Author/Videographer: Ari Matrajt
Assignment: Cloud 1
Course: MCEN 5151, Flow Visualization
Date: October 27, 2023
Cloud Type: Stratocumulus
Image Time Stamp: October 17, 2023, 18:27 MST
Image Location:UClub on 28th, Boulder, CO (N 40° 00.183', W 105° 15.477')

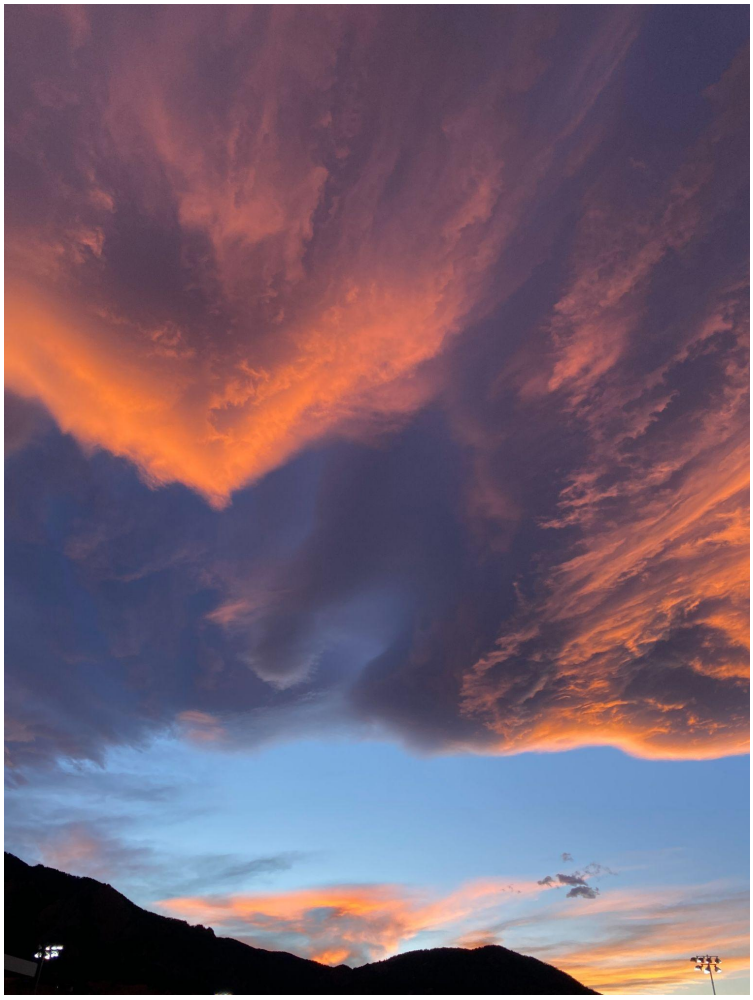

Figure 1: Image of Stratocumulus cloud

Introduction

The image in Figure 1 shows a stratocumulus cloud over Boulder, Colorado. It was taken on October 17 during sunset. The image has a wide range of colors, as well as a texture that resembles cotton candy. I chose this image over other cloud images I captured throughout the

semester because this cloud is a great example of flow visualization, as well as having great aesthetic appeal.

Image Circumstances

The image in Figure 1 was taken in Boulder, Colorado, near the UClub on 28th residential area. The specific coordinates are N 40° 00.183', W 105° 15.477', as well as an elevation of around 5430 feet over sea level. The image was captured at 18:27 MST as the sun was setting. The camera was facing West at the time the image was taken, at a 60° angle with the horizon to eliminate other objects from the frame. The mountains on the lower end of the image were not cropped to increase the contrast between the clouds's colors and the background, to accentuate the vibrancy of the color pallet present.

Cloud Information

The image in Figure 1 shows a cloud system composed of stratocumulus clouds above the mountains. The main cloud can be seen in the center of the frame, having an orange hue. Below is the Skew-T Plot from the Grand Junction weather station, a measurement taken from the University of Wyoming website for atmospheric data.

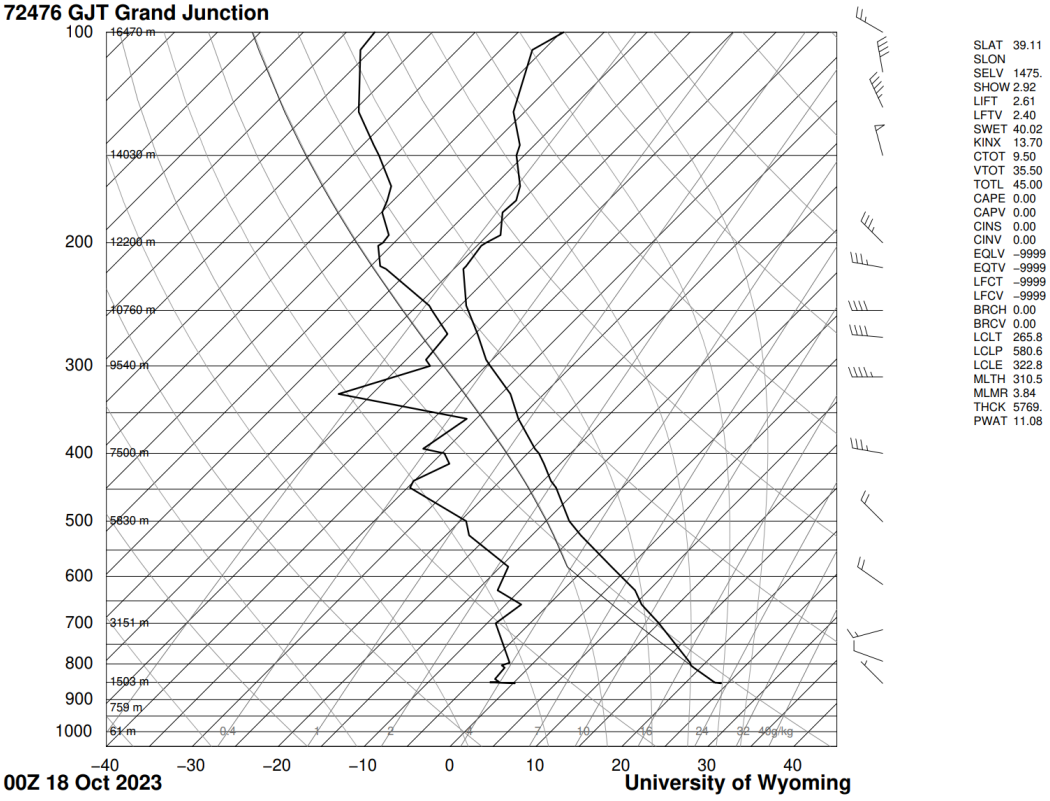

Figure 2: Skew-T Plot of Grand Junction for the Time the Image in Figure 1 was captured

The Skew-T diagram is a useful tool to assess the atmospheric conditions at a given location and time, being especially useful to determine the height clouds can form. Figure 2 shows that clouds could be formed at around 2000 meters. Stratocumulus clouds often appear at 500m-2000m, so the system depicted in Figure 1 would be on the higher end of this range. There was no precipitation that day, or after the time that the image was taken. It was not a windy day, leading to more stable atmospheric conditions. The clouds around the ones shown in Figure 1 were similar although they differed in color since they weren't facing the sun to be illuminated. Stratocumulus clouds usually consist of rounded masses, lines, or waves, and don't lead to precipitation [1]. Dry air prevents the clouds from moving in the vertical direction, remaining stagnant at lower altitudes [1].

Photographic Technique

The image in Figure 1 was taken using an iPhone 11 Pro, with an ISO of 80, an aperture of f/1.8, and a focal length of 4.22 mm. The approximate height of the cloud is 2000 m, while the distance to the object would be around 5000 m. The image consists of 3024 pixels by 4032 pixels. I chose not to edit the image since I felt that it conveyed what I wanted to show in terms of flow visualization as well as aesthetics. I believe that the image has a full range of colors and the composition is balanced, with the mountains in the bottom of the frame giving it more dimension and the light post providing a sense of scale. As a result, Figure 1 is both the original and final iteration.

Image Conclusions

The image in Figure 1, being the unedited and final version, shows a stratocumulus cloud hovering over the mountains during sunset. It has red and orange tones due to the sun, which contrasts with the deep blue in the sky and the black of the mountains in the background. Overall, I think this image conveys flow visualization and physics at the same time, with the texture of the cloud showing how it moves through the air and the physics behind the Skew-T graph explaining its movements and characteristics. I would like to research more into why stratocumulus clouds can look so different from each other and wonder what the exact meteorologic conditions were in Boulder at the time the image was taken since the available data is for a nearby region.

References

[1] “Learn about Stratocumulus Clouds.” Whatsthiscloud, 16 May 2023, whatsthiscloud.com/cloud-types/stratocumulus/.