Video Assignment Presentation due date: March 31st

Description: The objective of this project is to film a demonstration and explanation of a phenomenological fluid dynamic scenario, or the application of such in nature. The video should aim to be clear and informative, suitable for use in a first or second year physics, engineering, or oceanography course.

Resources: A number of tanks are available in the LSC for performing smaller scale fluid dynamics experiments and Laura deGelleke in the Department of Oceanography has graciously offered to facilitate their use. She can be reached at: laura.degelleke@dal.ca, or in LSC 3621. If you wish to use the Aquatron's facilities, Dr. Barclay can arrange this for you. Cameras can be used free of charge from Dal's A/V service (http://www.dal.ca/dept/its/its-services/av-services.html). Final Cut Express and iMovie are available on Dal Library workstations.

Topics: The following topics are suggested, although you may choose an unlisted topic with approval of Dr. Barclay.

- Perform an experiment exploiting the properties of a non-newtonian fluids.
- How do scallops swim?
- Explain the special circumstances and scales that cause the Socorro Islands bubble lassos.
- Show and explain the Marangoni effect.
- Compressible fluids: use high FPS video to film an implosion, shockwave or other event allowed by the compressibility of water.
- Demonstrate the Rayleigh-Taylor instability.
- Demonstrate the Kelvin-Helmholtz instability.
- Demonstrate the Plateau-Rayleigh instability.
- Demonstrate the Saffman-Taylor instability.
- Perfect laminar flow.
- Do something interesting with soap and/or soap bubbles.
- Access to a microscope and zooplankton? Describe the importance of scale in the way that zooplankton move around their world.
- Evaluate the ASCII fluids simulator against a benchmark problem of your choice: *http://www.ioccc.org/2012/endoh1/hint.html*

Grading: A grade out of 30 will be awarded. Equal weight will be given in the categories of

1) Scientific accuracy – Demonstrate a complete physical and mathematical grasp of the topic.
2) Instructional clarity – How clearly does the video explain the questions that arise from the topic? Are the explanations at the appropriate level?
3) Experimental, or observational, or computational quality – How well was the experiment executed/observation made/simulation computed?

The video will not be graded on production or entertainment value.