

## Research Class ROV Trogontherius

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### Abstract

The OSU ROV Trogontherius, named after the giant prehistoric beaver, is a research class remotely operated vehicle. The vehicle will be made available to the public research community at little to no cost in an effort to boost marine research in the region. ROV Trogontherius is designed, built, and maintained by the OSU ROV Team. Underwater robotics is a way to get students excited about science, technology, engineering, and math, and helps them see the practical applications of these subjects. The vehicle is currently designed to explore at 375 ft, and is equipped with a rolling launcher, thrusters, variable buoyancy, manipulator, cameras, and can accommodate subsystems upon request. The OSU ROV Team competes each year in the international Marine Advanced Technology Education ROV competition, requiring a technical report, poster, presentation, and timed underwater tasks. The vehicle's long term effectiveness rests on the team finding researchers to utilize the vehicle. To help ensure this, an Oregon student chapter was formed with the Marine Technology Society in order to allow researchers, developers, and industry representatives a platform to communicate with one another.



Images: The completed ROV Trogontherius as designed for the 2013 goal of reaching a depth of 375 ft.



Figure: A view of the ROV Trogontherius depicted in water with all components except the surface tether, hydraulic hoses, and outer covering. Items emitted were not shown for clarity.



Newberry Crater, Oregon



### Rolling Frame and Launcher

Lifting Capacity: 500 lb  
 Winching Range: 20 ft  
 Power Supply: 48 V  
 Length/Height: 6 ft  
 Width: 2.75 ft

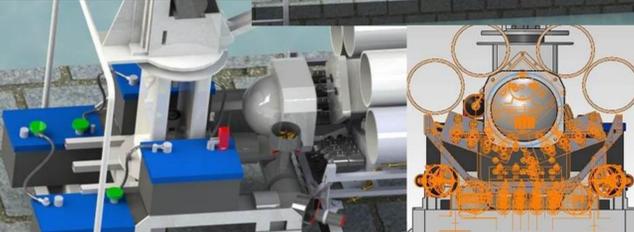


Figure: The rolling frame and launcher designed and built by the team, and a front view of the docked with hidden components in orange (lower right).

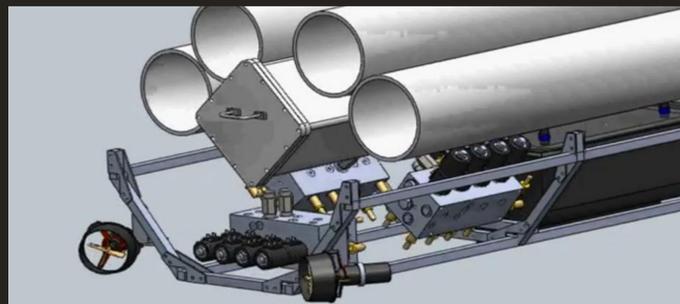


Figure: A view of the three hydraulic solenoid valve bodies (lower), the dry housing for the hydraulic motor and pump (middle), the four variable buoyancy tubes (top), and the electronics dry housing (back right).

### Electrical System

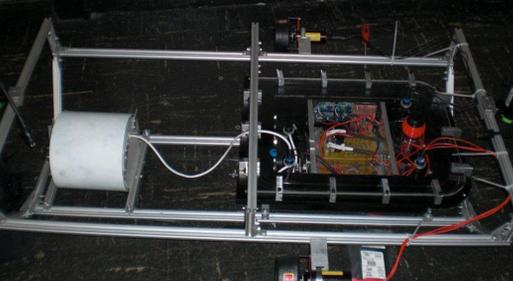
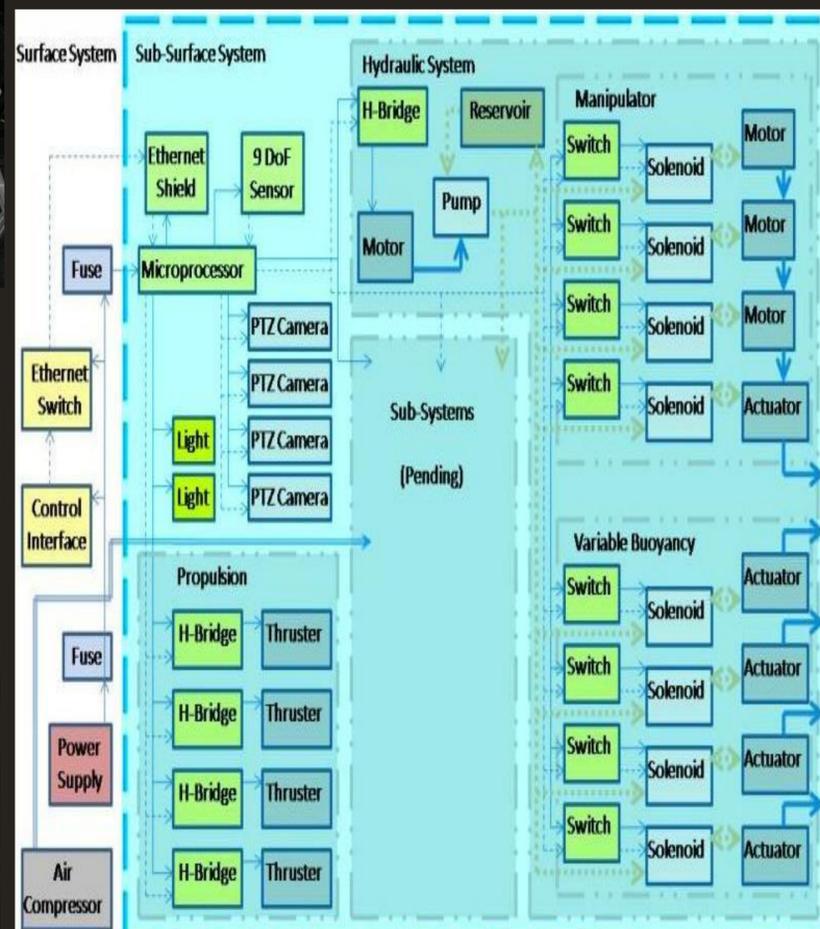


Figure: The electrical system (right), horizontal thrusters (middle top/bottom), vertical thrusters (far left/right), and early camera housing prototype (left).

### Camera Housings



(Clockwise from top left): A camera housing's inner shell being vacuum formed; the vacuum former built and used by the team; a complete camera assembly before the epoxy is added; a camera housing's assembled inner shell.



Product Breakdown Structure (PBS) p. 141, NASA/SP-2007-6105 Rev1

### Mission

The project allows students to design, build, maintain, and operate a research class ROV, made accessible to the public at little to no cost, in an effort to increase the quality of marine research in the region.

### Recent Field Work

Four returning ROV team members joined the Oregon Underwater Volcano Exploration Team this summer at the Newberry Crater in central Oregon to gain experience using ROVs in the field by collecting scientific clues about the volcano.

Sea Grant Oregon

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