

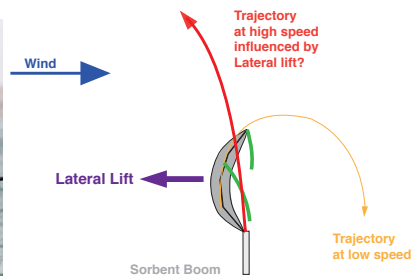
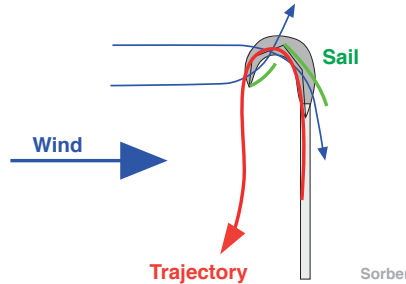
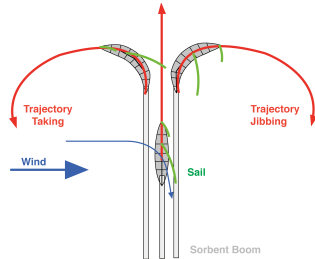
New properties of a shape-shifting hull?

Research questions.

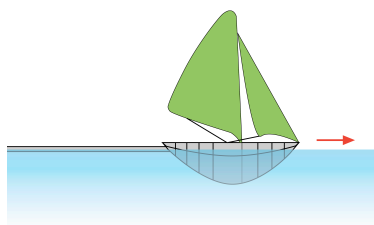
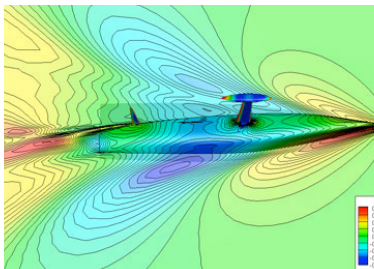
One invention = many innovations
shape shifting curved hull

The invention of the curved hull is introducing many new innovations. It provides better **trajectory control** and reduces the turning radius. By causing the hull to curve Protei turns. Curving the hull displaces the center of gravity and the center of floatation outside the volume of the hull providing more **dynamic stability**.

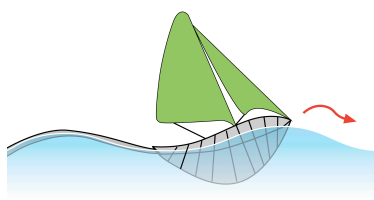
By having a main sail and a jib on a boat that curves means that the relative angle of these sails will change when turning. When tacking the jib catches the wind faster. When jibing the main sail switches side faster. One of the major advantages of a curved hull is that both sails can never be in irons at the same time, which means you have **constant pulling power** from the sail to pull something long and heavy. (oil absorbent boom / scientific payload).



At sufficient speed a curved hull may acquire hydrofoil properties. Instead of vertical lift Protei could produce **lateral lift** meaning the possibility of sailing closer to or further away from the wind therefore more relative motion to the wind and more speed.



A conventional displacement boat has a centerboard and a rudder as appendages. By Protei's shape shifting hull being the centerboard and the rudder it creates **less friction and turbulence**, which we hope will achieve greater speed.



A conventional rigid hull hits the water at every wave whereas Protei's flexible hull **follows the motion of waves**. By reducing the impacts of waves, do we gain stability and speed?