

## Ouray Ice Cliffs

This report covers the final project for the Flow Visualization course. Though this project was intended to be performed in a group, my group disbanded due to scheduling conflicts. The image I submitted was an attempt to capture the interaction the flowing water in a stream had with a sheet of ice protruding downward into the surface of the water. The image was taken in Ouray, Colorado, at the ice park nestled in Uncompahgre Gorge.

The walls of the gorge are covered in ice that descends to the bottom, where spring water runs. The image was taken from a bridge that spans the top of the gorge, looking down to where the water and ice meet. The basic set-up can be seen in Figure 1, which shows the image setting. The bridge visible in Figure 1 is where the camera was set up, and the bottom of the image shows the subject of the photograph taken. The water in the stream is flowing downstream, away from the viewer in the image, and swirls up against the protruding ice. As the flowing water encounters the protruding ice, the friction caused by the two surfaces meeting changes the flow dynamics. The flow becomes turbulent, causing the fluid to create little eddies which churn up air bubbles and create what looks like foam. This turbulence can be seen where the ice meets the flowing water in Figure 2.



**Figure 1. Photograph Setting <sup>2</sup>**

The image was taken from a bridge above the gorge, thus using only natural light. Though natural light can often be a little lacking, and on this specific day was not particularly bright, the ice and water reflecting enough light to keep thi image bright. The camera was propped for this image in order to keep

the camera steady.

The image chosen was photographed using a Canon PowerShot SX 160. Table 1 gives the camera and image specifications. The final image was only slightly modified from the original. There was no cropping performed, only a slight increase in contrast. The final image can be seen in Figure 2.

<b>Table 1. Camera and Image Specs</b>	
Dimensions (Pixels)	3456x4608
Flash	Not Used
Lens	7-44 mm
Focal Length	65 mm
F Number	f/5.6
Exposure Time	1/125
ISO	200



**Figure 1. Final Image**

I like the image itself, but I believe the subject of the image is not the fluid. At the same time, I think the ice gives us another look at fluid properties even though it is no longer a fluid. It shows us how the fluid acted previously, which is a nice addition. If I had the chance again I would try to get an image of the ice from the water level. I would have the water take up the majority of the image, with the ice providing an extra layer of detail, but it would be secondary this time.

## References

<sup>1</sup>"Turbulence." *Wikipedia*. Wikimedia Foundation, 25 April. 2013. Web. 25 Apr. 2013.

<sup>2</sup>"Ouray Ice Park - Ouray, CO." *Ice Climbing Photos*. N.p., n.d. Web. 29 Apr. 2013.

<<http://ouraylovers.com/ice-climbing/ouray-ice-park.htm>>.