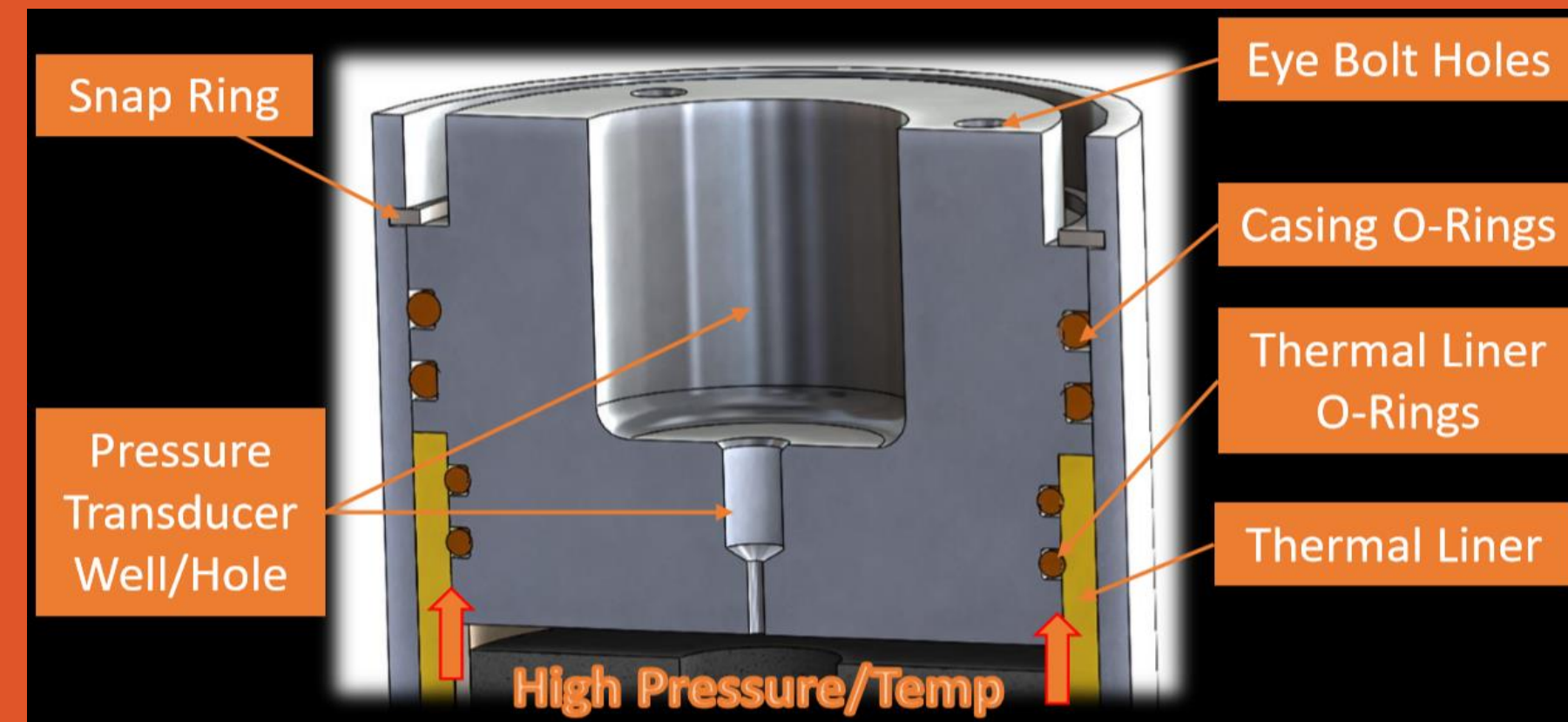


DESIGN FEATURES:

Forward Enclosure –

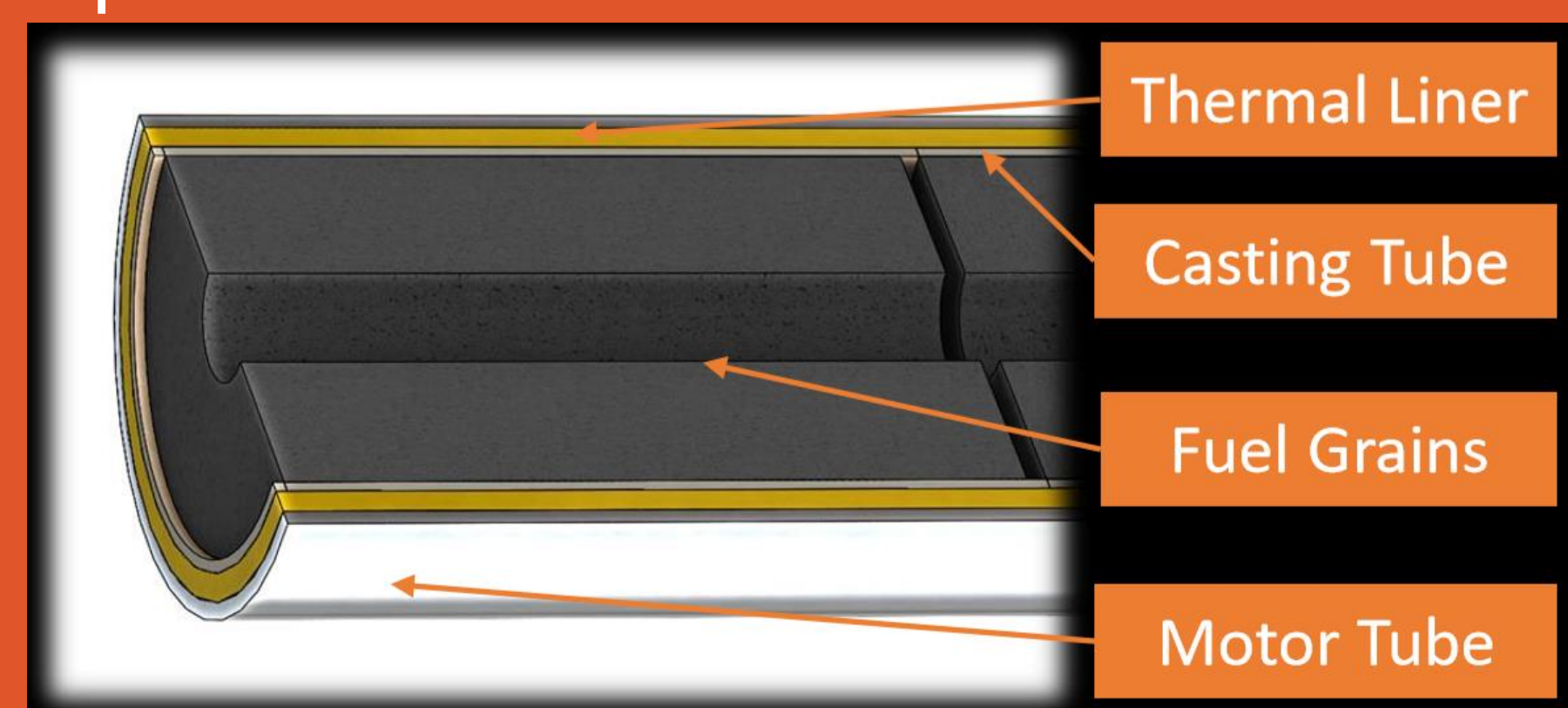
The forward enclosure is the cap on the end of the rocket motor.



- Measures Internal Pressure Using Pressure Transducer
- Prevents thermal failure by preventing circulation of hot gasses behind thermal liner
- Connects motor to the rocket and parachute

Motor Tube –

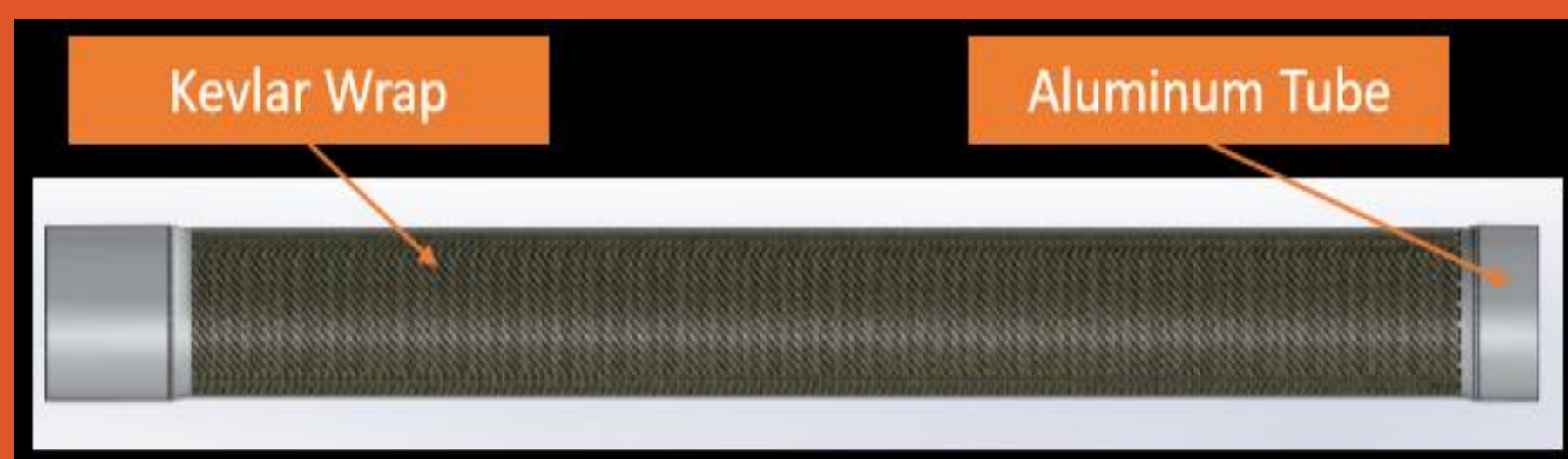
The motor tube is the external pressure vessel of the motor.



- Operates at 650 PSI & 2700°F internally

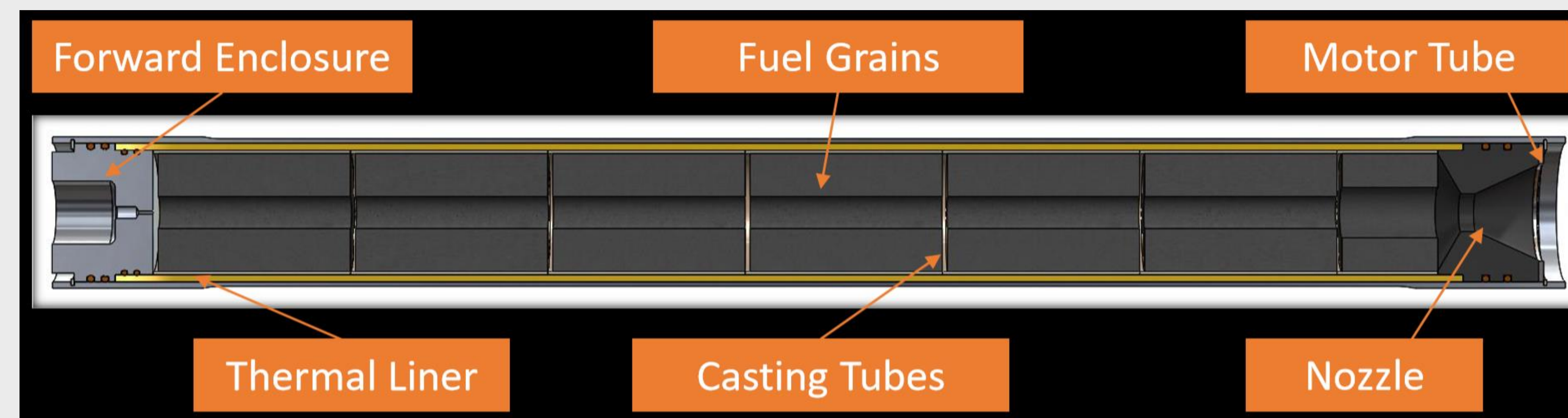
COPV –

A composite overwrapped pressure vessel, or COPV motor aims to reduce weight by replacing metal with composite materials.



ESRA 30K ROCKETRY TEAM PROPULSION: MOTOR CASING

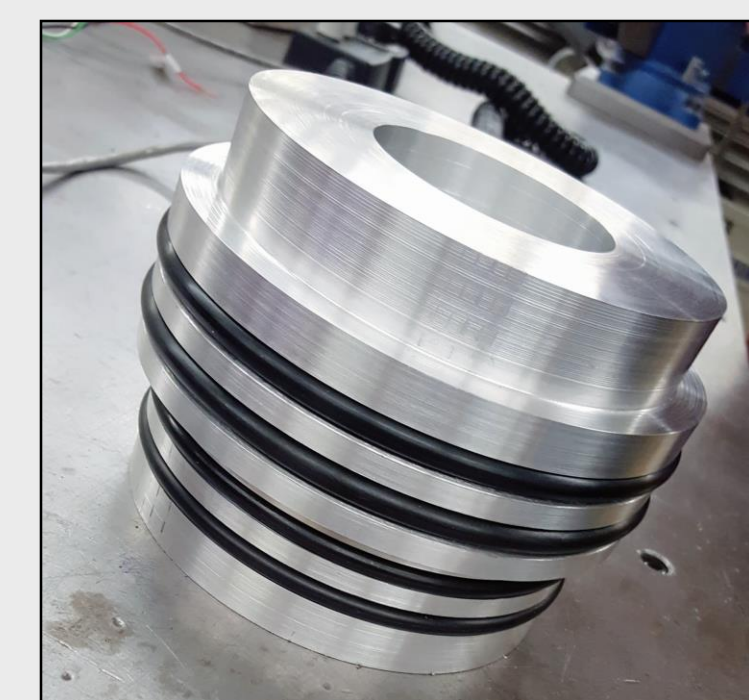
The ESRA team’s goal is to design and manufacture a solid-fuel rocket to compete in the Spaceport America Cup by launching to 30,000 ft carrying a scientific payload. The Propulsion: Motor Casing team is responsible for the design and manufacturing of the motor components on the competition rocket as well as the research and development of new-to-OSU motor casing technologies utilizing composites.



(Section View of ESRA Motor Model)

MANUFACTURING:

The forward enclosure was manufactured entirely by students in the OSU machine shop from aluminum 6060-T6 stock.

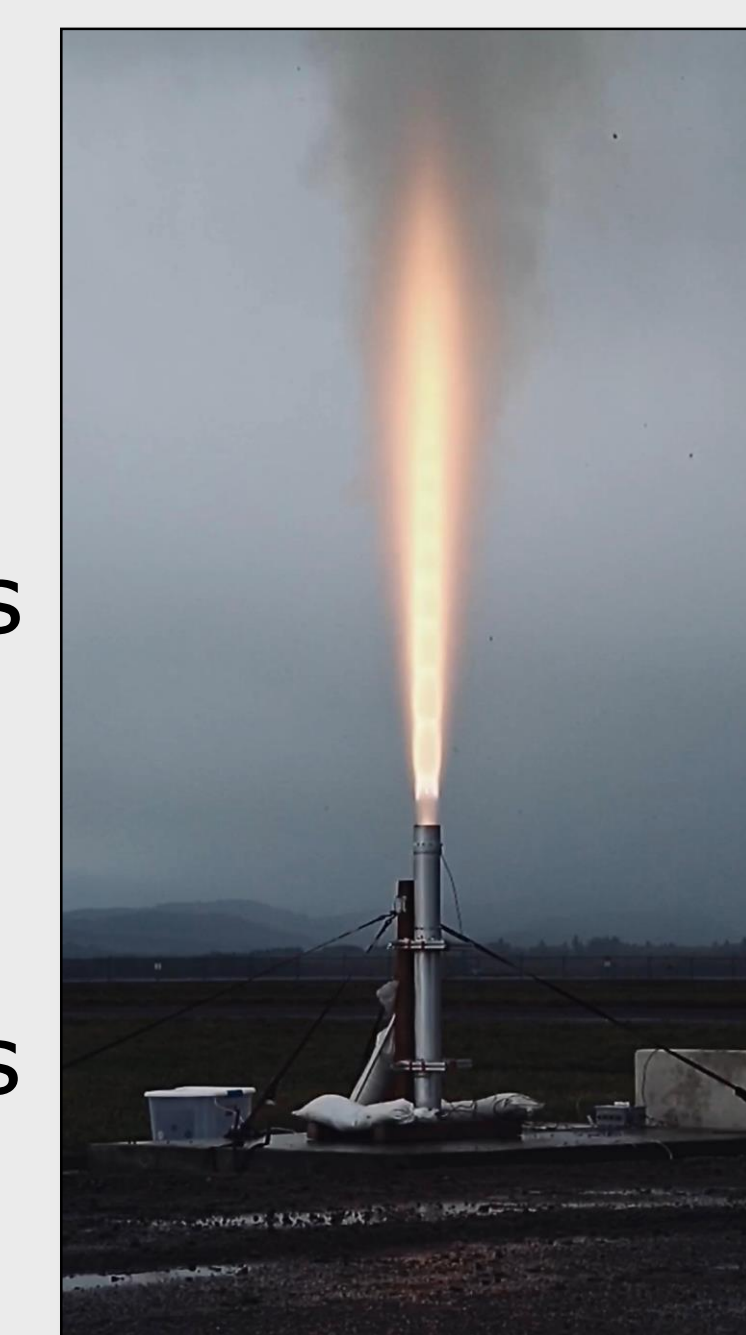


The motor tube was manufactured by a professional machine shop as OSU does not have the capabilities to machine something so large.

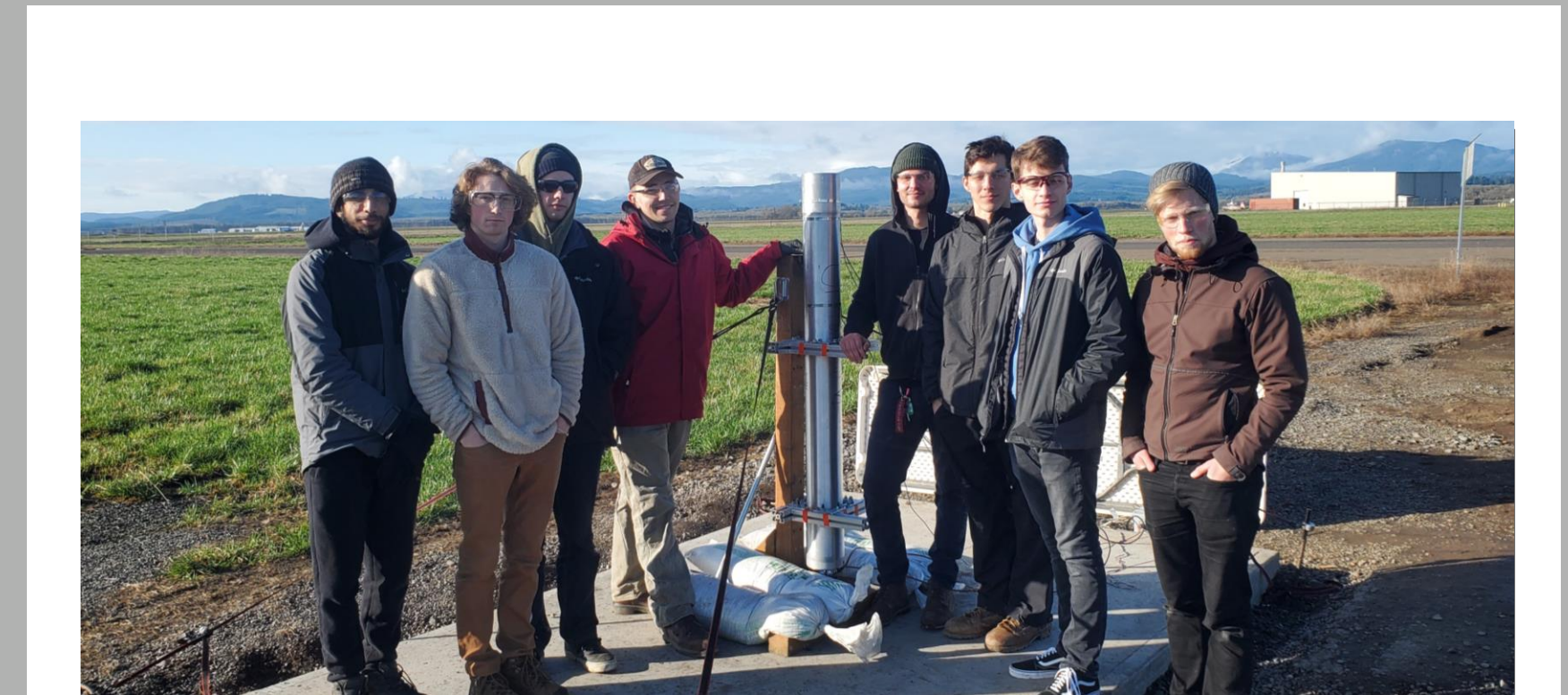
Other components were either used as purchased or altered to fit specific task.

TESTING:

The motor casing was first tested through hydrostatic testing where the casing was filled with water and pressurized to 1.5 times the expected pressure.



The motor casing dubbed "OI Faithful" has now been statically tested multiple times and reached pressures of 800 PSI and external temperatures of 280°F with no damage.



TEAM MEMBERS

- Jon Campillo
- Carter Hazen
- Harjot Saran
- Mathew Van Gordon

TECHNICAL ADVISOR

Dr. Nancy Squires

PROJECT SPONSOR

OSU AIAA



PROJECT STATUS

- The design manufacturing and testing is complete for the conventional motor casing design. This design will now be used in flight tests and ultimately in the Spaceport America competition
- The team is now focused on continuing research and manufacturing of a COPV motor

