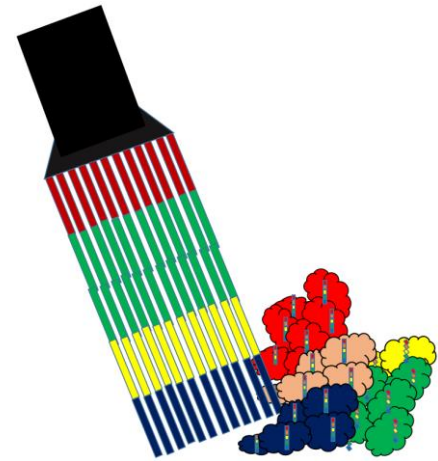
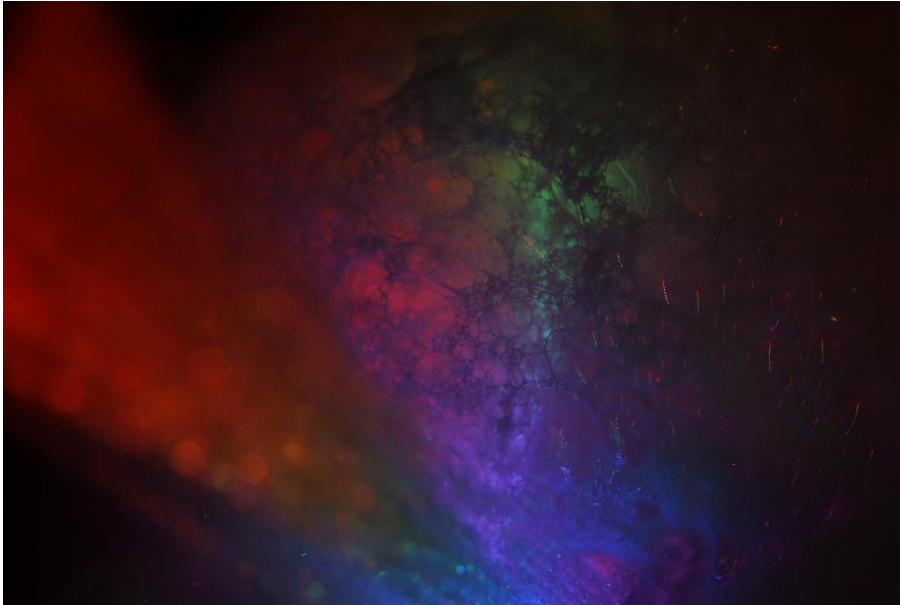


The initial plans for this project were actually in quite a different direction than the final outcome. As a team, we had wanted to show three different types of flow in a tube with three different lasers shining through the stream similar to a fiber optic effect. The lasers were going through the water with a total internal reflection that would create a nice color throughout the full falling of water. Luke Collier had strong ideas of using hot wheels as cars to have them follow through the “stop light” that was created using the three streams and lasers. When trying to make this idea into the image we had imagined, I never saw the dream we had pictured. Instead, Luke Collier also had an LED strip that is sold by SparkFun. This was able to shine any visible color light we wanted. It is about a meter long, so a decent amount of LED's can fit onto it. At this point I was not sure which direction to go since the initial plan was somewhat of a bust. I wanted to show the water flow in a way that would also allow for light to come into play. I knew we could get interesting reflections from the LED's if the lighting was right. I had seen an image earlier in the week where the artist had used bubbles to enhance smaller objects, and I thought that was a great idea. Phillip Nystrom held up the lights up in the air so they would shine directly into the shot I was trying to take. They had a reflection off of both the bubbles and off of the flowing water. I wanted to show the nozzle flow of water separate the soap bubbles, and comfortably push the soap up closer to the camera.

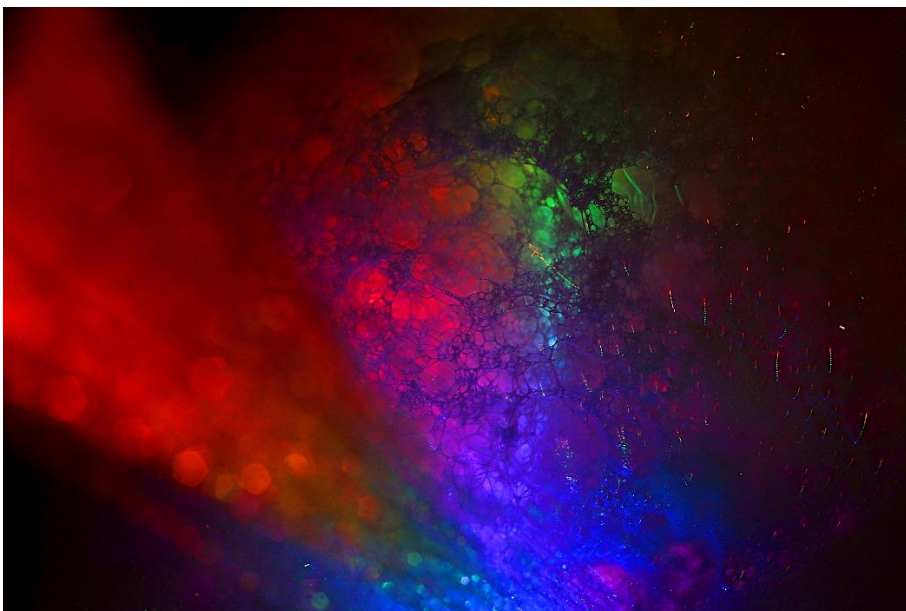
The flow of water is coming directly from a water faucet. This is creating a continuous laminar water flow. The water goes directly into the clogged sink where a pool of soap and water has started to build up. The holes where the water flows out of are roughly 1 cm with a viscosity of $1.004 \times 10^{-6} \text{ m}^2/\text{s}$. The water flow is estimated at 1 meter/second. This will give us a Reynolds number equal to 996. The viscosity changes once the water falls into the pool the sink has created. This is more of a transitional stage where bubbles start forming and rising to the top. The water is splashing down into the soap creating a hole, but allowing for bubbles to form up above around the stream since they are still mixing together. This creates a multitude of different bubble sizes and they are building off of each other which makes this web like appearance.



The techniques used in this photo are somewhat limited, but still allowed for a very detailed image. After a few drops of dish soap was poured into the large sink, water from the faucet was poured in. What makes this image pop, however, is the use of LED lights. You can immediately see the different colors reflected off of the stream from the faucet and dish soap. This is interesting, but the goal of the image was to do something interesting with the bubbles themselves. This is where the LED strip is reflected off of each individual bubble giving off a look of the icicle lights one would see on Christmas. It is interesting to see they reflect directly back into the camera lens almost undisturbed.



This is the original, unedited version of the photo used. As you can tell some work needs to be done in order to make this image into a presentable photo. The size of view is roughly a foot by a foot shot from a foot and a half away from the top of the soap. The focus is on the bubbles themselves to give a clear image of the LED strip reflection. I used Luke Colliers digital camera which is a Nikon 3200. ISO was set at 100 with an exposure at 1/20 seconds. The original image size is 5472 x 3648. For the final image the brightness was increased along with increased saturation. No cropping was done since I felt the image was at the correct size already. The exposure was decreased because it allowed for a blacker outline that generates a bigger focus towards in the center of the image. This also lets the reflections on the bubbles near the edge to stand out by themselves, only showing the lights.



The images reveals some flow of water, but more focus on the light aspect. I am extremely happy with how this photo turned out in the end. One thing I really enjoyed about the final outcome was the division of light in triangular formations in the soap. It creates a circular effect of light with a center point. The LED strips on the bubbles could not have been better in my opinion. I would have liked to get a little more focus on the water from the faucet, but the main goal was to capture the soap bubbling up. I would like to enhance more objects or different features in the bubbles next time. Overall, I am very pleased with this photo and editing.