Lunar Eclipse Notes

All times are UT. For PDT subtract 7 hours. 15 April 2014 UT. Observing Site Star Hill-KOA Campground just outside Santa Margarita Lake. 35d 19m N lat, 102d 30m W lon.

A quick note on how I name my images.

1Pre-Pre eclipse.

2PenI- Penumbral Ingress

3UmbI- Umbral Ingress

4Tot-Totality

5UmbE-Umbral Egress

6PenE- Penumbral Egress

Notes on how to interpret the images: Imagine yourself on the moon

Penumbral Phases- Partial phases. During these phases you would see the Sun partially eclipsed by the Earth if you were on the Moon.

1. Ingress-During this phase the Moon is just starting to enter the Earth's shadow. As this phase progresses a light gradient will develop across the moon as more of the Sun becomes covered
2. Egress- This is the ending phase of the eclipse as the Moon leaves the Earth's shadow. This is the reverse of the Ingress phase. The light gradient disappears as the Sun becomes more and more uncovered.

Umbal Phases: The Umbra is the part of the Earth's shadow where the Eclipse is total.

1. 1'st Contact. The edge of the Moon enters the Umbra.
2. 2'nd Contact. Totality. The Moon is totally in the Earth's Umbra. From the Moon the Sun is totally eclipsed by the Earth. The Moon is not totally invisible and is red because the atmosphere of the Earth refracts light. How dark and red the moon appears depends on how much cloud cover there is and how opaque they are.
3. 3'rd Contact. End of totality as the Moon starts to leave the Earth's Umbra.
4. 4'th Contact. The moon has now left the Earths shadow. The eclipse is not yet over as the Moon is still in the Penumbral Egress phase.

0120 Arrived and set up. Field repair-RA setting circle hanging up. Had to put washer on allen screw holding RA gearbox asbly in place.

0216 Sunset

0238 Starting to get dark. Moon has risen but is not not yet visible over eastern ridge. I can see the sunset shadow line in the sky progressing westward

0245 Still not risen over the ridge. Current plan is to use 300 mm telephoto. If the scale shows up right I'll keep it there. I will be using the eyepiece for any visitors.

0246 Jupiter is now visible. Io is currently in transit but I don't see it against the planet. Europa Ganymede and Callisto are visible - all on the same side of the planet. Ganymede is far and away the brightest. Took a couple of test images of the ridge line. Img 1Pre-1

0255 Moon is rising over the eastern ridge. Camera not lined up properly. Moon just out of view to the right. Img 1Pre-2 shows Moon just clearing tree.

0300 Moon cleared ridge line. Final pre-eclipse image 1Pre-3.

Equipment set. Stage set. Two hours until the beginning of the penumbral phase. A couple of local ranchers and campers at the campground. I showed them Jupiter and Mars as well as the Moon. I talked about my variable star astronomy and the type of Astronomy we do.

0405. Damn! Really bad news. Clouds have been forming since sunset and are pretty significant. It was crystal clear an hour ago. Moon is hazy.

0453 Eclipse is underway. Predicted Penumbral phase is beginning. If I were on the moon I would be seeing a bite taken out of the Sun. I do not expect to see anything visual yet.Image 2PenI-1. The shadow will be encroaching from the left side.

0500 Next image 2PenI-2. Visually nothing apparent yet. Moon is very hazy and washed out. These clouds are going to make it very difficult to spot any Penumbral shading.

0510 Img 2PenI-3

0522 Img 2PenI-4 I am seeing a 22 degree Ice Halo around the Moon. The FOV of the 300mm lens is too small to include it.

0530 Img 2PenI-5 Visually I do not see any penumbral gradient

0540 Img 2PenI-6 Moon appears distinctly darker, Not sure whether it is real or clouds Visually there does appear to be a brightness gradient across the moon.

0550 Img 2PenI-7 coming up on 1'st contact shortly- in about 8 minutes Part of the overall darkness is due to clouds but there is a definite Penumbral brightness gradient across the moon.

0558 Img 3UmbI-1 1'st contact. The umbral phase begins. If I were on the Moon I would see a partial eclipse of the sun on the right side of the image progressing to totality where the Sun becomes fully

eclipsed by the Earth. There is a definite gradient across the moon darkest at the limb near Aristarchus. The Umbral shadow is crossing the Ocean of Storms.

0610 Img 3UmbI-2 Big chunk taken out of the moon. Umbral shadow approaching the Straight Range in Mare Imbrium. Clouds are washing out the images. Visually the Straight Range was easily identifiable. On the image not so much.

0620 Img 3UmbI-3 Sinus Medii is going into the shadow. Umbral shadow coming up on the Sea of Serenity

0630 Img 3UmbI-4 Umbral shadow approaching Sea of Tranquility. Images are starting to get too dark. Change exposure settings. Light levels around me are definitely falling. Moon shadows are becoming indistinct.

0640 Img 3UmbI-5 Umbra coming up on Sea of Nectar. The Apollo 11 Landing Site has just gone into the shadow. Clouds are making it difficult to get decent exposures. Ugh. Uh. Oh. What a time for the camera battery to start getting weak. Time to change the batt on the camera before totality.

0650 Img 3UmbI-6 Umbra crossing middle of Sea Of Crisis. Cannot see moon shadow on the ground.

0700 Img 3UmbI-7 Coming up on 2'nd Contact shortly. Just a thin sliver of moon left.

0706 Img 4Tot-1 2'nd contact Totality Very dark eclipse. I had to push the camera to get any color. Lots of noise in the images. Not sure whether this eclipse is actually this dark or an effect of the clouds. Brightness of the Moon is not symmetric. Clearly shows it is not passing through the central zone of the Umbra.

0710 Playing with exposures

0720 Img 4Tot_2

0730 Img 4Tot-3

0740 Img 4Tot-4 These clouds are wrecking havoc with the imaging. In the Telescope eyepiece the moon is gorgeous. I am having to push the camera exposures and am getting a lot of electronic noise. The passage thru the Earth's Umbra is clearly not a central one and the brightness variations imply one hemisphere of the Earth is a lot less cloudy than the other

0750 Img 4Tot-5 Looks like the clouds are clearing a bit. The moon is brighter and clearer with some field stars. 4Tot-5a. That field star to the right is Spica in Virgo. You can definitely see the cloud haze in the star Spica. It's blue color is very apparent.

0800 Img 4Tot-6

0810 Img 4Tot-7 looks like those clouds are ting to clear off The moon has gotten brighter. And redder. It almost looks like the eclipse is ending- which is not the case yet. Still more than ten minutes until this phase ends.

0824 Img 5UmbE-1 3’rd Contact End of Totality. Caught this image just as the first bit of sunlight re-appears

0830 Img 5UmbE-2 Umbra uncovering Grimaldi. In this image there is almost a diamond ring effect from the haze. Clouds are much thinner than they were barely 30 minutes ago. I can see my Moon shadow again- although barely.

0840 Img 5UmbE-3 Ocean of storms emerging from the shadow. Approaching Aristarchus. Those clouds clearing off sure make a difference in identifying the shadow. The night is already banished. I can clearly see my Moon shadow again.

0850 Img 5UmbE-4 Tycho, Kepler, and Aristarchus are now uncovered. Copernicus about to re-appear. Some rays are visible already.

0900 Img 5UmbE-5 The straight range has just emerged from the umbra. Edge of umbra approaching the Teneriffe Mts and Plato in Mare Imbrium. I have changed the exposure settings to help identify emerging features as all trace of color is gone from the area still in the shadow.

0910 Img 5Umb-6 All of Mare Imbrium is uncovered. Umbra is moving across the Sea of Serenity.

0920 Img 5Umb-7 Seas of Serenity, Tranquility and Nectar uncovered. Coming up on 4’th contact in a bit over 10 minutes

0930 Im 5UmbE-8 Sea of Crisis uncovered. Coming up on 4’th Contact shortly

0932 Img 6PenE-1 4’th Contact. End of the Umbral phase of the Eclipse. There is now no part of the Moon seeing a total eclipse. There is still some penumbral shading around the Sea of Crisis. The Sun is still almost all- but not quite covered by the Earth. This shading will soon disappear. Because of the clouds this shading was very indistinct during the egress phase. The clouds now gone from this part of the sky.

0940 Img 6PenE-2 There is still penumbral shading visible but much less than in the previous image.. Fatigue is becoming a definite factor.

0950 Img 6PenE-3 There is still a little Penumbral shading visible. little penumbral shading

0900 Img 6PenE-4 The image indicates there may still be a slight Penumbral shading. I did not see any visually through the eyepiece.

0910 Img 6PenE-5 I do not expect there to be any further changes. I see no sign now of Penumbral shading.

0920 Img 6PenE-6

0930 Img 6PenE-7 Coming up on the end of the penumbral phase

0937 Img 6PenE-8 End of Penumbral phase. Thje Eclpipse is now completely ove

0950 A bonus. Took an image of Mars.

1000 Another bonus . Took and image of Saturn. And I am totally out of steam. Still have to break down and go home.