Design, build, and test an anti-fouling shutter/wiper for a glass window on an underwater pressure-resistant housing which will hold an autonomous (remotely controlled) camera.

Dr. Uwe Send and his team at the Scripps Institute of Oceanography has made leaps and bounds in the fields of ocean-climate interaction, and their fleet of research cameras are integral in CO2 uptake and acidification monitoring.

**Design Specifications**

- IPX8 Waterproof up to 30 atm
- Assembly will not crush up to 30 atm.
- Shutter and wiper system clears lens window of debris
- System is antibiofouling

**Project Sponsor**

Scripps Institution of Oceanography

**Manufacturing**

- 6061-T6 body and end caps machined at SDSU machine shop.
- 316 shutter, wiper, and lens window machined at SDSU machine shop.
- Polycarbonate edge guard outsourced to Incept3D.

**Assembly**

- O-rings seated into grooves on each cap, then lubricated. Rotary seal press fit into seat.
- Shutter coupled to motor, electronics connected from bulkhead.
- Copper tape for antibiofouling.

**Results**

- Shutter protects window from debris.
- Wiper removes debris from window.
- Assembly does not crush at operating pressure.
- IPX7 satisfied.