Team Third/IV 4
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With help from Will Dietz, Meredith Stading, and Ryan Wells
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1: Introduction

This image was created for the third team project, and the fourth IV assignment of the semester. I worked in collaboration with Will Dietz, Meredith Stading, and Ryan Wells to capture ferrofluid, a liquid that is attracted to the poles of a magnet.

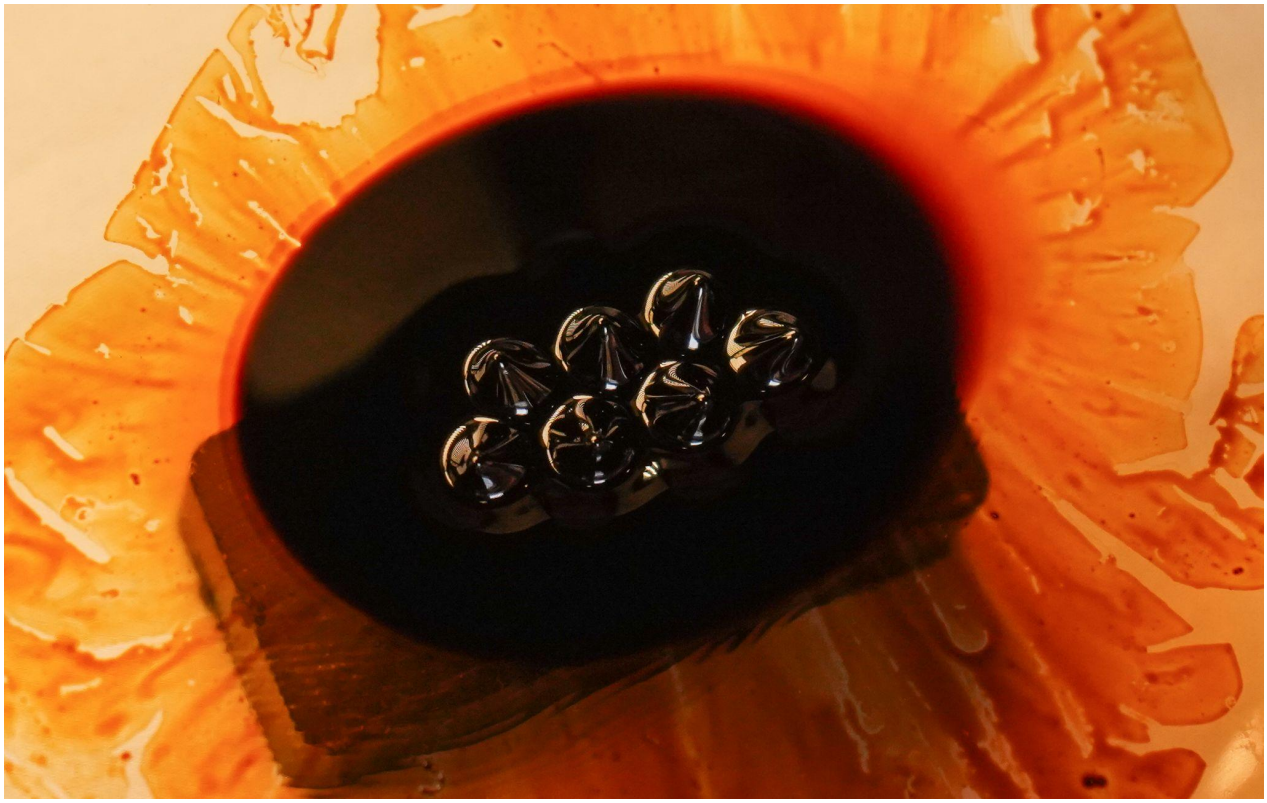

Figure 1: Final Ferrofluid Image

2: Set Up and Relevant Physics

The flow that is being captured here is about a tablespoon worth of ferrofluid that was dropped onto a glass pyrex dish. The dish is being held by Will and Maridith above a magnet that is about an inch long. The spikes of the ferrofluid got larger and the quantity decreased as the dish was held further from the magnet, resulting in this image.

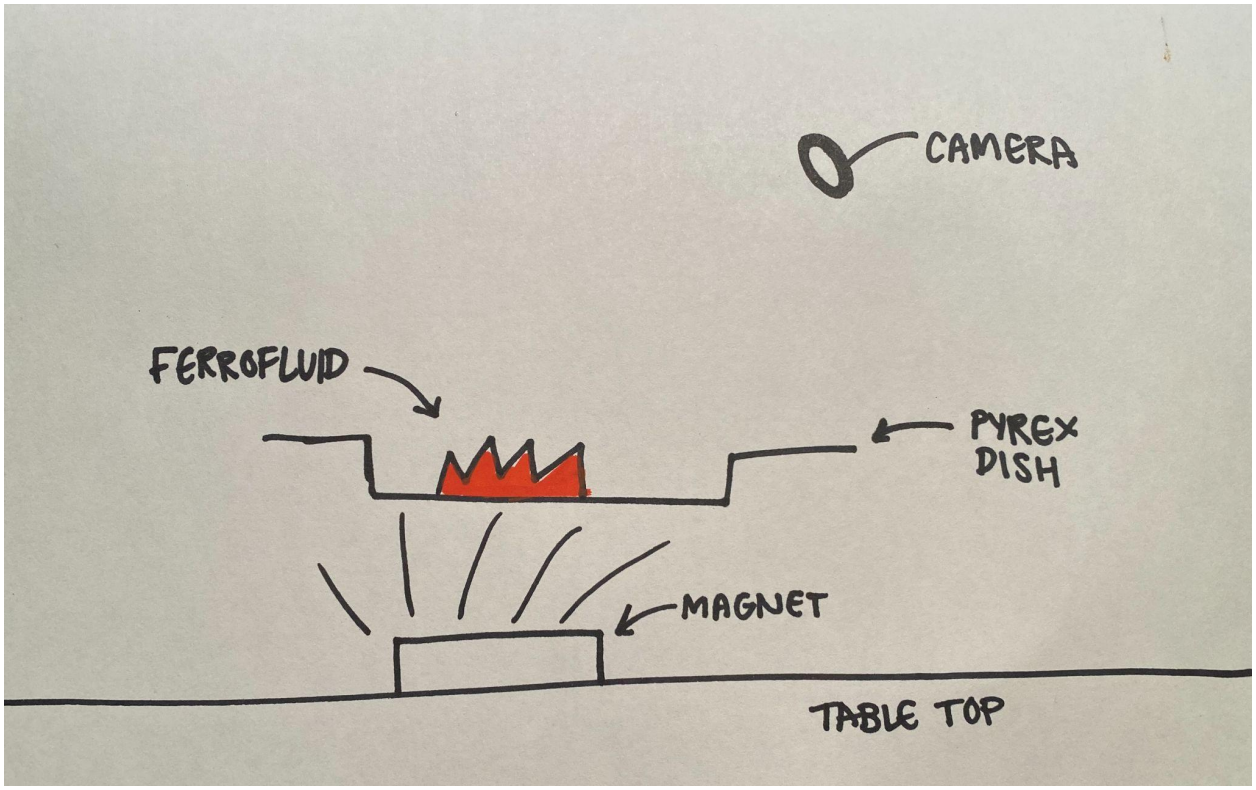

Figure 2: Sketch

"The first ferrofluid was invented by a NASA engineer named Steve Papell in the early 1960s", says Allesandra Potenza at *The Verge*. Originally designed to help move fuel around in space, today ferrofluids are used in speakers, hard drives, and skateboards, and more recently are being used in biomedicine. When the magnet was moved, the fluid followed.

3: Visualization Techniques

This experiment was done inside, on a table. To make the background white, a white sheet was laid on top of the table, and a 3-point LED Ikan light kit was used for lighting.. One light, the key, was set to 100% intensity. The second, a fill, was used at 50% intensity,

and a kicker (back light), was used with 20% intensity. Only one magnet was used in hopes for larger spikes in a smaller quantity, rather than more, smaller spikes.

4: Photographic Technique and Choices

Shot on a Sony A7III, the camera was about six inches away from the ferrofluid with the focal length at 65mm. The field of view was about 6in x 6in. The frame rate was set to 1/2500, and the f/stop was set to f/5.6 The original image was 6000 x 4000 pixels, while the cropped, final image is 2616 x 1653 pixels. In addition to cropping, all that was done was in editing were adjustments in exposure, saturation, and highlights, to make the highlights more evident on the peaks of the ferrofluid.

Figure 5: Original Image

5: Further Work

I think that this picture successfully highlighted the way that ferrofluid reacts in an environment with a magnet. It would have been interesting to experiment with stronger magnets and photograph it from different angles or experiment with video. I feel that this photo captured the phenomenon in a super artistic way.

6: Sources

Potenza, A. *(2018, June 12). How a 50-year-old NASA invention could change the way we fight cancer. The Verge. Retrieved November 16, 2022, from https://www.theverge.com/2018/6/12/17449910/ferrofluid-magnetic-nanoparticles-biomedicine-nasa-invention-cancer-infections-neurons*