

**William Norris**

**Clouds First**

**MCEN 4151**

**10/16/24**



### **1. Introduction**

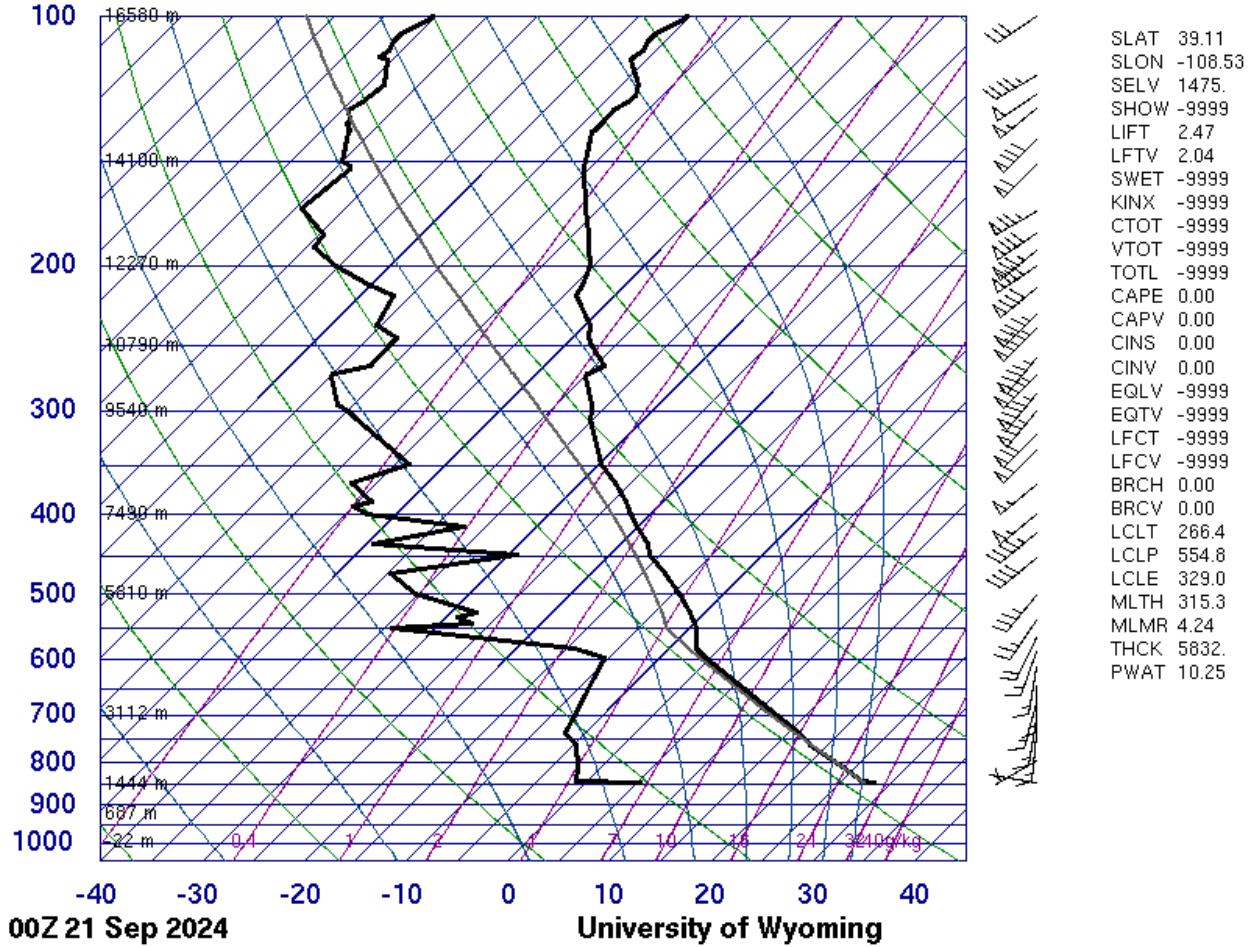
The image above shows cirrus clouds over Denver photographed on Sep 20, 2024. The photograph was taken at approximately 7:00pm local time and facing generally west. The image is significant because it highlights the fantastic color variations that can be seen as the sun sets over the mountains.

### **2. Details**

The clouds that are the focus of the primary image are cirrus clouds. These are high altitude clouds at approximately 20000 ft MSL and are made up of ice particles being dispersed along wind currents [2]. The SKEW-T diagram below [3] indicates that we would expect to see clouds forming at approximately 450mb. This lines up with where

we would expect to see cirrus clouds forming in the atmosphere.

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Additionally, we can expect other cloud layers to form around the cirrus clouds. In the main image you can see that surrounding the cirrus are some scattered cirrocumulus clouds. Cirrocumulus clouds are also high-altitude clouds that can be identified by forming rows and patches. They are often compared to the scales of a fish. In the image below I captured the distinctive patchwork pattern of the cirrocumulus clouds in the sky that same day. Cirrocumulus clouds form when the ice particles in a cirrus cloud thicken

and aggregate [1]. These clouds were farther to the south than the clouds in the main image.



Lastly: it can be noted that the CAPE value in the right hand column of the SKEW-T diagram is zero. This indicates a stable atmosphere which is highly unlikely to develop into any storms.

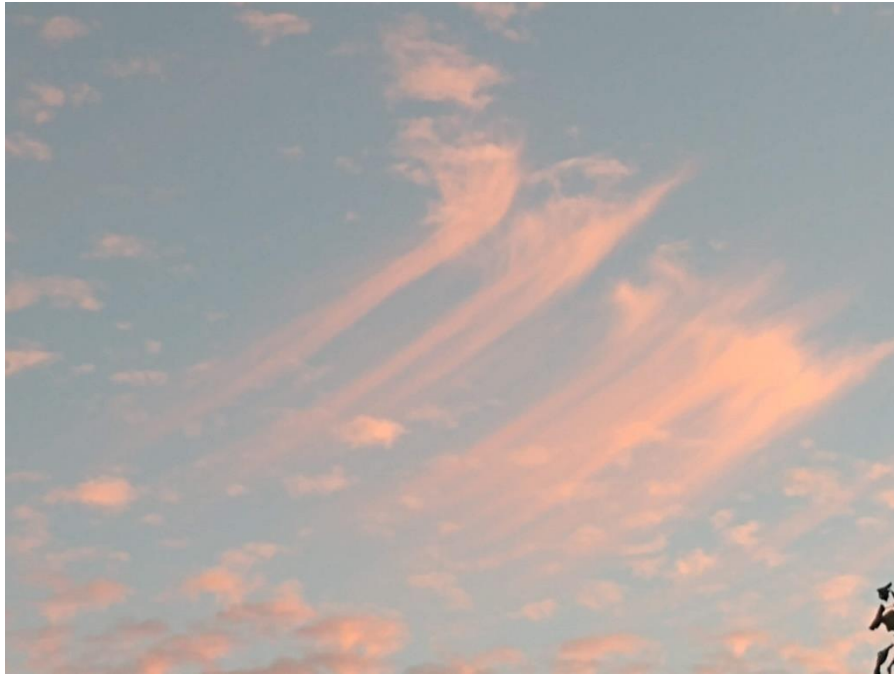
### 3. Photographic Technique

The picture was taken on a MOTO Z3 Play cellphone. The phone has a focal length of 4.25mm, with an f-stop value of  $f/1.7$ , shutter speed of  $1/125$  sec, ISO 88 and no exposure bias. The original image size is 4032x3024. The temperature at ground level was approximately 75 degrees F and the picture was taken at 7:06pm local time.

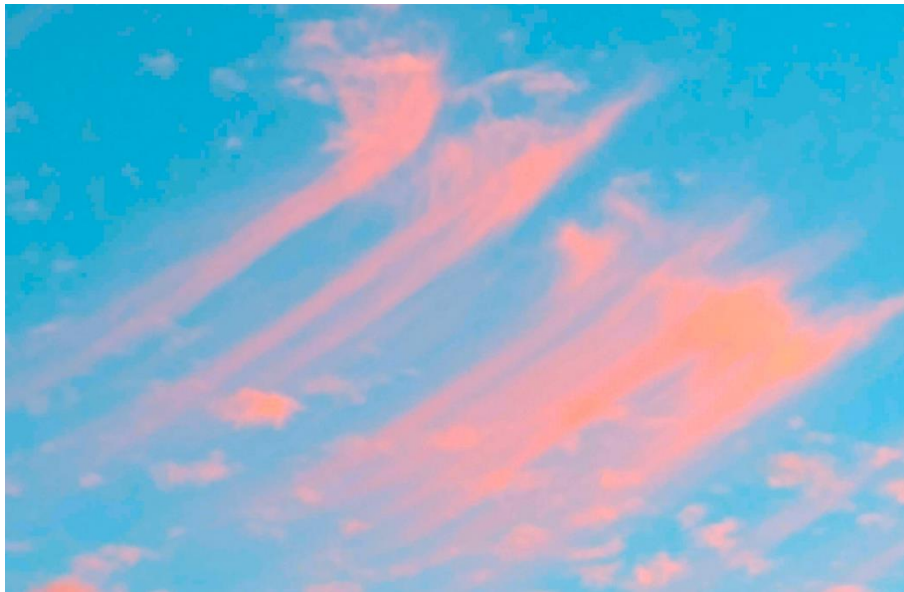
### 4. Editing Technique

From the original image seen below, the picture was first cropped down to a size of 3304 x 2215 pixels. Then the global chroma was maxed out and the highlights in that category were increased to 69.83%. The global saturation was then increased to 15%. Then the blue hue category under the RGB Primaries tab was decreased 13.1 degrees and finally the temperature under the color calibration tab was decreased to 4117K. This final step

is was really brought out the blue in the sky behind the clouds leading to the final image. The photo was edited using the program Darktable.



*Original*



*Edited*

## **5. Conclusion**

The opportunity to photograph these clouds was an overall success. These clouds were observed when traveling in a car but were able to be captured while stopped at a light.

The windows were rolled down which allowed for a clear image and a relatively good capture of multiple different types of clouds formed at approximately the same altitude. To improve this image a better camera could have been used and if time had allowed, more pictures or possibly even a timelapse of the clouds could have been interesting. Ultimately the pictures included were effective at capturing both cirrus and cirrocumulus clouds.

## 6. References

[1] "Cirrocumulus Clouds: Overview and Weather Prediction." *ZME Science*, [www.zmescience.com/feature-post/natural-sciences/climate-and-weather/weather-and-atmosphere/cirrocumulus-clouds/](http://www.zmescience.com/feature-post/natural-sciences/climate-and-weather/weather-and-atmosphere/cirrocumulus-clouds/). Accessed 16 Oct. 2024.

[2] "Cirrus Clouds: High, Wispy Streaks." *What'sthiscloud*, [whatsthiscloud.com/cloud-types/cirrus/](http://whatsthiscloud.com/cloud-types/cirrus/). Accessed 16 Oct. 2024.

[3] "SKEW-T Grand Junction." *University of Wyoming, College of Engineering*, [weather.uwyo.edu/upperair/sounding.html](http://weather.uwyo.edu/upperair/sounding.html). Accessed 11 Oct. 2024.