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Get Wet Report

This project is based on the idea of Flow Visualization, to understand the physical characteristics of the motion of fluids. The intent of the image was to capture a soap bubble popping under an ultraviolet light source. The black-light source would introduce a low-level light environment in order to capture the movement of the bubble in a long-exposure. Observing the surface tension acting upon the bubble in its static state and then capturing the moment of instability with it pops.

A light-sealed room was set up with a single black-light as a light-source. A smooth surface (in this case the edge of a bathtub) was covered with a surfactant (hand-soap) to reduce surface tension. Many bubbles hit the surface and popped at first. After mixing the bubble-solution partially into the existing hand-soap, a sufficient level of surface tension existed to allow a bubble to rest on the surface without popping. However the bubble would not pop on command, so the bubble-blowing instrument was used to cradle the bubble in the photo. When the bottom of the bubble came in contact with the surface under it, a small puncture allowed the air to escape through the bottom of the bubble.

In order to facilitate the flow experiment, special soap-bubbles would be needed that were mixed with a chemical dye that was responsive to black-light. A container of "Tekno Bubbles" was used for the soap bubbles. The compound inside "Tekno Bubbles" allowed for the molecules to emit visible light after absorbing the light form an ultraviolet source. Ultraviolet photons enter the fluorescent molecules, causing some of them to vibrate and transfer some of the energy away.[1] The energy loss from the transfer makes

it possible for the reemerging light to be visible.[1] A standard 15 Watt florescent black light was used for a light source placed approximately three feet away.

The field of view was five inches wide and the images were then cropped. The distance from the lens was approximately four feet. A macro-telephoto lens was used on a Nikon D50 DSLR camera. An ISO of 400, a focal length of 185mm and f-number of 4.8 were set. An exposure time of .62 seconds captured enough light and movement to satisfy the experiment.

The image of the deflating bubble reveals the diameter of the bubble evenly shrinking back into the bubble-wand's opening. What satisfies me most about the image is that zero Photoshop manipulation was needed to achieve an interesting photograph. The fluid physics could have been shown better with a different technique, but I fulfilled my intent with the experiment to capture a popping florescent bubble. To possibly develop this idea further, the solution of the "Tekno Bubbles" could be used in a different experiment under black-light to create similar ultra-violet experiments.

1. "Tekno Teknology." JVR Enterprises. Twin Oaks, MO. Internet source: http://www.teknobubbles.com/tekno_teknology.html