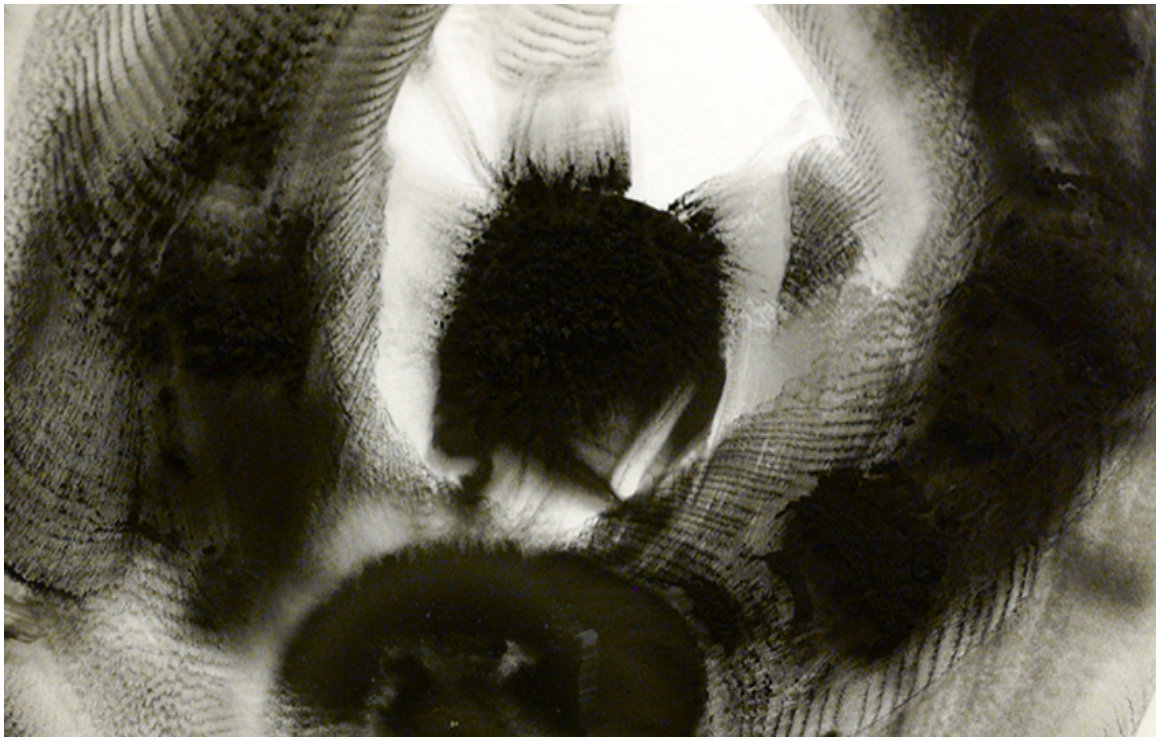
Team Project # 2:
Image Report



https://vimeo.com/89552307

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Flow Visualization
CU Boulder, Spring 2014

I. Project Goal and Description

The initial goal of this project was to create a homemade ferrofluid and demonstrate the spiking phenomenon when it is exposed to a magnetic field. MICR toner was mixed with vegetable oil, however the iron concentration in the toner was not high enough to create spikes. Since the ferrofluid did not work out, I instead used the dry toner in conjunction with a neodymium magnet

I determined a still image was insufficient to capture the movement in this experiment, so the final project is showcased in a high definition video format. The video itself may be found at the link on the cover page. Furthermore, the cover page image, taken from the actual video, accurately portrays the artistic style of the project.

II. Project Setup

The setup was very similar to the Get Wet assignment, so this and the following section are adapted from the Get Wet report.

1. Backdrop for correct exposure. Since the toner is dark gray in color, the black backdrop was swapped out for a white one.
2. Glass pane. White paper was added to the bottom to mitigate reflection and increase contrast.
3. Light source. Bulbs changed to daylight fluorescents.
4. Tripod, camera, and remote shutter.
5. Plastic container, not used in this setup.
6. (not pictured) ~1” ring-shaped neodymium magnet

III. Camera Setup

The camera is a Micro 4/3 model, specifically a Panasonic G5. All controls are set to manual and I used a Pentax 1:4 Macro lens, adapted from a film SLR. The

lens has a focal length of 50mm and was located about 12” directly above the glass pane

The aperture range on the lens is f/4-f/32. I shot at f/5.6 and ISO800 for the best exposure, given the lighting situation. The original video was captured in AVCHD quality at 60 fps. However due to editing the Vimeo version was downgraded to MP4.

IV. Project Methods

To start the project, a small amount of toner was placed in the center of the camera frame. Although I did not precisely measure it, I would estimate the weight to be ~5-10g (it is sold in 130g bottles).

Changing the location of the magnet is responsible for the movement of the toner particles. There was no pattern to the movements- I randomized them with the intention of adjusting video speed in post-processing.

Up until the last 30 seconds or so of the video, the magnet is placed flush against the glass plane. After that point it is moved up and down to create the thumping sensation.

In post-processing I brightened the video, cut out some frames, and modified the video speed through certain clips. Furthermore I had a music piece composed by Andriy Sovetov to add audio to the project.

V. Conclusion

This project demonstrates the magnetic forces of a ring-shaped magnet. The magnetic field wraps around the edges of the ring in addition to going straight through the center of the ring. The magnetic field through the ring-center is responsible for the magnet outline in the video.

Overall I am satisfied with the outcome of both the video and the audio.

VI. Sources

1. http://hyperphysics.phy-astr.gsu.edu/hbase/magnetic/curloo.html