

Team Second Report

Stephanie Mora



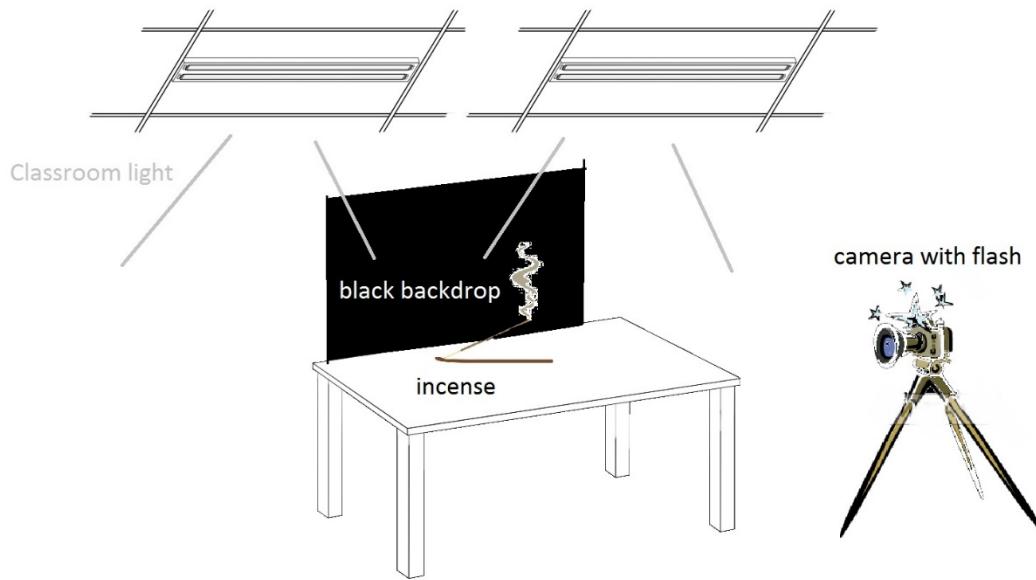
Second Team Write Up

Objective

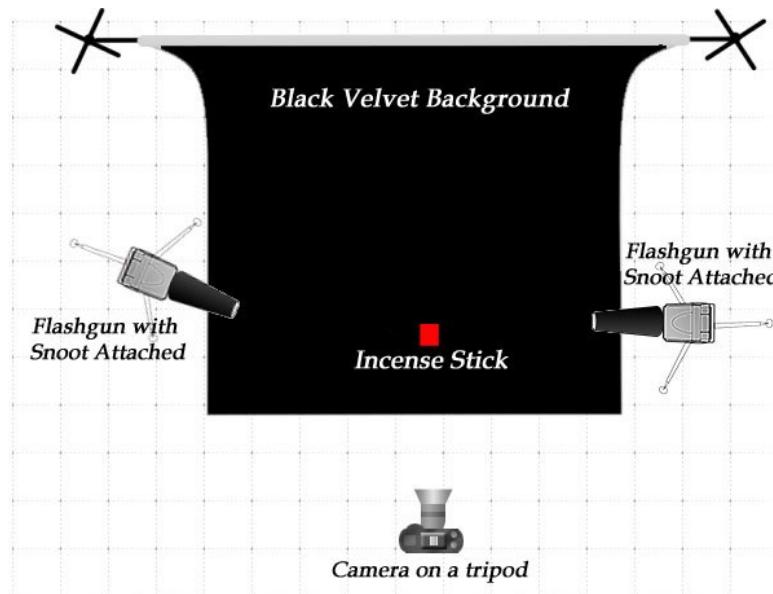
Smoke has always fascinated me, the delicate swirls and calming flow, I always found so beatiful. I had noticed recently that when I'd burn my incense, the smoke would form these curling waves for a few seconds before going wispy again. Capturing an image of those curling waves was my goal for this assignment. My teammates who helped me create this image are Tianzhu Fan, Yadira Valdez and Matthew Beckemeier.

Background

Below is the basic setup we had going for this picture. It turned out not to be the best because the front flash from the camera bounced off the backdrop and washed out some of the details from the smoke. Below that image is the set up we should have had to prevent the light washing out details. External flashes should have been on the both sides of the incense smoke. Additionally, there should have been no extra ambient lighting. Ideally with this set up you want your external flashes to be synchronized with your shutter speed.



Below is the set up we should have had to prevent the light washing out details. External flashes should have been on the both sides of the incense, with no flash coming from the front.



The instability captured is a type of Kelvin-Helmholtz Instability. This is a fluid instability that occurs in regions of high shear between two fluids with differing velocities and densities (1). In this case, the air in the room and the incense smoke. If surface tension is ignored, two fluids in parallel motion with different velocities and densities yield an interface that is unstable for all speeds, causing the waves to form (2).

We used nothing more than regular incense smoke to visualize the flow. As mentioned earlier, the lightening came from a front facing flash and ambient light, not the best decision to capture the details of the smoke.

Equipment & Post-Processing

The camera I used is a Canon PowerShot SX280 HS with an ISO of 100, 1/250 shutter speed, f/4, 8 mm focal length and front flash, for this picture. I tried using a tripod but the smoke would shift and change direction so much that it was easier to get good photos holding it in my hands. The board in behind was not a smooth velvet, it was a board that unfortunately had a lot of scratches. The majority of my time in photoshop was spent using the clone stand to get rid of the white lines. I also darkened background and dodged some of the smoke to make it stand out against the background more. Below is my original and edited photo.



Intent and Improvements

The phenomena I wanted to capture were these rolling waves, which was successful. If I could change things in this picture, I would want to capture the details of the smoke much more vividly, in better focus with better light. I would have wanted a scratch-free and very black backdrop. With all these things in place, the flow phenomena would have been much better illustrated. Getting a better focus on the smoke would allow me to have more options in post-processing. One of the things I would have liked would be put a rainbow gradient on the smoke. Especially with a stark black background. This is definitely a picture I would want to redo with the proper set up.

Citations

- (1) Kundu, P. K., Cohen, I. M. "Fluid Dynamics", 4th Edition, Academic Press, 2008
- (2) Kelvin–Helmholtz instability. (n.d.). Retrieved November 30, 2016, from https://en.wikipedia.org/wiki/Kelvin–Helmholtz_instability