Cyron Completo

Get Wet Report

ATLS 4151

Red Dye Nebula

This image is a submission for the Get Wet project. The intent of the image was to capture how a fluid spreads upon entering another fluid of similar density. My housemate, Harrison Snook, assisted me with the project by dropping various types of food coloring from various heights into the glass as well as dropping said types at various distances from the edge of the glass. Other attempts included dropping multiple droplets, blue droplets, red and blue droplets, stirring the water prior to application, and dropping said droplets at various distances from the edge of the glass. I settled on this image because it portrayed to most compelling and aesthetically pleasing result out of all the trials.

The glass in the image is an oversized wine glass that could hold an average wine bottle’s volume of liquid. The flow pictured is the aftermath of red food coloring colliding with the surface of water. In this image, the dye appears to be spreading both vertically and horizontally. It appears this way because the velocity of the droplet as it hit the surface of the water was enough such that it reached a depth of about 3.5 inches and because of the fluid’s tendency to spread outwards because of surface tension. The forces making the dyed fluid move are gravity and surface tension of both the dyed fluid and the water, making the dye change its position over time.

To accomplish this same image, a ~25-ounce glass vessel should be filled with water and a dropper containing ~0.25-ounces of red food coloring must be used to drop a single droplet near the center of the glass vessel. Once dropped, the photographer must capture the flow precisely when the dye begins spreading horizontally, but not after the dye mixes to a relatively stable state (where velocity of the dye’s mixing is close to zero). The red food coloring I used was purchased from Safeway and the brand of the food coloring is Signature Kitchens. The lighting I used in the scene was a floor lamp with a bulb that has adjustable brightness (three states) as well as sunlight coming in from a small window at the corner of the room.

The photograph was captured with an aperture of f/9, an exposure time of 1/30 seconds, a focal length of 35 mm (the lens range is 18 mm – 5 mm), an ISO speed of ISO-504, no exposure bias, and no flash. The camera I used was a Nikon D5200. The original image was captured in a raw format (NEF) and both the original and final images were at 6000 x 4000 pixels in dimension. I chose to use Adobe Lightroom to adjust the exposure, white balance, and levels of the photo, as the original photo was too dark and then Photoshop to hide areas of light reflection and to crop the image. I chose to use the above settings because it would allow me to capture a clear photo with a depth of field that could show the volume of the glass, so that I could capture the photo with as little ISO settings as possible to reduce graininess, and so that I would not need to use additional lighting in the scene because of my budget and time restrictions. I chose to not use flash as a source of lighting as that would result in glare emanating from the glass.

The image reveals the effect of the Rayleigh-Taylor instability from a fluid entering another fluid of similar density. I like the image because of its interesting nebula-like properties. I do not like that various blue colors are shown because of the glass and I hope to crop my images more in the future. I did fulfill my intent but I would like to show off various colors and fluids of varying density to develop the image further. By doing that, I could portray the Rayleigh-Taylor instability in a variety of situations.