Iridescence in Altocumulus Clouds – Clouds First

Gavin Lopez

10/19/2026

MCEN 5151: Flow Visualization

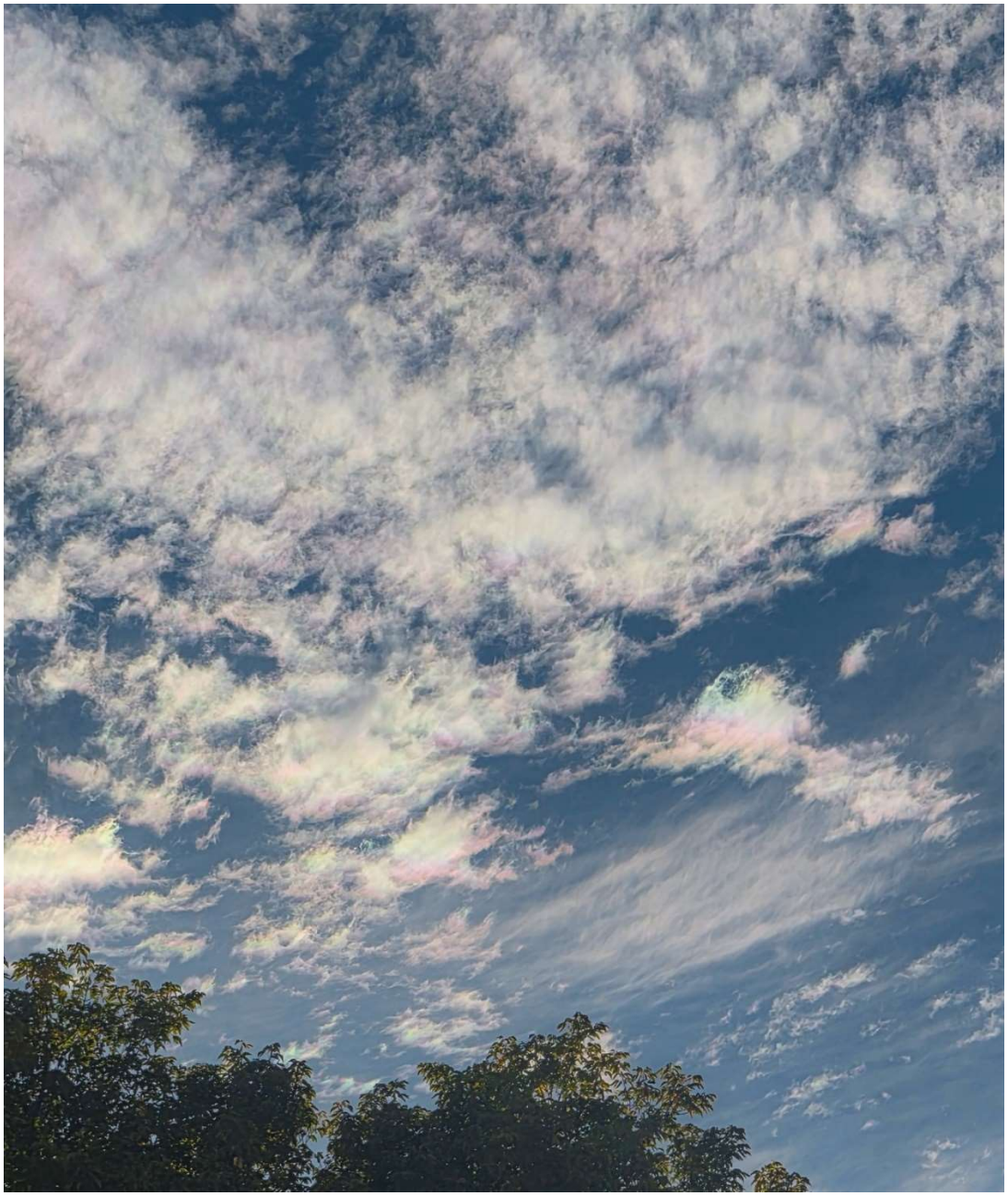


Image taken facing SW in Hayden, CO on September 5, 2026 at 18:32.

Abstract:

In the image on the title page, rainbow iridescence can be seen as the sun shines through altocumulus clouds in Hayden, CO. This image was taken for the Clouds First assignment in the Flow Visualization course at the University of Colorado Boulder. This assignment was aimed at familiarizing the class with types of flow phenomena by looking at cloud formations and behaviors, and learning how to take a good photograph of clouds.

This image was taken on September 5, 2026, at the Yampa River State Park in Hayden, Colorado about an hour prior to sunset at 6:32 PM MDT. The clouds were captured facing southwest, just above the angle of the sun at about 30° from the horizontal. The sun was below the clouds and behind a tree which helped reduce glare in the image.

Cloud and Weather Characteristics:

The weather around the time of this photo was mild and stable, with no precipitation in the days prior or following. Below in Figure 1, the Skew-T diagram from Grand Junction from September 6 at 00Z (Sep. 5, 6 PM MDT) is shown. The plot was sourced from [1].

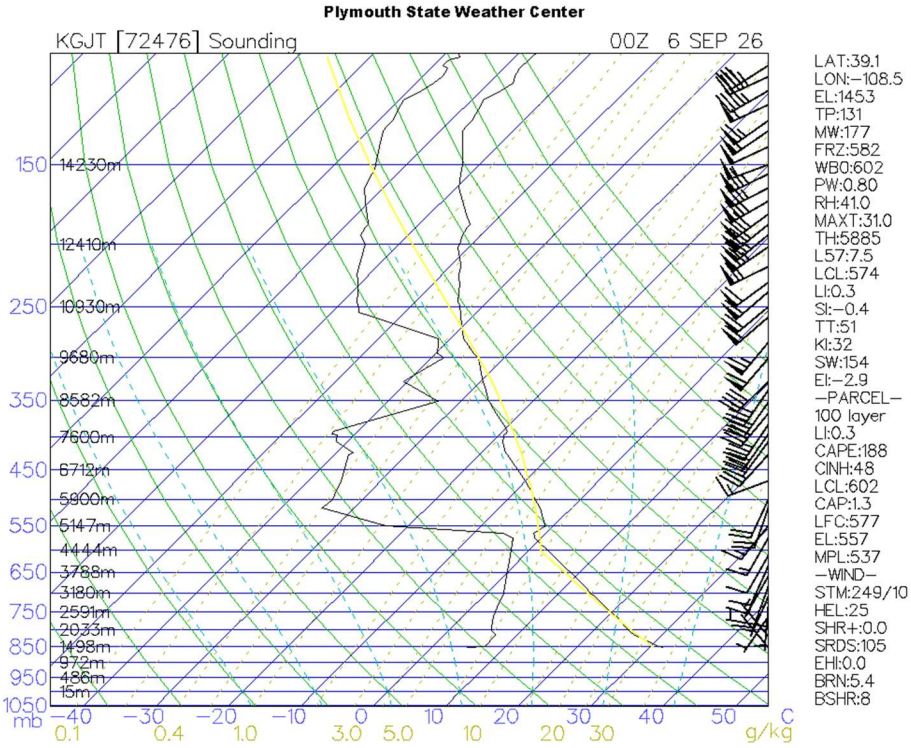


Figure 1: Sounding data from GJT on September 6 at 00Z.

Hayden is only ~100 miles from Grand Junction and is also on the west side of the Continental Divide, so this sounding data is likely fairly accurate for this time. The Skew-T shows a stable atmosphere with an LCL around 5,000 meters. This atmospheric stability, mild weather,

and LCL height support the identification of altocumulus clouds, which form in stable atmospheres between 2,000 and 7,000 meters [2]. Additionally, they are visually similar to reference photos of other altocumulus clouds [3]. These clouds are formed from small, isolated convection cells leading to the small individual “cloudlets” and a fish scale-like texture [4]. These convection cells occur when moist, rising warm air cycles with cold air and creates pockets where the clouds can form. Because these clouds formed around 5,000 meters and were around 30° from the horizontal, they were estimated to be about 10,000 meters from the camera, or ~6.2 miles.

The most striking part of the image is the rainbow-colored iridescence displayed by the clouds, especially some of the cloudlets closer to the sun. This iridescence occurs when sunlight refracts through ice or water droplets in a thin cloud. These droplets act as tiny prisms, causing the white light from the sun to split into its component colors [5]. Because the angle of the sun was shallow and the altocumulus clouds are fairly thin, the iridescence is particularly noticeable.

Imaging Technique:

The camera, lens, and exposure specifications are shown in the table below.

Table 1: Camera and image specifications

Camera model	Wide-Angle Lens on the Samsung Galaxy Z Flip 7
Effective Focal Length (as shot)	70 mm
Aperture	F1.8
Shutter speed	1/468
ISO	25
Image resolution (as shot)	2252 x 4000 pixels
Image resolution (final)	1389 x 1649 pixels
Field of view	34° Diagonal
Estimated distance from clouds	~6.2 miles

Most of these settings were automatically selected by the phone’s software to keep the exposure balanced. Editing of the photo was kept fairly minimal, cropping to better frame the clouds and balancing exposure and white balance to highlight the rainbow colors of the iridescence. All editing was done in Darktable. The original and edited images are shown below in Figure 2 for comparison.



Figure 2: The original, unedited image (left) and the final image (right).

Conclusion:

This image reveals the striking rainbow colors caused by sunlight iridescence in an altocumulus cloud. The wispy, individual cloudlets allow for the iridescence to be seen in numerous areas in the image. Additionally, the clouds visible in the picture highlight the stable atmosphere and mild weather at the time of the photo. The intent of this photo was to highlight the iridescence of the clouds, which I believe is done well, although it could be improved with a few small changes. Using a DSLR would allow for a higher resolution and more precisely focused image, and using a CPL or other polarized filter would cut down on glare, improving the visibility of the iridescence even more. Overall, though, I'm happy with the photo and the clarity of the physics it shows.

References:

(1) Plymouth State Meteorology. *RAOB Selector for Archived CONUS Data*. vortex.plymouth.edu. https://vortex.plymouth.edu/myowxp/upa/raobplt-a.html (accessed 2026-10-17).

(2) World Meteorological Organization. *Altocumulus*. International Cloud Atlas. https://cloudatlas.wmo.int/en/observation-of-clouds-from-aircraft-descriptions-altocumulus.html (accessed 2026-10-17).

(3) Pretor-Pinney, G. *Altocumulus*. Cloud Appreciation Society. https://cloudappreciationsociety.org/cloud-library/altocumulus/ (accessed 2026-10-17).

(4) Royal Meteorological Society. *Cloud Spotting for Beginners Part 1: Altocumulus*. RMetS. https://www.rmets.org/weather-photographer-of-the-year/resources/cloud-spotting-beginners-part-1-altocumulus (accessed 2026-10-17).

(5) Pretor-Pinney, G. *Iridescence*. Cloud Appreciation Society. https://cloudappreciationsociety.org/cloud-library/iridescence/ (accessed 2026-10-17).