

THE LUNAR OBSERVER

A PUBLICATION OF THE LUNAR SECTION OF THE A.L.P.O.

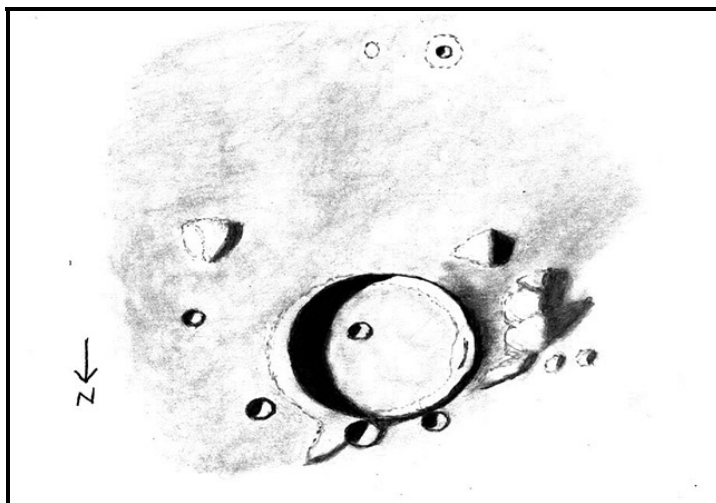
EDITED BY: Wayne Bailey wayne.bailey@alpo-astronomy.org

17 Autumn Lane, Sewell, NJ 08080

RECENT BACK ISSUES: http://moon.scopesandscapes.com/tlo_back.html

FEATURE OF THE MONTH – SEPTEMBER 2013

FONTENELLE



Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA

April 21, 2013 04:05-04:37, 04:49-05:05 UT, 15 cm refl, 170x, seeing 8/10

I sketched this crater and vicinity on the night of April 20/21, 2013 while watching the moon hide 14 Sextantis. Fontenelle sits on the north edge of Mare Frigoris well north of Plato. Librations were favorable for it that night. The interior of Fontenelle appears smooth except for a modest pit southeast of its center. There is some evidence of terracing inside its west rim. The craters Fontenelle H and R are along the north rim of Fontenelle. A wide, sharp projection from Fontenelle's rim is partly overlapped by Fontenelle R. The crater east of R is Fontenelle P, and a small pit is south of P and east of Fontenelle. The triangular peak just south of that pit is Fontenelle epsilon (The peak is shown on the Lunar Quadrant map, but the nearby pit is not). Fontenelle epsilon had a bright sunward side. There is a clustering of peaks west of Fontenelle not shown on the LQ map. The southernmost one showed a bright pointed sunward side and dark shadow. It is definitely a more conspicuous feature than Fontenelle epsilon. The other large peaks had lighter shadow and blended together. It was not easy to tell where one peak ended and another began. Two small detached peaks are farther west. The blended peaks apparently form a boundary of Mare Frigoris as does the sharp projection

at Fontenelle R. The terrain is lighter north of these features. Fontenelle G is the small pit well to the south. This crater is surrounded by a halo. A small, shadow-less bright spot is just east of Fontenelle G. The area between Fontenelle and Fontenelle G appears very smooth.

LUNAR CALENDAR

SEPTEMBER-OCTOBER 2013 (UT)

Sept. 02	05:00	Moon 6.1 Degrees SSW of Mars
Sept. 05	11:35	New Moon (Start of Lunation 1122)
Sept. 06	10:00	Moon 4.5 Degrees SSW of Mercury
Sept. 08	22:00	Moon 0.76 Degrees SE of Venus
Sept. 09	18:00	Moon 2.5 Degrees S of Saturn
Sept. 12	17:09	First Quarter
Sept. 12	18:30	Extreme South Declination
Sept. 14	01:00	Moon 1.5 Degrees NNW of Pluto
Sept. 15	16:35	Moon at Perigee (367,384 km – 228,284 miles)
Sept. 17	21:00	Moon 5.4 Degrees NNW of Neptune
Sept. 19	11:12	Full Moon
Sept. 20	13:00	Moon 3.1 Degrees NNW of Uranus
Sept. 26	01:06	Extreme North Declination
Sept. 27	03:55	Last Quarter
Sept. 27	18:18	Moon at Apogee (404,308 km – 251,225 miles)
Sept. 28	06:00	Moon 4.9 Degrees SSW of Jupiter
Oct. 01	02:00	Moon 6.4 Degrees SSW of Mars
Oct. 05	00:33	New Moon (Start of Lunation 1123)
Oct. 06	24:00	Moon 2.8 Degrees NNE of Mercury
Oct. 07	02:00	Moon 2.0 Degrees SW of Saturn
Oct. 08	14:00	Moon 4.6 Degrees N of Venus
Oct. 09	23:54	Extreme South Declination
Oct. 10	23:07	Moon at Perigee (369,811 km – 229,790 miles)
Oct. 11	05:00	Moon 2.0 Degrees NW of Pluto
Oct. 11	23:03	First Quarter
Oct. 13	05:00	Moon 1.2 Degrees WSW of asteroid 3-Juno
Oct. 15	02:00	Moon 5.5 Degrees NNW of Neptune
Oct. 17	21:00	Moon 3.3 Degrees N of Uranus
Oct. 18	23:36	Full Moon (Penumbral eclipse of Moon)
Oct. 23	09:18	Extreme North Declination
Oct. 25	14:26	Moon at Apogee (404,560 km – 251,382 miles)
Oct. 25	21:00	Moon 5.0 Degrees S of Jupiter
Oct. 26	23:41	Last Quarter
Oct. 29	21:00	Moon 6.1 Degrees SSW of Mars

AN INVITATION TO JOIN THE A.L.P.O.

The Lunar Observer is a publication of the Association of Lunar and Planetary Observers that is available for access and participation by non-members free of charge, but there is more to the A.L.P.O. than a monthly lunar newsletter. If you are a nonmember you are invited to join our organization for its many other advantages.

We have sections devoted to the observation of all types of bodies found in our solar system. Section coordinators collect and study members' observations, correspond with observers, encourage beginners, and contribute reports to our Journal at appropriate intervals.

Our quarterly journal, **The Strolling Astronomer**, contains the results of the many observing programs which we sponsor including the drawings and images produced by individual amateurs. Additional information about the A.L.P.O. and its [Journal is on-line at: http://www.alpoastronomy.org/index.htm](http://www.alpoastronomy.org/index.htm) I invite you to spend a few minutes browsing the Section Pages to learn more about the fine work being done by your fellow amateur astronomers.

To learn more about membership in the A.L.P.O. go to: <http://www.alpo-astronomy.org/main/member.html> which now also provides links so that you can enroll and pay your membership dues online.

When submitting observations to the A.L.P.O. Lunar Section

In addition to information specifically related to the observing program being addressed, the following data should be included (**Bold items are required**):

Name and location of observer

Name of feature

Date and time (UT) of observation

Size and type of telescope used

Magnification (for sketches)

Orientation of image: (North/South - East/West)

Seeing: 1 to 10 (1-Worst 10-Best)

Transparency: 1 to 6

Medium employed (for photos and electronic images)

Additional commentary accompanying images is always welcome.

CALL FOR OBSERVATIONS: **FOCUS ON: Schickard-Wargentín**

Focus on is a bi-monthly series of articles, which includes observations received for a specific feature or class of features. The subject for the **November 2013** edition will be **the Schickard-Wargentín area**. Observations at all phases and of all kinds (electronic or film based images, drawings, etc.) are welcomed and invited. Keep in mind that observations do not have to be recent ones, so search your files and/or add this to your observing list and send your favorites to:

Wayne Bailey - wayne.bailey@alpo-astronomy.org

Deadline for inclusion in the Schickard-Wargentín article is October 20, 2013

FUTURE FOCUS ON ARTICLES:

In order to provide more lead time for potential contributors the following targets have been selected:

<u>Subject</u>	<u>TLO Issue</u>	<u>Deadline</u>
Aristarchus	January 2014	December 20, 2013

CRATER CLUSTER AT SCHILLER C

Fred Corno

North of Schiller C and partially overlapping it, lies a cluster of craters: their rims barely appreciable against the surrounding plain, the craters are densely packed and irregular in shape. Rim overlapping is in fact in some case distorting the round figure a regular crater should display, even under the strong perspective shortage of a close-to-the limb feature.

In my observation of the 29th of July 2013 (fig.1, see fig.2 for a Lunar Orbiter image of the same area), made with a 4" Vixen achromatic refractor (a telescope I love, it being the first real astronomical instrument I ever owned) at 250x, the Moon was low on the horizon (about 23°25' high) and churning in the eyepiece, due to the hot currents from the daylight-heated town around me. Nevertheless, I recognized about a dozen of the cluster members, and they did not look right to me.

Craters often overlap: smaller craters pock the rim and the inside of larger craters, large craters almost obliterate craters as large, differently sized craters dot the rim of mare-buried craters and walled plains. It is usually easy to determine time sequence of their formation by scrutinizing overlapping structures and environmental details, as already discussed (Corno F. 2008 and 2009). But in this case, all craters overlapped chaotically, displaying a similar wearing, as if they formed all at the same time. The only features really recognizable as belonging to previous eras were the floor and the ruined and buried wall of Schiller C, in spots interrupted by the cluster members.

Clusters or short chains of craters are quite common in the area. Frequent impacts of multiple-bodied meteors are improbable: much more realistic is the hypothesis that all these features originated from secondary impacts of a larger event. And being the largest in the cluster is approximately 20 km across, really a large impact was what I needed! According to Wood (2013), a secondary crater can be at most 5% of the size of the principal: then a 300-400 km wide basin should be the origin of the ejecta creating the cluster.

What I need lays just about 1700 km apart, to the North-West: the Orientale Basin, centered at 19°S, 95°W, a typical multi-ringed structure, surrounded by four circular ranges from 320 through 930 km in diameter (Wood 2003).

Its ejected impact melt creates a blanket covering in patches the Schiller area and reaching as far as the South Pole region of the Moon, to Bailly and the Schiller-Zucchi Basin and beyond. Interspersed with blotches of impact melt are clusters of secondary craters, as those I focused on in my observation: in the Geological Map of the South Side of the Moon (Wilhelms et al, 1979), Schiller C is a crater older than the Imbrium and Orientale Basins, covered by melt from the Imbrium event, then further engulfed by the ejecta of the Orientale Basin, being these latter grooved and ridged in streaks radial from the Basin. The cluster of craters is clearly mapped as originated by secondary impacts of the Orientale Basin.

Starting from simple considerations about morphology, origin of the observed features was supposed and then confirmed by the search of the literature.

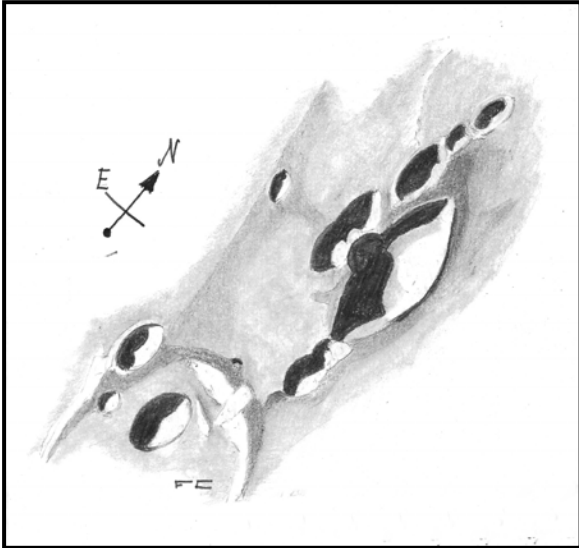
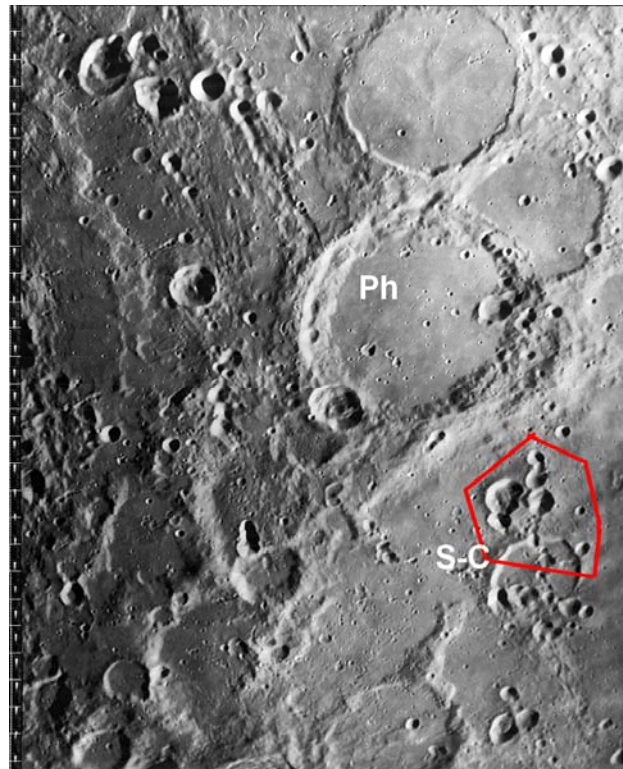


FIGURE 1: Drawing from the discussed observation: notice the orientation, derived by the use of a star diagonal. Vixen 102 M at 250x (orthoscopic eyepiece, 4 mm), poor seeing. Taken on the 29th of July, 2013, starting from 22.05 UT.

FIGURE 2: Lunar Orbiter image (LO4-172H1) of the discussed area, framed in red. S-C is Schiller C, Ph Phocylides. More craters cluster to the South across Schiller C. More clusters are interspersed among the fragmentary ejecta and grooves (see top left of the picture for an example).



References

- Byrne, C. J. (2005). *Lunar Orbiter Photographic Atlas of the Near Side of the Moon*. London: Springer - Verlag.
- Corno, F. (2008, August). A Simplified Stratigraphic Discussion of Madler and Environs. *The Lunar Observer, ALPO Lunar Section* , p. 7-8.
- Corno, F. (2009, February). A Simplified Stratigraphic Discussion of Ramsden and Environs. *The Lunar Observer, ALPO Lunar Section* , p. 4-7.
- Wilhelms, D. E. et al (1979). *Geological Map of the South Side of the Moon*. USGS.
- Wood, C. A. (2013, August). Hunting Secondary Craters. *Sky & Telescope* , p. 54-55.
- Wood, C. A. (2003). *The Modern Moon - a Personal View*. Cambridge, Massachusetts: Sky Publishing Corp.

FOCUS ON: Mons Rumker

By Wayne Bailey

Coordinator: Lunar Topographical Studies

The subject of this article, Mons Rumker (fig. 1), is a natural continuation of the previous article on domes. Even its name (Mons = mountain) seems to imply that it's different from other domes, although it's basically dome

FIGURE 1. MONS RUMKER – SHARP. Howard Eskildsen-Ocala, Florida, USA. August 7, 2006 01:19 UT. Meade 6" f/8 refractor, 2x barlow, NexImage, IR block filter.

shaped, not craggy or angular like other lunar mountains. Its structural complexity is reflected in the wide variety of suggestions advanced for its origin. These include: early descriptions as a ruined crater; an overlapping complex of multiple small volcanoes; a buried Procellarum floor topographic feature with superimposed volcanic domes; a large shield volcano; or a laccolith with superimposed volcanic domes.



Mons Rumker is a fairly large feature, at least compared to typical domes. Its basic structure is a large, low, somewhat irregular dome (65-70 km diameter) with multiple smaller domes (about 10 km diameter) superimposed on it (fig 2). Overall, the topography slopes down towards the northeast, with the general appearance of a U or C shaped ring opening toward the northeast. Much of the appearance of a partial ring may be due to the distribution of small domes atop the underlying plateau. The plateau

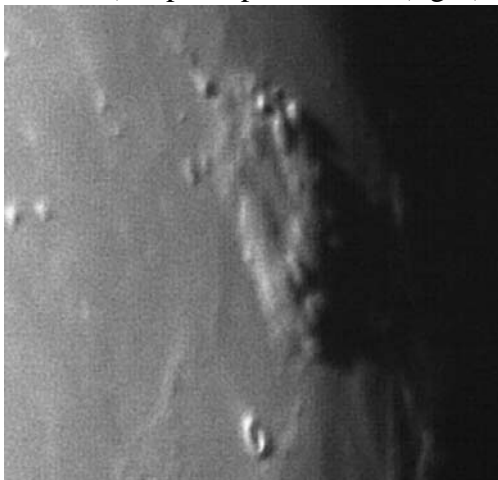


FIGURE 2. MONS RUMKER. Jay Albert-Lake Worth, Florida USA. August 19, 2013 02:54 UT. Seeing 5/10 Transparency 3/6. C-11 SCT, NexImage 5.

(or top of the large dome) may simply slope down to the northeast, emphasized by a sparser distribution of small domes in that section. Terrestrial telescopic images give the impression of a low bowl shaped region on the northeast flank. However the digital elevation models (DEM) shown in Lena et al (2013, figs 1.6 & 7.57) look more like a plateau with multiple peaks superimposed.

Located near the western limb of the moon, sunrise occurs only shortly before full moon, sunset shortly before new. Sunrise observing is conveniently timed in the late evening, but sunset observing occurs in early morning while the moon is at a low altitude (or during daylight). It's illuminated from about day 12 through 26 of the lunation. Since the surface appears similar to the surrounding mare, and the slopes on Mons Rumker are low, it becomes more difficult to detect at high sun angles (fig. 3).

Crater density on Mons Rumker is higher than on the surrounding Procellarum surface which indicates that it pre-dates the flooding of Procellarum. According to Schultz (1972), some linear features on Rumker align with Sinus Iridum, which pre-dates the flooding of Imbrium.

Several low relief wrinkle ridges are visible on the mare surface around Mons Rumker (figs. 4 & 5). It's usually stated that these don't continue onto Rumker. However, Schultz also claims that sinuous features can be traced onto Rumker in Lunar Orbiter images. I can imagine that a valley and ridge running from northeast to west in fig. 5 joins two wrinkle ridges on the mare surface.



FIGURE 3. MONS RUMKER-MAIRAN. Richard Hill—Tucson, Arizona, USA May 4, 2012 05:32 UT. Seeing 7/10. TEC 8" f/20 MAK-CASS, DMK21AU04. Wratten 23 filter.

Mons Rumker is one of the more enigmatic features on the moon. No consensus seems to have been reached concerning its formation. Although it clearly seems related to domes, it is larger and more complex. It seems likely that it is a composite of several structures. The one conclusion that seems certain about Mons Rumker is that it is not an impact feature.

FIGURE 4. MONS RUMKER SURROUNDINGS. Howard Eskildsen-Ocala, Florida, USA. November 30, 2009 01:54 UT. Seeing 8/10 Transparency 4/6. Meade 6" f/8 refractor, 2x barlow, DMK41AU02.AS, no filter.

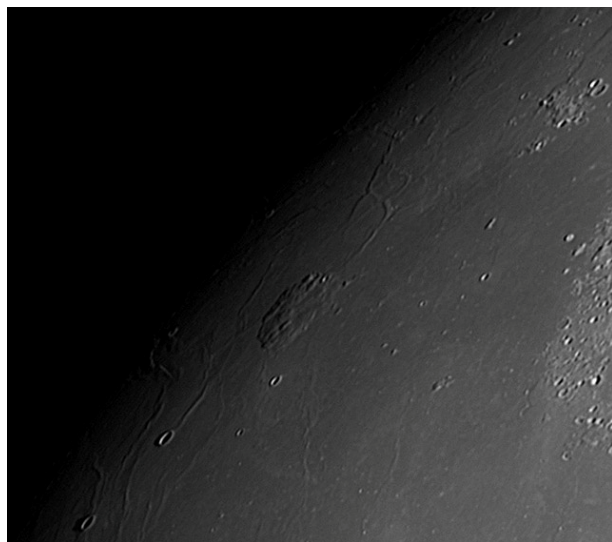


FIGURE 5 MONS RUMKER SURROUNDINGS. Richard Hill—Tucson, Arizona, USA May 7, 2009 04:18 UT. Seeing 7/10. C-14, 2x barlow, (f/22) SCT, DMK21AU04. UV/IR blocking filter.

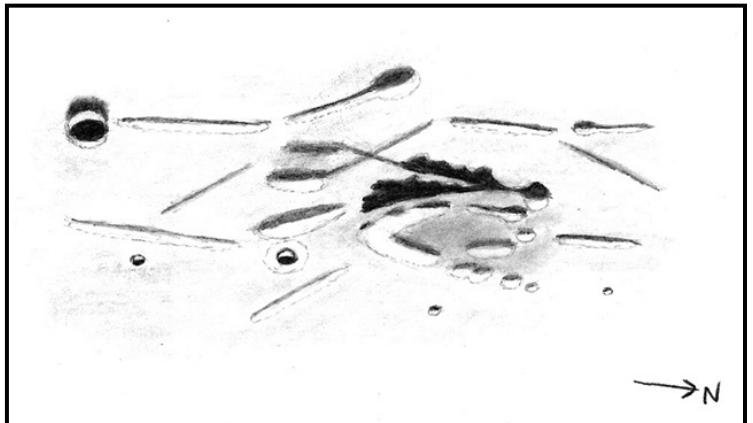
ADDITIONAL READING

- Bussey, Ben & Paul Spudis. 2004. The Clementine Atlas of the Moon. Cambridge University Press, New York.
- Byrne, Charles. 2005. Lunar Orbiter Photographic Atlas of the Near Side of the Moon. Springer-Verlag, London.
- Chong, S.M., Albert C.H. Lim, & P.S. Ang. 2002. Photographic Atlas of the Moon. Cambridge University Press, New York.
- Chu, Alan, Wolfgang Paech, Mario Wigand & Storm Dunlop. 2012. The Cambridge Photographic Moon Atlas. Cambridge University Press, New York.
- Gillis, Jeffrey J. ed. 2004. Digital Lunar Orbiter Photographic Atlas of the Moon. Lunar & Planetary Institute, Houston. Contribution #1205 (DVD). (http://www.lpi.usra.edu/resources/lunar_orbiter/).
- Grego, Peter. 2005. The Moon and How to Observe It. Springer-Verlag, London.
- Lena, Raffaello, Christian Wöhler, James Phillips & Maria Teresa Chiochetta. 2013. Lunar Domes, Properties and Formation Processes. Springer-Verlag, Milan.
- North, Gerald. 2000. Observing the Moon. Cambridge University Press, Cambridge.
- Rukl, Antonin. 2004. Atlas of the Moon, revised updated edition, ed. Gary Seronik, Sky Publishing Corp., Cambridge.
- Schultz, Peter. 1972. Moon Morphology. University of Texas Press, Austin.
- Wlasuk, Peter. 2000. Observing the Moon. Springer-Verlag, London.
- Wood, Charles. 2003. The Moon: A Personal View. Sky Publishing Corp. Cambridge.
- Wood, Charles & Maurice Collins. 2012. 21st Century Atlas of the Moon. Lunar Publishing, UIAI Inc., Wheeling.
- The-Moon Wiki. <http://the-moon.wikispaces.com/Introduction>

RUMKER

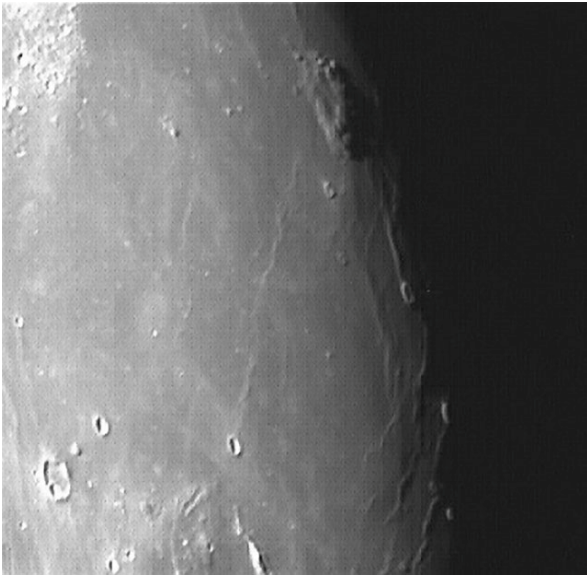
Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
February 20, 1997 01:22-01:50 UT, 15 cm refl, 170x, seeing 7/10

I had seen this large dome many times, and had taken it for granted. It was well placed for observation on the evening of Feb. 19/20, 1997, so I tried sketching this feature after timing the occultation of 29 Cancr. It took only a few minutes to realize that this was not a single dome but a collection of domes and hills, and that it would not be easy to draw. I went at it anyway. The brightest part of Rumker is a V-shaped area at its south end. There is a clump of hills to the east and north, and serrated shadows to the west. These serrated shadows were near but did not adjoin the



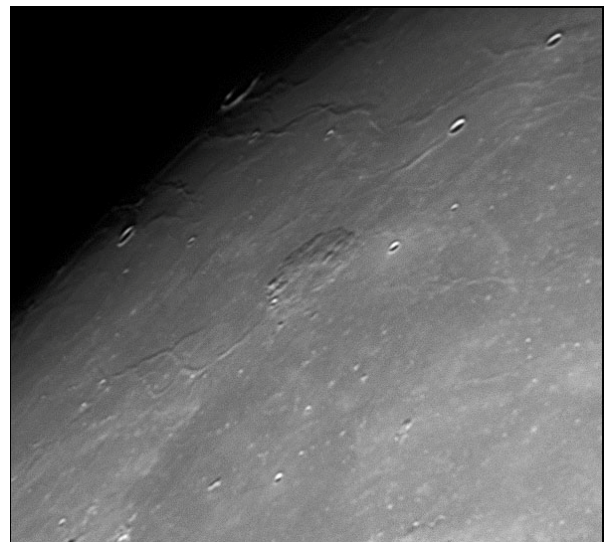
bright V-shaped area. The interior of Rumker appears darker than the surrounding maria. An assortment of linear detail is in the vicinity. Some are definitely ridges, while others are probably just wrinkles. At least three are swollen at one end. The sketch probably shows the detail better than words can describe. Rumker E is the modest crater near the southern point of the 'V'. This crater is surrounded by a halo. Rumker F is the smaller pit south of E. The relatively large crater with much exterior shadow is Naumann B. The most prominent ridge in the area begins just north of this crater.

ADDITIONAL MONS RUMKER OBSERVATIONS



MONS RUMKER. Jay Albert-Lake Worth, Florida USA. August 19, 2013 03:08 UT. Seeing 5/10 Transparency 3/6. C-11 SCT, NexImage 5.

Mons Rumker is north at the top of the frame with some often overlooked features on or near the Aristarchus Plateau at the bottom. Some of the latter features include the northern end of the Agricola Mountains, the crater Krieger with Krieger B inside and a northern part of the Rima Aristarchus. There is also a large dorsa running from the crater Nielsen north to Mons Rumker. I did not see a name for this dorsa in Rukl.



MONS RUMKER. Howard Eskildsen-Ocala, Florida, USA. December 30, 2009 01:44 UT. Seeing 8/10 Transparency 4/6. Meade 6" f/8 refractor, 2x barlow, DMK41AU02.AS, no filter.



MONS RUMKER. Richard Hill-Tucson, Arizona, USA March 25, 2013 02:05 UT. Seeing 7/10. TEC 8" f/20 MAK-CASS, DMK21AU04. Wideband 656.3nm filter.

When I was a youngster in the early 1960s with my 2.4" refractor just starting my study of the moon, I recall being disappointed as full moon approached and, to my mind then, things would get boring. For a time there would be no easily observed terminator with all it's topography only bright and dark blotches which at that time were much less interesting to me. But before the full phase there was this isolated odd lump on the terminator that I could spot. At that time my lunar library was limited to Patrick Moore's "Survey of the Moon" and Flammarion's "Astronomy" and neither made mention of it. I later found that it was Mons Rumker.

Seen here Mons Rumker is not a featureless lump but a dome-like mound with separate rounded peaks standing solitary in the flat plain of Sinus Roris. I cannot for the life of me understand how earlier lunar observers saw this as a ruined crater! Notice the sinuous dorsa to the south and complex braiding of dorsa to the north, one branch of which seems to pass right through (or under?) Rumker as seen in this image. If under it would certainly indicate that Rumker is younger than the plain.

LUNAR TOPOGRAPHICAL STUDIES

Coordinator – Wayne Bailey - wayne.bailey@alpo-astronomy.org

Assistant Coordinator – William Dembowski - dembowski@zone-vx.com

Website: <http://moon.scopesandscapes.com/>

OBSERVATIONS RECEIVED

JAY ALBERT – LAKE WORTH, FLORIDA, USA. Digital images of Mons Rumker(2).

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 7, 8, 10, 12 & 13 day Moon, Alphonsus, Alpine Valley, Aristarchus, Clavius, Clavius-Tycho, Copernicus, Eratosthenes, Gassendi, Mare Crisium, Mare Imbrium, Plato, Reiner Gamma, Sinus Iridum, Taurus-Littrow, Tycho & Western Limb.

FRED CORNO - SETTIMO TORINESE, ITALY. Drawing of Schiller C.

HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Copernicus-Lansberg, Darney-Hainzel, Helicon-Pytheas, Herschel-Carlini, Lansberg-Agatharchides, Mairan, Mons LaHire, Mons Rumker(2), Opelt, Reinhold-Lubiniezky & Tobias Mayer.

ROBERT H. HAYS, Jr.-WORTH, ILLINOIS, USA. Drawing of Mons Rumker.

RICHARD HILL – TUCSON, ARIZONA, USA. Digital image of Walther.

ANDRE MUNOZ- ABERYSTWYTH, CEREDIGION, UNITED KINGDOM. Digital images of Gassendi, Schiller & Sinus Iridum.

THIERRY SPETH-METZ-LORRAINE, FRANCE. Digital images of Aristarchus(3).

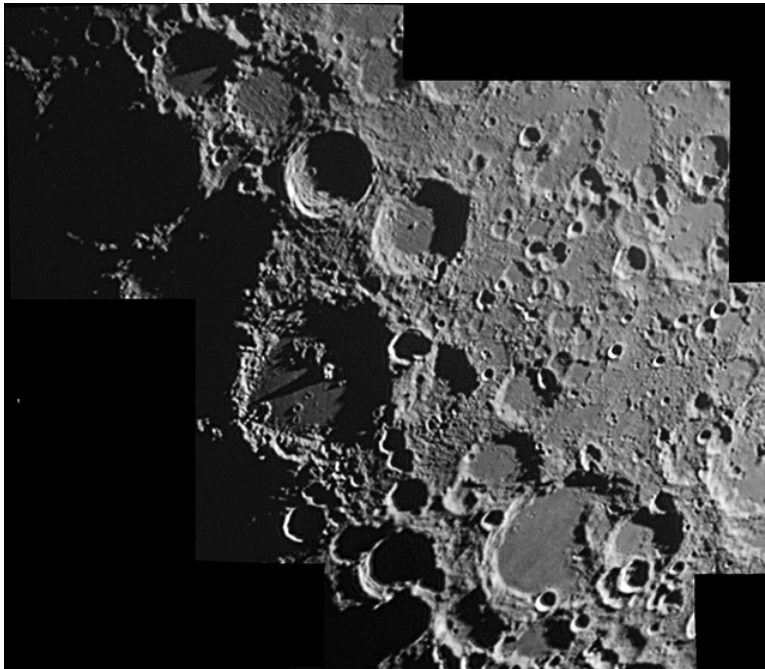
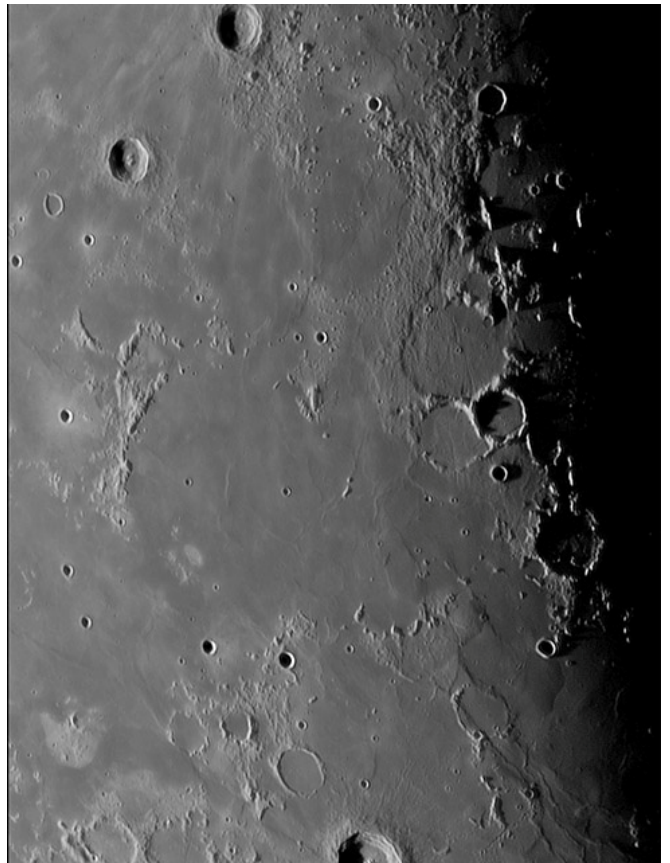
RECENT TOPOGRAPHICAL OBSERVATIONS



REINER Gamma - Maurice Collins-Palmerston North, New Zealand. August 20, 2013 08:35 UT. WO FLT-110, Refr, f/21(3x barlow). North down.

RECENT TOPOGRAPHICAL OBSERVATIONS

REINHOLD-LUBINIEZKY - Howard Eskildsen-
Ocala, Florida, USA. July 31, 2013 09:31 UT. Seeing
7/10, Transparency 4/6. 6" f/8 refractor, Explore
Scientific lens, 2x barlow, DMK 41AU02.AS, IR block
& V block filters.



WALTHER – Richard Hill – Tucson,
Arizona, USA August 14, 2013 02:36 UT.
Seeing 7/10. TEC 8" f/20 MAK-CASS,
DMK21AU04. Wideband 656.3 nm filter.

What a site greeted me when I finally got an early evening clearing in our monsoon storminess. The first thing that caught my eye was the wonderful long shadow from the off-center "central peak" on the floor of Walther (shown as "Walter" in VirtualMoon and Rukl). Notice how non-round this crater is. Just outside Walther to the right is the very strange crater triangular remnant crater Nonius, badly damaged by the Walther impact.

Just to the north of Walther is the relatively recent crater Werner and to its north is Blanchinus. Look at the floor of Blanchinus at this lighting. It is streaked with ejecta from nearby impacts. To the north of this is La Caille with a great shadow stretching halfway across its floor.

The second thing that caught my eye was the shadow at the bottom pointing towards Stofler. This is the shadow filled Nasireddin and the shadow it's casting in the sunrise. Note the delicate shading on the floor of Stofler too.

RECENT TOPOGRAPHICAL OBSERVATIONS



SCHILLER- Andre Munoz, Aberystwyth, Ceredigion, UK. July 19, 2013 22:10 UT. 8" reflector, Canon 60D, no filters.

ARISTARCHUS –Thierry Speth –Metz-Lorraine, France. August 19, 2013 19:11-19:19 UT. 200 mm, f/5, Newtonian. Afocal, 12mm ep, Casio Exilim.

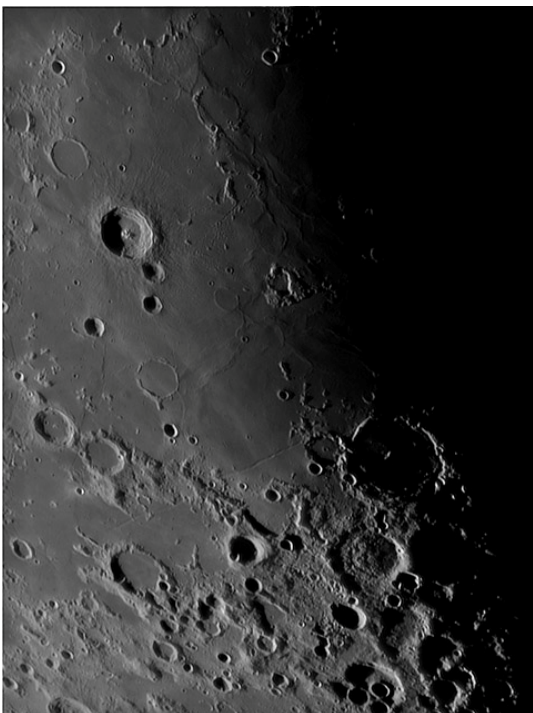
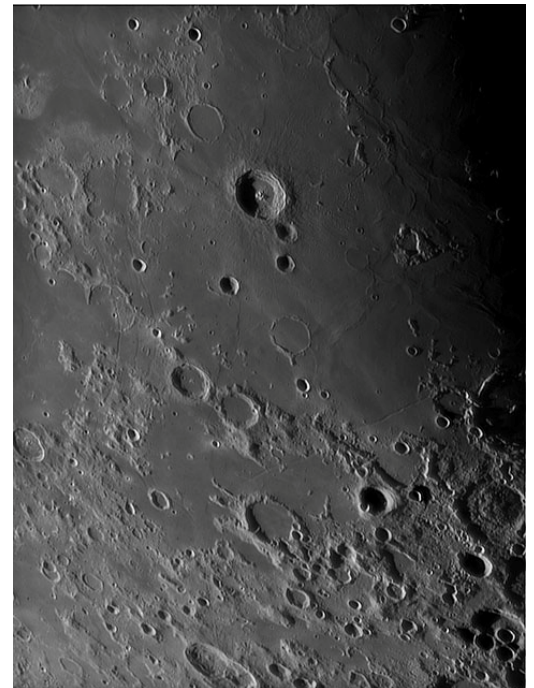


ADDITIONAL TOPOGRAPHICAL OBSERVATIONS



ALPINE VALLEY - Maurice Collins-Palmerston North, New Zealand. August 15, 2013 07:34 UT. FLT 110, f/21. North down.

DARNEY-HAINZEL- Howard Eskildsen-Ocala, Florida, USA. July 31, 2013 09:37 UT. Seeing 7/10, Transparency 4/6. 6" f/8 refractor, Explore Scientific lens, 2x barlow, DMK 41AU02.AS, IR block & V block filters.



OPELT-HEINSIUS- Howard Eskildsen-Ocala, Florida, USA. July 31, 2013 09:34 UT. Seeing 7/10, Transparency 4/6. 6" f/8 refractor, Explore Scientific lens, 2x barlow, DMK 41AU02.AS, IR block & V block filters.

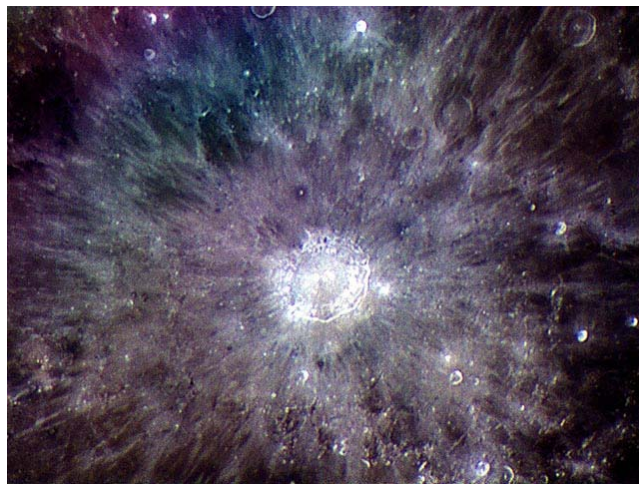
BRIGHT LUNAR RAYS PROJECT

Coordinator – Wayne Bailey – wayne.bailey@alpo-astronomy.org

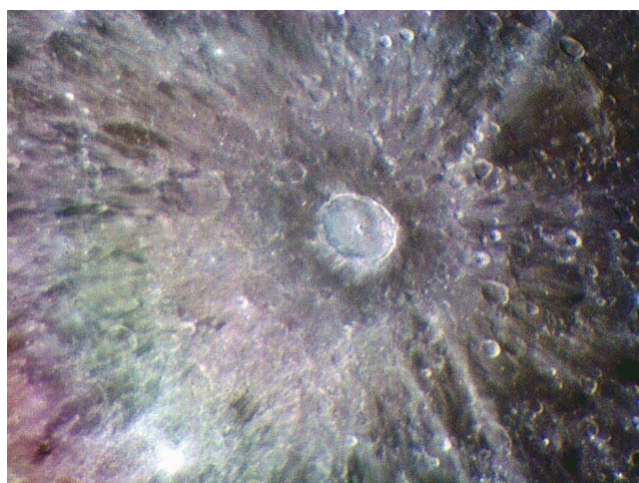
Assistant Coordinator – William Dembowski – dembowski@zone-vx.com

Bright Lunar Rays Website: <http://moon.scopesandscapes.com/alpo-rays.html>

RECENT RAY OBSERVATIONS

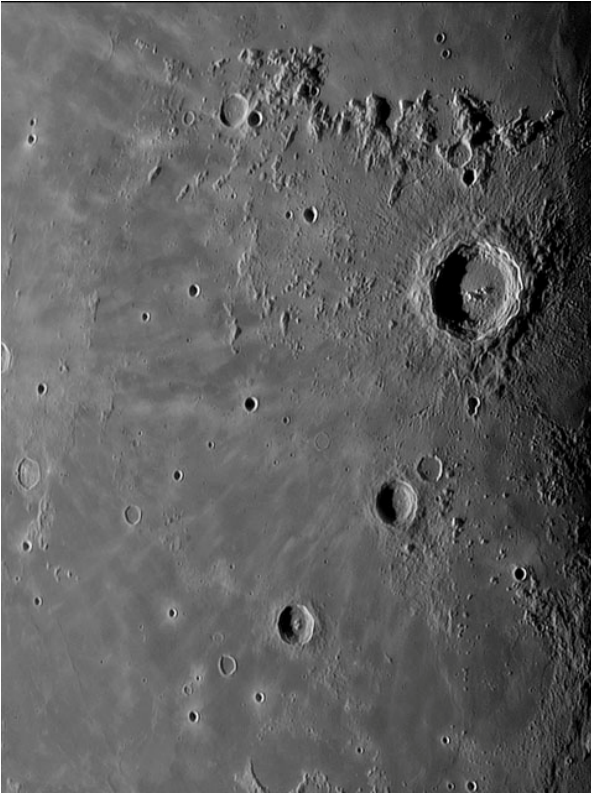


COPERNICUS - Maurice Collins-Palmerston North, New Zealand. August 20, 2013 08:34 UT. FLT 110, f/21, ASI120MC. North down. Right image color saturation increased.



TYCHO - Maurice Collins-Palmerston North, New Zealand. August 20, 2013 08:44 UT. FLT 110, f/21, ASI120MC. North down. Right image color saturation increased.

RECENT RAY OBSERVATIONS



TOBIAS MAYER-LANSBERG- Howard Eskildsen-Ocala, Florida, USA. July 31, 2013 09:29 UT. Seeing 7/10, Transparency 4/6. 6" f/8 refractor, Explore Scientific lens, 2x barlow, DMK 41AU02.AS, IR block & V block filters.

LUNAR TRANSIENT PHENOMENA

Coordinator – Dr. Anthony Cook – atc@aber.ac.uk

Assistant Coordinator – David O. Darling – DOD121252@aol.com

LTP NEWSLETTER – SEPTEMBER 2013

Dr. Anthony Cook - Coordinator

Observations for July were received from the following observers: Jay Albert (Lake Worth, FL, USA - ALPO) observed: Aristarchus, Gassendi, Herodotus, and Torricelli B. Maurice Collins (New Zealand - RASNZ) imaged: Alphonsus, Rima Hadley, Rimaes Triesnecker, Vallis Alpes, and took some whole Moon images. Marie Cook (Mundesley, UK) observed Aristarchus, Copernicus, Mons Pico, Plato, and Proclus. Norman Izett (New Zealand, NZ Astronomers) imaged the whole Moon. Mark Jones (Glen Burnie, MD, USA) imaged several features. Andre Munoz (Aberystwyth University) imaged Mersenius, Plato, and Schiller. Michal Pyka (Poland) imaged several features on the Moon, including Copernicus and Schiller. The following Brazilian observers submitted observations to help support the analysis of the candidate LTP observation described below: João Amancio (REA), Alexandre Amorim (REA/NEOA), Lucas Camargo da Silva (NEOA), and Antonio Martini Jr (REA).

News: NASA's LADEE lunar mission is due to launch on Sep 6th, so please keep a look out for news and information about this. If you want to support the ALPO [impact flash programme](#), please get in contact with Brian Cudnik (cudnik@sbcglobal.net), who is coordinating amateur earth-based observations of impact flashes, during the mission.

In August the BAA published a [refereed paper about the Greenacre and Barr observations](#) of transient colors in the Aristarchus region in 1963. This was one of the most famous confirmed observations of a LTP. The 50th anniversary of their two observations is coming up in October and November 2013. The paper states that whatever the cause, it was obviously not due to volcanism. Nor probably could it have been due to atmospheric spectral dispersion, or chromatic aberration, as some have speculated - most definitely not for the discreet R1 and R2 red spots seen in October. If you get a chance, have a read of the paper, and work through the logic of the findings. A nice animation, comparing the original ACIC chart with a modern LROX WAC mosaic, can be found on this [LPOD web page](#). If you discover anything you disagree with in the paper, please write a letter into the Journal of the British Astronomical Association to initiate a debate. Incidentally you can find some of the original Lowell Observatory archive material on a [web site](#) that Bob O'Connell set up, and this is open to anybody, whether you are interested in reading about LTP, or are a critic.

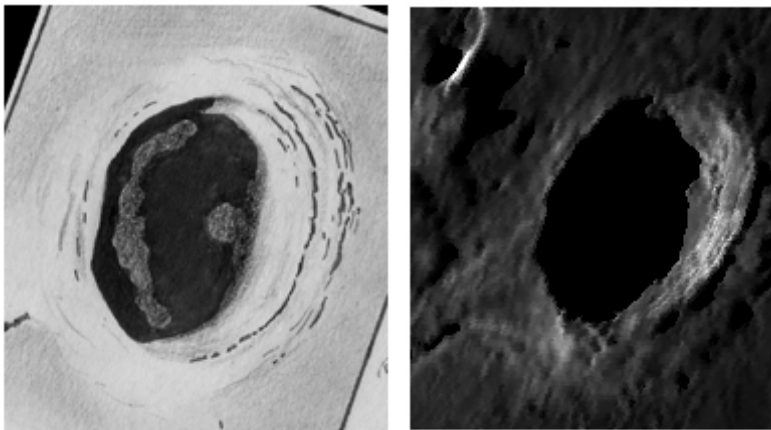


Figure 1. *Aristarchus comparison with north towards the top. (Left) Molesworth's sketch from 1897 Sep 22. (Right) An ALVIS simulation for the same date and assumed UT.*

The BAA Lunar Section director, Prof Bill Leatherbarrow, has recently been examining Molesworth's (1867-1908) observational log book, held in the BAA Lunar Section archives, and came across an observation of Aristarchus from 1897 Sep 22 concerning an unusual appearance in "Aristarchus" (see Fig 1 Left). Bill wondered whether we had this on our LTP database, and indeed we do:

Aristarchus 1897 Sep 22 UT 00:41 Observed by Molesworth (Trincomali, Shri Lanka, 9" reflector, conditions very good) - A glimmering knotted streak seen beneath and parallel to the W wall. At the centre of the E. Edge of the shadow was another faint glowing effect - probably coincident with the central peak. The crater was more than half filled with shadow. NASA catalog weight=3. NASA catalog ID #290. ALPO/BAA weight=2.

On the face of it this report sounds like the last vestiges of an inner terrace and central peak just projecting through the shadow into the setting sunlight. However using ALVIS (N.B. [LTVT](#) can perform a similar role) it was possible to generate a visualization of what Molesworth should have seen and compare it to his sketch (See Fig 1 Right). No sign can be seen of the streak, though there is an indentation in the floor shadow which might have tricked Molesworth into thinking that he was seeing some detail inside the shadow here. I tried a visualization for 00:00UT, but this still showed no streak inside the shadow on the west. It is possible of course that Molesworth was seeing detail inside the shadow due to light reflected off the eastern illuminated wall. This seems the most likely explanation, but to put it to the test, and remove Molesworth's sketch from the LTP database, we need observations (sketches or images) taken with modern day telescopes. From the British shores, where I live, the repeat illumination conditions will not be visible until 2015 Sep 09 UT 04:07, and even then this will be under twilight conditions. However observers at other geographical location, may have earlier chances to test out the above theory – so please keep your eyes open on the [repeat illumination predictions](#) for Molesworth's name, and let us know what you see?

LTP Reports: One LTP report was received during July, and as you can probably appreciate (see Fig 2), it looks somewhat amazing; something that many of us have dream (or worry) about seeing one of these days. However all is not what it seems and a note of caution is required.

Magnus 2013 Jul 18 UT 01:12:28-01:12:30 – a 10 picture burst (slow setting, approximately 3 sec) of images was taken with a Sony DXC9 (16.2 MP) camera by Mark Jones (Glen Burnie, MD, USA) – see Fig 2. He used Plossel/2x Barlow lens eyepiece projection, on a 10" Orion Dobsonian. The images showed, what some might consider to be a white cloud over a large part of the floor of the crater. Furthermore the apparent cloud was colorless and changed shape over time in a smooth way in the E-W direction. Many tens of other images were taken before and after this image burst but showed no trace of this cloud effect – though it should be said that different optical settings (distances between camera and eyepiece and Barlow) were being experimented with at the time. If this effect were to be real, then the area affected would be about 135 km in length, or the diameter of Magnus crater. There was even perhaps a slight hint of a shaded area to the north of the cloud, though to be honest this was at the limits of detection, not helped by a radial brightness gradient over the image. Magnus had only one previous LTP from earlier times, an obscuration seen by Chris Lord back in 1975 May 18 UT 21:15-22:45.

On the negative side of things, the cloud effect was not far off, and concentric with respect to, the image centre – which might imply internal reflection (this can be seen more clearly in differencing (not shown here) – with other images from that night which do not show the LTP. However the cloud effect did not stay fixed to the image centre as one would expect from an internal reflection. The effect appeared to be "more" fixed to the crater, though it jittered around noticeably in a N-S direction in a decidedly non-smooth way. However plenty of vignetting was also present on the images (clipped off in Fig 2) which again is a good indicator that internal reflection could in theory be prevalent. On the practical side of things, enormous velocities would have been needed to fill the crater with gas or dust in at least 3 seconds, and it was unlike any other LTP report from the past. This reduced the plausibility of the LTP, In view of this contradictory findings, an initial weight of 1 would have been assigned, just in case it was a new mechanism for LTP that we had not come across before.

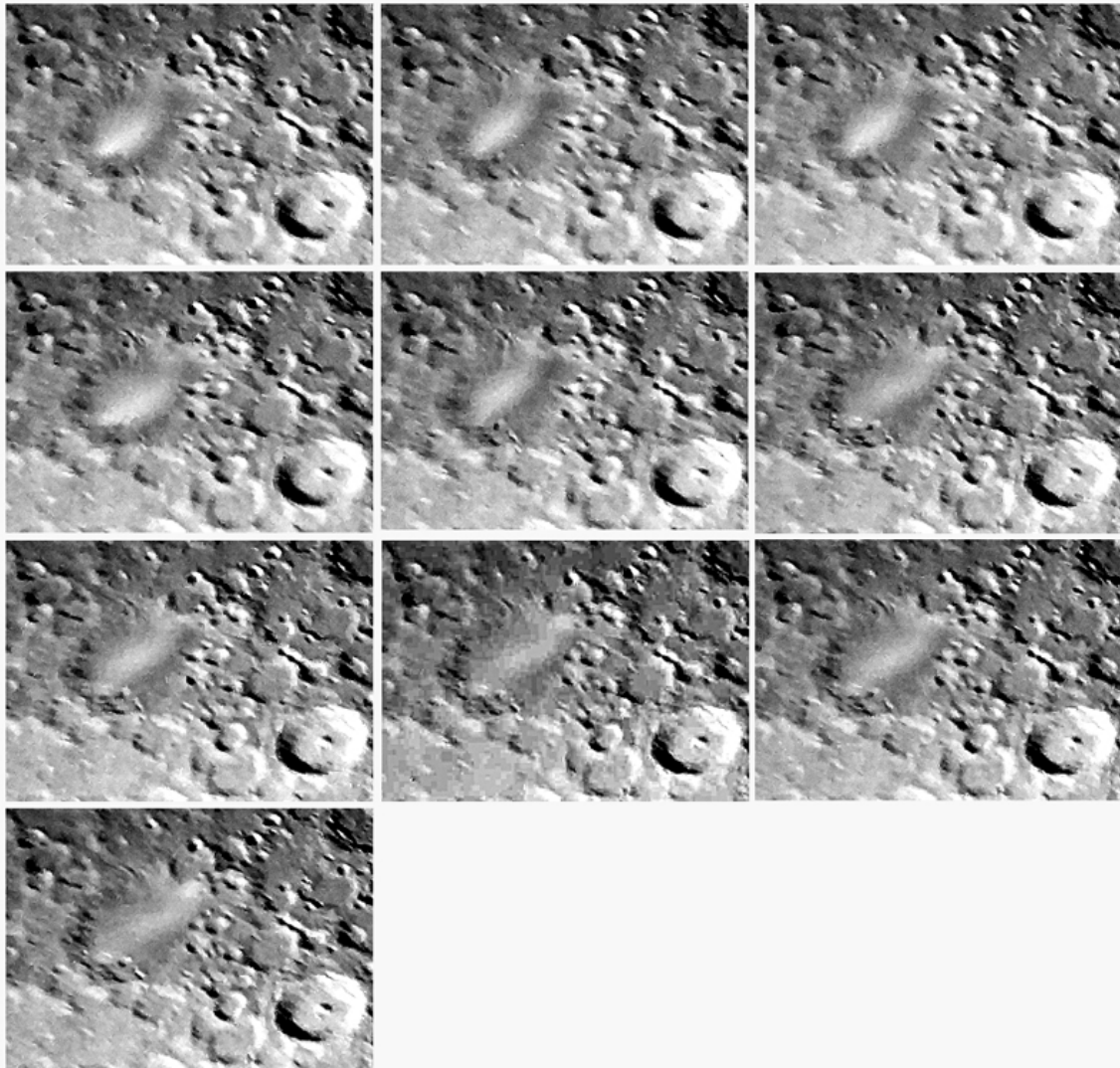


Figure 2. Mark Jones' image sequence of Maginus with south towards the top left, taken on 2013 Jul 18 UT 01:12:29-01:12:30 (camera GPS time). The image sequence from camera frames DSC09675 to DSC09684 starts on the top left, moves onto the top right, then down onto the next row, from the left to right, and so on. Note that these images have been clipped from the original images and registered together.

What we needed was to find out if anybody else was observing? I asked indirectly through the ALPO Lunar Section discussion group, via some Brazilian observers (see above), and through my Twitter alert page, whether anybody else was observing at the same time. However, the closest anyone came, apart from Mark Jones' adjacent images, were from Brazil. None of these showed any similar cloud effect. I also contacted Prof Arlin Crotts (Columbia University, NY) as his team operates a robotic telescope system to look for white light events. Fortunately his equipment had been taking images of the whole lunar disk every few seconds, and one of them matched the time of Mark Smith's images. I am therefore very grateful for Prof Crott's for letting me see the image – although I am not allowed to show it here, this image clearly reveals nothing was happening at 01:12:30UT. We cannot of course guarantee that Mark's camera did not have a timing error of a second or two, and was in between the images by Crotts – however LTP do not move as quickly as this over such a large area, nor are moving LTP so short lived. I am therefore assigning a weight of 0 i.e. not a LTP, with a probable cause of some kind of internal reflection that did not crop up in the other images.

Some lessons we must learn from this are that if you think you have detected a LTP, it is best to contact the ALPO/BAA Lunar Sections first. Mark Jones announced his observation through a popular astronomer's discussion forum. Discussion forums have their place, but you will find a mixture of expertise and backgrounds from people who leave comments – and this can be both confusing and lead to a bumpy ride for those new to dealing with the topic of LTP discoveries. Here in the Lunar Section, we go through a debriefing process, which can be sometimes arduous, but hopefully comes to an assignment of a weight, reflecting the reliability of the LTP report. It is interesting to note though, that without the images from Prof Crotts, this Maginus LTP might have attained a weight of 1 as it could not be entirely confirmed 100% as internal reflection with the information that we had.

I would like to thank Mark for sharing his images with us. It takes some courage to report something unusual seen on the lunar surface, even though on this occasion it turned out not to be a LTP. There are some tests for internal reflection that can be followed e.g. to move the telescope around and see if the effect stays completely with the lunar surface, and also to remove the camera to check visually with an eyepiece. Further ideas to eliminate false effects can be found in the back of the revised Hatfield Lunar Atlas. I have emailed Mark to encourage him to participate in ALPO's Lunar Section observational programme.

Routine Reports: Here are a selection of reports received during July that can help to re-assess some past LTP observations.

Theaetetus: On 2013 Jul 16 UT 06:43 Maurice Collins was imaging the Vallis Alpes area, and this just happened to cover Theaetetus crater at a similar illumination to a LTP seen by Patrick Moore back in 1952 Dec 15:

Theaetetus 1952 Dec 24 UT 20:00? Observed by Moore (England?) "Bright spot, hazy line of light" NASA catalog weight=4 (good). NASA catalog ID 556. ALPO/BAA weight=2.



Figure 3. *Theaetetus as imaged by Maurice Collins on 2013 Jul 16 UT 06:43 with north towards the top.*

As you can see from Figure 3, no hazy line of light was visible. Normally this might suggest raising the weight to a 3, however the UT given in the LTP report is "20:00?", meaning the exact UT was not known to Cameron, and 20:00 was guessed at. In view of this I will leave the weight at a 2. More future observations are needed.

Aristarchus: On 2013 Jul 20 UT 00:45-01:25 Jay Albert observed Aristarchus at similar illumination to the following LTP report:

Aristarchus, Schroter's Valley, Herodotus 1881 Aug 06 UT 00:00? Observed by Klein (Cologne, Germany, 6" refractor, 5" reflector) "Whole region between these features appeared in strong violet light as if covered by a fog spreading further on 7th. Examined others around & none showed effect. Intensity not altered if Aris. placed out of view." NASA catalog weight=4 (high). NASA catalog ID #224. ALPO/BAA weight=3.

Jay commented that the terminator was just W of Herodotus, - he saw no violet or other color in the Aristarchus area, including Schroter's Valley, which was brightly lit, and Herodotus. Aristarchus' floor was almost entirely in shadow, but the W wall was very bright with terracing and the vertical bands easily seen. Aristarchus' central peak was not visible. I do not propose to change the weight of this LTP report.

Aristarcus: On 2013 Jul 22 UT 23:20-23:25 Marie Cook observed Aristarchus under similar illumination to a 1955 LTP as seen by Bartlett:

On 1955 Oct 31 at UT 00:40-05:00 Bartlett (Baltimore, MD, USA, S=3-1, T=4, to S=5, T=5) observed in Aristarchus the following: "At 0040 bright blue viol.gl., E, NE rim; dark viol. nimb; pale viol. radiance on m. At 0450 intense blue-viol. gl. on E, NE, rim; dark viol. nimb., pale viol. on m.". The Cameron 1978 catalog ID=623 and weight=4. The ALPO/BAA weight=2.

Marie found the crater to be normal in appearance with the usual bands visible. However seeing was III and transparency poor, so it seems unfair to alter the weight when Bartlett had better observing conditions.

Eratosthenes and Tycho: On 2013 Jul 30 UT 17:55 Norman Izett imaged the whole Moon under similar illumination to two 1976 LTP's by Bartlett, and one by David Darling:

Eratosthenes 1976 Jun 20 UT 07:57 Observed by Bartlett (Baltimore, MD, USA, 4.5" refractor, 40-450x, S=6.5, T=4-3) "Floor covered with shadow & c.p. seen as 5deg bright spot. Another minute spot 5deg bright on SE floor in shadow. (only low hills on floor in SE. spot on terrace?" NASA catalog weight=4. NASA catalog ID 1436. ALPO/BAA weight=2.

Eratosthenes 1976 Aug 18 UT 06:12 Observed by Bartlett (Baltimore, MD, USA, 4.5" refractor, 45, 225x, S=6, T=3-2) "Again, c.p. is vis. within shadow but much brighter than on Aug, 4 (4 deg) & similar to June at same col. The 2nd bright spot seen in June was not seen tonite. (roughness on walls seen in LO IV & V pics show why these pseudo-shadows appear)." NASA catalog weight=4. NASA catalog ID #1445. ALPO/BAA weight=2.

Tycho 1992 Aug 21 UT 07:58-10:59 Observed by Darling (Wisconsin, USA, 16" & 11" reflectors, visual, photographic, CCD video observations made) "At 08:56UT a V-shaped glow started to appear in the shadow to the east of the central peak" ALPO LTP report. ALPO/BAA weight=1.

No sign was visible of the central peak in Eratosthenes, despite it being on the early side of the repeat prediction (when the Sun was higher), nor the V-shaped formation in Tycho. However it is possible that the image resolution was not good enough to see any of these. The weights shall therefore remain as they are.

Suggested Features to observe in September: For repeat illumination (and a few repeat libration) LTP predictions for the coming month, these can be found on the following web site: <http://users.aber.ac.uk/atc/tlp/tlp.htm>. If you would like to join the LTP 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 LTP, please give me a call on my cell phone: +44 798 505 5681 and I will alert other observers. Twitter LTP alerts can be accessed on <http://twitter.com/lunarnaut>.

Dr Anthony Cook, Institute of Mathematical and Physical Sciences, University of Wales Aberystwyth, Penglais, Aberystwyth, Ceredigion, SY23 3BZ, WALES, UNITED KINGDOM. Email: atc @ aber.ac.uk.

KEY TO IMAGES IN THIS ISSUE

1. Alpine Valley
2. Copernicus
3. Darney
4. Fontenelle
5. Mons Rumker
6. Opelt
7. Reiner gamma
8. Reinhold
9. Schiller
10. Tobias Mayer
11. Tycho
12. Walther

FOCUS ON targets

X = Schickard-Wargentin (November)

Y = Aristarchus (January)

