# Hannah Brothers

**Flow Visualization: Clouds First**
**MCEN 5151**
**Stratocumulus and Lenticular Cloud**
**September 22nd, 2025**
**9:55am MDT**
**40.00733°N, 105.26000°W**

This image was taken for the first clouds assignment for CU's Flow Visualization course. This image depicts a lenticular cloud that had formed above a layer of stratocumulus clouds, and was taken with the intent to capture a beautiful and unique cloud I had noticed in my daily routine. I began this assignment with the hope to capture a cloud that is unique to forming in close proximity to mountains, which this photo captures.

This photo was taken on September 22nd, 2025 at 9:55am MDT. This was taken approximately 30° or  40° above the horizon, located at 40.00733°N, 105.26000°W, while I was facing Northwest near the CU Engineering Parking Garage.

The clouds in this image are likely stratocumulus and lenticular clouds. As can be seen in the lower part of the image, the clouds are puffy-looking and somewhat flat, which is an indicator of stratocumulus clouds. These clouds can be found at a range of altitudes, but would likely be present at the altitude of the expected location for clouds on the Skew-T diagram. Lenticular clouds are specific to mountainous regions, and are known for their flat, disk-like shape. The cloud above the stratocumulus clouds is most likely a small lenticular cloud, as this image was taken in close proximity to the mountains. When this photo was taken, the rest of the sky contained clumped sections of other stratocumulus clouds, with clouds building behind the mountains. The wind was light to moderate, but blowing from primarily the westward direction. A front was approaching during this time frame, and it thunderstormed that evening. The clouds the rest of that week had been very similar, and were also primarily stratocumulus clouds.

The skew-T diagram from this day and time frame is shown below.

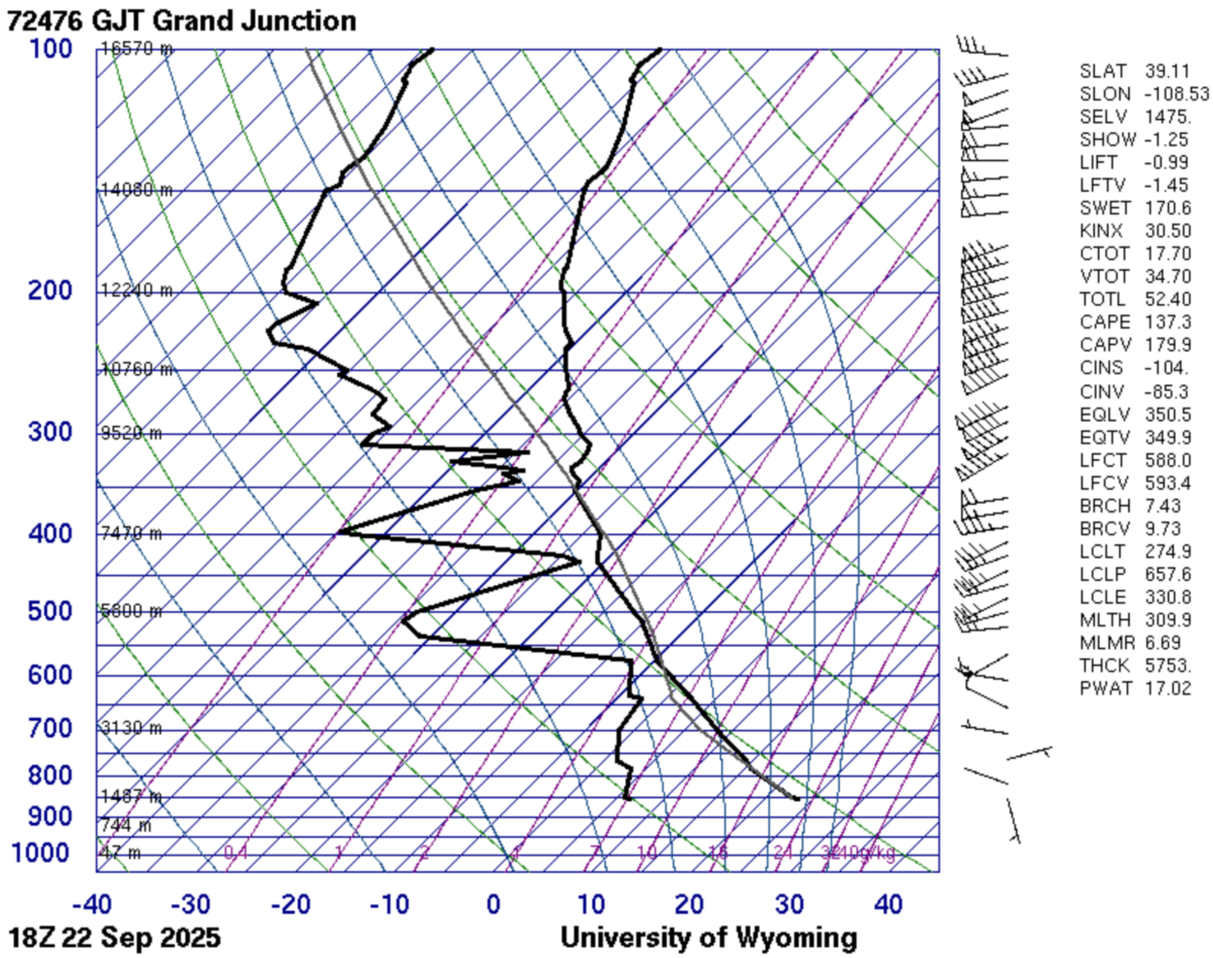


Fig.1. Skew T Diagram from September 22nd, 2025

As can be seen from this diagram, clouds could be expected around or above 4000m and 6000m. Because the cloud that I captured appeared lower in the sky, I expect that it was a stratocumulus, rather than an altocumulus, as stated previously. In the lower region where clouds could be expected, the atmosphere is slightly to moderately unstable until 7470m. This provides justification for the presence of cumulus versus stratus clouds, as cumulus clouds form in unstable atmospheres. This is also likely due to the presence of a coming cold front, which would bring more cumulus clouds. Lenticular clouds form when air is pushed over large objects, such as mountains. As air is pushed over large obstacles, the air condenses and forms the classic long flat shape of a lenticular cloud.

This image was taken using my iphone 14, as I noticed this cloud on my daily routine to class. The image was recorded using my phone's main wide camera, which is equivalent to a 26mm lens with an equivalent wide aperture of f/1.5. The photo lists the focal length using digital zoom to be equivalent to 71mm and the shutter speed to be 1/11364s. The final image is 2574 x 1767 pixels. The original image is shown below and is 3024 x 4032 pixels. This original image was altered in post processing by increasing the local contrast and altering the color balance rgb values.

Fig. 2. Original Cloud Image

The cloud image that I captured reveals the beautiful forms that clouds can take, especially those near mountains, like the lenticular cloud that I found. I like the contrast in my final image, as I think that it helps to bring out the colors present in the cloud’s contours. I also think that this image does a good job at showing the fluid physics of lenticular clouds, as you can see the cloud’s layers and curvature. However, I dislike the height that this photo was taken from. I think that I may have been able to get a better photo of this cloud if I were higher up, instead of on ground level. I would like to further explore how lenticular clouds form, and how far away from mountains or other large obstacles they can form. In the future, I could further explore this idea by taking an image at a higher height or by trying to get a cloud image at sunrise or sunset.

References:

Atmospheric soundings. (n.d.). https://weather.uwyo.edu/upperair/sounding_legacy.html