



# “CLOUDS FIRST”

Image Context Report

## ABSTRACT

This report will provide context for my first cloud image in the fall 2016 flow visualization class.

## Daniel Luber

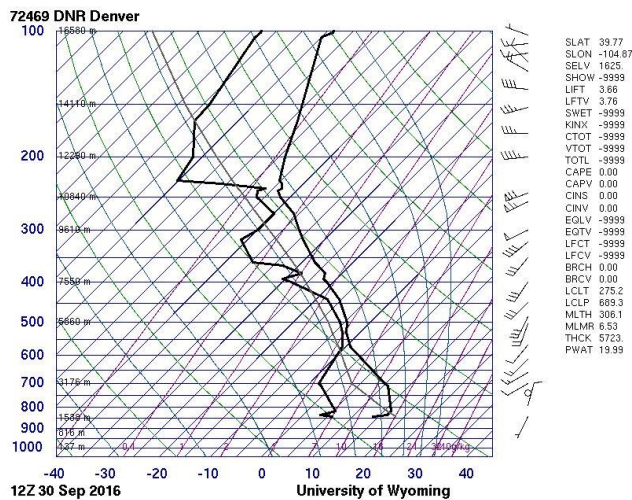
Flow Visualization: The Physics and Art of Fluid Flow

# 1 CONTEXT AND PURPOSE

I am very excited to speak about my first cloud image for the class Flow Visualization. The overall objective of this assignment was to become more aware of a type flow that is happening constantly around you, clouds. We were encouraged to take as many cloud pictures as possible in as many varying conditions as possible and select our favorite to present for critique. I had taken cloud photos from various locations around Colorado in various types of weather. Ironically, the photo I chose was one taken right outside of my apartment. I was finishing some assignments one evening and looked outside my window to see a very spectacular sunset starting to develop over the flatirons. Quickly grabbing my camera and tripod, I went outside and photographed the cloud phenomena over a period of thirty minutes. I was very happy to capture the different wind layers through the multi directional cloud systems. Also, the various altitudes of the cloud systems allowed for unique sunset induced lighting on both of the cloud systems.

# 2 FLOW APPARATUS

The flow apparatus will be described as the environment that produced the environment for these clouds to be generated and flow in the way that they did. The particular clouds in this photo are high altitude cirrus clouds with stratocumulus clouds underneath. This cloud formation occurred in a stable



atmosphere as seen by the zero value for CAPE in the Denver Skew-T diagram for the time of day the photo was taken. I would argue that this isn't necessarily accurate. I was seeing many transitionary and unstable characteristics in the cloud structures at the time of the photo. The time the photo was taken was several hours after Skew-T data was collected. The atmosphere could have transitioned to being unstable during this time.

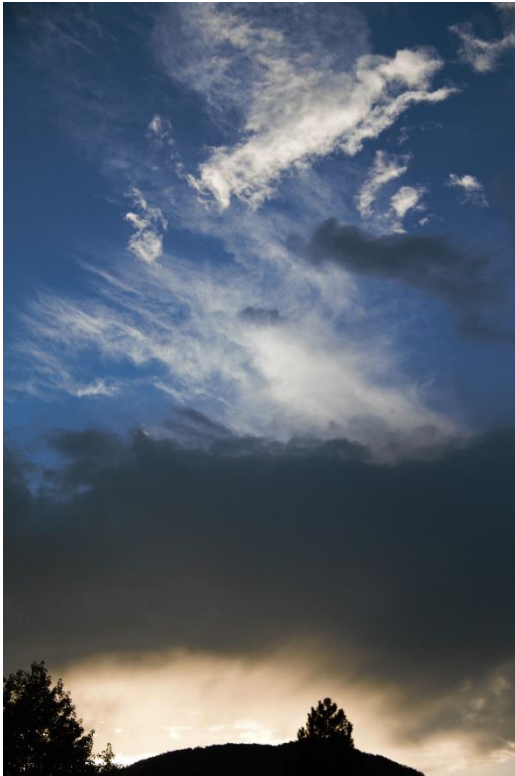
The unique wind patterns also took part in the creation of this cloud phenomena. The layers of different wind direction created the crisscross like configuration of the cirrus and stratocumulus clouds. This multidirectional wind is quite common, however, having clouds at both elevations to show both directions is less common. This image shows this phenomenon quite well.

The last portion of the apparatus I would like to touch on is the lighting. The setting sun in combination with low and high elevation cloud configurations allows for the unique lighting on the bottom portions of the different cloud types pictured. Additionally, the intense lighting from behind the mountains allows for the silhouetting to occur on the mountains and trees in the foreground.

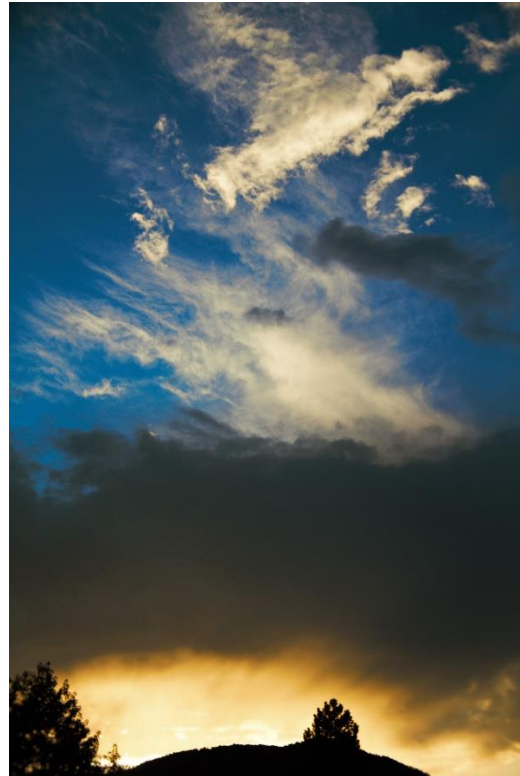
### 3 DESCRIBE THE VISUALIZATION TECHNIQUE

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The visualization technique is quite natural in this photograph. Relatively minor lighting and color effects were done in post processing. You can see that when comparing the figure 2 and 3 below. Figure 2 is the original image before post processing and Figure 3 is the image after post processing.



*Figure 1- Original image before post processing*



*Figure 2-Final image after post processing*

You can see in the final image that colors were saturated as a whole. The foreground was slightly blurred with an intent to help remove them as a distraction.

### 4 PHOTOGRAPHIC TECHNIQUE

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I'll begin my discussion on my photographic technique with my camera. I am using a Canon 7D DSLR camera body. Capable of achieving 18.1 MP of resolution in its highest quality mode. The camera has a APS-C sensor, not a full frame. At the time I was using a Canon 18-200 mm F/3.3-5.6 lens. The lens had a Tiffen circular polarizer on it as well. The camera modes for this particular image were as follows, F/4.5 (lowest with the current zoom state of lens), ISO-100, Exposure time of 1/400 sec. with a focal length of 50 mm of zoom at the time. The mountains pictured in the foreground are approximately 3.5 miles away, and the trees about 1/10<sup>th</sup> of a mile away.