The purpose of this project was to make visually interesting images of soap films while also maintaining any relevant scientific information. Our group chose soap films because they are easy to make and produce lighting effects. Our initial plan was to make a video of the soap film on a high speed camera so that we could make an everyday phenomena seem supernatural. We succeeded to make excellent footage of the soap film both in a seemingly static situation and in a dynamic situation. We were not sure if each member of the team had to write their own report, or if we only needed to write one group report. The group decided that it would be best if we each wrote a report on the individual photos that we took along with the high speed footage. I chose to write about our first set up.

For our first soap film set up we simply made very thick soap film by adding a lot of over the counter soap to a tray with a little bit of water in it. We then simply placed a piece of scrap plastic tubing with a diameter of roughly 5 inches into the tray. Upon removal, we took photos of the resulting soap film that formed on the inside of the tube. To get the best image of the soap refracting the light from our source we had to stand at an angle of 20 degrees from the soap film. We initially only wanted shots of the soap refracting the light, but after taking a few shots it was clear that there was something better. As the soap film degrades you can watch it flow around the tube. The film at the top portion of the tube fall back down due to gravity which causes the soap to get thinner, and as a result the color gradient changes. This is apparent in the four photos I chose to present for this project. In the photo on the far left we see a fully developed soap film, and as we travel to the right we see the color gradient change with the degradation of the film.

These shots were taken using the light refracting properties of soap films. The source lighting was three stage lights provided by the film department shinning through a diffuser. The lighting source was pointed directly toward the soap film and the cameras were positioned at a 20 degree angle from the surface of the film. No other lights were used but a white sheet was used for backlight reflections.

The size of the field of view in these photos is kind of hard to explain. The viewer is looking at the 5” diameter tube at an angle and this alters the field of view. I would say the field of view is no more than 5” by 12”. The camera was located about a foot away from the object being photographed. I used a Nikon D70 with a 50mm fully manual lens in conjunction with a UV haze filter. The Nikon D70 is 6.2 megapixel digital SLR, and I set the maximum width to be 3054 pixels and the maximum height to be 2014 pixels for these shots. I was focusing at maximum closeness, which for the lens I was using is around 0.45 meters or 1.5 feet. All the original photos were taken with a shutter speed of 1/125 of a second, an aperture value of f-8, an exposure value of 0.0, and an ISO value of 200. The four final photos that I chose to present under went some minor alterations in Photoshop. For each photo I set the temperature to 3650, the tent to -16, and the recovery to 100. I also increased the fill light to 63 and the black levels to 39, as well as, set the contrast to +100 and the clarity to 100. Each photo was also rotated 90 degrees and cropped so that the soap film was in the center of the scene.

In each of these images the color gradient is the first thing that sticks out. However, there is more going on in these pictures than just refraction of light. As the soap falls from the top of the tube it causes wakes to form behind bodies of different densities. These bodies fall at different rates depending on there size, the bigger bodies fall at faster rates than smaller ones. These bodies are large soap molecules that the film cannot retain. As these bodies fall they drag the film with them causing the film to degrade. This degradation is visible and can be seen in my four photos near the upper edge of the tube. As the soap falls the film is stretched causing the top of the film to turn black just before the film brakes. I really like these images because we were not expecting to take photos of moving flow, but rather, were expecting the soap film to be static. Since the theoretically static soap film is in no way static I think these images provide intricate details into the physics of fluid motion. If we were to do this

again I would try to see if we could get different color gradients or create different falling bodies within the film. One way this could be done is by making an even thicker soap film, or perhaps shinning different shades of light on the film. Either way this is a cool technique to explore in more detail in the future.