

Figure 1: Team Third Image

Team Third Report

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5/3/2018

MCEN-4151

Flow Visualization: The Physics and Art of Fluid Flow

Background

This image was not of an experiment that was designed and carried out, it was simply an observation of a phenomenon as it too place. I drank Kefir out a glass, and the residue settled in this manner. It looks a bit like an evil eye with the colors inverted. The flow is caused by a sediment laden fluid that causes rivulets,

Experimental Setup and Process

The experimental setup for this image was very simple. It was simply a glass filled and emptied of Kefir. This glass was then allowed to sit for an hour. The picture was then taken from directly above the glass. The flow was illuminated by ambient light, with light entering the glass from all directions. Since the glass was transparent, the flow was backlit in all directions.

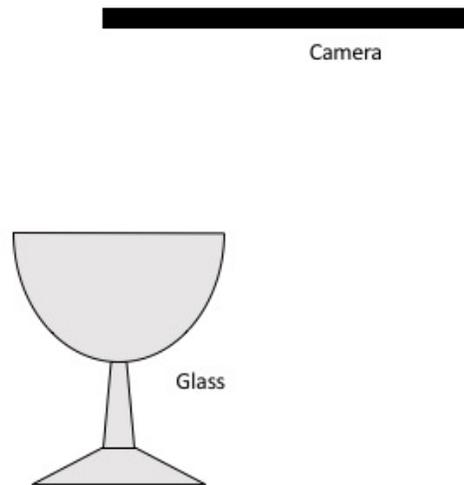


Figure 2: Experimental Setup

An iPhone 6 was used as the camera. The image was edited in Adobe Photoshop. First the background was blacked out using the brush tool. The contrast was adjusted to 38 with the brightness at -9. Hue was changed to -4 and the curves adjusted slightly. Then the image was cropped to the size of the glass. Figure 3 shows the original unedited image.



Figure 3: Original Team Third Image.

Fluid Physics

The flow phenomenon here is due to the sediment or particles present in the original fluid. As the surface of the Kefir residue began to dry, the liquid started to separate out and flow down to the bottom of the glass. When a small drop would start to move, it would combine with another drop. As the drops get bigger, the rivulets also increase in size. These small drops that have a more liquid composition wash away the sediment in their flow path, creating the rivulets.

Conclusion

Flow phenomena occur everywhere and are surprisingly beautiful most of the time. If you pay attention, then you will start to notice them more. Instead of coming up with some elaborate experiment, I decided to find something beautiful that just occurred. This scary eye was the result of that.

References

Vorobieff, P, et al. "Meandering of a Particle Laden Rivulet." *Www.witpress.com*, 2009, www.witpress.com/elibrary/wit-transactions-on-engineering-sciences/63/20109.