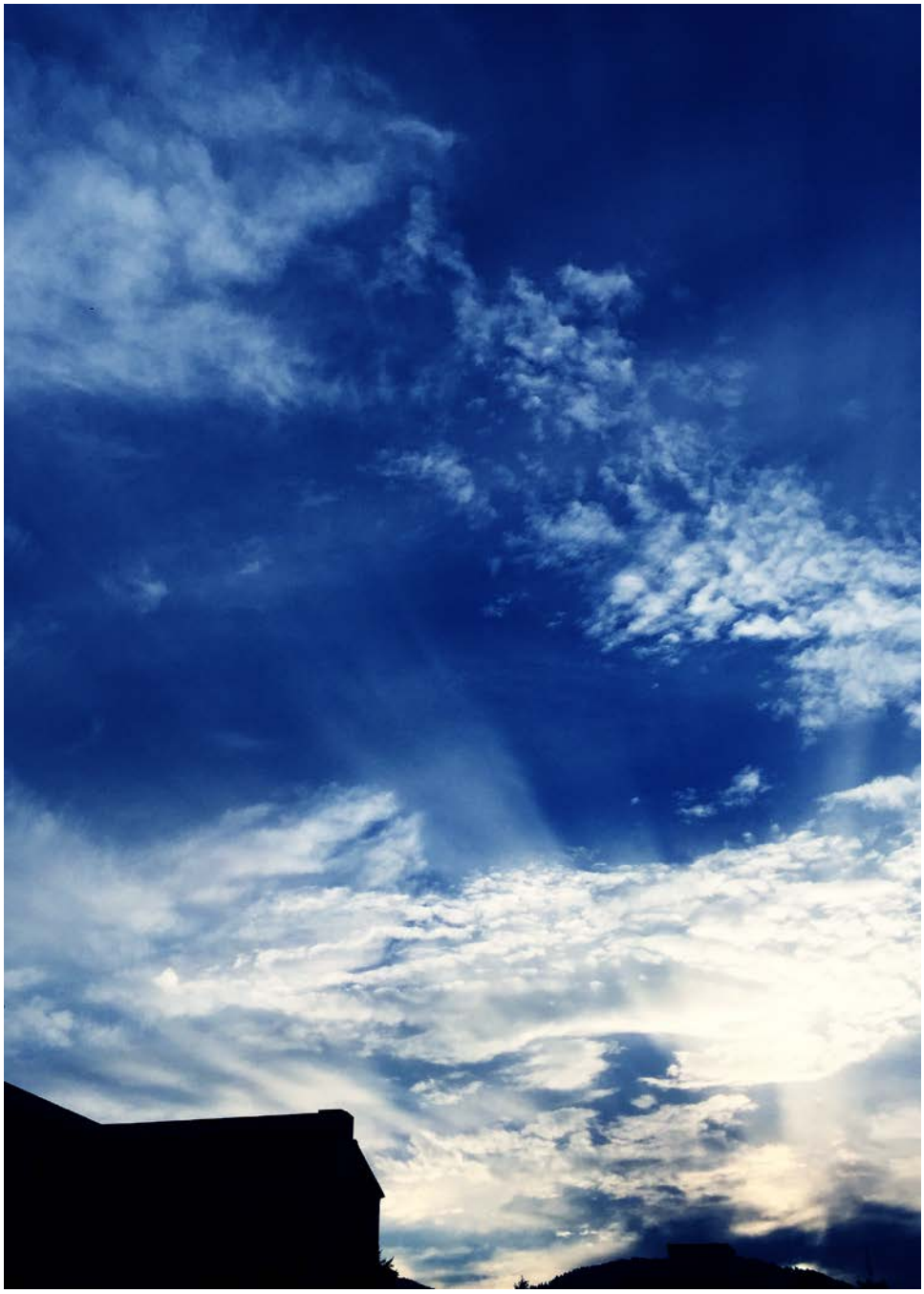
Clouds 1



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The purpose of this first clouds assignment was to turn to the sky and explore the many different types of clouds and to gain an understanding of how they get their beautiful shapes and textures. The image chosen is an attempt to capture altocumulus clouds in an unstable atmosphere. The image was taken at sunset for a more dramatic lighting effect.

The image chosen for this assignment was taken on the CU Boulder campus at sunset facing west. The camera was at about 45 degrees from the horizon at an elevation of 5,430 feet. The time and date was 6:18 PM on September 22, 2015.

This image captures small puffy altocumulus clouds in an unstable atmosphere. The rest of the sky was mostly clear with the majority of the clouds sitting over the Front Range. These clouds did not produce any rain. Looking at the skew-T diagram seen in Figure 1 it can be seen that the weather was quite mild however the atmosphere is unstable due to the positive cape. This is consistent with the puffy type clouds observed in the image. The altocumulus clouds seen in the image are likely at around 20,000ft in altitude. In this case these clouds are likely orographic altocumulus stratiformis perlucidus. Orographic clouds are clouds that are formed by cool air getting forced upwards by the mountains. Altocummulus means they are mid-level clouds. Stratiformis means that they cover a large area. Perlucidus means there are spaces in-between the tufts. They split into little tufts because the air currents that are formed from the mountains, similar to a standing wave on the surface of a stream [2]. Due to the setting sun some crepuscular rays can also be seen through the clouds. These are caused from obstructions that block the light such as mountains and clouds or both in this case. Although the light appears to converge to the sun this is only an illusion caused by perspective, the light rays are actually parallel. Crepuscular rays are visible because the light scatters as it passes through the atmosphere, they are commonly seen when the sun is low on the horizon because there is more atmosphere for the light to pass through [1].

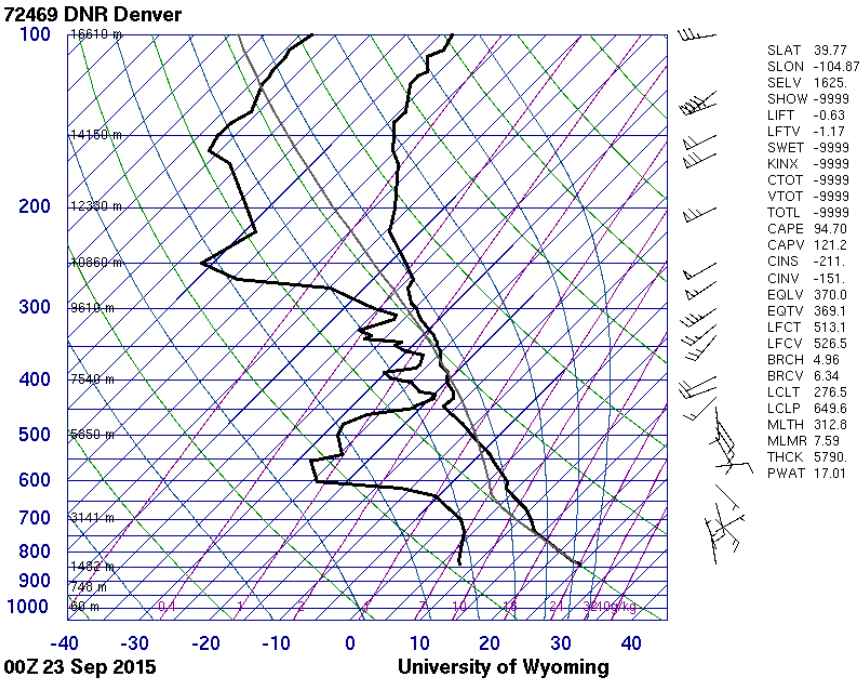

Figure 1 Skew-T diagram for Denver on September 22 at 7pm local time.

The field of view for this image was roughly 5,000ft across and 30,000ft high. The clouds were approximately 25,000ft from the lens of the camera. This image was taken with an iPhone 6, 8-megapixel 4.15mm iSight camera. The aperture was f/2.2, shutter speed was 1/3300 seconds and ISO was 32. Post processing was done using Photoshop Elements 13 and included cropping the image, increasing contrast, and manipulating the colors to deepen the blue in the sky. The original image was 2448 x 3264 pixels and 2022 x 2831 after cropping. I also removed the light post because it was distracting. These changes can be seen in Figure 2.

Figure 2 Before post processing on left, after post processing on right

This image is a good example of orographic altocumulus clouds on a clear day. You can visibly see the layer of clouds over the mountaintops produced by the orographic effect. I also like the effect that the crepuscular rays have on the photo. I wish the photo had a wider field of view to capture more of the sky. In the future getting a better vantage point to shoot from and maybe going for a more panoramic effect would produce a better image.

Work Cited

[1] Baker, Jess. "Science Behind the Optical Illusion of Crepuscular Rays (PHOTOS)." *The Weather Channel*. Weather.com, 4 Aug. 2015. Web. 13 Oct. 2015.

[2] Pretor-Pinney, Gavin, and Bill Sanderson. *The Cloudspotter's Guide: The Science, History, and Culture of Clouds*. New York: Berkley Pub. Group, 2006. Print.