From: Eli Tziperman <*eli@eps.harvard.edu*>
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Subject: Oscars project: double diffusion! (Deadlines: March 6, March 29)
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Dear physical oceanographer friends,

It's time to start working on our EPS/ESE 131 Oscars (a 3−minute video) group assignment: double diffusion!

Details:

You are asked to experimentally demonstrate the phenomenon of double diffusion, read about it fir st here: https://en.wikipedia.org/wiki/Double_diffusive_convection.

Needed ingredients:
* water
* fridge & stove
* salt
* food coloring

Experiment 1: Dissolve plenty of salt in very hot water, then cool it to near freezing. Add the f ood coloring to near−boiling water. In a transparent glass container, pour the cold salty water, and then the warm, fresh & colored water. Watch and videotape.

Experiment 2: Dissolve salt in hot water, adding food coloring. In a transparent glass container, pour first very cold fresh water, and then the warm/salty/colored water. Watch and videotape.

Hints: (1) In either experiment, we want the cold water to be denser than the warm water, so that they can form two layers. You may need to adjust the salt concentration to make sure that's the case. (2) We want the initial state to be two distinct layers of water, with minimal mixing betwe en the two. When we pour the hot water over the cold water slowly, we want to minimize mixing bet ween the two; for this purpose, it is best to place a spoon (or a Scotch−Brite Kitchen Sponge) su bmerged near the surface of the lower, cold, layer and gently and slowly pour the hot water into the spoon, letting it spread horizontally from there.

Engage scientifically and?most importantly?emotionally :−), producing a (no more than!) 3−minute video to document your exp

Advice: personally appearing in your movie makes all the difference.

Timeline:
* By Friday, March 6, 4 pm: divide into groups of 3?4 for this assignment; let Kirstin know who you plan to work with . Let us know ASAP if we can help you find a group!
* By Sunday, March 29, midnight: submit your video to Kirstin. We'll watch the videos in class th at week.

Some past examples:

Surface waves:
http://www.seas.harvard.edu/climate/eli/Courses/EPS131/2005fall_a/student−movies/
Internal waves:
http://www.seas.harvard.edu/climate/eli/Courses/EPS131/2008spring/student−movies/
Thermohaline circulation:
http://www.seas.harvard.edu/climate/eli/Courses/EPS131/2012spring/student−movies/
Great Pacific garbage patch:
http://www.seas.harvard.edu/climate/eli/Courses/EPS131/2010spring/student−movies/
Surface waves:
http://www.seas.harvard.edu/climate/eli/Courses/EPS131/2014spring/student−movies/

Brine rejection:
http://www.seas.harvard.edu/climate/eli/Courses/EPS131/2016spring/student−movies/
Phase velocity components of 2d plane−surface waves:
http://www.seas.harvard.edu/climate/eli/Courses/EPS131/2018spring/student−movies/
Sweet viscosity:
https://www.seas.harvard.edu/climate/eli/Courses/EPS131/2020spring/student−movies/
Sea level:
https://www.seas.harvard.edu/climate/eli/Courses/EPS131/2022spring/student−movies/
Visualizing vorticity:
https://www.seas.harvard.edu/climate/eli/Courses/EPS131/2024spring/student−movies/

Enjoy! Please get in touch if you need help or advice.

Kirstin and Eli