THE LUNAR OBSERVER

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

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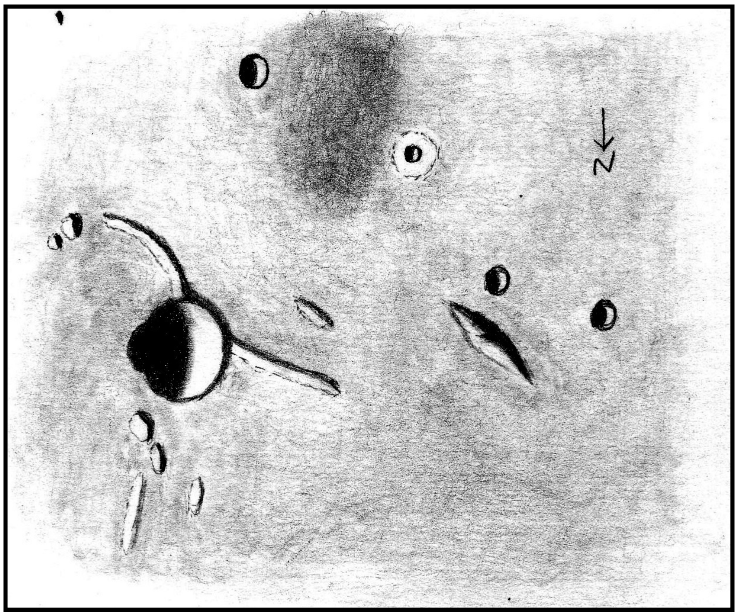
RECENT BACK ISSUES: http://moon.scopesandscapes.com/tlo_back.html

FEATURE OF THE MONTH – NOVEMBER 2017

JANSEN B (CARREL)



Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
June 1, 2017 01:56-02:20, 2:32-1:40; UT, 15 cm refl, 170x, seeing 8/10.

I observed this crater and vicinity on the evening of May 31/June 1, 2017 before the moon hid rho Leonis. This area is in central Mare Tranquillitatis south of Jansen. Carrel is a moderate-sized crater with a rounded protrusion on its east side. This may be a large slump or an overlapping impact. A group of peaks and a short ridge are north of Carrel, and a wide, low ridge extends from Carrel's west side. A nearby short ridge is not quite parallel to the longer one. A curved ridge and two peaks near Carrel's south end may be remnants of an old ring. Jansen G is the crater south of Carrel, and Ross G and Fare the pair west of Carrel. A small pit with a halo is between Jansen G and Ross G. This pit is not shown on the Lunar.Quadrant map. A particularly dark area of Mare Tranquillitatis is between Jansen G and the haloed pit. The large, elongated peak north of Ross G is Ross mu.

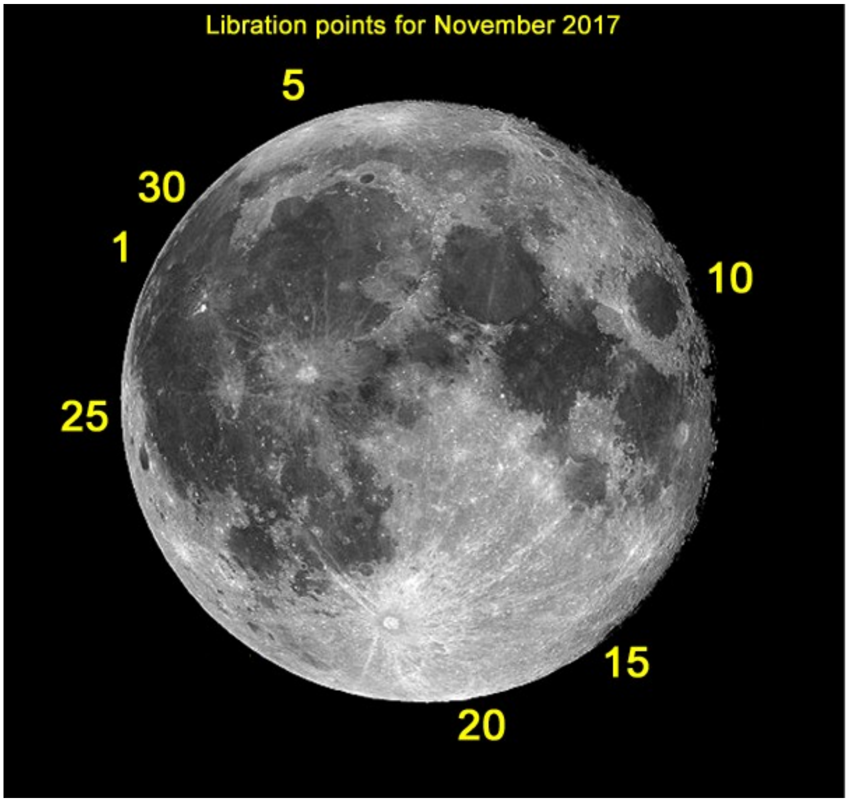
LUNAR CALENDAR

NOVEMBER-DECEMBER 2017 (UT)

2017		UT	EVENT
Nov	04	05:23	Full Moon
	06	00:09	Moon Perigee: 361400 km
	06	02:19	Moon-Aldebaran: 0.7° S
	08	01:28	Moon Extreme North Dec.: 19.8° N
	10	20:37	Last Quarter
	10	22:40	Moon Ascending Node
	11	16:07	Moon-Regulus: 0.4° S
	15	00:40	Moon-Mars: 3.4° S
	18	11:42	New Moon
	21	00:34	Moon-Saturn: 3.3° S
	21	18:52	Moon Apogee: 406100 km
	22	02:06	Moon Extreme South Dec.: 20° S
	26	17:03	First Quarter
Dec	03	13:00	Moon-Aldebaran: 0.8° S
	03	15:47	Full Moon
	04	08:42	Moon Perigee: 357500 km
	05	11:43	Moon Extreme North Dec.: 20° N
	08	22:25	Moon-Regulus: 0.7° S
	10	07:51	Last Quarter
	13	16:27	Moon-Mars: 4.5° S
	14	14:26	Moon-Jupiter: 4.7° S
	18	06:31	New Moon
	19	01:27	Moon Apogee: 406600 km
	19	09:31	Moon Extreme South Dec.: 20.1° S
	26	09:20	First Quarter
	31	00:25	Moon-Aldebaran: 0.7° S

LUNAR LIBRATION

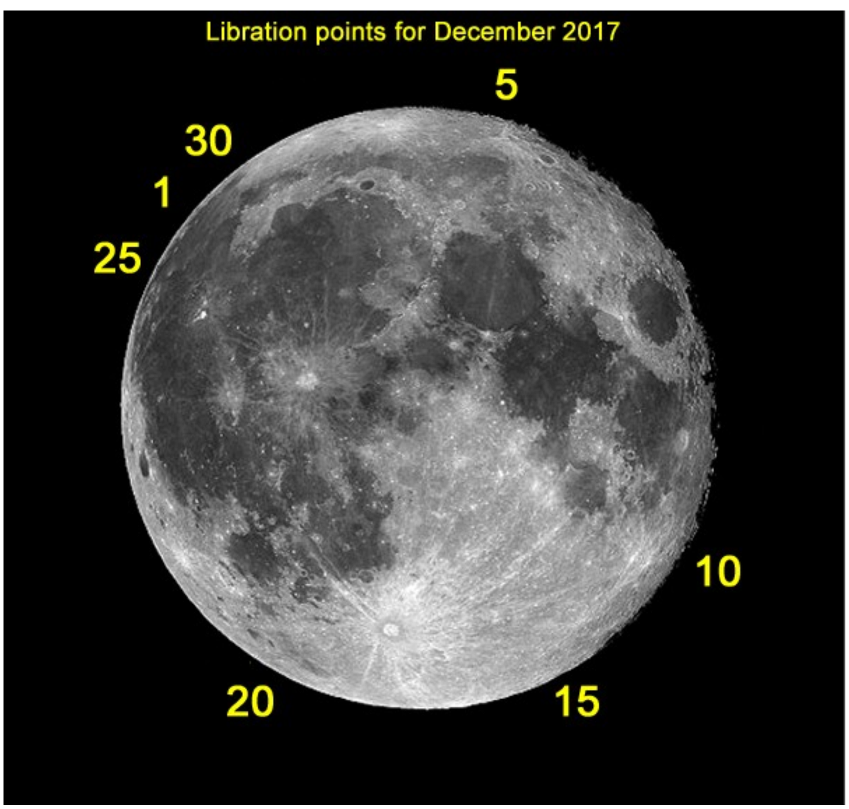
NOVEMBER-DECEMBER 2017



Size of Libration

11/01	Lat +03°49'	Long -06°54'
11/05	Lat +06°32'	Long -02°14'
11/10	Lat +01°30'	Long +05°10'
11/15	Lat -05°16'	Long +05°30'
11/20	Lat -05°54'	Long +01°13'
11/25	Lat -00°31'	Long -05°29'
11/30	Lat +05°42'	Long -07°23'

NOTE:
Librations are based on a geocentric position at 0 hr. Universal Time.



Size of Libration

12/01	Lat +06°20'	Long -06°21'
12/05	Lat +04°42'	Long +01°11'
12/10	Lat -03°00'	Long +07°06'
12/15	Lat -06°38'	Long +04°34'
12/20	Lat -03°16'	Long -03°16'
12/25	Lat +03°28'	Long -07°33'
12/30	Lat +06°39'	Long -05°39'

NOTE:
Librations are based on a geocentric position at 0 hr. Universal Time.

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 Journal of the Association of Lunar and Planetary Observers-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.alpo-astronomy.org.** 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:

Name and location of observer
Name of feature
Date and time (UT) of observation (use month name or specify mm/dd/yyyy, dd/mm/yyyy)
Size and type of telescope used Magnification (for sketches)
Filter (if used)
Medium employed (for photos and electronic images)
Orientation of image: (North/South - East/West)
Seeing: 0 to 10 (0-Worst 10-Best)
Transparency: 1 to 6

Full resolution images are preferred-it is not necessary to compress, or reduce the size of images. *Additional commentary accompanying images is always welcome.* **Items in bold are required. Submissions lacking this basic information will be discarded.**

Digitally submitted images should be sent to both
Wayne Bailey – wayne.bailey@alpo-astronomy.org
and Jerry Hubbell –jerry.hubbell@alpo-astronomy.org

Hard copy submissions should be mailed to Wayne Bailey at the address on page one.

CALL FOR OBSERVATIONS:
FOCUS ON: Montes & Mons –Mountains and Mountain Ranges

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 **January 2018** edition will be **Mountains and Mountain Ranges.** 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 these features to your observing list and send your favorites to (both):

Jerry Hubbell –jerry.hubbell@alpo-astronomy.org
Wayne Bailey - wayne.bailey@alpo-astronomy.org

Deadline for inclusion in the Montes & Mons article is December 20, 2017

FUTURE FOCUS ON ARTICLES:

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

Subject	TLO Issue	Deadline
Rima – Rilles	**Mar. 2018**	**Feb. 20, 2018**
Craters – Latest and Greatest	**May 2018**	**Apr. 20, 2018**

Focus On: Lunar Dorsa-Wrinkle Ridges

Jerry Hubbell

Assistant Coordinator, Lunar Topographical Studies

With this month's Focus On series, we continue our discussion of the different types of lunar features with Dorsa, or wrinkle ridges. When looking over the face of the moon, if you consider the edges of the maria as a shoreline, there appear to be very large ripples offshore that are somewhat concentric with the shoreline. This description is more than an analogy as it appears that when the maria were formed, the flowing magma from deep within the moon may have spewed forth in "gushes" instead of a steady flow. Although speculation, this may have caused the lava to pile-up and form the dorsa. Although there is dorsum of various sizes, only the largest of these seem to be concentric to the center of impact for these large basins.

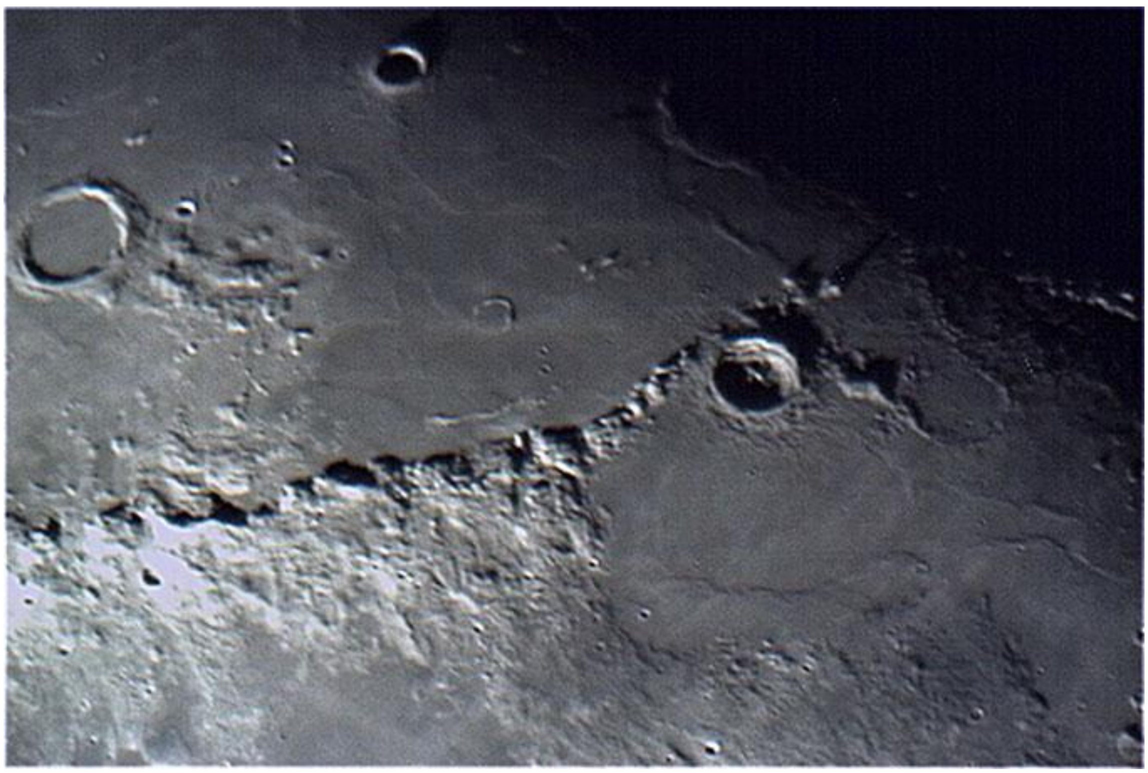


Figure 1. *Dorsa Near the Apennines, Palus Putredinis, and Eratosthenes, Jay Albert, Lake Worth, Florida, June 16, 2014 0245-0255UT, Celestron C-11, Celestron NexImage 5 camera, north/up, east/left.*

The dorsum (individual ridge), and dorsa (systems of ridges), are best observed when the sun is low on the local horizon during lunar sunrise or sunset. Although dorsum are located anywhere there is a relatively smooth surface, it becomes very challenging to observe the smallest of these. The best place to start your search is directly on the terminator or to the east (sunrise) or west (sunset) of the terminator. Figure 1 shows a few of these more challenging dorsa on the terminator, northwest of the crater Eratosthenes (center right).

These ghostly features can be used to test the resolving capability of your imaging system much like the use of crater sizes, although not as precise. When observing dorsum on the terminator, the dorsum shadow will show you the form of the feature and how it snakes over the landscape. There may be opportunities to discover very small features when amplified via the shadow.

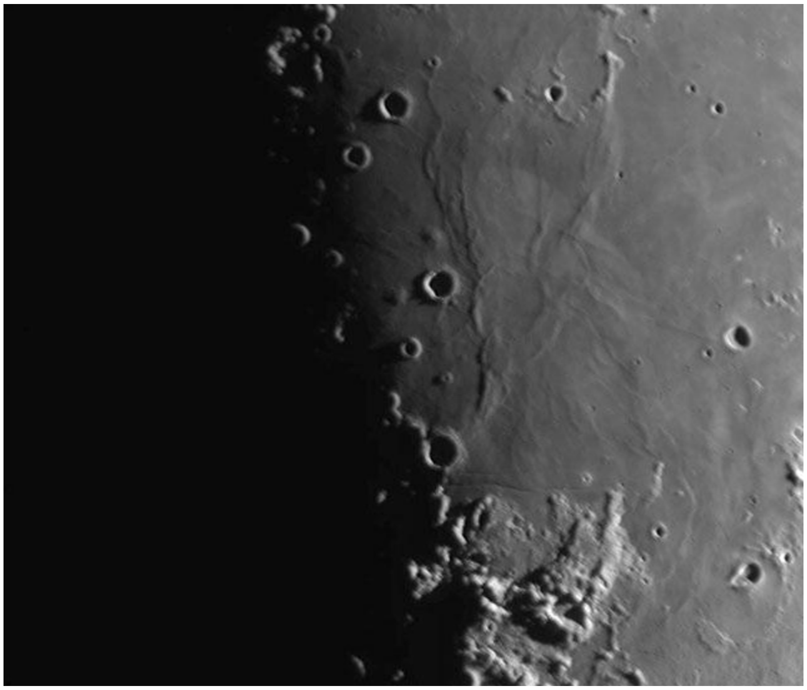


Figure 2*. Dorsa Near Arago, David Teske, Louisville, MS, May 2, 2017 0146 UT, 140 mm Maksutov, Mallincam Skyraider GMTm camera, Seeing 4-5/10, north/up, east/right.*

Figure 2 shows how these dorsa can be resolved within a few kilometers of the terminator. A good tool for planning your observation of dorsa is the Lunar Reconnaissance Office ACT-REACT Quick Map . Under the LROC WAC Basemaps tab, you will find the selection for WAC Nearside (big shadows) which you can use to find and locate the various dorsa you wish to observe. The USGS "Lunar Wrinkle Ridges (Dorsum) and Ridge Systems" website offers a good list of features from which to start your studies and observations. Figure 3 shows one of the easiest and most prominent dorsa to observe, Dorsa Smirnov. This dorsa, coupled with Dorsa Lister forms what Chuck Wood called "A Glorious Serpentine Ridge". This feature, which extends for 250 miles (400 km), can be examined in detail in the LPOD image.

As one of the various types of features available for observation on the lunar surface, dorsum and dorsa offer a particularly rich variety of forms and challenges you to improve your observation skills and imaging techniques.

Figure 3. *Dorsa Smirnov, Jerry Hubbell, Mark Slade Remote Observatory (MSRO), Locust Grove, VA, September 10, 2017 0133 UT, 6-inch APO refractor, 2x Barlow, Point Grey Flea 3 GigE CCD video camera, Seeing 6/10, north/up, east/right.*

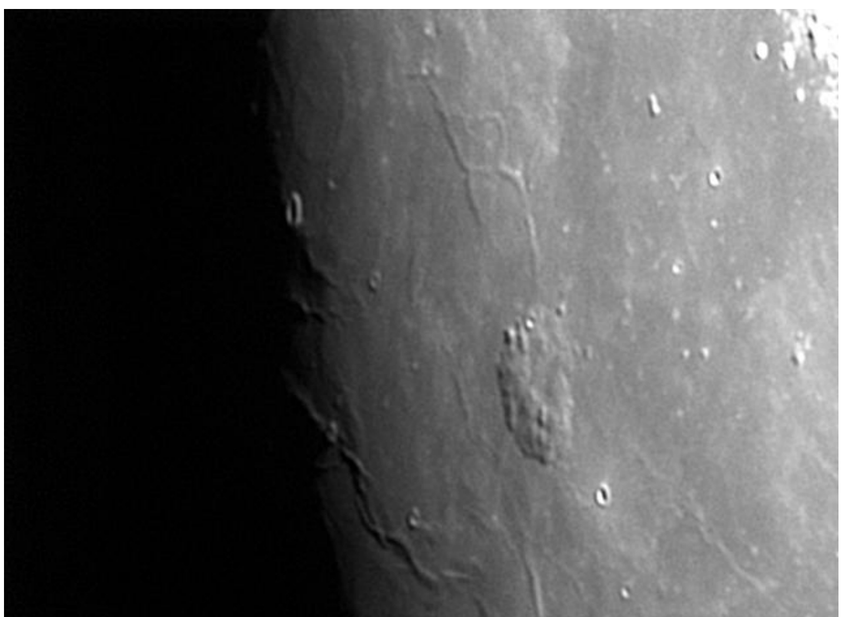


Figure 4. *Dorsa near Mons Rümker, Jerry Hubbell, Locust Grove, VA, January 6, 2012 0133 UT, 5-inch APO refractor, DMK 41AU02 CCD video camera, Seeing 6/10, north/up, east/right.*

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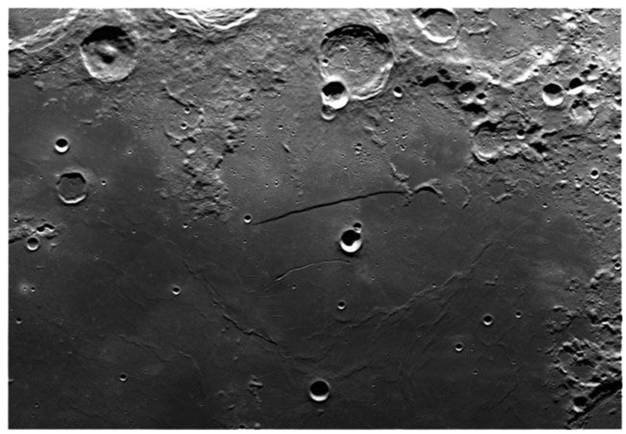
ADDITIONAL DORSA IMAGES

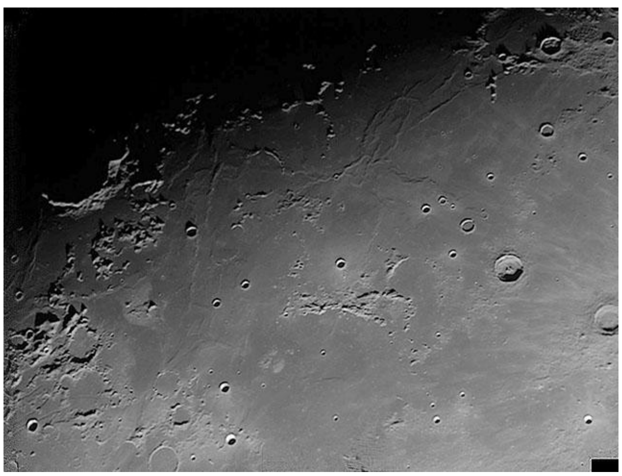
Dorsa near THEOPHILUS, Luis Francisco Alsina Cardinalli, Oro Verde, Argentina, January 15, 2016, 00:10 UT, 25-cm SCT, 106x w/telextender, Canon EOS Digital Rebel XS.

Dorsum near RUPES RECTA. Luis Francisco Alsina Cardinalli, Oro Verde, Argentina, Sepetember 10, 2016 22:51 UT, C-11 Edge HD SCT, QHY5-II.



Dorsa in MARE IMBRIUM- César Fornari - Oro Verde, Argentina. September 10, 2016 23:12 UT. C-11 Edge HD SCT, QHY5-II.

Dorsa in MARE HUMORUM - Desireé Godoy - Oro Verde, Argentina. December 10, 2016 02:04 UT. 250mm LX-200, EOS Digital Rebel XS, Astronomik 742 IR-pass filter.



Dorsa in MARE COGNITUM. Michael Sweetman - Tucson, Arizona, USA, October 1,, 2017 05:48 UT. Seeing 5-6/10, transparency 3/6. 4" Celestron refractor f/20. Skyris 132M, Baader fringe killer filter.

Dorsa in MARE HUMORUM. Michael Sweetman - Tucson, Arizona, USA, October 1,, 2017 05:52 UT. Seeing 5-6/10, transparency 3/6. 4" Celestron refractor f/20. Skyris 132M, Baader fringe killer filter.

RADIAL DORSA IN MARE IMBRIUM

Alberto Anunziato

This image (fig. 1) comes from an observation session for the "Lunar Geological Change Detection Program", the requested target was Montes Spitzbergen, which is in the shadows and therefore the image has so much black space. But the illumination conditions were ideal for finding dorsa near the terminator, which I noticed as I traversed the archives of the Lunar Section of the Asociación Entrerriana de Astronomía in search of images for this Focus On.

***FIGURE 1*. - RADIAL DORSA IN MARE IMBRIUM.** Oro Verde, Argentina. April 30, 2016 06:52 UT. 250mm. LX 200 SCT.QHY5-II.

From the dimly lit relief of Eratosthenes at the far right of the image a dorsum runs towards Lambert, parallel to the edge of the largest mascon (mass concentration) on the moon, discovered by the Lunar Orbiter in 1968 as a positive gravity anomaly. The loading of the crust by a mascon generates a pattern of wrinkle ridges radial to or concentric with the center of the dense concentration of mass below the Mare Imbrium. This dorsum is concentric to the edge of the mare, like most dorsa. Most of the dorsa observed in this image are radials to Mare Imbrium and less conspicuous than concentric ones. From left to right we observe: 1) a dorsum that almost touches Promontorium Laplace, 2) a dorsum that passes between Lambert and Timocharis, probably a spine from the arch formed by the dorsa that connects Timocharis with Lambert; 3) the Dorsum Grabau, that passes between Timocharis and Carlini D (Landsteiner is the most prominent crater, to the left of the small Carlini D); 4) The two almost identical craters on the left are Helicon and Le Verrier; from the vicinity of Le Verrier arises a dorsum that almost reaches Montes Recti and converges with a concentric dorsum on the edge of the Mare imbrium; 5) to the right of the dorsum that runs between Le Verrier and Montes Recti there are two parallel dorsa, one ends at Le Verrier E and another arises near Pico D and passes between Le Verrier E and Pico B, 6) to the right of Pico B runs a dorsum that ends near the Montes Teneriffe, whose highest points are illuminated by the Sun.

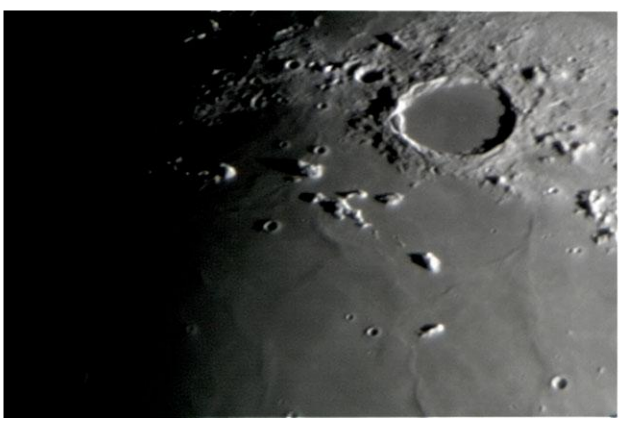


***FIGURE 2*. - DORSA NEAR PICO B.** Oro Verde, Argentina. December 20, 2015 02:06.UT. 250 mm. LX 200, 168x(with Telextender). Canon Eos Digital Rebel XS.

In fig. 2, obtained in an earlier lunar observation session, we complete the panorama with other dorsa radial to Mare Imbrium: the one that passes between Pico E and the isolated peak south of Mons Pico; and the one that goes from Piazzi Smith to the border between Mare Imbrium and Montes Alpes in Plato J.

These radial dorsa can only be appreciated under a very low angle of illumination when they cast shadows onto their surroundings The dorsa concentric with Mare Imbrium,, that indicate the location of the basin's inner ring buried beneath the lava flows that formed the mare, are much more prominent and can be observed even far away from the terminator.

NOTES ON LUNAR IMAGES CONTAINING WRINKLE RIDGES

David Teske

The subject of figures 1 & 2 is Mare Crisium and its wrinkle ridges near its eastern shore. Mare Crisium is about the size of the state of Arkansas. Under low illumination, a concentric system of low mare ridge, about 100 to 150 m tall, is is visible around the outer perimeter of its lava surface, about 50 km from the shore of Mare Crisium. On eastern Mare Crisium, Dorsa Harker, named after the British petrologist Alfred Harker (1859-1939) is about 180 km long, and its north Dorsa Tetyaev, named after the Soviet geologist Mikhail M. Tetyaev (1882-1956) is about 200 km long. These ring ridges mark the inward edge of a bench or annular plateau where lavas get deeper in the interior of Mare Crisium.

***FIGURE 1*. Mare Crisium**. *Louisville, Mississippi USA. October 7, 2017 07:35 UT. Seeing 4/10. Colongitude 111.0°. 102 mm f/7 APO, 2.5x Power Mate. ZWO ASI 120 mm-s.*

Mare Humorum has lovely set of wrinkle ridges around its eastern side. This mare can be dated to the Nectarian period, being some 3.8 to 3.9 billion years old. Flooding lava came later, with lavas up to 3 km deep in the central Mare Humorum area. After the lava stopped rising and flowing from the mantle, the lava layers collapsed under their own weight and deformed the lunar crust by compressional forces. This created wrinkle ridges, fracture zones, and escarpments around the edge of the basin. Thus, these wrinkle ridges in Mare Humorum are associated with stressed created by the basin's ring structure. These wrinkle ridges run entirely around the eastern part of Mare Humorum, perhaps marking the eastern rim of a submerged inner mountain ring 200 km in diameter. The western side of Mare Humorum does not show these wrinkle ridges.

***FIGURE 2. Mare Crisium**. Louisville, Mississippi USA. June 11, 2017 7 8:50 UT. Seeing 4/10. Colongitude 109.9°. 102 mm f/7 APO, 2x barlow. Mallincam Skyraider GMTm.*

Figure 3 is of the Mare Humorum. Figure 4 shows an unnamed braid-like wrinkle ridge in Sinus Aestuum that extends from southwest to northeast. Figure 5 shows wrinkle ridges in eastern Mare Serenitatis. The Serpentine Ridge runs roughly north to south along the eastern side of Mare Serenitatis. To the north, starting near the crater Posidonius is the Serpentine Ridge, Dorsa Smirnov, which turns into Dorsa Lister that angle to the southwest, and then Dorsum Nicol that veers south towards the crater Plinius. This entire winding ridge is part of the 620 km diameter inner ring of the Mare Serenitatis Basin. So the Serpentine Ridge is the remains of a buried mountain range that formed the inner ring of the Serenitatis Basin. Dorsa Smirnov, named after the Soviet naturalist Sergei S. Smirnov (1895-

1947) has the appearance of a braided rope that is up to 15 km wide, about 100 km from the mare border, and is about 200 km long. The Dorsa Lister, named for the British zoologist Martin Lister (1638-1712) is a system of ridges about 300 km long that curves parallel to the southern shore of Mare Serenitatis.

FIGURE 3. Mare Humorum-Bullialdus*. Louisville, Mississippi USA. October 1, 2017 7 2:19 UT. Seeing 4/10. Colongitude* 35.2°*. 102 mm f/7 APO, 2.5x Power Mate. ZWO ASI 120 mm-s.*

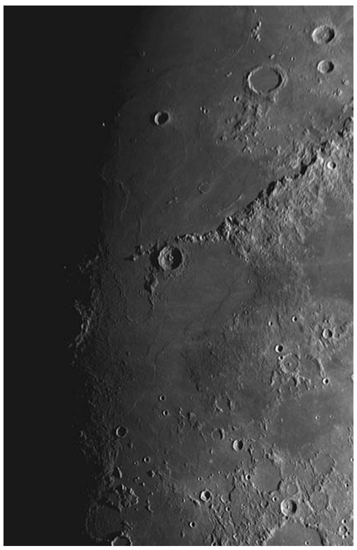


FIGURE 4. Sinus Aestuum*. Louisville, Mississippi USA. July 3, 2017 02:17 UT. Seeing 5/10. Colongitude 16.4°. 102 mm f/7 APO, 2x barlow. Mallincam Skyraider GMTm.*

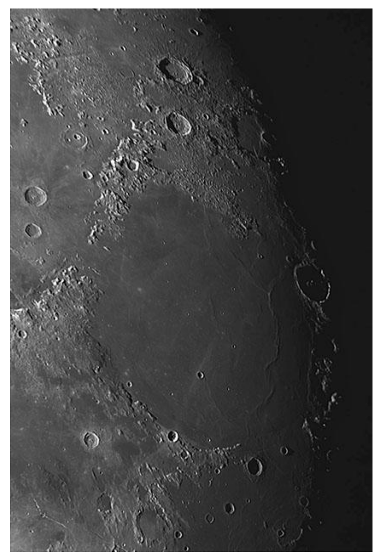


FIGURE 5. Dorsa Smirnov*. Louisville, Mississippi USA. June 14, 2017 7 10:18 UT. Seeing 5/10. Colongitude 147.6°. 102 mm f/7 APO, 2x barlow. Mallincam Skyraider GMTm.*

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ANOTHER X

Richard Hill

I've heard it said, "Why observe the moon? Nothing changes there, it's a dead world and our spacecraft have seen it all." Not quite true. The lighting is constantly changing, terminators reveal detail that can often be fleeting and will be missed unless your ever vigilant. This region (fig. 1), centered on 43km diameter crater Henry Freres with the sharp edged walls. To the left of it (west) is the shadow filled oval of Byrgius (90km) with Byrgius A (19km) taking a bite out of the eastern wall. Under higher sun this latter crater is very bright with a bright ray pattern around it similar to Proclus on west side of Mare Crisium. On the right side of the image is the flat bottomed Mersenius (87km) and at the bottom of this image another flat bottomed crater Vieta (90km). All three of these similarly sized craters are "Nectarian" age, created the same time as Mare Nectaris about 3.9 billion years ago, as is H. Freres though it looks younger.

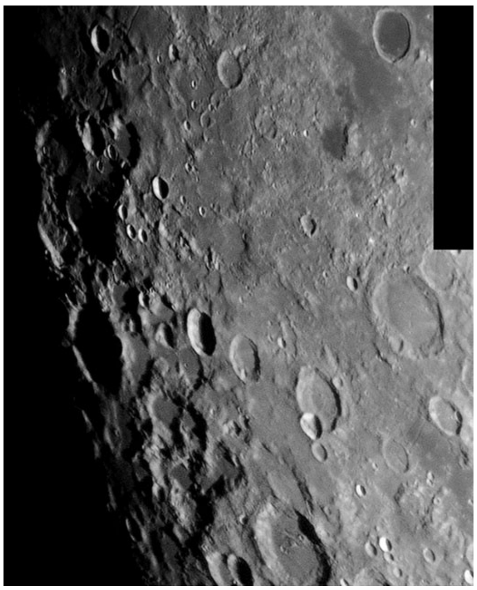

***FIGURE 1*. BYRGIUS.** *Tucson, AZ USA. October 14, 2016 04:44UT. Seeing 8/10. Tec 8" Mak-Cass, f/20, 656.3nm filter, Skyris 445.*

Below Byrgius is an odd cluster of overlapping craters that take on the appearance of an animal track. I call it the "Bear paw " footprint. The top two craters are Byrgius S, and Byrgius R. The next one down is Vieta E. The large depression that forms the heal of the Bear paw footprint is Lagrange G, with Lagrange being in full shadow here. Can you see the footprint? Now notice something I found in it that I don't find mentioned in historical texts or recent. See the neat little white "X" in the middle of the footprint? When I first spied it I went back to my lunar images back to 2007 and it was in every one of similar colongitude. I did find images of it in the Hatfield Lunar Atlas (Plate 11d) and the Lunar Orbiter imagery Photo No. IV-161-H1. It is only visible until Byrgius A is in sun when its brightness and ray pattern dominates this area.

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HALE

Richard Hill

This is another peek over the edge (fig. 1). We start with the nice crater-in-crater near center of this image. That's Boussingault (134km diameter) and the interior crater, Boussingault A (72km). To the left is the flat

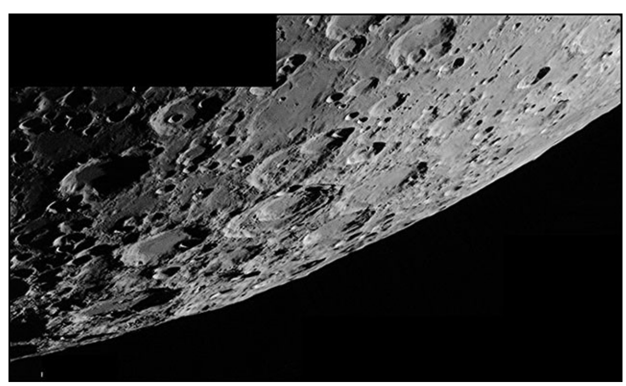

***Figure 1*. HALE.** *Tucson, AZ USA. September 27, 2017 01:49 UT. Seeing 8/10. Tec 8" Mak-Cass, f/20, 656.3nm filter, Skyris 445.*

floored Boguslawsky (100km) and below it Demonax (117km) with the small crater, Demonax A on its floor. Due to the libration on this night, this is a particularly good view of this crater. Above Boguslawsky is a mostly shadow filled Manzinus (100km) almost a twin to the former crater in diameter, age and appearance. To the right of Boussingault we see Helmholtz (99km) and below these two forming a tight triangle is Neumayer (78km). Following a line from the center of Helmholtz through the center of Neumayer we come to the highly foreshortened and not often seen crater Hale (87km). This crater is usually out of view except during favorable librations. Just a little smaller than Copernicus the morphology of this crater is very similar with a well defined central peak and strongly terraced walls. Notice how it looks so shallow while Copernicus always seems so deep seen from overhead. This is what Copernicus would look like at this location!

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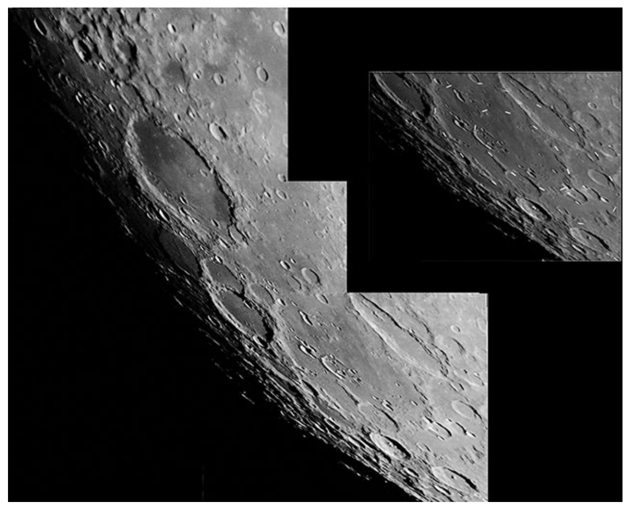
SCHILLER-ZUCHIUS BASIN

Richard Hill

The moon is nearly full and many think there is little left to see but the terminator still has some gems available for study. Just above center in this image is the great walled plain of Schickard (233km diameter) with it's beautifully mottled floor, dark to the north and south but a bright band through the middle. Below this is the smaller walled plain Phoclydes (117km) and between them the rather polygonal crater, Nasmyth (80km). To the left of Nasmyth is a flooded crater Wargentin (87km) that filled with lava and is now a high plain. This grouping of craters is one that I learned early in my lunar observing days.



<u>Figure 1</u>. SCHILLER-ZUCHIUS BASIN. *Tucson, AZ USA. October 14, 2016 04:59 UT. Seeing 8/10. Tec 8" Mak-Cass, f/20, 656.3nm filter, Skyris 445.*

To the right of Phoclydes is the odd footprint shaped crater Schiller (179 x 71km). It is thought that this feature formed from a very low angle impact about 3.9 billion years ago. At the bottom of this image are two similar craters. The one in the lower right corner is Bettinus (73km) and the one above and to the left is Zucchius (66km). Zucchius, the east wall of Schiller and Phoclydes mark the outer edges of a basin that stretches between them called, appropriately enough, the Schiller-Zacchius Basin (335km dia.). It's not real obvious but once you see it you will notice it from then on. On the north side of the basin is a curious collection of what look like secondary craters. It's an area that is worth some investigation when the moon is nearly full.

Thanks to a note posted by Chuck Wood, I was pointed to a mapping of the basin that was more accurate than what I had been using. As a result I have been able to note the outer two rings of the basin on my image with much more certainty (see insert).

At the top of insert you can see Schiller, at bottom is Zucchius (and cut off in the upper left corner is Phoclydes. This is a double ring basin. The inner ring is outlined here so you can see it clearly. The outer ring takes in almost all of Schiller.

The article I was pointed to is at:http://www.lpod.org/archive/LPOD-2004-10-17.htm from the old, and greatly missed, Lunar Picture of the Day that Chuck ran. As it says in the article, "foreshortening sometimes makes it difficult to understand the geometric shapes of craters [or basins!] anywhere within about 30 degrees of the limb." I thank Chuck for his informative and helpful posting!

LUNAR TOPOGRAPHICAL STUDIES

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OBSERVATIONS RECEIVED

JAY ALBERT – LAKE WORTH, FLORIDA, USA. Digital images of dorsa near Montes Apennines & Mons Rumker, Grimaldi-Gassendi, Sinus Iridum & Mons Rumker.

ALBERTO ANUNZIATO - ORO VERDE, ARGENTINA. Digital images of dors in Mare Imbrium(2), Grabau & Heim-Zirkel.

JUAN MANUEL BIAGI - ORO VERDE, ARGENTINA. Digital images of Kepler. Langrenus & Mare Imbrium.

MIKE BOSCHAT – HALIFAX, NOVA SCOTIA, CANADA. Digital image of Alphonsus.

LUIS CARDINALI - ORO VERDE, ARGENTINA. Digital images of Mare Serenitatis, Oceanus Procellarum, RupesRecta, SinusAestum & Theophilus.

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 8, 12 & 13(2) day moon, Alphonsus, Bullialdus, Copernicus, Plato & Theophilus.

HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Ariadaeus, Montes Haeus & Proclus.

WALTER ELIAS - ORO VERDE, ARGENTINA. Digital images of Aristarchus, Gassendi & Torricelli B.

CÉSAR FORNARI - ORO VERDE, ARGENTINA. Digital images of Mare Imbrium & dorsa Smirnov.

DESIREÈ GODOY - ORO VERDE, ARGENTINA. Digital image of Mare Humorum.

MARCELO GUNDLACH – COCHABAMBA, BOLIVIA. Digital images of ACopernicus & Walther-Zach.

RICHARD HILL – TUCSON, ARIZONA, USA. Digital images of Birgius, Clavius, Hale, Janssen, Langrenus, Pythagorus, Schiller-Zuchius Basin & Wargentin

JERRY HUBBELL – LOCUST GROVE, VIRGINIA, USA. Digital images of dorsa Lister, dorsa Smirnov, Lacus Somiorum, Mare Nectaris, Mare Tranquilitatis, Plato(2), Plinius & Theophilus.

MICHAEL SWEETMAN – TUCSON, ARIZONA USA. Digital images of Mare Cognitum-Riphaeus Mountains, Mare Humorum & Clavius-Longomontanus.

DAVID TESKE - LOUISVILLE, MISSISSIPPI, USA. Digital images of dorsa Smirnov, Mare Crisium (2), Mare Humorum & Sinus Aestuum.

RECENT TOPOGRAPHICAL OBSERVATIONS

SINUS IRIDUM - Jay Albert, Lake Worth, Florida USA. October 15, 2017 09:44 UT. Nexstar 6” SCT, 114x, iPhone 6S.

KEPLER- Juan Manuel Biagi-Oro Verde, Argentina. October 7, 2017 05:44 UT. LX200 250 mm SCT, Canon EOS Digital Rebel XS.

ALPHONSUS—Michael Boschat,- Halifax, Nova Scotia Canada. October 27, 2017 21:58 UT. Seeing 8/10, transparency 4/6. ETX-90, 2x barlow, Canon xsi.

I was just looking at the Moon's terminator using 140x and noticed that Alphonsus central peak was catching the sunlight, and just near it's base was a "halo" of sunlight just ever illuminating the crater floor. It was just an interesting observation so I decided to try and get a image of the area. I took a series of exposures trying to get a deceant image. I used the live view on camera to focus the craters as sharp as possible. This was about the best image I could get. Also, I was shooting though my open apartment window, and visually looking though the eyepiece everything was sharp and clear, very, slight turbulence.

Ed. Note: Good observation to notice this. It is the normal appearance around this phase as can be seen by comparing to the image by Maurice Collins (below) taken one lunation earlier.

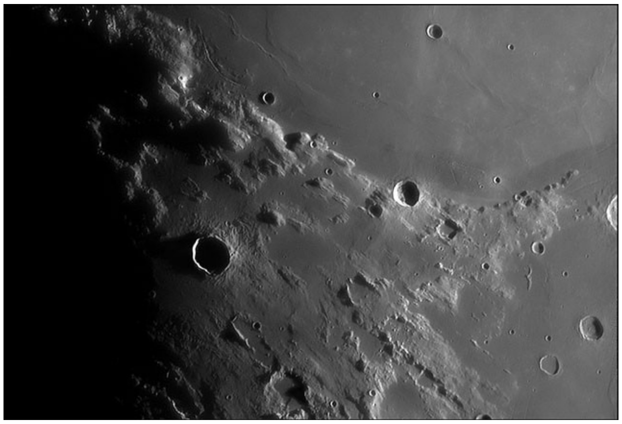
RECENT TOPOGRAPHICAL OBSERVATIONS

ALPHONSUS- Maurice Collins,- Palmerston North, New Zealand. September 28, 2017 09:25 UT. FLT-110, f/14 ASI120M. North down.

BULLIALDUS- Maurice Collins,- Palmerston North, New Zealand. September 30, 2017 07:52 UT. FLT-110, f/14, ASI120MC. North down,

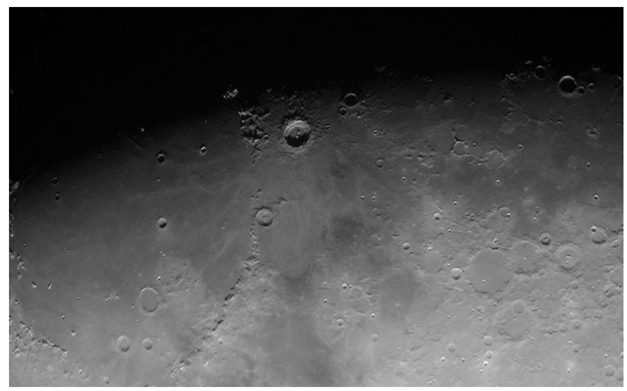
GASSENDI - Walter Elias, Oro Verde, Argentina. October 7, 2017 04:50 UT. 900mm Helios Reflector f/8, 2x barlow. Motorola XT1563.

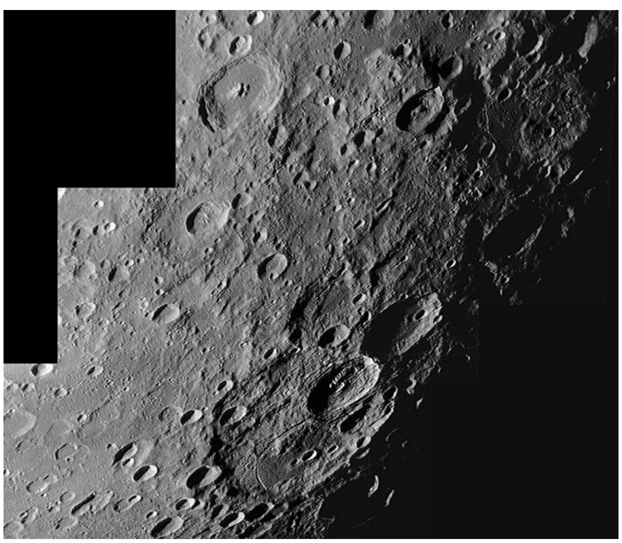
RECENT TOPOGRAPHICAL OBSERVATIONS



MONTES HAEMUS - Howard Eskildsen, Ocala, Florida, USA. October 26, 2017 23:34, UT. 6” Refractor, f/8, 2x barlow, W-8 Yellow filter, DMK41AU02.AS.

COPERNICUS– Marcelo Gundlach, Cochabamba, Bolivia. September 30, 2017 01:00 UT. Seeing 810, transparency 6/6. 120mm f/8 refractor, 40mm eyepiece. Canon Power Shot A-620.





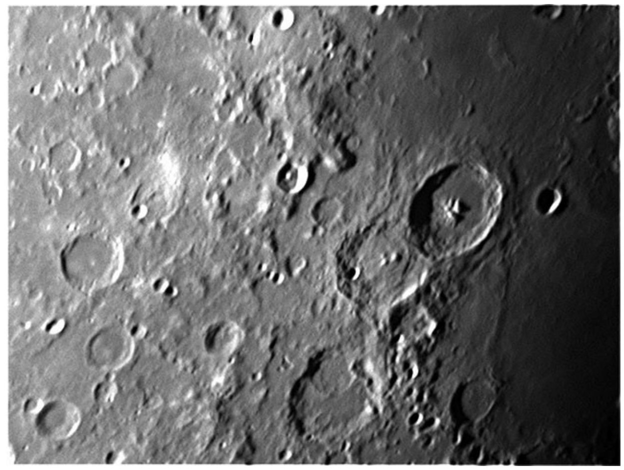
JANSSEN - Richard Hill – Tucson, Arizona, USA October 9, 2016 00:02 UT. Seeing 8/10. 8” Mak-Cass, f20, 656.3 nm filter, SKYRIS 445M.

Most lunar aficionados tend to observe and image the 196km diameter Janssen during the waxing moon rather than waning. I would urge you to not miss the opportunity to see the sun setting on this tortured walled plain, it's a very dramatic sight. Here we see Janssen at the lower center of this image with the grand curved rille on its floor, part of the Rimae Janssen that can be seen on either side of it as well. Janssen overlaps and older unnamed crater that you can see to the northwest, that was of similar diameter. On the north side of its floor is another very interesting crater Fabricius (80km) with an unusual mountain chain next to the central peak. To the north of Fabricius is the slightly larger Metius (90km).

The crater at the top of this image is Piccolomini (also 90km) with nicely terraced walls and a central peak reminiscent of Theophilus. Just below Piccolomini is the smaller Stiborius (46km) that sits in a much older ruined crater. To the right of Piccolomini is a very clear crater, Neander (51km) that appears to have infill on the north side from slumping of the wall. Further to the right is a nice unnamed rima with the last rays of the lunar day making it so obvious. Before leaving note the ridge that runs from just east of Piccolomini to the shared wall of Fabricius and Metius. This rupes is not named either.

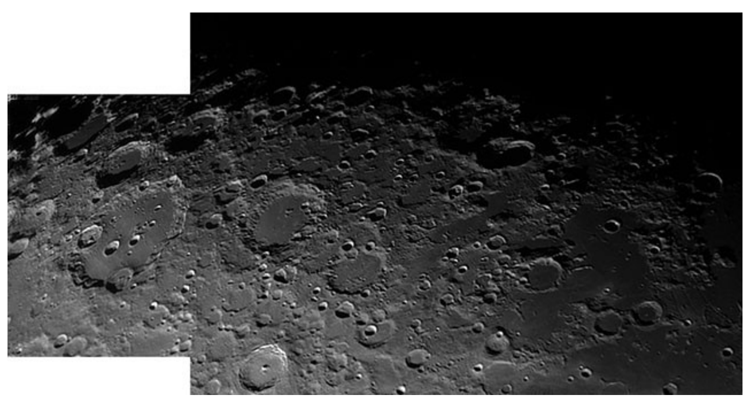
RECENT TOPOGRAPHICAL OBSERVATIONS

THEOPHILUS – Jerry Hubbell · Wilderness, Virginia USA.. September 10, 2017 01:32 UT. 0.15m refractor, f/16. Seeing 5/10, transparence 4/6, colongitude 141.2º. Point Gray Flea 3 GigE digital video, ..



TYCHO - Camilo Satler, Oro Verde, Argentina. October 7, 2017 06:29 UT. 250mm LX-200 SCT, Canon EOS Digital Rebel XS

CLAVIUS-LONGOMONTANUS
Michael Sweetman - Tucson, Arizona, USA, September 30, 2017 05:57 UT. Seeing 5-6/10, transparency 3/6. 4" Celestron refractor, f/20. Skyris 132M, Baader fringe killer filter.



BRIGHT LUNAR RAYS PROJECT

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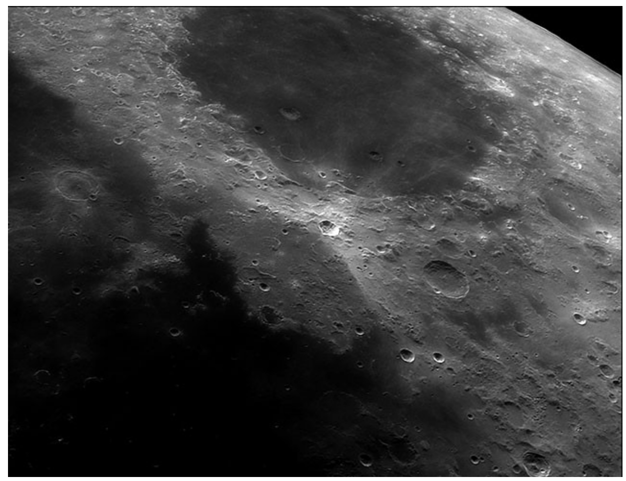
Assistant Coordinator – Jerry Hubbell –jerry.hubbell@alpo-astronomy.org

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

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

RECENT RAY OBSERVATIONS



PROCLUS- Howard Eskildsen, Ocala, Florida, USA. October 26, 2017 23:53, UT. 6" Refractor, f/8, 2x barlow, W-8 Yellow filter, DMK41AU02.AS.

Two Views of Proclus: These images are processed slightly differently to show the extent of the rays emanating from the small, bright crater at the central image. The bright, feather rays emanate from the hummocky-floored Proclus with an obvious zone of avoidance to the lower left of the crater. A large object collided with the moon at a very low angle creating the rays laterally and downrange from the point of impact, but none from the direction of approach. This is a very fascinating crater lying just below Mare Crisium which seems to look on impassively.

LUNAR GEOLOGICAL CHANGE DETECTION PROGRAM

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

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

Observations for September were received from the following observers: Jay Albert (Lake Worth, FL, USA - ALPO) observed: Alphonsus, Kies, Mons Lambert γ, Peirce, Plato, the South Pole region, Sasserides H, and Tycho. Alberto Anunziato (Argentina – AEA) observed: Aristarchus, earthshine, Plato, Proclus, and Vallis Schroteri. Thomas Bianchi and Liviano Betti (Italy – UAI) imaged the whole disk of the Full Moon. Maurice Collins (Palmerston North, New Zealand – ALPO/BAA/RASNZ) imaged: Alphonsus, Bullialdus, Copernicus, Plato, Theophilus, and several other features. Marie Cook (Mundesley, UK, BAA) observed: Lichtenberg, Macrobius, and Plato. Walter Elias (Argentina – AEA) imaged Alphonsus, Mare Crisium, and Theophilus. Valerio Fontani (Italy, UAI) imaged Copernicus, and the whole disk of the Full Moon. Les Fry (Elan Valley, UK, NAS) imaged Earthshine and the crescent Moon. Rik Hill (Tucson, AZ, USA – ALPO/BAA) imaged Hale and Mare Smythii. Franco Taccogna (St Petersburg, Russia – UAI) imaged the Full Moon. Aldo Tonon (Italy – UAI) imaged the disk of the Full Moon. Gary Varney (Pembroke Pines, FL, USA - ALPO) imaged Kies.

News: I would like to invite readers to take part in observations of the Geminid meteor shower impacting the Moon around December 13 (or over Dec 12-14). If you are interested, please contact the lunar impact flash coordinator, Brian Cudnik (bmcudnik @ gmail. com), or myself, as it would be great to increase the number of lunar impact flashes captured on video by amateurs. In particular it would be valuable scientifically to gather many simultaneous light curves. This could help in four ways: (a) it would improve the signal to noise ratio (photometric quality) of each flash recorded, (b) we could establish to what extent atmospheric seeing modifies the flash light curve, (c) if filters are used then we can determine the temperature of each flash, and (d) it could help to confirm that at least some impact flashes have measureable spatial extent. In order to participate you would need:

1. A telescope e.g. ~8" or thereabouts, whereby you can put a camera at Newtonian Focus, or a low F/No. focal point.
2. A Watec 902H camera (or something similar) – I bought an ex-Law Enforcement one, from E-Bay the other day for around $50, and it works fine, albeit has about 5 hot pixels, but these do not interfere with impact flash observations. Actually any monochrome camera capable of videoing at 25-30 frames per second (or faster) and can record stars down to magnitude 9-10 will work. Note that such cameras are also ideal for Lunar Occultation work!
3. Although you can observe in white light, a filter such as an R,G,B CCD filter or a Johnson U,B,V,R,I photometric filter would help us determine the color and blackbody temperature of the flash. Note that R or G from the first set, or V, R, I from the second set of filters are more, preferable because the flashes are brighter in red and near-IR light.
4. A 12V regulated DC power supply to plug into the back of the camera (Alternatively a battery holder will do if you get the right connector).
5. A composite video cable long enough to go from the camera into a video capture device.
6. A video capture device. I use a USB 2.0 AVI capture device costing about $50 from Amazon which captures raw video in monochrome fast enough on my laptop computer. Alternatively copy onto an old VHS tape recorder and digitize later, or an old Digital 8 Camcorder with a socket for analog video input and digital Firewire output. Please do not capture as MPEG e.g. DVD recorders as these destroy vital information in the video.
7. Impact flash detection software e.g. Lunarscan, or ALFI – the latter can be obtained by emailing me for a test version, and can work on the day side of the Moon too.

Jill Scambler (BAA), who is looking into LTP statistics, has emailed to say that she is busy plotting graphs of the frequency of LTP per crater.

LTP Reports: Herodotus: On 2017 Sep 02 UT 23:35-00:30 Alberto Anunziato (AEA) sighted visually, using a Meade EX 105 telescope at x154 and under 6/10 seeing, a light spot close to the “X” marked on the sketch in Fig 1 (Top Left). Alberto refers to it in his notes as a “dubious bright spot”, which was neither permanently, nor clearly visible, but more rather twinkling than steady, however it was not diffuse. After 00.00 UT it was more difficult to see. It had the appearance of something “atmospherical”, and coincided in position with the zones in which the shadow of the rim extended towards the center of Herodotus. Alberto’s sketch shows the spot slightly to the SE of the center of the crater, and there is a faint white spot in the area, which is normal, however it is odd that the visibility of the spot changed? Readers may be interested to know that the times of this observation coincided with repeat illumination sightings of a central pseudo peak by H.P. Wilkins (Fig 1 – Top Right) and one by Bartlett:

Herodotus 1950 Mar 30 UT 19:00? Observed by Wilkins (Kent, UK, 15" reflector) "Transient c.p. (similar phen. to Bartlett's in later yrs.? see #532). NASA catalog weight=4. NASA catalog ID #523. ALPO/BAA weight=3.

Herodotus 1971 Jul 05 UT 03:48 Observed by Bartlett (Baltimore, MD, USA) described in the NASA catalog as: Pseudo-c.p. I=4(albedo) appeared to cast a distinct shadow. 1st time seen. (Apollo 15 photo shows an apparent slight elev. nr. center -- very very low hills? 5" reflector x79, 283x, NASA catalog weight=1. ALPO/BAA weight=2.

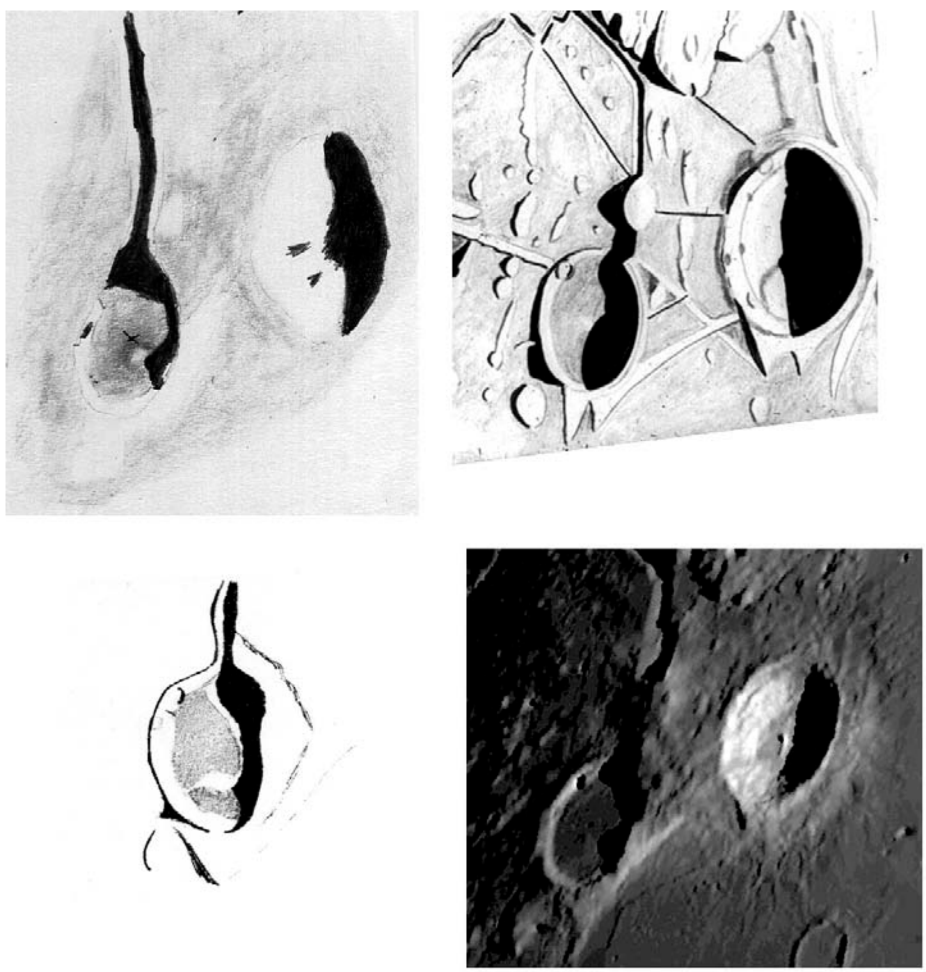


Figure 1. Herodotus orientated with north towards the top. **(Top Left)** A sketch by Alberto Anunziato (AEA) made on 2017 Sep 02 UT 23:35-00:30. **(Top Right)** A 1950 Mar 30 UT 19:00 sketch by H.P. Wilkins (BAA). **(Bottom Left)** A 1954 Sep 10 UT 02:00 sketch by E.J. Reese (ALPO). **(Bottom Right)** An ALVIS visualization of what Herodotus/Aristarchus would have looked like during H.P. Wilkins observation from 1950 Mar 30. Note that LTVT has similar visualization functionality to ALVIS and is available from: https://ltvt.wikispaces.com/LTVT+Download

The 1950 Wilkins and the 1971 Bartlett spots were more central than Alberto's spot. But there is a sketch (Fig 1 –Bottom Left) by E.J. Reese in 1954 Sep 10, UT 02:00 which does have a strong resemblance to what Alberto has drawn. Fig 1 – Bottom Right is an ALVIS visualization of what H.P. Wilkins should have seen back in 1950, and again shows a slightly lighter patch on the floor of Herodotus, just SE of the center. I am assigning a weight of 1 to Alberto's observation because although a light spot on the SE floor is normal, it is perhaps unusual for it to become less noticeable over a short time – though Alberto does mention that he had interference from clouds at intervals. Based upon what I have seen from Fig 1, I am beginning to wonder if the central pseudo peak mystery of Herodotus could be explained away simply by inaccuracies in sketches made by Wilkins, and the description by Bartlett, mistakenly placing the light spot at the center of the floor of the crater and not slightly further to the SE?

Routine Reports: Below is a selection of reports received for June-July that can help us to re-assess unusual past lunar observations.

East of Kies: On 2017 Sep 01 UT 00:41 Gary Varney (ALPO) Imaged this area under the same illumination conditions (to within ±0.5°) to a report from Canada in 1984:

On 1984 Jun 09 at UT 04:55-05:14 P. Jean (Outremont, Canada) detected in the dark side of the Moon, a few km east of Kies crater, a bright point that should not be poking out of the shadow (according to Foley). The Cameron 2006 catalog ID=244 and the weight=3. The ALPO/BAA weight=2.

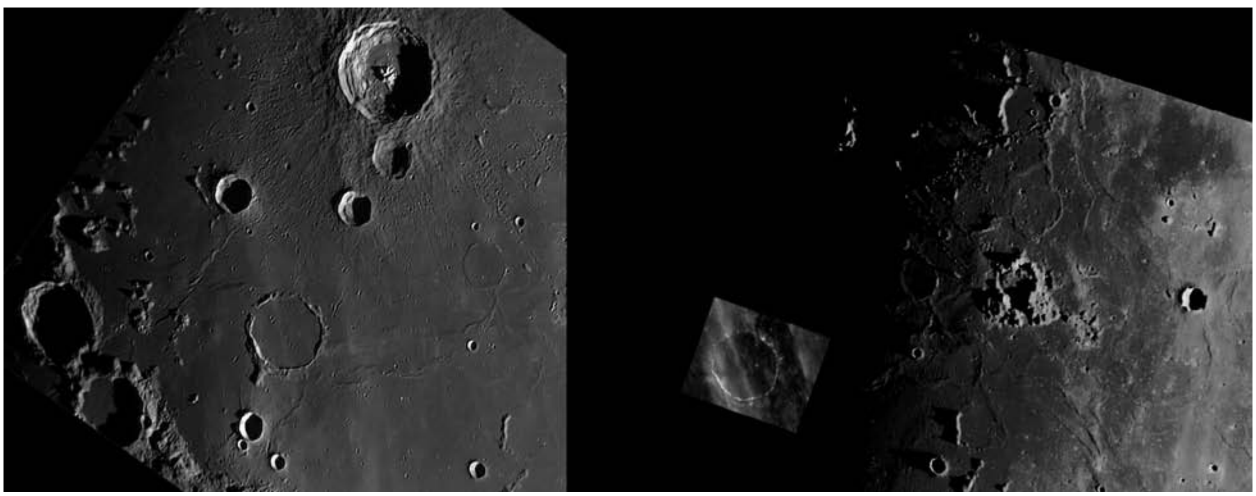


Figure 2. The ring crater Kies, just below center in these images, with north towards the top right**. (Left)** An image by Gary Varney (ALPO) taken at 00:41 UT**. (Right)** An ALVIS visualization (LTVT has similar functionality to ALVIS and is available from: https://ltvt.wikispaces.com/LTVT+Download) of what the region would have looked like in terms of illumination on 1984 Jun 08 UT 05:14, but extending further to the east. Note that as Kies is not visible, an insert, from the Clementine UVVIS image mosaic has been included for reference purposes.

Gary's image (Fig 2 - Left) shows no obvious sign a bright point a few km east of Kies, and the night side of the Moon was well to the west of Kies. Jay Albert managed a visual check that night, and also comments that: the terminator was far way to the west, at approximately 160 km. He could not see anything unusual to the east, but could see *"a bright peak about 10km W of the volcanic dome a little W of Kies, but it was in sunshine and nowhere near the terminator"* – you can see this in Fig 2 (Left). In view of this I checked to see what we had in the ALPO/BAA archives and unfortunately found nothing other than a mention in the BAA Lunar Section Circular from 1984 Jul, p2 which states: *"There is one report that should be commented upon:- Pierrette Jean of Outremont, Canada has sent a drawing made between 04.55 – 05.15 UT 1984 June 9th. Seeing II. In darkened zone a few miles east of Kies, a bright point. (PWF comment, at position given on drawing there would appear to be no feature of adequate elevation to give such an effect although there are some domes present)".*

So could this be an error by Pierrette Jean perhaps getting the date wrong? Fig 2 (Right) shows what the area should have looked like on 1984 Jun 08, one day earlier than the reported LTP. Indeed Kies is now on the night side of the Moon shadow. However there is no sign of any obvious bright spots a few km to the east, just a few faint craters and small mountains. In view of the uncertainty as to the date, I will reduce the weight of the 1984 report from 2 to 1, at least until we can find the missing sketch of the report and verify the date?

Tycho: On 2017 Sep 01 UT 01:24-01:55 Jay Albert (ALPO) imaged and visually observed Tycho about 22 minutes before a similar illumination window (of ±0.5°) for an observational report from Italy in 1998:

Tycho 1998 Feb 06 UT 22:48-22:54 R. Braga (Corsica (MI), Italy, 102mm f8.8 refractor, x180, with diagonal, Wratten 23A, 80A and an OR5 filter, seeing II, Transparency good). Observer noticed that the floor darkened towards the NW (IAU), particularly with the blue Wratten 80A filter. The ALPO/BAA weight=2.

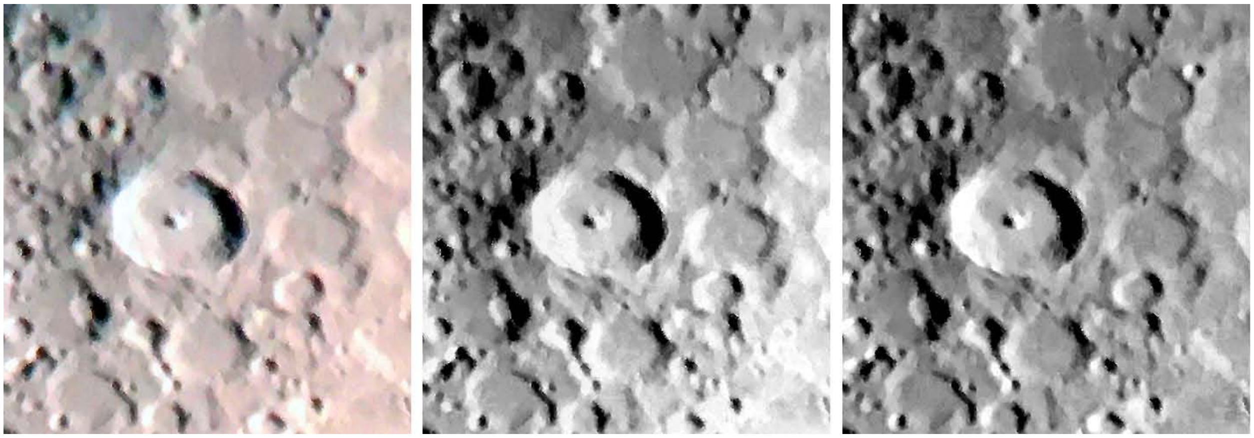


Figure 3. A cellphone snapshot of Tycho by Jay Albert, taken on 2017 Sep 01 UT 01:24, orientated with north towards the top. **(Left)** The color image, with color saturation increased to 60%. **(Center)** The red channel image. **(Right)** The blue channel image.

Jay comments that visually Tycho's floor darkened to the NW of the central peak when viewed without filters, in white light. However in Wratten 25 (red) and 44A (blue/green) filters, the floor appeared to darken more through the blue/green filter, thus confirming Braga's description. Jay was using a Celestron 6" NexStar SCT at x214, under transparency 3rd magnitude and 7-8/10 seeing conditions. A cell phone image was captured and is shown in Fig 3 and confirms that the floor is slightly darker towards the NW, however when examining red and blue channels of the image, it is not at all apparent that the NW floor is darker still in blue light, however this maybe down to the color sensitivity and image noise in the cell phone image? I think as Jay saw a visual darkening effect in blue light and that was what was seen by Braga, that we will lower the weight down to 1, at least until we can obtain a color image confirming this.

Full Moon: On 2017 Sep 05 UT 17:47-22:06 by UAI observers: Franco Taccogna, Thomas Bianchi and Liviano Betti, Valerio Fontani, and Aldo Tonon imaged the Moon (See Fig 4) under the requested range of selenographic colongitudes given on the Lunar Schedule web site:

ALPO Request: Please take images of the Full Moon, but make sure you under expose as we want to avoid bright ray craters like Aristarchus, Tycho, Proclus etc from saturating. The purpose behind this is we want to compare with images of Earthshine which are essentially zero phase illumination images, like at Full Moon. There have been reports in the past that Aristarchus varies greatly in brightness compared to other features. David Darling (a past LTP coordinator) has suggested this was simply due to libration effects, i.e. viewing angles, so we would naturally like to test this theory out. Also if you have any past images of close to Full Moon, please send these in too if the above mentioned craters are not saturated. Pretty much any size telescope can be used to take these images so long as we can clearly see the above craters. Obviously do not attempt this if the sky is cloudy or hazy. Observations will be presented in the "Lunar Observer" - a monthly publication of the Lunar Section of ALPO. All reports should be emailed to: a t c @ a b e r . a c . u k

We have been running this Full Moon project for some time now. Interestingly the images taken in September have some similarities with those made in November 2016 in the January newsletter, in terms of crater brightness. Namely the bright patch near the crater, Hell, remains one of the highest albedo areas on the Moon, and the reference area of Plato is the darkest of the limited number of craters used in the study. Surprisingly Aristarchus is not the brightest crater on the Moon, and is outflanked by Tycho, Censorinus, and Proclus, except in blue light (6% brighter than in red or green), where it appears clearly brighter than Tycho.

Figure 4. Images of the Full Moon taken by UAI observers on 2017 Sep 05 under a range of image resolutions, taken through telescopes unless specified otherwise. These are orientated with north towards the top. **(Top Left)** 17:47 UT: A color image (Supplied JPEG image scale = 14.9 km/pixel) by Franco Taccogna, taken, using a Nikon D7100, f=105mm, f/8 lens, with a 1/1000th sec exposure. **(Top Center)** 20:23 UT: A color image (Supplied JPEG image scale = 3.3 km/pixel) by Thomas Bianchi and Liviano Betti, taken through a Zen APO f/10 15cm aperture refractor. **(Top Right)** 21:17 UT: A color image (Supplied JPEG image scale = 2.2 km/pixel) by Valerio Fontani. **(Bottom Left)** 21:19 UT: A monochrome image (Supplied JPEG image scale = 2.2 km/pixel) taken through an IR Pass Band 685 nm filter by Aldo Tonon. **(Bottom Right)** UT 22:06: A color image (Supplied JPEG image scale = 6.2 km/pixel) taken by Aldo Tonon.

Looking at the normalized set of photometric readings graph in Fig 5, you might be mistaken for thinking that the craters measured are varying considerably in apparent brightness, however this is almost certainly not the case because the images taken were provided at different image scales, and the 21:19UT image was not an RGB image at all, but taken in the near IR. Image resolution has quite a dramatic effect on bright small features in that it blurs the central bright area over the darker surrounds. This explains why points are more bunched together in the 17:47 and 22:06 images. When comparing Full Moon images in future, we need to make sure we use images of similar resolution, or downgrade high resolution images to the lowest resolution used. The 685nm near IR passband filter measurements (21:19UT) have been placed into the red light plot in Fig 5 (Left) as this seemed the closest waveband to put them into, though as you can see from the plot it is quite likely that some color differences between red and near IR are showing up and causing the big step with respect to the previous 21:17UT image taken in red light. So again in future we must always compare images in the same waveband. In terms of relative brightness, in green light (ignoring the two lower resolution images, and the near IR image) the brightest of the seven craters selected is the spot near Hell, or Censorinus, followed by Proclus, Tycho, Aristarchus, Kepler and Plato. This exercise has been interesting as it has highlighted issues over resolution, waveband, and I even found difficulty in deciding which parts of each crater to measure. It illustrates how purely visual estimates of the relative brightness of craters, in the past, would have been very subjective, and difficult to compare. However we shall persist and come up with a set of rules/instructions on how to compare crater brightness in different images in future.

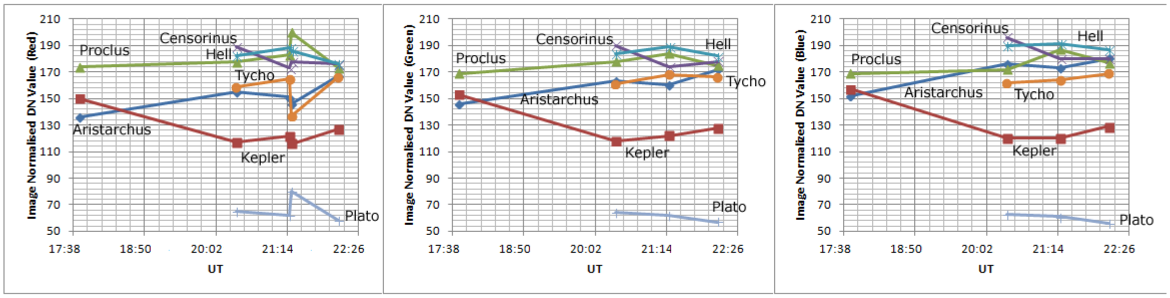


Figure 5. Plots of normalized (Crater brightness values least square fitted to a mean of each crater) crater brightness measurements, versus UT, as measured in three different wavebands. Please do not pay too much attention to the lines fitted between points, these are here purely to help identify the craters and give an approximate idea of the relative brightnesses. Further details and analysis are contained in the text. **(Left)** Red crater brightness and one 656nm pass band set of measurements at 21:19UT. **(Center)** Green crater brightness crater measurements. **(Right)** Blue crater brightness measurements.

Lichtenberg and Macrobius. On 2017 Sep 08 UT 21:50-22:00 (Lichtenberg) and 22:00-22;10 (Macrobius) Marie Cook, examined these craters visually at x80 with a 9cm Questar telescope under Antoniadi II-III seeing and good transparency conditions. The illumination and topocentric libration (viewing angle) for both were within ±1° to the following two observational reports:

Lichtenberg Area 1940 Oct 19 UT 07:11 Observed by Barcroft (Madera, CA, 6" reflector) Pronounced reddish-brown or orange color. Less marked than previous night, & slight on 22nd. See #'s 477; 478". NASA catalog weight=3. NASA catalog ID #476. ALPO/BAA weight=2.

Macrobius 1971 Mar 15 UT 02:07-03:15 Observed by Sparks (Exmouth, UK, 6" reflector x400) "Strong pink color extending whole curve of crater's illum. wall, starting & ending in shadow side. Color grew deeper, then faded & ended at 0315h. Changed eyepieces. No other feature had this tho. looked for. Survived many separate powers of eyepieces."NASA catalog weight=2. NASA catalog ID #1289.ALPO/BAA weight=2.

Marie had a very close look at both of these craters, but could not see any of the colors described. We shall therefore leave their weights as they are for now.

Earthshine: On 2017 Sep 19 at 05:13 UT Les Fry (NAS) imaged the earthshine under a similar lunar phase to a limb ring effect that Dr Martin Hoffmann mentions in his EPSC conference abstract. Fig 6 (Right) shows up the earthshine limb of the Moon quite well. Compare it with Fig 1 in the above abstract and see what you think? As mentioned in earlier newsletters, I have some doubts about the dusty exosphere theory presented in the EPSC abstract (for many reasons), but we will persist with some repeat illumination observations for the next few months in order to better understand earthshine limb/image noise effects.

Figure 6. The Waning thin crescent Moon on 2017 Sep 19 UT 05:13, taken by Les Fry (NAS) using a Canon 1100d & 300mm lens with a ¼ sec exposure on a setting of ISO 800. North on the Moon is towards the top left. **(Left)** Raw image. **(Right)** Color and contrast enhanced image.

Mare Crisium: On 2017 Sep 23 UT 22:10-22:30 Walter Elias (AEA) imaged and observed, using an Celestron CPC 1100), the area under similar illumination (to within ±0.5°) of a LTP report from 1969:

SE edge of Mare Crisium 1969 Jul 17 UT 20:00 Observed by Hedervari, Hegyessy, Geller (Budapest, Hungary, refractor x200 & x300) "Saw a "mediocre" yellow light. Area photographed on 7/19/1969 but no LTP noted (Apollo 11 watch)" NASA catalog weight=4. NASA catalog ID No. 1153. ALPO/BAA weight=3.

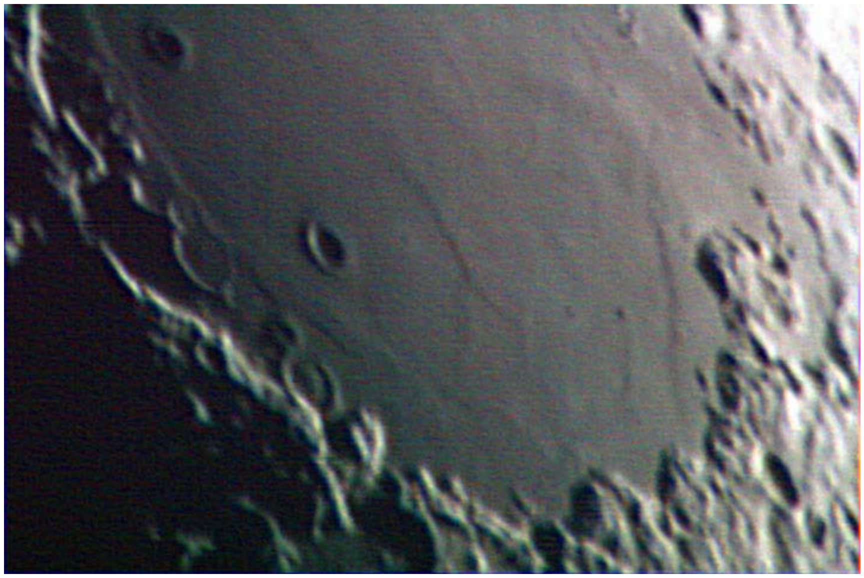


Figure 7. Mare Crisium as imaged by Walter Elias (AEA) on 2017 Sep 23 UT 22:10 and orientated with north towards the top left. This image has had atmospheric spectral dispersion removed, and has had its color saturation increased to 60%.

Despite color enhancement, no "mediocre yellow light can be seen on the SE edge of Mare Crisium in the excellent image shown in Fig 7. The fact that the Hungarian observers were using a refractor in 1969 might suggest chromatic aberration as a cause, and they have not made any mention of checks with filters. Also the Cameron report says that it didn't show up on a photograph taken on that date. We shall therefore lower the weight from 3 to 2 to compensate for these issues.

Alphonsus: On 2017 Sep 28 UT 09:25 Maurice Collins imaged Alphonsus within similar illumination (to within ±0.5°) of a LTP report from 1958:

Alphonsus: On 1958 Nov 19 UT 04:00-04:30 H.F. Poppendiek, and W.H. Bond, San Diego, CA, USA, using a 6" f/8.7 Newtonian (x370), saw a large plume-like diffuse cloud over central peak, very large compared to central peak (@ approx 32km diameter) with intensity much different from other parts. Brightness between walls and shadowed floor. Would take 3 minutes to collapse, so continuously fed. 13-14 days later, at SS, central peak was normal. Kuiper took photos after Kozyrev's observations, but saw nothing abnormal. Drawing. Haas saw nothing in 12inch reflector at the time. Cameron 1978 catalog LTP ID=705 and weight=4.

Maurice's image (ALPO/BAA/RASNZ) can be seen in Fig 8 (Top Left) and as a comparison, you can view a sketch (Top Right) that was illustrated for the Poppendiek and Bond LTP report in 1958 for the Publications of the Astronomical Society of the Pacific, p233-235 & p253. In this 1958 illustration, the background photograph was not from the same date/time, but included to show where the location of the cloud had been seen, and its extent. Going back through our archives I found some other observations under similar illumination, one by Rik Hill (ALPO/BAA) shown in the bottom right, and a sketch by Raffaello Lena (GLR), in the bottom right. These are all within the thirty minute observing window, in terms of Selenographic Colongitude that Poppendiek and Bond report their LTP over, namely 4.6° to 4.9°. A little bit of further information can be gleaned from the PASP report, namely that the effect did not change during the observation, it obscured the central peak and associated craterlet, and had a uniform brightness somewhere between that of the sunlit rim of Alphonsus and the back shadowed floor. Poppendiek regarded himself as having 20 years experience in observing the Moon. In the same PASP journal, but on p234, Walter Haas writes that he too was observing Alphonsus that night, from 03:20-

05:20UT, on and off (never away from the scope for more than 20-25 min at a time) using a 12” reflector at x303. At 03:20 Walter observed Alphonsus and noted that little but the central peak appeared in sunlight, and by 05:30UT two thirds of the floor was in sunlight. From Walter’s viewpoint, although he was not observing Alphonsus continuously, he was pretty sure that he would have seen anything unusual if it had occurred. I shall therefore lower the weight, but in view of the fact that modern repeat illumination images/and sketch do not replicate exactly what was seen in 1958, nor explain the apparent obscuration of the central peak, we will still keep this on the LTP database, but now with a weight of just 1.

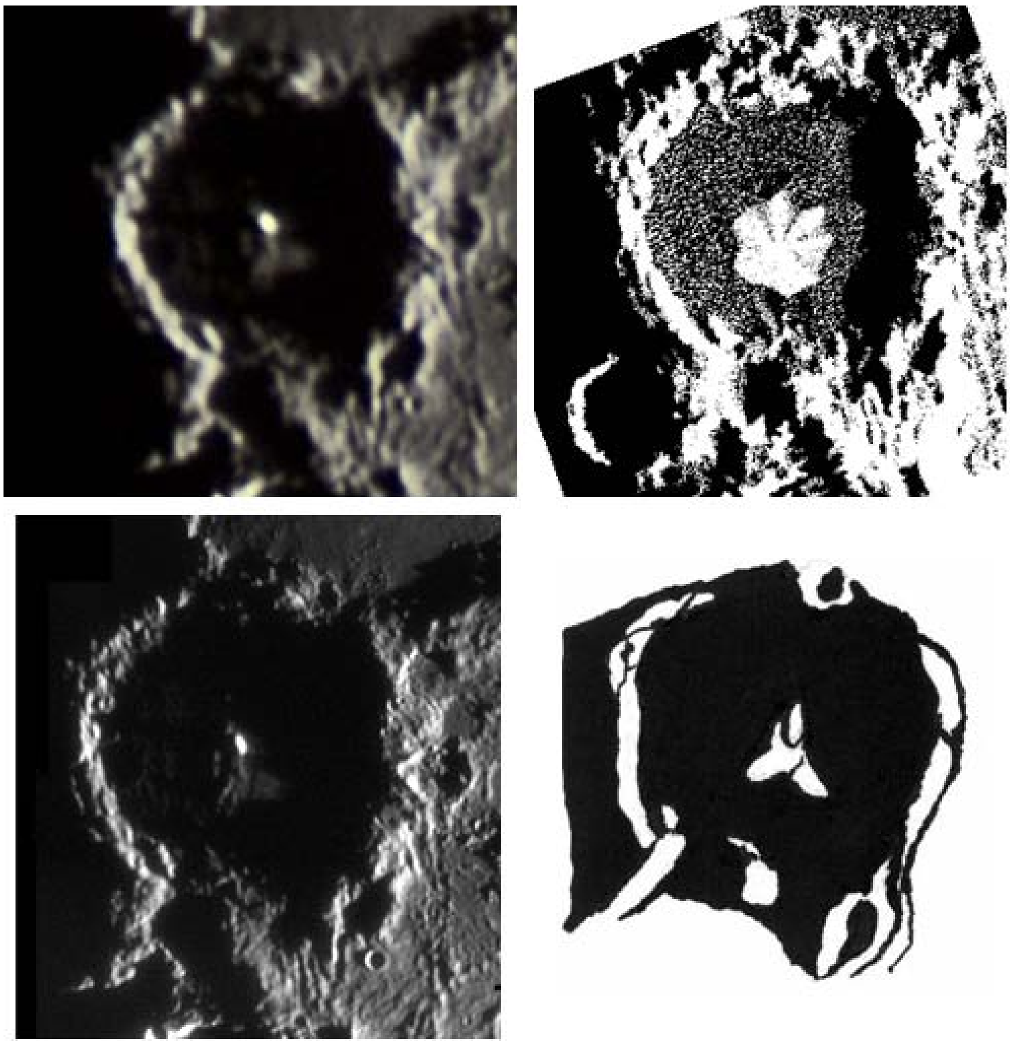


Figure 8 Alphonsus as orientated with north towards the top. **(Top Left)** Imaged by Maurice Collins on 2017 Sep 28 UT 09:25. **(Top Right)** A sketch related to the 1958 Nov 19 UT 04:00-04:30 LTP showing the location of a cloud like LTP around the central peak – note that the background shadows are from a photograph from another date/UT and do not reflect where the shadows would have been. **(Bottom Left)** An image by Rik Hill (ALPO/BAA) from 2012 Mar 01 UT 01:51. **(Bottom Right)** A sketch by Raffaello Lena (GLR) from 2001 Oct 24 UT 21:20.

General Information: For repeat illumination (and a few repeat libration) observations for the coming month - these can be found on the following web site: http://users.aber.ac.uk/atc/lunar_schedule.htm . By re-observing and submitting your observations, only this way can we fully resolve past observational puzzles. To keep yourself busy on cloudy nights, why not try “Spot the Difference” between spacecraft imagery taken on different dates? This can be found on: http://users.aber.ac.uk/atc/tlp/spot_the_difference.htm . If in the unlikely event you do ever see a LTP, firstly read the LTP checklist on http://users.aber.ac.uk/atc/alpo/ltp.htm , and if this does not explain what you are seeing, 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 LTP alerts can be accessed on

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KEY TO IMAGES IN THIS ISSUE

1. **Alphonsus**
2. **Arago**
3. **Bullialdus**
4. **Byrgius**
5. **Carrel=Jansen B**
6. **Clavius**
7. **Copernicus**
8. **Dorsa Smirnov**
9. **Gassendi**
10. **Hale**
11. **Herodotus**
12. **Janssen**
13. **Kepler**
14. **Kies**
15. **Mare Cognitum**
16. **Mare Crisium**
17. **Mare Humorum**
18. **Mare Imbrium**
19. **Mons Pico**
20. **Mons Rumker**
21. **Montes Apenninus**
22. **Montes Haemus**
23. **Proclus**
24. **Rupes Recta**
25. **Schiller**
26. **Sinus Aestuum**
27. **Sinus Iridum**
28. **Theophilus**
29. **Tycho**