ASSOCIATION OF LUNAR & PLANETARY OBSERVERS
ALPO
Founded in 1947

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 – AUGUST 2018

MAESTLIN

Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
February 27, 2018 01:55-02:55 UT, 15 cm refl, 170x,
seeing 8-7/10, transparency 6//6.

I sketched this crater and vicinity on the evening of Feb. 26/27, 2018. This area is in Oceanus Procellarum west of Encke. Maestlin itself is a modest, crisp crater northeast of a broken ring. The very similar crater to the west is Maestlin H. The two largest peaks between these craters are Maestlin mu and nu. A tiny peak is just west of nu. More tiny peaks are strung out north of Maestlin. This sketch is actually dominated by the aforementioned broken ring which is Maestlin R. This feature is a collection of peaks and ridges arranged in a half circle. There is nothing remaining of any southwest rim. Maestlin lambda is probably the nearest peak due south of Maestlin, but its neighbor to the south shows darker shadowing. Maestlin iota is the large ridge farther to the south. Two short ridges protrude from the southern end of Maestlin iota in a rabbit ears fashion. A large peak and ridge, not connected with Maestlin R, is south of iota, and two short ridges and a bright spot are in this area. A large curved ridge, not shown on the Lunar Quadrant map, is south of Maestlin mu. This is a remnant of the northwest rim of Maestlin R. Several smaller peaks are nearby. There are several vague bright patches in this area. One such patch in the northern end of Maestlin R shows weak shading indicating a low elevation. There is also a fuzzy strip of shadowing inside the east side of Maestlin R. The small pit southwest of Maestlin R is Maestlin G, and a tiny isolated peak is between this pit and Maestlin iota.

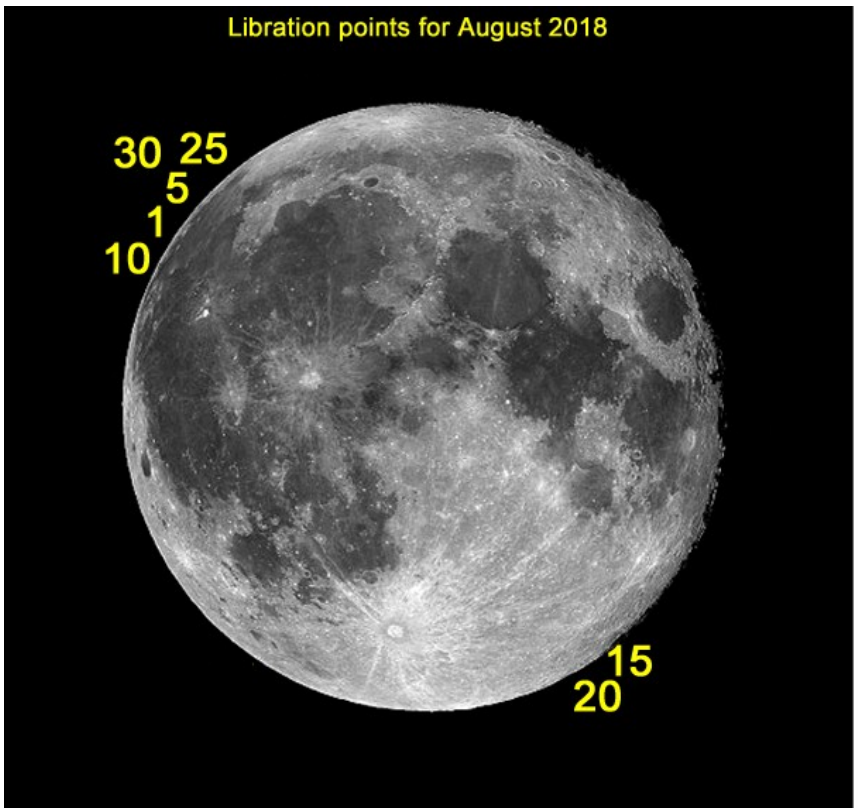
LUNAR CALENDAR

2018	U.T.	EVENT
Aug 04	18:18	Last Quarter
08	22:33	Moon Extreme North Dec.: 20.8° N
10	13:40	Moon Ascending Node
10	18:05	Moon Perigee: 358100 km
11	09:47	Partial Solar Eclipse
11	09:58	New Moon
14	13:35	Moon-Venus: 6.4° S
17	10:38	Moon-Jupiter: 4.8° S
18	07:49	First Quarter
21	09:55	Moon-Saturn: 2.4° S
22	02:58	Moon Extreme South Dec.: 20.8° S
23	011:23	Moon Apogee: 405700 km
24	04:51	Moon Descending Node
26	11:56	Full Moon

2018	U.T.	EVENT
Sep 03	01:37	Last Quarter
05	06:56	Moon North Dec.: 20.8° N
06	22:42	Moon Ascending Node
08	01:21	Moon Perigee: 361400 km
09	18:01	New Moon
14	02:21	Moon-Jupiter: 4.6° S
16	23:15	First Quarter
17	16:46	Moon-Saturn: 2.3° S
18	09:35	Moon Extreme South Dec.: 20.9° S
20	00:54	Moon Apogee: 404900 km
20	09:30	Moon Descending Node
25	02:53	Full Moon

LUNAR LIBRATION

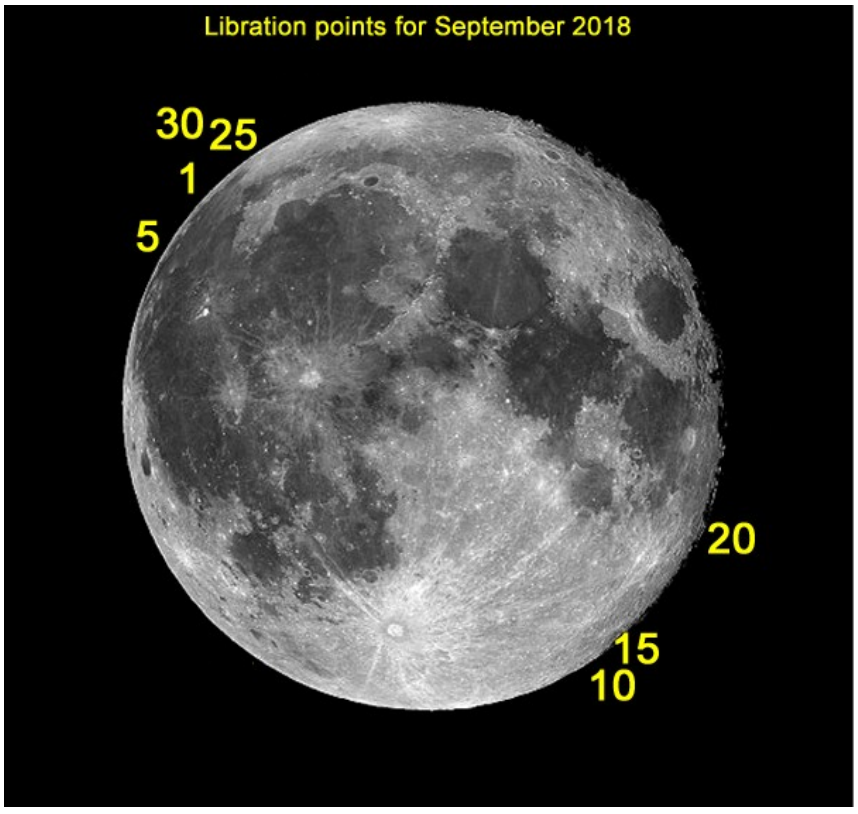
AUGUST-SEPTEMBER 2018



Size of Libration

08/01	Lat +05°08'	Long -05°52'
08/05	Lat +06°45'	Long -07°23'
08/10	Lat +01°01'	Long -01°27'
08/15	Lat -06°12'	Long +06°31'
08/20	Lat -05°12'	Long +05°31'
08/25	Lat +01°09'	Long -01°09'
08/30	Lat +06°23'	Long -05°57'

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



Size of Libration

09/01	Lat +06°42'	Long -06°26'
09/05	Lat +03°10'	Long -04°13'
09/10	Lat -04°48'	Long +03°20'
09/15	Lat -06°04'	Long +06°32'
09/20	Lat -00°31'	Long +01°04'
09/25	Lat +05°31'	Long -04°29'
09/30	Lat +05°35'	Long -04°45'

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.

SUBMISSION THROUGH THE ALPO IMAGE ARCHIVE

ALPO's archives go back many years and preserve the many observations and reports made by amateur astronomers. ALPO's galleries allow you to see on-line the thumbnail images of the submitted pictures/observations, as well as full size versions. It now is as simple as sending an email to include your images in the archives. Simply attach the image to an email addressed to

lunar@alpo-astronomy.org (lunar images).

It is helpful if the filenames follow the naming convention which, for the lunar gallery is:

FEATURE-NAME_YYYY-MM-DD-HHMM.ext

YYYY {0..9} Year
MM {0..9} Month
DD {0..9} Day
HH {0..9} Hour (UT)
MM {0..9} Minute (UT)
.ext (file type extension)
(NO spaces or special characters other than "_" or "-")

As an example the following file name would be a valid filename:

Copernicus_2018-04-25-0916.jpg
(Feature Copernicus, Year 2018, Month April, Day 25, UT Time 0916)

Additional information requested for lunar images (next page) should be included on the image. Alternatively, include the information in the submittal e-mail, and/or in the file name (in which case, the coordinator will superimpose it on the image before archiving). As always, additional commentary is always welcome and should be included in the submittal email, or attached as a separate file.

If the filename does not conform to the standard, the staff member who uploads the image into the data base will make the correction prior to uploading the image(s). However, if they come in the recommended format, it would reduce the effort to post the images a lot.

Observers who submit digital versions of drawings should scan their images at a resolution of 72 dpi and save the file as a 8 1/2' x 11? or A4 sized picture.

Finally a word to the type and size of the submitted images. It is recommended that the image type of the file submitted be jpg. Other file types (such as png, bmp or tif) may be submitted, but may be converted to jpg at the discretion of the coordinator. Use the minimum file size that retains image detail (use jpg quality settings. Most single frame images are adequately represented at 200-300 kB). However, images intended for photometric analysis should be submitted as tif or bmp files to avoid lossy compression.

Images may still be submitted directly to the coordinators (as described on the next page). However, since all images submitted through the on-line gallery will be automatically forwarded to the coordinators, it has the advantage of not changing if coordinators change.

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-hhmm or yyyy- mm-dd-hhmm)
Filter (if used)
Size and type of telescope used Magnification (for sketches)
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 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: Apollo 17 Region—Sea of Serenity

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 **September 2018** edition will be the **Apollo 17 Region—Sea of Serenity** 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 Apollo 17 Region—Sea of Serenity article is August 20, 2018

FUTURE FOCUS ON ARTICLES:

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

Subject	TLO Issue	Deadline
Apollo 16 Region – Descartes and Cayley Plains	November 2018	October 20, 2018
Apollo 15 Region – Mare Imbrium and Hadley Rille	January 2019	December 20, 2018
Apollo 14 Region – Fra Mauro	March 2019	February 20, 2019
Apollo 12 Region – Ocean of Storms	May 2019	April 20, 2019
Apollo 11 Region – 50th Anniversary – Sea of Tranquility	July 2019	June 20, 2019

ARAGO B & C

Alberto Anunziato

In the proximity of the terminator, and while making observations for the Lunar Geological Change Detection Program, I contemplated the landscape in the vicinity of Arago. Further to the north, in the area not included in this sketch (fig. 1), Arago Alpha and Arago Beta domes appeared in all their magnificence, which was an indication of the good seeing of the moment and an incentive to sharpen the view in search of details. Arago C, in the center of the image, is a small craterlet barely 3 kilometers in diameter. At the time of the observation it seemed obvious that it was a small crater because of its very dull glow. However, it projected a very defined and prolonged shadow (which caught my attention enough to make a detailed observation), with a triangular shape. Looking for the scant information about Arago C available to amateur astronomers, I found the website of the.moon.wikispaces about Arago (https://the-moon.wikispaces.com/Arago) which mentions that Arago C " was twice depicted as a hillock by Harold Hill's book A Portfolio of Lunar Drawings. On page 6 Mr.Hill says: -The small object lying just NE of Arago B was twice depicted as a hill and yet it has been observed as an unmistakable craterlet at other times! ". Remembering my observation, the confusion is plausible, since the shadow projected by Arago C seems much longer than could be projected by the walls of such a small crater, in addition to presenting that triangular shape shadow resembling the shadow that would project an isolated peak: "Seeing can play some strange tricks with interpretation and I have found under a low lighting that the bright sun-facing inner walls of craterlets can sometimes be mistaken for hills", in words of Harold Hill.

FIGURE 1*.** ***Arago B & C*- Alberto Anunziato Paraná, Argentina. May 20, 2018 22:00-22:30 UT. Seeing 8/10. Meade EX105, 154x..*

On the left, we observe Arago B and Manners, casting shadows to the west and with their interior completely dark. The southern end of the drawing is occupied by the outer walls of Sabine and Ritter, illuminated at the border of the terminator. In the center, slightly to the left, we can distinguish what at first seemed to me a dorsa system, by the appearance of pronounced shadows and illuminated parts. In the aforementioned website they are called "Piero Leonardi Arcuate Fractures". These archuate rilles are visible in the images of the Lunar Orbiter (Plate 218 of the Lunar Orbiter Photographic Atlas of the Moon, Bowker and Hughes, Langley Research Center, 1971) and in those of the Lunar Reconnaissance Orbiter. It is interesting to note the bright areas on the floor of Mare Tranquilitatis that are distinguished in the lower part of the drawing, especially between Manners and the arcuate rilles.

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HAIL CAESAR!

Rik Hill

As the first of the Twelve Caesars (a book by Gaius Suetonius Tranquillus) and the general that united the beginnings of the Roman Empire that changed world history, Gaius Julius Caesar certainly deserved to be recognized on the moon with the 94 km diameter crater can be seen just above center in this image. In fact, he is the ONLY one of those Twelve Caesars that has been so honored most of them falling short of being honorable! Caesar has an interesting unnamed valley on its north side with Julius

Caesar G in the center and below is the beautiful graben-like rille Rima Ariadaeus, some 226km long, partly in darkness here.

At the top of the image (fig. 1) we see the southern portion of Mare Serenitatis with the 27km diameter crater Menelaus on the shore. Just above this crater you'll see a nice dome on one of the Rimae Menelaus. Straight east or right of Julius Caesar is another very nice 27km crater, Arago. This has a nice distinctively terraced interior that makes it easy to identify. Just above this crater and also to the west are two more catalogued domes well shown here. Between Arago and Julius Caesar is a nice system of rills, Rimae Sosigenes, with Sosigenes itself being the 19km diameter crater just east of Caesar.

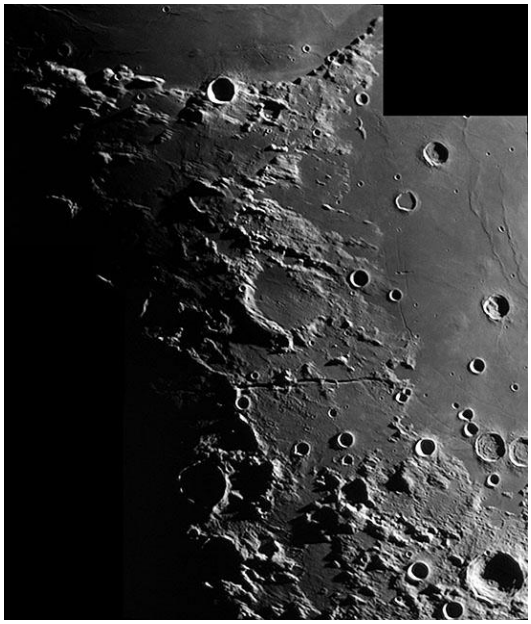

FIGURE 1*.** ***Julius Caesar- *Richard Hill – Tucson, Arizona, USA June 20, 2018 02:46UT. Seeing 8-9/10. Colongitude 349.7°. TEC 8" f/20 Mak-Cass, 610 nm filter, SKYRIS 445M.*

In the lower left corner is another well terraced crater, Delambre (54km). Above it are the twin craters Sabine (32km) and Ritter (31km, partial). Lastly the shadow filled crater below Rima Ariadaeus right on the terminator is Agrippa (48km), just a circle of light as the sun catches the very tops of the crater walls.

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Deslandres and the Plains of Hell

David Teske

Deslandres is the huge crater in the center of the image (fig. 1) northeast of Tycho and south of the Straight wall. Though it has always looked like a giant crater to me, Deslandres is so poorly preserved that few observers recognized it as a crater until the 20th century. With a diameter of 256 km, it is about the same size as Bailly, of the southwestern lunar limb (fig. 2). Perhaps because it is so large and battered, Deslandres escaped notice for such a long time. Because it contains the conspicuous 33 km diameter crater Hell, the broader crater was referred to as Hell Plain.

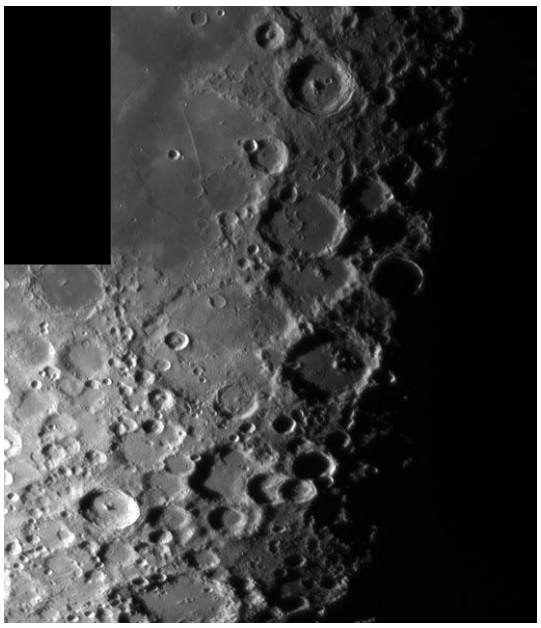

FIGURE 1*.** ***Deslandres *– David Teske, Louisville, Mississippi, USA, 05 July 2018 09:44 UT. Colongitude 173.8 degrees, seeing 7/10, Celestron 8, zwoASI120mms camera,*

Deslandres is an ancient giant crater of Pre-Nectarian age, 4.6 to 3.92 billion years old named after the French solar astronomer Henri Deslandres who lived from 1853-1948. Because of its size, Deslandres could have been a small basin, but it lacks any evidence of concentric outer ramparts and no gravitational anomaly

typical of a basin. Deslandres is very shallow, so perhaps it does have an inner ring that lies under volcanic flows or impact ejecta. The floor of Deslandres has a slight rise to its central region, perhaps a hint of some volcanic uplift from below.

Hell, named after Maximiliam Hell, the Hungarian astronomer who lived from 1720 to 1792 is a 2,200 m deep crater on the floor of Deslandres. It has a dark floor composed of a mass of ridges and an offset, somewhat pyramidal central peak 900 m tall. Hell is a Triesnecker-class crater with smooth interior walls and a slump-filled floor. The northwestern half of the crater has undergone major changes due to slumping, while the southeastern floor avoided slumping. None of its original floor can be detected. Hell overlaps a larger, older crater whose northern wall is gone. The floor of this crater is nearly filled by material of the same texture of Deslandres.

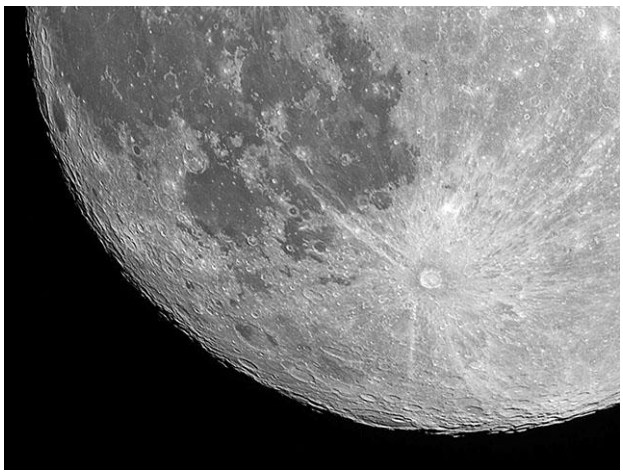

FIGURE 2. Deslandres *– David Teske, Louisville, Mississippi, USA, 29 April 2018 at 0733 UT Colongitude 74.3 degrees, seeing 8/10, 4 inch APO refractor, zwo ASI120mms,*

On the southeastern wall of Deslandres lies the 63 km diameter crater Lexell which seems to be a subsidence feature. As such, Lexell forms a prominent bay in the southeast of Deslandres. Named after the Swedish mathematician and astronomer Anders Lexell who lived from 1740 to 1784, this Eratosthenian age (3.15 to 1.1 billion years old) crater though missing its northern wall still retains its central peak.

Probably most striking in this area are features on the floor of Deslandres. There are two distinctive chains of secondary craters that cross Deslandres. The easiest to see consists of a chain of five shallow craters in a line in the northeastern floor. The other crater chain starts north of Deslandres on the shores of Mare Nubium and cuts Deslandres's floor north and west of Hell. Neither of these chains point to Imbrium or any other reasonable sources. Also, appearing as a star-like brightening in one of Tycho's rays, the Cassini Bight Spot is a 3 km wide fresh crater with spikes of rays extending out a few kilometers. This crater may be the age, or much younger than Tycho. This may be an oblique impact event similar to that of Proclus. The system of rays is directed towards the east in the form of a fan deposited at an angle of 90 degrees. The longest streak runs directly east 50 km to the center of the crater Walter. At Full Moon, this is one of the brightest points on the Moon.

References

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Wood, Charles A. 2003. The Modern Moon, Sky Publishing Corp., Cambridge.

LUNAR TOPOGRAPHICAL STUDIES

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

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

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

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

OBSERVATIONS RECEIVED

JAY ALBERT - LAKE WORTH, FLORIDA, USA. Digital images of Mare Imbium & Sinus Iridum.

ALBERTO ANUNZIATO - ORO VERDE, ARGENTINA. Drawing of Arago B &C.

SERGIO BAMBINO - MONTEVIDEO, URUGUAY. Digital images of Copernicus(2), Gassendi(2) & Tycho(3).

JAIRO CHEVEZ - POPAYÁN,COLUMBIA. Digital images of Maurolycus, Mons Hadley, Plato & Tycho.

ABEL CIAN - PARANÁ, ARGENTINA. Digital images of Aristarchus(2), Daniel(2), Gassendi, Mare Humorum, Mare Crisium, Moltke, Plato(5), Proclus & Ross.

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 11 & 15 day Moon, Aristarchus(3), Copernicus, East limb, Gassendi, Janssen, Mare Crisium, Mare Frigoris, Mare Huorum, Oceanus Procellaru, Petavius, Plato & Schiller-Zuchius.

WALTER ELIAS - ORO VERDE, ARGENTINA. Digital images of Aristarchus, Aristarchus-Copernicus(2), Atlas-Hercules, Carlini, Censorinus, Clavius, Copernicus(2), Einmart, Fracastorius, Gassendi, Lyell, Mare Crisium & Pitiscus.

RICHARD HILL – TUCSON, ARIZONA, USA. Digital images of Apollo 17 area(4), Littrow(2), Posidonius-Littrow, Taurus-Littrow, Fra Mauro-Apollo14 site & Julius Caesar.

PEDRO ROMANO – SAN JUAN, ARGENTINA. Digital images of Fracastorius, Mare Serenitatis, Piccolomini & Plinnius.

ROBERT STUART – RHAYADER, WALES, UNITED KINGDOM. Digital images of Copernicus, Copernicus-Fra Mauro Eratosthenes & Fra Mauro.

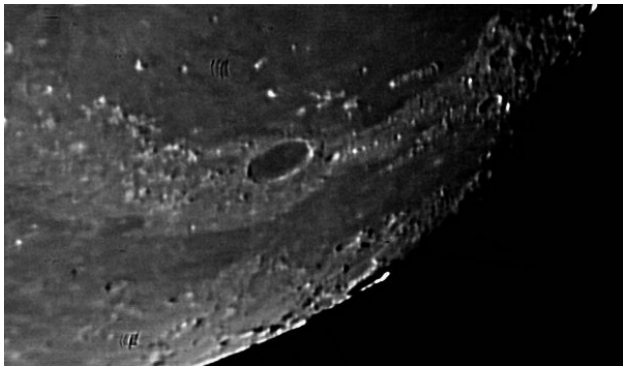
DAVID TESKE - LOUISVILLE, MISSISSIPPI, USA. Digital images of Deslandres.

ALAN TRUMPER - ORO VERDE, ARGENTINA. Digital images of Alphonsus, Censorinus, Gibbou Moon, Mare Crisium, Menelaus & Proclus.

RECENT TOPOGRAPHICAL OBSERVATIONS

SINUS IRIDUM - Jay Albert, Lake Worth, Florida USA. July 24, 2018 02:09UT. Seeing 5-6/10, transparence poor. 8" NexStar Evolution, 226x, 9mm orthoscopic eyepiece. iphone .

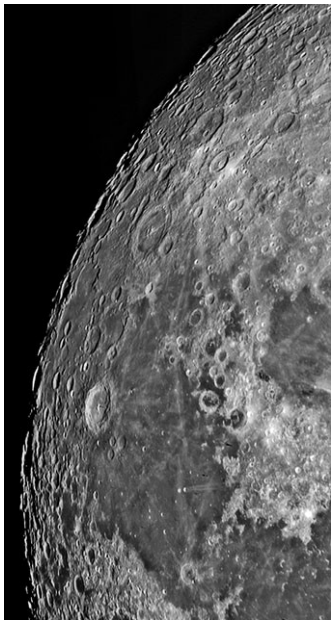
MAUROLYCUS – Jairo Chavez,- Popayán Columbia. June 20, 2018 01:05 UT. 10" Dobsonian, Huawei Y360 camera, ISO200.



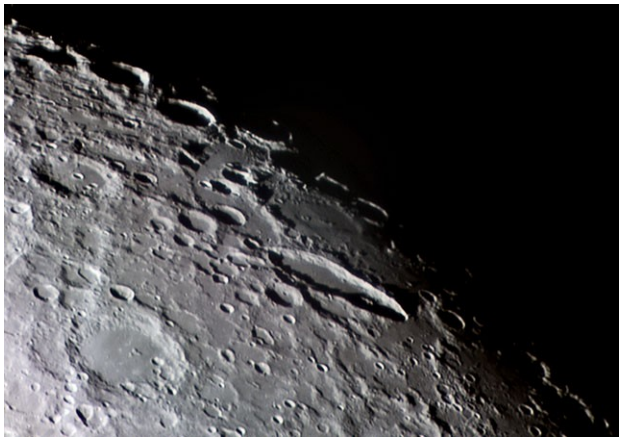
PLATO – Abel Gonzalez Cian, Paraná, Argentina. May 25, 2018 03:28UT. 10" Meade Lightbridge, Nikon D3100. north down.

RECENT TOPOGRAPHICAL OBSERVATIONS

MARE HUMORUM - Maurice Collins,- Palmerston North, New Zealand. June 29, 2018 09:04 UT. FLT-110 f/14. ASI120M.C North down.



PETAVIUS-LANGRENUS - Maurice Collins,- Palmerston North, New Zealand. June 29, 2018 08:59 UT. FLT-110 f/14. ASI120M.C North down.



SCHILLER-ZUCHIUS - Maurice Collins,- Palmerston North, New Zealand. July 24, 2018 08:42 UT. FLT-110 f/21. ASI120M.C North down.

RECENT TOPOGRAPHICAL OBSERVATIONS

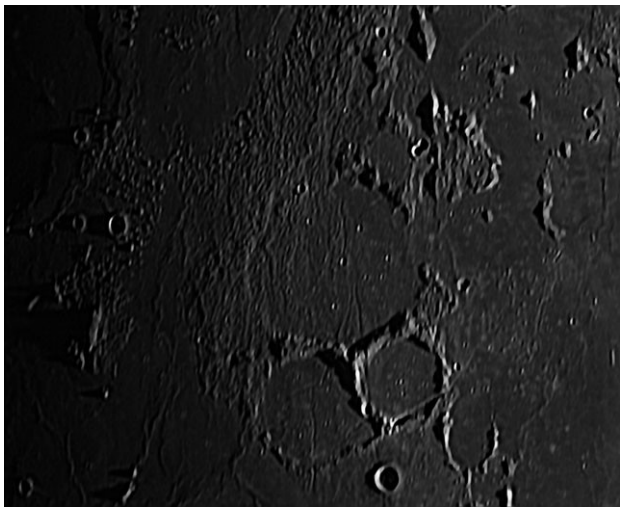
CLAVIUS - Walter Elias, Oro Verde, Argentina. May 24,, 2018 22:15 UT. 10" LX-200, 96x , Canon EOS Digital Rebel. XS.

PITISCUS - Walter Elias, Oro Verde, Argentina. May 19, 2018 23:51 UT. 10" LX-200, 106x with telextender, Canon EOS Digital Rebel. XS.

PICCOLOMINI - Pedro Romano, San Juan, Argentina. June 19, 2018 23:10 UT. 500mm reflector, ASI 120.

RECENT TOPOGRAPHICAL OBSERVATIONS

ERATOSTHENES - Robert Stuart– Rhayader, Wales, United Kingdom June 22, 2018 20:27 UT. 25cm f/6.3 Newtonian, 3x barlow. ZWO 1178 MC Baader narrow band green filter.



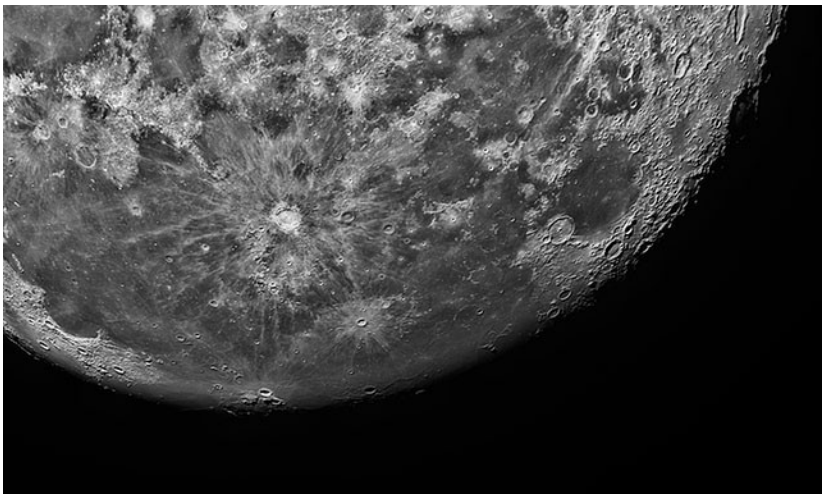
FRA MAURO - Robert Stuart– Rhayader, Wales, United Kingdom June 22, 2018 21:04 UT. 25cm f/6.3 Newtonian, 3x barlow. ZWO 1178 MC Baader narrow band green filter.

ALPHONSUS - Alan Trumper, Oro Verde, Argentina. May 6, 2018 03:59 UT. 250mm Meade 2120. Nikon D5100.

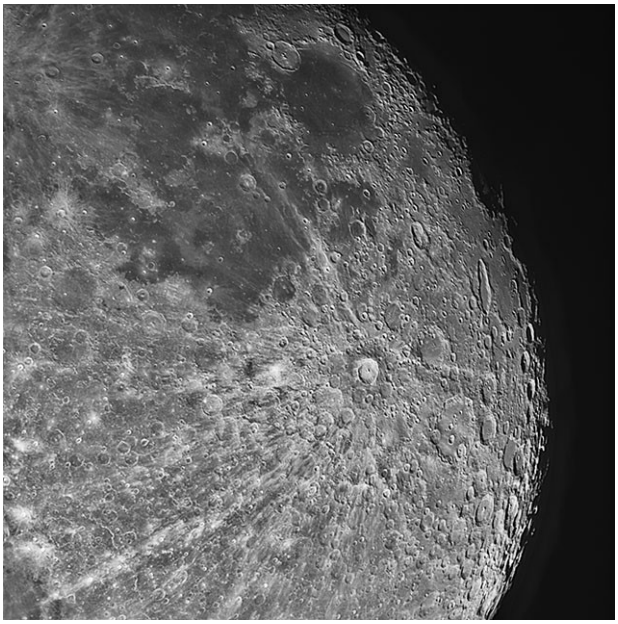
BRIGHT LUNAR RAYS PROJECT

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



COPERNICUS-KEPLER - Sergio Babino,- Montevideo, Uruguay. May 26, 2018 22:45 UT. 81 mm refractor. ZWO 174 mm. Baader Moon & Skyglow filter.



TYCHO - Sergio Babino,- Montevideo, Uruguay. May 26, 2018 22:23 UT. 81 mm refractor. ZWO 174 mm. Baader Moon & Skyglow filter.

LUNAR GEOLOGICAL CHANGE DETECTION PROGRAM

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

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

Reports have been received from the following observers for June: Jay Albert (Lake Worth, FL, USA - ALPO) observed: Aristillus, Fracastorius, Plato, Puiseux, and Theophilus. Jairo Chavez (Columbia - LIADA) imaged: Maurolycus, Mons Hadley, Plato, Posidonius, and Tycho. Maurice Collins (New Zealand – ALPO/BAA/RASNZ) imaged: Alphonsus, Aristarchus, Clavius, Copernicus, Deslandres, the eastern limb, Janssen, Langrenus, Manilius, Mare Crisium, Mare Frigoris, Mare Humorum, Mare Imbrium, Mare Orientale, Mare Nectarus, Oceanus Procellarum, Petavius, Rupes Recta, Stevinus, Tycho, and Several Features. Anthony Cook (Newtown, UK - ALPO/BAA) imaged several features. Marie Cook (Mundesley, UK – BAA) observed: Plato. Walter Elias (AEA) imaged mare Crisium. Rik Hill (Tucson, AZ, USA – ALPO/BAA) imaged: Julius Caesar and Vallis Rheita. Robert Stuart (Rhayader, UK – BAA) imaged: Bullialdus, Cichus, Copernicus, Eratosthenes, Guericke, Kies, Pitatus, Timocharis, and Wurzelbauer. Franco Taccogna (Italy – UAI) imaged Plato.

News: This newsletter is for the August/September BAA Lunar Section Circular and covers observations for June. Normal service will be resumed in the October edition! Please continue to send your observations in though!

TLP Reports: No TLP reports were received for June.

Routine Reports: Below is a selection of reports received for June that can help us to re-assess unusual past lunar observations – if not eliminate some, then at least establish the normal appearance of the surface features in question.

Aristillus: On 2018 Jun 03 UT 06:35-07:08 Jay Albert (ALPO) observed visually and imaged this crater under the following two repeat illumination events, to the nearest ±0.5°.

> *Aristillus 1939 Jul 06 UT 05:00 Observed by Haas? (NM?, USA, 12" reflector?) "Dark area in W. part of floor was I=1.3 but other dates were brighter. or same. yet cond. similar (see #454, 459 & 461)" NASA catalog weight=4. NASA catalog ID #450. ALPO/BAA weight=3.*
>
> *Aristillus 1939 Sep 03 UT 05:00 Observed by Haas? (New Mexico?) "Dark area in W. part of floor was I=4.0, comp. with I=1.3, & I=3.7 (see #450, & #454). Used different telescope, but can't explain diff. in albedo, since phase is similar in 2 & dist. from term. similar in all (normal?)." NASA catalog weight=4. NASA catalog ID #459.ALPO/BAA weight=3.*

Jay noted that he did not see a "dark area" in western part of the floor as the floor was fully lit, being an even shade of medium gray with a light spot (a hill or other elevated area) at the base of the west wall. The SW wall was partly shaded with the terracing showing high relief and good detail as well as a roundish, black spot just below the rim. There was another, smaller black spot north of the first one on the top of the west rim. The east wall was sunlit and terraced with a vertical gray band running down to the floor. A cell phone photo can be seen in Fig 1. It is difficult to know to what exactly the "dark area" in the western part of the floor that Walter Haas was referring to as it was not obvious to Jay, or from his photo where this was? Jay wonders if an experienced observer, like Walter Haas could have listed the wrong crater when writing his TLP report, or perhaps it could it have been incorrectly labelled when the NASA catalogue was compiled?

Figure 1. Archimedes, Autolycus and Aristillus as imaged by Jay Albert (ALPO) on 2018 Jun 03 UT 07:06 with a hand held iphone 6S cell phone placed next to a 7mm Ortho eyepiece on a Celestron NexStar Evolution 8" SCT, under a mostly clear, but very hazy sky. Transparency was magnitude 1 for most of the session, however seeing was steady at 8/10. The image is orientated with north towards the top.

Mare Crisium: On 2018 Jun 18 UT 21:22 Walter Elias (AEA) imaged this area under repeat illumination conditions (to within ±0.5°) to the following very old report of a TLP:

Mare Crisium 1672-2-3 G.D. Cassini_GD. (Italy?) *Nebulous appearance seen. Cameron 1978 catalog assigns an ID No. of 12 and a weight of 1. ALPO/BAA catalog assigns a weight of 1. Reference: Bode, J.E. (1792), Berliner Atron. Jahr., 112, p252.*

Figure 2 Mare Crisium, orientated with north towards the top left, as imaged by Walter Elias (AEA) on 2018 Jun 18 UT 21:22.

Walter's image (Fig 2) certainly shows a nebulous appearance to the dark mare. Is this what Cassini was describing with the inferior instruments that were available to them in that era? Should we use this argument to demote the 1672 TLP to a weight of 0?

Ross D: On 2018 Jun 20 UT 02:46 Rik Hill (ALPO/BAA) imaged the Julius Caesar in a mosaic, and part of one of the images just clipped the Ross D area, which was under both repeat illumination and topocentric libration, to within ±1° to the following 1964 report:

Near Ross D (23E, 12N) 1964 May 18 UT 03:54-04:53 Observed by Harris, Cross et al. (Whittler, CA, USA, 19" reflector x720, 8" reflector x322, S=G) "White gas obscuration. Moved 20mph, decreased in extent. Phenom. repeated. Drawing." NASA catalog weight=5. NASA catalog ID 811. ALPO/BAA weight=4.

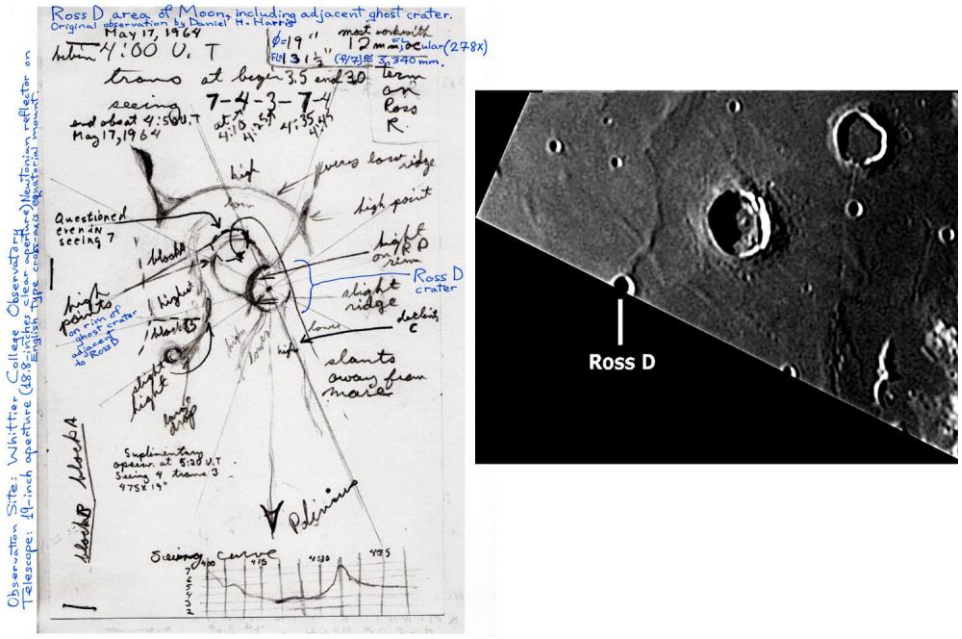


Figure 3. The area around Ross D, orientated with north towards the bottom. **(Left)** A summary sketch made from observers using the 19" aperture scope at Whittier College, CA, USA on 1969 May 18 UT 04:00-04:55 (Note the May 17 on the sketch refers to the local date). **(Right)** Part of an image mosaic of Julius Caesar, by Rik Hill (ALPO/BAA) taken on 2018 Jun 20 UT 02:46. Ross D is just on the edge of the image making up his mosaic. I have taken liberty with enhancement and significantly pushed the sharpening and the contrast to bring out detail around Ross-D.

Ross D caused quite a bit of observational excitement during the 1960's with several reports of TLPs here, so it is refreshing that we can get to see a modern day image (Fig 3 - Right) under very similar illumination and viewing angles to the original sketch (Fig 3 - Left). You can see from Rik's image that Ross D sits on a wrinkle ridge, a tectonic feature formed when the original mare basalt contracted and folded during cooling. Images of some wrinkle ridges show fresh boulders at their bases, indicating that, for a very few at least, they are still tectonically active causing fractured folded material, at times, to fall down hill. This of cause does not mean that the wrinkle ridge that Ross D sits astride is currently tectonically active, nor that displaced boulders rolling down hill occasionally could create an effect big enough to be seen from Earth.

Anyway concerning the comparison of the sketch and the modern day image, you can clearly see the inverted "Y" or "X" shaped wrinkle ridge to the SW. To the SE is a slightly dark tadpole egg embryo-like feature seen both on the sketch and in the image. With a bit of averted vision, there are faint indications of a curved arc coming off the "Y" or "X" wrinkle ridge, and joining up with the tadpole egg embryo-like feature. As to the ghost crater effect just on the east side of Ross-D, which is clearly shown on the sketch with a topographic high, or bright point (in this area too), well there is no sign of this at all on Rik's image. Possible reasons are that the image contrast is just not sufficient, or that back in 1964 May 18 there was a real TLP going on here? I will leave the weight at 3 for now – but we definitely need more high resolution images of this crater. I would like to thank Rik Hill for supplying an extra image, upon request, showing a little more of this crater and to Gene Cross, one of the

original Ross-D observing team members, for supplying his interpretation.

Plato: On 2018 Jun 22 UT 02:11 Jairo Chavez (LIADA) imaged this crater just 26 min after the ±0.5° similar illumination window for the following Russian report:

Plato 1925 Jun 20 UT 20:00? Observed by Markov (Russia) "Light bands in bottom seen in shadow & did not seem to be elevations. These have been seen 5X from 1913-1922." NASA catalog weight=3. NASA catalog ID #391. ALPO/BAA weight=2.

Figure 4. Plato as imaged by Jairo Chavez (LIADA) on 2018 Jun 22 UT Jun 22 UT 02:11and orientated with north towards the top.

Markov describes "light bands" which did not seem to be due to elevations? One can certainly see some gaps between the shadow spires in Fig 4. But whether these constitute light bands in the eyes of the observer, is a common issue with these types of LTP associated with Plato. I think, unless any other evidence comes to light, that I will reduce the weight to 1.

Eratosthenes: On 2018 Jun 22 UT 06:06-06:08 Maurice Collins (ALPO/BAA/RASNZ) imaged this crater under identical illumination (±0.5) to a Harold Hill report from 1947:

Eratosthenes 1947 Jan 30 Mean Col. 16deg. Observed by Hill (UK) "Main peak of massive central mountain group appeared to be in a shadowless condition having regard to its claimed height of 6,600 ft. The whole of the floor to the west should have still been in darkness. Instead immediately to the west was a dark (intensity 1.5-2) region extending almost to the foot of the bright inner wall and very diffuse in outline. The observation could not be followed through due to increasing cloud, but on the following night all was normal.". ALPO/BAA weight=3.

Figure 5. Eratosthenes as imaged by Maurice Collins (ALPO/BAA/RASNZ) on 2018 Jun 22 UT 06:06-06:08 Maurice Collins. Colour saturation increased to 50%.

For those who are curious why life-long TLP skeptic, Harold Hill, would report something like this, see p48 of his Lunar Portfolio book. He never regarded his observation as a classic TLP, but was curious none-the-less, and in a letter to me, dated 2003 Jan 7th wrote: *"My own interpretation of the event in Eratothenes of 1947 Jan 30 is such that it will not be repeated however long observers may look at times of repeat illumination/libration. I regard it as a temporary obscuration caused by raised regolithic material as a result of a meteoric impact – a purely chance event and nothing of an endogenous nature. It was a pity that any such dissipation of 'dust' and eventual uncovering of the shadow could not be followed on the same night due to cloud intervening."* Harold Hill was right in his letter, if the cause was a dust cloud from an impact, then we should not

expect to see it under repeat illumination – though we need to do these repeat illumination studies to be sure and to investigate whether atmospheric/scope optical effects could play a part. Indeed if you look at Fig 3between the illuminated west rim and the central peaks, you can see a bluish glare – however this is likely caused by scattering effects in our atmosphere, or optics, as its present in other areas in the image too. Could this have been an explanation for what Harold Hill saw back in 1947. Again like the Walter Haas observation, it would be surprising whether such a skilled observer (even in their early days) would have been taken in by this, so I think I shall leave the weight at 3 for now, but keep this explanation on the records.

Cichus: On 2018 Jun 22 UT 22:20 there was a lunar scheduling event to observe the needle-like effect just on the night side of the Moon - and this was observed by Anthony Cook and Bob Stuart:

BAA Request: Following an article by Nigel Longshaw in the Journal of the British Astronomical Association in 2015 June (p154-157), we would like to encourage sketches and images of the Cichus-Weiss region of the Moon. At this particular illumination you may be able to see (depending upon libration) a "curved thread of light" effect extending into the night side of the Moon, just north of Cichus. The effect was originally detailed by Thomas Elger in a sketch from 1888. We would very much like to know the duration of this effect. Ideally suited for scopes of aperture 4" or larger. If imaging, try over exposing slightly in order to bring out detail on the terminator.

Figure 6. The Cichus area of the Moon on 2018 Jun 22, orientated with north towards the top. **(Left)** by Anthony Cook(ALPO/BAA) taken at 22:20 UT with a 20 cm Newtonian with x3 Barlow, through a Wratten 87C near IR filter. The camera used was a Watec 902H camera. The video has been processed with Registax. Contrast has been enhanced to bring out detail on the terminator. **(Right)** Taken by Bob Stewart (BAA) at 22:22 UT.

We have discussed this effect many times before, in particular see: p18 of Feb 2017 TLO. The images, in Fig 6, by myself and Bob Stewart, did not quite capture the start of the effect, but must have been close. Although Bob's image is sharper than mine (I was using a near-IR filter), my image has been more over-exposed and shows slightly deeper into the terminator area. You can quite clearly see the needle like effect on the night side of the Moon and the formation of a 2nd ray of light jut to the north. The primary ray has two dark bands cutting across its east and west ends. I have included the data points in Fig 5, to show how the visibility varies with lunar season. As one would expect, the threadlike shadows start at an earlier selenographic colongitude during the lunar winter –

though we could do with a few more data points to help narrow down the hypothetical emergence line I have indicated in yellow. Indeed it may not be a line, but a curve – only more observations can tell us for sure. Although the appearance of the thread-like effect is due to sunlight, from part of the solar disk, breaking through gaps in the highland to the east, and reaching slightly high areas on the flatter terrain, and is clearly not a TLP, it may explain some past TLP descriptions of thread-like glows seen on the terminator in the past. Also I would be very keen to have colour images because 2018 Feb 24 Michael Crook (BAA) noted visually that the needle-like effect took on a slight golden hue – so it would be interesting prove this with imaging – though important to check for colours elsewhere on the terminator, for comparison.

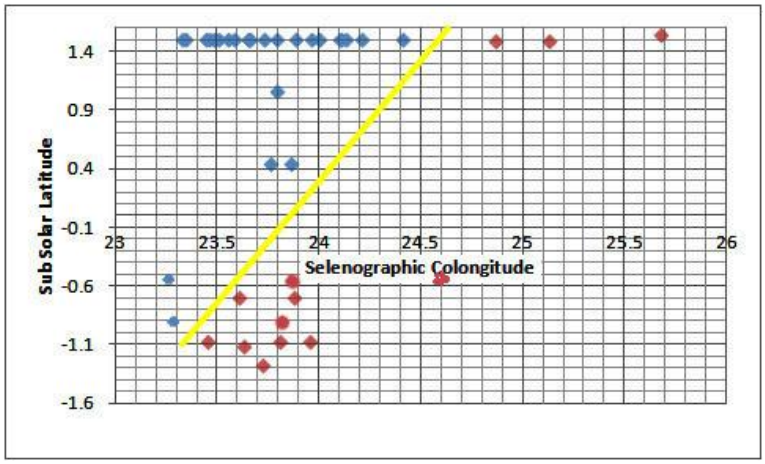


Figure 7 A plot of observations, collected over many years, of the Cichus-Weiss region on a Sub-Solar Latitude versus Selenographic Colongitude graph. Each grid cell corresponds to 0.1˚. The blue points are non-sightings of the thread-like formation on the night side. The red dots are sightings. The yellow line is a hand drawn guestimate of where, in terms of selenographical colongitude, and sub-solar latitude, we might expect to see the needle-like thread effect appear.

Plato: On 2018 Jun 23 UT 19:38, 19:52 & 20:25 Franco Taccogna (UAI) imaged the crater under repeat illumination conditions (±0.5° tolerance) to the first two historic reports below. At 21:39 Franco Taccogna (UAI) imaged and Marie Cook (BAA) observed (2150-21:55 UT) the crater under repeat illumination and viewing angle, to within ±1°, to the third report below:

The above notes are based upon the Cameron 2006 catalog extension TLP ID 145 and weight=4. ALPO/BAA weight=3.

Plato 1870 May 10 UT 22:00 Observed by Birt (England) "Extraordinary display of lights. Says not effect of sunlight" NASA catalog weight=4. NASA catalog ID #167.ALPO/BAA weight=3.

2006 Feb 08 C. Brook of Plymouth UK, using a 4" refractor x216, noticed at UT 20:10 dark patches coming and going (in terms of visibility) on the floor of Plato. Occasional views of the central cratelet (seen as a white spot) were glimpsed. The dark patches seen lasted about 1-2 seconds before fading out during each visibility cycle. Teneriffe Mountains were checked but no sign of seeing effects that might explain the dark floor patches. By 20:26UT the dark patch effect was fading and by 20:31UT floor detail was visible. Observations ceased at UT 20:34. Seeing conditions were II and the Moon was at a high altitude. Other observers were alerted but came on-line after the effect had finished. ALPO/BAA weight=2.

Concerning the 1870 report, I am a somewhat mystified over what could have been described as "an extraordinary display of lights". Franco's three images (Fig 8 a-c) shows nothing like this. Perhaps it had something to do with the visibility of the cratelets on the floor, whose study was a popular hobby of Victorian astronomers?

The 1981 TLP report is a little more interesting as we have no less than four of the original sketches (Fig 8 e-h). Peter Foley's sketch (Fig 8e) clearly depicts the lack of detail he saw on the southern rim, as does Hedley Robinson's sketch (Fig 8f), and the images in Fig 8 (a-c) show that the rim is certainly less contrasty here. Peter Foley is very specific as to the extent of the mistiness – which does not agree entirely with the extent of the low contrast southern rim in the images. There is also a dark spot on the inner southern floor in Peter Foley's sketch

(Fig 8e) which is not present on any of the other sketches – this maybe a shadow in an enclave of the inner southern wall? Martin Mobberley's second sketch (Fig 6h) has a dark spot, but it is on the northern inner wall/floor boundary, and curiously does not appear on any of Franco's images? There seems to be a light triangular floor area which shows up in three of the sketches (Fig 8e-g), though it has been depicted with shading(?) in Hedley Robinson's sketch (Fig 8f). Curiously Peter Foley has drawn three floor craterlets, but only the central one has been correctly positioned as it was in Martin Mobberley's sketches (Fig 8f & h). Although we cannot address the colours mentioned in the 1981 report with monochrome images, it is interesting that we see no sign of the vertical streaks crossing the floor from the claimed obscuration site, which Moore mentions. All the 1981 reports are illustrative of what we would expect to see, in terms of the level of detail, with different seeing conditions, nevertheless there are enough interesting points raised e.g. the dark spot seen by Martin Mobberley on the N rim, and the specific shape of the obscuration as seen by Foley, to merit keeping the weight at 3. Incidentally we have covered this repeat illumination event before in the July 2014 newsletter, p16-21 in quite a lot of depth and had already reduced the weight from 4 to 3.

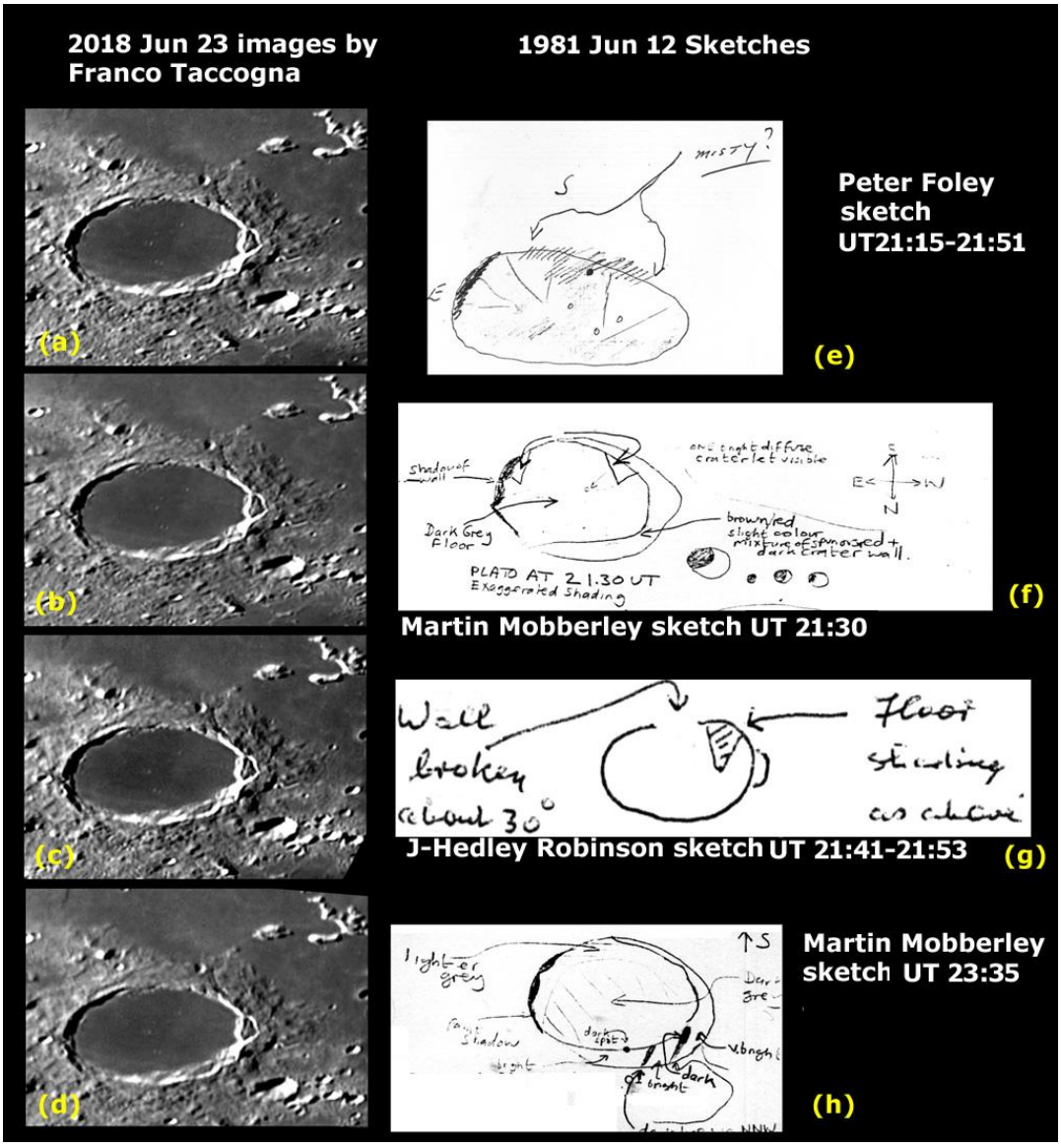


Figure 8. Images and sketches of Plato, orientated with north towards the top. **(a-d)** Images by Franco Taccogna (UAI) on 2018 Jun 23. **(e-h)** Sketches made by BAA observers on 1981 Jun 12.

For the Clive Brook's 2006 report, Marie Cook found that the crater was sharp and clear, with some features seen close to the wall. but no sign of any dark variable patches coming and going. The 21:39UT image that Franco took (Fig 9a) is the within the repeat illumination/topocentric libration tolerance to the 1982 report, You can quite clearly see the central floor craterlet and also some dark regions to the floor, though these do not

seem to change much in relation to the earlier images in Fig 8. Just out of interest I have included some other images (Fig 9b-d) from 2006 Feb 08, which although taken later on that night after the TLP observation by Clive had ended, can be compared to Franco's image from 2018. Please bear in mind that astrophotography techniques, and cameras, were not as advanced twelve years ago. Anyway in all the images you can see dark markings on the floor, roughly in the same place. The arrow in Fig 9c points to something which looks hazy on the SE rim, but is just a seeing blurred bright area, more clearly visible in Figs 9a and 9d. In view of the effects of seeing, atmospheric transparency/scattering, and resolution would have on the visibility of features on the floor, in particular the contrast of the dark areas, a very plausible explanation for the Clive Brook TLP report might simply be atmospheric conditions – though we cannot be entirely sure. So for safety I will lower the weight of the 2006 report from 2 to 1.

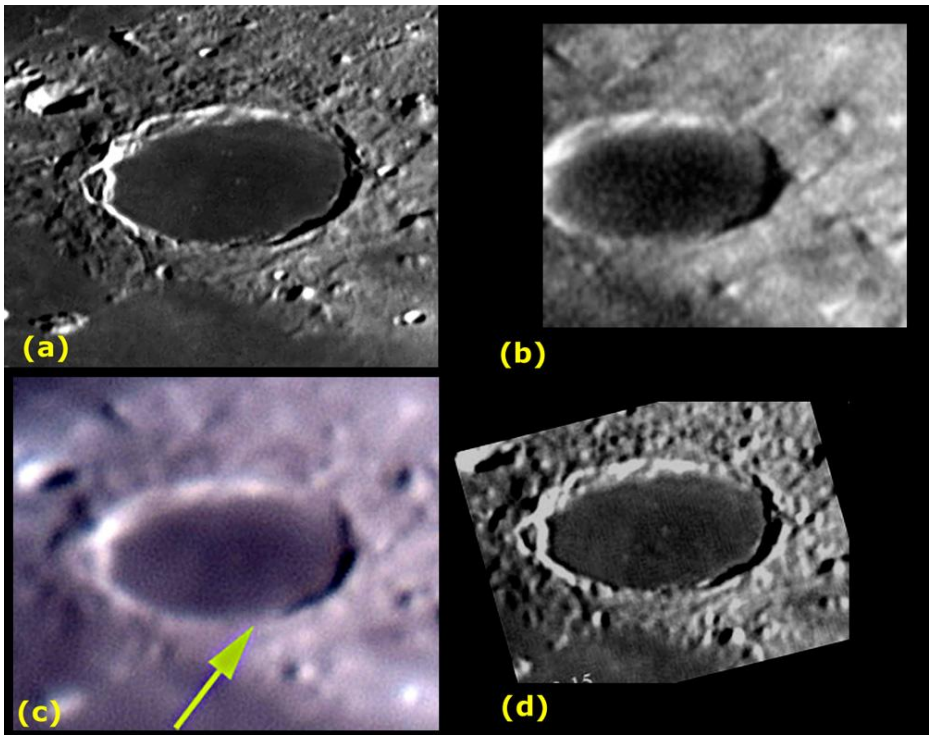


Figure 9. Plato orientated with north towards the top, and viewed under similar illumination and topocentric libration. (a) An image by Franco Taccogna (UAI) taken in 2018 Jun 22 UT 21:39 – the highest resolution image out of the four shown here. (b) A monochrome image by Anthony Cook (ALPO/BAA), taken on 2006 Feb 08some time between 20:37 and 21:50 UT. (c) An image by Giancarlo Vignale (GLR) taken off of the GLR Lunar Section web site via archive.today webpage capture – original image taken on 2006 Feb 08 UT 21:54. The arrow indicates presumably somewhere they wanted to check up on for a possible obscuration. (d) A monochrome image by Brendan Shaw (BAA) taken on 2006 Feb 08 UT 22:15.

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 TLP, firstly read the TLP 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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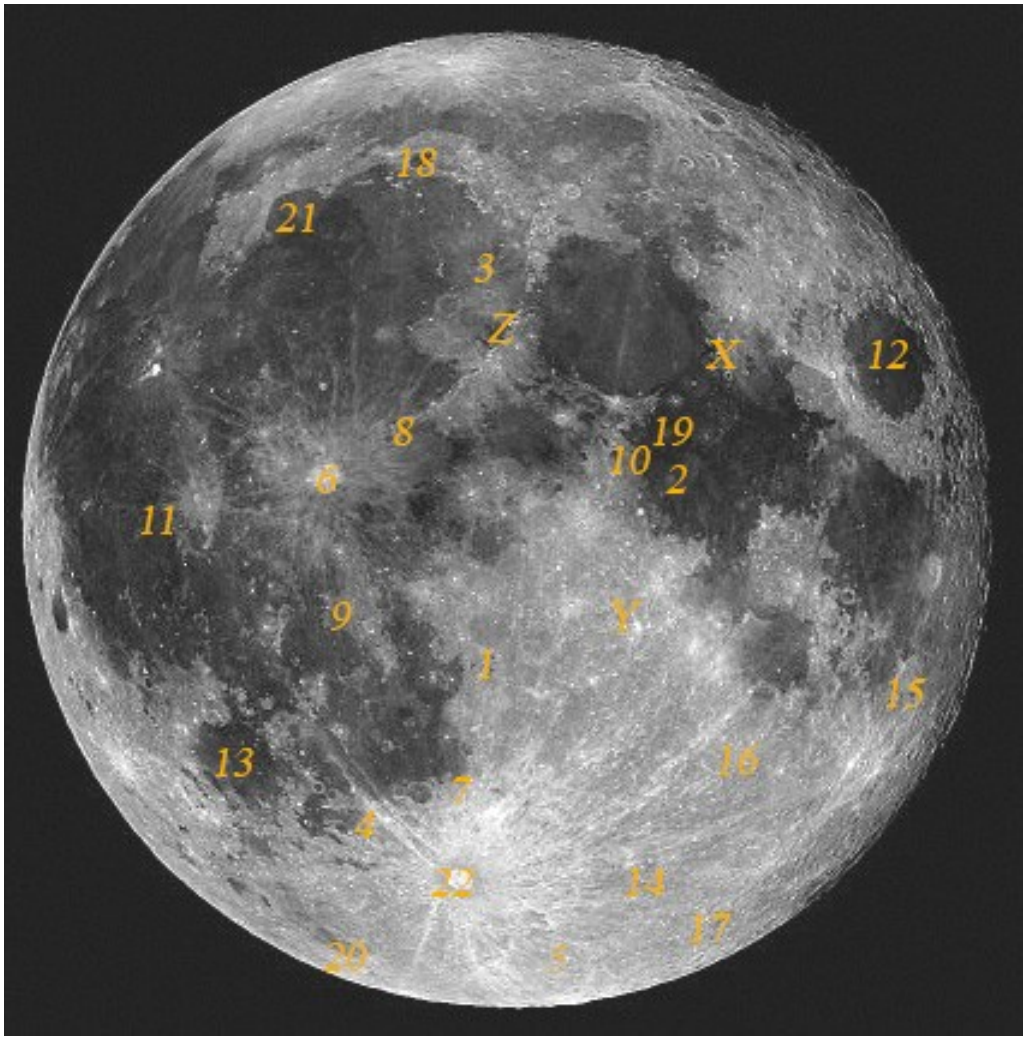
KEY TO IMAGES IN THIS ISSUE

1. **Alphonsus**
2. **Arago**
3. **Aristillus**
4. **Cichus**
5. **Clavius**
6. **Copernicus**
7. **Deslandres**
8. **Eratosthenes**
9. **Fra Mauro**
10. **Julius Caesar**
11. **Maestlin**
12. **Mare Crisium**
13. **Mare Humorum**
14. **Maurolycus**
15. **Petavius**
16. **Piccolomini**
17. **Pitiscus**
18. **Plato**
19. **Ross**
20. **Schiller**
21. **Sinus Iridum**
22. **Tycho**



FOCUS ON targets

X = Apollo 17 Mare Serenitatis
Y = Apollo 16 Descartes-Cayley Plains
Z = Apollo 15 Mare Imbrium-Hadley Rille