

Cloud First

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10/19/26

MCEN 5151: Flow Visualization, Cloud First Report



Introduction

I captured this photo for the Cloud First assignment to show how clouds form over the foothills and spread sideways rather than grow taller. I used an iPhone 13 camera and included the Flatiron and autumn trees to highlight scale and the beautiful color contrast.

Circumstances

I took the photo on October 8th, 2026, at 2:22 pm, in front of the SECC building at CU Boulder's East Campus. The camera faced west-southwest toward the Flatiron, tilted approximately 10-15 degrees above horizontal. The sun was in the south-southwest, so it lit the cloud edges and left the bases in shadow.

Clouds and Weather

The image shows cumulus mediocris clouds transitioning into stratocumulus. They have flat gray bases, bright edges, and limited vertical growth, with blue sky between them. I used the Grand Junction (KGJT) to find the skew-T diagram that explains how the cloud forms and how the air moves:

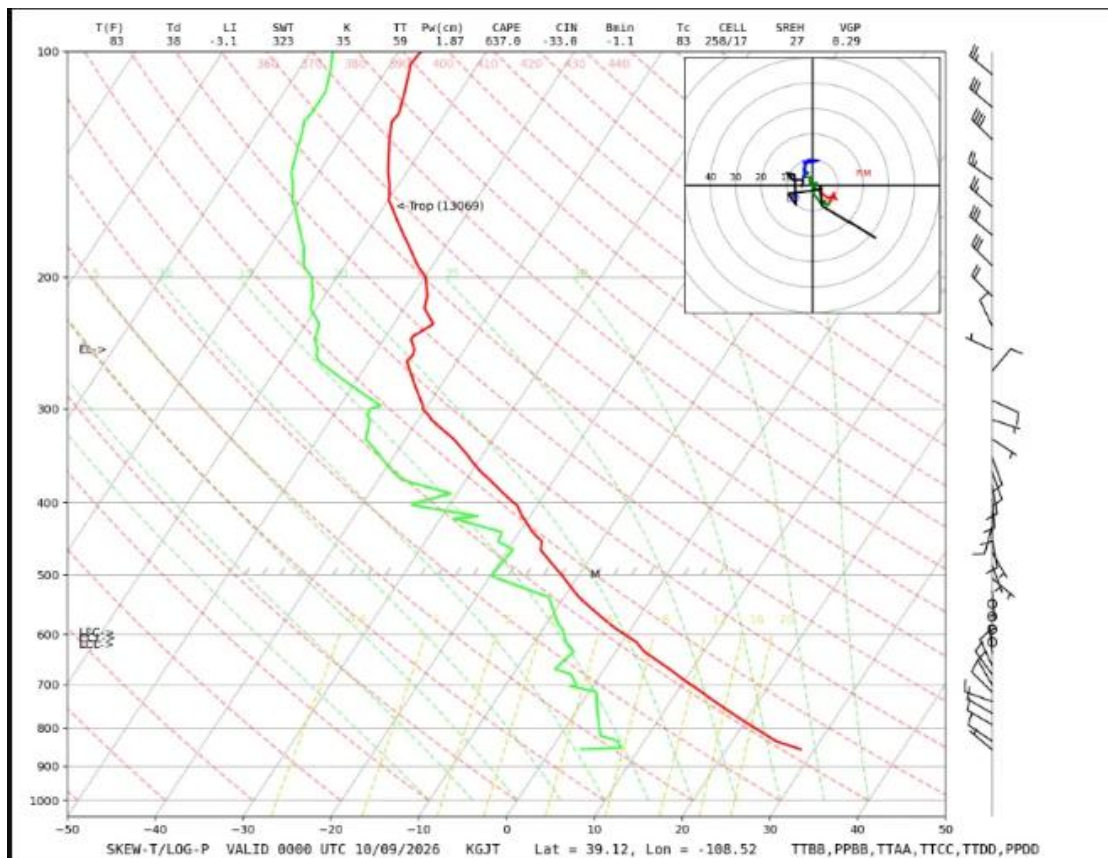


Figure 1: Skew-T diagram from Grand Junction, CO (KGJT) (Upper-Air Page: RAL Real-Time Weather, n.d.)

As shown in the image above, the cloud forms near 600-620 mb, about 4 km above sea level. Also, following a parcel of air from the dry adiabat to the moist adiabat near the temperature profile shows that the air was conditionally unstable. In addition, the winds got stronger with height.

Photograph technique

The field of view is about 3-4 km wide at the Flatiron, and I used the iPhone 13 camera:

- 5.1mm, f/1.6
- 1/2460 s, ISO 50, 0 EV
- Original image: 3024 x 4032 pixels

In darktable, I slightly increased the brightness to show detail in the dark cloud bases. I also cropped out some of the grass and sidewalks. The final image is (738 x 450 pixels)

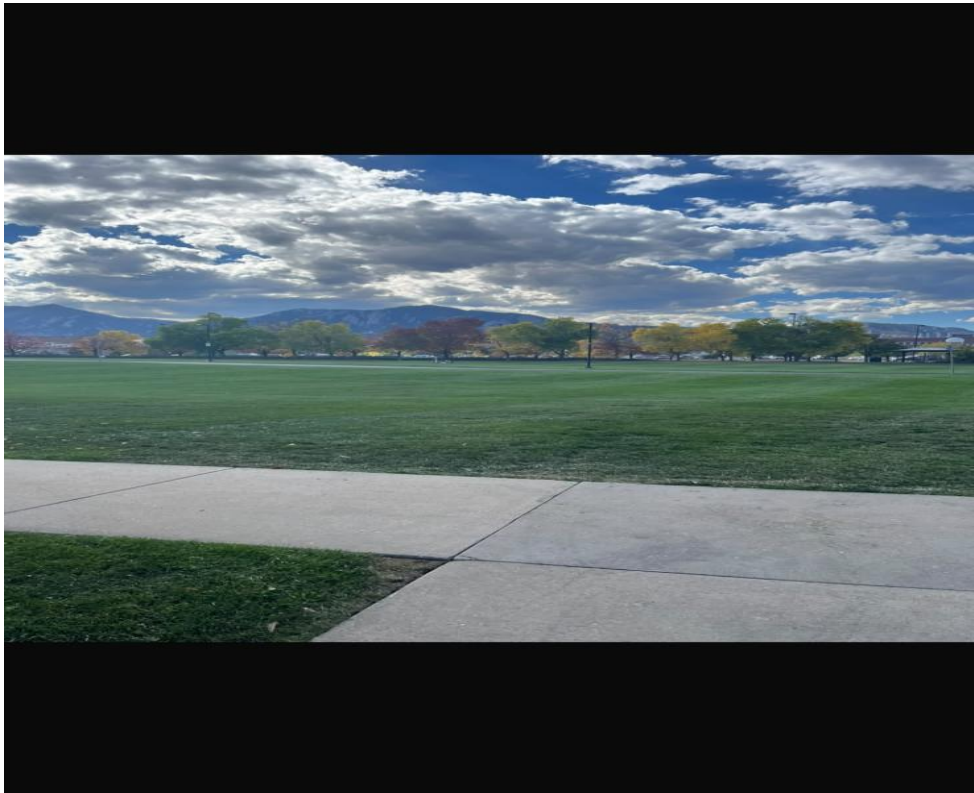


Figure 2: Original photo before editing



Figure 3: Final image after brightness adjustment and cropping in darktable

Reflection

The image shows clouds with a contrast between bright edges and dark bases, and the Flatiron adds scale. What I really like about this photo is the time of day and the size of the cloud. In the next cloud assignment, I am really looking forward to capturing cirrus and cumulonimbus clouds, and maybe using another time of day, like some of my classmates who captured cirrus at night, as in Matthew's photo.

Reference

Upper-Air page: RAL Real-Time Weather. (n.d.). Retrieved October 19, 2026, from
<https://weather.ral.ucar.edu/upper/>