The Lunar Observer

A Publication of the Lunar Section of ALPO

David Teske, editor

Coordinator, Lunar Topographic Studies Section Program

February 2024

In This Issue

Online readers, click on images for hyperlinks

Lunar Reflections

Wishing all of our readers and contributors a very pleasant and happy welcome. From what I have heard from our contributors across the globe, the weather has been less than ideal for lunar (or any other sky) observing. But through it all, we have pulled together some outstanding observations of out nearest neighbor in space.

I thank all of our contributors for their observations of the Moon. We have very interesting articles about the lunar topography by Alberto Anunziato, Paul Walker and Robert H. Hays, Jr. As always, Tony Cook provides insight with his Lunar Geologic Change and Basin and Buried Crater articles. Plus, we have outstanding images and drawings of the Moon in our Recent Topographic Studies. These images include interesting imaging techniques, whether it be the "mineral Moon" (page 36) or the use of increasingly strong barlow lenses (pages 29 and 37-39). Many thanks to all who made this possible!

Watch this space for announcements. The ALPO website is getting updated. This includes the lunar section. This will include a "subscription" to *The Lunar Observer*. When that is active, I would like all readers to subscribe. This will save me from sending out a couple hundred individual emails each month. Of course, I will let this be known when it is live.

Please remember to follow the future Focus-On topics and gather observations of these features. Next up is the very interesting Lacus Mortis. Observations are due to Alberto and myself by February 20, 2023.

Clear skies,
-David Teske

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Lunar Topographic Studies

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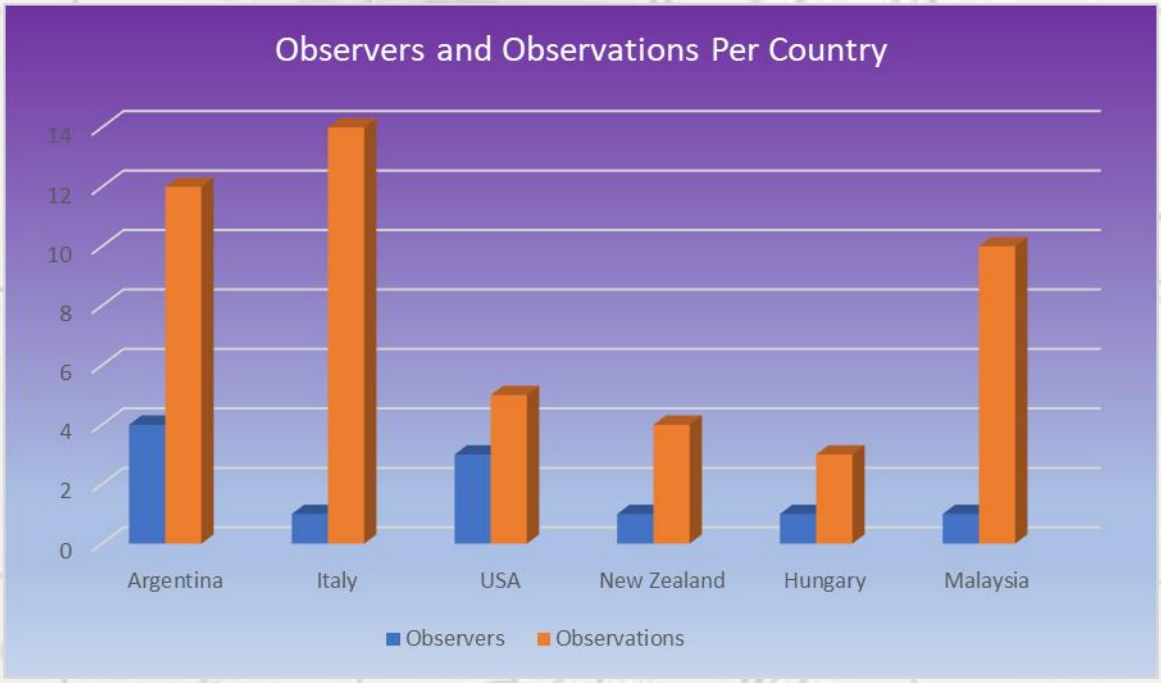
Observations Received

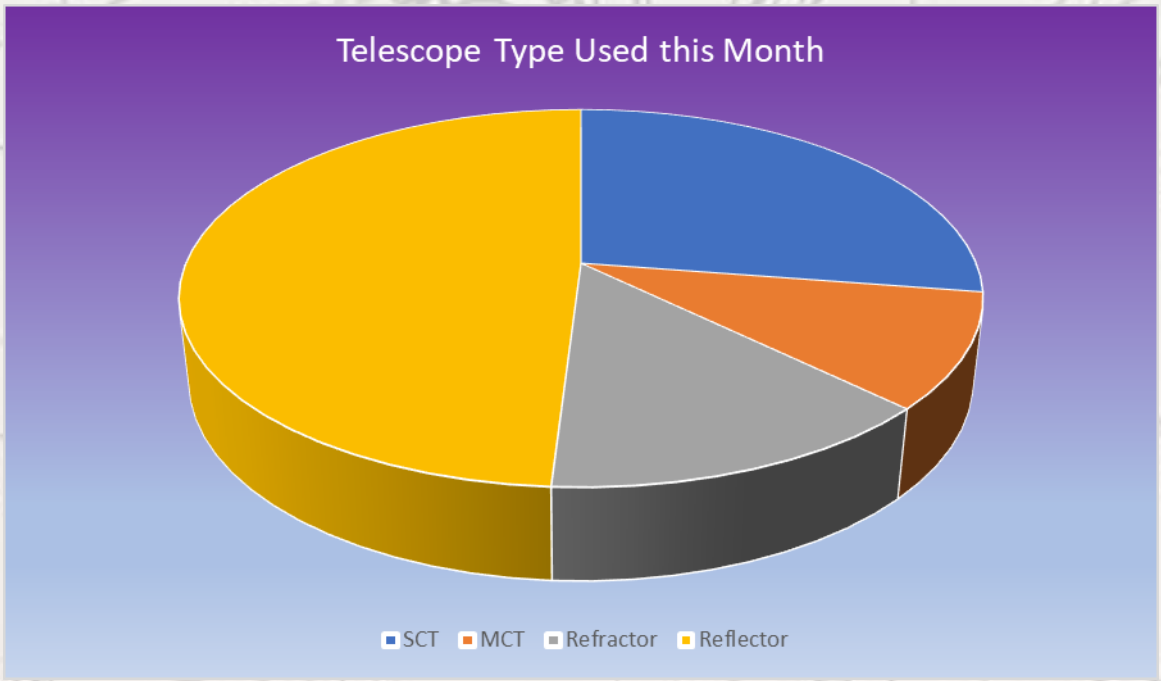
Name	Location and Organization	Image/Article
Alberto Anunziato	Paraná, Argentina	Articles and drawings *The Wrinkle Ridges of Mare Cognitum, Dorsa Geikie and Dorsa Mawson* and *Long Shadows on the West Shore of Mare Crisium.*
Maurice Collins	Palmerston North, New Zealand	Images of the 12-day old Moon (2) and the 14-day old Moon (2).
Massimo Dionisi	Sassari, Italy	Images of Geminus, Lacus Temporis, Messala, Mare Crisium, Cleomedes, Endymion, Vendelinus, Furnerius, Petavius, Langrenus, Mare Spumans, Mare Crisium South, Yerkes and Mare Crisium North.
Walter Ricardo Elias	Oro Verde, Argentina	Images of Mare Crisium, Tycho, Herodotus and Aristarchus (3).
István Zoltán Földvári	Budapest, Hungary	Drawings of Röntgen, Cremona and Nansen.
Robert H. Hays, Jr.	Worth, Illinois, USA	Article and drawing *Cauchy and Rupes Cauchy*.
Eduardo Horacek	Mar del Plata, Argentina	Images of Sinus Iridum (3).
Gregory T. Shanos	Sarasota, Florida, USA	Images of Hyginus, Mare Crisium and Mare Serenitatis.
Michael Teoh	Heng Fe Observatory, Penang, Malaysia	Images of Petavius, Strabo, Lacus Temporis, Mare Crisium, Geminus, Vallis Rheita, Langrenus, Manzinus, Vlacq and Furnerius.
Gonzalo Vega	Oro Verde, Argentina	Images of the Full Moon and the Waxing Gibbous Moon (2).
Paul Walker	Middlebury, Vermont, USA	Article and image *Lacus Excellentiae, Schickard and Phocylides.*

Many thanks for all these observations, images, and drawings.

February 2024 *The Lunar Observer*
By the Numbers

This month there were 51 observations by 11 contributors in 6 countries.





Lunar X Predictions for 2024

40°N-75°W, Eastern Time Zone

Date, 2024	358° Colongitude	Altitude/Azimuth	Cloudy Nights
January 18	5:15 am	–37° / 345°	4:05 am
February 16	7:40 pm	+66° / 236°	6:49 pm
March 17	10:22 am	–11° / 38°	10:10 am
April 15	11:08 pm	+43° / 268°	11:41 pm
May 15	11:01 am	–16° / 53°	12:13 pm
June 13	10:15 pm	+34° / 244°	11:49 pm
July 13	9:11 am	–43° / 58°	10:48 am
August 11	8:15 pm	+24° / 212°	9:31 pm
September 10	7:49 am	–65° / 65°	8:29 am
October 9	8:12 pm	+16° / 206°	8:09 pm
November 8	8:33 am	–49° / 79°	7:49 am
December 7	10:43 pm	+4° / 253°	9:36 pm

Note: The Lunar X is not an instantaneous phenomenon; rather, it appears and evolves over several hours, so the times above are fundamentally approximate and serve only as a guide. The ardent observer should look a little early to catch the initial visible illumination. A less-dramatic Lunar X against a fully illuminated background can still be seen at least several days later. Because of the Moon's nominal 29.5-day synodic period (phase-to-phase), favorable dates for a given location tend to occur on alternate months (unfavorable dates for 40°N-75°W are shaded gray in this table). The 358° colongitude value for the terminator reaching the Lunar X and making it visible (see this RASC paper) and the corresponding lunar altitude/azimuth for 40°N-75°W were determined with WinJUPOS, which is freeware linked from the WinJUPOS download page.

The Cloudy Nights comparative data, derived by a different method, was presented in this post.

Daylight Saving Time for 2024 begins on March 10 and ends on November 3. The listed times are EST/EDT as appropriate for the date.

Submitted by Greg Santos.

The Wrinkle Ridges of Mare Cognitum

Alberto Anunziato

Mare Cognitum became independent from Mare Nubium in 1964 when it also became the best-known lunar region, at least for a few months, while the glory of the Ranger 7 probe lasted, the first to take very close photographs of the lunar surface, before crashing in the area. Peter Grego's description in "The Moon and How To Observe It" is extremely precise: "Mare Cognitum is a dark lava plain, somewhat oval in shape, measuring 330 km from Montes Riphaeus in the northwest to its southeastern shoreline near Guericke. Mare Cognitum, the "Known Sea", takes its name from the fact that the probe, Ranger 7, secured the first detailed close-up photographs of the Moon's surface prior to its (intended) crash-landing on the sea in July 1964". The name was proposed by Gerard Kuiper, who was honored at the center of Mare Cognitum, since the crater almost 7 kilometers in diameter located there bears his last name. It is the crater that we see near the right margin of IMAGE 1 (which does not cover the entirety of Mare Cognitum). The other crater, which we see at the west end, is Euclid D, a little smaller (less than 6 kilometers in diameter). The panorama we see in IMAGE 1 could be a huge ancient crater, of which Montes Riphaeus (left margin) would be the western edge and the eastern edge the isolated elevations that protrude from the lava to the right and north.

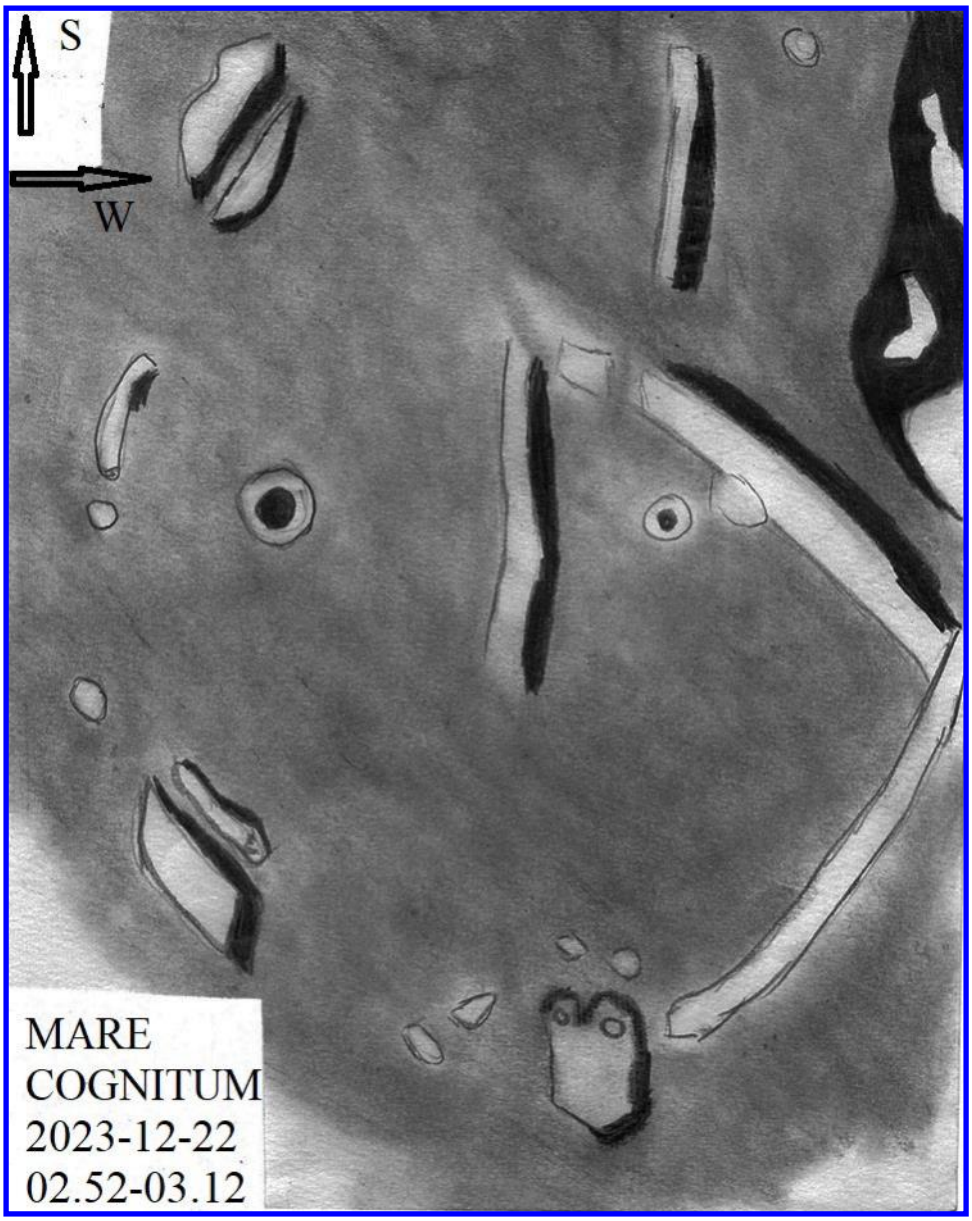


Image 1, Mare Cognitum, *Alberto Anunziato, Paraná, Argentina. 2023 December 22 02:52-03:12 UT. Meade EX105 mm Maksutov-Cassegrain telescope, 196 x.*

My intention when observing Mare Cognitum near the terminator was to record the wrinkle ridges that appeared, only 3 and very inconspicuous. Two segments run from north to south and a more important segment that runs from northwest to south east and appears to end between the first two, in what appears to be a separate segment from the main segment. There are two small bright areas that could look like elevations, like those seen to the north and east, but less bright. Nothing more, which is quite discouraging, since if we look at IMAGE 2, obtained from the Lunar Reconnaissance Orbiter Quickmap, Mare Cognitum seems to have dozens of ridges that would be almost invisible.

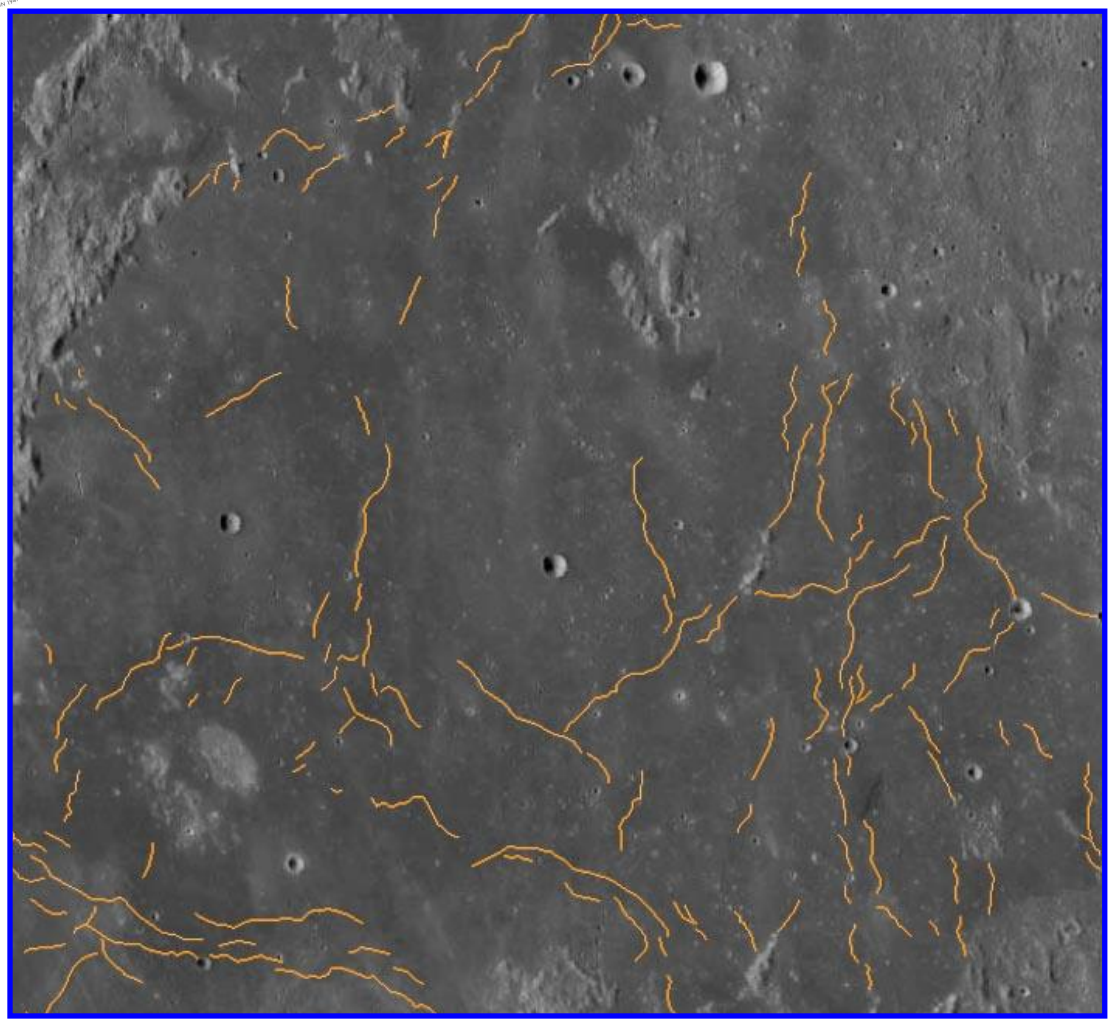


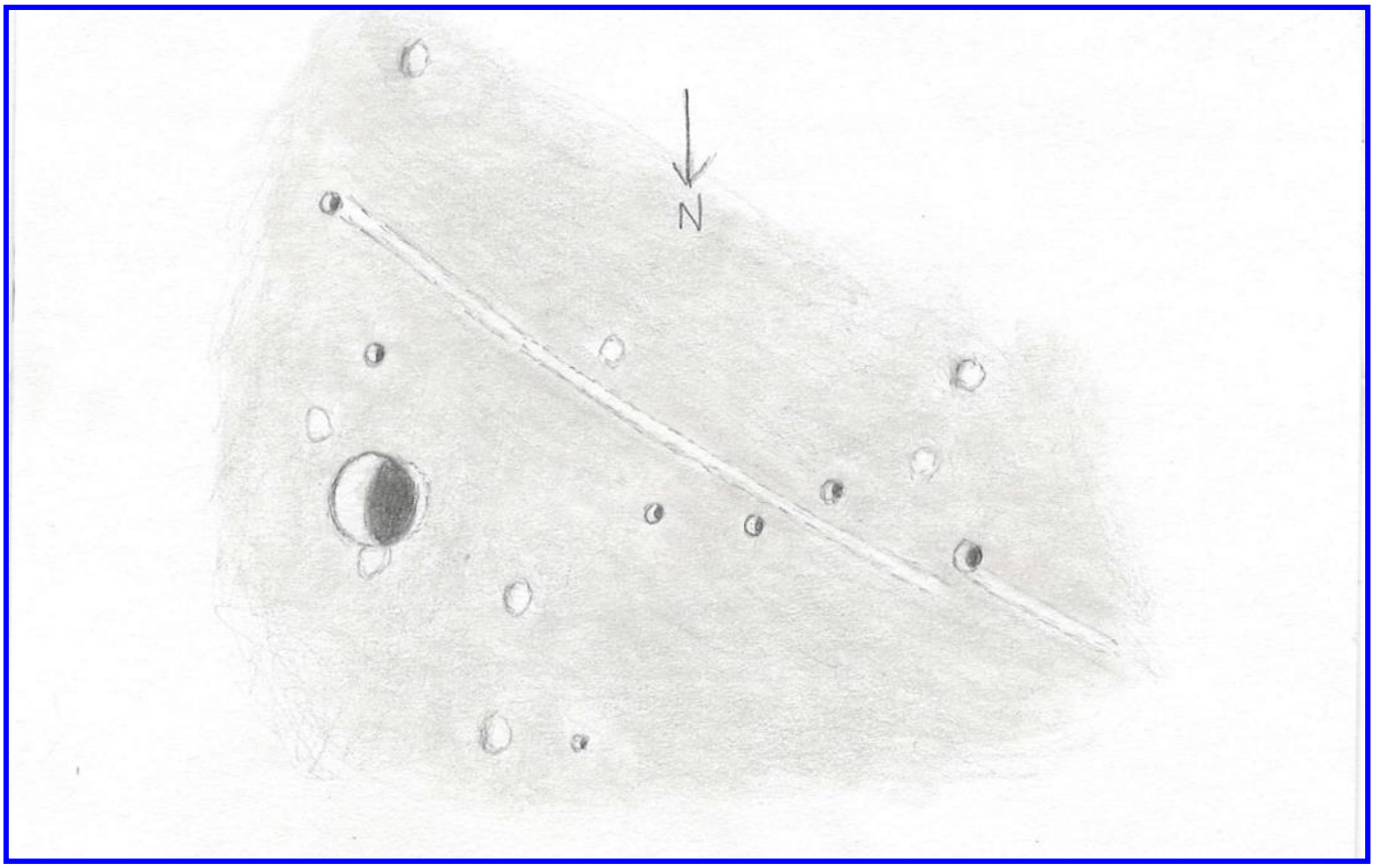
***Image 2, Mare Cognitum**, LROC.*

Which brings us to a series of curiosities about this very flat, or deceptively flat, area. Firstly, it appears that before Ranger 7 crashed on July 31, 1964, taking photographs up to 0.2 seconds before impact, no craters or craterlets were recorded within Mare Cognitum in observations from Earth, they appeared in the close-up images, (surely Kuiper and Euclides D were known). Secondly, at the time of the Ranger 7 mission, a scientist as important as Harold Urey, part of the mission team, considered that it could be an ancient dissected lake. The quote is from Urey, taken from "The New Moon" by Arlin Crotts: "But if water were present on the Moon, one may ask how much and for how long. Since river valleys or stream structures of any kind are not present on the Moon, it seems certain that the amount was small and the time was short. Small effects of this kind could have been destroyed by the erosion processes shown to be present by the Ranger 7 pictures. Could it be that the comparatively smooth floors of the maria are the beds of ancient temporary lakes? Their smooth structure has led most students of the subject to assume that the maria are lava flows, and anyone not subscribing to this view is compelled to try to devise other explanations for this smoothness. The Ranger 7 pictures have made many people, including me, think seriously that Mare Cognitum consists of fragmented material rather than lava flow material (…) Could it be water or ice covered with some layer of dust and could it have become filled with water by temporary rains, and are its walls impervious to water while those of other craters are not? (…) "Meteorites and the Moon" by Harold C. Urey, 1965, Science, 147,1262". Third, an observational conundrum. Grego mentions that "Near its western shoreline can be found a teardrop-shaped dome 20 km long. Unique among lunar domes, it is composed of brighter material than the surrounding mare, and it can be seen under a high illumination. A group of hills to its west also have a high albedo. It is possible that the dome and the nearby hills are the remnants of a submerged crater, the dome representing the crater's central uplift." I could not see this bright dome, although perhaps it can only be seen with frontal illumination, but I was still intrigued, due to its location there may be two not very bright areas, one on the northern margin of the central ridge, near Euclides D, and the other a little further east, in the center of the three segments of the ridge that can be seen, although it does not appear that they are the 20 kilometers in length that Grego speaks of.

Lunar Topographic Studies
The Wrinkle Ridges of Mare Cognitum

Cauchy and Rupes Cauchy

Robert H. Hays, Jr.



Cauchy and Rupes Cauchy, *Robert H. Hays, Jr., Worth, Illinois, USA. 2023 October 02 07:00-07:22; 07:30-07:38 UT. 15 cm reflector telescope, 170 x. Seeing 8-9/10, transparency 6/6.*

I observed this area on the morning of October 2, 2023 after the Moon uncovered 45 Arietis. Cauchy is a crisp, mid-sized crater in southeast Mare Tranquillitatis. Cauchy E is the small crater south of Cauchy, and Cauchy C is the similar crater farther to the south. Two bright spots are just north and southeast of Cauchy. The hill south of Cauchy C is probably Cauchy omega. Three pits form a gentle curve west of Cauchy. The middle one is Cauchy F, but the other two are unlabeled on the Lunar Quadrant map. Cauchy B is the large crater farther to the west. A modest hill is south of Cauchy B, and a small bright spot is between this hill and Cauchy B. Two more hills are northwest of Cauchy, and a tiny pit is nearby. The main feature in this area is the long, nearly straight white line which is the sunlit side of Rupes Cauchy. This fault begins at Cauchy C and extends northwestward, passing between Cauchy F and its southeastern neighbor, and had a break north of Cauchy B. It resumes at Cauchy B and continues in the same direction. A small bright spot is just south of a very slight bend in the fault. Rima Cauchy is shown on the LQ map north of Rupes Cauchy, but I saw absolutely nothing of the rille at this time.

Dorsa Geikie and Dorsa Mawson

Alberto Anunziato

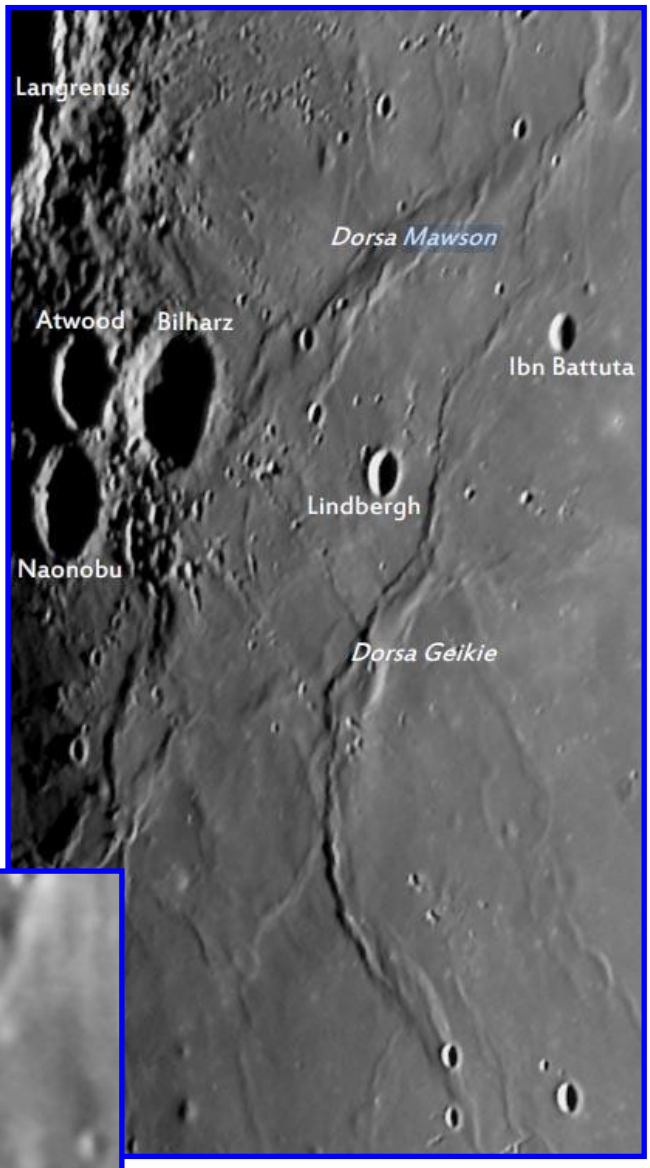
In the central part of its eastern edge, Mare Fecunditatis has two wrinkle ridges that near the terminator present a very interesting view: Dorsa Geikie and Dorsa Mawson. Both run concentric to the shore of Fecunditatis. Garfinkle, in Luna Cognita, tells us that: "In the oblong maria, such as Fecunditatis and Oceanus Procellarum, wrinkle ridges tend to run north to south down the center of these maria, possibly following fracture lines. An additional theory holds that the ridges are actually narrow lava flows emanating from crater vents".

To find our area, you have to look for Langrenus, to the north there are 3 craters in a cluster: Atwood, Naonobu and Bilharz (Left edge of IMAGE 1) and to the west is first Dorsa Mawson (180 kilometers long), then Lindbergh (13 kilometers in diameter), further west comes Dorsa Geikie (240 kilometers in length) and further west we find Ibn Battuta (12 kilometers in diameter). Of the 3 craters named first we are not going to see almost anything, since the terminator passes exactly over them, we only see the brightness of the west wall of Bilharz.

Image 1, Dorsa Geikie and Dorsa Mawson, *Alberto Anunziato, Paraná, Argentina. 2023 December 30 05:10-05:45 UT. Meade EX105 mm Maksutov-Cassegrain telescope, 196 x.*

We start with Dorsa Mawson, to the east (left of IMAGE 1). Garfinkle describes it this way: "Dorsa Mawson, to the southeast of the craters Ibn Battuta and Lindbergh in Mare Fecunditatis, is a fine example of a ropey platykurtic wrinkle ridge. The broad low ridge runs for about 180 km (111.84 miles) in a generally northeasterly direction from the eastern arc of the ghost crater Goclenius U. The northern end of the ridge consists of at least two parallel ridges". Goclenius U does not appear in IMAGE 1, I do not remember observing it, but I was worried about recording the ridges and I was probably not attentive enough. I was also unable to resolve the two parallel segments at the northern end.

Both Goclenius U and the northern fork can be seen perfectly in IMAGE 2, which belongs to page 76 of Volume 1 of Kwok Pau's "Photographic Lunar Atlas for Moon Observers." I have frequently mentioned in previous texts that this work, in addition to all its other qualities, has the best collection of wrinkle ridge images that I know of. So, when I try to interpret the shadows and brightness that I observe with my small telescope, I first resort to the images from the Kwok Atlas. Let's see then a little about the topography of Dorsa Mawson. IMAGE 3 is a detail of IMAGE 2. In IMAGE 1 the shadow of the eastern margin is quite deep while the crest, or rather segments of the crest, pass along the western margin, in IMAGE 1 we see three crest segments, from north to south: a segment parallel to the margin, a second parallel to the margin but that appears to branch towards the center, and a third segment that runs in echelon with respect to the arch. When the crests are in an echelon pattern with respect to the arc, they are more difficult to observe than the crests that run from north to south, so it is interesting to have observed them on Dorsa Mawson. IMAGE 3 is an enlargement of IMAGE 2, in which we mark the three segments that coincide with the bright areas marked in IMAGE 1. IMAGE 3 presents a fascinating panorama of the complex topography of Dorsa Mawson, with numerous secondary crests on the eastern margin, opposite the margin along which the main crest run. You will be able to forgive the incorrect location of the Lindbergh crater in IMAGE 1, if you see IMAGE 2, it is located further north than I drew it.



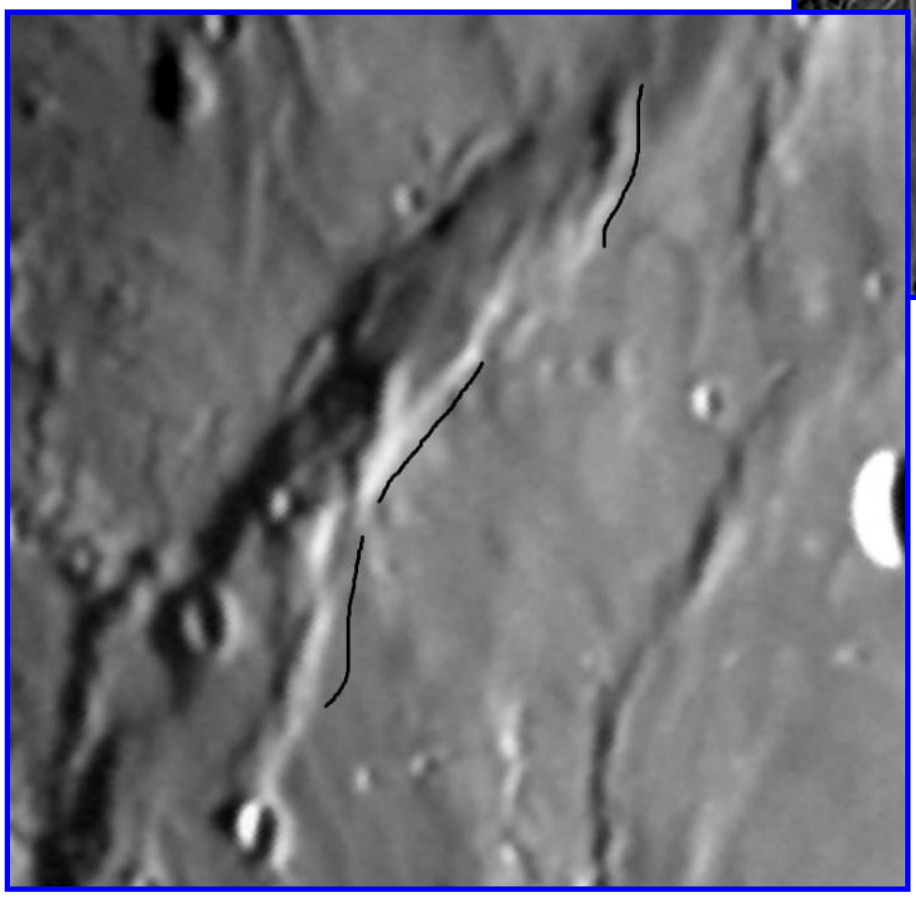
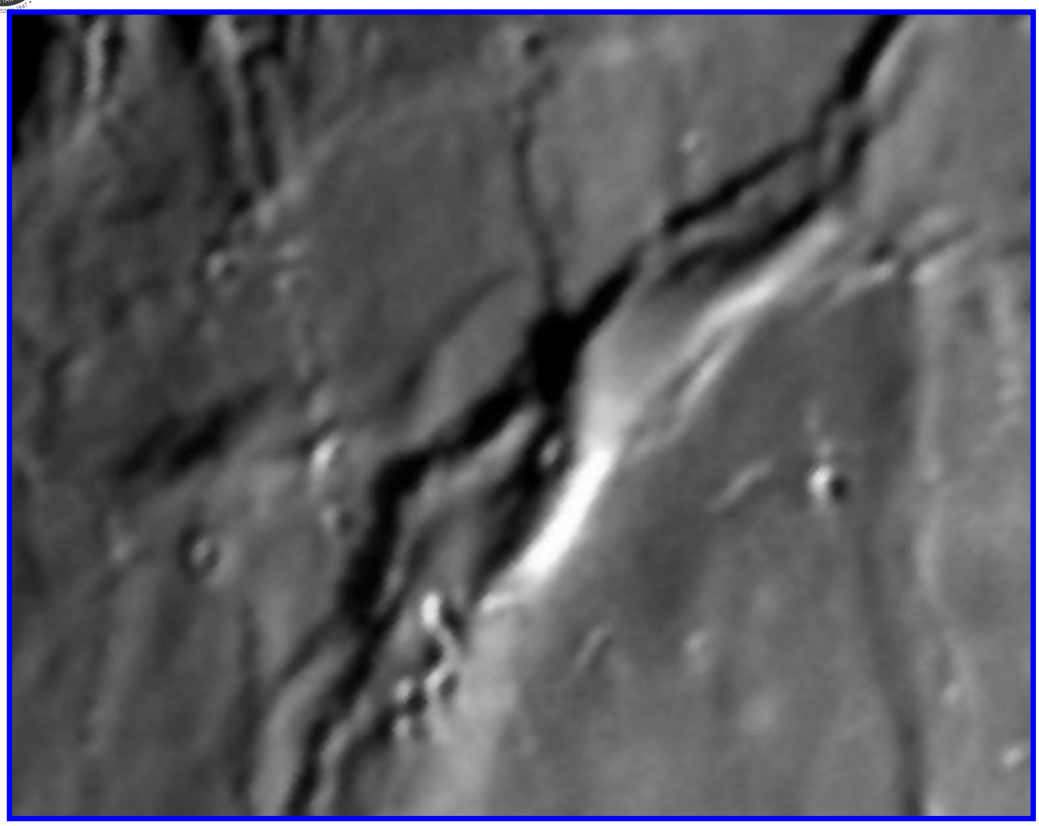


Image 2, Above, Dorsa Geikie *from Volume 1, page 76 of Photographic Lunar Atlas for Moon Observers by KC Pau. North is down, west is right.*

Image 3, Left, Dorsa Geikie *from Volume 1, page 76 of Photographic Lunar Atlas for Moon Observers by KC Pau. North is down, west is right. This is an enlargement of image 2.*

Lunar Topographic Studies
Dorsa Geikie and Dorsa Mawson



To the west of Lindbergh, and east of Ibn Battuta, is our second wrinkle ridge: "North of Dorsa Mawson is the gentle arc of Dorsa Geikie, another very low multiple-branched ropey ridge. To the west of Dorsa Geikie is an unnamed low ridge that bisects and forms the outline for a chain of three unnamed ghost craters" (Garfinkle). The low ridge that Garfinkle refers to in western Geikie appears in both IMAGE 1 and IMAGE 2. Dorsa Geikie is thinner and longer than Mawson and also has another parallel segment, to the west. If we see IMAGE 2 we see that it has a wider central area, which we also see in IMAGE 1, and that its crest seems to run along its eastern margin, except in the wide central area where there seems to be a crest on each margin. In IMAGE 1 I recorded the ridge of the western margin in the wide central zone and then further north a thinner crest over the eastern margin. The western crest even casts its own shadow, parallel to the shadow of the eastern margin of the arch. IMAGE 4 is another detail from IMAGE 2 and shows that, indeed, the western crest in the broad central area of Dorsa Geikie is very bright, while the crest on the eastern margin is not as bright and appears more uniform (IMAGE 5, another enlargement of IMAGE 2).

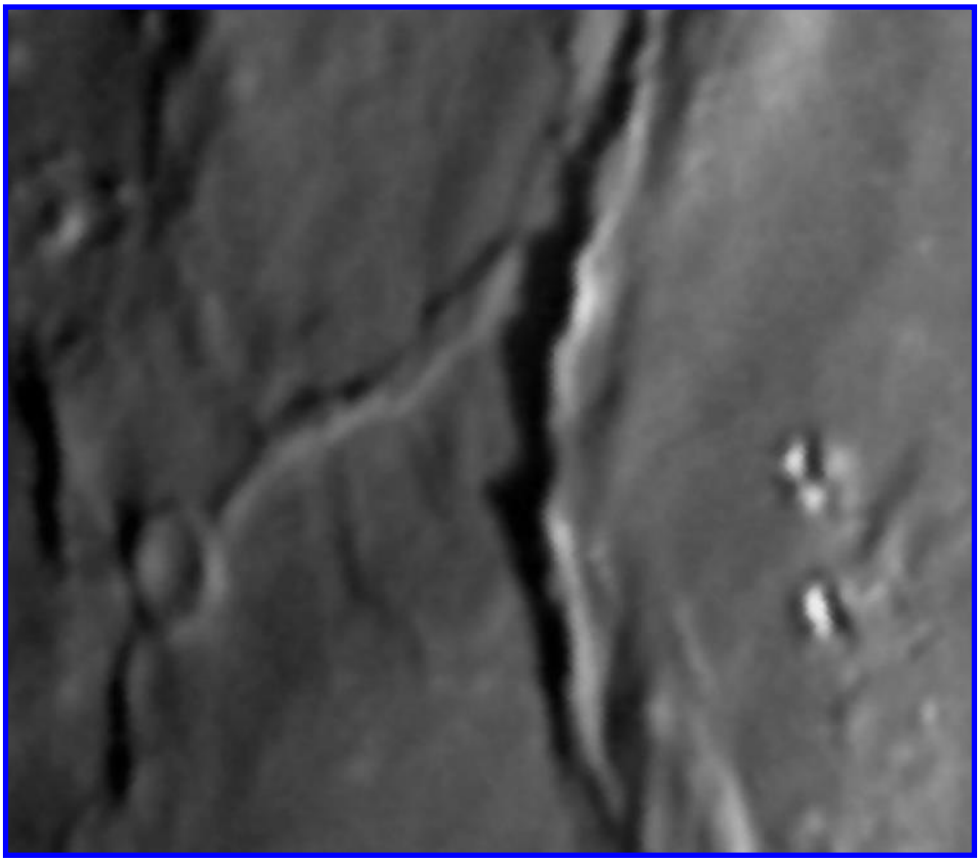
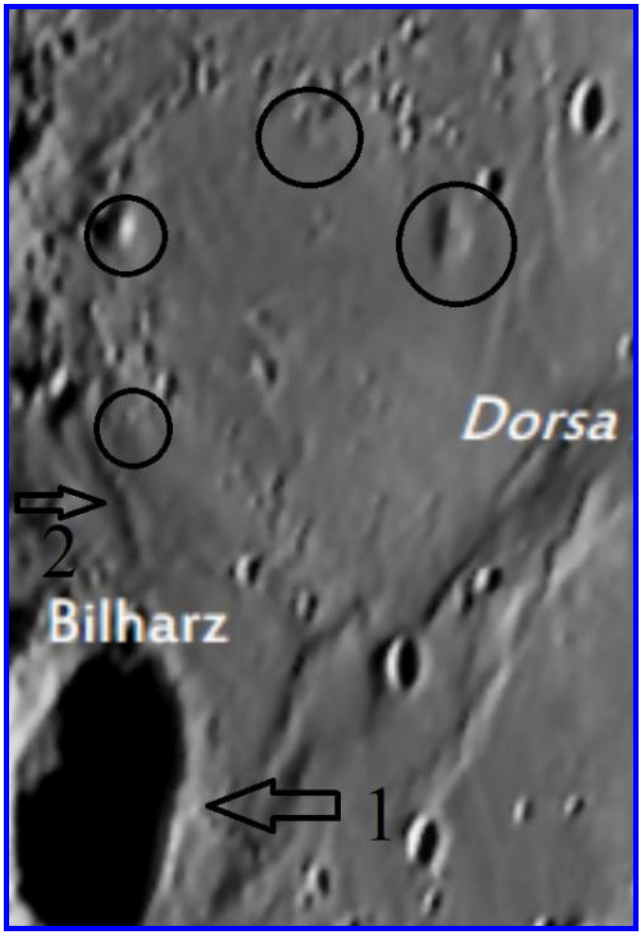
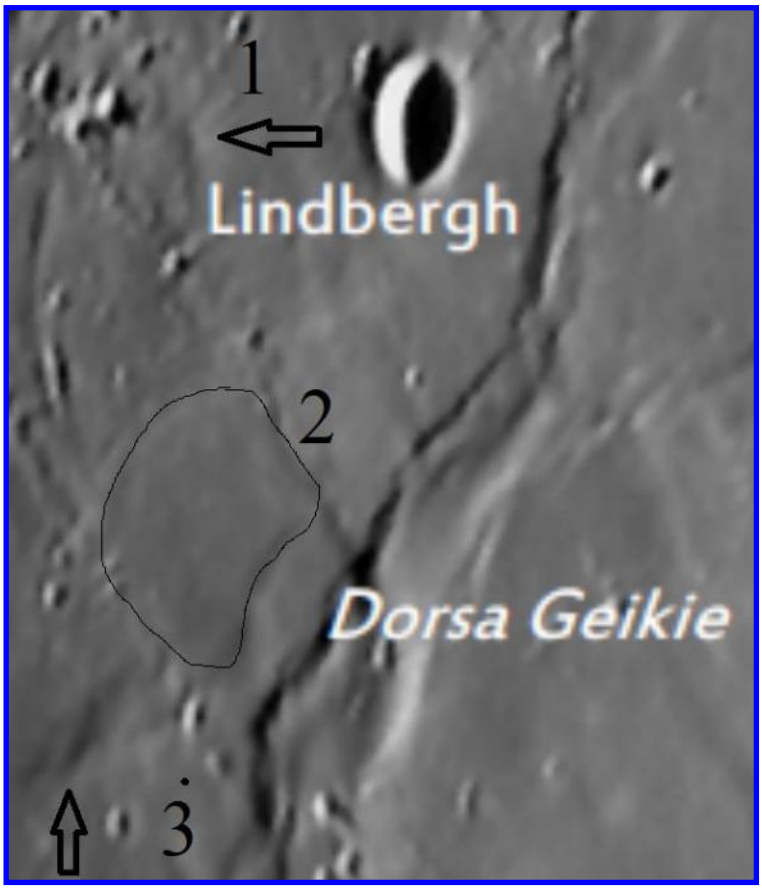


Image 4, Above, Image 5, Right, Dorsa Geikie *from Volume 1, page 76 of Photographic Lunar Atlas for Moon Observers by KC Pau. North is down, west is right. These are enlargements of images of image 2.*

Lunar Topographic Studies
Dorsa Geikie and Dorsa Mawson

At the time of recording the observation there were some "non-wrinkle ridge" details that caught my attention. In the area between the two ridges, north of Lindbergh, a dark crater-shaped spot could be seen very clearly, with the shade of shadow that usually indicates a depression. Due to its location in IMAGE 1, it could be the area marked with the number 1 in IMAGE 6. A buried crater? In the days that follow I will try to go deeper. A little further north was a bright area that cast shadows, with the typical landform protruding from the lava. Due to its location, it could be the one we marked with the number 3, although it does not seem that said elevation could shine as brightly. The same could be said of the bright spot between Lindbergh and Dorsa Mawson in IMAGE 1, which could coincide with the not very prominent point 1 in IMAGE 6. IMAGE 7, like IMAGE 6, is an extension of IMAGE 2. In it we see another intriguing detail from IMAGE 1: a circular area with the shadow tone typical of depressions in the terrain and in the shape of another buried crater, is located southwest of Bilharz and its shadow merges with that cast by the neighboring Dorsa. What could be the northeastern edge of the possible crater glowed similarly to what the strip of Bilharz's western wall looked like. Inside, a series of bright spots could be seen, with differences in brightness, some with shadows, as if they were mounds (brighter than domes) that delimited the edge of this supposed crater. In IMAGE 7 we mark the details of this area: arrow 1 marks the western wall of Bilharz, which marks the boundary of the terminator in IMAGE 1, arrow 2 the bright area that could be the northeast wall of the supposed buried crater, and the circles mark high areas that could coincide with those marked in IMAGE 1 (in which 5 appear, while in IMAGE 7 we see 4). In IMAGE 7 the brightest area (on the left, above) clearly coincides with the brightest area observed in IMAGE 1.





Without a doubt, a fascinating area, which belies the bland and boring character that is usually attributed to Mare Fecunditatis.

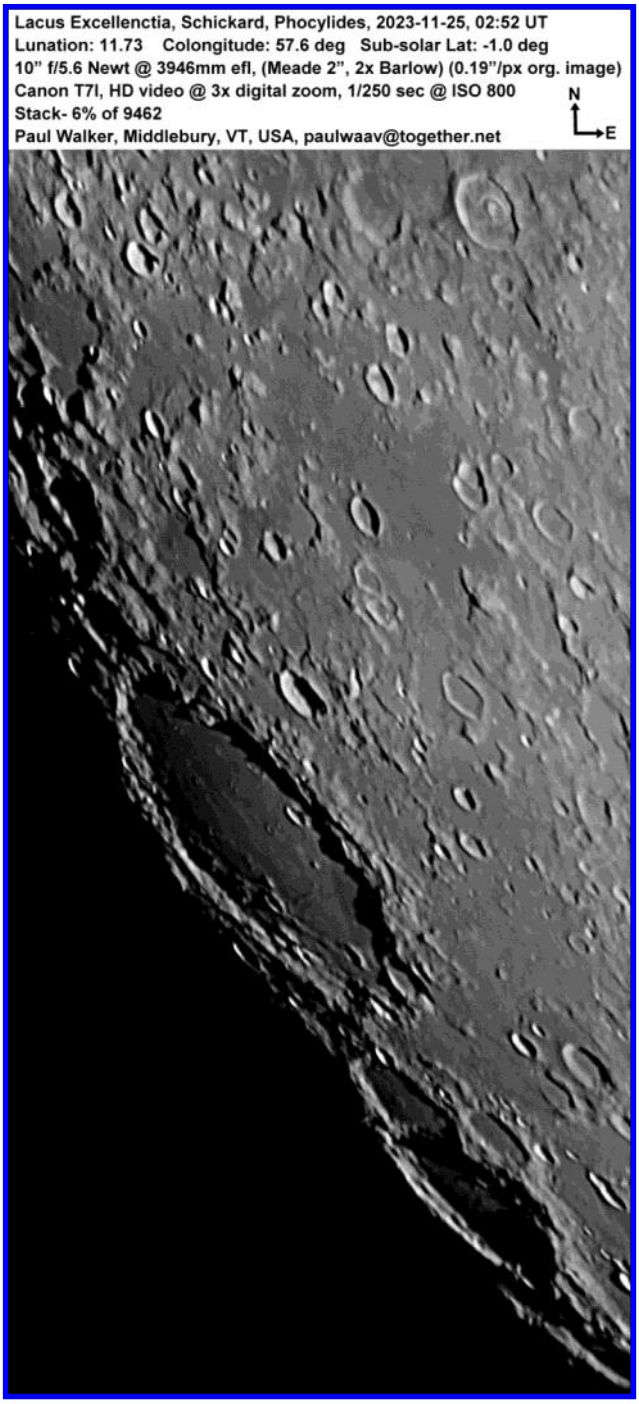
Image 6, Above, Image 7, Left, Dorsa Geikie *from Volume 1, page 76 of Photographic Lunar Atlas for Moon Observers by KC Pau. North is down, west is right. These are enlargements of images of image 2.*

Lunar Topographic Studies
Dorsa Geikie and Dorsa Mawson

Lacus Excellentiae, Schickard and Phocylides
2023-11-25, 02:52 UT

Paul Walker

This area is on the south-southwestern part of the Moon. The top of the image just touches on the southern end of Mare Humorum. All of Lacus Excellentiae is visible near the top, Schickard is the largest crater here. Below that is an interesting pair of craters Nasmyth (northern) and Phocylides (southern)

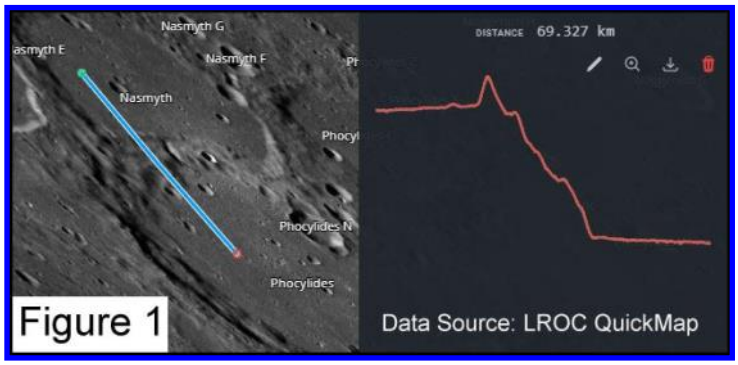


***Lacus Excellentiae, Schickard and Phocylides**, Paul Walker, Middlebury, Vermont, USA. 2023 November 25 02:52 UT, colongitude 57.6°. 10 inch f/5.6 reflector telescope, 2x barlow, 3946 mm efl, Canon T7i HD video.*

At the top right corner is Vitello, a 41 km (25 mi) crater sitting just below Mare Humorum. This crater is very old, ~3.8 billion years. In this image you get a hint of a somewhat unusual feature, a circular ring around its central peak. Zooming in on the Virtual Moon Atlas (VMA) reveals this to be a circular fracture, in some places a double fracture. There are other craters with radial cracks but I haven't seen any as continuous as this, at least not yet.

Whenever I have viewed Schickard it has exhibited a fairly flat floor, though as can be seen here it has some low ridges. There are also several small craters on the floor. Not easy to see in this image, the north end of the floor and the southeast part (partly in shadow) are a bit darker than the middle. With a higher Sun angle, this should be easier to see.

I always like to view the pair of craters Nasmyth and Phocylides just below Schickard when the Sun is rising over them. It's easy to see the difference in the elevation of their floors and quite striking. The elevation Phocylides' floor is ~ +430m and Schickard's ~ -1550 m. Another notable feature or lack of a feature is that there is practically no raised wall between them, mostly just a drop off from Nasmyth to Phocylides (see Figure 1). Neither crater has a central peak. What at first glance looks like a low peak in Nasmyth in this image is actually a crater.



Lunar Topographic Studies
Lacus Excellentiae, Schickard and Phocylides

Just below Phocylides is what looks like the west and east walls of a crater. Based on the apparent elongation, 2 craters, it was hard to identify this area in the Virtual Moon Atlas (VMA) and the LROC QuickMap (https://quickmap.lroc.asu.edu/). It/they looks very different on the maps which have so little shadowing. If I zoom in a bit, I get the impression there may be two highly eroded overlapping craters there. One up against Phocylides and the other farther south (visible in the extreme lower right-hand corner of the image. As I zoom in more, this impression erodes somewhat. The LROC QuickMap shows them better than the VMA. Using the LROC QuickMap and its inspection tool, the upper "crater" is too eroded to show any walls a floor. The lower feature does show fairly good indications of walls and a floor (see Figures 2, 3 and 4).

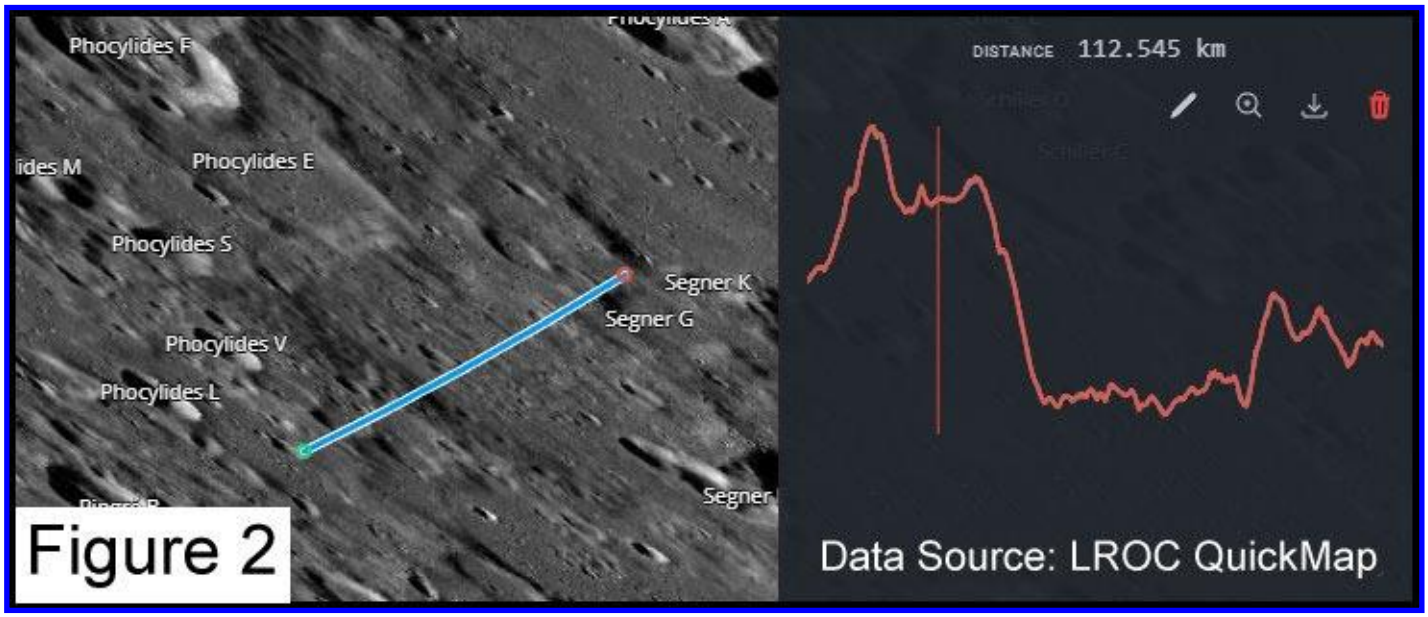


Figure 2, Unidentified craters below Phocylides, *LROC.*

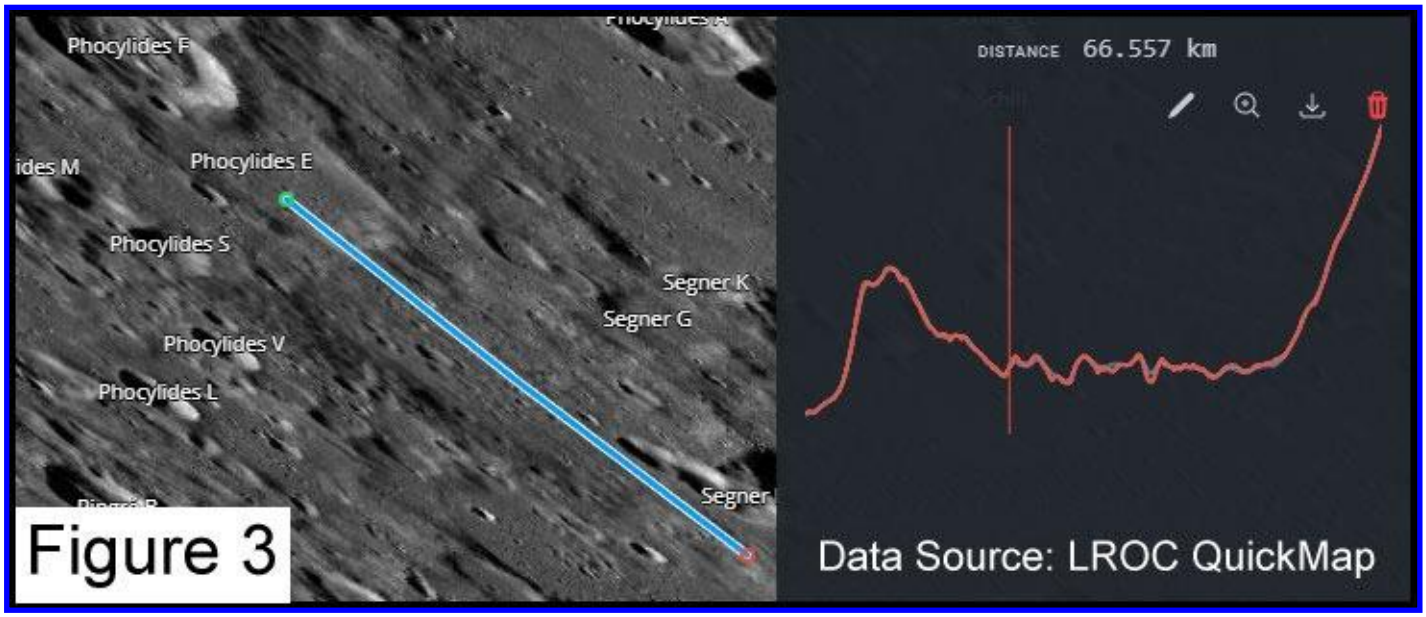


Figure 3, Unidentified craters below Phocylides, *LROC.*

Figures 2 and 3 indicate a depression and walls, while Figure 4 only a wall on the south side. Neither seems to be named though I see that the eastern half of the upper "crater" is designated as Phocylides E, not to be confused with Phocylides F just to E's north and which is smack dab on the south wall of Phocylides. Only small arcs of the west and east walls of F are visible in my image. I am starting to expand my use of the investigative tools available on the LROC QuickMap. It occurred to me that a gravity map might tell me more about these suspected craters. In Figure 5, I use the Grail Free Air Gravity overlay. The blue line in Figure 5 is same as in figure 4. With the gravity map it looks like there is an old buried crater to the west of Phocylides E for a total of 3 old crater below Phocylides making up the west and east walls visible in my image.

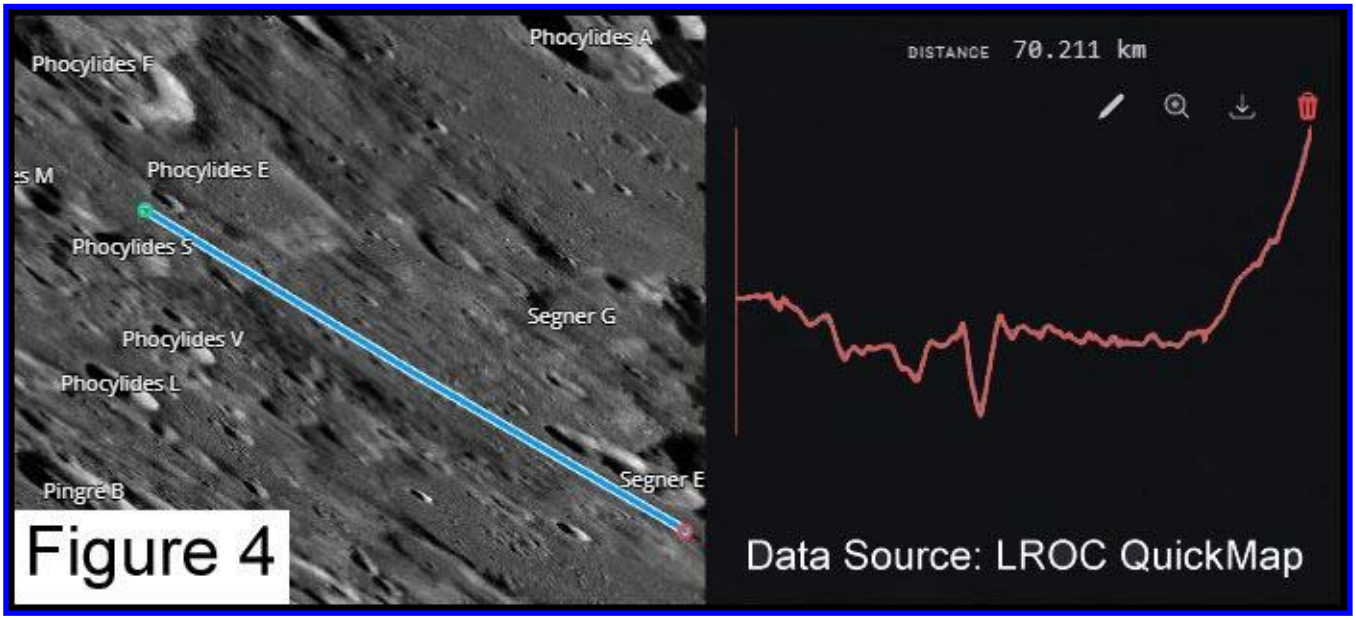


Figure 4, Unidentified craters below Phocylides, *LROC.*

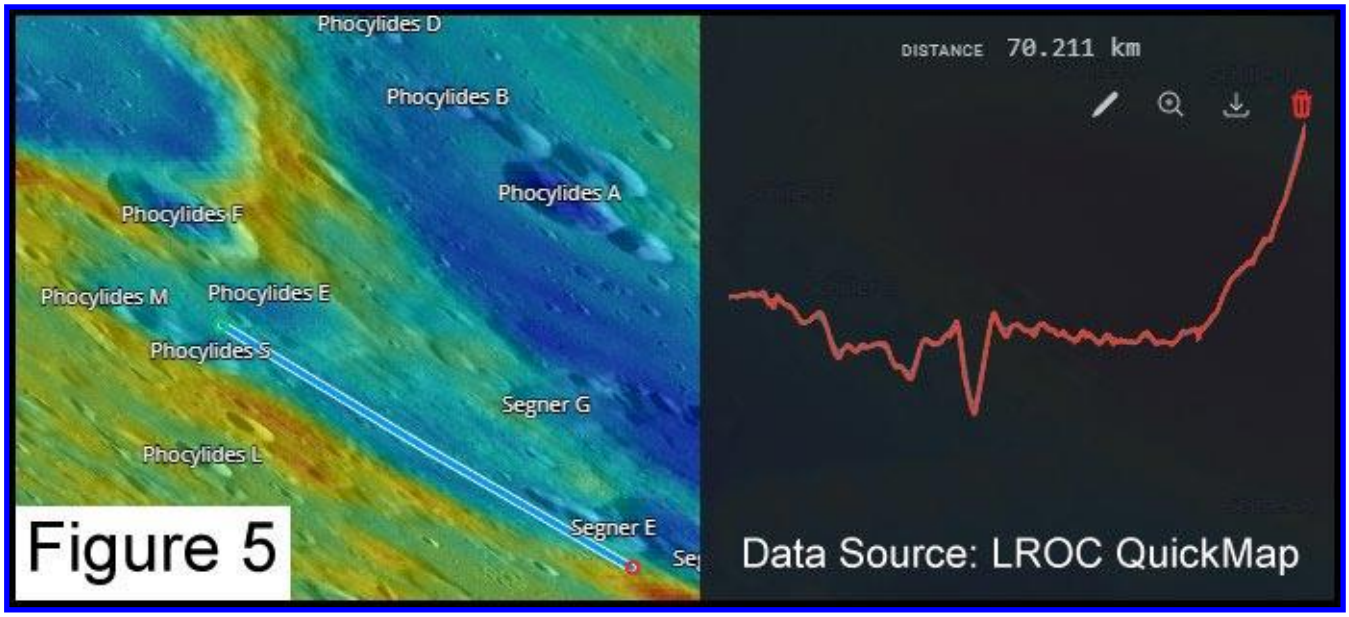


Figure 4, Unidentified craters below Phocylides, *GRAIL Free Air Gravity Overlay.*

Long Shadows on the West Shore of Mare Crisium

Alberto Anunziato

IMAGE 1 does not respond to anything other than the fascination I felt when observing the western shore of Mare Crisium when the terminator passed through the east of Picard, with the waning moon (90% illumination, colongitude 123.2º). I had never seen such a dramatically expressionistic panorama. The shadows of the steep mountain edge of Mare Crisium extend far into the interior of the mare, except for the area in front of Yerkes. The craters that we see, from south to north, are Lick (of which its eastern wall is barely visible), the small Greaves, the spectacular ghost crater Yerkes (I had never seen its almost non-existent walls casting shadows), the small Yerkes E, further east Picard (who begins to be swallowed by shadows) and the very long shadows of Peirce and Swift. What we draw as a thin dark line is a wrinkle ridge (which can be seen in the Lunar Reconnaissance Orbiter Quickmap), of which nothing more than the shadow can be observed. The only unknown from the observation is an area of very weak brightness, which appears to have a shadow to the east. A dome? Not that I know. I don't think I will discover a dome with a 4 inch, so I estimate that it must be some bright area and the shadow only a mental addition produced by an observation bias.

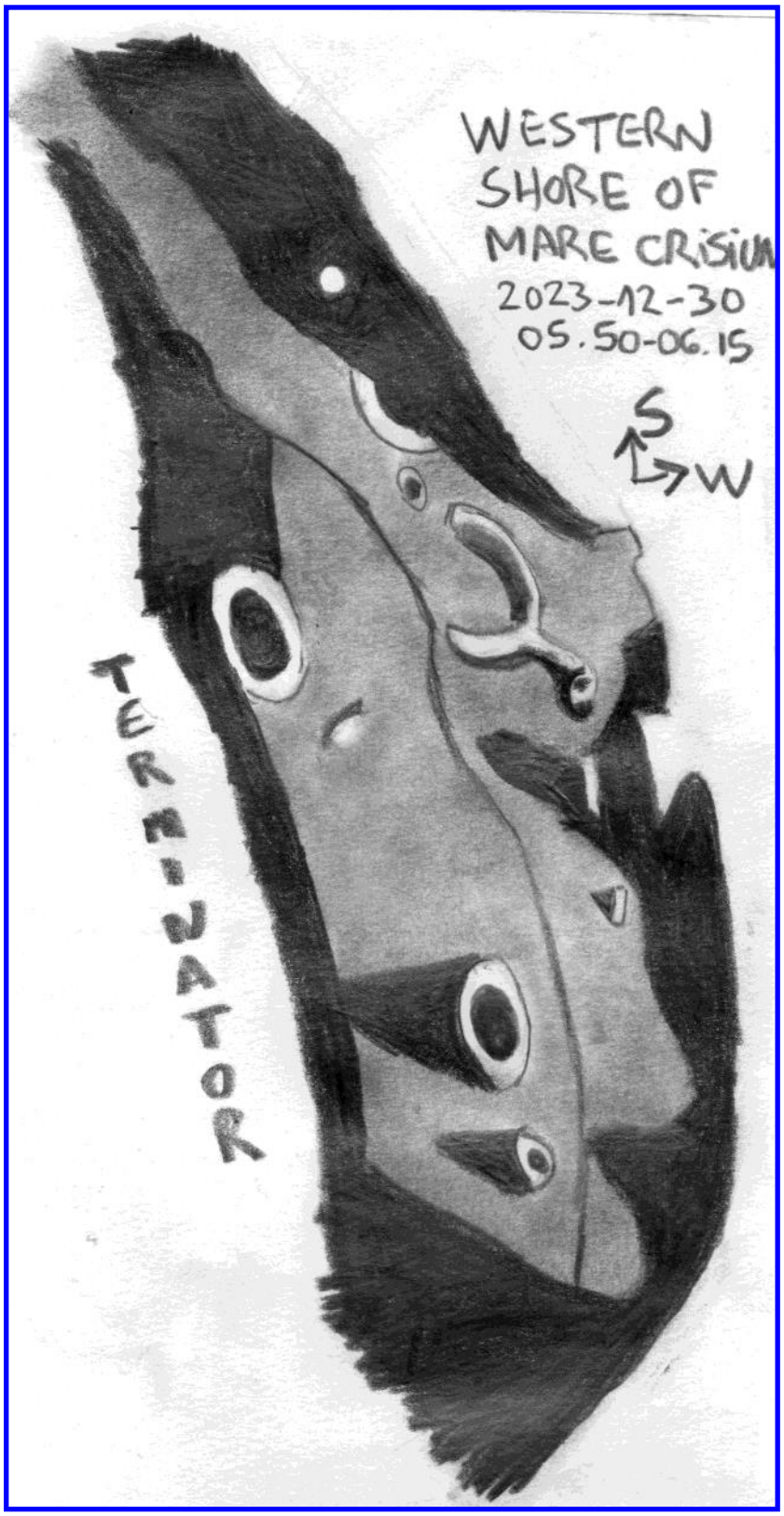
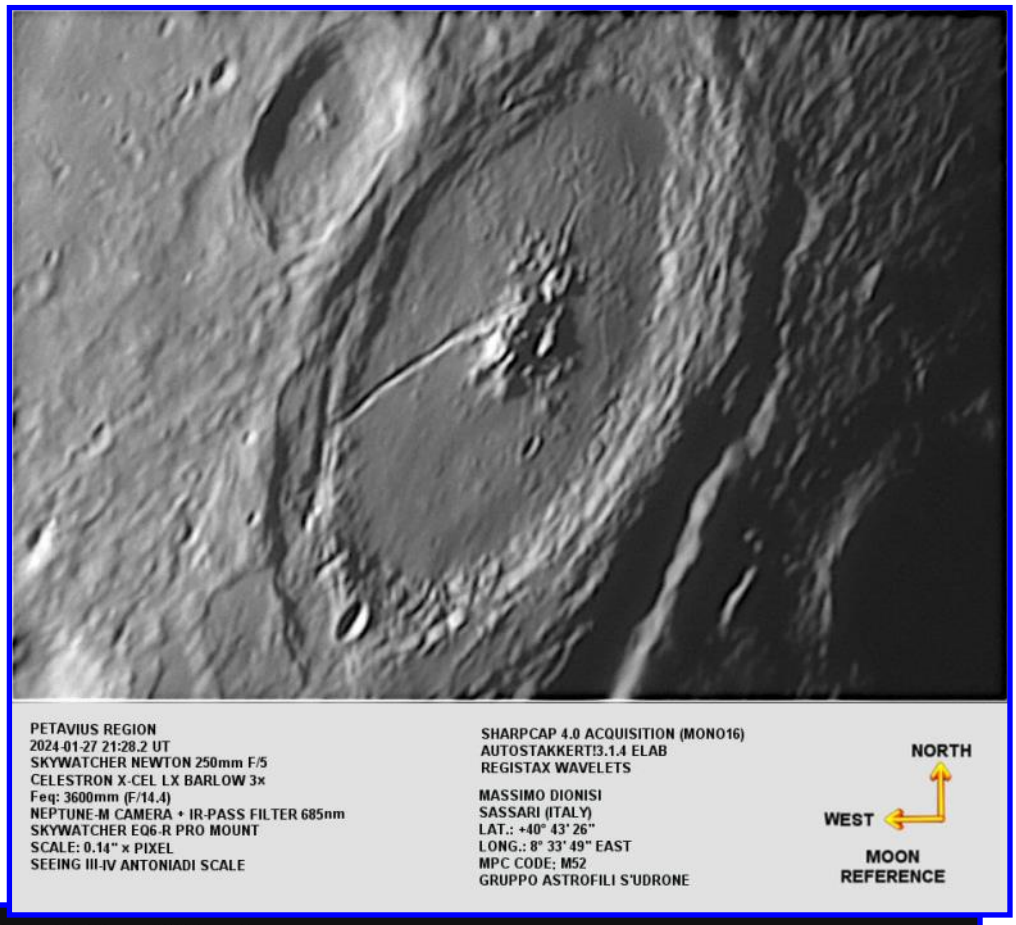


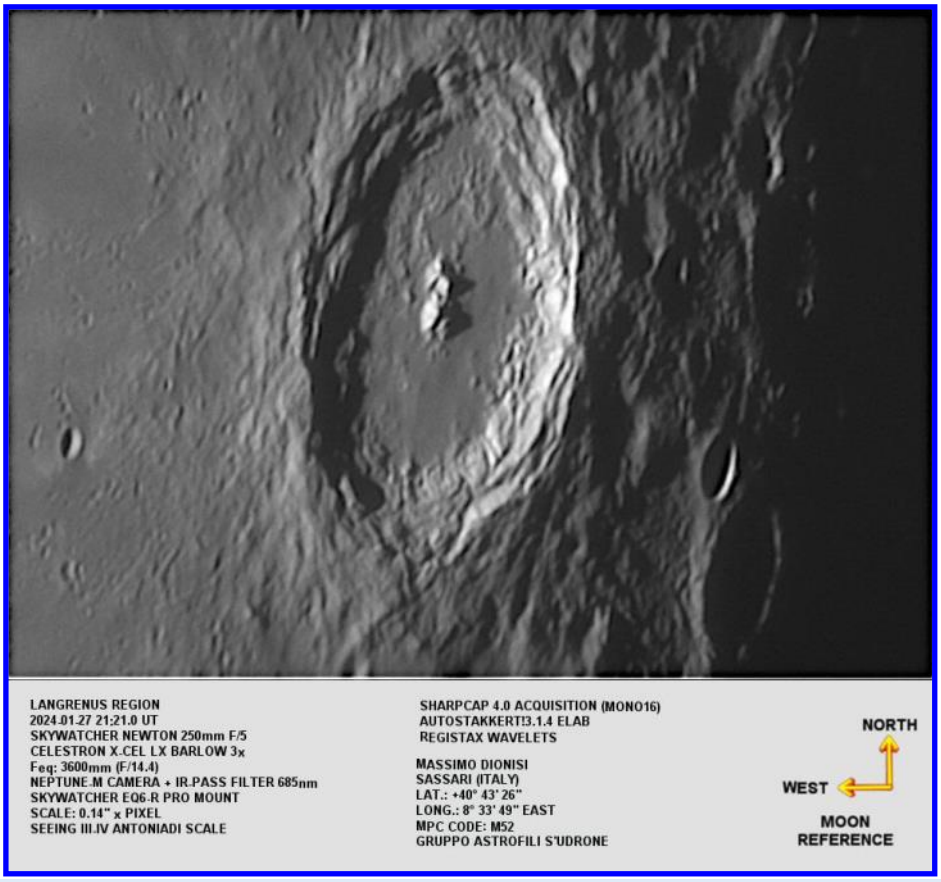
Image 1, Mare Crisium, *Alberto Anunziato, Paraná, Argentina. 2023 December 30 05:50-06:15 UT. Meade EX105 mm Maksutov-Cassegrain telescope, 196 x.*

Petavius, *Massimo Dionisi, Sassari, Italy. 2024 January 27 21:28 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*



Strabo, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 19:41 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*

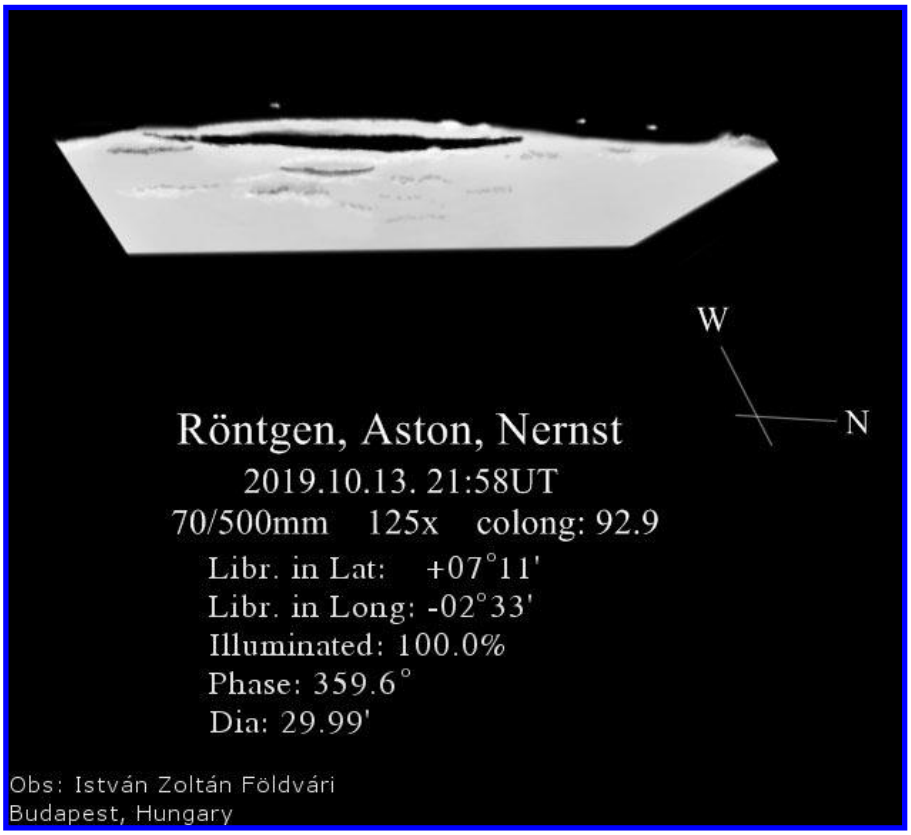
Recent Topographic Studies



Petavius, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 19:48 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*

Langrenus, *Massimo Dionisi, Sassari, Italy. 2024 January 27 21:21 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

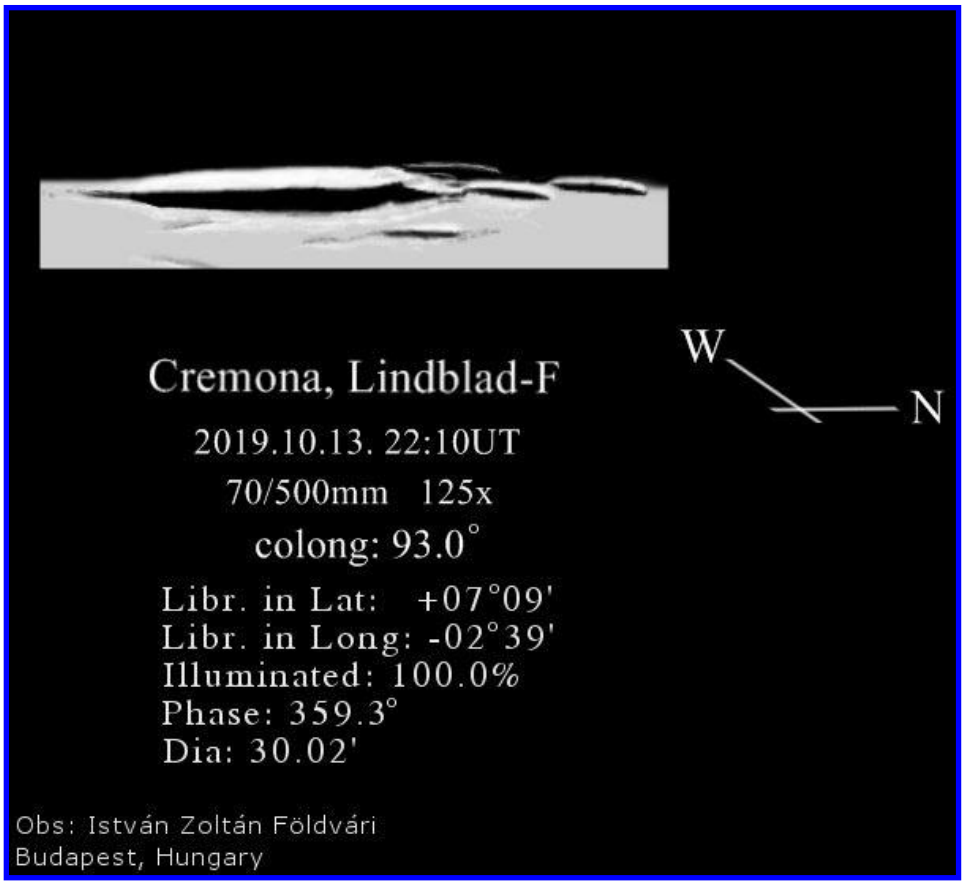
Recent Topographic Studies



Röntgen, Aston and Nerst, *István Zoltán Földvári, Budapest, Hungary. 2019 October 13 21:46-22:07 UT, colongitude 92.9°. 70 mm refractor telescope, 500 mm focal length, Vixen Lanthanum LV 4mm eyepiece, 125x. Seeing 6/10, transparency 4/6.*

Mare Crisium, *Walter Ricardo Elias, Oro Verde, Argentina. 2024 January 15 23:51 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl, QHY 5 II C camera.*

Recent Topographic Studies



Cremona and Lindblad-F, *István Zoltán Földvári, Budapest, Hungary. 2019 October 13 22:08-22:22 UT, colongitude 93.0°. 70 mm refractor telescope, 500 mm focal length, Vixen Lanthanum LV 4mm eyepiece, 125x. Seeing 6/10, transparency 4/6.*

Mare Imbrium and Sinus Iridum, *Eduardo Horacek, Mar del Plata, Argentina. 2020 April 04 02:28 UT. 150 mm Maksutov-Cassegrain telescope, Canon EOS Rebel T5i. North is down, west right.*

Recent Topographic Studies

Houssay and Nansen, *István Zoltán Földvári, Budapest, Hungary. 2019 October 13 22:23-22:45 UT, colongitude 93.4°. 70 mm refractor telescope, 500 mm focal length, Vixen Lanthanum LV 4mm eyepiece, 125x. Seeing 6/10, transparency 4/6.*

Sinus Iridum at Dawn, *Eduardo Horacek, Mar del Plata, Argentina. 2023 November 22 23:15 UT. 150 mm Maksutov-Cassegrain telescope, Canon EOS Rebel T5i. North is down, west right.*

Recent Topographic Studies

Hyginus, *Gregory T. Shanos, Sarasota, Florida, USA. 2023 November 21 00:04 UT. Meade LX200 10 inch Schmidt-Cassegrain telescope, Optec f/6.2 focal reducer, ZWO ASI178MM camera. Seeing 6/10, transparency 7/10. Greg adds: "*The Moon at 56.6% phase on Nov 21, 2023 at 00h 04.9m UT at approximately 48 degrees above the horizon. Seeing was 6/10 above average and the transparency was 7/10, clear yet humid. Image taken with a MEADE LX200GPS 10 inch with a ZWO ASI 178MM monochrome camera, IR cut window and Optec f/6.2 focal reducer from Sarasota, Florida by Gregory T. Shanos. Aligned and stacked with Autostakkert 3.14, sharpened with Registax 6.08 and final processing in Photoshop CS4. Notable features include Hyginus which looks like a T. rex footprint in Mare Vaporium."

Geminus, *Massimo Dionisi, Sassari, Italy. 2024 January 27 20:31 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

Recent Topographic Studies

Mare Crisium, *Gregory T. Shanos, Sarasota, Florida, USA. 2023 November 21 00:09 UT. Meade LX200 10 inch Schmidt-Cassegrain telescope, Optec f/6.2 focal reducer, ZWO ASI178MM camera. Seeing 6/10, transparency 7/10. Greg adds: "*The Moon at 56.6% phase on Nov 21, 2023 at 00h 08.7m UT at approximately 48 degrees above the horizon. Seeing was 6/10 above average and the transparency was 7/10, clear yet humid. Image taken with a MEADE LX200GPS 10-inch with a ZWO ASI 178MM monochrome camera, IR cut window and Optec f/6.2 focal reducer from Sarasota, Florida by Gregory T. Shanos. Aligned and Stacked with Autostakkert 3.14, sharpened with Registax 6.08 and final processing in Photoshop CS4. Notable features include Mare Crisium, the rayed crater Proclus and Mare Tranquillitatis. Below Mare Crisium are Mare Undarum and Firmicus."

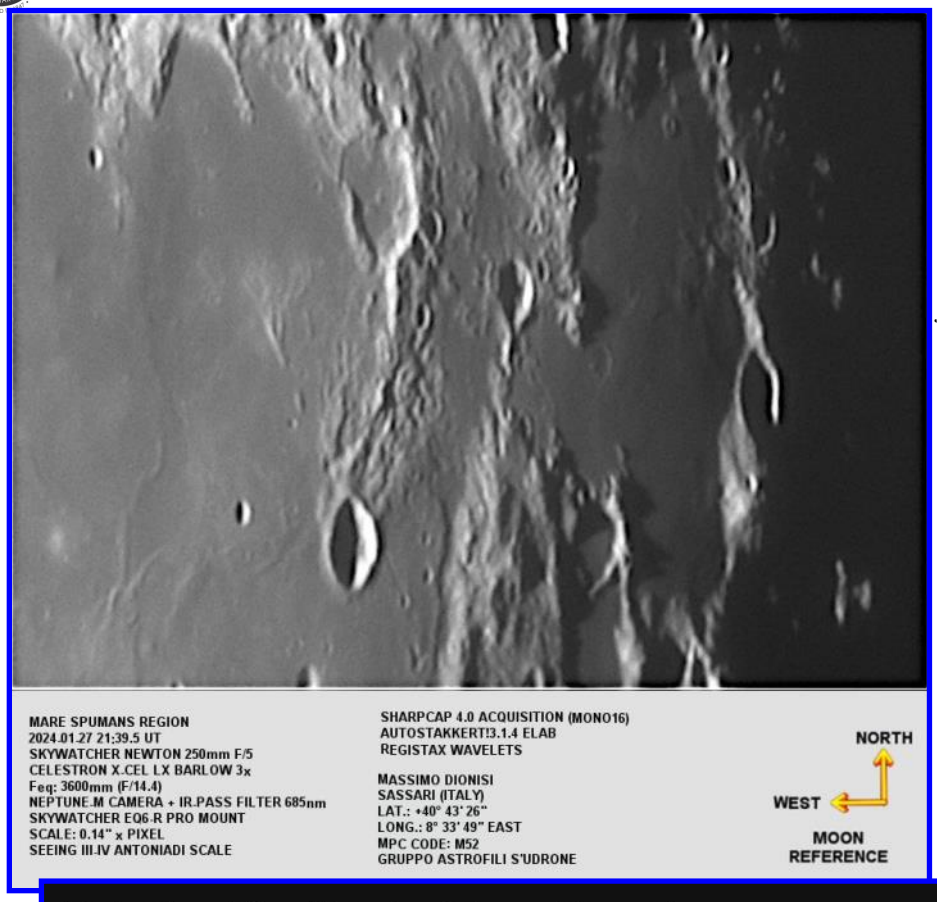
14-Day old Moon, *Maurice Collins, Palmerston North, New Zealand. 2024 January 25 09:26 UT. Sky Watcher Esprit 80 ED refractor telescope, QHY5III462C camera. Poor seeing, A-IV.*

Recent Topographic Studies

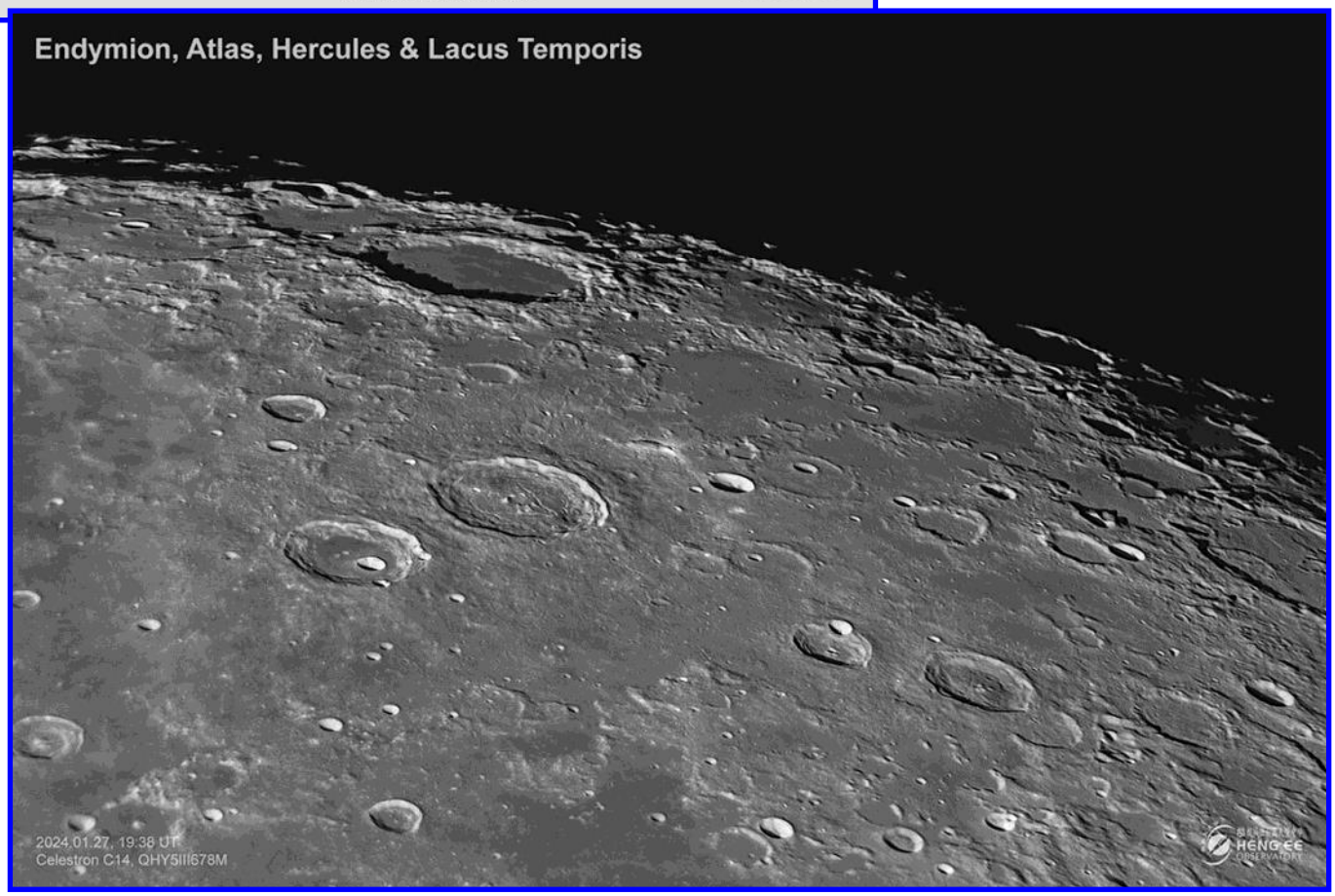
Sinus Iridum, *Eduardo Horacek, Mar del Plata, Argentina. 2023 November 23 00:14 UT. 150 mm Maksutov-Cassegrain telescope, Canon EOS Rebel T5i. North is down, west right.*

Tycho, *Walter Ricardo Elias, Oro Verde, Argentina. 2024 January 23 01:08 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl, QHY 5 II C camera.*

Recent Topographic Studies



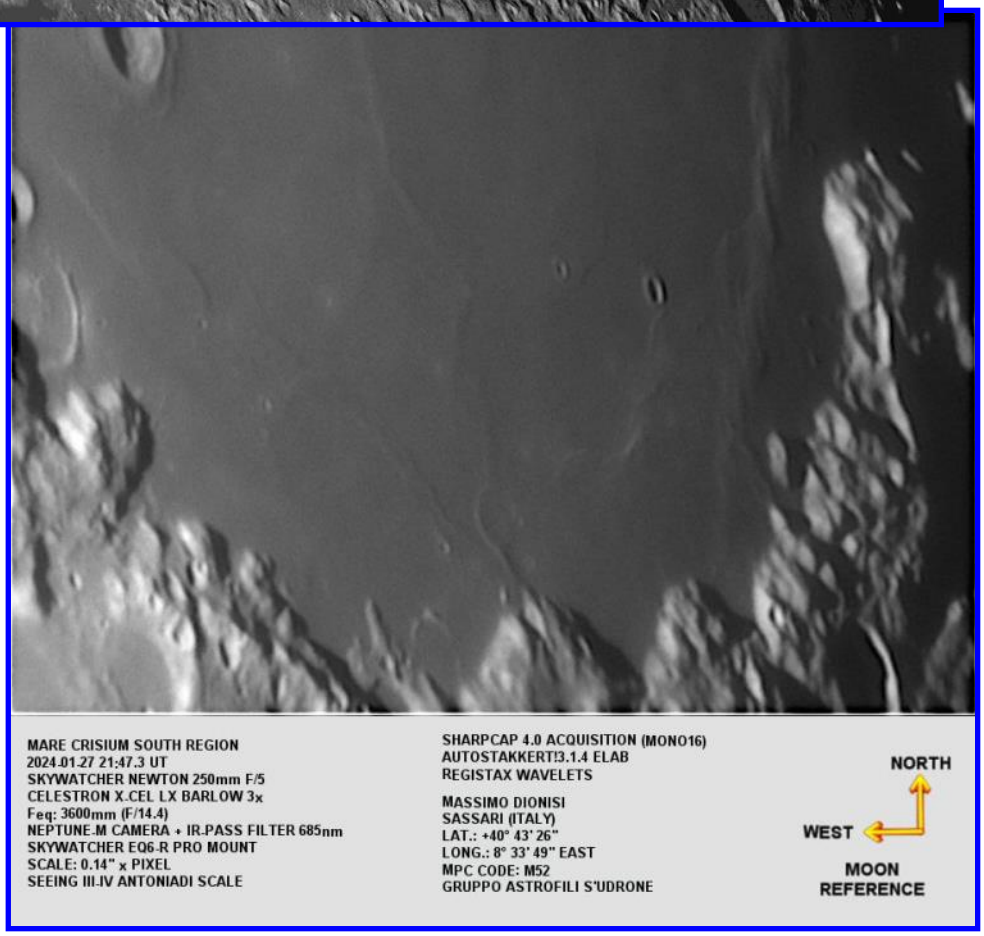
Mare Spumans, *Massimo Dionisi, Sassari, Italy. 2024 January 27 21:39 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*



Lacus Temporis, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 19:38 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*

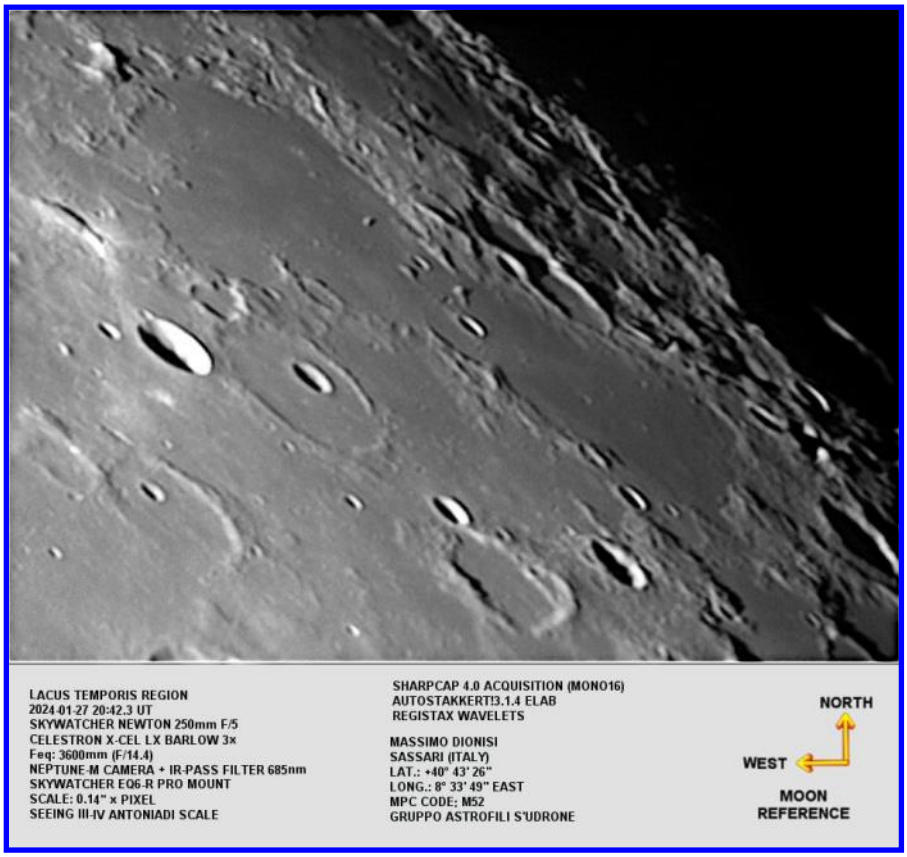
Recent Topographic Studies

Mare Crisium, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 19:33 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*



Mare Crisium South, *Massimo Dionisi, Sassari, Italy. 2024 January 27 21:47 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

Recent Topographic Studies

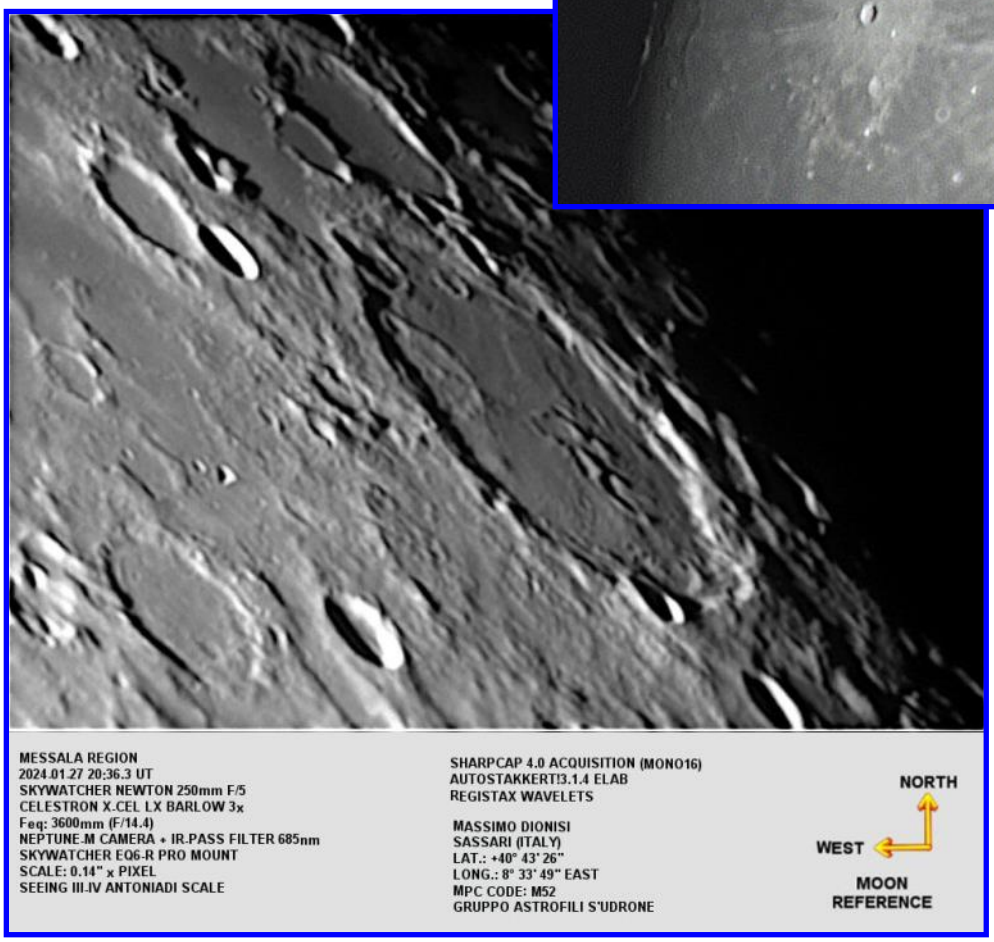


Mare Serenitatis, *Gregory T. Shanos, Sarasota, Florida, USA. 2023 November 21 00:09 UT. Meade LX200 10 inch Schmidt -Cassegrain telescope, Optec f/6.2 focal reducer, ZWO ASI178MM camera. Seeing 6/10, transparency 7/10. Greg adds: "*The Moon at 56.6% phase on Nov 21, 2023 at 00h 04.9m UT at approximately 48 degrees above the horizon. Seeing was 6/10 above average and the transparency was 7/10, clear yet humid. Image taken with a MEADE LX200GPS 10-inch with a ZWO ASI 178MM monochrome camera, IR cut window and Optec f/6.2 focal reducer from Sarasota, Florida by Gregory T. Shanos. Aligned and stacked with Autostakkert 3.14, sharpened with Registax 6.08 and final processing in Photoshop CS4. Notable features include Mare Serenitatis, Montes Hadley & Montes Caucasus. Prominent craters include Aristoteles, Eudoxus, Cassini, Aristillus and Archimedes."

Lacus Temporis, *Massimo Dionisi, Sassari, Italy. 2024 January 27 20:42 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

Recent Topographic Studies

Herodotus, *Walter Ricardo Elias, Oro Verde, Argentina. 2024 January 23 02:23 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl, QHY 5 II C camera.*



Messala, *Massimo Dionisi, Sassari, Italy. 2024 January 27 20:36 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

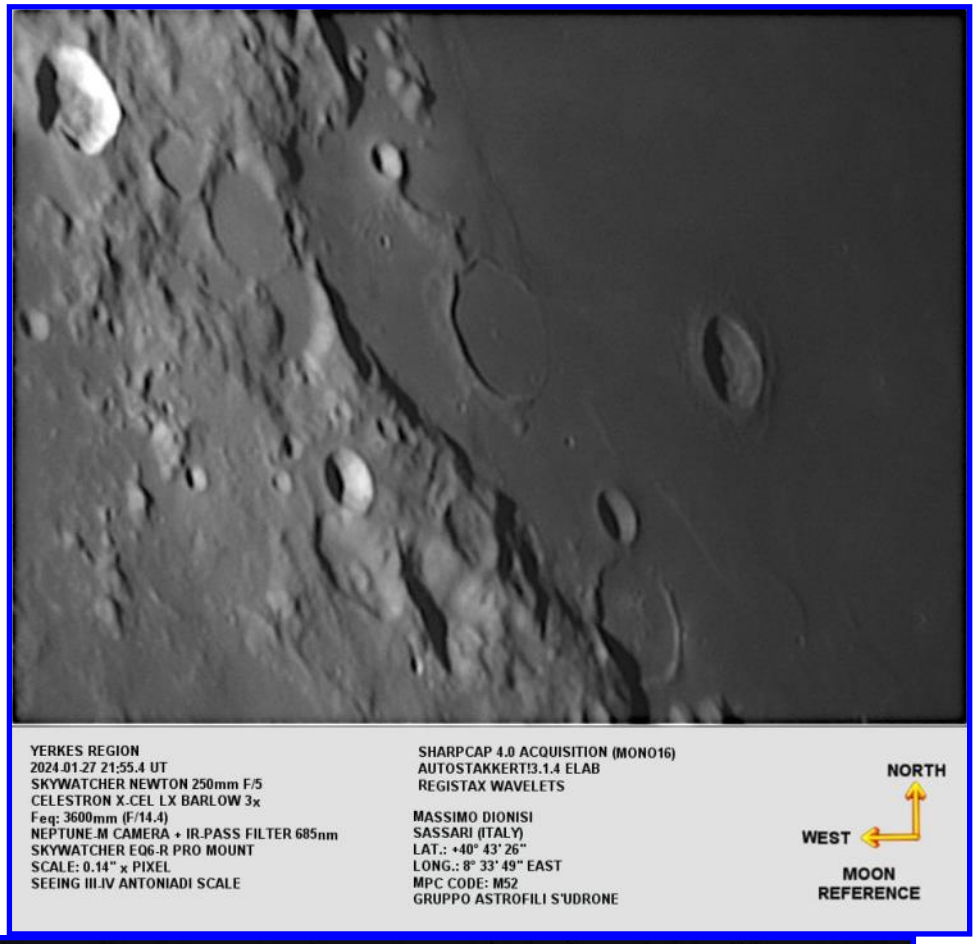
Recent Topographic Studies

12-Day old Moon, *Maurice Collins, Palmerston North, New Zealand. 2024 January 23 08:54-08:55 UT. Sky Watcher Esprit 80 ED refractor telescope, QHY5III462C camera.*

12-Day old Moon, *Maurice Collins, Palmerston North, New Zealand. 2024 January 23 09:07-09:14 UT. Sky Watcher Esprit 80 ED refractor telescope, 2.5x barlow, QHY5III462C camera. Maurice adds:* "Here are a couple of full disc images. I tested out my new barlows. The seeing was poor, so it didn't help much. Visually the view was nice with just the 6.4mm eyepiece at 78X and the 5.5mm at 90X without any barlow. Imaging, the 2.5X barlow magnified less than my 2X and just reaches focus with the imager through the diagonal, but not with an eyepiece that I tried, and the 5X was too much for the seeing conditions. I previously thought that the 2.5X barlow only worked with the 80mm extension tube (and does visually with eyepiece) but the QHY imager must be able to reach in to get the focal plane better. So least it works and may prove useful."

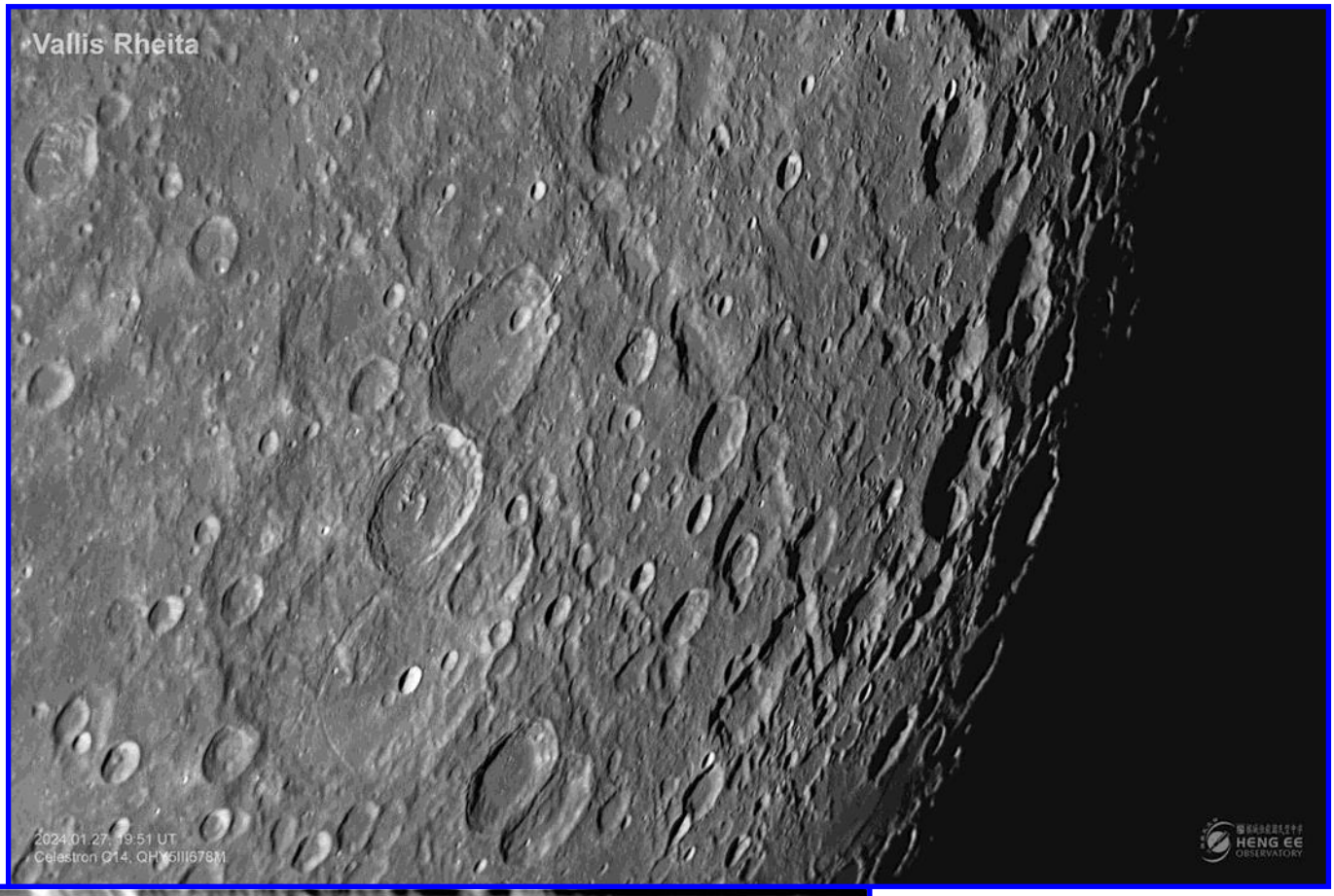
Recent Topographic Studies

Yerkes, *Massimo Dionisi, Sassari, Italy. 2024 January 27 21:55 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

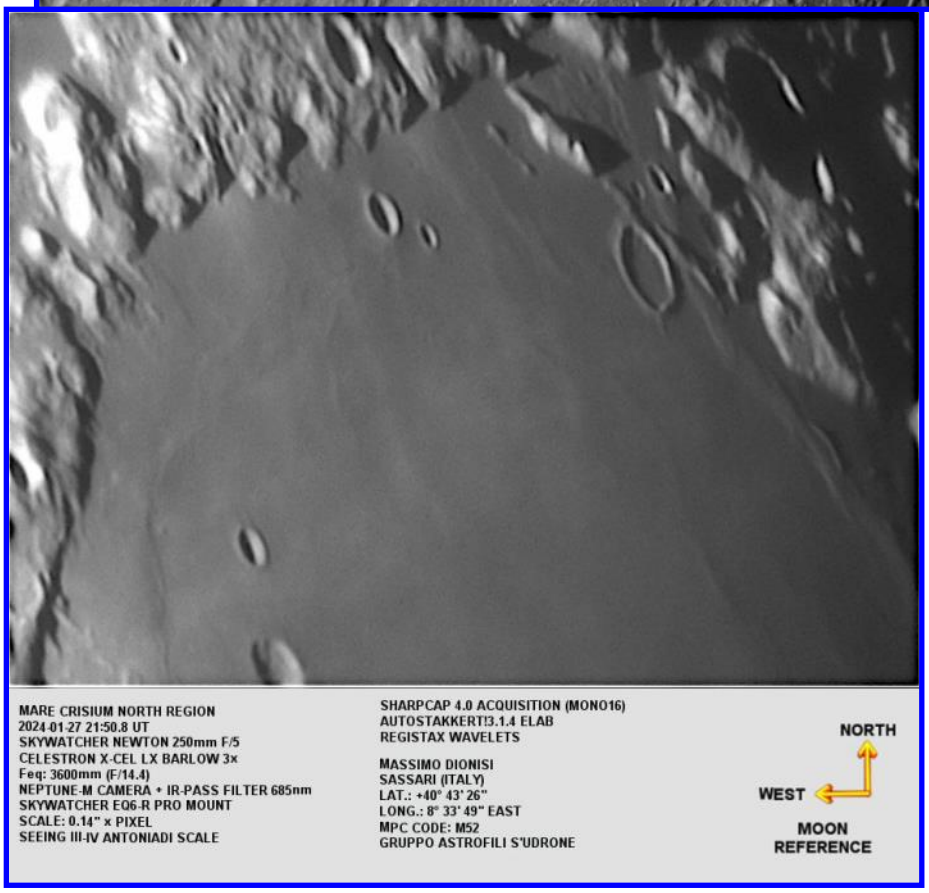


Geminus, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 19:36 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*

Recent Topographic Studies



Vallis Rheita, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 19:51 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*

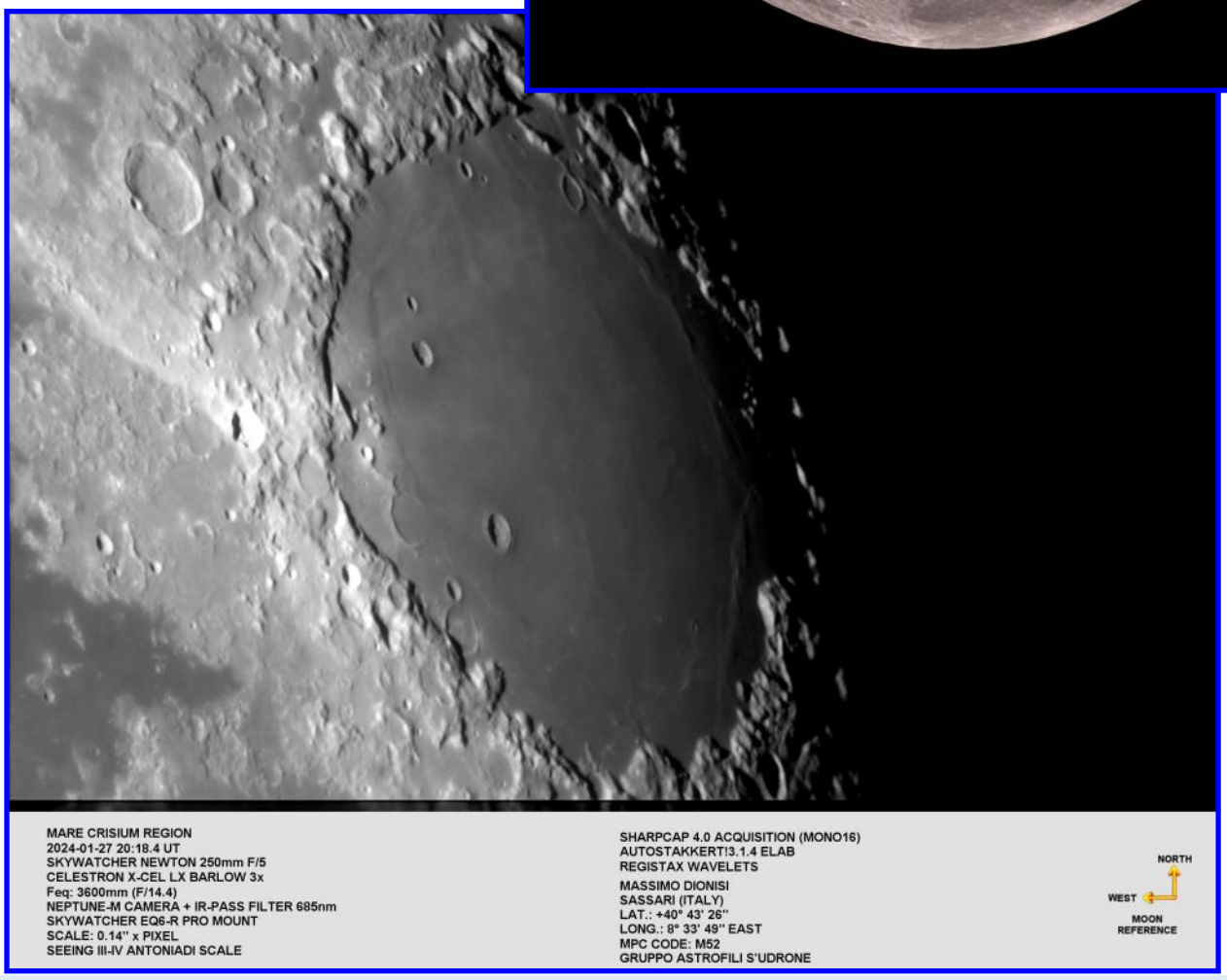


Mare Crisium North, *Massimo Dionisi, Sassari, Italy. 2024 January 27 21:50 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

Recent Topographic Studies

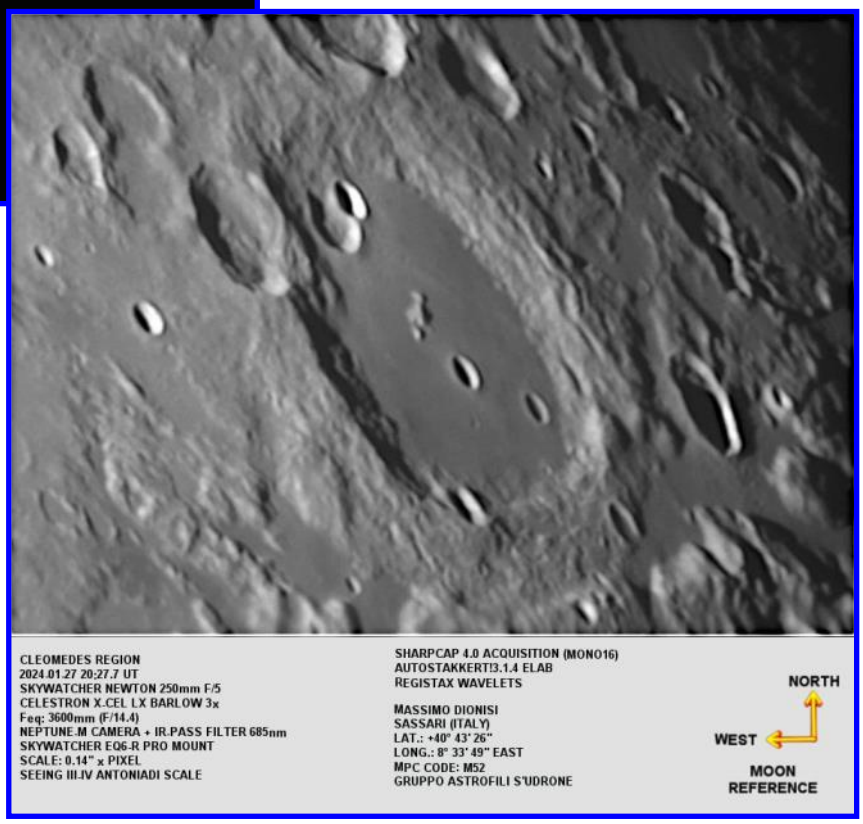
14-Day old Moon, *Maurice Collins, Palmerston North, New Zealand. 2024 January 25 09:32 UT. Sky Watcher Esprit 80 ED refractor telescope, 2.5x barlow, QHY5III462C camera. Poor seeing, A-IV.*

Mare Crisium, *Massimo Dionisi, Sassari, Italy. 2024 January 27 20:18 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*



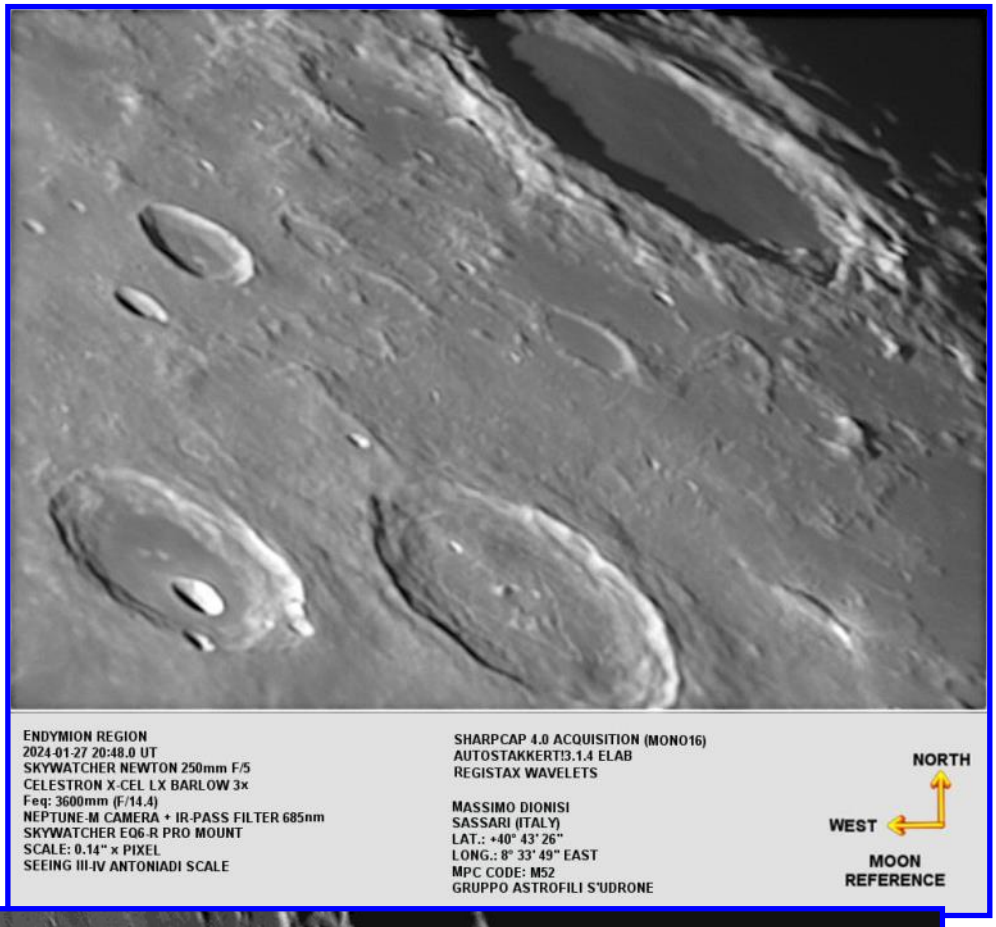
Recent Topographic Studies

Full Moon, *Gonzalo Vega, Oro Verde, Argentina. 2024 January 25 22:00 UT. 114 mm reflector telescope, EQ2 mount, 900 mm fl, UV/IR filter, Player One Ceres C camera.*



Cleomedes, *Massimo Dionisi, Sassari, Italy. 2024 January 27 20:27 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

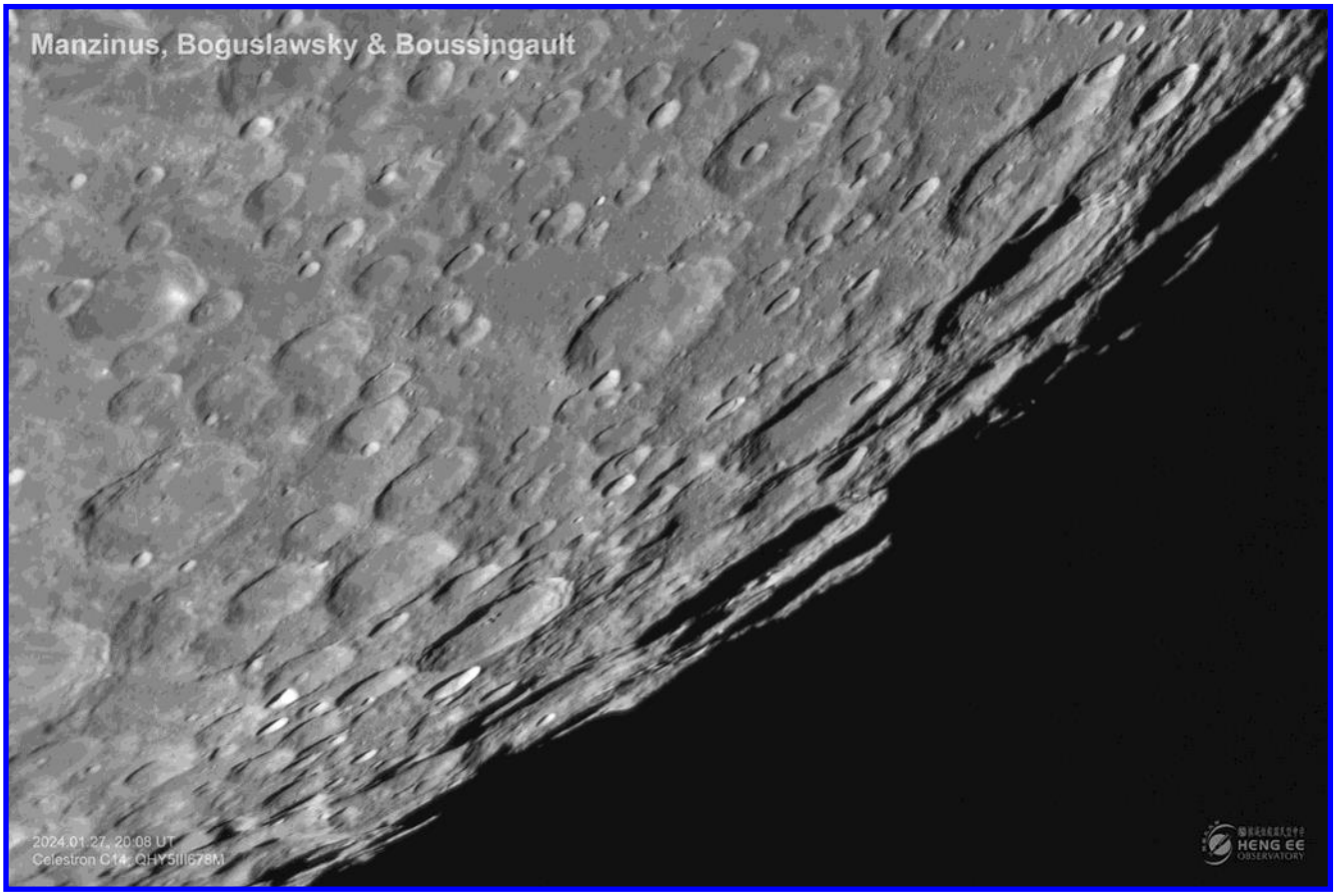
Recent Topographic Studies



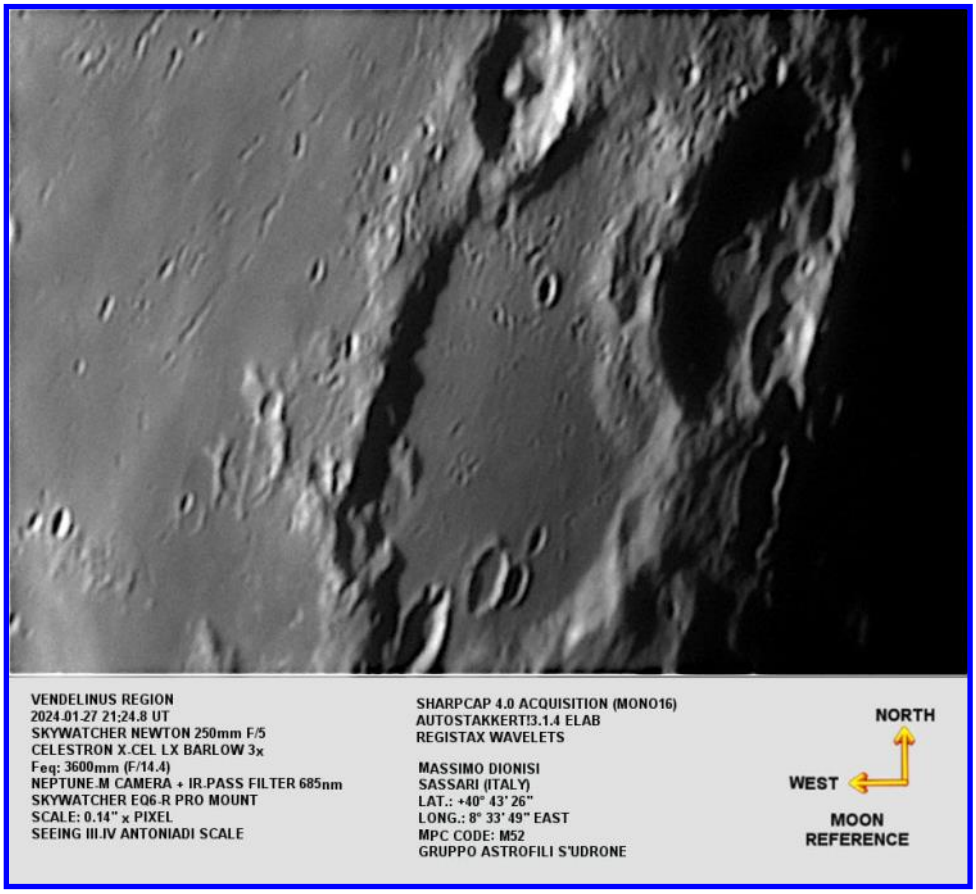
Endymion, *Massimo Dionisi, Sassari, Italy. 2024 January 27 20:48 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

Langrenus, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 21:13 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*

Recent Topographic Studies



Manzinus, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 20:08 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*



Vendelinus, *Massimo Dionisi, Sassari, Italy. 2024 January 27 21:24 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

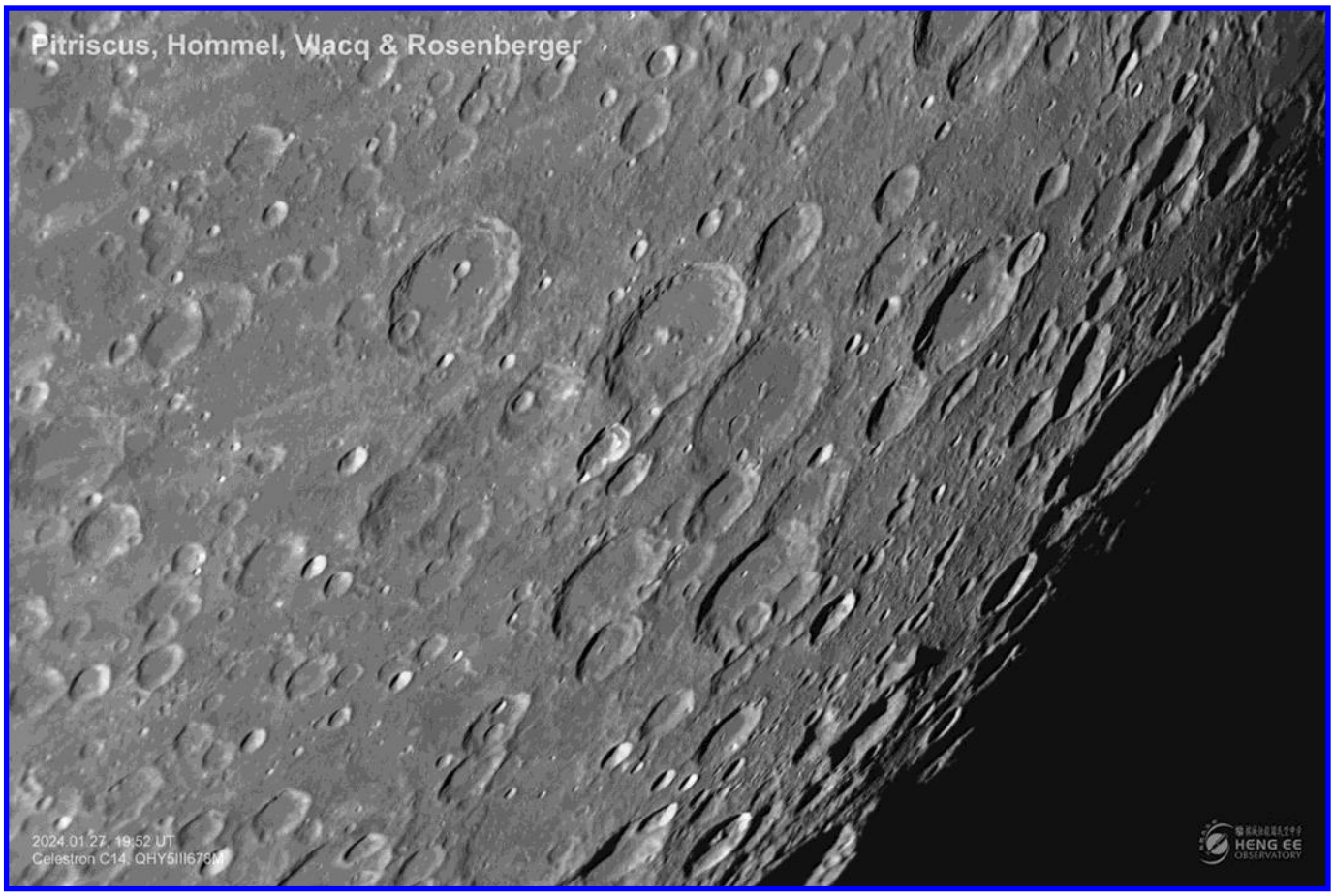
Recent Topographic Studies

Waxing Gibbous Moon, *Gonzalo Vega, Oro Verde, Argentina. 2024 January 20 20:30 UT. 200 mm reflector telescope, EQ5 mount, 1,000 mm fl, UV/IR filter, Nikon D5100 camera.*

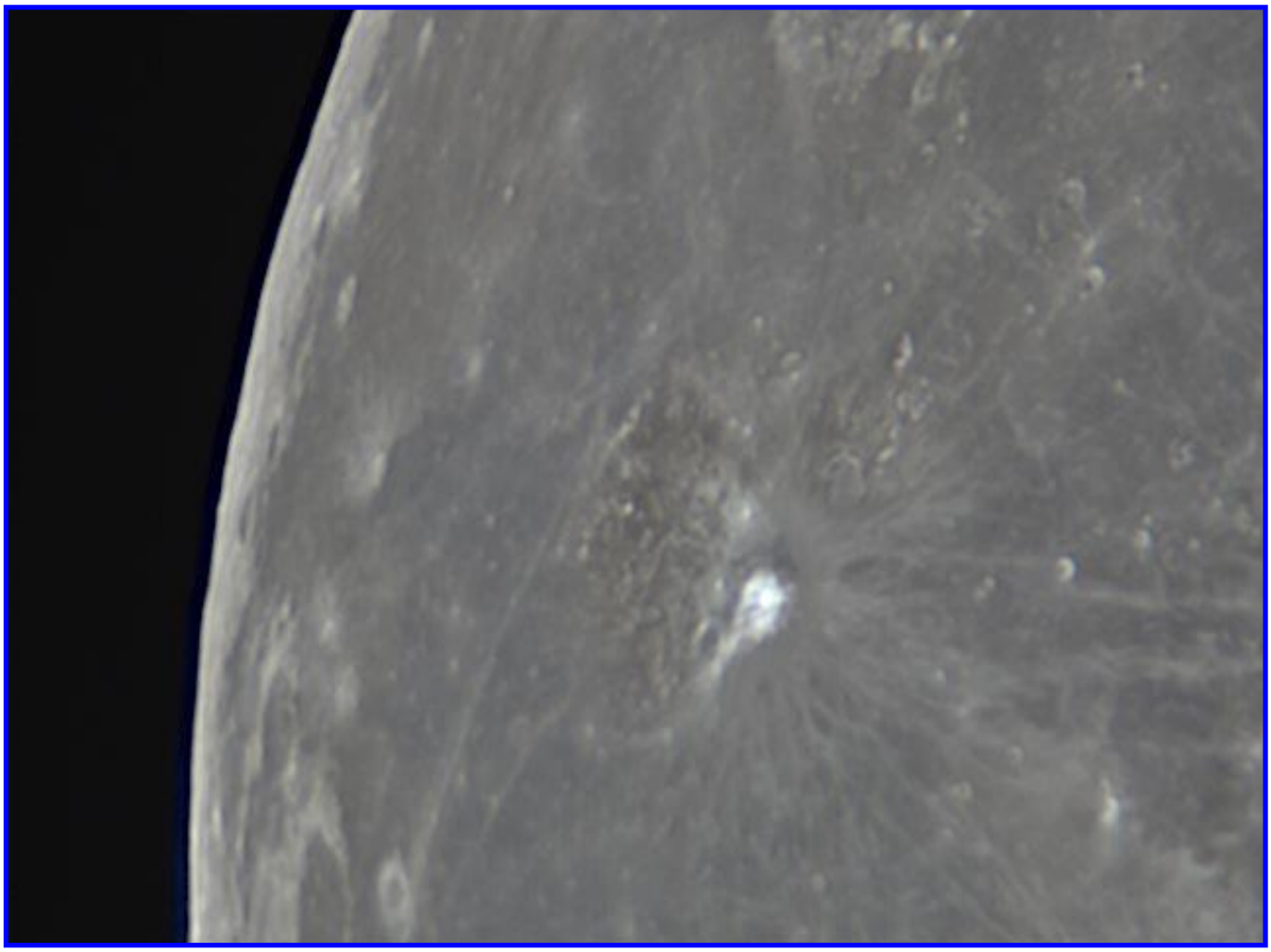
Recent Topographic Studies

Aristarchus, *Walter Ricardo Elias, Oro Verde, Argentina. 2024 January 31 00:31 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl, QHY 5 II C camera.*

Vlacq, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 19:52 UT. Celestron 14 inch Schmidt -Cassegrain telescope, QHY5III678M camera.*

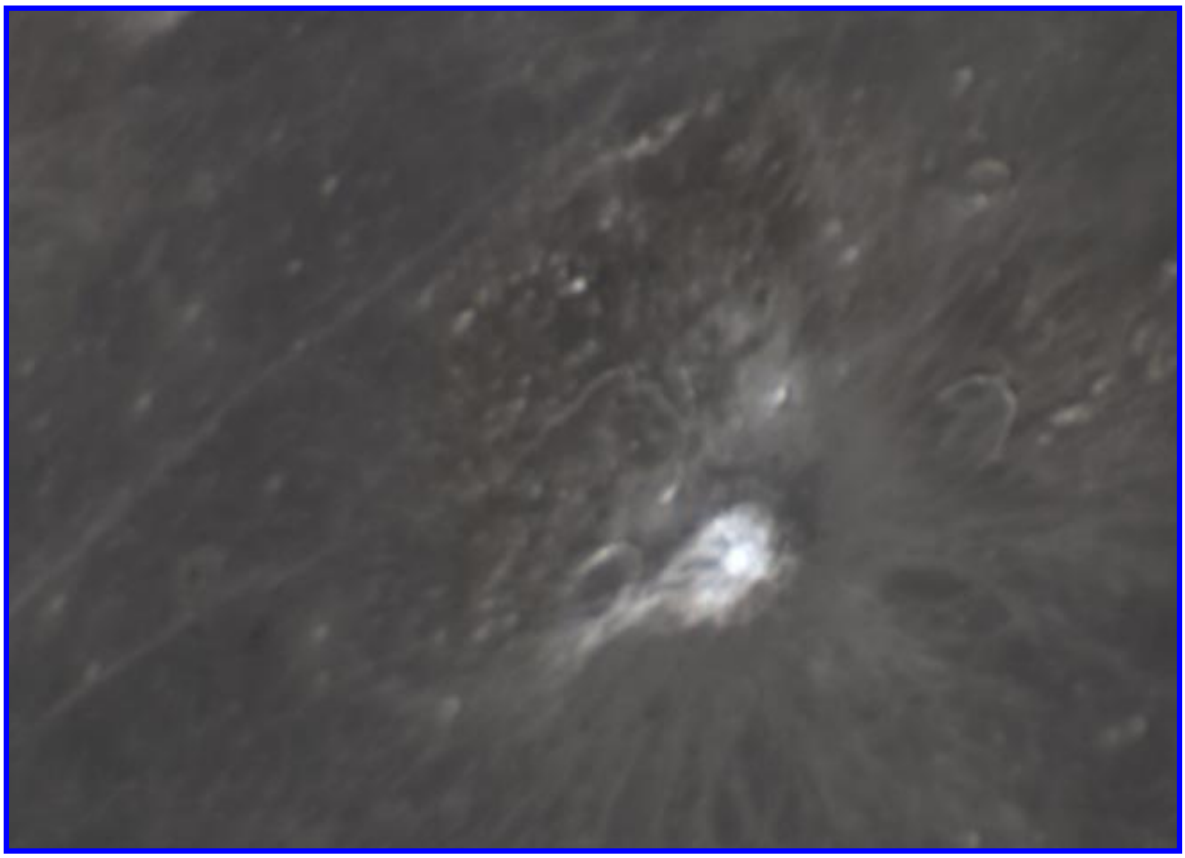


Recent Topographic Studies



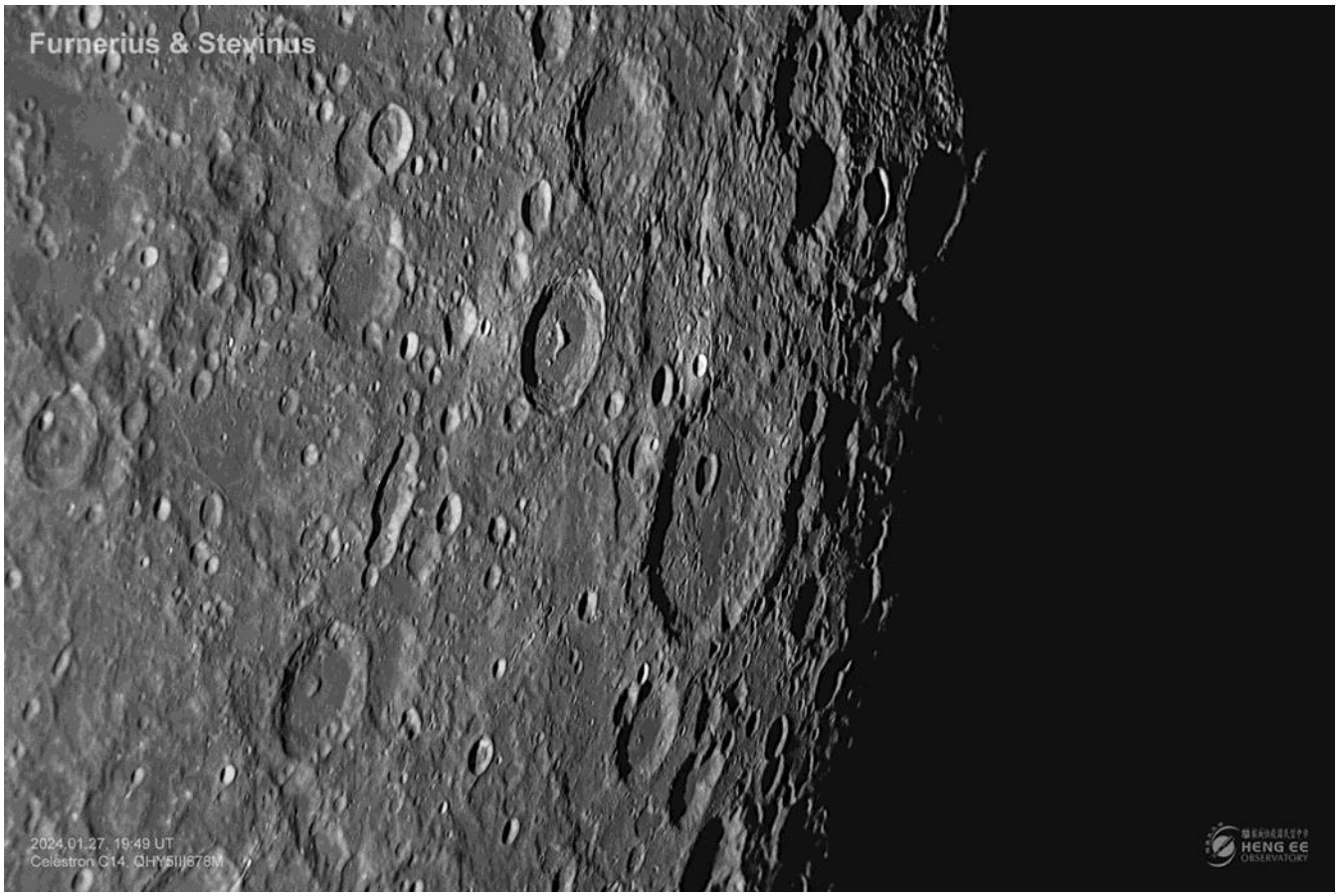
Aristarchus, *Walter Ricardo Elias, Oro Verde, Argentina. 2024 January 31 00:45 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl, 2x barlow, QHY 5 II C camera.*

Recent Topographic Studies



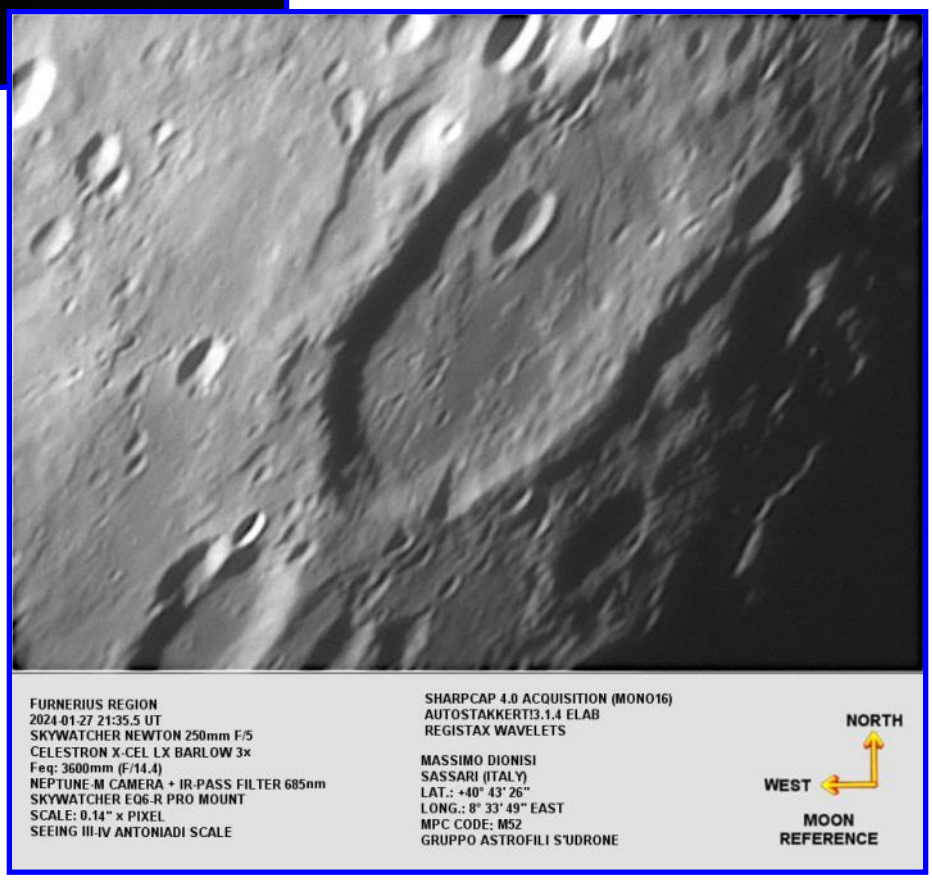
Aristarchus, *Walter Ricardo Elias, Oro Verde, Argentina. 2024 January 31 00:53 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl, 3x barlow, QHY 5 II C camera.*

Furnerius, *Michael Teoh, Heng Fe Observatory, Penang, Malaysia. 2024 January 27 19:49 UT. Celestron 14 inch Schmidt-Cassegrain telescope, QHY5III678M camera.*



Recent Topographic Studies

Waxing Gibbous Moon, *Gonzalo Vega, Oro Verde, Argentina. 2024 January 18 18:50 UT. 114 mm reflector telescope, EQ2 mount, 900 mm fl, UV/IR filter, Player One Ceres C camera.*



Furnerius, *Massimo Dionisi, Sassari, Italy. 2024 January 27 21:35 UT. Sky Watcher 250 mm f/5 Newtonian reflector telescope, 3x barlow, e.f.l. 3,600 mm, IR pass filter 685 nm, Neptune M camera. Seeing III-IV on Antoniadi Scale.*

Recent Topographic Studies

Lunar Geologic Change Detection Program

Coordinator Dr. Anthony Cook- atc@aber.ac.uk
Assistant Coordinator David O. Darling -DOD121252@aol.com

2024 February

News: Alas a backlog of academic and other necessary work has hit me this month, so this LGC newsletter is limited to just a list of the observations received. We will cover these December observations and also those from January, in a lot more detail in next month's newsletter.

LTP Reports: No LTP reports were received for December though on 2023 Nov 24 UT 20:40 Massimo Giuntoli (BAA) observed that the western wall of Cavendish E was emerging into sunlight (the floor was still in shadow) – the northern part of the wall was very bright – almost as bright as Aristarchus. Massimo adds "it was not brilliant, but it was eye-catching". Was anybody else observing at this time? It is probably just a sun facing slope catching the sunlight?

Routine reports received for December included: Alberto Anunziato (Argentina – SLA) observed: Aristillus, Copernicus, Eratosthenes, Plato, Vallis Schroteri. Massimo Alessandro Bianchi (Italy – UAI) imaged: several features. Maurice Collins (New Zealand - ALPO/BAA/RASNZ) imaged: Archimedes, Clavius, and several features. Walter Elias (Argentina – AEA) imaged: Kepler and Plato. Valerio Fontani (Italy – UAI) imaged: Cyrillus. Jean-Marc Lechopier (Teneriffe, Spain – UAI) imaged: Cyrillus. Bill Leatherbarrow (Sheffield, UK – BAA) imaged: Bullialdus, Burg-Lacus Mortis area, Catherina, Clavius, Copernicus, Fracastorius, Montes Recti, Piccolomini, Pitiscus-Hommel area, Pythagoras, and Theophilus. Euginio Polito (Italy – UAI) imaged: Aristarchus, Copernicus, Cyrillus, Ramsden and several features. Franco Taccogna (Italy – UAI) imaged: Aristarchus, Copernicus, Cyrillus, Plato, Ramsden, and several features. Aldo Tonon (Italy – UAI) imaged: Aristarchus, Mons Vinogradov, and several features. Alexander Vandenbohede (Belgium – BAA) imaged: Petavius. Fabio Verza (Italy – UAI) imaged: Plato and Ramsden. Ivan Walton (UK - BAA) imaged: Eudoxus. Luigi Zanatta (Italky – UAI) imaged: Plato and Ramsden.

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. 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 https://twitter.com/lunarnaut .

Dr Anthony Cook, Department of Physics, Aberystwyth University, Penglais, Aberystwyth, Ceredigion, SY23 3BZ, WALES, UNITED KINGDOM. Email: atc @ aber.ac.uk

Lunar Calendar February 2024

Date	UT	Event
1	0800	Spica 1.7° south of Moon
2	2318	Last Quarter Moon
5	0100	Antares 0.6° south of Moon, occultation Middle East to Philippines
5		West limb most exposed -7.8°
7	1900	Venus 5° north of Moon
7		Greatest southern declination -28.2°
8	0700	Mars 4° north of Moon
8	2200	Mercury 3° north of Moon
8		North limb most exposed +6.6°
9	2259	New Moon, lunation 1251
10	1900	Moon at perigee 358,088 km Large Tides
11	0100	Saturn 1.8° north of Moon
12	0700	Neptune 0.7° north of Moon, occultation Antarctica region
13	1701	Moon at ascending node
15	0800	Jupiter 3° south of Moon
16	0200	Uranus 3° south of Moon
16	1501	First Quarter Moon
16		Moon 0.6° south of Pleiades
17		East limb most exposed +7.0°
19		Greatest northern declination +28.3°
21	0200	Pollux 1.6° north of Moon
21		South limb most exposed -6.7°
24	1230	Full Moon smallest Full Moon in 2024
25	1500	Moon at apogee 406,312 km
27	2253	Moon at descending node
28	1400	Spica 1.5° south of Moon

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 non-member 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 :

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 "-". Spaces within a feature name should be replaced by "-".)
As an example the following file name would be a valid filename:

Sinus-Iridum_2018-04-25-0916.jpg
(Feature Sinus Iridum, Year 2018, Month April, Day 25, UT Time 09 hr16 min)

Additional information requested for lunar images (next page) should, if possible, 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 changes prior to uploading the image(s). However, use of the recommended format, reduces the effort to post the images significantly. 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

Resolution appropriate to the image detail is 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:
David Teske – david.teske@alpo-astronomy.org
Alberto Anunziato–albertoanunziato@yahoo.com.ar
Wayne Bailey—wayne.bailey@alpo-astronomy.org

Hard copy submissions should be mailed to David Teske at the address on page one.

CALL FOR OBSERVATIONS: FOCUS ON: Lacus Mortis

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 March 2024, will be Lacus Mortis. 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):

Alberto Anunziato – albertoanziato@yahoo.com-ar
David Teske – david.teske@alpo-astronomy.org

Deadline for inclusion in the Lacus Mortis Focus-On article is February 20, 2024

FUTURE FOCUS ON ARTICLES:

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

Subject	TLO Issue	Deadline
Lacus Mortis	**March 2024**	**February 20, 2024**
Chains of Craters	**May 2024**	**April 20, 2024**
Mare Nectaris	**July 2024**	**June 20, 2024**
Aristoteles and Eudoxus	**September 2024**	**August 20, 2024**
Archimedes Region	**November 2024**	**October 20, 2024**

Focus-On Announcement

Lacus Mortis: One of the Strangest-Looking Parts of the Moon

The definition belongs to the remembered Peter Grego and they are words that justify us taking a tour of this selenographic feature, difficult to define: a plain? Rather, an enormous and very old crater, of which little remains, in the center of which is a very prominent crater, Bürg, and which has been almost completely covered by lava, which adds to the charm of this very ancient crater-plain the attractions of rilles, wrinkle ridges and even the skylight of a lava tube. We are going to add images to analyze this very particular area, located at the eastern end of Mare Frigoris.

JANUARY 2024 ISSUE-Due December 20, 2023: SINUS IRIDUM

MARCH 2024 ISSUE: Due February 20, 2024: LACUS MORTIS

FOCUS ON MAY 2024: Due April 20, 2024: CHAIN OF CRATERS

FOCUS ON JULY 2024: Due June 20, 2024: MARE NECTARIS

FOCUS ON SEPTEMBER 2024: Due August 20, 2024: ARISTOTELES AND EUDOXUS

FOCUS ON NOVEMBER 2024: Due: October 20, 2024: ARCHIMEDES, AUTOLYCUS AND ARISTILLUS

David Teske

Focus-On Announcement
Chains of Craters: The More the Better

Today we know the origin of the groupings of craters very close to each other, but it took years of progress in our knowledge of the Moon to know if the craters that appear very close to each other have a common origin and what that origin is. We are going to learn about the chains of craters (or Catenae, according to the International Astronomical Union) that appear on the Moon, whether they were produced by the fragmentation of an impactor, by secondary impacts of a main crater or by collapses of volcanic origin. Let's share images of chains of craters from the smallest to the super massive ones like Vallis Rheita.

MARCH 2024 ISSUE: Due February 20, 2024: LACUS MORTIS

FOCUS ON MAY 2024: Due April 20, 2024: CHAIN OF CRATERS

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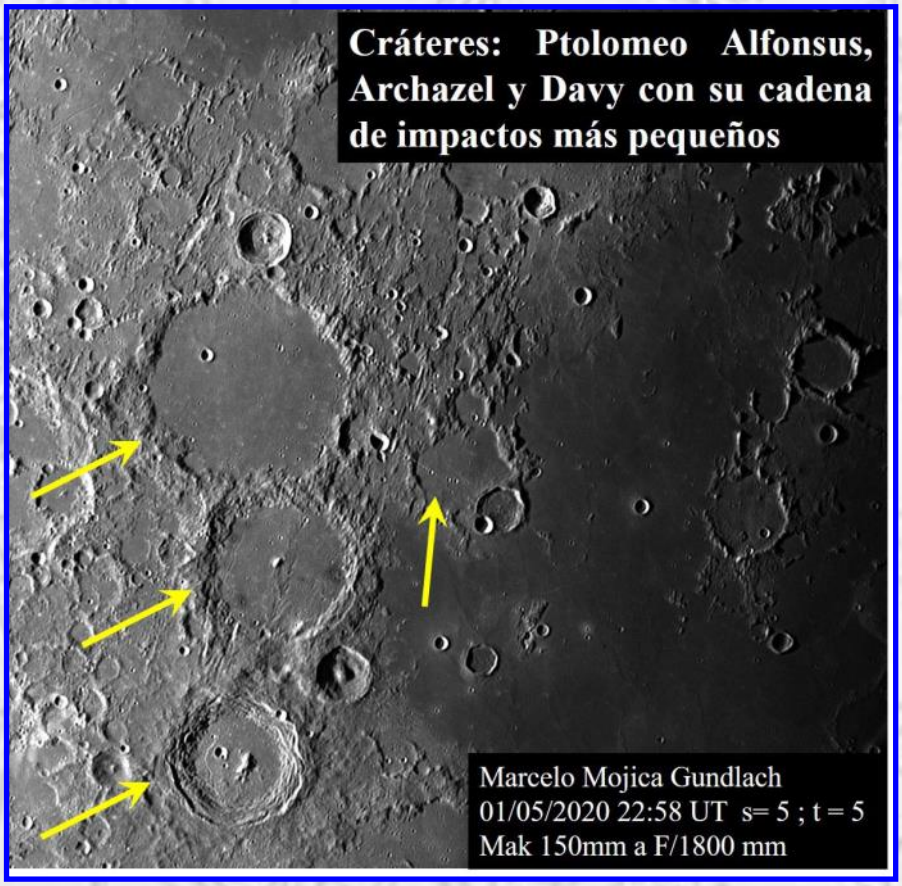
FOCUS ON NOVEMBER 2024: Due: October 20, 2024: ARCHIMEDES, AUTOLYCUS AND ARISTILLUS



Marcelo Mojica Gundlach

Key to Lunar Images In This Issue

Gregory Shanos

1. Aristarchus
2. Cauchy
3. Cleomedes
4. Cognitum, Mare
5. Cremona
6. Crisium, Mare
7. Endymion
8. Excellentiae, Lacus
9. Furnerius
10. Geikie, Dorsa
11. Geminus
12. Herodotus
13. Houssay
14. Hyginus
15. Imbrium, Mare
16. Iridum, Sinus
17. Langrenus
18. Manzinus
19. Messala
20. Petavius
21. Rheita, Vallis
22. Röntgen
23. Serenitatis, Mare
24. Spumans, Mare
25. Strabo
26. Temporis, Lacus
27. Tycho
28. Vendelinus
29. Vlacq
30. Yerkes