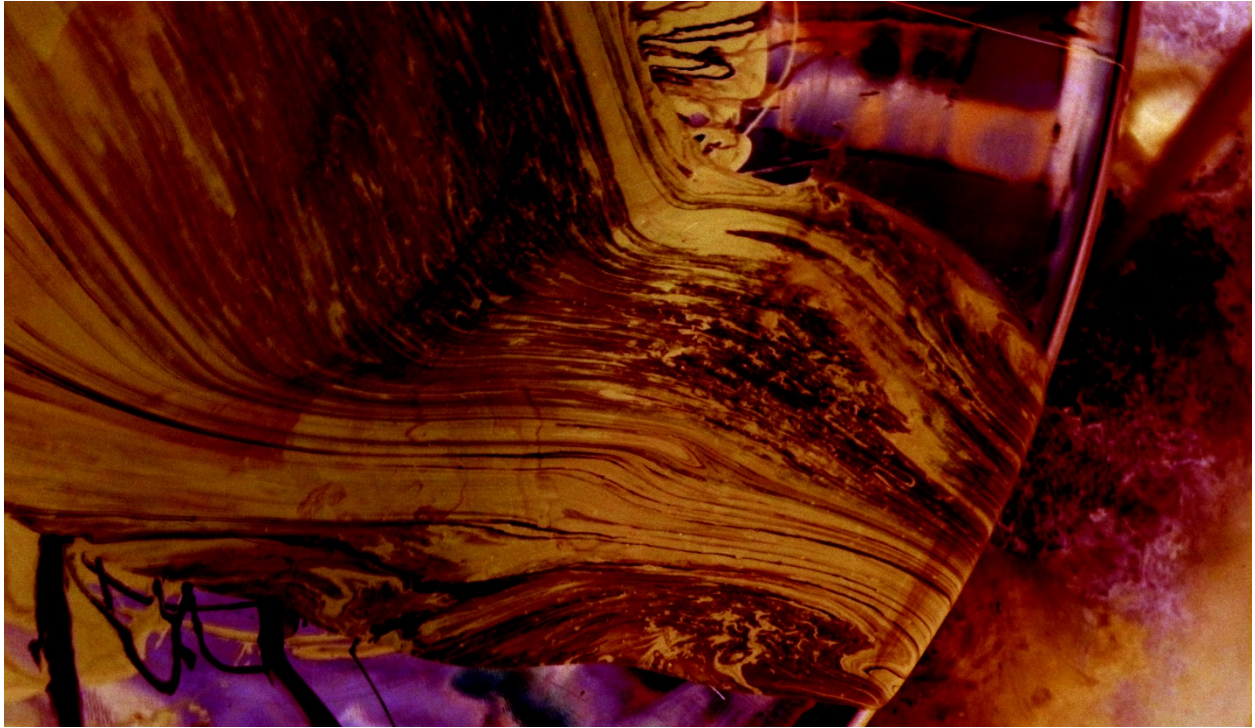


Paint Mixing in Aluminum Bowl Displaying Non-Diffusive Mixing



Emily Kolenbrander

Undergraduate
University of Colorado at Boulder
Department of Mechanical Engineering

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Professor Jean Hertzberg

INTRODUCTION AND PURPOSE

This photograph and paper was created for the Second Team Photo assignment in the Flow Visualization course at CU Boulder. The instructions for this assignment were to simply capture an image of any flow that displays physical phenomenon. I decided to interpret physical phenomenon related to non-diffusive mixing in liquids of different color. In order to display this effect, I used two different paint colors mixed in an aluminum bowl. This image was inspired by the paint mixing images displayed in the ECCR wing of the Engineering Center, the image specifically was called "Layers of poured paint result in non-diffusive mixing due to the low Reynolds number." In 2012 by Joshua Smith.

FLOW GENERATION

The apparatus used to capture this image was extremely simple, consisting of several components: two different colors of Behr House Paint, Purple and White, a large aluminum bowl, and natural light coming from the window. In capturing this image I simply mixed the two different paint colors in the large bowl. I took several pictures of the mixed paint in several configurations. This image was actually taken when I was washing the components after the photo session. I noticed that the paint pouring out of the bowl looked awesome, and ran back upstairs to get the camera. In this image, the paint is pouring out of the side of the bowl with the water in the sink in the background (seen in the bottom right corner of the image).

FLUID PHYSICS

The fluid phenomenon displayed in this image is directly a result of the properties of paint. House paint (used in this image) has an extremely high viscosity when stationary. This is an important property that allows the paint to resist outside forces, making it much easier for the paint to stick to a wall and resist gravity instead of sliding down to the floor. Just from simple life analysis, it can be determined that the paint requires significant outside force to change the properties.

PHOTOGRAPHIC TECHNIQUE

The camera used to capture this shot was a Nikon CoolPix P80 held above the paint as it was mixing. As can be seen in the data in Figure 3, a fairly large aperture was used $f/3.5$, giving the image a greater depth of field. This allowed for the depth of the bowl and concavities.

DSCN0934	
JPEG image	
Date taken:	1/24/2014 8:09 AM
Tags:	Add a tag
Rating:	☆☆☆☆☆
Dimensions:	1024 x 768
Size:	272 KB
Title:	Add a title
Authors:	Add an author
Comments:	Add comments
Camera maker:	NIKON
Camera model:	COOLPIX P80
Subject:	Specify the subject
F-stop:	$f/3.5$
Exposure time:	1/70 sec.
ISO speed:	ISO-64
Exposure bias:	0 step
Focal length:	5 mm
Max aperture:	3
Metering mode:	Pattern
Flash mode:	No flash, compulsory
35mm focal length:	27
Date created:	1/29/2014 11:18 AM
Date modified:	1/29/2014 11:18 AM

Figure 1: Photo data

IMAGE POST PROCESSING

In the final stages of this image creation, I did minimal edits using Adobe Photoshop. Using the Curves function, I increased the contrast in the image, and then reversed the colors. This allowed for the color contrast to be much more vivid in the image.

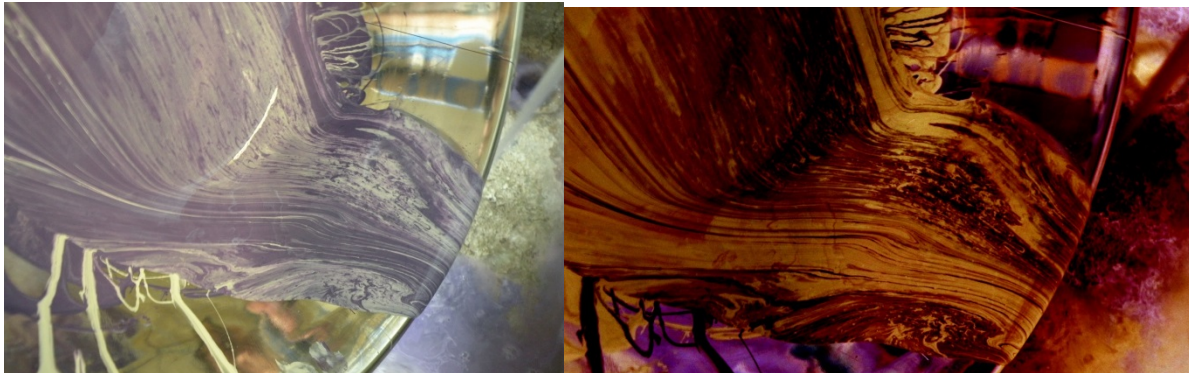


Figure 2: Left: Original image, Right: Final image

REFERENCES

1. http://www.colorado.edu/MCEN/flowvis/galleries/2012/Team-3/FV_popup1-34.htm