Figure 1 - Clouds 2 Final Image

The image used for the second "Clouds" assignment was captured on April 2nd, at 6:32 PM. The location of the image was on Regent Drive, near the southeast corner of the business field, looking northeast over the Engineering Center. This image was chosen because of the fact that it was at sunset, and is very aesthetically pleasing. Additionally, the bright yellow mountain wave cloud seems to be peeled away by air currents, and the clouds to the right of it have interesting shape and composition. The image was directed at about a 30 degree angle from the horizon in the center. Using a horizontal distance estimate of about 5 miles, the height estimate of the bright cloud in the image is about 4000 meters. Verification of this estimate can be found later in the analysis of the skew-t plot.

The clouds in the image have a variety of shapes, but there are a few clues that can be used to better understand the exact types of clouds shown. First of all, the bright cloud is the remnant of a mountain wave cloud, or an altocumulous lenticularis. The cloud is parallel to the mountain range, and roughly lens-shaped in the upstream direction. The puffy cloud below the bright one in this image was much lower in altitude, and probably a type of stratoculumous,

although there were no other clouds in the sky like this one to compare it to. The trailing clouds to the right of the altocumulous lenticularis confused me at first, but after some speculation I believe they are the dissipating fragments of that cloud. For some reason, even though the CAPE is 0 (as shown on the skew-t), the altocumulous lenticularis is not actually stable in the atmosphere. The high winds at altitudes above the main cloud are streaming it away, creating the shapes on the upper right quarter of the image.

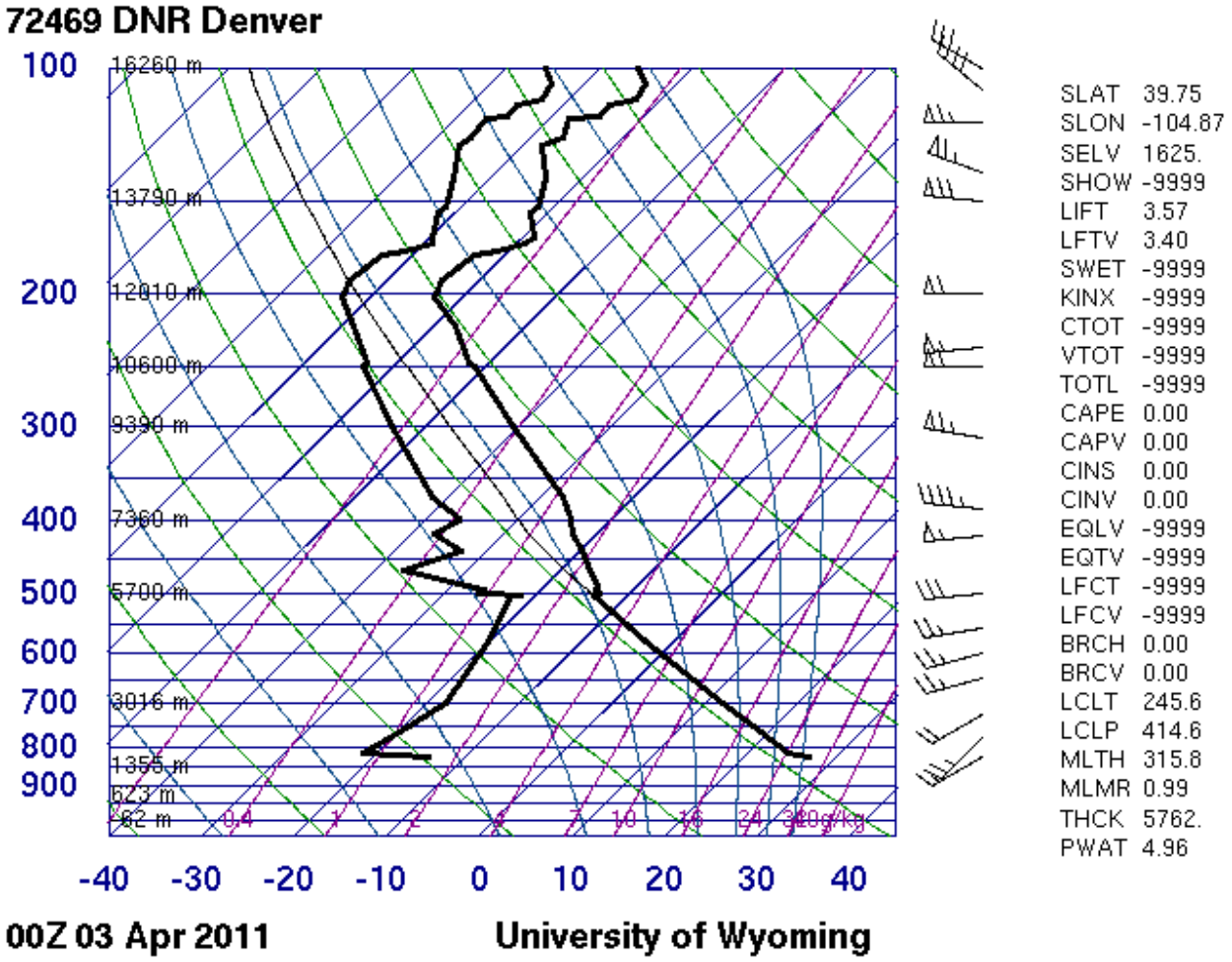

Figure 2 - April 2nd 6 PM Skew-T Plot

The rest of the sky was partly cloudy, with a large number of other altocumulous lenticularis clouds near the mountains. April 1st and 3rd were both fair weather days with no fronts moving through. Stable atmospheres in Boulder often produce altocumulous lenticularis clouds due to the proximity of the mountains. These particular cloud shapes are relatively common, even though I thought this particular image had some very unique shapes. As

mentioed before, the estimated altitude for the altocumulous lenticularis was about 4000 meters. The skew-t plot shows a minimum difference between the air temperature and the dew point temperature to occur at an altitude of about 6700 meters. This altitude value seems more indicative of most of the other clouds in the sky that day, and I believe the altocumulous lenticularis pictured in the image to be relatively low in the sky compared to the other clouds.

Figure 3 - Clouds 2 Original Image

This photograph was actually taken during a drive around town in an attempt to get as many viewpoints as possible. However, it proved difficult to get a decent image, and this was one of the few taked that didn't have significant line-of-sight blockers. As such, in order to get the best image in the limitted time frame, I chose to use some automatic settings on my camera. They ended up choosing: F-stop f/3.2; Exposure time 1/80 seconds; ISO speed 80; and focal length of 5mm. The original image was rather undersaturated on these settings, although they produced a fairly crisp image under such a low-light and long-distance environment. The

camera used was a PENTAX X90 DSLR, and the original size of the image was 4000 pixels wide by 3000 pixels tall. The bottom 900 pixels were cropped off to remove the silhoette of the Engineering Center, because I found it to be too distracting. The original image can be seen above. The contrast was increased which caused over-brightening and a slight loss of information in the brightest parts of the lenticularis cloud, however it appears to have eccentuated the details of the trailing end of the cloud in the rest of the image. This trade-off was reasonable to me. In the end I was much happier with this image than my Clouds 1 image. I took a lot of pictures over the course of many weeks to achieve this one, whereas for the first Clouds assignment I took a picture of a cloud one day and sort of forgot about it. Thanks to these assignments I can hardly go outside without noticing the clouds and having an urge to take pictures of them.