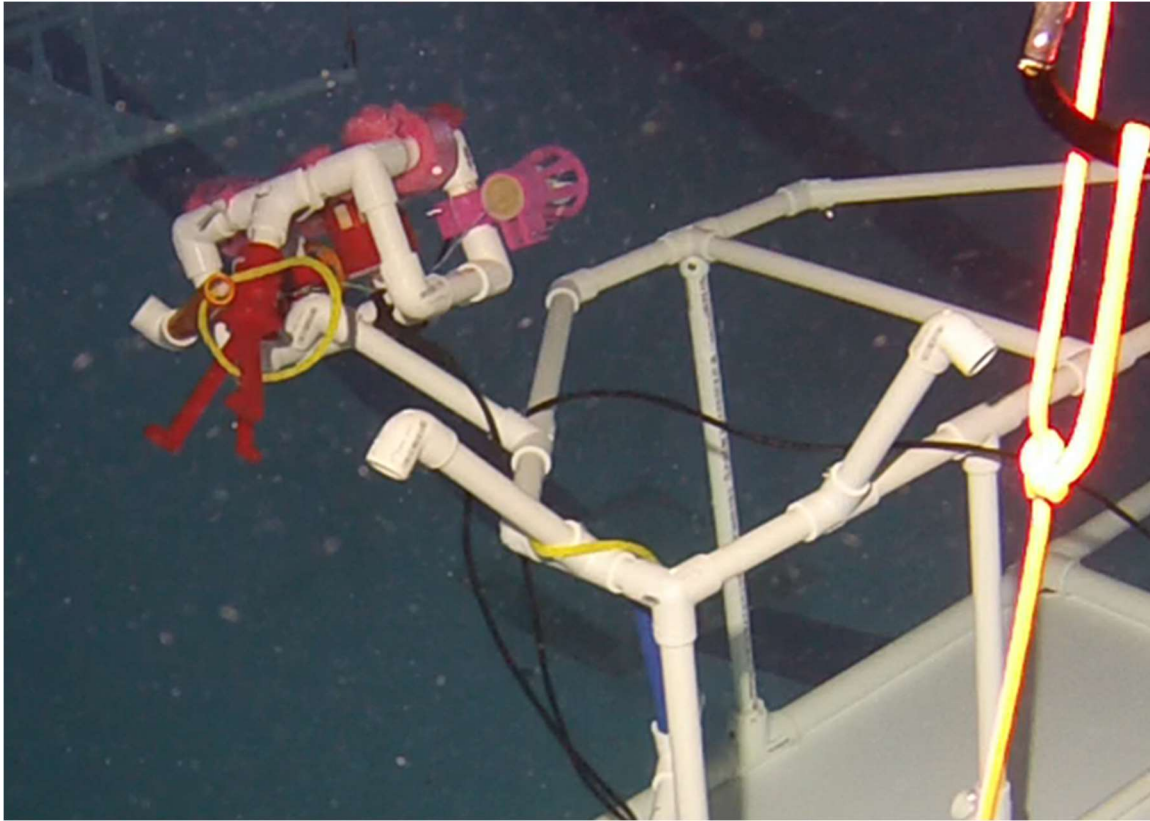


Poolside at the International Tournament. In the left lane is the PVC Pirates team of Nataly Schoening and Kayla Knudtson. In the right lane is Team Leviathan of Laurel Anderson and Melissa Haigh. The teams are maneuvering their ROV through the five rings of the obstacle

course. Taking photos and video in the bleachers are Coach Erik Wolbach, parent Kim Schoening and parent Becky Knudtson. The photo was taken by Robin Anderson.



Underwater photo of PVC Space Pirates navigating through the mission course. Photo courtesy of Ken Welch, Civil Air Patrol. Team named their vehicle "Polly"



Underwater photo of Team Leviathan navigating through the mission course. Photo courtesy of Ken Welch, Civil Air Patrol. Team named their vehicle "Larry"



International Tournament Teams From left to right: Sophomore Laurel Anderson, Junior Melissa Haigh, Senior Nataly Schoening, and Senior Kayla Knudtson. ROVs named "Larry" and "Polly" are also present.



International Tournament Teams From left to right: Sophomore Laurel Anderson, Junior Melissa Haigh, Senior Nataly Schoening, and Senior Kayla Knudtson. ROVs named “Larry” and “Polly” are also present.