OFFICIAL ABSTRACT and CERTIFICATION

The Effect of Structural Shapes on Fluid Flows in Fluid-Structure Interactions

Sarah Pomerantz
Half Hollow Hills High School West, Dix Hills, New York, United States

Computational Fluid Dynamics is the use of computer simulations to study fluid flows, and in this case Fluid-Structure Interactions, where fluids flow past and interact with various obstacles. Using Ansys Student software, this research studied the flow past 9 objects: a circular cylinder, a horizontal ovular cylinder, a vertical ovular cylinder, a cube, an equilateral triangular prism pointing towards the outlet, an equilateral triangular prism pointing towards the inlet, a cube rotated 90, an equilateral triangular prism pointing towards the wall, and a right scalene triangular prism. In the end it was found that objects with similar properties create similar recirculation regions and flow patterns.

Category
Pick one only — mark an "X" in box at right

- Animal Sciences
- Behavioral & Social Sciences
- Biochemistry
- Biomedical & Health Sciences
- Biomedical Engineering
- Cellular & Molecular Biology
- Chemistry
- Computational Biology & Bioinformatics
- Earth & Environmental Sciences
- Embedded Systems
- Energy: Sustainable Materials and Design
- Engineering Mechanics ■
- Environmental Engineering
- Materials Science
- Mathematics
- Microbiology
- Physics & Astronomy
- Plant Sciences
- Robotics & Intelligent Machines
- Systems Software
- Translational Medical Sciences

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check ALL that apply):

   ☐ human participants ☐ potentially hazardous biological agents

   ☐ vertebrate animals ☐ microorganisms ☐ rDNA ☐ tissue

2. I/we worked or used equipment in a regulated research institution or industrial setting: ■ Yes ☐ No

3. This project is a continuation of previous research. ☐ Yes ■ No

4. My display board includes non-published photographs/visual depictions of humans (other than myself): ☐ Yes ■ No

5. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only ■ Yes ☐ No

6. I/we hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work. ■ Yes ☐ No

This stamp or embossed seal attests that this project is in compliance with all federal and state laws and regulations and that all appropriate reviews and approvals have been obtained including the final clearance by the Scientific Review Committee.