



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> <b>Phillip B. Behm</b>	<b>Project Number</b> <b>J0102</b>
<b>Project Title</b> <b>Supercavitation</b>	
<b>Objectives/Goals</b> Question I'm investigating: Does supercavitation reduce the drag on a submerged streamlined object? Hypothesis: My hypothesis is that supercavitation will reduce the drag, however, only if the speed of the air coming out of the front is correct. If it is too high I believe it will increase the drag.	
<b>Abstract</b> <b>Methods/Materials</b> Procedure: Make a torpedo-looking object. Drill a series of holes into the front of the torpedo and another one in the side so air can be pushed through that hole and out the others at the front of the torpedo that you just drilled. Build an apparatus that can accommodate a water pump and a testing chamber. Attach a 2.5-Newton scale to a rolling carriage that can hold the torpedo underwater while the water runs by it. The drag is measured at this time with a 2.5-Newton scale. Next, air, at a speed of about 10-PSI, is pushed out of the front of the torpedo by an air compressor. The drag is again measured. The air speed is then increased to 20 PSI, 30 PSI, and 40 PSI. The drag is measured at these intervals. My torpedo length was about 1-1/2 inches. The test chamber was 1 inch across and 1-3/4 inches high. Materials: Aluminum, Steel, Wood, Water Pump, Air Compressor, Plastic Bottle, Plexy Glass, 1-inch wheels and axles, Outlet and Wiring, and 1/2-inch and 1-inch PVC Piping.	
<b>Results</b> Results: The results show that when the valve was half open or about 20 PSI, the drag was the least. Also, data shows that with the valve completely open or about 40-PSI, the drag was actually increased.	
<b>Conclusions/Discussion</b> Conclusion: The results of this experimentation support my hypothesis. Supercavitation does reduce the drag to a point. If the air speed is too high it creates more drag. In conclusion, supercavitation works well if used correctly.	
<b>Summary Statement</b> Will supercavitation, an air bubble around a submerged streamlined object, affect the drag on that object in moving water?	
<b>Help Received</b> Father helped build apparatus; Mother helped format report.	