The British Astronomical Association
Lunar Section Circular
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Director: Bill Leatherbarrow
Editor: Peter Grego

From the Director

Last month's *LSC* contained an interesting item in Tony Cook's TLP report about the crater Linné—a crater small in size, but one that has (since Julius Schmidt's announcement of its 'disappearance' in October 1866) played a part out of all proportion to its physical form in the history of reported changes on the Moon. Tony's article included an image by Brendan Shaw that appeared to show Linné's interior shadow falling in the 'wrong' direction when compared with the shadows in adjacent craters.

I have seen this appearance before, and it has been recorded by other imagers. Pete Lawrence, for example, has a fine image taken on 12 April 2008 [Fig. 1], showing the anomaly in a way strikingly similar to Brendan's image. The appearance is certainly intriguing, but I suspect it is easily explained: I think, like Tony, that what we are interpreting as the illuminated inner eastern slopes of Linné is in fact the bright ejecta blanket outside the crater's eastern wall, and this is creating the impression of a shadow falling in the wrong direction. My own image, taken on 4 March 2009 [Fig. 2], shows a less anomalous appearance. We are working at the limits of resolution here, and the eye—and camera—are easily deceived. It would be good to look at this again, perhaps with the assistance of high-resolution imaging at longer focal lengths.

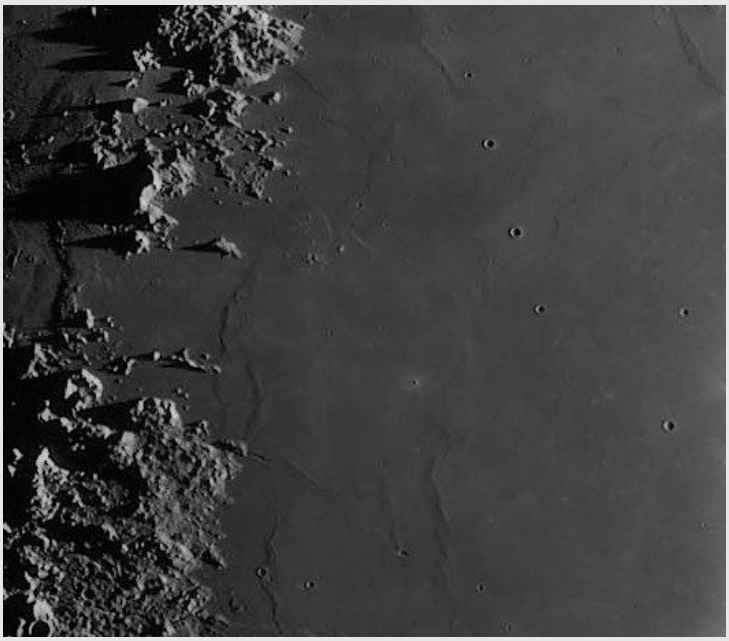
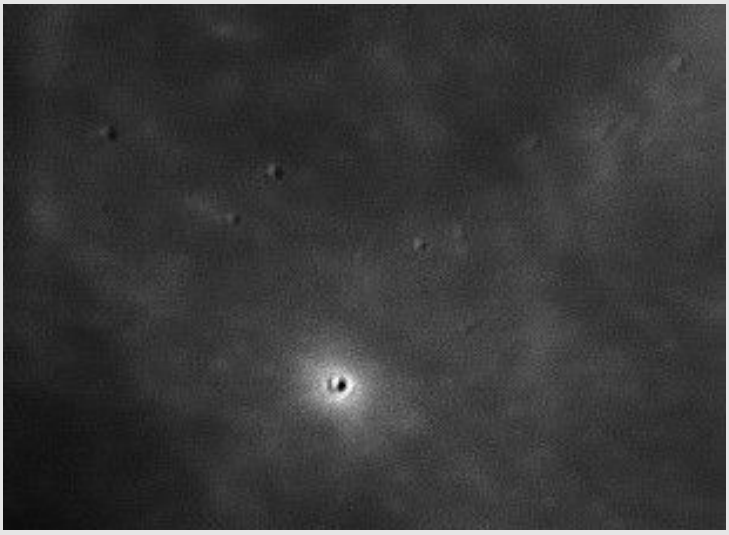


Fig. 1 (above) Linné, imaged by Pete Lawrence on 12 April 2008. Fig. 2 (below). A closer view of Linné, imaged by Bill Leatherbarrow on 4 March 2009.

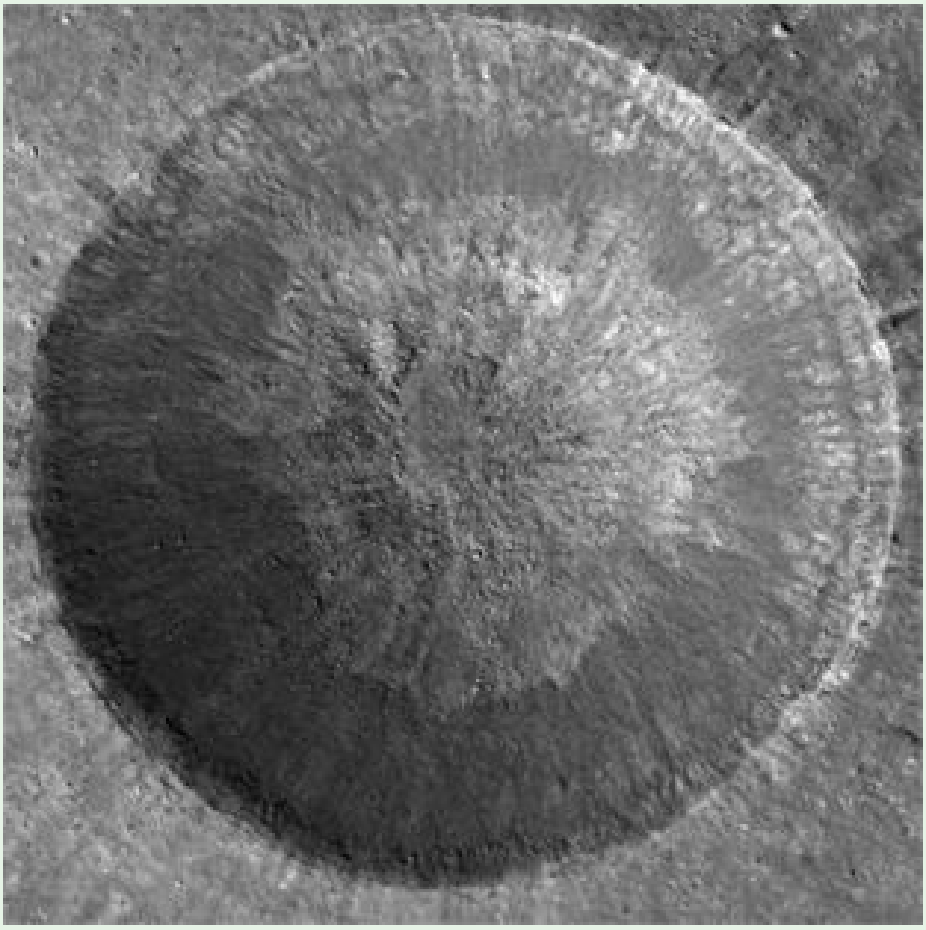


Also intriguing is Tony's suggestion that Linné might be a double, or concentric, crater with an inner ring. The LRO WAC image reproduced in Tony's report certainly shows something, but is this really an inner ring or merely the effect of scree falls? NASA's colour coded relief map of Linné, based on LROC NAC data, does not appear to suggest anything out of the ordinary, and there is little evidence of an inner ring in the video topographic model that may be found on the same site:

http://www.nasa.gov/mission_pages/LRO/multimedia/lroimages/lroc-20110314-linne.html

So, once again Linné shows its ability to intrigue. It may well be nothing more than a perfectly normal and relatively fresh impact crater (see the LROC image in Fig. 3), but it continues to reward the careful observer. We should make a point of examining it regularly, particularly under evening illumination in the autumn months ahead, when the waning gibbous Moon is high in UK skies.

Bill Leatherbarrow
Director, BAA Lunar Section



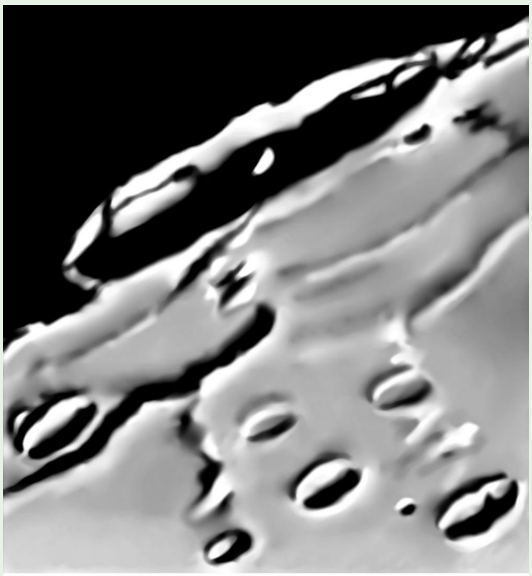
Tony Cook replies:
Having taken a look at video animations of flybys through the NASA Digital Elevation Model (DEM) of this crater (see http://spaceports.blogspot.com/2011/04/linne-crater-not-just-another-hole-in.html) I concur with the director's view that the apparent concentric crater appearance, that I referred to in the WAC image (*LSC* 2011 July, p14, Fig. 2), is most likely caused by a circumferal edge of contrasty scree fall on the conical crater slopes. Neverless there are still changes in the north and south portions of the shadow in the WAC image which could at least infer a subtle change in gradient here too.

Fig.3. Linné, imaged by LROC.

Topographical notes compiled by Peter Grego

Visual studies and observations
Since July's *LSC* topographic observations have been received from Peter Grego (St Dennis, UK), Chuck Hastorf (Arizona, USA), Dale Holt (Chipping, UK), Phil Morgan (Tenbury Wells, UK) and Erica Rix (Ohio, USA).

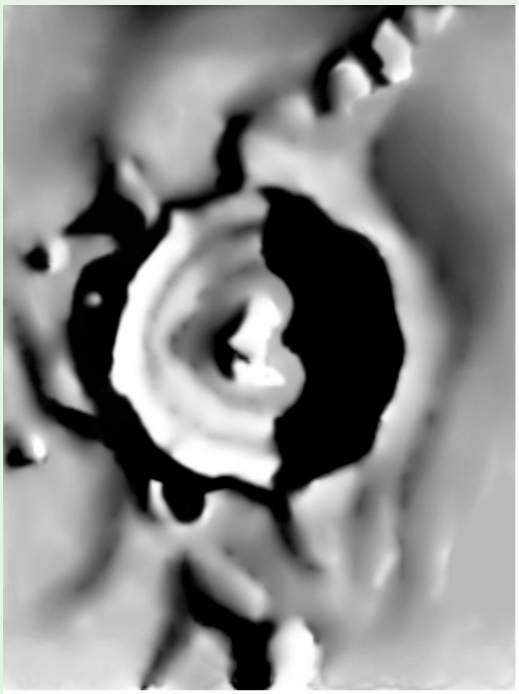
Pythagoras **Peter Grego**
Sunrise over Pythagoras near the Moon's northern limb. Libration was slightly unfavourable for this area, and I would not normally sketch the Moon at such a low altitude, but the pull of this crater was irresistible. Pythagoras was largely filled with shadow cast by its eastern rim, but the central peak was illuminated along with the upper parts of the crater's inner western wall. A line of terracing was evident along the southern part of the inner western wall, and terracing had also begun to emerge from the northern end of the wall. A dark breach in the eastern flanks of the outer wall led to the crater Babbage; the northern part of Babbage was depicted, including the floor craters Babbage A and Babbage C. Adjoining Babbage, part of the crater South was also depicted. The conjoined crater Horrebow to the southeast was observed, along with Robinson, South B and the southern part of J. Herschel and its illuminated inner wall. The terrain mid-way between J. Herschel and Pythagoras showed a ridge-like feature parallel with the eastern wall of Pythagoras. A pleasing study, if not overly detailed, and an area worth returning to under a similar illumination but better conditions all round.



Pythagoras
2011 July 13
23:10-35 UT
Col: 68.6-68.8°
Seeing: AIII, Moon just 15° high in south
200mm SCT, 100x & 200x (binoviewer)
Peter Grego (St Dennis, Cornwall, UK)
PDA sketch

N
E

2011 July 9. Poor seeing and a low Moon in twilight, with some hazy cloud towards the end of the session made for difficult conditions. Under similar circumstances at home I might never attempt to observe the Moon, but as a guest at Paul Stephens' observatory I felt compelled to make the effort. The general features of Eratosthenes and its immediate area were observed. Eratosthenes was some distance from the morning terminator, its eastern rim casting a shadow which covered around a third of the crater's interior. The central peaks were seen, along with terracing along the middle of the inner western wall. The inner northern wall was less bright than the rest of the inner wall. The peaks of the southern Montes Apenninus, north of Eratosthenes, were nicely illuminated; to the crater's southwest was the hefty unnamed mountain block lying between Eratosthenes and Stadius (Stadius is not depicted in this sketch). Eratosthenes H was also observed.



Eratosthenes

2011 July 09
20:45-55 / 21:20-35 UT
Col. 18.4-18.8°
Seeing: AIII, Moon low, hazy cloud
175mm MCT, 50 & 100x, integrated light
Peter Grego (Long Marston, Warks, UK)
PDA sketch

2011 July 21
01:00-30 UT
Col. 154.9-155.1°
Seeing: AII-III
200mm SCT, 100x 200x, integrated light
Peter Grego (St Dennis, Cornwall, UK)
PDA sketch

2011 July 21. In this follow-up observation the general features of Eratosthenes and its immediate area were observed; the same area and scale of observation was attempted. Eratosthenes was some distance from the evening terminator, and nowhere in the area depicted could any truly black shadow be detected. Its inner western wall was shaded, but some of the central terracing remained in direct sunlight. Two blocky central peaks were seen, each casting a slight grey shadow, although they did not bear a great deal of resemblance to my previous observation, although it must be pointed out that the orientation of this image is rotated more than 20° in comparison, so that lunar north is almost directly up. Terracing was observed along the middle of the inner eastern wall, and there was broad dusky banding in the north. The peaks of the southern Montes Apenninus were brightly illuminated. Rays from Copernicus crossed the area outside Eratosthenes.

Join us at our Yahoo! Group

Lunar Topographic Studies

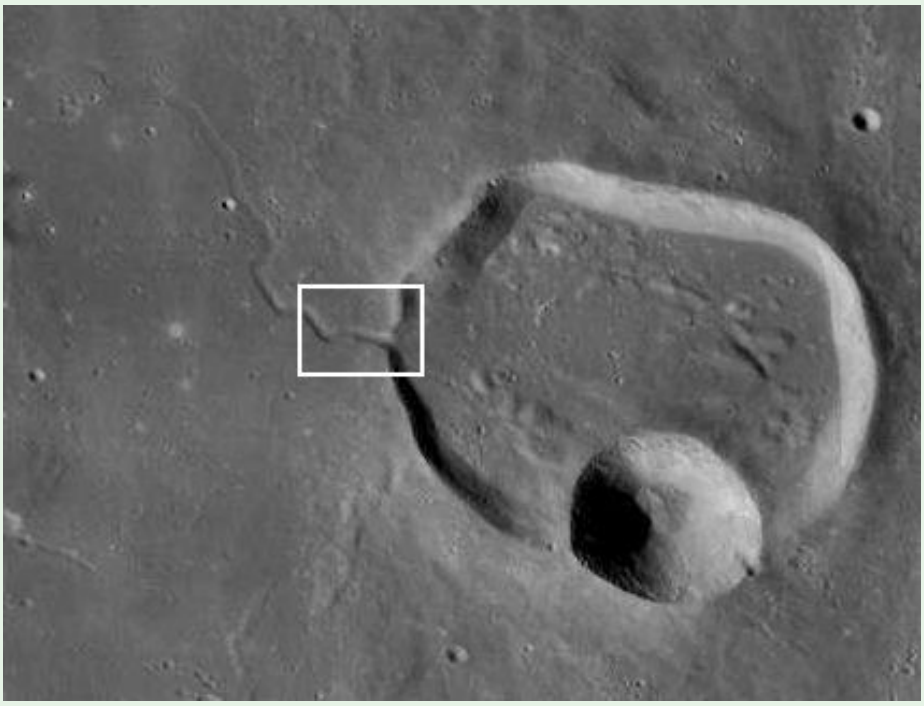
If you'd like to view many more BAA Lunar Section members' observational drawings, along with some of the observations featured in this (and previous) *Lunar Section Circulars*, you're welcome to join our Yahoo! Group at:

http://uk.groups.yahoo.com/group/baalunarsection-topography/

Krieger's riverbed

Phil Morgan

Fig. 1 (above). LROC image of Krieger.
Fig. 2 (below). Location of LROC close-up (see p5).



The distinctive and unique nature of lunar sinuous riles was first noted by W.H. Pickering, who also suggested that they were the remains of dry river beds because of the resemblance of their meanders to that of terrestrial river channels. It is now generally accepted that the sinuous rilles are collapsed lava tubes and not depressions that carried any material actually along the lunar surface. I have been looking for instances were it maybe possible to show that some sinuous rilles did indeed act like a surface riverbed and deposited lava downstream from the primary vent.

Figure 1 (LROC image) shows the crater Krieger from an Earth based perspective (north up). The sinuous rille that exits the western rampart looks as though it was a conduit for lava that overflowed from the crater at a low point in the rampart. Figure 2 is simply a guide to show the location of the LROC close up of the two meanders in Figure 3 as the rille exits the outer western rampart of the crater.

Note that opposite the points marked A and B there are characteristic river-like deeps on the outer leading edge of the meanders. At A and B themselves there appears to be shoals of sediment that have built up on the inner apex of the sinuosity at these locations due to the slower rate of flow, with the corresponding faster outer flow scouring and deepening the outer apex. The point arrowed C is the neck were the rille passes out of Krieger's western rampart.

In Figure 1 it can be seen that the rille disappears and re-emerges later along its length. This could be down to lava overflowing the rilles banks, but is more likely due to later flooding from other nearby fissures. Other notable features are the lack of a lobate 'head' for the rille, but this is also absent from about a third of other sinuous rilles, but it could also have been destroyed by the later flooding or infilling of the crater floor of Krieger.

It seems unlikely that this rille was ever gouged out initially by outpourings of lava. More likely that if lava ever did flow on the surface here, it made use of a pre-existing sinuous rille as a channel.

In the final analysis one has to concede that maybe the points arrowed A and B are simply landslides or just a general slumping of the rille banks at these critical locations—but who can say for certain?

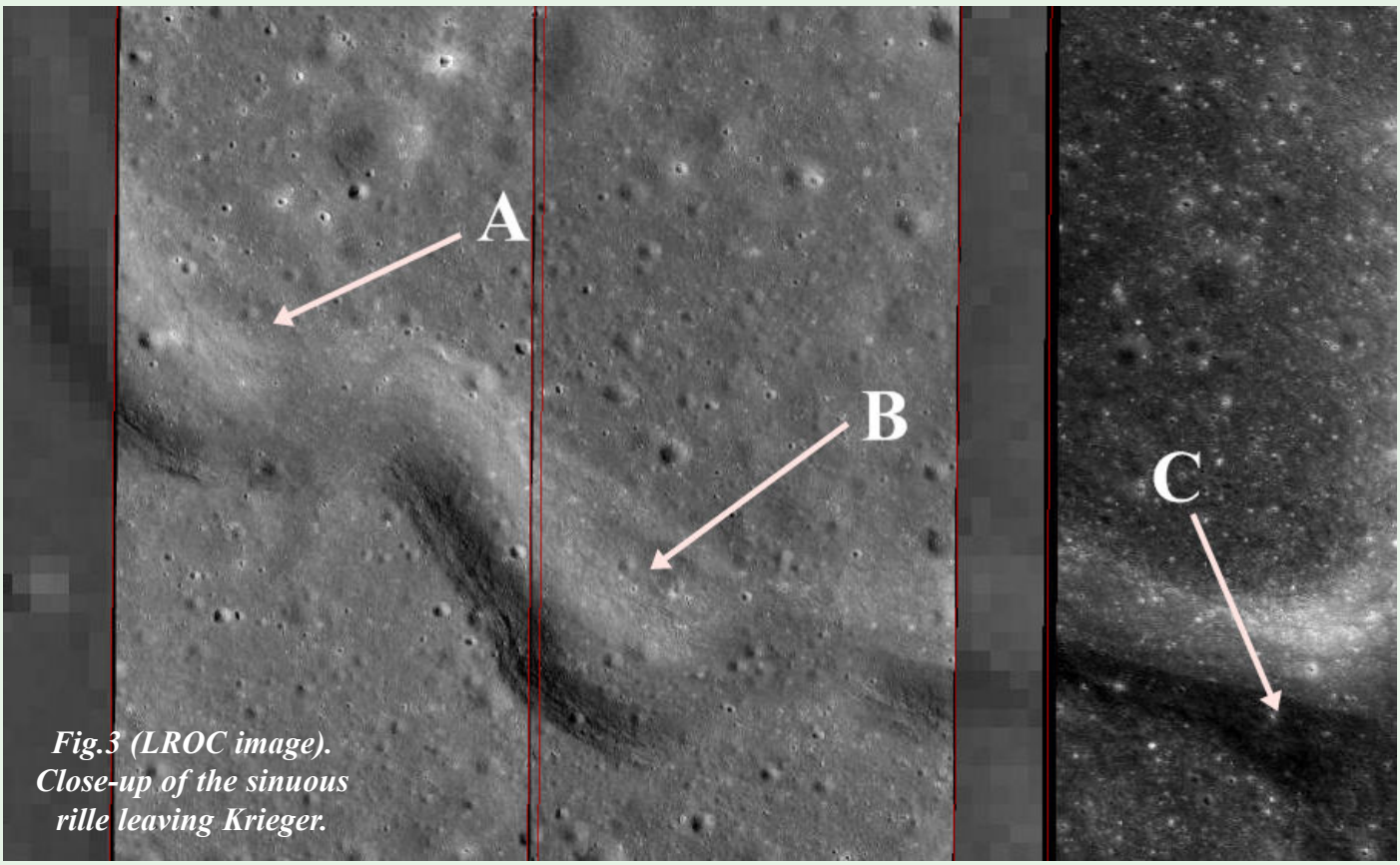


Fig.3 (LROC image). Close-up of the sinuous rille leaving Krieger.

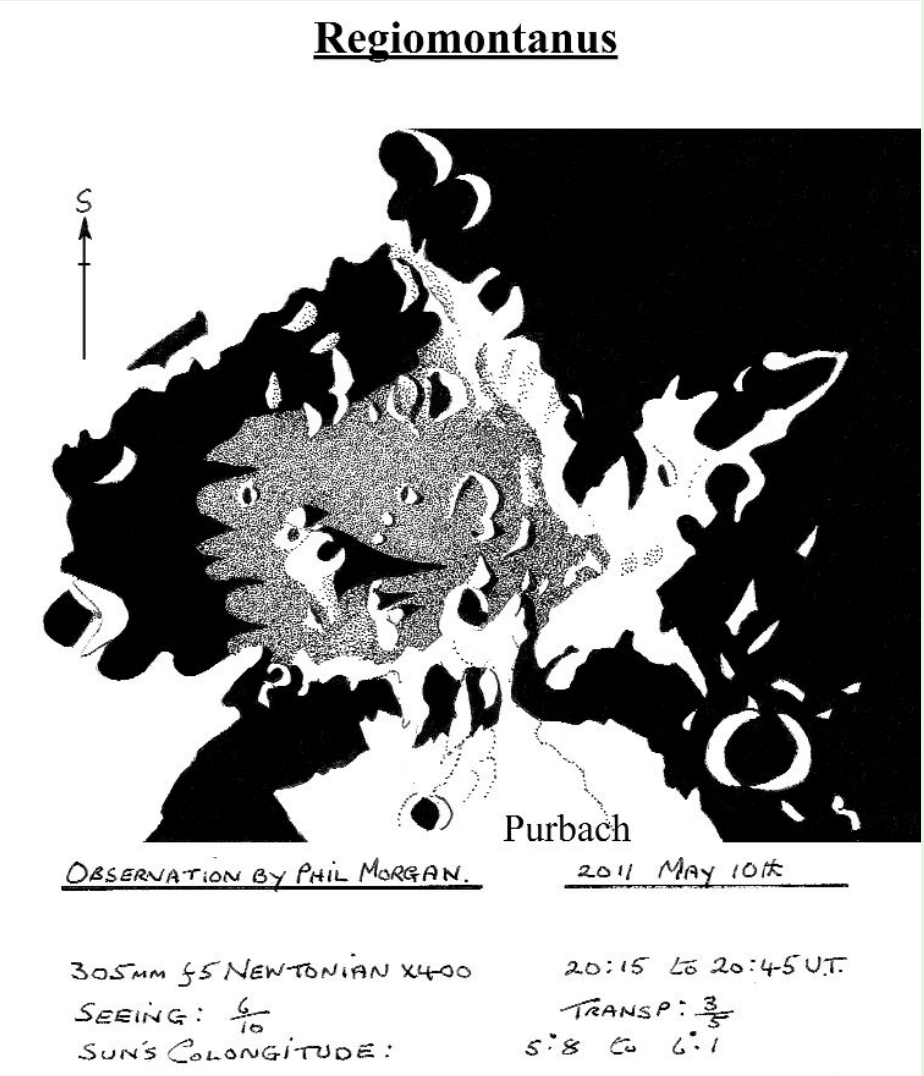
Regiomontanus A—
a lunar Kilauea?

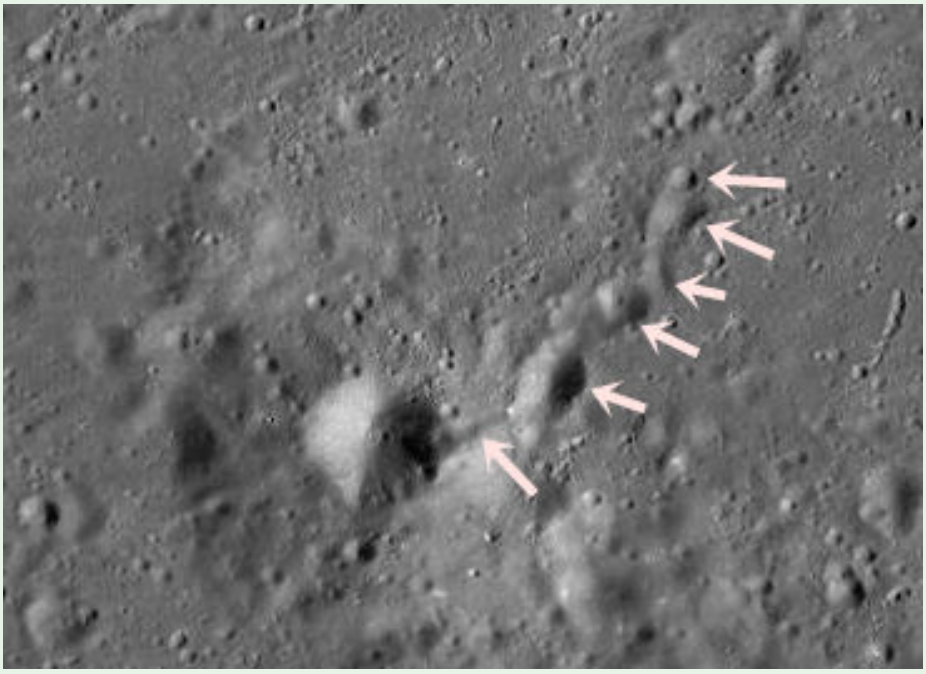
Phil Morgan

Situated just south of the crater Purbach (Rükl, plate 55) is the irregular shaped structure Regiomontanus. This has a north-south diameter of only 110 km compared to its east-west diameter of 126 km due to the encroachment into the north rampart by the later Purbach.

My latest observation (right) was made on 10 May 2011, and showing up quite dramatically was the central, crater-topped peak, designated Regiomontanus A. This small craterlet is about 4 km across and sits perfectly on top of the remains of the central mountain mass.

To the Earth based observer Regiomontanus A looks a lot like a terrestrial strato volcano, but down on the lunar surface, and seen in profile, it would have the more





LROC image of Regiomontanus A showing (arrowed) small pits and rifts that may be associated with the craters formation.

gentle sloping appearance of the Hawaiian volcano Kilauea—a typical basaltic shield structure with slopes of no more than 6 degrees on the outer flanks. Kilauea also has a summit caldera 3.5 km across and 150 metres deep. One notable feature is the rift zone that runs right across it, with two branches starting at the summit and running to the east and south-west respectively. On the surface, the rift is marked by old cones and lakes of solidified lava. The LROC (south up) image at left shows us that the outer west flank of Regiomontanus A is also breached by a rift that continues as a chain of five or so shallow pits, some elongated along the general strike of the chain to the south-west. Despite these obvious similarities, it would take a brave person to suggest that sometime in the past Regiomontanus A once gave rise to eruptions of lava just like Kilauea!

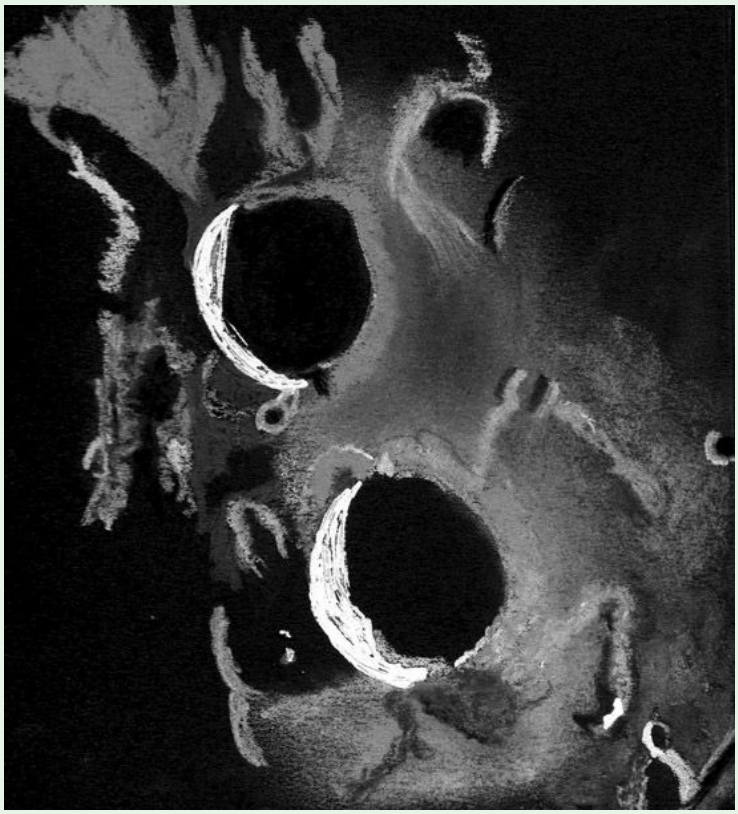
Agrippa and Godin **Dale Holt**

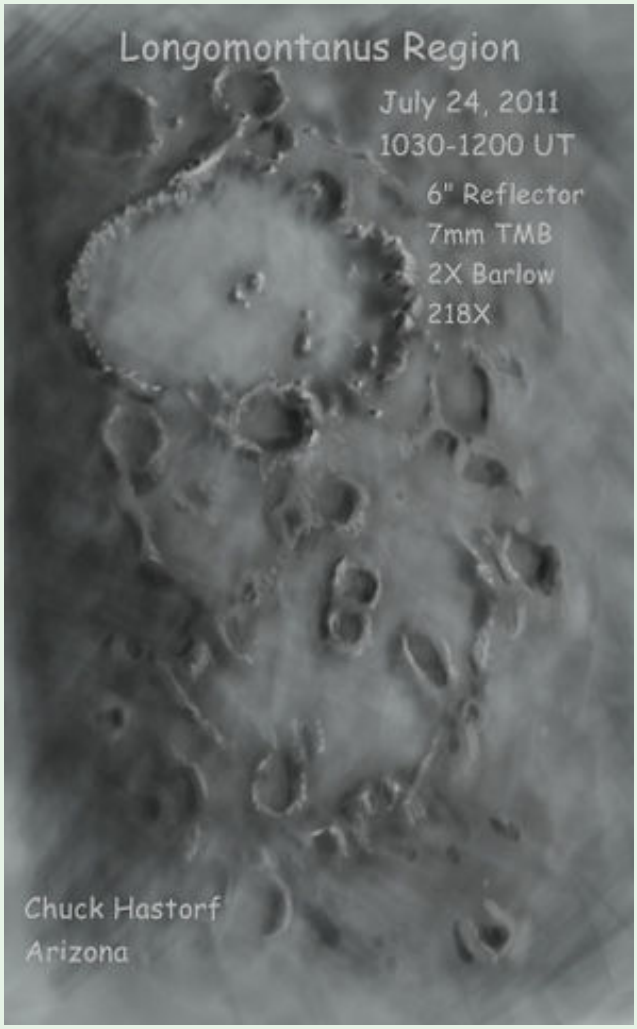
I noted as I walked into the garden that the Moon was peeking out been rain clouds and indeed between heavy showers. I had to see if I could get the telescope onto it; I knew it would be close as it was low in the west and likely to be obscured by the house. I opened the observatory roof and ascertained that there was a short window to capture a view and sketch I grabbed this brief moment and within minutes of the Moon disappearing behind the roof line of my house. Hurriedly I put the120N+ video camera into the 6-inch refractor's diagonal, got the scope pointing at the Moon, and the the Moon onto the monitor, and focused. I quickly defined region for sketching and hit the single frame freeze button. I could then relax; I had my target for sketching so I parked the 'scope, closed off the roof, poured out a glass of wine and sketched the Moon from the monitor screen view here.

The two craters and surrounding environs were unknown to me until I finished my pastel on black art paper sketch and consulted a few volumes from the shelves and quickly found them to be Agrippa and Godin. Agrippa, the lower and larger of the two in my sketch is 46 km across and 3.1 km deep. Godin is 35 km across and slightly deeper at 3.2 km. Just below Agrippa in the bottom right hand corner of the sketch you can just see the dark linear line of the rille, Rima Ariadaeus, this in reality is N-NE of Agrippa.

Technical details: 7 July 2011 at 21:45 UT. 153 mm triplet refractor, Watec 120N+ video camera from the screen image.

Editor's note: The observation featured on Chuck Wood's Lunar Photo of the Day on 9 July. The text above comes from Dale's blog at http://chippingdaleobservatory.com/blog/





Observational drawings by Chuck Hastorf.

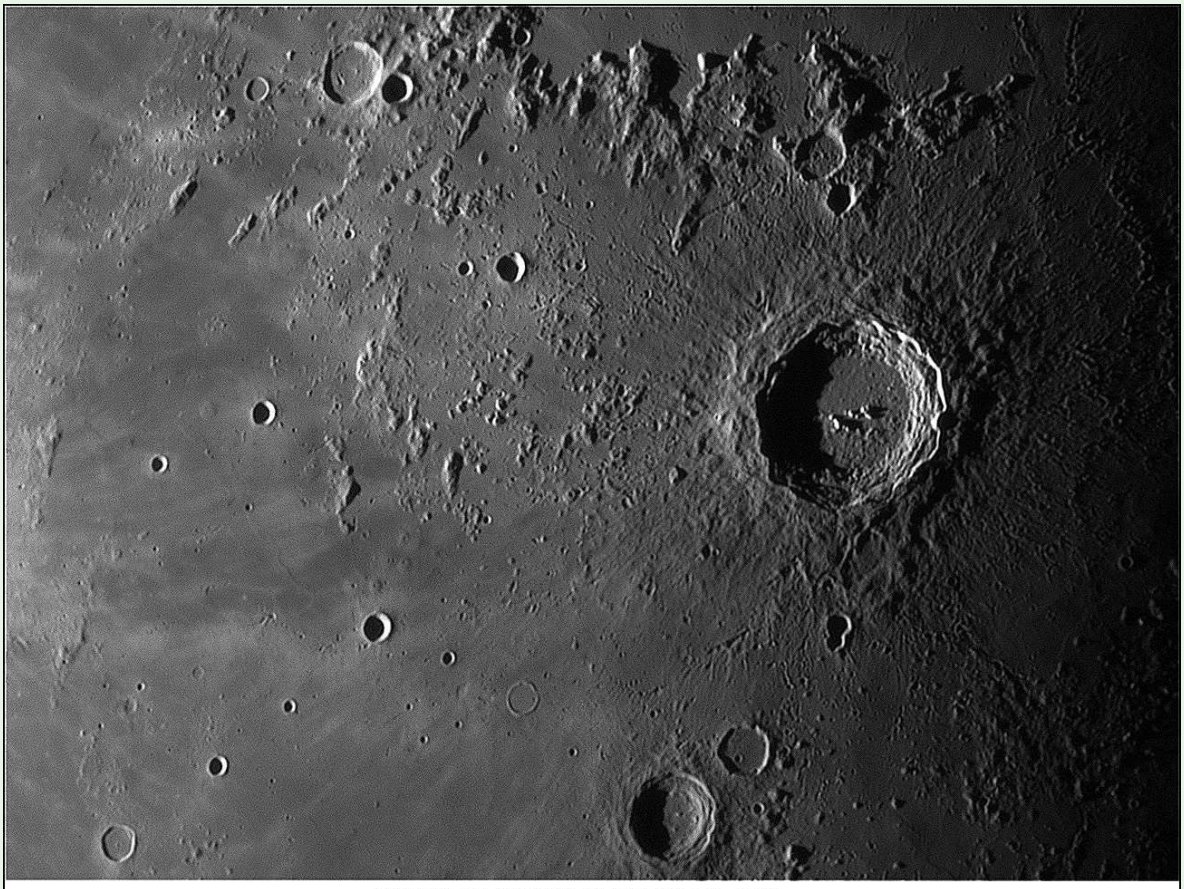
Lunar images

Since July's *LSC*, a superb selection of lunar images have been received from Mike Brown, Maurice Collins, Jamie Cooper, David Finnigan, Larry Todd and Dave Tyler (note: not all of these contributors are BAA members). As usual, a lack of space prevents displaying most of these images here, but representative examples have been included.

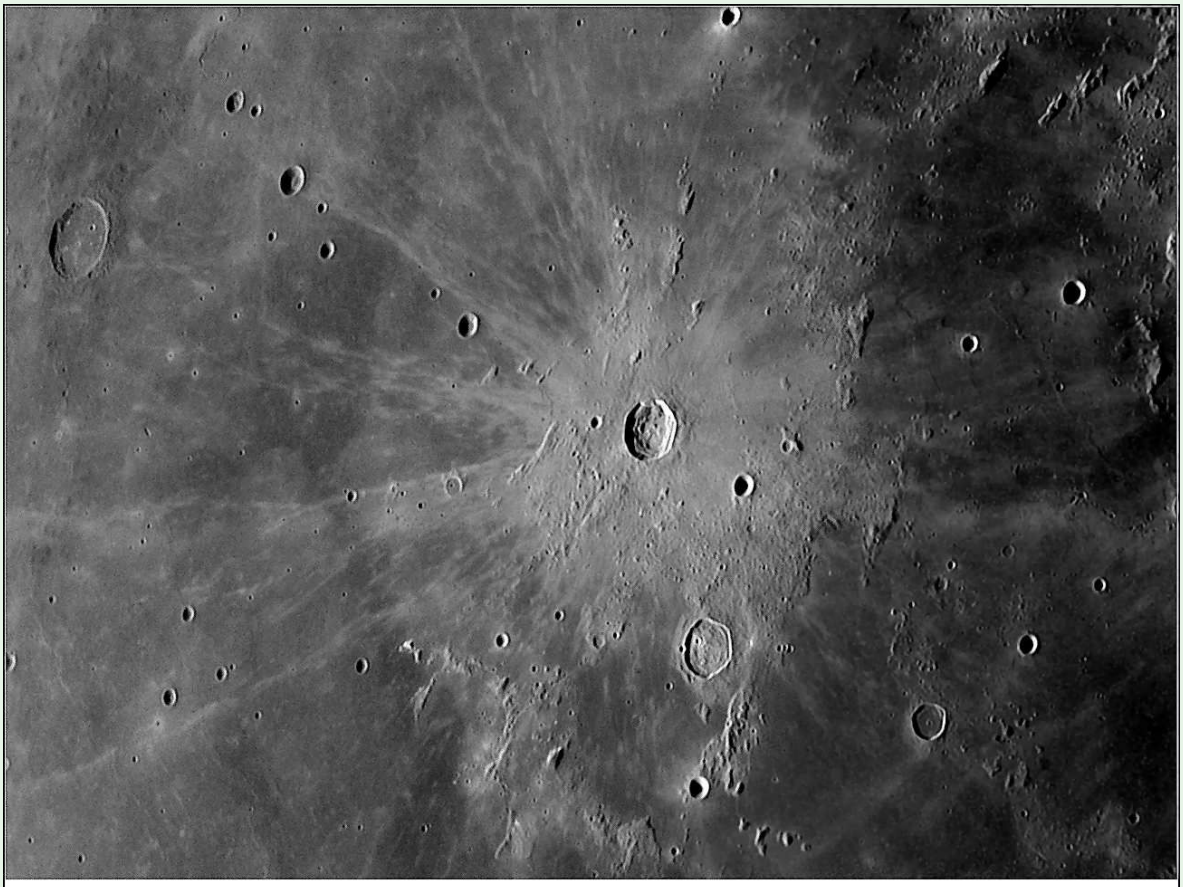
Note: If you are submitting images or observational drawings to the *LSC*, in addition to emailing them to the editor, please also cc your contributions to the Director, Bill Leatherbarrow, who is maintaining an archive of material. It would greatly help in cataloguing and archiving this material to include in each image file name the most relevant details of your image/observation, including date, time(s), feature, instrument(s) and magnification, filter used (if any), and observer's name.

Sinus Iridum, 23 July 2011, 04:21 UT. Col. 181.5°. Seeing 3/10, transparency fair. 8-inch Meade LX200 classic, f/25, DMK21AU04.AS camera, Baader IR pass filter. 1271 frames at 30 fps processed in Registax 5. D.T. Finnigan (Halesowen, UK).

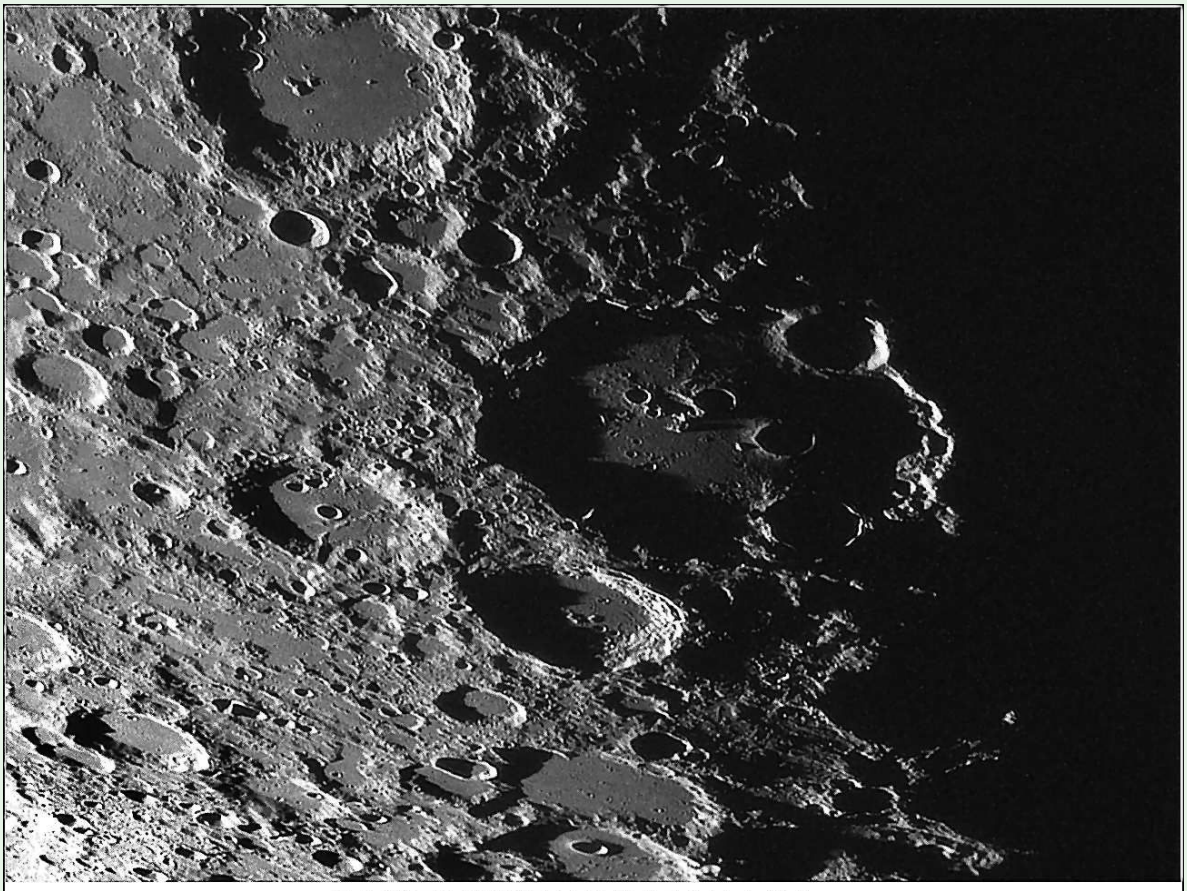
Dave Tyler notes: I have just been experimenting with a DLSR for single frame (as opposed to mosaics, which lunar eclipses don't allow) whole moon shots, not as easy as one might think to get sharp images. This colour shot is only four images stacked in R6. The seeing was not an issue until I saw the rippling in Registax. The moon was at 29° altitude. The 5-inch APO seemed to max out the seeing and technique, as a four quarter frame mosaic experimental comparison shot with my C14 was no better. The camera was a Canon EOS20DA with 8.2 Megapixels. The 5-inch AP was 40-inch focal length. The 1411 pix high image had 895 pixels spare. The 2336 pix height chip would just cope with 60-inch focal length (increased the pixel count in the image so as to be 900 high at 50% to fit the screen).



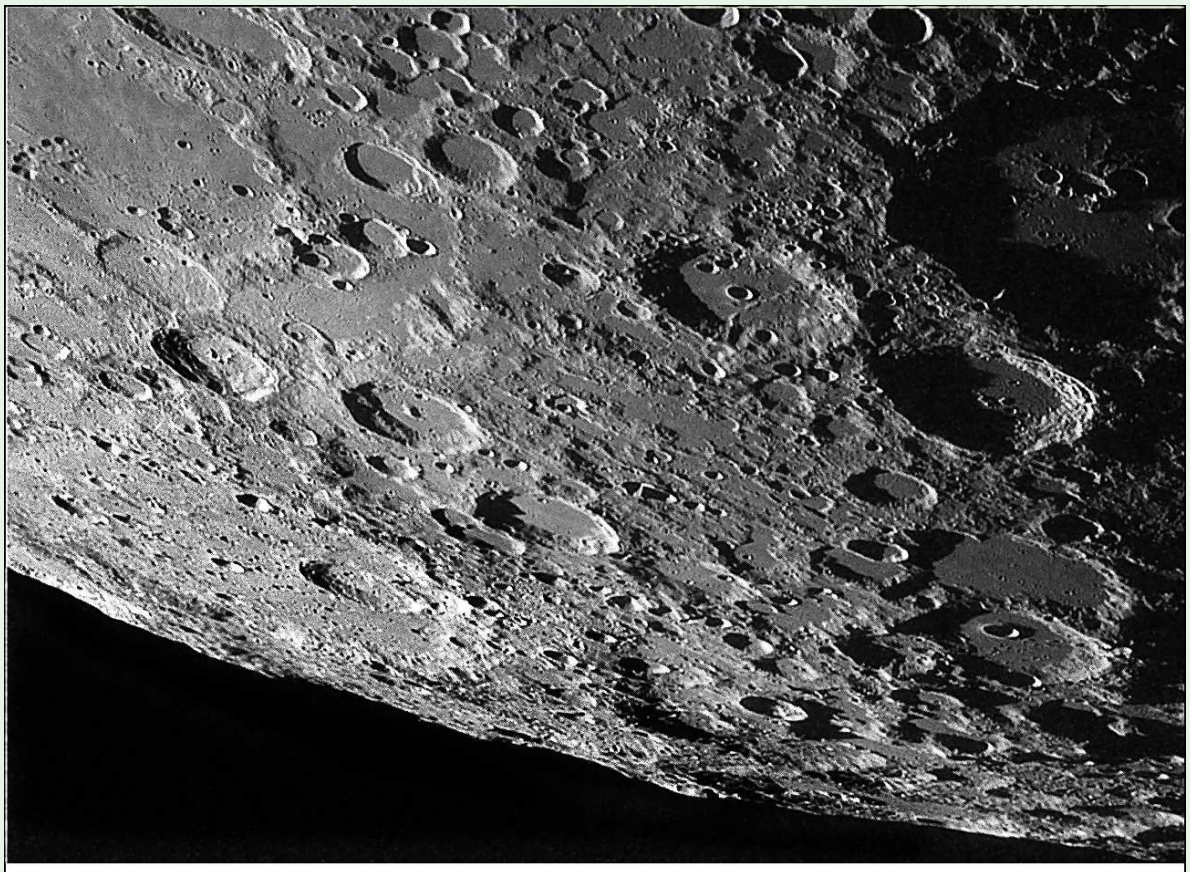
COPERNICUS 03.53.15 U.T. 24 July 2011
10 inch F9.36 Long Focus Newtonian, AE Apo. Barlow working at F14 (1.5x)
Basler Ace 1300 mono CCD video camera, Hoya 830nm filter, 1/38 second, 64 frames
Gain 738, Seeing 4/10, Transparency 10/10
Mike Brown, Huntington, York, U.K. 53.59.12 North, 1.03.20 West



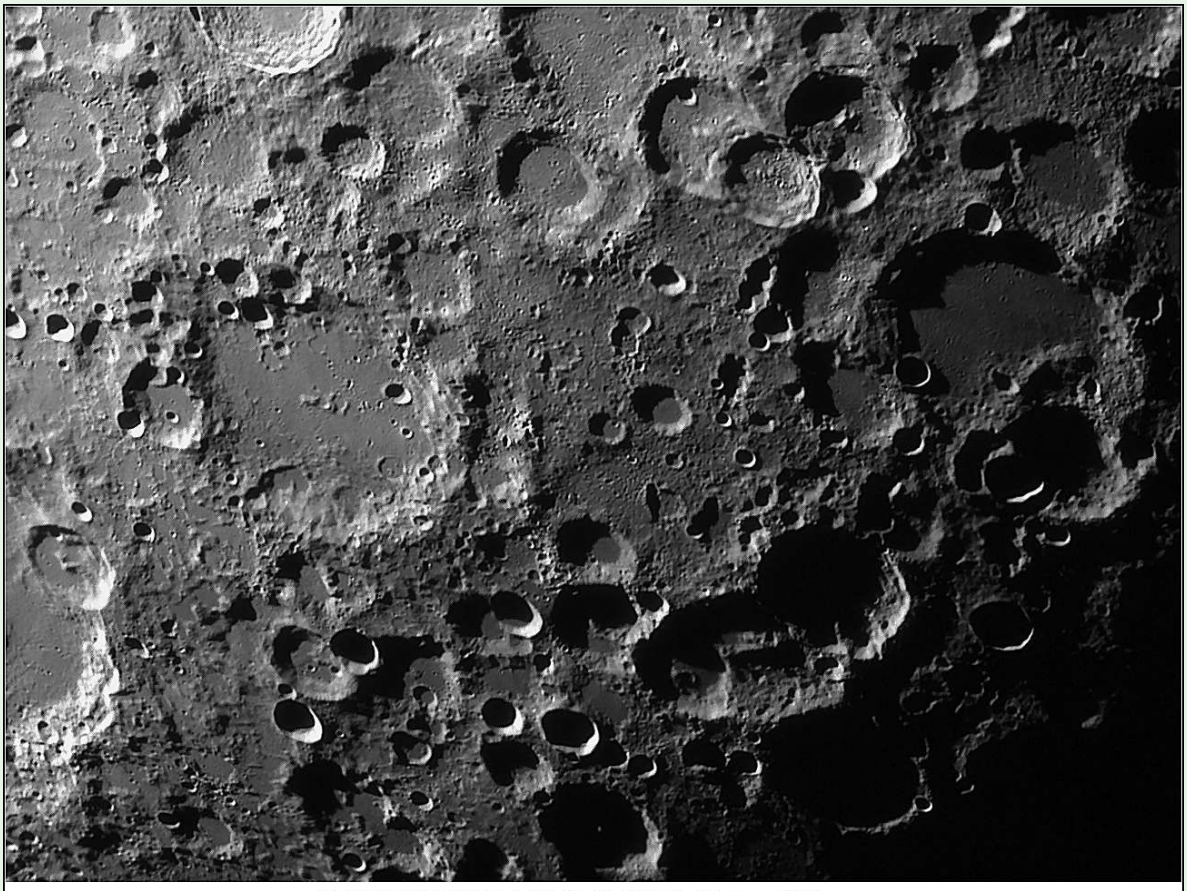
KEPLER 04.05.01 U.T. 24 July 2011
10 inch F9.36 Long Focus Newtonian, AE Apo. Barlow working at F14 (1.5x)
Basler Ace 1300 mono CCD video camera, Hoya 830nm filter, 1/28 second, 200 frames
Gain 554, Seeing 4/10, Transparency 10/10
Mike Brown, Huntington, York, U.K. 53.59.12 North, 1.03.20 West



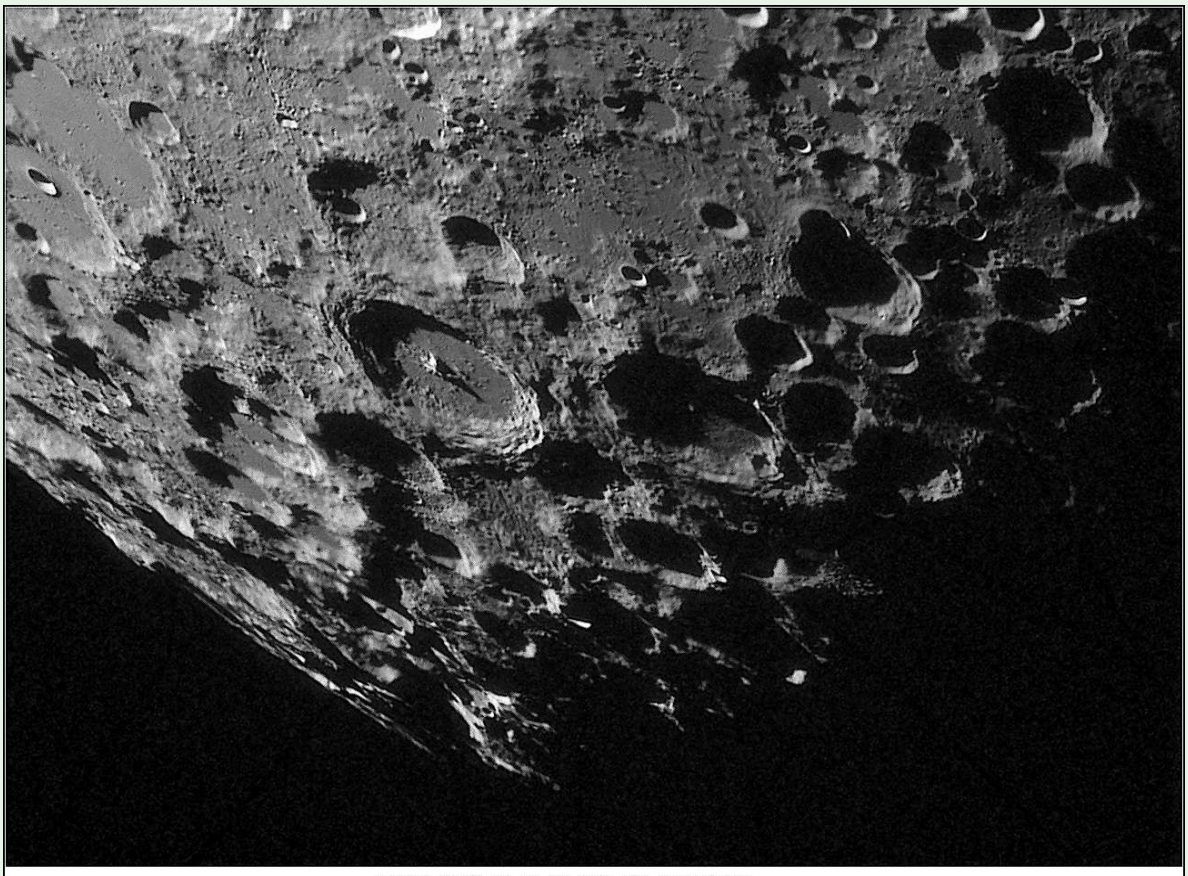
CLAVIUS AT SUNSET 04.24.53 U.T. 24 July 2011
10 inch F9.36 Long Focus Newtonian, AE Apo. Barlow working at F14 (1.5x)
Basler Ace 1300 mono CCD video camera, Hoya 830nm filter, 1/39 second, 150 frames
Gain 673, Seeing 4/10, Transparency 10/10
Mike Brown, Huntington, York, U.K. 53.59.12 North, 1.03.20 West



SEGNER to CLAVIUS 04.19.12 U.T. 24 July 2011
10 inch F9.36 Long Focus Newtonian, AE Apo. Barlow working at F14 (1.5x)
Basler Ace 1300 mono CCD video camera, Hoya 830nm filter, 1/39 second, 64 frames
Gain 608, Seeing 4/10, Transparency 10/10
Mike Brown, Huntington, York, U.K. 53.59.12 North, 1.03.20 West



MAGINUS TO STOFLER 04.29.47 U.T. 22 July 2011
10 inch F9.36 Long Focus Newtonian, AE Apo. Barlow working at F14 (1.5x)
Basler Ace 1300 mono CCD video camera, Baader Red filter, 1/79 second, 100 frames
Gain 527, Seeing 6/10, Transparency 10/10
Mike Brown, Huntington, York, U.K. 53.59.12 North, 1.03.20 West



MORETUS 04.35.41 U.T. 22 July 2011
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Basler Ace 1300 mono CCD video camera, Baader Red filter, 1/94 second, 64 frames
Gain 465, Seeing 6/10, Transparency 10/10
Mike Brown, Huntington, York, U.K. 53.59.12 North, 1.03.20 West


13-day Moon
2011 July 14
1140 - 1204UT
ETX-90 & LPI
Maurice Collins
Palmerston North, NZ
13-day Moon
Supercolour
2011 July 14
1140 - 1204UT
ETX-90 & LPI
Maurice Collins
Palmerston North, NZ


16-day Moon
2011 July 17
0901 - 0936UT
ETX-90 & LPI
Maurice Collins
Palmerston North, NZ

Transient lunar phenomena, August 2011 Tony Cook

Observations for June 2011 were received from the following observers: Jay Albert (Lake Worth, FL, USA) observed: Agrippa, Censorinus, Picard, Plato, Proclus, Pytheas, and Swift. Maurice Collins (New Zealand) observed: Aristarchus, the lunar eclipse, Marius, Schickard, and took whole disk images. Marie Cook (Mundesley, UK) observed: Beaumont, Censorinus, Copernicus, Messier & A, Moltke, Mons Pico, Mons_Piton, Plato, Proclus, and Promontorium Agarum. Colin Henshaw (Saudi Arabia) captured: whole disk images of the Moon, Earthshine, and the lunar eclipse. Norman Izett (New Zealand) observed: The lunar eclipse and took a whole disk image of the Moon. Kerry Koppert (New Zealand) took a whole disk image of the Moon. Piotr Malinksi (Poland) observed: Aristarchus, Hevelius and took a whole disk image of the Moon. Shaw (UK) observed: Alphonsus, Mare Humboldtianum, Plato, Proclus, Promontorium Agassiz, Ross D, Torricelli, and Tycho. Hamish Watchman (New Zealand) took a whole disk image of the Moon. We seem to have a really good set of contributors from New Zealand this month, and Colin Henshaw deserves a special mention because he has imaged the Moon for the majority of days in June.

News: Thanks to the understanding of several observers that I contacted, requesting them to resubmit their observations, it has been possible to reconstruct must of the missing observational archive from mid March to mid May that were lost when my laptop hard drive broke. A few additional files from this period were also recovered by the system manager at work who quite literally froze and then took the hard drive apart and got it working again for short periods, though directories and files were often mixed up. The moral of the story is everybody should do backups as often as possible!

I would like to thank Alexandre Amorim, from Florianopolis, Brazil for pointing out a reference to a TLP observation by Jose Brazilicio de Souza on May 11 in *Revue l'Astronomie*, vol 9 (1890), p. 73-74, which you cannot find in the Cameron catalog. I have summarized the report below:

1885 May 11 UT 08:00 Gutenberg area (somewhere in the highlands between Mare Nectaris and Mare Fecundatis). J. Braziliano de Souza (Florianopolis, Brazil) observed in Earthshine two small luminous red points. He changed the eyepieces but the effect remained. The TLP was discovered at 05:00 local time - or 08:00 UT. Alas Sun rise occurred not long after the discovery and so the development of the TLP could not be followed. No other observers were around to confirm the report. ALPO/BAA weight=2.

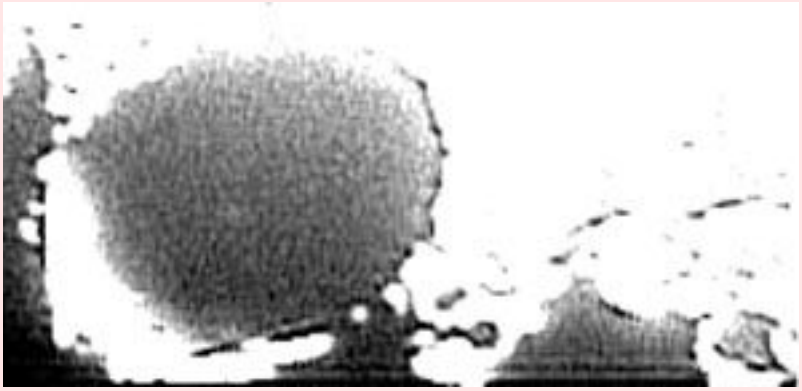

Figure 1 – The ghostly central peak of Tycho.

Brendan Shaw has been investigating his Tycho observation from 2003 May (See figure 1) when he imaged the central peak of the crater about 0.9° in solar altitude before it should have been visible in sunrise. Even allowing for the angular radius of the Sun, experiments that Brendan performed with LTVT showed that it was appearing at least 0.6° too early. We would therefore very much like to encourage you to try to image the shadowed interior of Tycho at the following dates and UTs over the next few months in order to see how early we can push the appearance of the central peak of Tycho. What we think is happening is that the illuminated rim is scattering light inside the crater and this is illuminating the central peak sufficiently for it to be seen in shadow. If this is not the explanation, and the central peak is sometimes visible and sometimes not at the same solar altitude, then we must invoke a TLP explanation. This is a very interesting experiment to perform, seeing detail inside shadowed areas, so please take part and encourage other astro-imaging folks to join in.

So please try to image Tycho at the times given in Table 1, remembering that slightly over exposed images will help to see detail inside the shadow. Visual observers can attempt this, but we suspect that CCD will be more effective at picking out the faint central peak whilst it is still in shadow. Two previous years are also included if anybody would like to check back through their records.

2009	**2010**	**2011**	**2012**
Jan-04 UT18:27 to 21:27	Jan-08 UT18:42 to 21:42	Jan-13 UT03:35 to 06:35	Jan-02 UT12:01 to 15:01
Jan-19 UT11:00 to 14:00	Jan-23 UT19:06 to 22:06	Jan-27 UT15:34 to 18:34	Jan-16 UT23:24 to 02:24
Feb-03 UT10:35 to 13:35	Feb-07 UT07:43 to 10:43	Feb-11 UT19:21 to 22:21	Feb-01 UT03:46 to 06:46
Feb-17 UT23:49 to 02:49	Feb-22 UT10:48 to 13:48	Feb-26 UT04:52 to 07:52	Feb-15 UT13:05 to 16:05
Mar-05 UT02:06 to 05:06	Mar-08 UT20:36 to 23:36	Mar-13 UT09:49 to 12:49	Mar-01 UT18:19 to 21:19
Mar-19 UT12:15 to 15:15	Mar-24 UT01:08 to 04:08	Mar-27 UT18:11 to 21:11	Mar-16 UT02:55 to 05:55
Apr-03 UT16:16 to 19:16	Apr-07 UT09:21 to 12:21	Apr-11 UT22:34 to 01:34	Mar-31 UT07:12 to 10:12
Apr-18 UT00:27 to 03:27	Apr-22 UT13:44 to 16:44	Apr-26 UT07:19 to 10:19	Apr-14 UT16:36 to 19:36
May-03 UT04:44 to 07:44	May-06 UT21:57 to 00:57	May-11 UT09:39 to 12:39	Apr-29 UT18:27 to 21:27
May-17 UT12:31 to 15:31	May-22 UT00:42 to 03:42	May-25 UT20:10 to 23:10	May-14 UT05:51 to 08:51
Jun-01 UT15:37 to 18:37	Jun-05 UT10:25 to 13:25	Jun-09 UT19:32 to 22:32	May-29 UT04:31 to 07:31
Jun-16 UT00:36 to 03:36	Jun-20 UT10:30 to 13:30	Jun-24 UT08:40 to 11:40	Jun-12 UT18:32 to 21:32
Jul-01 UT01:24 to 04:24	Jul-04 UT22:46 to 01:46	Jul-09 UT04:59 to 07:59	Jun-27 UT14:06 to 17:06
Jul-15 UT12:50 to 15:50	Jul-19 UT19:53 to 22:53	Jul-23 UT20:52 to 23:52	Jul-12 UT06:39 to 09:39
Jul-30 UT10:50 to 13:50	Aug-03 UT11:05 to 14:05	Aug-07 UT14:48 to 17:48	Jul-27 UT00:00 to 03:00
Aug-14 UT01:19 to 04:19	Aug-18 UT05:42 to 08:42	Aug-22 UT08:53 to 11:53	Aug-10 UT18:21 to 21:21

Aug-28 UT20:44 to 23:44	Sep-01 UT23:28 to 02:28	Sep-06 UT01:43 to 04:43	Aug-25 UT10:55 to 13:55
Sep-12 UT14:06 to 17:06	Sep-16 UT16:41 to 19:41	Sep-20 UT20:52 to 23:52	Sep-09 UT05:50 to 08:50
Sep-27 UT07:50 to 10:50	Oct-01 UT11:58 to 14:58	Oct-05 UT14:13 to 17:13	Sep-23 UT23:18 to 02:18
Oct-12 UT03:08 to 06:08	Oct-16 UT05:19 to 08:19	Oct-20 UT08:57 to 11:57	Oct-08 UT17:23 to 20:23
Oct-26 UT20:36 to 23:36	Oct-31 UT00:36 to 03:36	Nov-04 UT04:23 to 07:23	Oct-23 UT13:16 to 16:16
Nov-10 UT16:20 to 19:20	Nov-14 UT19:40 to 22:40	Nov-18 UT21:19 to 00:19	Nov-07 UT05:19 to 08:19
Nov-25 UT11:06 to 14:06	Nov-29 UT13:25 to 16:25	Dec-03 UT19:55 to 22:55	Nov-22 UT04:33 to 07:33
Dec-10 UT05:33 to 08:33	Dec-14 UT11:22 to 14:22	Dec-18 UT10:07 to 13:07	Dec-06 UT17:54 to 20:54
Dec-25 UT02:53 to 05:53	Dec-29 UT02:24 to 05:24		Dec-21 UT20:27 to 23:27

Table 1. Suggested times to look for the central peak of Tycho, whilst it is still in shadow. Note that observers must check that the Moon will be visible from their geographical observing site before attempting any of these.

TLP Reports: No TLP were reported in June.

Routine Reports: On 2011 Jun 09 UT 03:00-03:10 Jay Albert re-observed Agrippa under the same illumination conditions to a Bartlett TLP outlined below:

Agrippa 1966 Oct 24 UT 01:48-02:12 Observed by Bartlett (Baltimore, MD, USA, 5" reflector, x283, S=6, T=3-2) "Shadow of c.p. light & greyish, scarcely distinguishable from floor. (sun is quite high (39deg) so shadow ought to be nearly gone)."NASA catalog weight=4 (good). NASA catalog ID #985.ALPO/BAA weight=1.

Jay's observing conditions were not ideal, but comments: "The crater's central peak was bright and its black shadow was easily seen against the light-medium grey floor. Though smaller, the shadow of neighboring Bodin's central peak was also seen. Jay used a NexStar 6" SCT (x214) without filters. The sky had haze of varying thickness. Transparency was magnitude 2 and seeing was 4/10. Now the instruments sizes and transparency were similar, and yet Jay saw a black shadow, whereas Bartlett saw a light and grayish shadow. I had previously assigned a weight to Bartlett's report of 1, as he had reported grey shadows in Agrippa a little too often for my liking. However after reading Jay's report on how clearly seen the black shadow was, I am tempted to raise Barlett's TLP weight up to 2 as I now feel he ought to have seen the black shadow.

On 2011 Jun 14 Piotr Malinski obtained a high resolution monochrome image of Aristarchus that matched the same illumination and topocentric libration to Ron Livesey's TLP report from 1996 Oct 25UT19:05-19:55 to within +/-1° . We have examined the TLP before, but only under similar illumination conditions. Although not showing the image here, I can confirm that simulations using Piotr's image of atmospheric spectral dispersion, definitely create the red tinge seen on the east and south east edges of Aristarchus and the SW ray. Once again however the spurious colour should have been seen on other features too by Ron Livesey, and it was not. Therefore the 1996 TLP report, keeps its very low weight of 1.

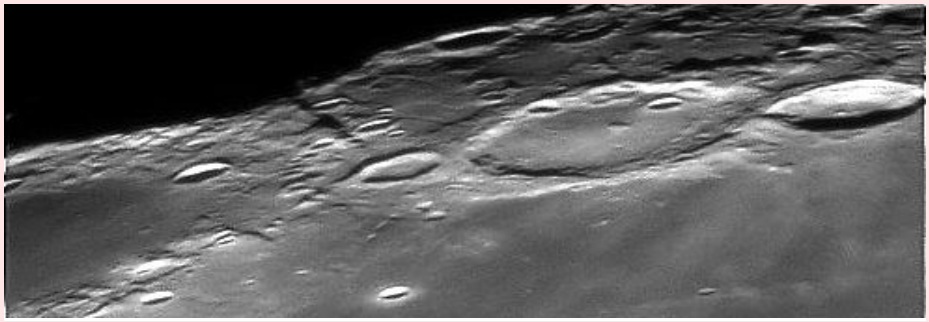

Figure 2. Pitor Malinski's image – Grimaldi (left) and Hevelius (right of centre). 2011 Jun 14 UT 21:44. North is to the right.

Piotr also sent me a rather nice image of what at first appears to be a long shadow coming off the terminator, close to the lunar western limb (See Figure 2). I suspect though that this is caused by topography just to the west of Lohrmann, as I can also see it in Plate 39 of Rükl's *Hamlyn Atlas of the Moon*.

On 2011 Jun 08, both Maurice Collins and Hamish Watchman were busy producing image mosaics of the Moon. This covered a period when Gundlach observed the following TLP on lunar surface in Maurolycus:

Maurolycus 2000 Aug 06 UT 23:45 observed by Gundlach (Bolivia, telescope with Sony Camcorder) "Observer reported capturing an abnormality near the rim. Darling, suspects that this is a normal appearance based upon a later observation under similarillumination." ALPO observation. ALPO/BAA weight=1.

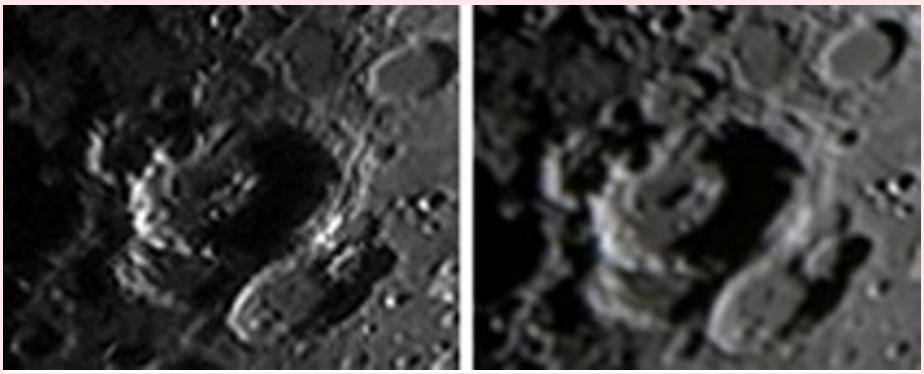

Figure 3. Maurolycus crater imaged on 2011 Jun 08 with north at the top. Left: extract from a UT 05:50-06:20 mosaic by Hamish Watchman. Right: extract from a UT 05:26-06:23 mosaic by Maurice Collins.

Although I do not possess a copy of the Gundlach images, looking at Maurice Collins' image in Figure 3, I suspect it might have been the fuzzy area on the SE rim. Hamish's image is sharper, presumably due to better seeing conditions, therefore its probably that the TLP report from 2000 may have been seeing related? If anybody has a copy of that original TLP image, please could they send it to me for examination. This TLP will remain at a weight of 1 for now.

Suggested Features to observe in August: For those of you without access to the internet (in the UK), below is a list of repeat conditions for when a feature will exhibit the same illumination and libration as was seen for a historical LTP observation from the past. The low altitude of the Moon will be a challenge, however I have highlighted two especially important observations in red if anyone is interested. By re-observing and submitting your observations, we will get a clear understanding of what the feature ought to have looked like at the time. Only this way can we really fully analyze past LTP reports.

2011-Aug-11 UT 22:15-23:33 Ill=96% **Herodotus and Prinz** observed by Lena and Mirteto on 1995-10-06: *Check for brightness changes in the crater and also any signs of flashes (Herodotus only) from small craterlets, or spots, scintillating in the atmospheric seeing.*
2011-Aug-12 UT 19:34-21:09 Ill=99% **Plato** observed by Pratt on 1874-01-01: *Please sketch or image the crater.*
2011-Aug-12 UT 19:34-22:19 Ill=99% **Daniell** observed on 1982-03-08: Please sketch or image and also can you detect any colour?
2011-Aug-13 UT 00:15-00:51 Ill=99% **Plato** observed by Taylor on 1971-01-10: *Is there any colour or evidence of short term brightness variation on the east wall and floor indentation into the wall?*
2011-Aug-13 UT 00:29-03:43 Ill=99% **Aristarchus** observed by Bartlett on 1957-7-11: *Please look for any signs of colour in the crater and the plateau area.*
2011-Aug-13 UT 01:37-03:43 Ill=99% **Madler** observed by Haas on 1940-08-17: *How bright is the spot on the southern rim, compare to other bright spots on other craters.*
2011-Aug-13 UT 21:42-01:37 Ill=100% **Censorinus** observed by Hopmann on 1964-04-26: *Please monitor the brightness over time, comparing to other craters, or by doing time lapse imaging*
2011-Aug-14 UT approx 20:01 Ill=99% **Aristarchus** observed by Moore on 1977-07-01: *What colour is the south-southeast section of the wall?*
2011-Aug-14/15 UT 21:55-00:11 Ill=99% **Linne** observed by Sykes on 1983-01-29: *Please just verify that the crater resembles a point, but also check out for brightness changes over time.*
2011-Aug-14/15 UT 21:55-00:11 Ill=99% **Torricelli B** observed by Foley and several observers on 1983-01-29/30: *This was a major TLP alert, seen by several observers. A JBAA paper was written about the TLP. A few attempts have been made to re-observe at the same illumination and libration and viewing angle, but nothing similar to the 1983 report was seen. Please compare the brightness to other features over time and also look for colour. Would welcome some high resolution colour imagery.*
2011-Aug-14 UT 22:31-01:23 Ill=98% **Aristarchus** observed by Bartlett on 1976-08-11: *Check for colour in and around Aristarchus, and on the plateau. Also how sharp is the west wall?*
2011-Aug-14/15 UT 21:55-00:11 Ill=98% **Arago B and Moltke** observed by Mobberley on 1983-01-29: *Can you see any colour on Arago B and how bright is Moltke compared to other craters?*
2011-Aug-16 UT 20:56-00:49 Ill=91% **Vallis Schroteri** observed by W.H. Pickering on 1897-10-13: *High resolution sketches or images would be welcome*
2011-Aug-17 UT 03:45-04:58 Ill=90% **Birt and A** observed by Doherty on 1972-09-25: *Please monitor the relative intensities of the bright areas inside Birt. Any sign of a point of light west of the centre of Birt A?*
2011-Aug-18 UT 04:08-05:00 Ill=83% **Aristarchus** observed by Bartlett on 1954-08-18: *Would you say that the northern half of the crater is fuzzy and ill-defined in appearance?*
2011-Aug-22 UT 00:21-04:25 Ill=47% *Please check **Earthshine** for sporadic meteor impact flashes.*
2011-Aug-23 UT 01:06-04:27 Ill=37% *Please check **Earthshine** for sporadic meteor impact flashes.*
2011-Aug-24 UT 01:59-04:29 Ill=28% *Please check **Earthshine** for Gamma Leonid meteor shower impact flashes.*
2011-Aug-25 UT 03:01-03:23 Ill=19% **Herodotus** observed by Bartlett on 1976-08-21: *N.B. this is not repeat libration, but is there any sign of a pseudo peak inside the crater?*
2011-Aug-25 UT 03:01-04:31 Ill=19% *Please check **Earthshine** for Gamma Leonid meteor shower impact flashes.*
2011-Aug-26 UT 04:10-04:32 Ill=11% *Please check **Earthshine** for sporadic meteor impact flashes.*

For repeat illumination (only) TLP predictions for the coming month, these can be found at http://users.aber.ac.uk/atc/tlp/tlp.htm .For members who do not have access to the internet, please drop me a line and I will post predictions to you. If you would like to join the TLP telephone alert team, please let me know your phone No. and how late you wish to be contacted. If in the unlikely event you see a TLP, please give me a call on my cell phone: +44 (0)798 505 5681 and I will alert other observers. Note when telephoning from outside the UK you must not use the (0). When phoning from within the UK please do not use the +44! Twitter TLP alerts can be accessed on http://twitter.com/lunarnaut.

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Occultation news August 2011 Tim Haymes

57 Leonis graze 2011 June 8. A succesful observation of this graze occultation is reported by Brian Mills and his team who recorded multiple events. Three observers got positive results, one of them seeing four events the other two saw two events each from stations near Hildenborough, Kent, UK. Congratulations to the team for their excellent result. This was a favourable Northern limit graze falling bellow the v6.5 limit in the BAAH. The redish star was v6.7. Moon phase was 48%, altitude 18° in the West, cusp angle 4°. The area of the limb was in the 'Cassini region', libration long -3.18 and Lat +7.66 (computed by Occult V4). However 'JJ Cassini' is the more correct description. Northern limit grazes can be in rugged areas as this limb profile indicates (Fig. 1).

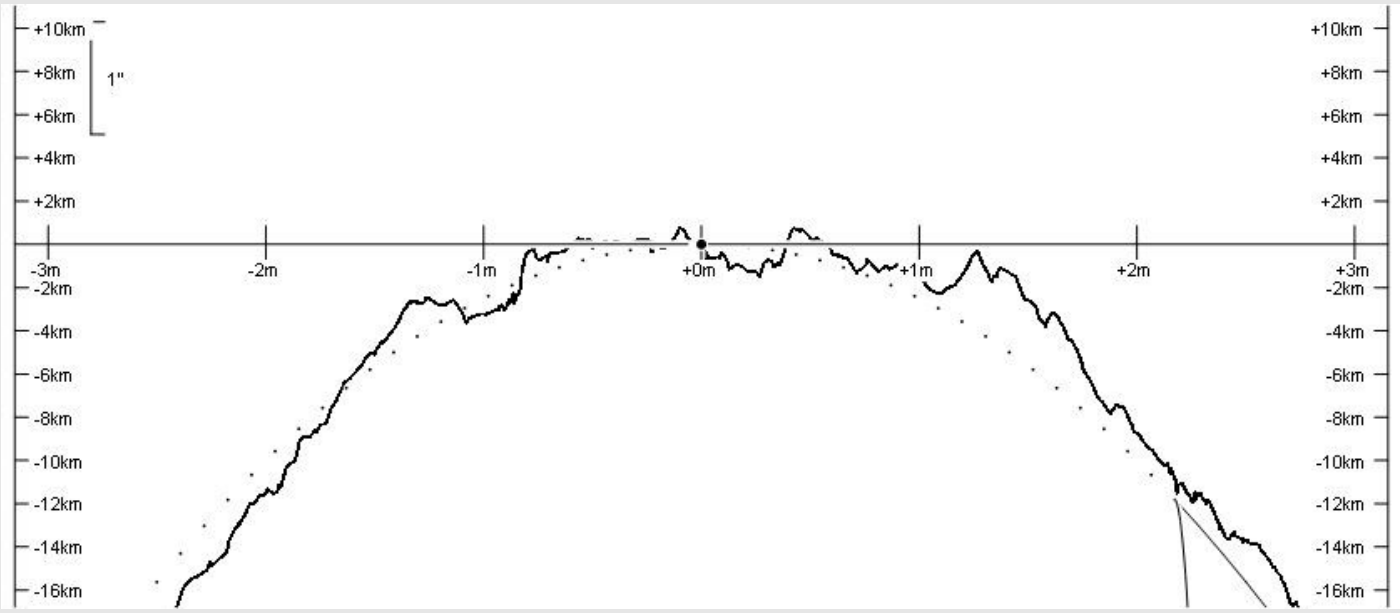

Fig. 1. Graze Profile of ZC 1590 on 2011 June 08

Graze occultation of Aldebaran, Scotland, 1978 Aug 26. On the subject of grazes, I recently wrote an article published in the *Journal for Occultation Astronomy*, that reported my analysis of cine film of this event. Super-8 film was copied to AVI format and analysed by LIMOVIE to obtain a light curve of the fading events. I have since uploaded a compilation of the tape recording and movie onto YouTube http://www.youtube.com/watch?v=YgXbyabAtiM. Some readers of this *LSC* will remember the occasion, because they observed it themselves!

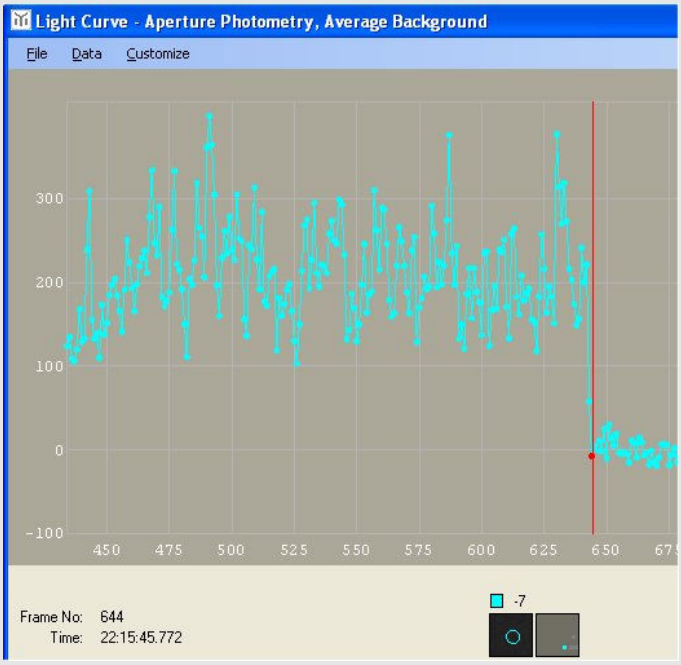

Fig. 2. AVI analysis with TANGRA software.

Grazes of 1st magnitude stars (UK, 2012-2050). Occult software was used to predict grazes over mainland UK at night. Aldebaran. 2015 Feb 26 0020 UT: Visible from Scotland. The Southern limit passes over Castletown and Riess (Caithness). Spica. 2032 Mar 01 0350UT: This graze path crosses the southern UK. Regulus. No grazes found, but a bright limb dissappearance occurs on 2025 Dec 10 07h, 1 hr before sunrise. Antares. No grazes found, but one total occulation in this period close to Moon Set occurs 2028 Jul 04 01Hr.

Recent total occultations. The coordinator recorded a dissappearance of EZ Virginis (SAO158504, XZ 20213, Mv 7.8) on 2011 July 09 at 2215 UT using a

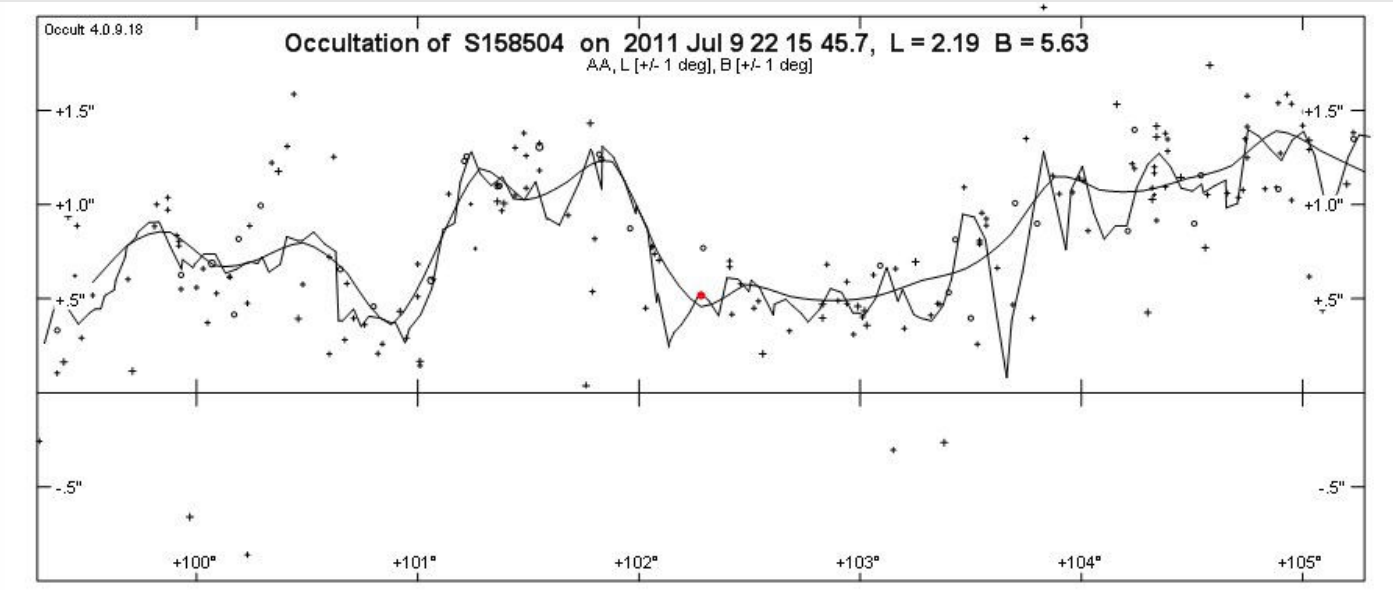

Fig. 3. Reduction profile.

WATEC 120N+ (setting 1) and Blackbox GPS time inserter. Passing the result through Occult4 gave an O-C of 0.06". The exact time of dissapearance was obtained from analysis of the AVI with TANGRA software (Fig. 2 on p16). The result is displayed on the Reduction Profile (Fig. 3 above). The variation in the light curve is caused by bad seeing. Key to the Reduction Profile: The observation is a RED dot. Circles are previous video measurements, crosses are visual observations. The smooth line is the Kaguya LowRes and is close to the Watts Limb profile. The jagged line is Kaguya HighRes and may have errors. The horizontal line is the Mean Lunar Limb (See Occult4-help). Displays are from the software.

Predictions for Birmingham, August 2011

Longitude 001° 44' 44.0" W, Latitude 52° 27' 41.4"N, Alt. 50m; Telescope dia. 15cm. Refer to the *LSC* Mar 2011 for an explanation of the columns. Times are UT at Birmingham add 1 hr for BST. The event may occur later or earlier by several minutes depending on your location and other circumstances. Predictions are generated with Occult V 4.0.9.1 by David Herald. Double stars are indicated in the table. These can produce non-instantious events during occultation and are of special interest.

y	m	day d	Time h	m	s	P	Star No	Sp D	Mag v	Mag r	% Ill	Elon	Sun Alt	Moon Alt	Moon Az	CA o	PA o	VA o	AA o	Notes
11	Aug	11	20	46	6	D	2902	K0	5.9	5.4	96+	157	-9	15	152	72S	102	120	112	57 Sagittarii, *Double star
	Aug	13	18	58							100									Full Moon
11	Aug	17	3	48	8	R	3524	F0	6.9	6.7	90-	142	-9	39	208	23N	308	291	332	Double star
11	Aug	19	0	2	39	R	197	K0	7.0	6.5	76-	122		31	111	42N	294	329	316	*Double star
11	Aug	19	23	23	32	R	313	K0	7.1	6.2	68-	111		22	92	55S	214	254	235	*Double star
11	Aug	21	22	17	57	R	534	A0	6.1	6.1	50-	89		3	59	82N	266	300	280	22 H1. Tauri, *Double star
11	Aug	22	3	48	14	R	76325	G0	7.9	7.4	47-	87	-11	50	127	28N	320	352	333	Double Star
11	Aug	24	2	52	16	R	77442	B9	8.3	8.2	28-	64		28	89	50N	308	349	311	
11	Aug	25	1	27	20	R	1010	F2	7.9	7.7	20-	53		7	65	78S	260	296	257	
11	Aug	25	3	31	42	R	78632	G5	7.4	6.9	19-	52		24	88	27S	210	251	207	Double Star
11	Aug	25	3	36	40	R	78626	A0	8.5	8.5	19-	52		26	88	77N	285	326	283	
11	Aug	26	3	9	24	R	11396	G0	8.7	8.5	11-	39		12	75	56N	310	348	301	
11	Aug	26	3	10	18	R	97067	A0	8.9	8.9	11-	39		12	75	86N	279	318	271	Double Star
11	Aug	26	3	15	56	R	97072	A2	7.7	7.6	11-	39		12	76	79S	264	303	256	

Occultation co-ordinator, Tim Haymes, Hill Rise, Knowl Hill Common, Knowl Hill, Reading RG10 9YD
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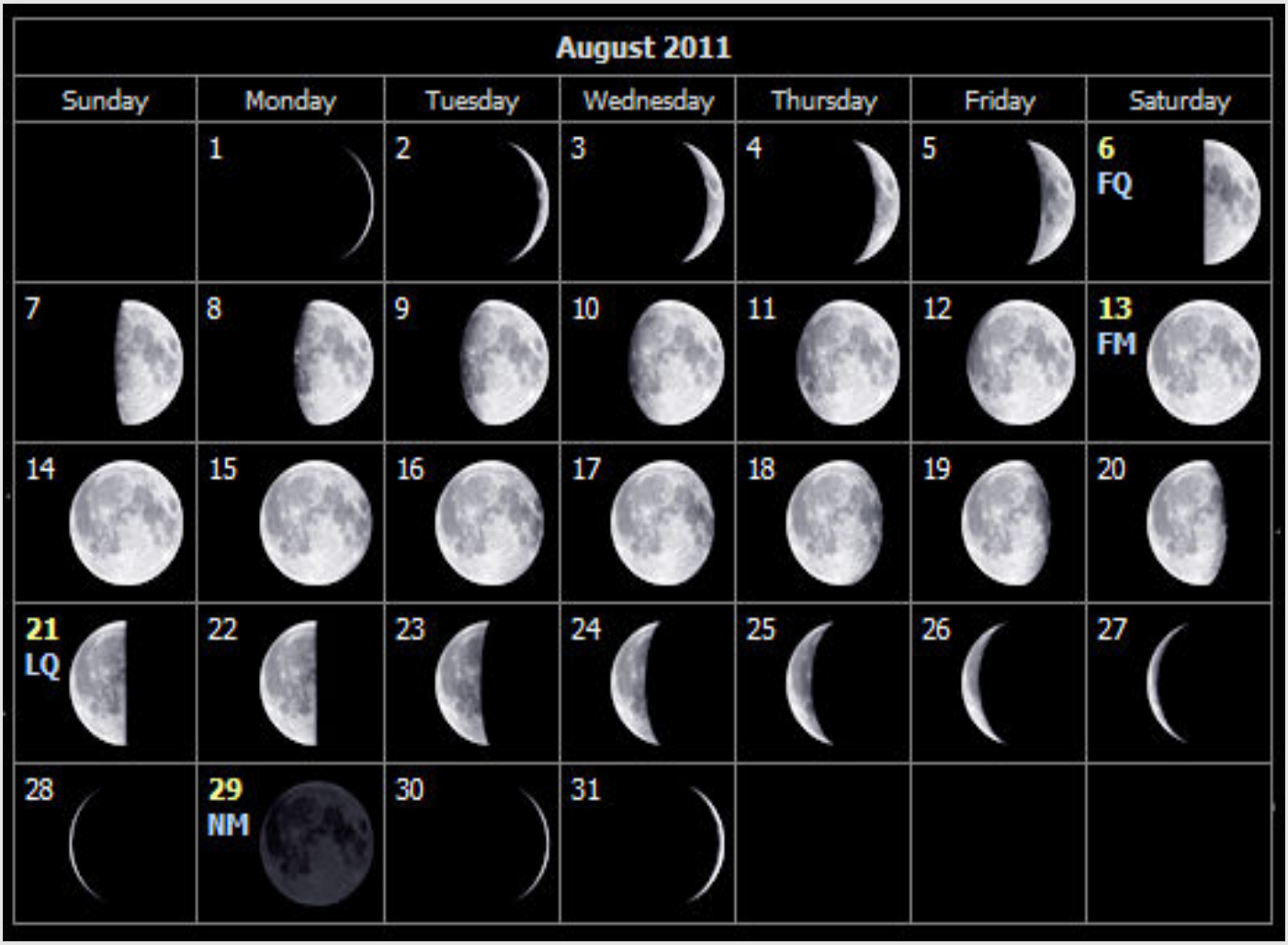
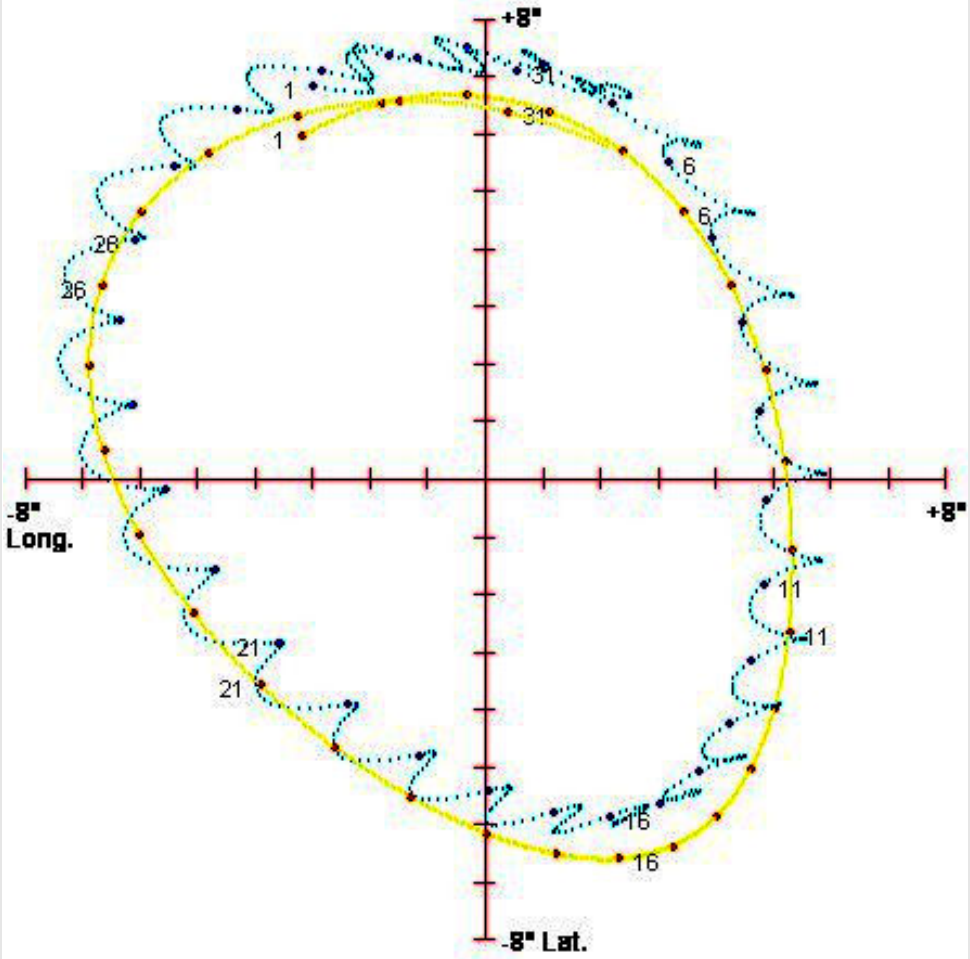


Lunar libration for August 2011 (from LunarPhase Pro)



Lunar data for August 2011 (from a program by Gareth Williams)

2011 AUG.	Age d	Phase	Earth's Selenographic Longø	Earth's Selenographic Latø	Sun's Selenographic Colongø	Sun's Selenographic Latø	R.A. h m	Dec. ø	Rises h m	Sets h m	Transit h m	Alt ø
1.0	1.2	0.022	-3.2	5.9	289.5	-1.08	09 42	9.0	06 41	20 08	13 33	43
2.0	2.2	0.068	-1.8	6.5	301.7	-1.10	10 36	3.5	08 05	20 29	14 24	38
3.0	3.2	0.139	-0.4	6.6	314.0	-1.12	11 29	-2.3	09 28	20 50	15 16	32
4.0	4.2	0.230	1.1	6.4	326.2	-1.14	12 23	-7.9	10 52	21 13	16 08	26
5.0	5.2	0.336	2.4	5.7	338.5	-1.17	13 18	-13.0	12 15	21 39	17 01	21
6.0	6.2	0.448	3.4	4.7	350.7	-1.19	14 14	-17.3	13 35	22 12	17 57	18
7.0	7.2	0.562	4.3	3.4	2.9	-1.21	15 12	-20.6	14 51	22 54	18 54	15
8.0	8.2	0.670	4.9	1.9	15.1	-1.24	16 11	-22.6	15 57	.. ..	19 51	14
9.0	9.2	0.769	5.2	0.3	27.3	-1.27	17 10	-23.3	16 52	.. ..	20 48	15
10.0	10.2	0.853	5.4	-1.2	39.5	-1.29	18 08	-22.6	17 34	00 48	21 42	17
11.0	11.2	0.919	5.3	-2.7	51.7	-1.32	19 04	-20.6	18 07	01 57	22 34	20
12.0	12.2	0.966	5.1	-4.0	63.9	-1.34	19 58	-17.6	18 33	03 10	23 22	24
13.0	13.2	0.992	4.7	-5.0	76.1	-1.37	20 48	-13.9	18 55	04 22	.. ..	..
14.0	14.2	0.998	4.1	-5.9	88.3	-1.39	21 37	-9.5	19 13	05 34	00 08	28
15.0	15.2	0.984	3.3	-6.4	100.5	-1.40	22 23	-4.9	19 30	06 43	00 50	33
16.0	16.2	0.951	2.4	-6.6	112.7	-1.42	23 08	-0.1	19 46	07 51	01 34	38
17.0	17.2	0.902	1.3	-6.5	124.8	-1.43	23 52	4.6	20 03	08 59	02 15	43
18.0	18.2	0.839	0.1	-6.2	137.0	-1.43	00 36	9.1	20 21	10 06	02 57	47
19.0	19.2	0.765	-1.2	-5.6	149.2	-1.44	01 22	13.2	20 43	11 13	03 39	51
20.0	20.2	0.680	-2.5	-4.7	161.4	-1.44	02 08	16.8	21 09	12 19	04 24	55
21.0	21.2	0.589	-3.8	-3.7	173.6	-1.44	02 57	19.7	21 42	13 24	05 10	58
22.0	22.2	0.493	-5.0	-2.4	185.9	-1.44	03 48	21.9	22 23	14 26	05 59	60
23.0	23.2	0.395	-5.9	-1.1	198.1	-1.44	04 41	23.0	23 15	15 21	06 51	61
24.0	24.2	0.299	-6.6	0.4	210.3	-1.44	05 36	23.0	.. ..	16 09	07 44	60
25.0	25.2	0.208	-6.8	1.9	222.5	-1.44	06 32	21.8	.. ..	16 48	08 38	59
26.0	26.2	0.128	-6.6	3.3	234.8	-1.44	07 28	19.3	01 31	17 20	09 33	56
27.0	27.2	0.063	-6.0	4.5	247.0	-1.44	08 24	15.7	02 50	17 47	10 27	51
28.0	28.2	0.020	-4.8	5.6	259.2	-1.44	09 20	11.1	04 13	18 11	11 20	46
29.0	29.2	0.002	-3.3	6.2	271.5	-1.44	10 15	5.7	05 38	18 32	12 13	40
30.0	0.9	0.013	-1.5	6.5	283.7	-1.45	11 10	-0.1	07 04	18 54	13 06	34
31.0	1.9	0.053	0.3	6.3	296.0	-1.45	12 05	-5.9	08 30	19 17	13 59	28

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Observations and items related to a specific area of lunar study should be sent to the appropriate member of the BAA Lunar Section Committee, but send any material of a more general nature to the Editor.

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