The Lunar Observer

A Publication of the Lunar Section of ALPO
David Teske, editor
Coordinator, Lunar Topographic Studies Section Program

June 2023

In This Issue

Online readers, click on images for hyperlinks

Lunar Reflections

As summer begins in the northern hemisphere (and winter in the southern hemisphere), I hope that this issue of The Lunar Observer finds you and your loved ones doing well. It is an exciting time for us here. This month, we welcome two new contributors including Marvin Huddleston FRAS with his interesting take on Reiner Gamma, the topic of last month's Focus On article. Marvin was the ALPO Lunar Topographic Studies coordinator back in the 1970s. We welcome him back! Also new this month, Jeff Grainger of the UK presents his views of the Tycho, Bailly and Clavius region with some great imaging. This is along with the regular contributors Robert H. Hays, Jr., Rik Hill and Alberto Anunziato with their tours of lunar topography and Guillermo Scheidereiter presents the Moon of Buenos Aires. This is along with 24 contributors from across the planet contributing beautiful lunar images and drawings. Please note that Tony Cook is unable to presented his articles about Lunar Geologic Change and Buries Basins and Craters due to extenuating circumstances. Tony has asked that observations of these features continue and to send them to Tony as usual. Many thanks to all who contributed. I think this is the largest by page count The Lunar Observer yet. It took me two maps to list the 80 lunar features discussed on these pages.

A very special treat came to me this month. Mary Haas Alba, the daughter of the late Walter Haas, the founder of ALPO sent me tubes of old lunar maps of her father's. They are spectacular! Most of them are the 300 inch lunar map made by H. Percy Wilkins back in the 1950s. I will be using them on future articles, but for now, they adorn the some of the pages of our present issue.

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

Clear skies,

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Lunar Topographic Studies

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Observations Received

Name	Location and Organization	Image/Article
Esteban Andrada	Mar del Plata, Argentina	Image of Aristarchus.
Alberto Anunziato	Paraná, Argentina	Articles and drawings *In the Border of Libration: Babbage and Pythagoras, The Topography of an Irregular Wrinkle Ridge in Mare Nectaris* and *Two Interesting Aspects of the Aristarchus Plateau.*
Sergio Babino	Montevideo, Uruguay	Image of Aristarchus.
Steve Bacon	Killen, Alabama, USA	Images of Fabricius, Rheita Valley and Reiner Gamma.
Wayne Bailey	Three Points, Arizona, USA	Images of Abulfeda, Aristarchus, Babbage, Bürg, Hommel, J Herschel, Janssen, Maurolycus, Messala, Mare Crisium, Mare Fecunditatis, Mare Serenitatis, Neander, Ross, Schickard, Sirsalis and Wargentin.
Francisco Alsina Cardinalli	Oro Verde, Argentina	Article and images *The Topography of an Irregular Wrinkle Ridge in Mare Nectaris.*
Jairo Chavez	Popayán, Colombia	Images of the Waning Gibbous Moon (2), First Quarter Moon, Montes Caucasus, the Waxing Gibbous Moon and the Full Moon.
Massimo Dionisi	Sassari, Italy	Images of Reiner Gamma, Mons Rümker, Marius, Prinz, Wollaston, Herodotus, Cavalerius, Schickard, Grimaldi, Manilius, Julius Caesar, Aristillus and Cassini.
Walter Ricardo Elias	AEA, Oro Verde, Argentina	Images of Proclus (2), Plato and Eratosthenes, (2).
István Zoltán Földvári	Budapest, Hungary	Drawings of Dubiago, Liebig, Schiller-Zucchius basin, Proclus, Plinius, Cauchy, Apollo 16 region and Bullialdus.
Jeff Grainger	Cumbria, UK	Images of Drygalski, Piccolomini (3), article and 25 images *Tycho, Clavius, Bailly Overview.*
Marcelo Mojica Gundlach	Cochabamba, Bolivia	Article and images *The Topography of an Irregular Wrinkle Ridge in Mare Nectaris*, images of Manzinus, Posidonius, Theophilus, Tycho (3), Copernicus (2), Plato (2), Montes Apenninus (2) and Rupes Recta (2).
Robert H. Hays, Jr.	Worth, Illinois, USA	Articles and drawings *Asclepi* and *McClure*.

Lunar Topographic Studies

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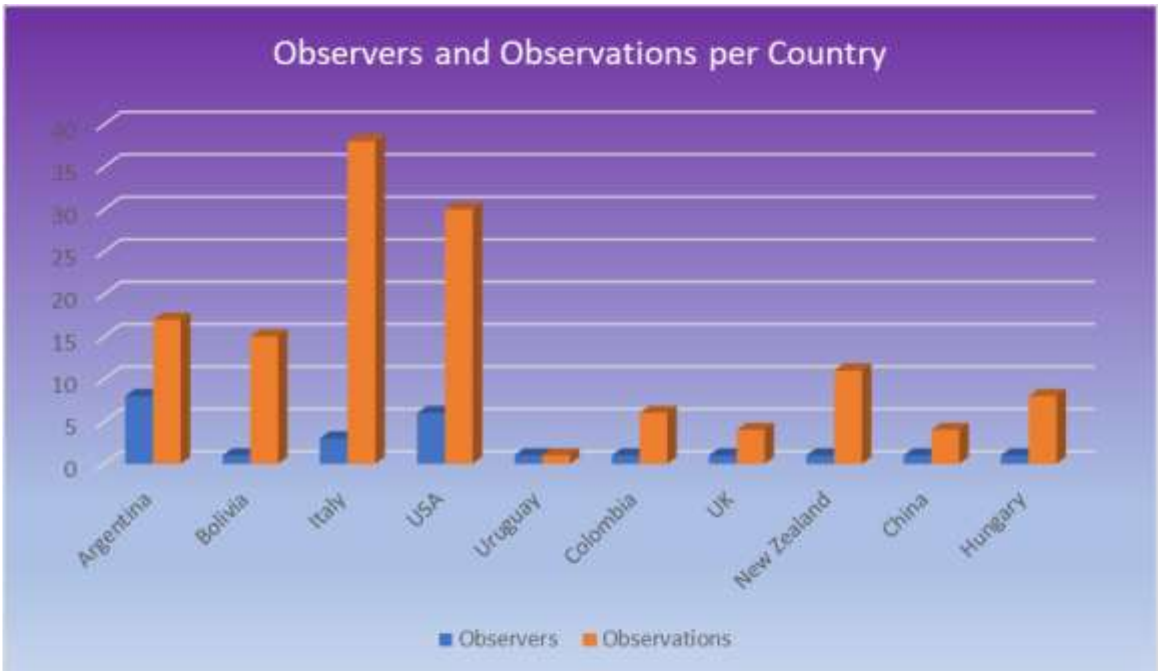
Observations Received

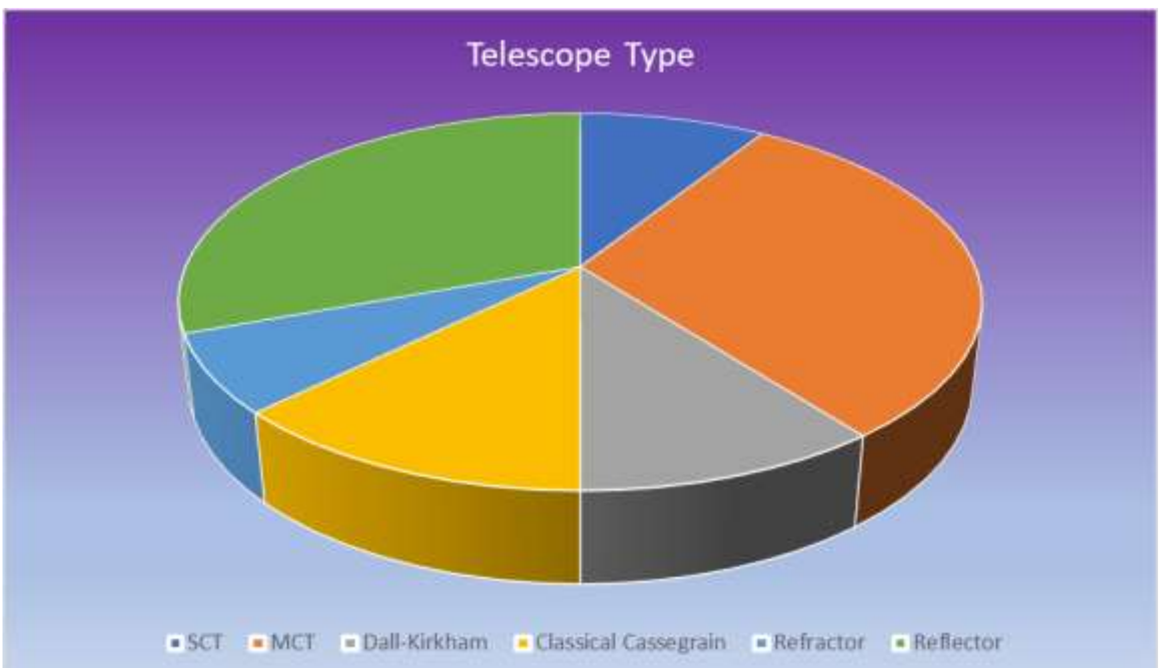
Name	Location and Organization	Image/Article
Rik Hill	Loudon Observatory, Tucson, Arizona, USA	Article and image *Janssen to Rheita*, image of the young Moon.
Eduardo Horacek	Mar del Plata, Argentina	Image of Aristarchus.
Marvin W. Huddleston, FRAS	Bronson, Florida, USA	Article *The Mystery of Reiner Gamma and a Possible Correlation to the Elysium Planitia Martian Swirls.*
Raffaello Lena	Rome, Italy	Images of Arago, Aristillus rays, Janssen, Kepler, Mercurius, Piccolomini, Theophilus, Tycho, Lacus Veris, Vallis Rheita and Posidonius.
KC Pau	Hong Kong, China	Image of Montes Apenninus and Grove (3).
Raúl Roberto Podestá	Formosa, Argentina	Images of Mare Serenitatis, Tycho, Ptolemaeus, Theophilus and Rupes Recta.
Guillermo Daniel Scheidereiter	LIADA, Rural Area, Concordia, Entre Ríos, Argentina	Article *The Moon of Buenos Aires.*
Fernando Surá	San Nicolás de los Arroyos, Argentina	Images of Copernicus and Plato.
Larry Todd	Dunedin, New Zealand	Images of Geminus (2), Mare Crisium, Petavius, Atlas, Bailly, Grimaldi, Eddington, Mare Humorum, Delisle and Sinus Iridum.
Fabio Verza	SNdR, Milan, Italy	Images of Janssen, Censorinus, Theophilus (3), Aristoteles, Atlas, Endymion, Maurolycus, Lacus Mortis, Posidonius (2), Capella, Gutenberg and Piccolomini.
Paul Walker	Middlebury, Vermont, USA	Images of Barrow, Aristillus, Rima Hyginus, Hipparchus, Blanchinus and Licetus.

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

June 2023 *The Lunar Observer*
By the Numbers

This month there were 134 observations by 24 contributors in 10 countries.





ALPO 2023 Conference: Call for Papers

Tim Robertson & Ken Poshedly,
ALPO Conference coordinators

Overview

Due to the success of attracting more and more viewers and participants to our online conferences, the 2023 Conference of the ALPO will once more be held online, this time on Friday and Saturday, July 28 and 29.
The ALPO conference times will be:

- Friday from 1 p.m. to 5 p.m. Eastern Time (10 a.m. to 2 p.m. Pacific Time)
- Saturday from 1 p.m. to 6 p.m. Eastern Time (10 a.m. to 3 p.m. Pacific Time).
- The ALPO Conference is free and open to all via two different streaming methods:
- The free online conferencing software application, Zoom.
- On the ALPO YouTube channel at *https://www.youtube.com/channel/UCEmixiL-d5k2Fx27Ijfk41A*

Those who plan to present papers or presentations must (1) be members of the ALPO, (2) use Zoom, and (3) have it already installed on their computer prior to the conference dates. Zoom is free and available at *https://zoom.us/*
Those who have not yet joined the ALPO may do so online. Digital ALPO memberships start at only $22 a year. To join online, go to *http://www.astroleague.org/store/index.phpmain_page=product_info&cPath=10&products_id=39*, then scroll to the bottom of that page, select your membership type, click on “Add to Cart” and proceed from there.
There will be different Zoom meeting hyperlinks to access the conference each of the two days of the conference. Both links will be posted on social media and e-mailed to those who wish to receive it that way on Thursday, July 27.
The Zoom virtual (online) “meeting room” will open 15 minutes prior to the beginning of each day’s activities.
Those individuals wishing to attend via Zoom should contact Tim Robertson at *cometman@cometman.net* as soon as possible.

Conference Agenda

The conference will consist of initial welcoming remarks and general announcements at the beginning each day, followed by papers and research findings on astronomy-related topics presented by ALPO members.
Following a break after the last astronomy talk on Saturday will be presentation of the Walter Haas Observing Award. A Peggy Haas Service Award may also be awarded.
A keynote speaker will then follow the awards presentations on Saturday. The selection of a keynote speaker is in progress and the final decision will be announced in the summer issue of this Journal (JALPO65-3).

Presentation Guidelines

All presentations should be no more than 15 minutes in length; the preferred method is 12 minutes for the presentation itself plus 3 minutes for follow-up questions. The preferred format is Microsoft PowerPoint.
Send all PowerPoint files of the presentations to Tim Robertson at *cometman@cometman.net* .

Suggested Topics

Participants are encouraged to present research papers and experience reports concerning various aspects of Earth-based observational astronomy including the following.

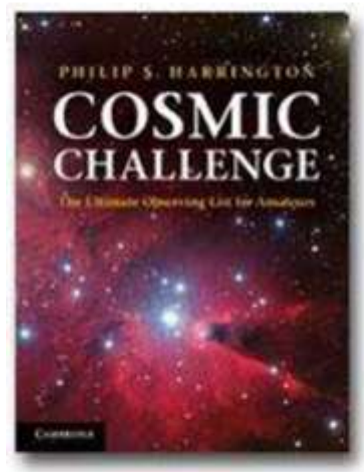
- New or ongoing observing programs and studies, specifically, how those programs were designed, implemented and continue to function.
- Results of personal or group studies of solar system or extra-solar system bodies.
- New or ongoing activities involving astronomical instrumentation, construction or improvement.
- Challenges faced by Earth-based observers such as changing interest levels, deteriorating observing conditions brought about by possible global warming, etc.

Information about paper presentations, the keynote speaker and other conference data will be published in this Journal and online as details are learned.

Lunar X and V Visibility 2023
Submitted by Greg Shanos

Table 4.3 Lunar X and Lunar V Visibility Timetable

	2023
Jan	29; 00:37
Feb	27; 15:02
Mar	29; 04:59
Apr	27; 18:10
May	27; 06:28
Jun	25; 18:02
Jul	25; 05:07
Aug	23; 16:07
Sep	22; 03:26
Oct	21; 15:27
Nov	20; 04:23
Dec	19; 18:16



Note: The dates and times listed are based on calculations made with the Lunar Terminator Visualization Tool (LTVT) by Jim Mosher and Henrik Bonda. This useful freeware program may be downloaded from https://github.com/fermigas/ltvt/wiki.

Lunar Topographic Studies

The Moon of Buenos Aires

Guillermo Scheidereiter

There was a time when I frequented the great city of Buenos Aires a lot, since I studied mathematics at a university there. Perhaps, you, dear reader, do not know Buenos Aires and will not know it through this very brief writing, but let me tell you that this magical city has a bit of Paris, a touch of New York, a certain architecture of London, some corner similar to any one of Madrid, memories of Lisbon and Berlin, some church of Moscow, an Italian port, a little bit of Europe on every corner and a lot of Argentina everywhere. Its corners breathe tango and mystery. Hundreds of passers-by fill the sidewalks, street junctions, shop windows, bars, restaurants and cafes. The canopies shine, the cars honk, the people close to each other go down and up the stairs going in and out of the subway; disinterested voices are heard, dancers cross their legs to the rhythm of a bandoneon, spectators in full hullabaloo go in and out of theaters and bookstores, and finding a solitary corner seems impossible.

I really liked walking around Buenos Aires among so many people and, in particular, on Saturdays I enjoyed walking through the neighborhood of San Telmo. This is an old place, known as the historic center of the city, since its origins date back to the 18th century before Argentina was an independent nation. San Telmo is full of antique shops, its main street is called Defensa and, like many others, it is made of cobblestones, made of stone, for another era, crowded with tourists who chatter in their own languages while taking photographs, galleries where antique objects are traded, a busy market of nostalgic and amazing things and Plaza Dorrego, the main one of the neighborhood, full of people who browse antique dealers and stalls of artisans who sell their art, while others let the hours pass in a picturesque bar where you can listen to a tango by Gardel.

It was one of these afternoons, late at night, when I was returning from a coffee at the historic Bar Británico and entered an old building gallery on Defensa Street, where there seemed not to be so many people. I started walking the aisles looking at the store windows and I don't know why that place held my attention more than usual. Perhaps it was a mask shop like those used in 18th century European court parties or a shop window covered with goblins, fairies and mythological beings from another era. The truth is that they began to lower some blinds of shops that closed and, when I was about to leave there and return to Defensa Street, brought by the air that crept into the corners, I heard music that had Andalusian airs and I walked following the sound of the guitar strings, whose arpeggios sounded clearer and louder the closer I got avoiding nooks and corridors. Suddenly, a small circular hall opened before me, barely lit with a pair of lampposts and two musicians dressed in black and brown, sitting on one side, each with their guitars, gave life to the melody. Wide and tall frames with wooden doors and closed windows made up the circular outline and in front of me a large open door opened onto a roofless inner courtyard where the almost full moon rose beyond the walls. In the center of the courtyard was what looked like an old cistern with an ornate iron curb, a survivor from a colonial period.

A woman's hand emerged from the shadows and caressed the shoulder and bearded face of one of the guitarists; With a sensual step, the one who would give voice to the andalusian guitars advanced towards the light: a slender figure in a white tunic and her hair tied up adorned with flowers in the same tones. The woman directed her steps towards the center and began to sing:

The moon came to the forge
in her bustle of spikenard.
The boy stares at her.
The boy is staring hard.

In the feverish air
the moon sways her arms,
showing, lewd and spotless,
her cruel, tin breasts.

Impressed by the scene and the magical context in which it took place, I was astonished to recognize the lyrics of a magnificent poem by the Spanish writer Federico García Lorca entitled "Romance de la Luna, Luna", written in 1924 and published in 1926, where the leading role poetic of writing is the Moon. And it is that literature has used the resource of the personification of the Moon until leaving it squeezed, fragile and trembling. Listing the writers who paid homage to the goddess of the night sky would be ridiculously long, but suffice it to say that there were many throughout the vast world.

In García Lorca's romances, the Moon appears as a symbol of death and in this particular poem, the presence of a child presages a sad outcome. In the representation, the Moon enters a gypsy blacksmith's workshop where a dead child lies and the scene takes place in such a gloomy environment.

The woman took air for the following two stanzas:

"Run away, moon, moon, moon.
If the gypsies find us,
they would cut out your heart
to make necklaces, silvery rings."

"Child, let me dance.
When the gypsies come,
they will find you on the anvil
with your tiny eyes shut tight."

At this point in the poem, the boy and the moon engage in a dialogue in which, in principle, the boy asks the moon to flee so that his people, the gypsies, do not tear out his heart to carve white necklaces and rings next to the forge. The Moon responds to the boy to let her dance and reveals that he lies sadly lifeless and that the gypsies will find him. The woman's voice carried those words like moonlight gliding over silk. A moment of pure mystery began to give way to a bandoneon rhythm, a dim light illuminated a corner where a man inflated the bellows of the instrument with air and what began as a song with Andalusian airs, was gradually transformed, without any friction or abruptness, into a tango. Next to the man was a seated child, dressed in sepia tones, with a hat in his hand.

"Run away, moon, moon, moon.
I can hear their horses."
"Child, let me be, don't tread
on my shiny, starched white."

The rider was galloping closer
beating upon the drum of the plain.
Inside the forge the boy
had his eyes shut tight.

Those of us who know the Moon can think about it in its details and, surely dragged by the intonation of the stanzas, at that moment I imagined a special part of the Moon. I thought Archimedes was the head of a lunar personification and the surrounding mountains his hair; the Montes Apenninus and the Montes Alpes, arms raised with Eratosthenes and Plato like hands with open palms, waist towards the Caucasus and a white dress stretching over the plains of Eudoxus, Aristoteles and beyond. I felt that it was the shape of the Moon dancing, asking the boy not to step on his starched clothes. The child lies on the forge with his eyes closed and his spirit is entangled in the arms of the Moon that comes to carry him.

"I thought Archimedes was the head of a lunar personification and the surrounding mountains his hair; the Montes Apenninus and the Montes Alpes, arms raised with Eratosthenes and Plato like hands with open palms, waist towards the Caucasus and a white dress stretching over the plains of Eudoxus, Aristotles and beyond".

I noticed that in that oval there were more people that I could not see. Figures that, suddenly, seemed sinister to me. The ember of a cigarette illuminated a face that was looking at me from a corner. I perceived the dark figure of a tall man in a black hat. The Moon still remained in the clearing of the walls of the courtyard and the guitars were mixed with the cadent bandoneon, when the suggestive figures leaning on the door frames were noticed among the shadows, just when in the lyrics of the poem the new characters appear and the voice of the woman followed:

Across the olive grove, bronze
and dreams, the gypsies arrived.
Their heads held high,
their eyes half shut.

Ai, how the night owl sings!
How she sings on the night tree!
The moon goes through the sky
leading a boy by the hand.

A couple of dancers followed the rhythm of the tango in the courtyard outside, around the curb of the cistern. I don't know at what point they appeared there, both dressed in black. I felt like I wasn't clear about how time was passing, if time was passing at all. I imagined the gypsies on their horses crossing the olive grove while the moon is taking the child and I thought that the dancers, perhaps, represented them. The woman kept moving among the musicians, letting her white dress brush the shadows as she passed and I didn't know if she repeated the verses or sang them only once. The song, with multiple similes to the Moon, was mixed with the Moon itself that gave a certain radiance to the old tiles, to the walls, to the frames of the doors, to the body of the guitars and to the hands of the men, to the white dress of the lyrical woman and to the corners of the bandoneon.

In the forge the gypsies
weep and sob aloud.
The breeze is watching, watching.
The breeze keeps watch all night long.

At that moment, the woman sat down next to the child and hugged him. The bandoneon seemed alienated and the guitars with it, the ballerina's heels moved swiftly over the tiles of the backyard supported by the firm feet of her partner, who hugged the graceful figure of a woman to her body. I perceived a candle burning behind a grating and a dark, hunched figure seemed to cry. A slight breeze showed me that the Moon was no longer visible over the patio and when a cold hand brushed my arm, I felt a chill run down my back. Once again, the ember of the cigarette lit up that grim man's face and I felt that I had to run and get away from there.

My hurried steps took me back towards Defensa street and the light from a street lamp showed me that my watch showed eleven o'clock at night. How could it be so long? What happened in that circular enclosure like the Moon? With fear I looked around me and there was no one there. Indeed, dear reader, I forgot to tell you that after nine at night, there are places in Buenos Aires that go into the shadows, as if the life and hubbub of just a few hours ago suddenly went out. I headed towards the Plaza de Mayo knowing that a few streets separated me from there. With some haste I looked for a taxi with my eyes, but to no avail. Distant voices betrayed human presence behind the dark corners and turns and, after walking (almost running), a few streets, passing under some scaffolding, I could see the lights of the square. But my bewilderment was even greater because there were no people left in the square either and I felt that someone was watching me from the shadows I left behind. I searched the sky longing for a testimony of reality and there was the Moon, mysteriously entangled among ghostly clouds.

I walked as fast as I could between unlit storefronts, closed doors, empty sidewalks and many shadows, until suddenly, two people crossed in front of me in a clear and disinterested dialogue. I was hit by a cold wind and I saw a waiter serving a coffee on the sidewalk opposite, a police mobile stopped at a traffic light, some street vendors offered trinkets to some funny tourists who were dining at a table and the noise and bright lights of the canopies, showed me that I was on Corrientes Avenue, the street of Buenos Aires that never sleeps and, just there, far from that mysterious gallery of San Telmo, I felt safe.

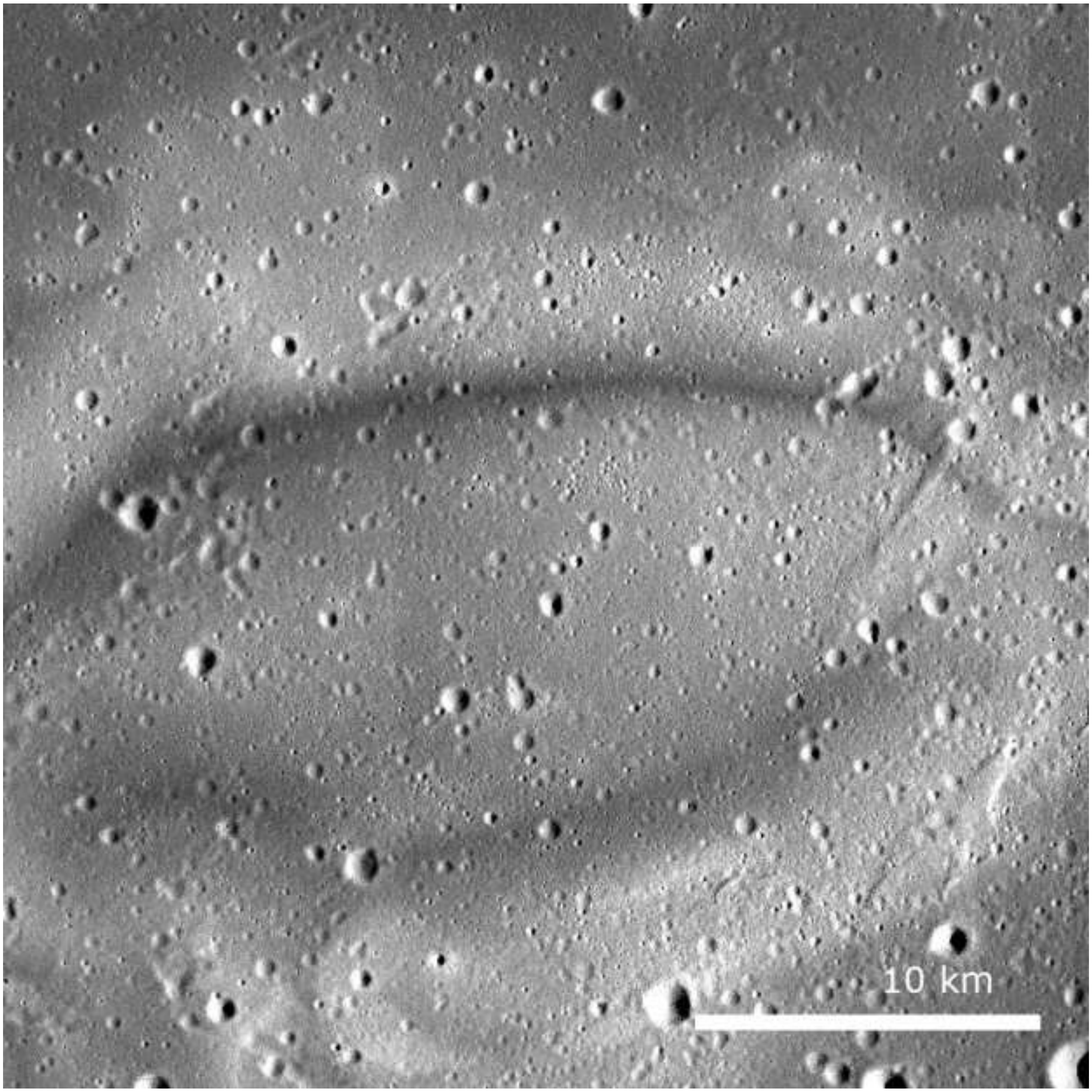
I didn't know what happened that night between the poem, the Moon, the gruesome scene, and my insignificant self as a spectator. Even today I have what I lived very present, like a constant emulation of an old tango by Homero Manzi that says: "tango neighborhood, moon and mystery, from the memory I see you again". Perhaps, the streets of Buenos Aires evoke the Moon in every corner and the Moon caresses them with its mantle of light.

I do not know how faithful to the facts my story was, but I assure you that before stepping on the sidewalk of Corrientes Avenue, I looked back and saw the grim face of that man recoil behind the shadows of a door frame, while the ember of the cigarette illuminated the brim of the hat. The Moon was still there, like a silver lady in the Buenos Aires night. I do not know how faithful to the facts my story was, but I assure you that before stepping on the sidewalk of Corrientes Avenue, I looked back and saw the grim face of that man recoil behind the shadows of a door frame, while the ember of the cigarette illuminated the brim of the hat. The Moon was still there, like a silver lady in the Buenos Aires night.

Notes:
1. English translation: https://www.babelmatrix.org/works/es/Garc%C3%ADa_Lorca,_Federico-1898/Romance_de_la_luna,_luna/en/5639-Ballad_of_the_moon,_moon
2. “Romance de la Luna, Luna”, Federico García Lorca; Read by Luigi Maria Corsanico: https://www.youtube.com/watch?v=GbIU84PA0uE&t=120s
3. Interpretation of Ana Belén: https://www.youtube.com/watch?v=lCUbo6eiWos
4. Interpretation of Noel Luna: https://www.youtube.com/watch?v=XB-SOLNAQZk
5. The interpretation of that night in Buenos Aires is not on the web.

The Mystery of
Reiner Gamma
And a Possible Correlation to the Elysium Planitia Martian Swirls

Marvin W. Huddleston, FRAS



Reiner Gamma lunar swirl (7.5° N, 301.0°E); NAC controlled mosaic containing images, M1139307518L/R, M1139300406L/R, M1139286182L/R, M1139293294L/R, and M1108661104R [NASA/GSFC/Arizona State University].

The Mystery of Reiner Gamma and a Possible Correlation to the Elysium Planitia Martian Swirls

Abstract

The primary purpose of this paper is to draw attention to a proposed correlation between the lunar feature Reiner Gamma, heretofore noted as γ and similar Swirls on the planet Mars (near the crater Zunil in the Elysium Planitia region) which are undoubtably volcanic in origin and have been shown to be geologically young events. γ is a marking on the moon taking the pattern of a swirl and is a fascinating lunar phenomenon that has intrigued and puzzled scientists for many years. The only other known swirls are found on the Moons far side in the region of Mare Ingenii, possibly another on Mercury (which seems to be a matter of debate), and the proposed new swirls on Mars in the region of Elysium Planitia.

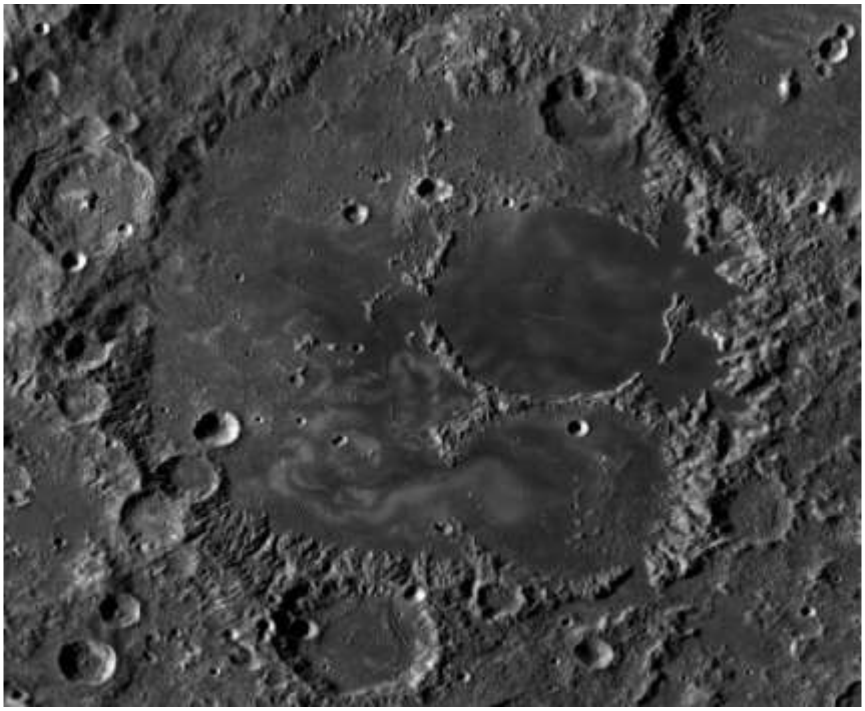
The γ swirl measures about 43 miles (70 km) in diameter, and it appears as a bright, elongated and distorted high albedo feature on the lunar surface. It is located in the impact basin Oceanus Procellarum at 7.5°N latitude and 59.5°W, not far from Marius Hills. One can trace a major Kepler Ray due west to γ, giving the impression that the Kepler Ejecta blanket is the source of this curious marking. It is, however, this writer's opinion that the key to γ's origin is found on Mars. The feature has a surface texture appearing smooth lacking any rugged texturing typical of much of the moon. One astronomer described Lunar Swirls, "Picture a cup of coffee, steaming and black. Add a dollop of milk and gently stir. Eddies of cream go swirling around the cup. Magnify that image a million times and you've got a Lunar Swirl."

Despite extensive study and observation by centuries of Selenologists, the origin and nature of γ remains a matter of debate. One of the puzzling aspects of it is that it seems to have withstood space weathering remarkably well, resulting in suggestions by some that known magnetic anomalies have shielded it from the solar wind. Telescopic observation illustrates that γ holds its high albedo reflectance throughout the lunar cycle. Unlike lunar rays, γ appears brighter when the sun is at a low angle of reflectance; a similar albedo characteristic has been noted atop some lunar domes. This writer has even noted it during bright lunar eclipses. I challenge other observers to try for it during future eclipses. It is also recognizable in earthshine.

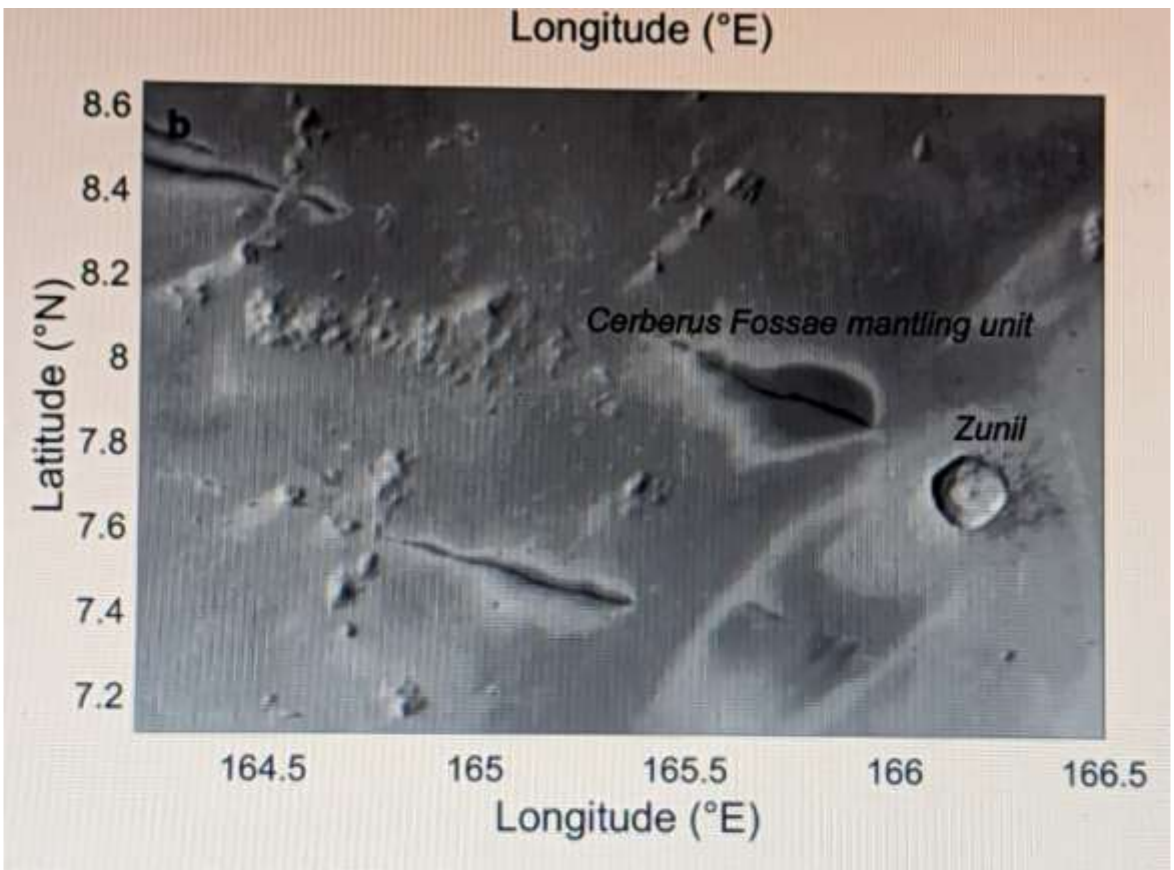
Theories vary as to its origin, including the theory that the swirl is related to magnetic anomalies on the Moon. Scientists from the University of California, Berkeley and the University of Hawaii proposed that a region of magnetized crust on the Moon created this swirl. This magnetized crust was thought to have created interaction between the solar wind and the Moon's weak magnetic field. The theory suggests that this magnetized crust is possibly responsible for γ's unique appearance. For an exhaustive treatment on γ and theories as to its origin, see Alberto Anunziato's excellent article in this publication, May 2023.

Before the invention of the modern internet, a curiosity this author encountered was that many earlier visual observers were aware of γ but often paid little attention to it. That was my discovery when I became interested in researching γ during my days as Coordinator of the ALPO Lunar Selected Areas Program in the mid to late '70's. This led me to later write a paper I published at an ALPO National convention. Alter noted it merely as "unnamed" in his work "Pictorial Guide to the Moon." Even as prolific lunar observers as Patrick Moore admitted paying little attention to it, illustrated in its absence in five of his books on the Moon. It is not mentioned in 'The Moon' by Wilkins and Moore. Harry Jamieson noted it and expressed that is was an all too often overlooked feature in need of further investigation. Walter Haas referred to it as a true curiosity during a telephone conversation. Alika K. Herring stated "I have observed the feature many times over the years, of course, but never did a definitive study of it. I do agree it is a curious feature." To his credit Ernest Cherrington wrote in a book about observing the moon through binoculars "…more conspicuous is the diamond-shaped spot just west of Reiner. Spot is 27x50 mi., without relief, strangely patterned, and apparently associated with no crater unless it is to be Kepler 360 mi E (VIII Grimaldi NE 2.6)." David Teske offered a thorough survey of older various atlases and their treatment of γ.

The Mystery of Reiner Gamma and a Possible Correlation to the Elysium Planitia Martian Swirls

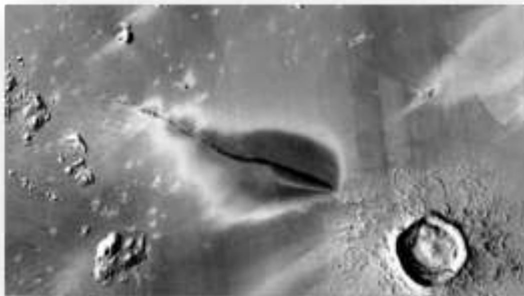


NASA Lunar Reconnaissance Orbiter Wide Angle Camera. (Image Credit: NASA/GSFC/Arizona State University).

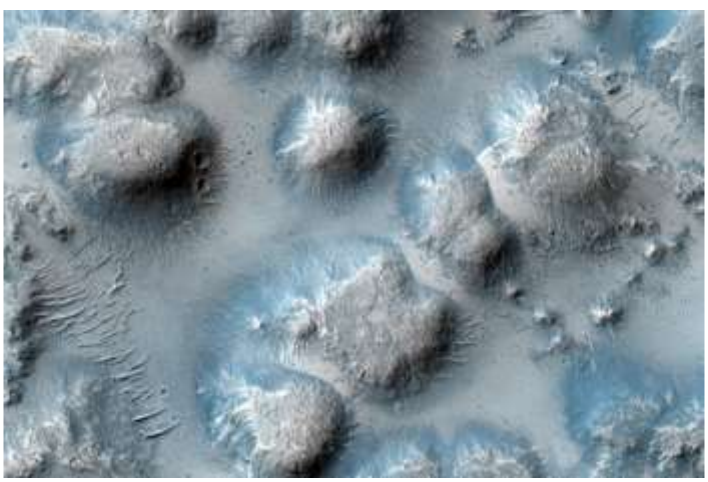


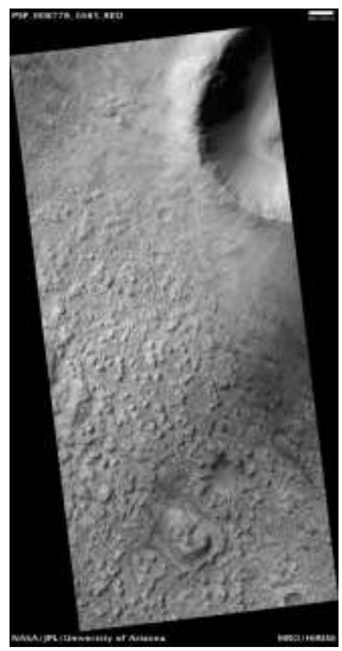
NASA / JPL / MSSS / The Murray Lab

The Mystery of Reiner Gamma and a Possible Correlation to the Elysium Planitia Martian Swirls



Side by side comparison of one of the Elysium Planitia Swirls (NASA) and Reiner Gamma oriented for illustration



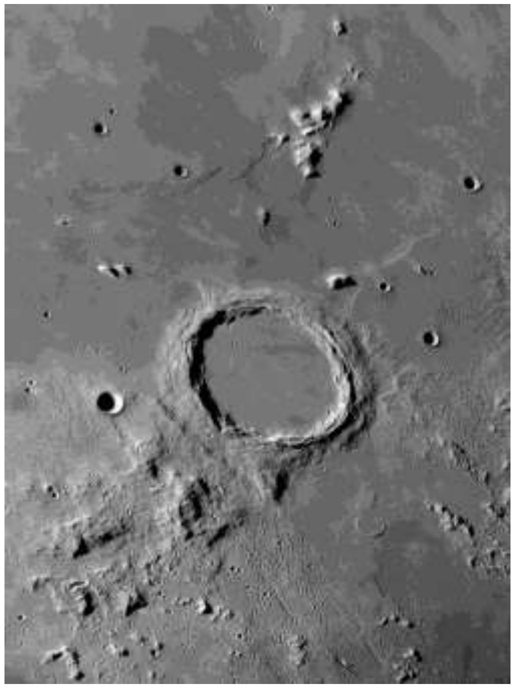


Hills on Mars resembling Marius Hills Region. HiRISE/NASA

I found the similarities between γ and the Elysium Planitia swirls near the crater Zunil on Mars to be striking, then I realized there was a correlation between the volcanic regions on the Moon and Mars which intensifies curiosity. The regions of the swirls are remarkably similar, both exhibiting hills such as the ones on Mars and in the region of the moon's Marius Hills.

A question the Martian hills similarities raise is are the Marius Hills on the moon and the Elysium Planitia Hills on Mars similar in morphology, and if so, what does this say about the correlations between the swirls on both the Moon and Mars? Were these regions the result of volcanism resulting from basin forming impacts?

The Mystery of Reiner Gamma and a Possible Correlation to the Elysium Planitia Martian Swirls



Crater Archimedes image by Robert Reeves, used by permission. The crater floor filled subsequent to crater creation. Could such a lava intrusion may have erased volcanic a fissure that created Reiner Gamma?

Volcanic activity on the Moon is another theory, and γ lies in a region known for such activity, exhibiting volcanic domes, ridges, etc. Such a vent possibly released a stream of molten lava, which interacted with the surrounding lunar soil to create the swirl pattern. Schultz (1972) suggested it "…simply may be coincidental, the inferred topographic control suggests a near-surface flow feature." Given the remarkable similarity between γ and Elysium Planitia on Mars it seems possible that the fissure of the lunar vent creating γ subsequently closed the fissure. On the moon, we see similar examples of such events in the craters such as Archimedes.

Another theory is that these are due to the impact of cometary bodies. Mass extinction theories, including the demise of the dinosaurs, include the theory that major "showers" of comets from the Oort cloud caused such extinctions. This theory gives credence to the belief that Swirl features
Indigenous to the Moon are of similar cometary origin.[18]

There are schools of thought regarding the cometary impact view of the origin of the lunar swirl features proposing that γ and those swirls found on the lunar far side are the result of the impact of a split nucleus comet. There are at least two impact points identified: the far side crater Goddard A marking the point of impact of one of these nucleuses, whereas a smaller crater on the rim of O'Day would mark the second point of impact. γ shows signs of increased cratering compared to its surroundings, which may indicate such a "shower" event possibly occurred. Thus, these swirl patterns could be the result of high-velocity imprinting of cometary dust and the fine structure of the coma. The age of these patterns has suggested these patterns relatively young lunar features (ibid, Schultz, and Srnka, 1980).

One must wonder if our view of comets has changed enough to rule out the idea that cometary impacts caused the swirl features, while at the same time raising the question as to whether water ice found on the moon might be the result of such impacts. This writer comes out of a generation of amateur astronomers who often viewed comets as mere gaseous comas composed mostly of ice and vapor often sporting one or more tails. A new finding from the James Webb Telescope reports water has been identified in Comet 238P/Read. It and the new field of research that has sprung up using Citizen Science, tasked with the detection of Active Asteroids, raises such questions concerning the origin of our earths water, which in turn raises the same question regarding water on our moon. A recent discovery has been made of a new class of Asteroid known as Active Asteroids. These vagabonds masquerade around the Asteroid Belt and elsewhere in our solar system disguised as comets and raise questions regarding the difference between comets and asteroids.

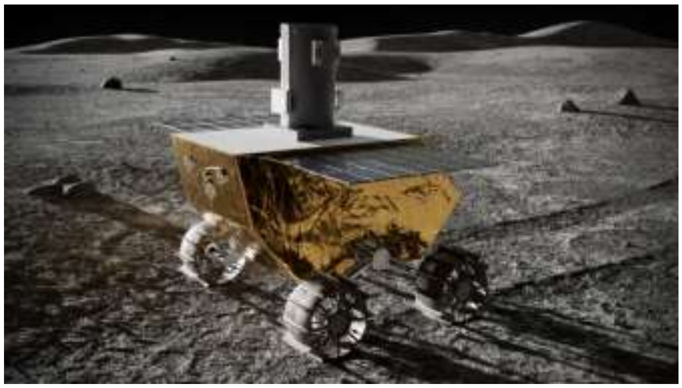
The idea of fragmented cometary structures impacting the moon is nothing new. Comet Shoemaker-Levy 9 and its impact with the planet Jupiter illustrated that multiple fragments of a comet might impact a body such as the moon in the past. Multiple impact sites are visible on the moon clearly illustrates this. Additional examples of such fragmented (split nucleus) comets can be cited, such as comet West (1976). Comet Brooks 2 (1886), which may also be an example fragmented from the gravitational forces of Jupiter. Evidence of multiple nucleus comets impacting solar system bodies may be cited. For example, Ganymede exhibits “lined up” craters that suggest the impacting body to have been that of such a multiple or split nucleus object. Callisto boasts 13 similar examples, including Gipul Catena, a 620 km impact crater chain. Lunar counterparts for such alignments are not unusual. One choice example lies east of the lunar crater Walter (near Long. 6.45, Lat. -42.41, see IV-107-H3), consisting of an alignment of six craters closely matching the Gipul Catena feature on Callisto. While many of these probably resulted from secondary impact of major crater ejecta, it is logical to assume that multiple nucleus cometary impacts are responsible for others. This brings forth the possibility of a new observational program for the identification and cataloging of aligned craters.

Unlike the moon and Mars, the Earth’s atmosphere plays a crucial role in protecting our planet from most medium sized comets or meteoroids. Once one enters the earth’s atmosphere, it experiences significant atmospheric drag, causing it to heat up and often disintegrate before reaching the surface. Thus, our atmosphere serves as a protective shield. Combined with the larger size and higher density of Earth this results in most meteoroids burning up resulting in few that reach the ground. Larger impacts result in greater consequences, for example the extinction of the dinosaurs from the Chicxulub impact. Of those that reach the ground, notable peculiarities have been known to exist, such as the Tunguska event. Tunguska is the closest known event to have impacted earth that might be compared to a supposed object creating γ under an impact hypothesis, but there are a couple of problems: Our moon has no atmosphere shielding it from an asteroid, meteoroid, or comet striking Oceanus Procellarum creating γ. Nor does the Moon (or Mars for that matter) have a global magnetic field. Thus, it is an unlikely candidate as a type we could point to as an impacting body creating γ. Mars, on the other hand, does have a very thin atmosphere, primarily composed of carbon dioxide, which is 100 times less dense than that of Earth. Therefore, had lunar and Martian Swirls been caused by a Tunguska class event it is unlikely that they would not have left more of an impact scar than merely the swirling patterns of high and low albedo surface deposits.

This investigator believes the key lies in the volcanic fissures found transecting the Martian Swirls. It is here proposed that γ was created by similar volcanic venting interacting with the magnetic anomalies known to be present at Reiner Gamma. The γ fissures have undergone some yet to be identified process erasing their contribution to the curious object. Aside from the fissures, Elysium Planitia and γ are almost identical.

In conclusion, the genesis of the feature γ, despite these and other theories, remains a mystery. Further earth based telescopic study and observation of the swirl as well as space probes will offer new understandings of the geological and magnetic properties of the Moon and solar system bodies. Lunar missions have been proposed to visit γ, most notably the Lunar Vertex mission which will send tiny robots to the feature as early as 2024. It will be interesting to watch developments in our knowledge of the geology and morphology in the regions of the Martian swirls as well.

γ and other solar system swirls are mystifying lunar and solar system phenomenon which have puzzled lunar observers and other scientists for centuries. Its origin and nature remain unknown, but theories related to magnetic anomalies and volcanic activity have been proposed. More research is necessary to uncover the secrets of this fascinating lunar feature.



Lunar Vertex: https://www.jhuapl.edu/news/news-releases/211018b-lunar-vertex

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18. https://amp.abc.net.au/article/102352206 Interesting to note this study highlights a lack of carbon dioxide.
19. https://www.zooniverse.org/projects/orionnau/active-asteroids/about/research
20. NAU Communications, The NAU Review, “Where Earths Water Comes From, Preparing For DART Impact and a Discovery from Active Asteroids,” October 6, 2021. https://news.nau.edu/astronomy-dps-meeting/ - This writer is proud to be involved now for a few years in the Active Asteroids project and has contributed 63,280 classifications searching out such objects using the Zooniverse platform; I was credited with making the initial discovery that a new Active Asteroid called 2015 TC1 is in fact a Jupiter Class Comet.

Lunar Vertex: “Solving Mysteries Swirling Around the Moon’s Magnetic Regions;” https://www.jhuapl.edu/news/news-releases/211018b-lunar-vertex

The Mystery of Reiner Gamma and a Possible Correlation to the Elysium Planitia Martian Swirls

In the Border of Libration: Babbage and Pythagoras

Alberto Anunziato

When you don't have the opportunity to observe, incredibly there are more than two months that I can't observe, you have to go to the months in which the observations were as many as there were sketches in the observation diary left behind without analyses. This was the case of an old observation, motivated by the contrast between two craters overlapping, one in shadows and the other visible, one ancient and degraded and another much more recent, in an area where it is not frequent to observe details with a small telescope like mine: the northern part of western limbo.

***Pythagoras and Babbage,** Alberto Anunziato, Paraná, Argentina. 2022 October 09 04:10-04:25 UT. Meade EX105 Maksutov-Cassegrain telescope, 154x.*

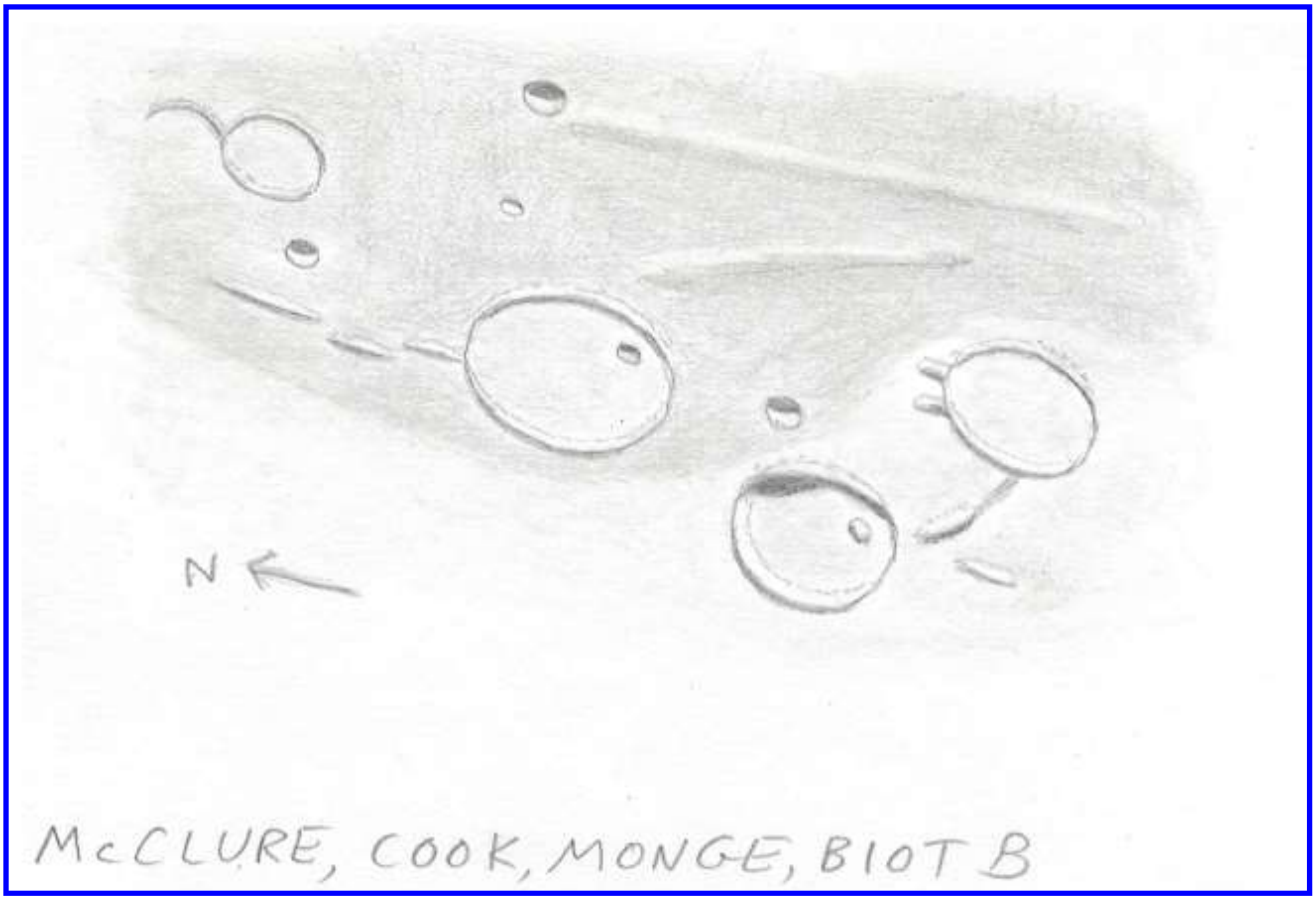
The crater in the east is Pythagoras (130 kilometers in diameter), a crater similar to Copernicus, but difficult to appreciate because of its location. We owe the comparison to Peter Grego: (The Moon and How to Observe It, page 157): "Pythagoras is slightly larger than Copernicus, but they are remarkably similar-looking craters when viewed from above. Like Copernicus, Pythagoras has a scalloped rim, broad walls with intricate layers of terracing and a hilly floor (hillier in the south), from which protrudes a group of central mountains. Because the crater has been carved from highland crust, the external impact structure so clearly seen in the vicinity of Copernicus is generally absent from the surroundings of Pythagoras". Pythagoras is as deep as Copernicus and so its interior is buried in shadows, except for the central peak (rather, the highest central peak), and the terracing of the walls, albeit slightly pronounced, is visible in the difference in brightness on the west wall (in our image we represent the bright areas with lines, since it is difficult to neatly indicate the differences in brightness).

What was perceived intuitively, that we were either in the libration zone or on its edge, is confirmed by the wonderful book that we have just cited: "Pythagoras lies just outside the libration zone, and although it never disappears completely beyond the northwestern limb, an unfavorable libration will make it appear extremely foreshortened. At a favorable libration and angle of illumination, observers can gain at least some idea of how grand this crater really is, as the terraced northwestern wall shines beyond central mountains that are seen in profile against each other. This is how the interior of Copernicus must appear when viewed from a low angle". Like Anaxagoras, a bit more east, Pythagoras is a splendid crater with bad luck: "no one who observes it fails to lament is not nearer the centre of the disc, as it would then undoubtedly rank among the most imposing objects of its class. Even under all the disadvantages of position, it is by far the most striking formation in the neighborhood", as Thomas Elger said in The Moon (page 91). By contrast with a marvel like Pythagoras, Babbage, although larger (144 kilometers in diameter), pales. Old, weathered and therefore shallow, its interior resembles the ancient description of a large crater: "a walled plain". Of course, there are not even traces of a central peak, but its monotony is offset by two huge craters inside: Babbage A (26 kilometers in diameter) and Babbage C (14 kilometers in diameter). Its walls are monotonous and low and with the grazing lighting they blend with the west wall of Pythagoras. Elger describes it as "fine telescopic object at sunrise, the interior being crossed by a number of transverse markings representing ridges" (page 87), we did not see the marks but we did see the details of the west wall, like inlets inside the crater, higher than the rest (since they cast a shadow), which he refers to as "the curious detail on the W. wall is also worth examination at this phase".

Babbage, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 14 04:47 UT, colongitude 64.3°. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

McClure, Cook, Monge and Biot B

Robert H. Hays, Jr.



McClure, Cook, Monge and Biot B, *Robert H. Hays, Jr., Worth, Illinois, USA. 2023 February 26 01:48-02:22 UT. 15 cm reflector telescope, 170x. Seeing 7/10, transparency 6/6.*

I observed these craters on the evening of February 25/26, 2023. These four craters are near the southern tip of Mare Fecunditatis. They are arranged roughly north to south; Cook is the largest of the four, and has the pit Cook A inside its southeast rim. Cook B is located well to the east of Cook. It must be fairly deep judging from its interior shadow. A small pit between Cook and Cook B is much shallower. McClure is the farthest north of this foursome, and it is the smallest of the group. The partial ring protruding from its north rim is McClure C, according to the Lunar Quadrant map. The small crater McClure B is just west of McClure. Three ridges form a broken line in this area. Biot B is the southernmost crater of this group. Two peaks protrude from its north rim. The three aforementioned main craters are all quite shallow. Monge is between Cook and Biot B, and must be deeper than its neighbors. It showed dark interior shadow at this time. This shadow was wider toward its north side. Monge also has a pronounced D shape with its west side having a shallow curvature. A conspicuous peak is inside the south rim of Monge. Two ridges are south of Monge and west of Biot B. Cook G is the small crater east of Monge and south of Cook. This pit, Cook B and McClure B are of similar size and crispness. The edge of Mare Fecunditatis is fairly well-defined east of Biot B and Monge. Two long vague wrinkles are south of Cook and west of Biot B. The north end of one is very near Cook B.

Lunar Topographic Studies
McClure, Cook, Monge and Biot B

The Topography of an Irregular Wrinkle Ridge in Mare Nectaris

Luis Francisco Alsina Cardinalli, Marcelo Mojica Gundlach and Alberto Anunziato

In other issues (July 2022 and May 2023) of our magazine we have dealt with the peculiar topography of the western shore of Mare Nectaris (IMAGE 1 right), more specifically the wrinkle ridge that extends between Beaumont and Theophilus. There are two reasons to speculate about the unusual topography of this nameless ridge. First, Mare Nectaris is a very old and degraded basin. Second, there are very few dorsa in the lavas of Mare Nectaris, as we see in IMAGE 2, obtained with the layer Map of lunar wrinkle ridges (digitized from LROC Wide Angle Camera (WAC) global mosaic and hillshade maps generated from GLD100 Digital Terrain Model) from the Lunar Reconnaissance Orbiter Quickmap, and they mostly run concentric to the basin, so they could be the remnants of a ring.

Image 1, Mare Nectaris, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2019 July 07 23:30 UT. 150 mm refractor telescope, ZWO ASI120 camera. North is up, west is right.*

Image 2, Mare Nectaris, *LROC Hillshade.*

Lunar Topographic Studies
The Topography of an Irregular Wrinkle Ridge in Mare Nectaris

If the dorsum of the western shore of Mare Nectaris is the superficial expression of the submerged relief, and not the product of compression forces, its topography could be explained a little better (IMAGE 3, detail of IMAGE 1), very different from the topography typical of a wrinkle ridge. If we go from south to north, we find three very different segments. Segment 1 shows an elevation with an extended gentle slope to the east and a steep slope to the west, which is characteristic of a ridge, although the upper component of a typical ridge, called crest or crenulated ridge, is not perceived to be present. Segment 2 appears to consist of an abrupt, bright elevation with defined shadows, as if it were a ridge without the lower component (arch), which would be anomalous. It is interesting that, if we look at the issues quoted from The Lunar Observer, we realize that visually with a small telescope the three segments are perceived as a continuum, in which segment 2 looks like the crest above the arch, whereas in the images illustrating this text appears to be missing the arch below the crest. Also very interesting is segment 3, which looks like a raised triangle with two elevations in its northern part, at each end, bright and casting shadows. This segment is confused with the foothills that constitute the ejecta mantle of Theophilus (does it belong to the exterior of Theophilus or to the ridge?).

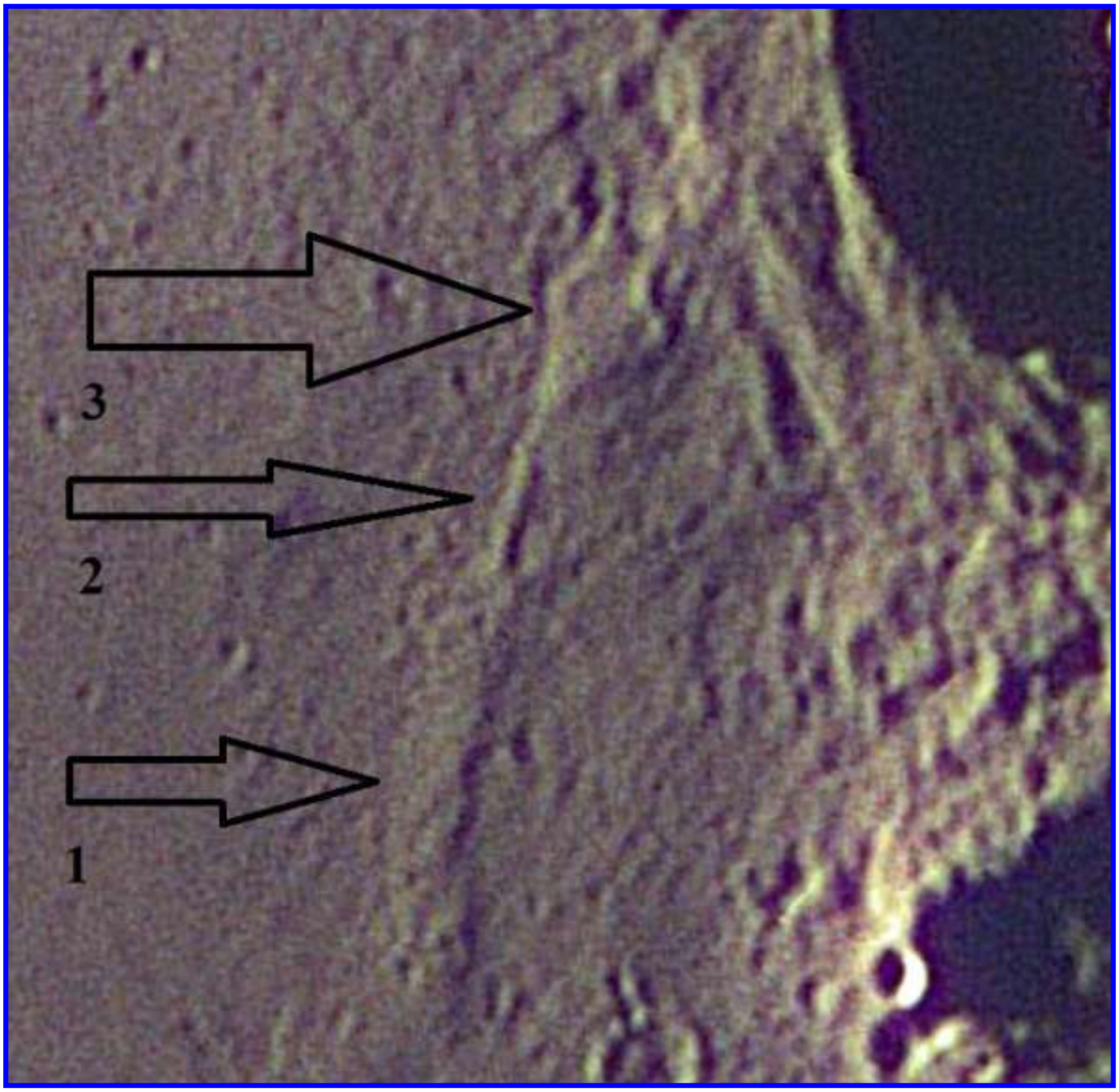


Image 3, Mare Nectaris, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2019 July 07 23:30 UT. 150 mm refractor telescope, ZWO ASI120 camera. North is up, west is right. This is a close-up of image 1.*

In IMAGE 4 the illumination is not very different, although we are closer to the terminator (compare the shadows inside Theophilus), but with the Sun a little lower on the lunar horizon the panorama changes. And this makes us reflect on how difficult it is to know the topographic structure of the wrinkle ridges if we don't observe it when the terminator passes very, very close to them.

Image 4, Mädler, *Luis Francisco Alsina Cardinalli, Oro Verde, Argentina. 2016 January 15 00:10 UT. Meade LX200 10 inch Schmidt-Cassegrain telescope, Canon EOS Digital Rebel XS camera.*

Let's go back to our division into 3 segments in IMAGE 5 (detail of IMAGE 4). The first segment shows 3 crests, which we deduce from appearing slightly brighter and, above all, from the shape of the corresponding shadows, which the highest crests cast on the arch. There also appears to be a secondary crest on the east slope, parallel to the echelon crests on the west slope. In this image the arch is more clearly perceived, and segment 2 does not seem to be disconnected from segment 1 (as in the first image), look at the shadow cast by the west slope: it corresponds to the steepest slope of segment 1 (where its three ridges are found) and also the lower half of segment 2 (perhaps there would be a parallel ridge to the west). My interpretation of segment 2 is that it is not as anomalous as it appears in the first image. It is an arch with two crests, the very small one that we already mentioned and the main one, much brighter (higher) and with defined shadows. The shadow of the main crest hides much of the arch and even creates the pareidolia of a crater. Segment 3 appears with a much more defined and complicated topography. On the one hand, it could be that it presented a main crest that ran along the same line as the crest that we marked in segment 2, on the eastern slope, and a secondary crest on the western slope. In this image, segment 3 appears clearly triangular, which would be highly anomalous. Most likely, it is relief that forms part of Theophilus' exterior materials (formerly known as “glacis”), which would be consistent with the ridge layout of the LRO Quickmap.

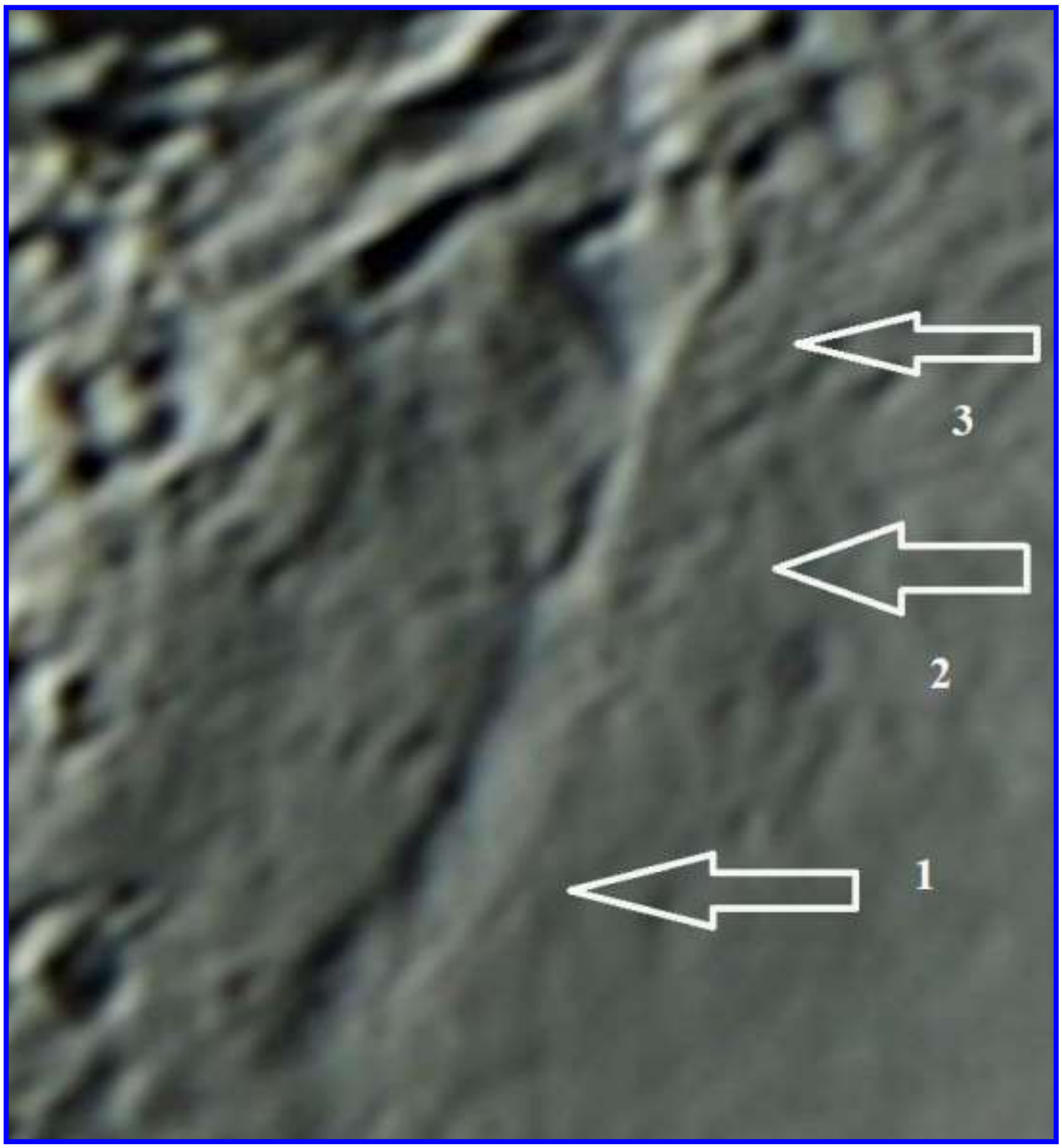


Image 5, Mädler, *Luis Francisco Alsina Cardinalli, Oro Verde, Argentina. 2016 January 15 00:10 UT. Meade LX200 10 inch Schmidt-Cassegrain telescope, Canon EOS Digital Rebel XS camera. This is a close-up of image 4.*

To clarify and summarize what has been exposed, we have prepared a "map" of our ridge (IMAGE 6) that can be compared with an image (IMAGE 7) taken a few minutes before IMAGE 4, in which the topographic panorama can be seen more clearly. We only include segments 1 and 2, since segment 3 is highly doubtful as being part of the ridge (according to the criteria outlined above). With an arrow we indicate the steepest slope (the eastern slope in segment 1 and the western slope in segment 2). Regarding how the two components of the ridge are arranged (the lower component, arch, and the upper, steeper component, crest or crenulated ridge), both segments present different but characteristic topographies. Remember that "the orientation of the major crenulated ridge forms a distinct and regular pattern. The crenulated ridge segments occur either 1) generally parallel to the arch in a sinuous map pattern (…) or 2) at some angle to the main trend of the arch in an echelon pattern" ("Morphologic Components and Patterns in Wrinkle Ridges: Kinematic Implications", J.C. Aubele et al). Segment 1 presents 3 crests (2, 3 and 4) "echelon" (Aubele's second option), while segment 2 presents a crest (6) that rests on the steepest slope (Aubele's first option). Crests 2 (segment 1) and 5 (segment 2) are secondary crests parallel to the main ones, secondary crests are generally parallel and these are no exception. Making a template with the topography of the dorsum can be a resource so that the following observations are more precise and focus on confirming or denying the proposed topography, instead of trying to elucidate the topography at the moment of observing.

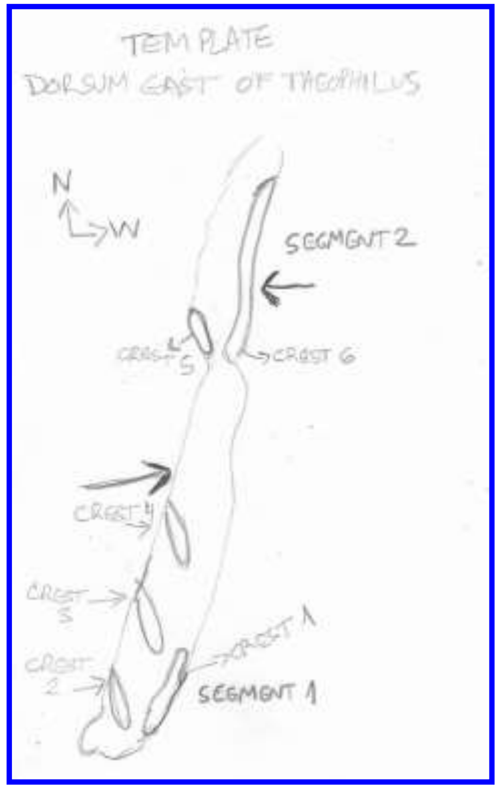


Figure 6, *Map of Dorsum east of Theophilus.*

Image 7, Mädler, *Luis Francisco Alsina Cardinalli, Oro Verde, Argentina. 2016 January 14 23:53 UT. Meade LX200 10 inch Schmidt-Cassegrain telescope, Canon EOS Digital Rebel XS camera.*

Janssen to Rheita
Rik Hill

An electronic failure with my larger telescope has forced be back to the Dynamax 6. This image comes from that. On the left side of the image, we see the large ancient crater Janssen (196 km dia.). On its floor is beautiful system of rimae, some of which are still in deep shadow here. On the north wall is the crater Fabricius (80 km) and its near twin (in size) Metius (90 km). The former has a very interesting mountain range on its floor but most of that too is in shadow. Running down the image from top to bottom just right of center is the huge trench of Vallis Rheita. Going south from Metis are two (three?) parallel smaller similar trenches. These are controversial with some believing they are just overlapped craters and others that they are scars from a large impact to the north with craters formed on top of that. The problem with that is that neither Vallis Rheita nor the other two smaller grooves point exactly back to a large impact. They miss Mare Nectaris by some distance.

It is interesting to point out the dark elongate feature that runs from between Fabricius and Metius to the upper left into the terminator. This is created by the chance alignment of crater walls and mountain shadows and not a real feature like the Vallis itself. This is the kind of thing that lighting can do to trick you on the Moon!

This image is made from two 1500 frame AVIs stacked with AVIStack2 (IDL) knitted together with MS Ice and further processed with GIMP and IrfanView

Janssen to Rheita, *Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2023 April 25 02:19 UT, colongitude 325.7°. Dynamax 6 inch Schmidt-Cassegrain telescope, 665 nm filter, SKYRIS 132M camera. Seeing 8/10.*

Two Interesting Aspects of the Aristarchus Plateau

Sergio Babino, Eduardo Horacek, Esteban Andrada and Alberto Anunziato

Looking for images for future Focus-On, I found images that prominent observers in our region, Sergio Babino (Sociedad Astronómica Octante de Montevideo, Uruguay) and Eduardo Horacek and Esteban Andrada (Trapecia Austral of Mar del Plata, Argentina) reported to the Sociedad Lunar Argentina for a Lunar Alert that we had launched to study a small ridge that ends in the Herodotus A crater. This ridge is quite small and really gets lost among the wonders of the area that its images portray. In the images that I present, what Charles Wood has called "the most unusual feature on the Moon: the Aristarchus Plateau. With all the strange and weird landforms that exist on the Moon you may think I exaggerate, but all the other candidates are simply the largest or most unusual examples of standard features-whereas the Aristarchus Plateau is unique" (The Modern Moon. A Personal View). The two magnificent images that I share illustrate only two aspects of this area, it seemed a little unfair to me that these images that we used at the time to analyze a dark secondary wrinkle ridge do not have a more prominent place, when they show the Aristarchus Plateau so splendidly. Two details jumped out at me as I scrolled through these images. In IMAGE 1 you can clearly see a feature of the Aristarchus Plateau that is familiar but not as easy to see, Aristarchus Plateau is "an elevated diamond bounded by straight sides that measures 170 by 200 km. It is darker than the surrounding maria" (Wood). Remember the photographic images of the area that you have seen and you will see that this difference in color is clearly visualized in few, which is not so obviously visually seen either (I think I remember having seen it only 1 or 2 times).

Image 1, Aristarchus Plateau, *Eduardo Horacek/Esteban Andrada, Mar del Plata, Argentina. 2022 July 22 00:16. 150 mm Maksutov-Cassegrain telescope, Canon EOS Rebel T5i.*

Lunar Topographic Studies
Two Interesting Aspects of the Aristarchus Plateau

This is a bit counter-intuitive: a dark area that is higher than the brighter areas. Charles Wood and Robert Garfinkle tell us the story of how this dark diamond was "discovered": "An unusual, delicate reddish hue was first noticed in 1647 by Hevelius and was confirmed in an Apollo color photograph in 1972" (Wood). "The plateau has also been called "Wood's Spot," because of the tendency for it to take on a pale mustard or green-yellowish gray glow during full moon. The plateau is probably the most colorful region on the nearside. The alternate unofficial designation of the plateau as "Wood's Spot" is derived from the fact that the plateau appears as a black spot on the ultraviolet photographs of the Moon taken in 1910 and 1911 by American physicist and inventor Robert Williams Wood (1868–1955). He discovered that the plateau had the anomalous appearance of being the darkest place on the Moon when photographed in ultraviolet light. He also found what appears to be sulfur deposits north of the crater Aristarchus indicating that the material was thrown out onto the plateau by volcanic explosions of ash containing sulfur, or by the condensation of ejected sulfur vapors" (Garfinkle).

IMAGE 2 shows another feature: the highest point of the Aristarchus Plateau, marked by shadows on the Vallis Schröteri that outline the summits that cast them. Again, remember the images of the area, it is not easy to distinguish this point, which is really high: "The highest point on the plateau is at about 4550 m (14,927 feet) above the surrounding mare surface. This point is at the summit of the shield volcano at the "Cobra Head" crater, which is on the western flank of this plateau" (Garfinkle). The other wonders of the area will have to be found by the reader.

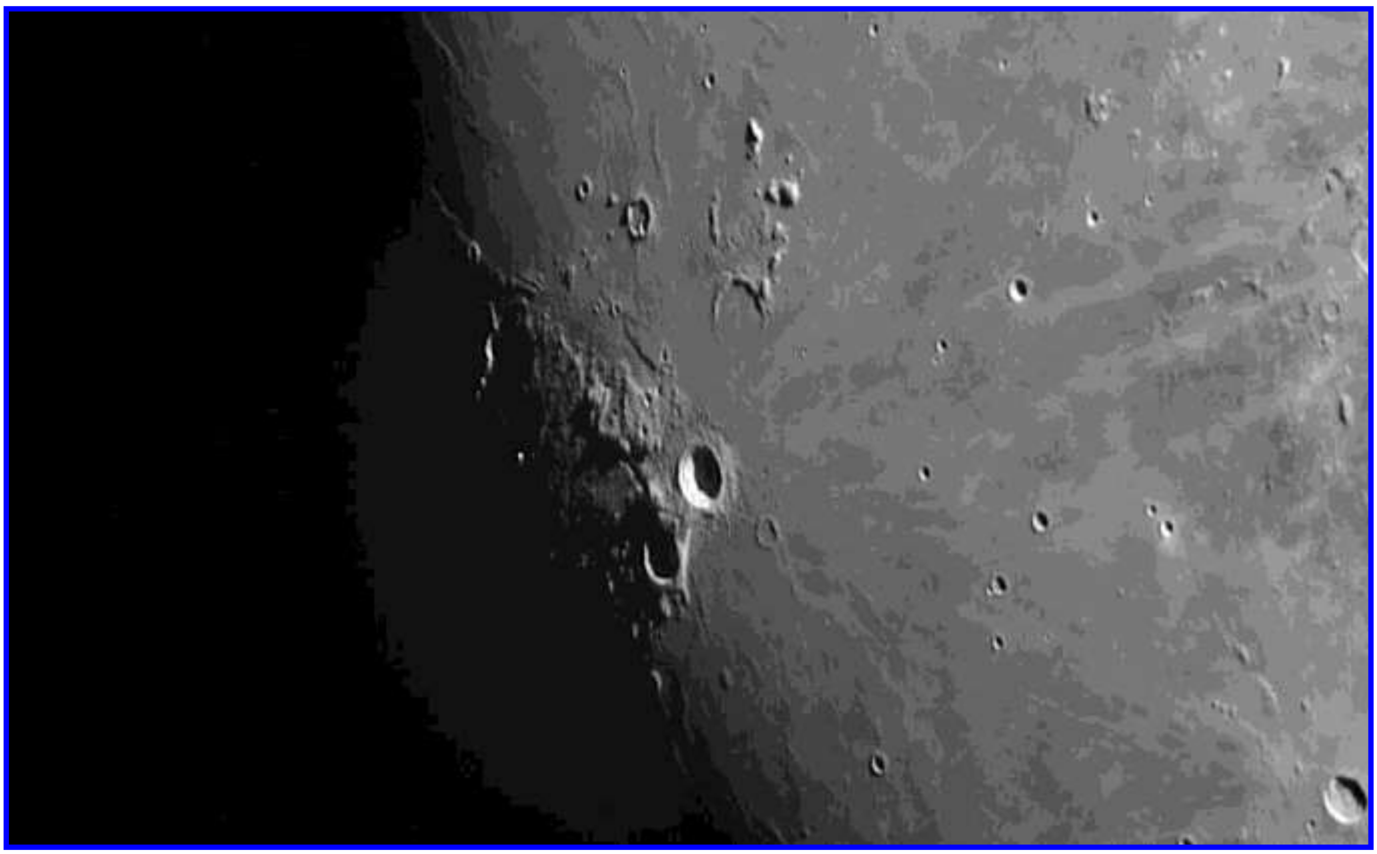
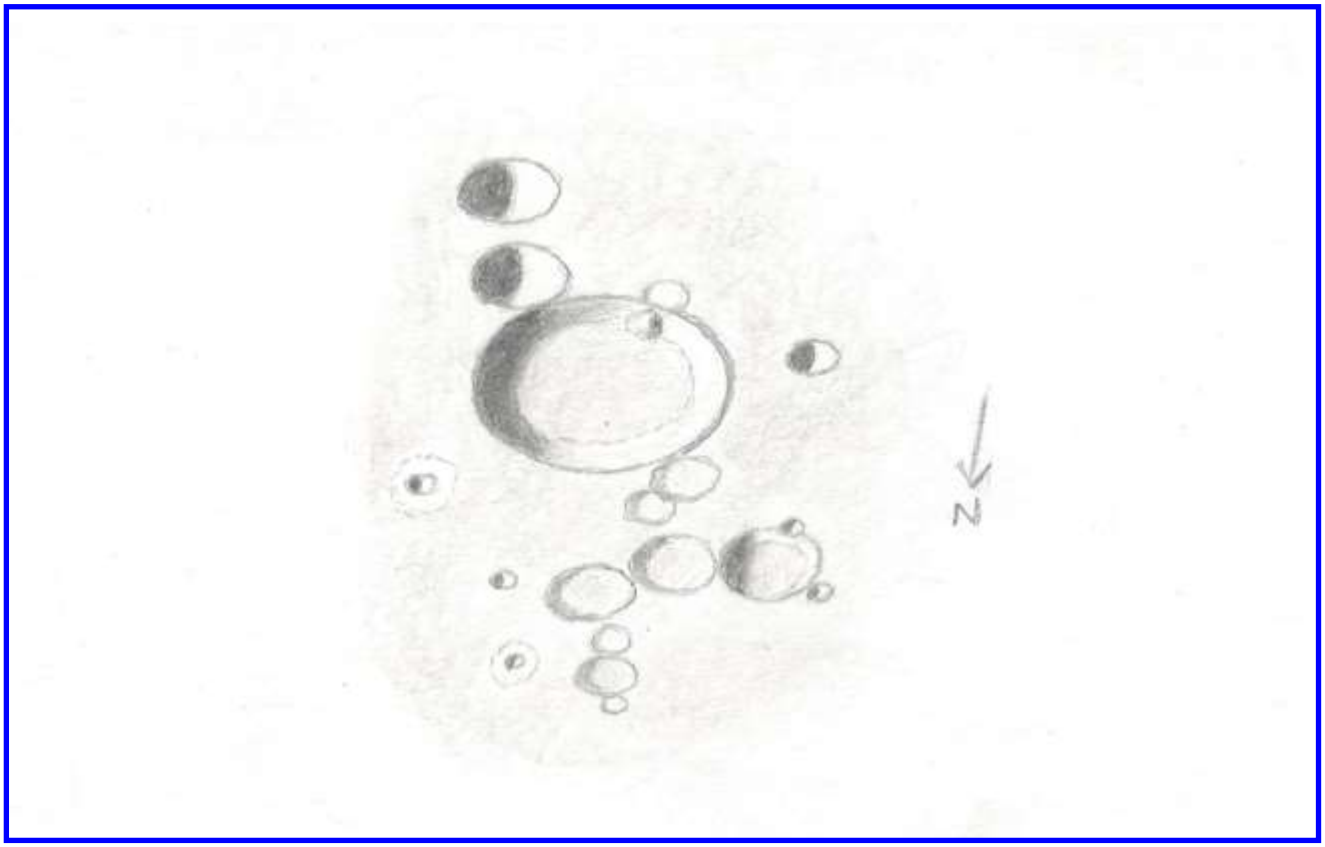


Image 2, Aristarchus Plateau, *Sergio Babino, Montevideo, Uruguay. 2020 April 08 00:16 UT. 203 mm catadrioptic telescope, ZWO ASI174 camera.*

Asclepi

Robert H. Hays, Jr.

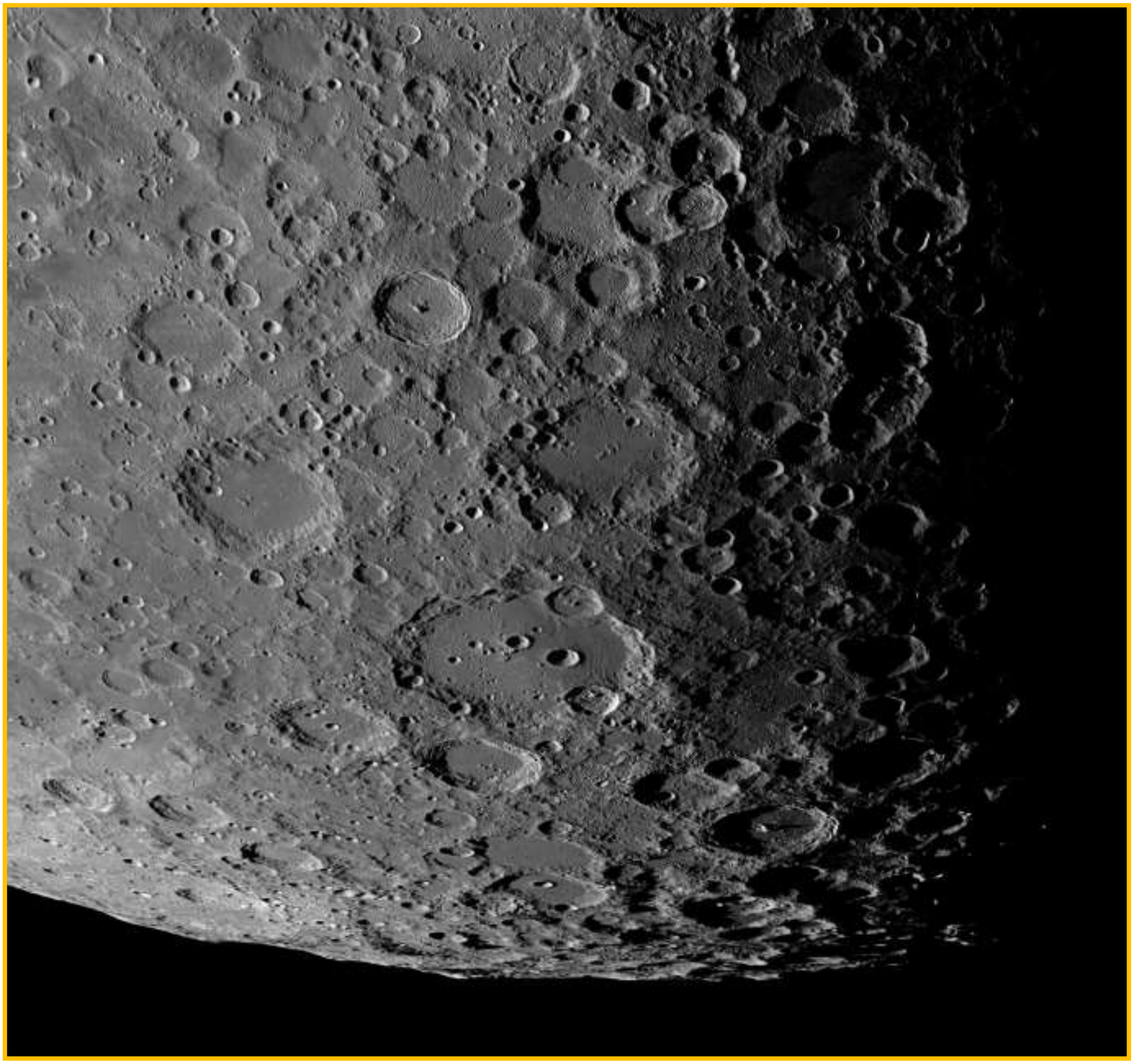


Asclepi, *Robert H. Hays, Jr., Worth, Illinois, USA. 2023 March 30 02:17-02:55 UT. 15 cm reflector telescope, 170x. Seeing 7-8/10, transparency 6/6.*

I sketched this crater and vicinity on the evening of March 29/30, 2023. This is a mid-sized crater west of Hommel in the heavily cratered lunar southern region. Asclepi has a featureless floor, but there is a substantial peak inside its southern rim. A small ghost ring is just outside the southern rim near this peak. A variety of craters surround Asclepi. Hommel K is the deep crater just south of Asclepi, and Hommel L is its twin to the south. The modest crater Tannerus N is west of Asclepi, and a small crater with a halo is east of the main crater. A group of mostly shallow craters is north of Asclepi. The conspicuous trio from east to west is Asclepi D, Asclepi B and Tannerus H. The last named is deeper than its neighbors. Two small pits are on its rims. Asclepi G is the small crater just east of D. An overlapping pair of saucers are between Asclepi and Asclepi B. The western one appears to overlap the other one. The largest crater north of Asclepi D is Asclepi A, and Asclepi C is the very shallow crater between Asclepi A and D. A tiny, shallow pit abuts the north rim of Asclepi A, and a craterlet with halo is east of A.

An Overview of Clavius, Tycho and Bailly

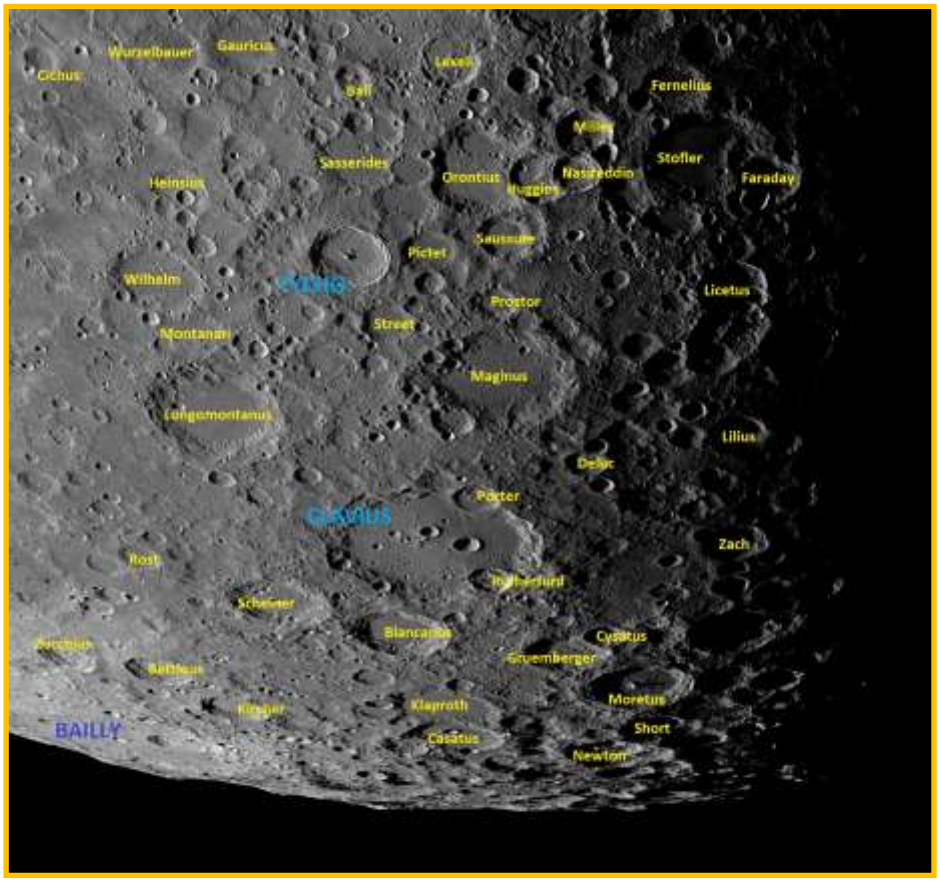
Jeff Grainger



Tycho to Bailly: 20.78 days 02.57 UT September 17 2022 [41]
[Altitude: 49*45' Azimuth: 121*41' Libration:

Major Craters	Diameter (km)	21C	Duplex	Moore
Clavius	231	15 E6		
Tycho	86	15 E2		
Bailly	301	24 G7		
Moretus	114	15 H8		

Lunar Topographic Studies
An Overview of Clavius, Tycho and Bailly



Many years ago (1973) I bought a copy of the original Hatfield Photographic Lunar Atlas. The images, taken on film, are crude by modern standards but at the time – especially for an amateur astronomer – they were revolutionary and inspirational. I determined that at some stage I'd produce my own book of lunar images.

Fast forward to 2016 and I produced a collection of C8 images of the moon. Ten copies of a book were run-off; I was very pleased, but at the same time disappointed as the digital book company was set up to produce books of everyday jpeg images and they couldn't cope with the very wide dynamic range of black and white lunar photos.

Since August 2022 I've taken every opportunity to image the moon when suitably placed. I use a C11 Edge for the task.

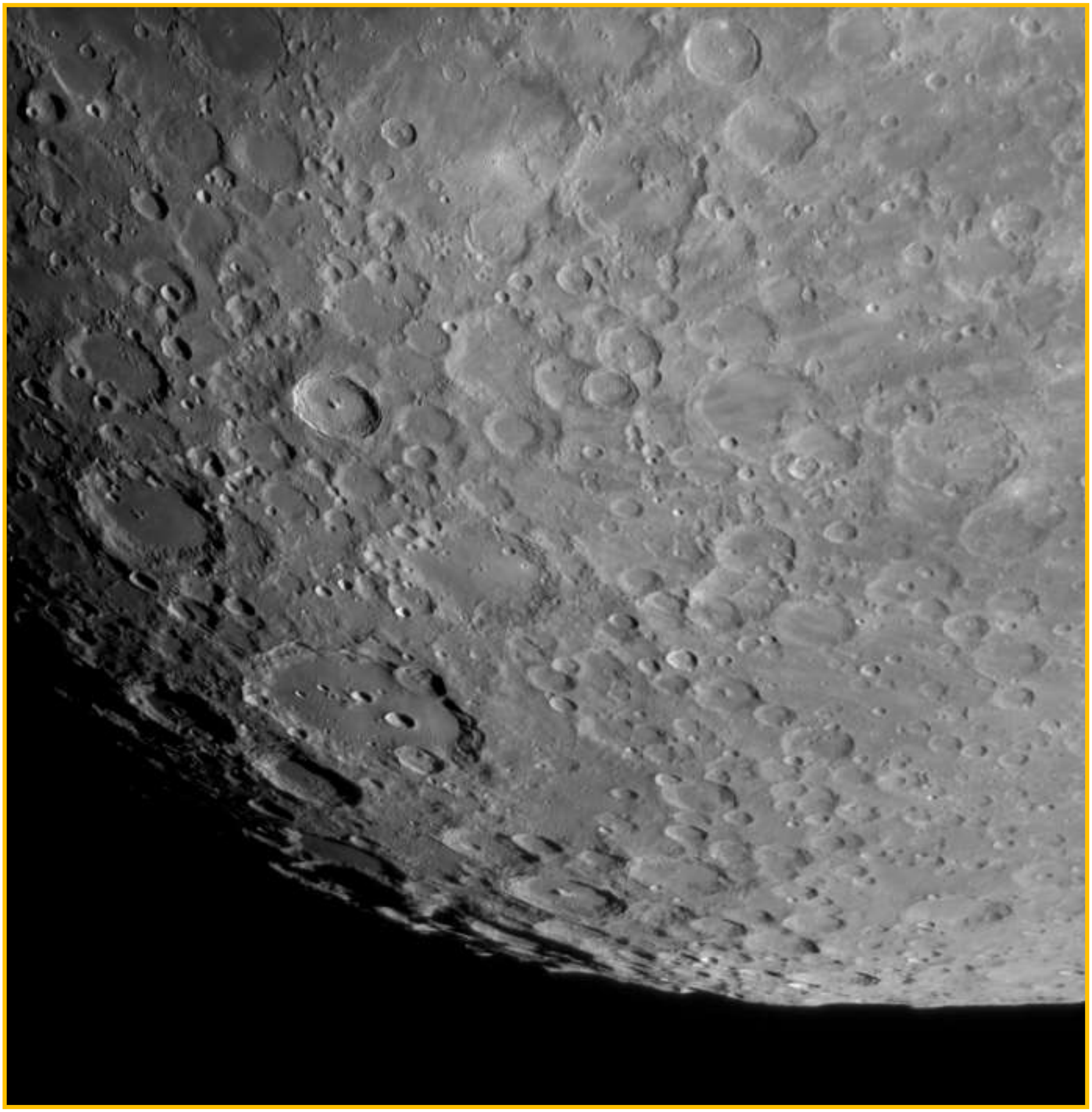
I decided to put my latest collection of images onto a memory stick. The "document" would consist of a Word component, split into sections, into which the TIF files from my imaging could be directly slotted. I'd also include a set of original non-compressed TIF files in simple folders on the stick.

The "project" consists of 2 main parts: A set of full-disk images of the moon, taken at different phases using a wider-field ZWO ASI 174 camera (5.8-micron pixels). A second part with the moon split into 25 regions (e.g., Crisium, Copernicus) each region containing collections of closer views using an ASI 290 camera (2.9-micron pixels).

The attached document represents one of the regions "Clavius Tycho Bailly" and presently contains 25 images. Using Word and folders it's easy to add new images as they are acquired. I'd like to produce a book from all this data – amounting to around 1500-man hours of work. For the moment an "e-document" may have to do.

Lunar Topographic Studies
An Overview of Clavius, Tycho and Bailly

Clavius Tycho Bailly region 1



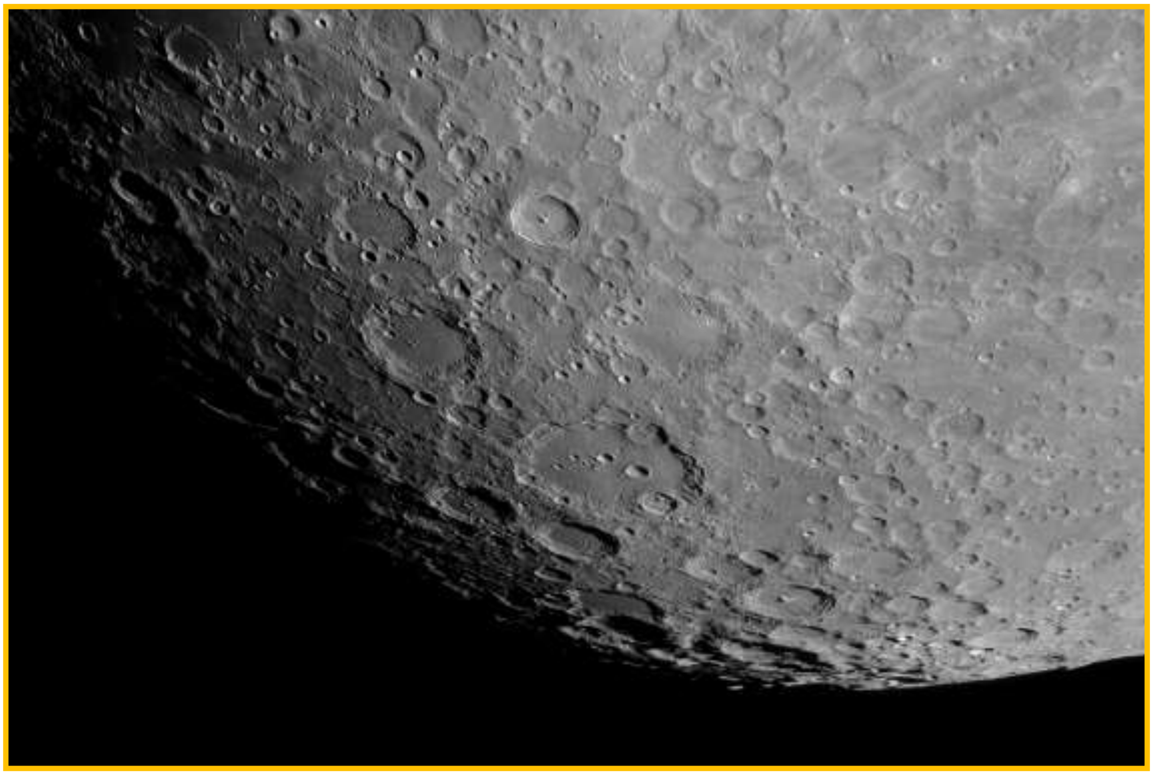
Deslandres through Tycho to Clavius: 9.89 days 20.23 UT December 03 2022 [86]
[Altitude: 41*41' Azimuth: 172*20' Libration:

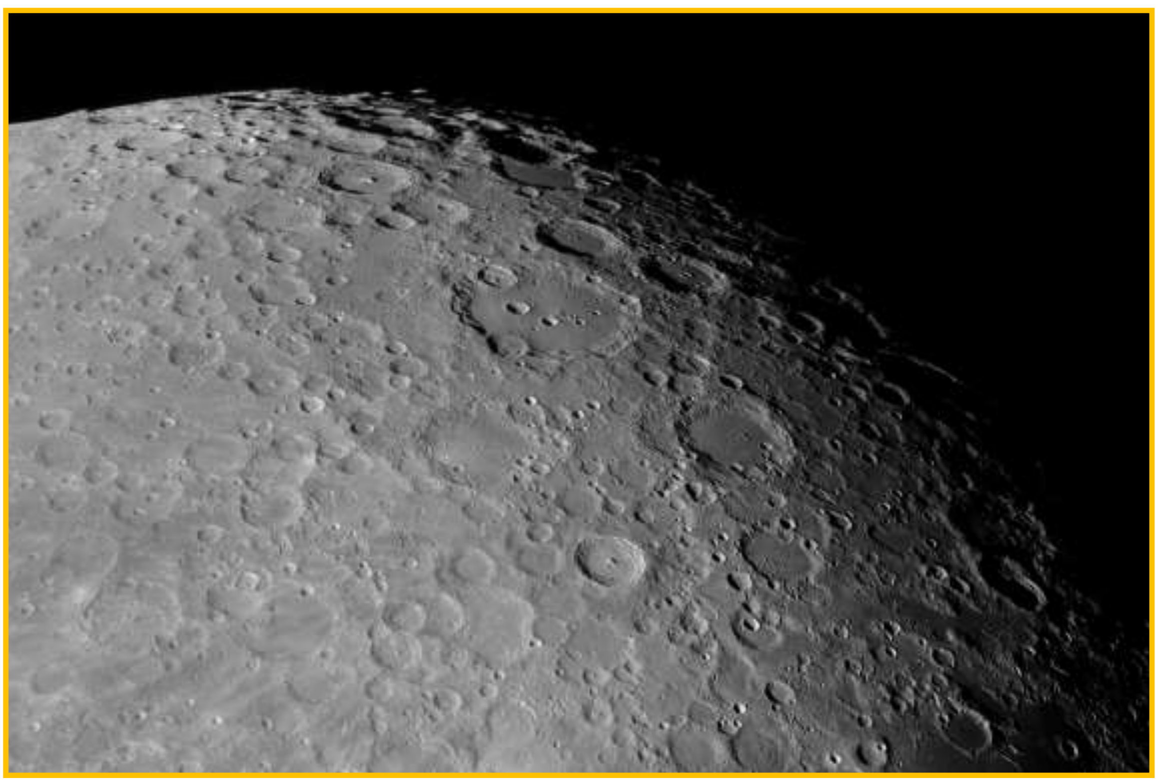
Close-up of Tycho: 9.89 days 20.23 UT December 03 2022 [87]
[Altitude: 41*41' Azimuth: 172*20' Libration:

Tycho is one of the youngest large craters on the moon, age estimated at ~ 110My.
The extensive ray system will be the subject of an extensive sequence of images later in this document.

The following pages present a sequence of images with both N up and S up aspects for the OVERALL (Tycho to Bailly) scheme. ALL individual Tycho images are N up.

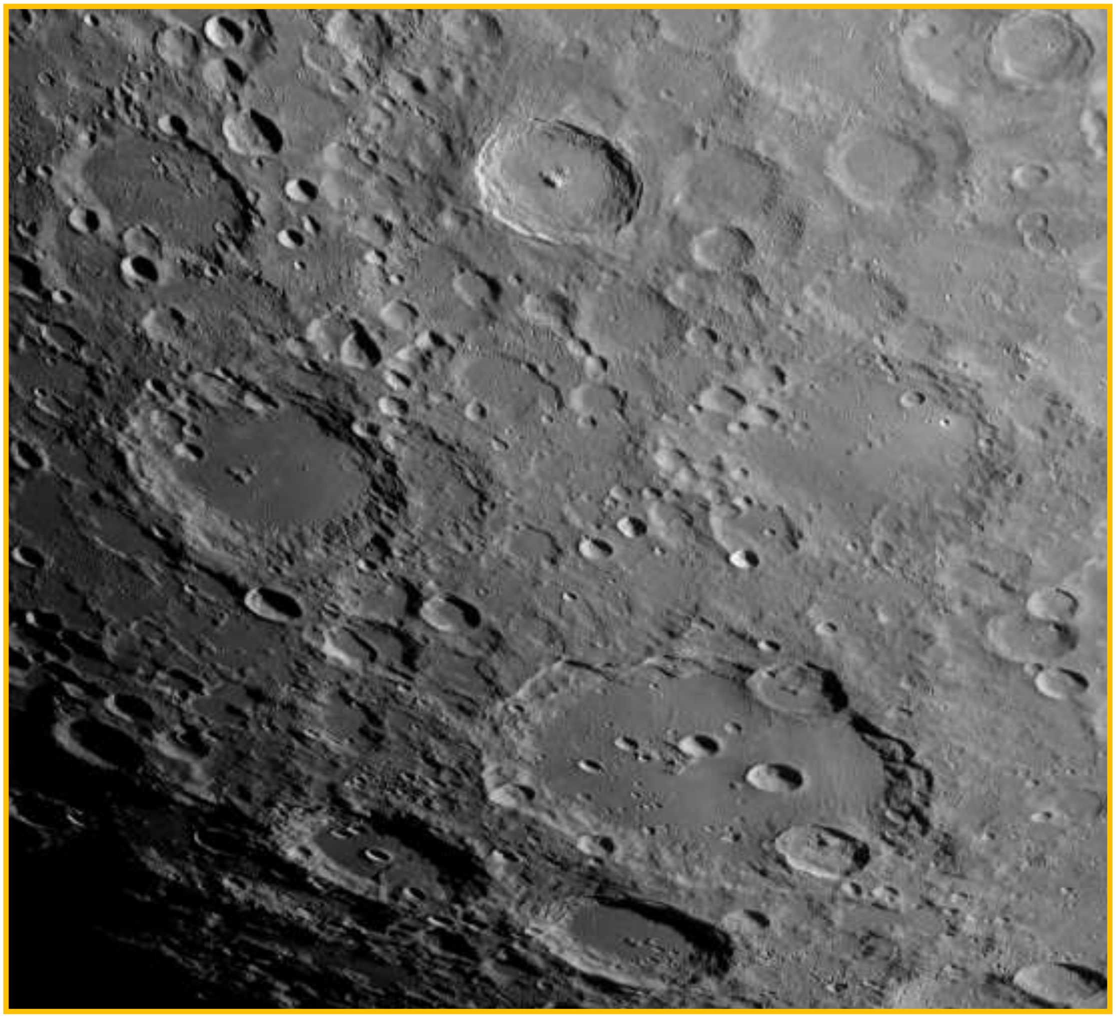
Clavius Tycho Bailly region 3



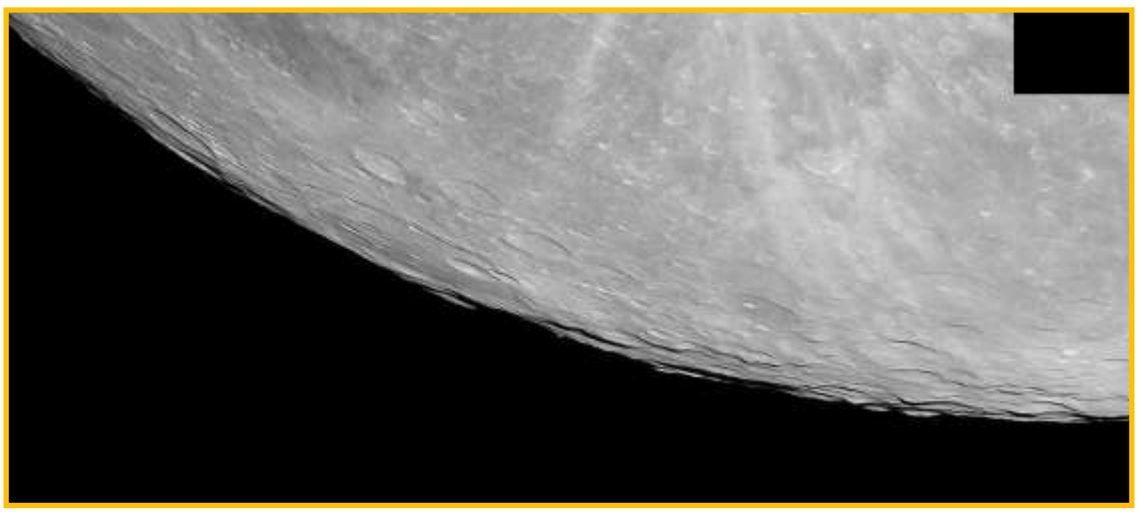


Clavius Tycho region N up and S up: 10.34 days 18.28 UT January 02 2023   [123/123S]

Clavius Tycho Bailly region 4



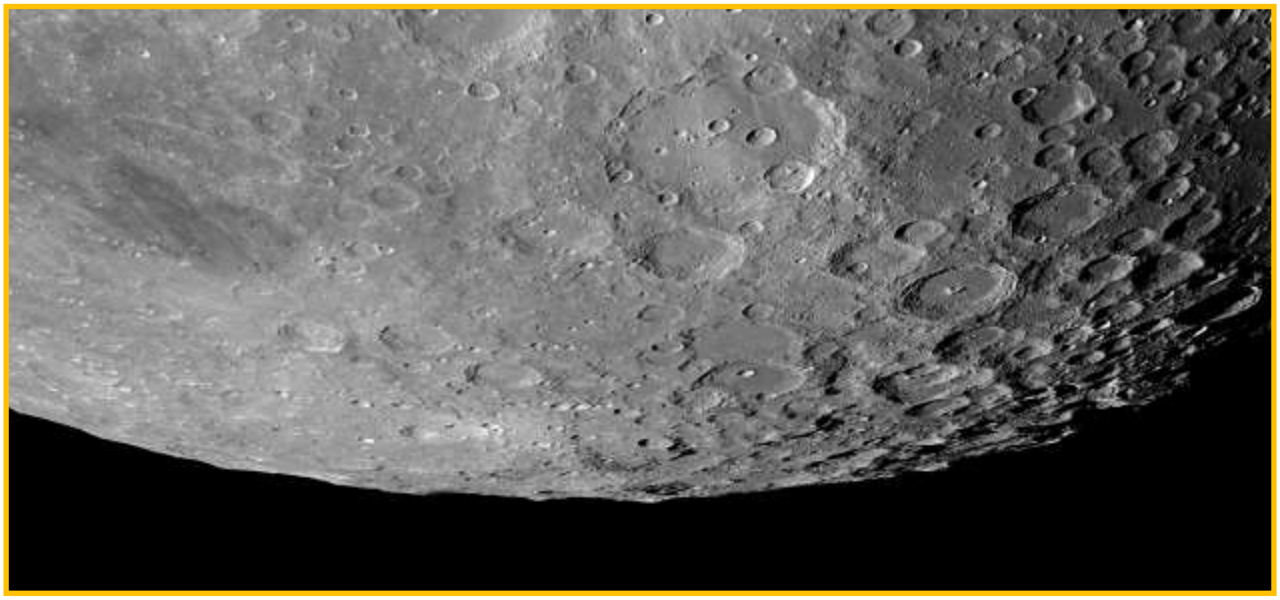
Close-up of Tycho from previous image: 10.34 days 18.28 UT January 02 2023   [124]
[Altitude: 45*25'   Azimuth: 125*15'   Libration:

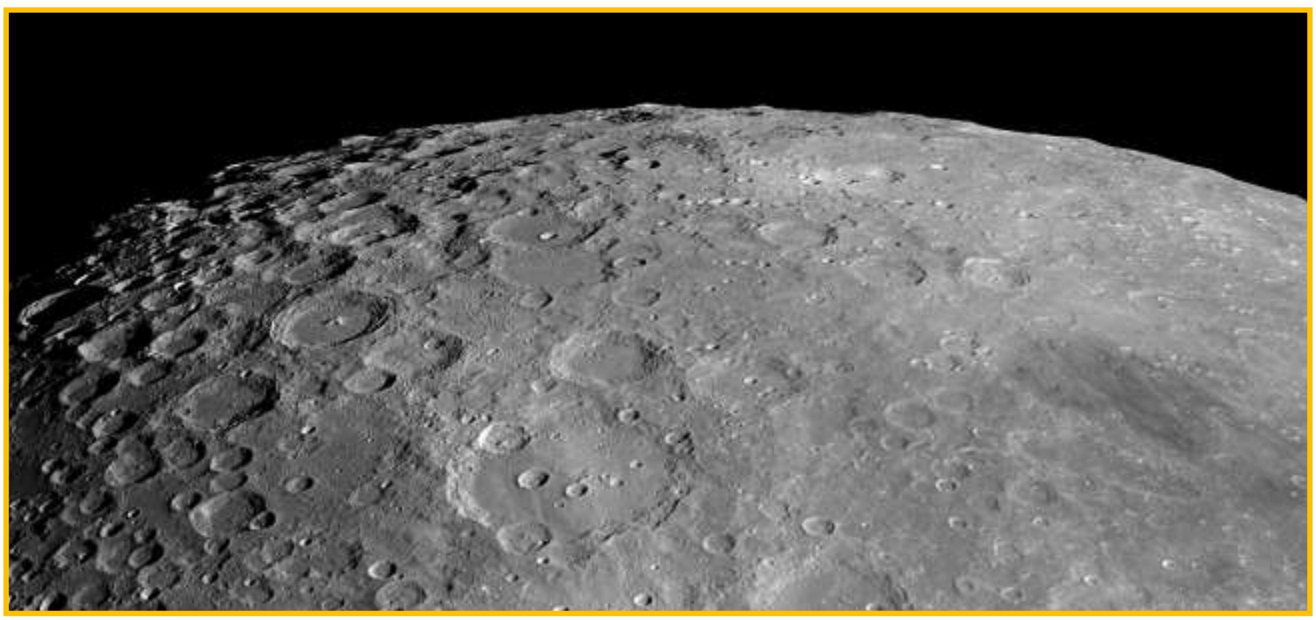


Clavius Tycho Bailly region 5

The bottom of page CTBR4 shows the giant crater Bailly (301km) – the largest crater (though technically a small "Basin") on the Near Side of the Moon. Taken near to Full Moon. The rugged terrain to the East of Bailly are the Leibniz mountains.

14.02 days 23.21 UT December 07 2022 Alt: 59*51' Az: 165*02' Lib: [103]

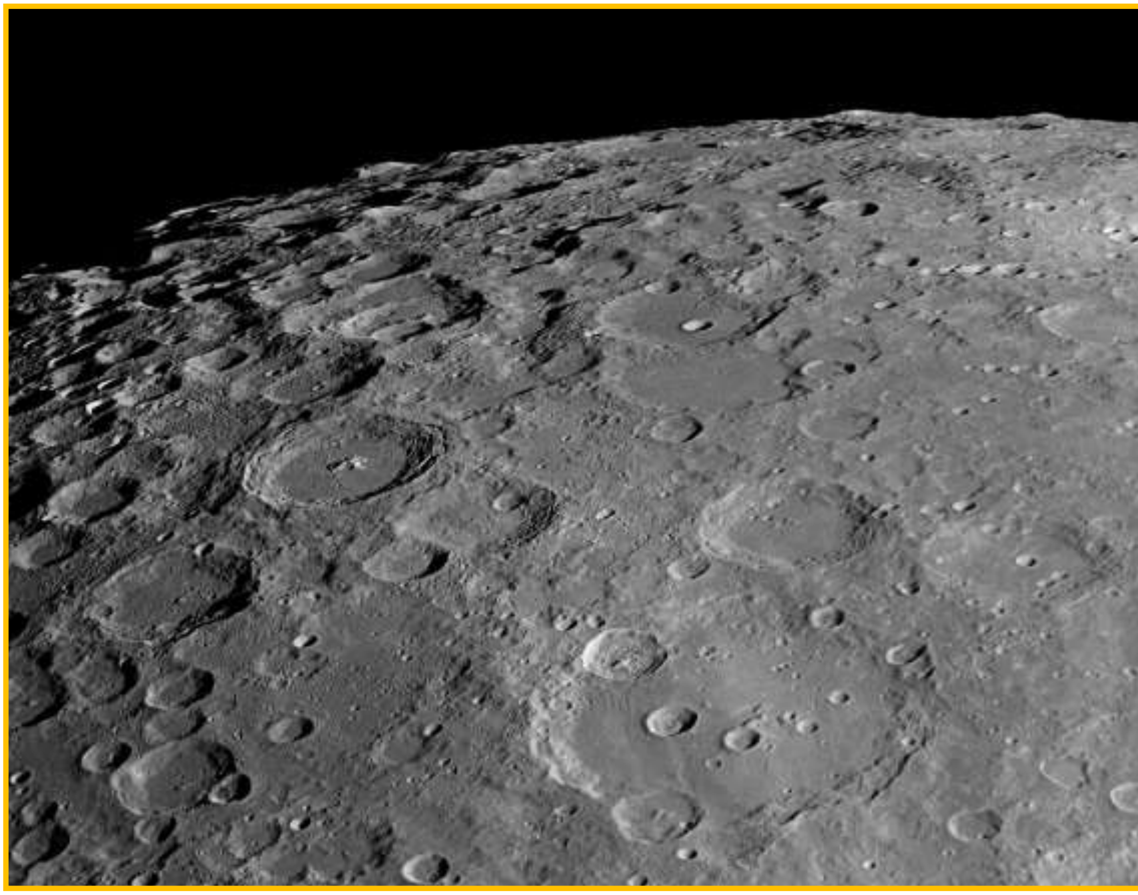




Clavius to Bailly: 18.65 days 02.28 UT November 13 2022 [68/68S]
[Altitude: 59*28' Azimuth: 145*27' Libration:

Elusive craters Drygalski and Hausen are visible to the S of Bailly. See Nov 14 2022 and Oct 18 2022 for clearer images of these [Images 82N/S and especially 58].

Clavius Tycho Bailly region 6



Clavius to Moretus (top), Tycho (bottom): 18.65 days 02.28 UT November 13 2022 [69/70]
[Altitude: 59*28'   Azimuth: 145*27'   Libration:

Clavius Tycho Bailly region 7

Clavius to South Pole (top two)/Close-up of Bailly, Drygalski and Hausen: 19.67 days 02.55 UT November 14 2022 [82/82S/82SDH]
[Altitude: 56*10' Azimuth: 137*38' Libration:

The large craters Drygalski (162km) and Hausen (167km – rarely seen and NOT in Moore) require a suitable libration to bring them into view. It is rare that Bailly is so far from the southern limb as it is here.

Lunar Topographic Studies
An Overview of Clavius, Tycho and Bailly

Clavius Tycho Bailly region 8

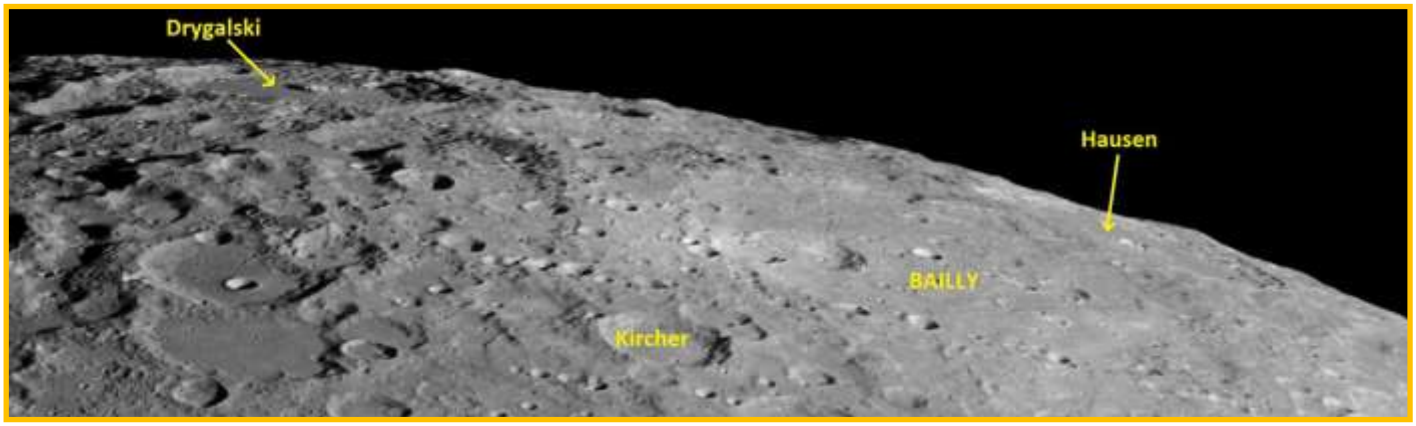
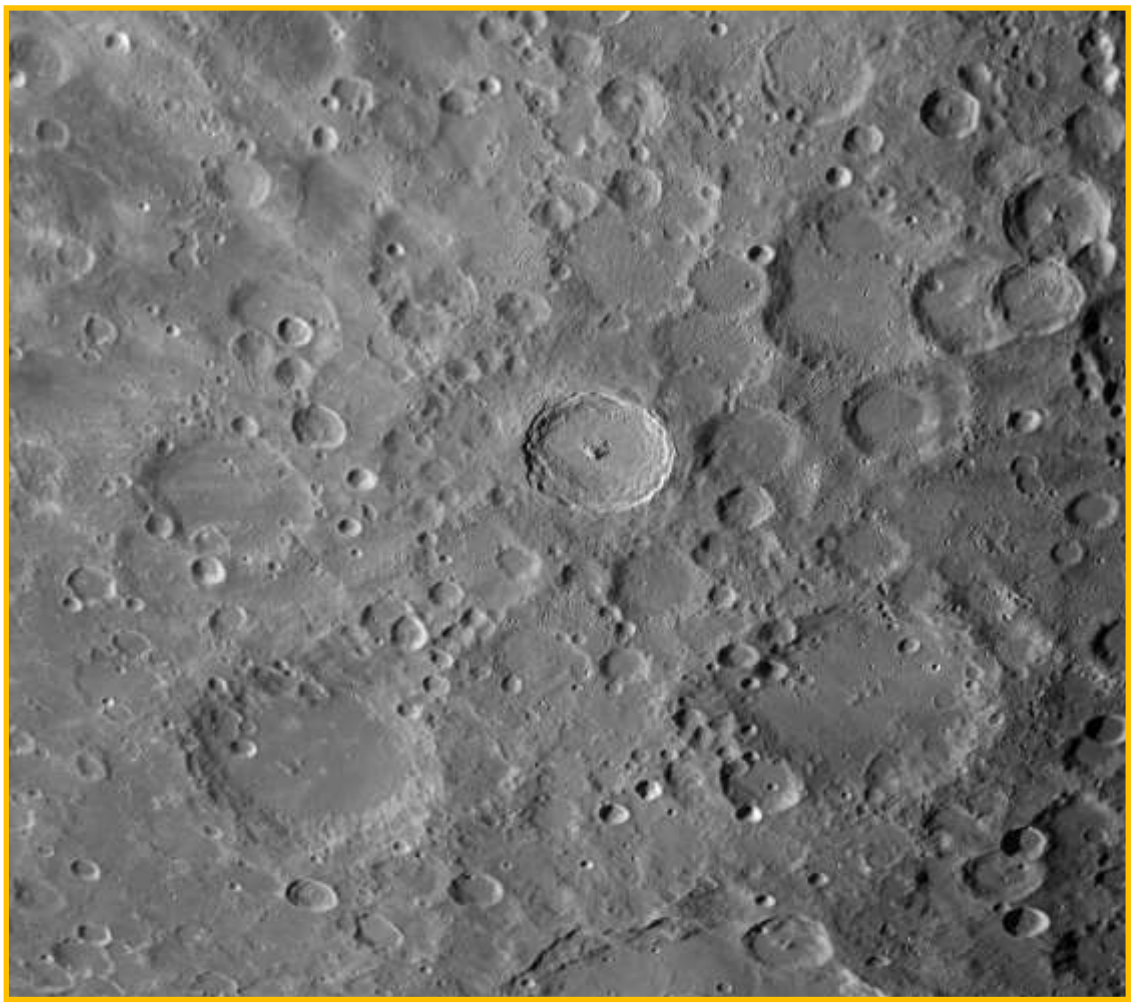


Diagram emphasizing the positions of Drygalski and Hausen.

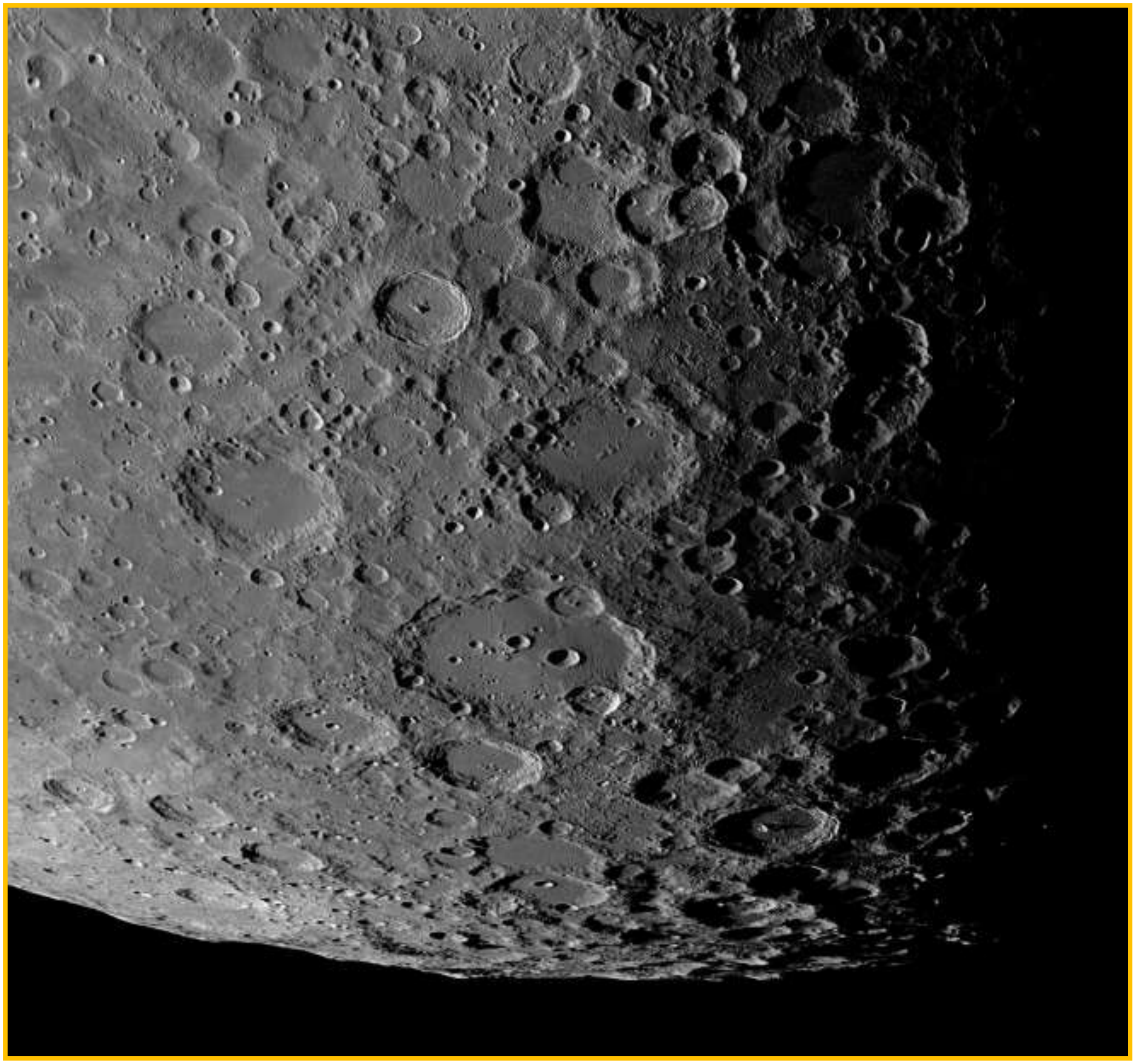


Tycho and adjacent features: 19.67 days 02.55 UT November 14 2022 [82SDHP/83]
[Altitude: 56*10' Azimuth: 137*38' Libration:

Lunar Topographic Studies
An Overview of Clavius, Tycho and Bailly

Clavius Tycho Bailly region 9

North UP

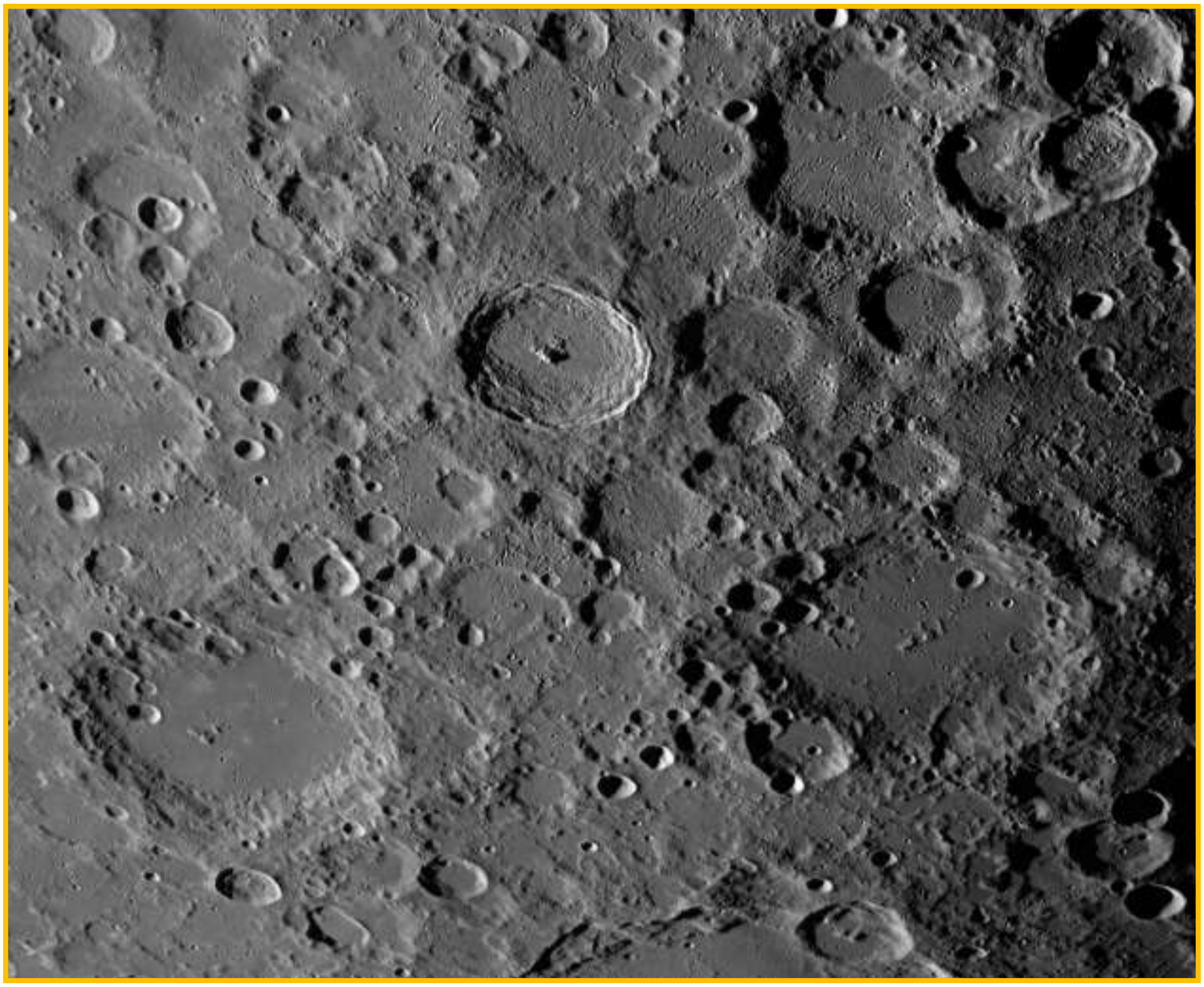


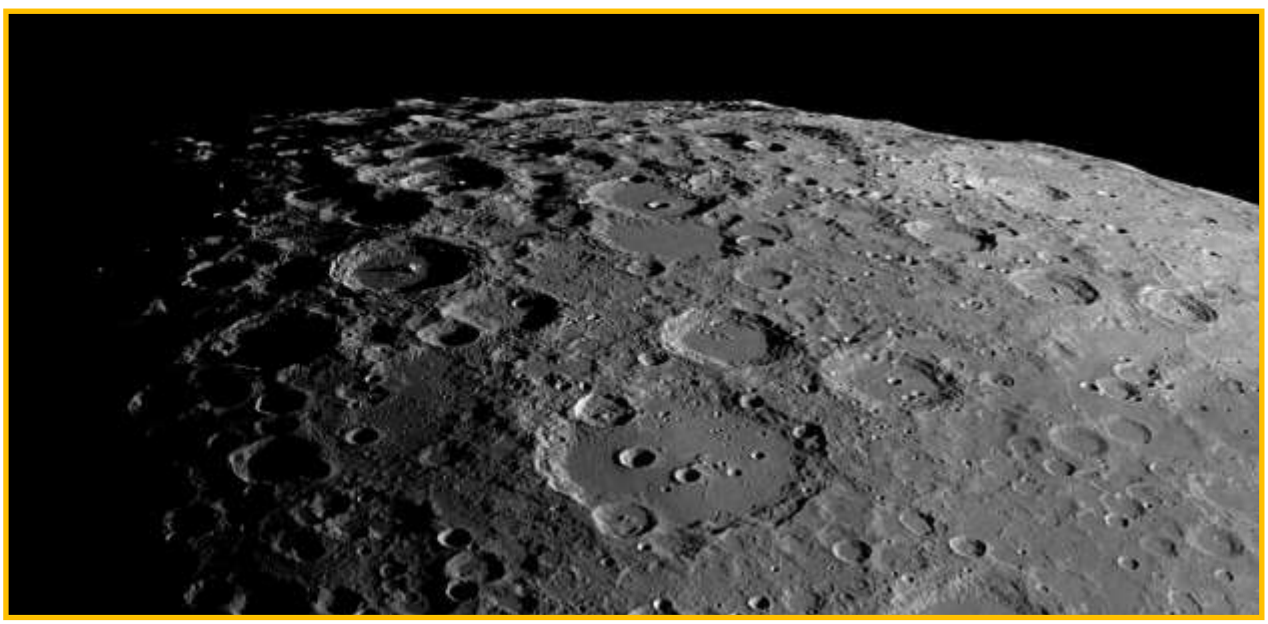
Tycho and adjacent features: 20.78 days 02.57 UT September 17 2022   [41]
[Altitude: 49*45'   Azimuth: 121*41'   Libration:

A close-up of the Tycho region is on the next page (N up, as usual). Compare this to the previous Tycho images. [41A]

The lower image on the next page shows a close-up of Clavius and Moretus, with S up. [42S] The comparable S up version of the image above is on page CTBR 11. [41S]

Clavius Tycho Bailly region 10

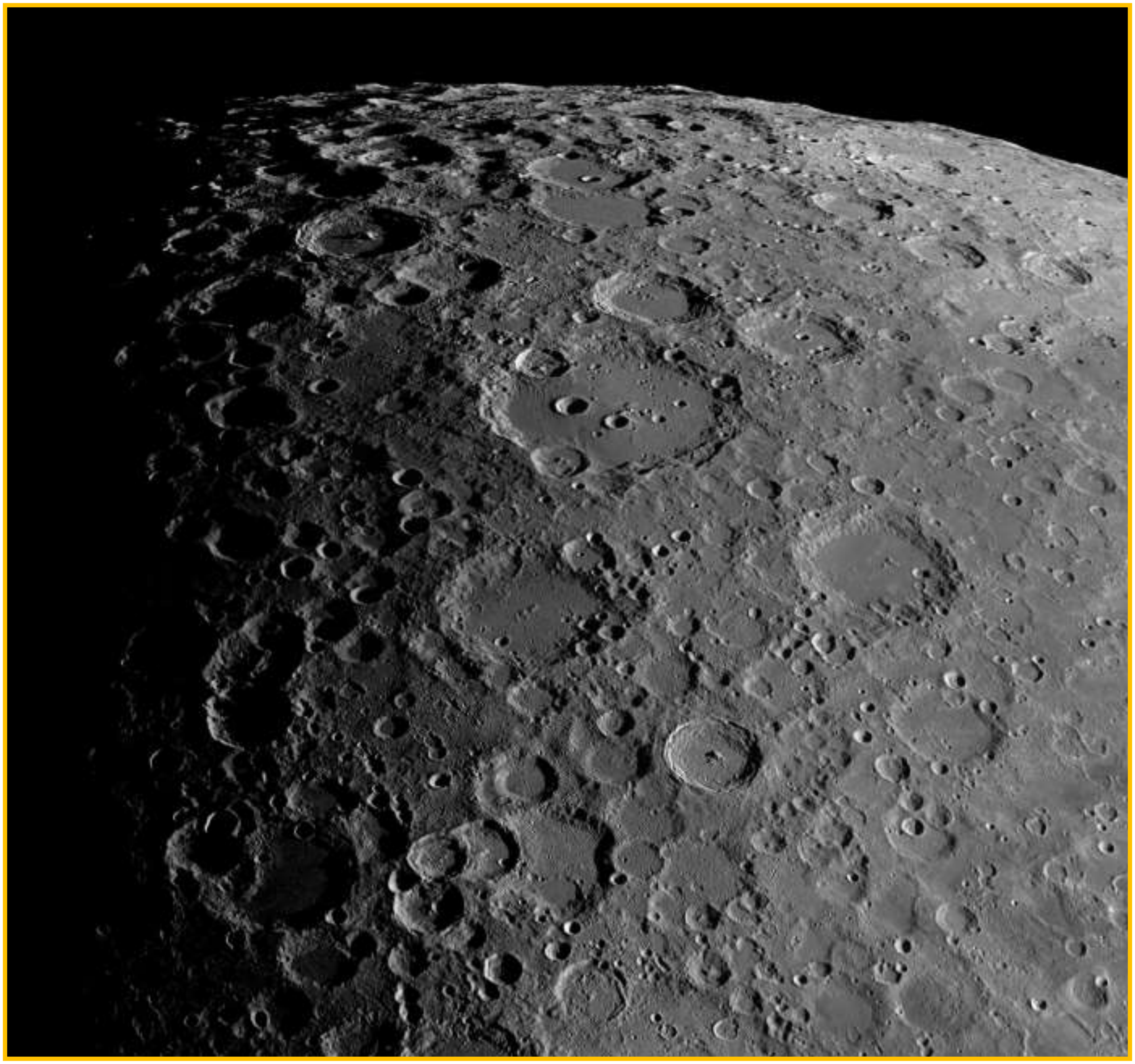




Lunar Topographic Studies
An Overview of Clavius, Tycho and Bailly

Clavius Tycho Bailly region 11

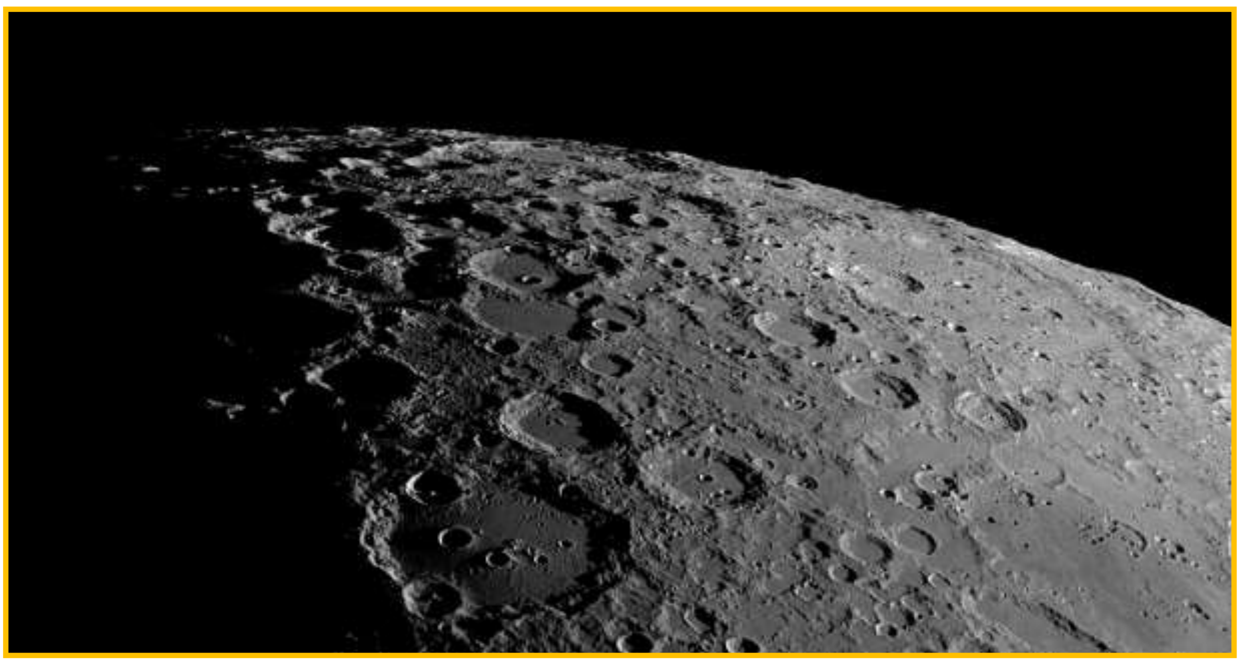
South UP



Tycho and adjacent features: 20.78 days 02.57 UT September 17 2022 [41S]
[Altitude: 49*45' Azimuth: 121*41' Libration:

Clavius Tycho Bailly region 12

Moretus central peak protruding from shadow: 21.40 days 03.37 UT August 19 2022 [6S]
[Altitude: 46*11' Azimuth: 128*36' Libration:



Bailly, Drygalski and Hausen prominent: 22.26 days 04.02 UT October 18 2022 [58]
[Altitude: 48*35' Azimuth: 119*15' Libration:

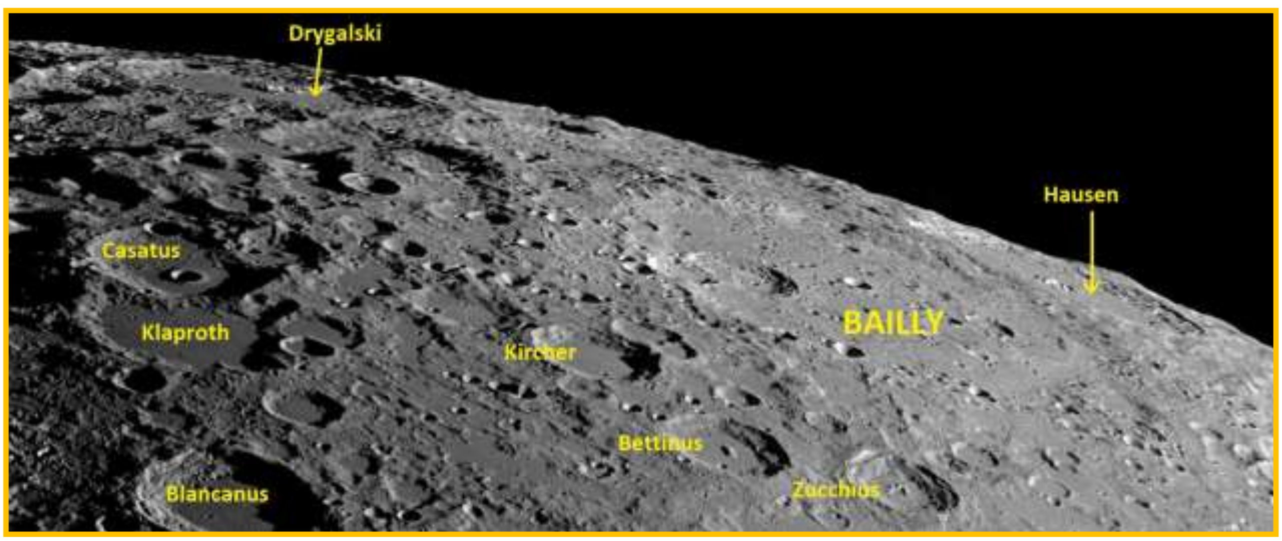
Lunar Topographic Studies
An Overview of Clavius, Tycho and Bailly

Clavius Tycho Bailly region 13

The image below is taken from the one on the bottom of the previous page.

The area near to the South Pole has been enlarged to emphasize the VERY clear of the elusive southern craters Drygalski and Hausen.

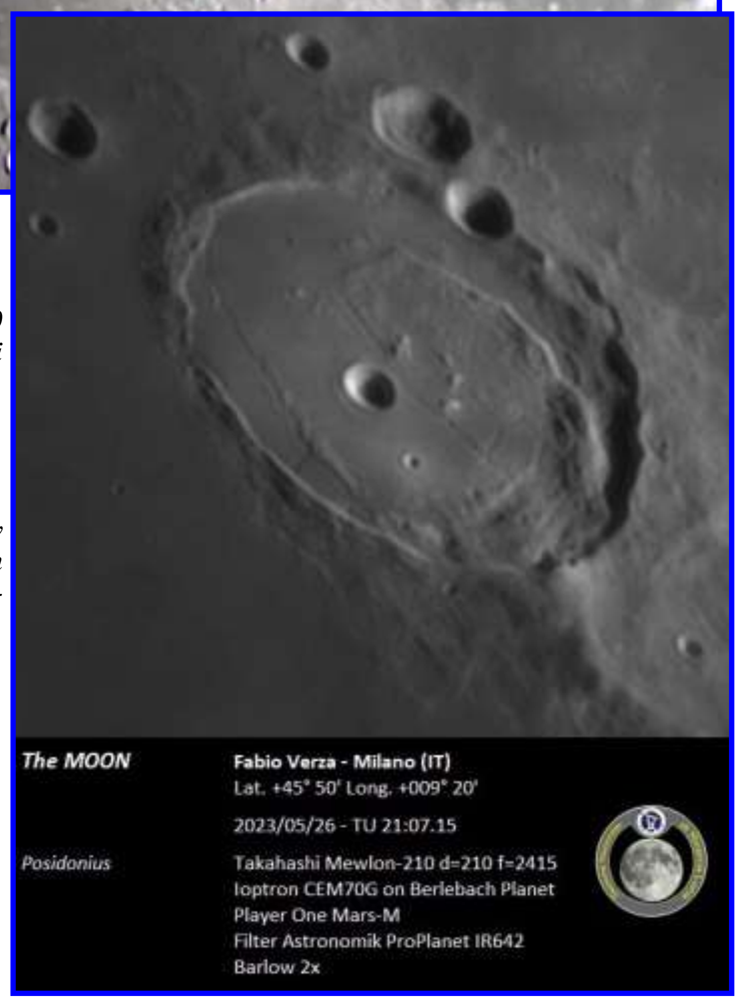
This image is probably the clearest view: compare with November 13 and November 14.



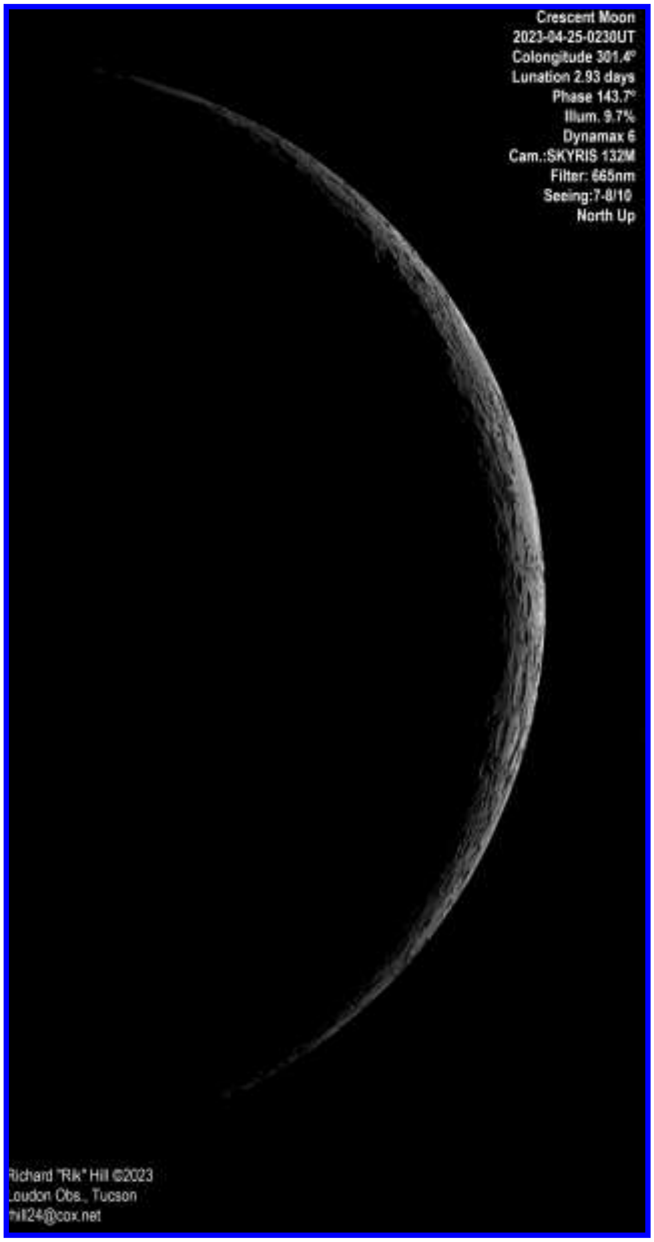
Bailly, Drygalski and Hausen prominent: 22.26 days 04.02 UT October 18 2022 [58]
[Altitude: 48*35' Azimuth: 119*15' Libration:

Eratosthenes, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2023 May 28 21:57 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl., 3x barlow, Canon T1i camera.*

Posidonius, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 21:07 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 2 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*



Recent Topographic Studies



3-Day-Old-Moon, *Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2023 April 23 02:30 UT, colongitude 301.4°. Dynamax 6 inch Schmidt-Cassegrain telescope, 665 nm filter, SKYRIS 132M camera. Seeing 7-8/10.*

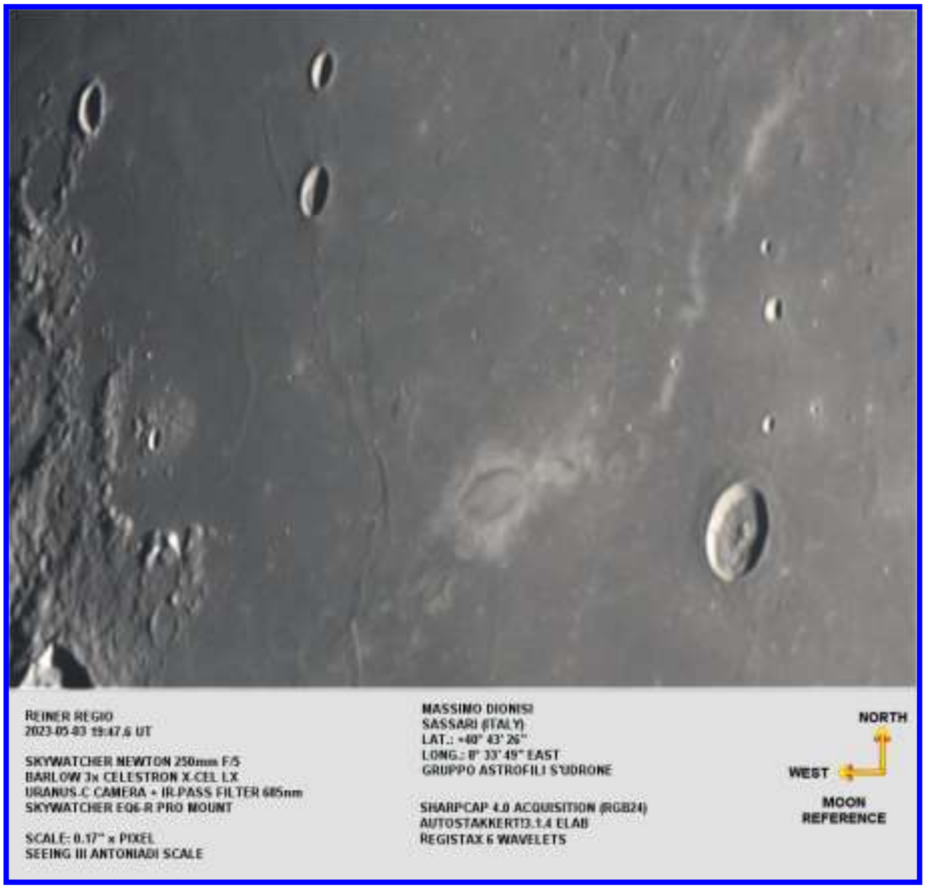
Mt_Apenninus taken with 250mm f/6 Newtonian with 2.5X barlow on 15 September 2022, 21h41m UT, Colongitude: 152.5 degree

Cropped from LROC-QuickMap

Montes Apenninus comparison, *KC Pau, Hong Kong, China. Top image taken 2022 September 15 21:41 UT, colongitude 152.5°. 10 inch reflector telescope, 2.5x barlow. Lower image cropped from LROC image. KC adds: "*The photo shows the area of Mt Apenninus. The top one is taken with my 10" reflector with 2.5X barlow and the other one is cropped from LROC-QuickMap. Coincidentally, the lighting condition of two photos is almost well matched. Of course, the resolution of my photo may not be compared with that of LROC. However, it's not much difference between these two photos in term of resolution. "

Recent Topographic Studies

***Reiner Gamma,** Massimo Dionisi, Sassari, Italy. 2023 May 03 19:47 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685 nm, Uranus C camera. Seeing III Antoniadi Scale.*

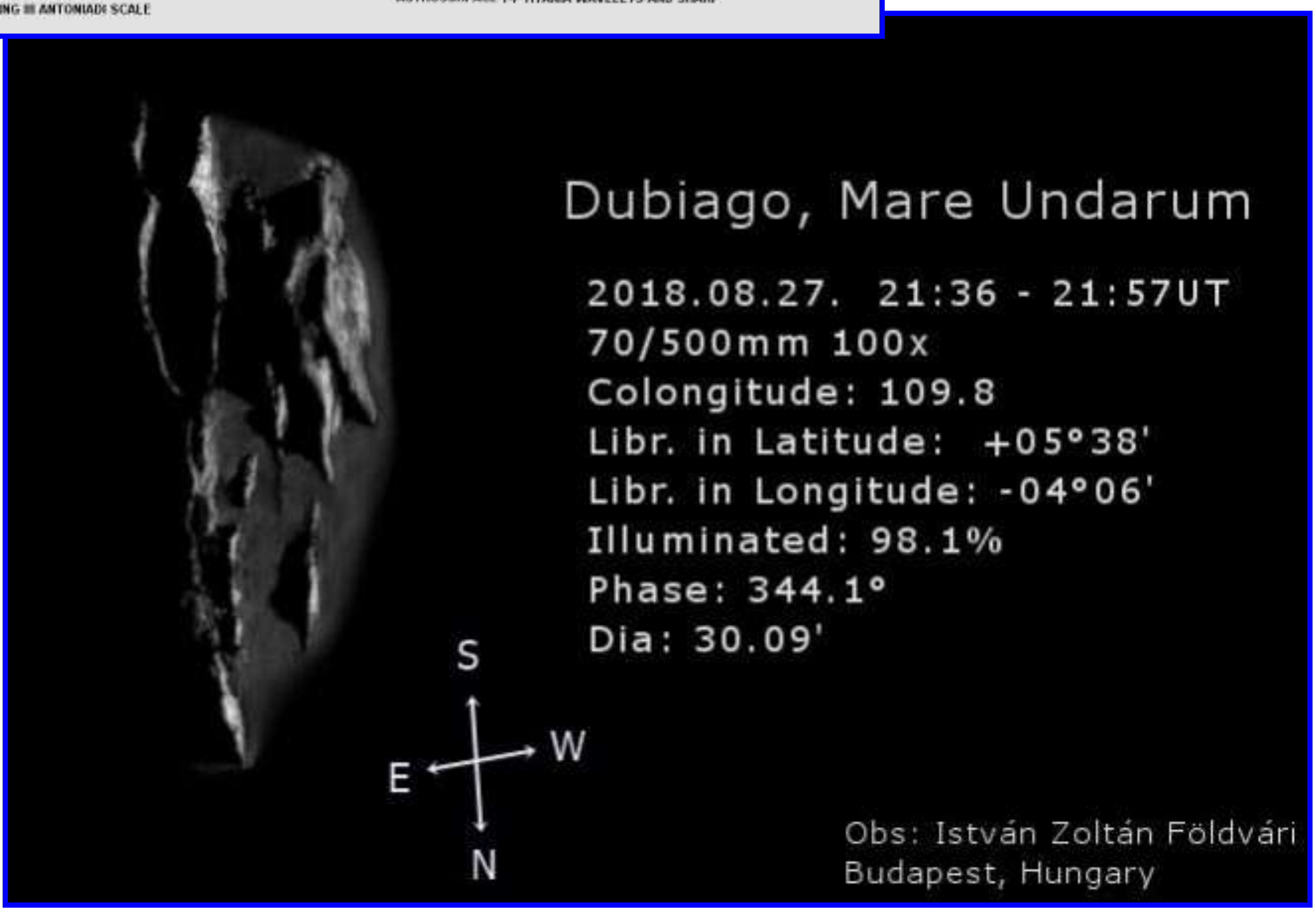


***Bailly,** Larry Todd, Dunedin, New Zealand. 2023 May 04 08:24UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*

Recent Topographic Studies

Mons Rümker, *Massimo Dionisi, Sassari, Italy. 2023 May 03 19:33 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685 nm, Uranus C camera. Seeing III Antoniadi Scale.*

Dubiago and Mare Undarum, *István Zoltán Földvári, Budapest, Hungary. 2018 August 27, 21:36-21:57 UT, colongitude 109.8°. 70 mm refractor telescope, 500 mm focal length, 10 mm Plossl, GSO 2x barlow, 100x. Seeing 5/10, transparency 5/6.*



Recent Topographic Studies

Marius Region, *Massimo Dionisi, Sassari, Italy. 2023 May 03 20:04 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685 nm, Uranus C camera. Seeing III Antoniadi Scale.*

Arago Domes, *Raffaello Lena, Rome, Italy. 2023 April 26 19:15 UT. 18 cm Maksutov-Cassegrain telescope.*

Recent Topographic Studies

Prinz Region, *Massimo Dionisi, Sassari, Italy. 2023 May 03 19:21 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III Antoniadi Scale.*

Reiner Gamma, *Steve Bacon, Molly Brown Observatory, Killen, Alabama, USA. 2023 February 04 06:39 UT. Meade 8 inch Schmidt-Cassegrain telescope, Meade 2x barlow, f/20, Meade LPI-G advanced monochrome camera.*

Recent Topographic Studies

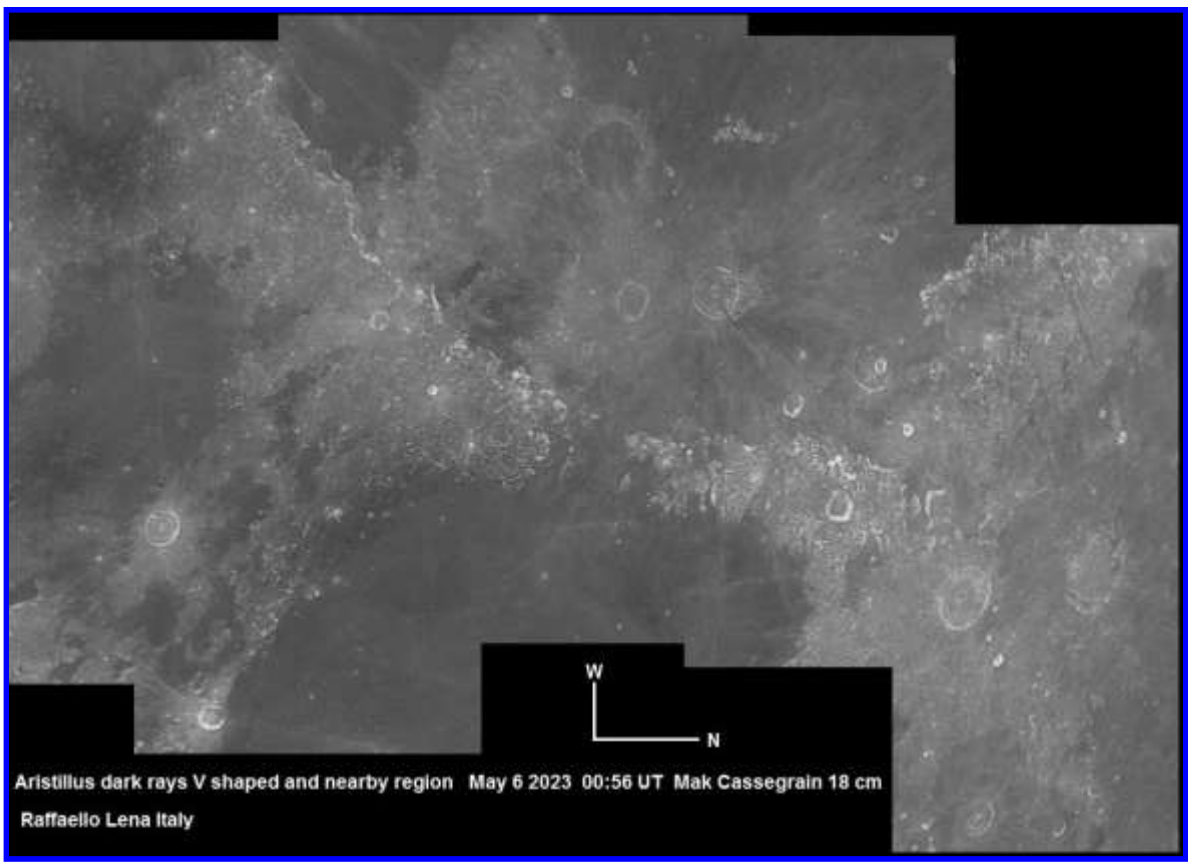
Wollaston Region, *Massimo Dionisi, Sassari, Italy. 2023 May 03 20:14 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III Antoniadi Scale.*

Part of the Schiller-Zucchius basin, *István Zoltán Földvári, Budapest, Hungary. 2018 September 21, 20:28-20:44 UT, colongitude 54.5º. 70 mm refractor telescope, 500 mm focal length, 10 mm Plossl, GSO 2x barlow, 100x. Seeing 7/10, transparency 5/6.*

Recent Topographic Studies

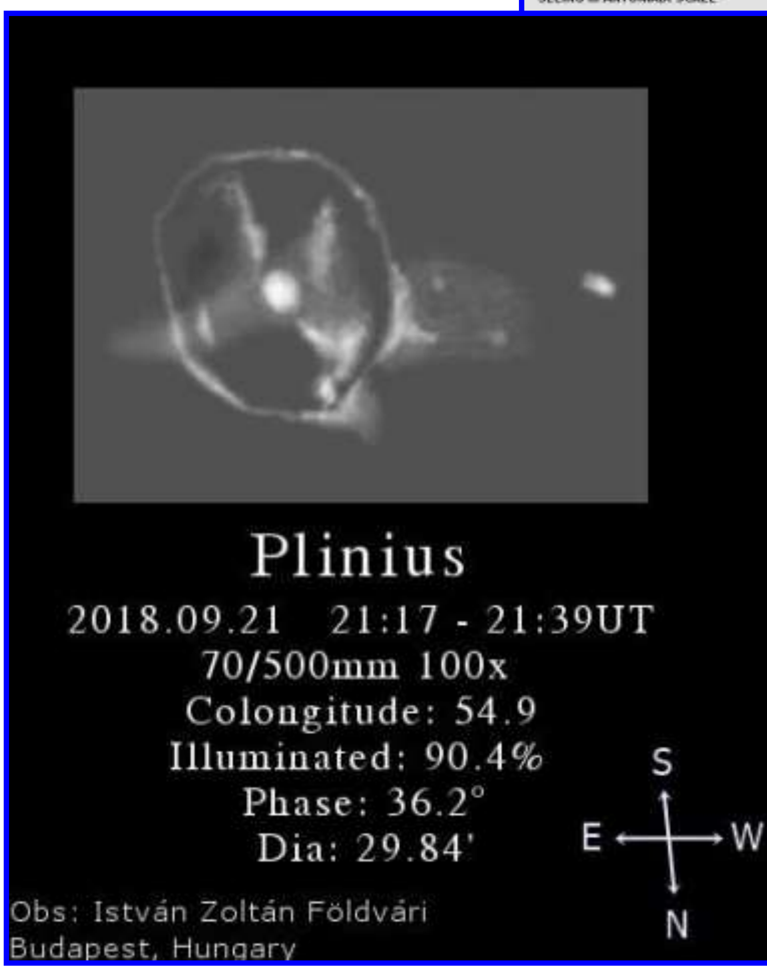
Herodotus Region, *Massimo Dionisi, Sassari, Italy. 2023 May 03 20:19 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III Antoniadi Scale.*

Aristillus dark rays, *Raffaello Lena, Rome, Italy. 2023 May 06 00:56 UT. 18 cm Maksutov-Cassegrain telescope. North is right, west is up. Raf adds:* "Image where Aristillus displays a V shape rays. Along the eastern inner wall and rim is an unusual narrow ribbon of dark material visible as two dark rays (of V shape) at the inner and outer slopes of the northeastern part of the crater along the nearby regions (our old work done)."



Recent Topographic Studies

Cavalerius Region, *Massimo Dionisi, Sassari, Italy. 2023 May 03 20:27 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III Antoniadi Scale.*



Plinius in full light, *István Zoltán Földvári, Budapest, Hungary. 2018 September 21, 21:17-21:39 UT, colongitude 54.9º. 70 mm refractor telescope, 500 mm focal length, 10 mm Plossl, GSO 2x barlow, 100x. Seeing 7/10, transparency 5/6.*

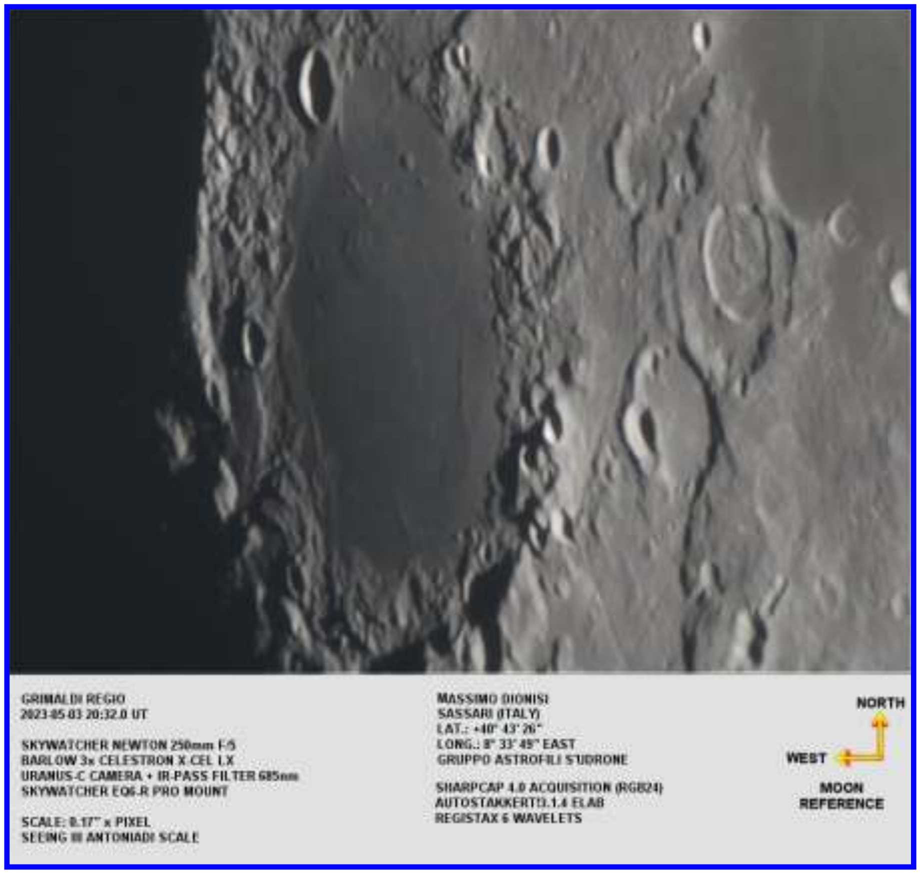
Recent Topographic Studies

Schickard Region, *Massimo Dionisi, Sassari, Italy. 2023 May 03 20:38 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III Antoniadi Scale.*

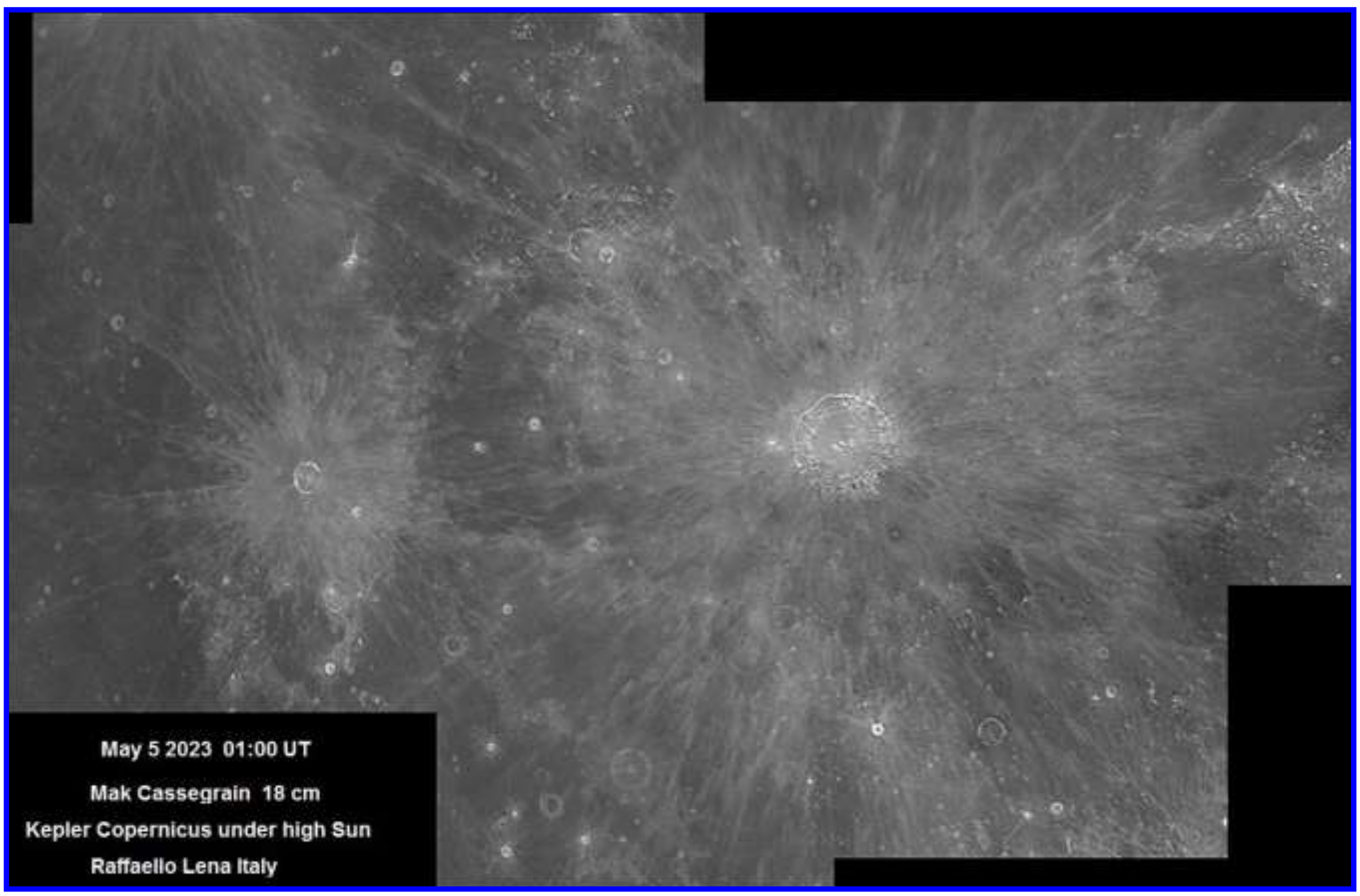
Janssen, *Raffaello Lena, Rome, Italy. 2023 April 26 19:44 UT. 18 cm Maksutov-Cassegrain telescope.*

Recent Topographic Studies

Grimaldi Region, *Massimo Dionisi, Sassari, Italy. 2023 May 03 20:32 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III Antoniadi Scale.*



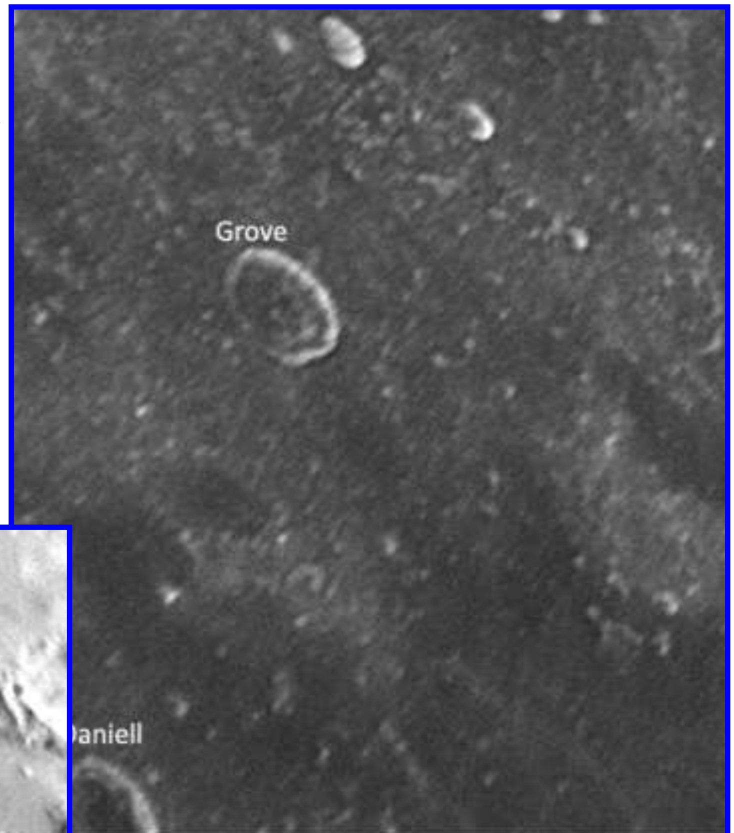
Kepler to Copernicus mosaic, *Raffaello Lena, Rome, Italy. 2023 May 05 01:00 UT. 18 cm Maksutov-Cassegrain telescope.*



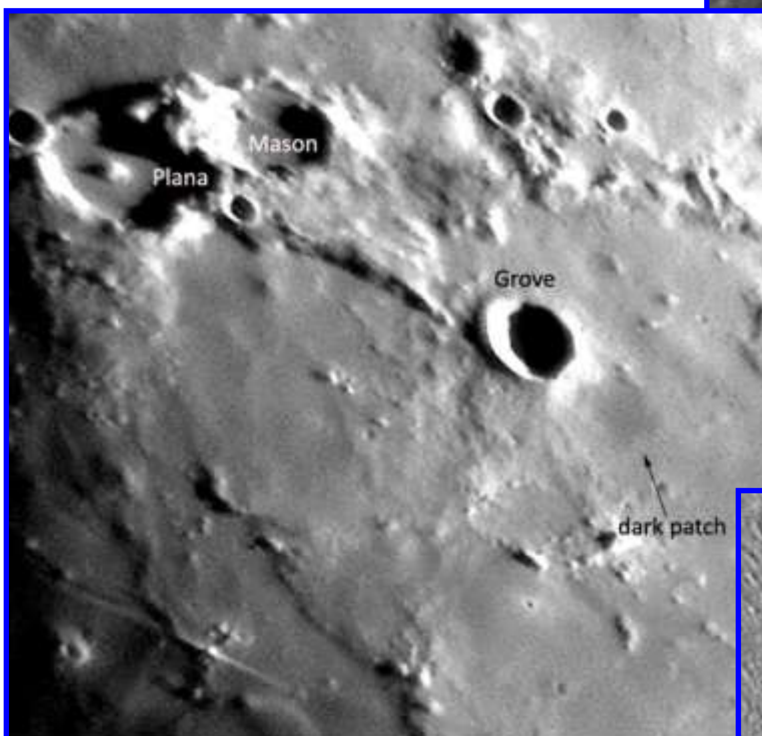
Recent Topographic Studies

Grove, *KC Pau, Hong Kong, China. 2011 August 14 15:07 UT, colongitude 96.0º. 10 inch reflector telescope, 2.5x barlow.*

Grove, *KC Pau, Hong Kong, China. 2019 December 02 11:10 UT, colongitude 336.5º. 10 inch reflector telescope, 2.5x barlow.*



14 Aug 2011 15h07m UT Colong: 96.0



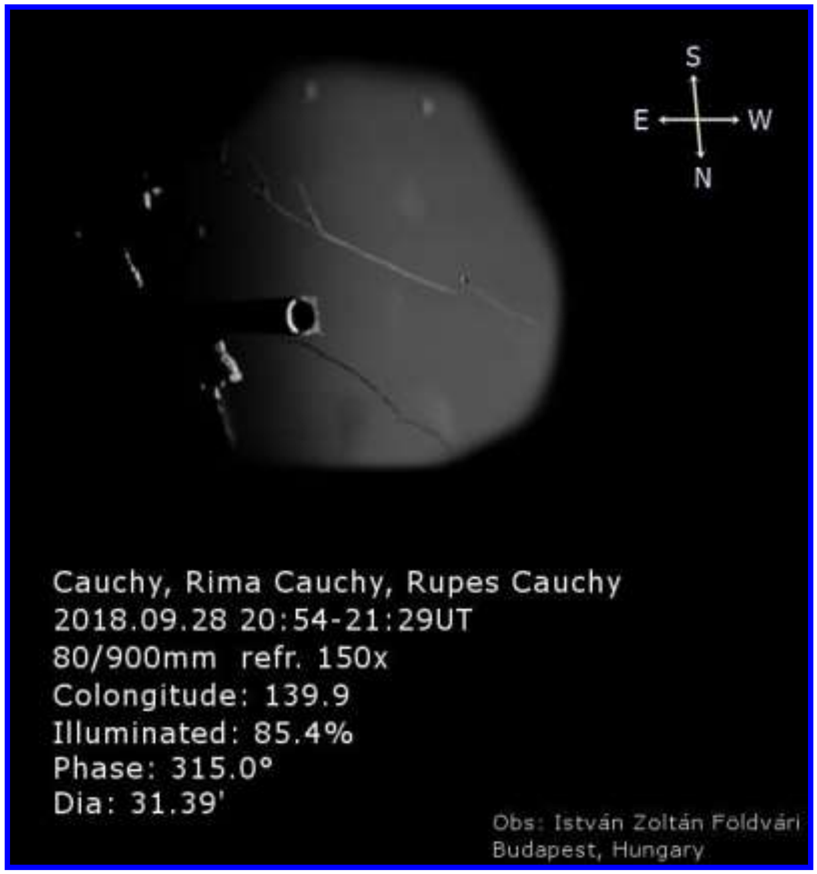
2 December 2019 11h10m UT Colong: 336.5

Grove, *KC Pau, Hong Kong, China. 2021 January 02 21:50 UT, colongitude 140.3º. 10 inch reflector telescope, 2.5x barlow.*

KC adds: "Enclosed are some photos that show the suspected buried crater near Grove under different illumination. I hope these photos may help to further study of this crater by TLO readers. " See the May 2023 The Lunar Observer for an article by Alberto Anunziato about Grove and this dark patch to its southeast.

7 January 2021 21h50m UT Colong: 140.3

Recent Topographic Studies

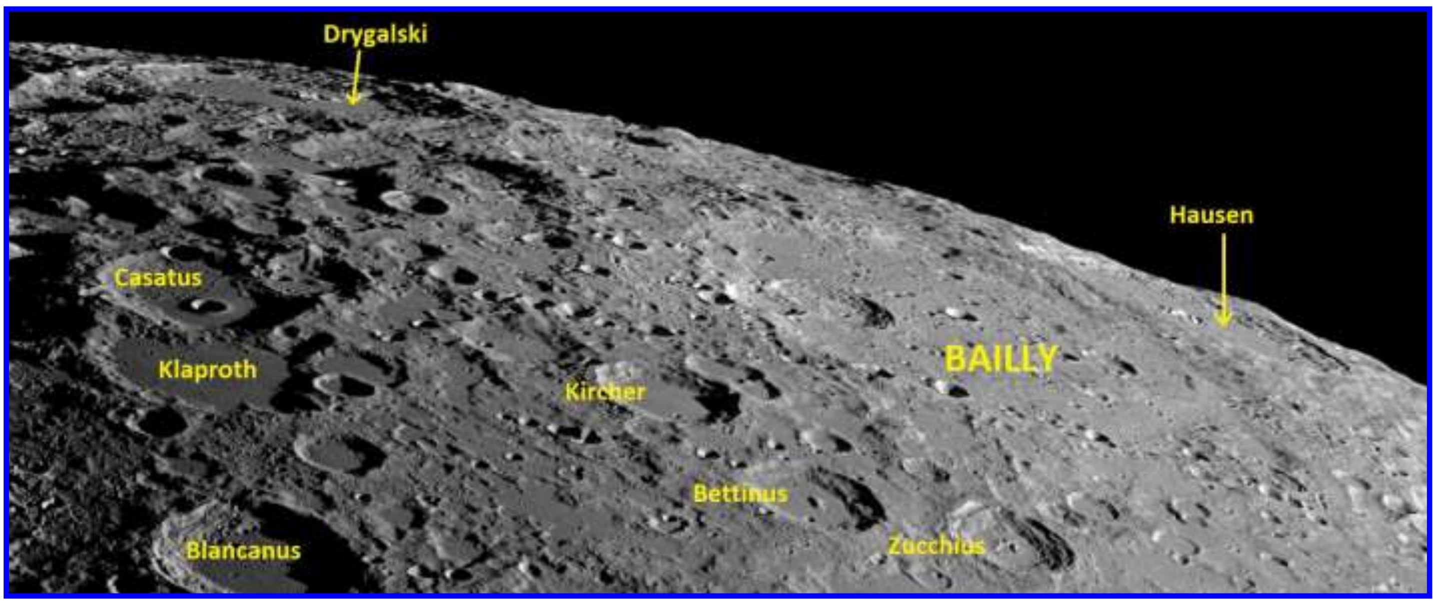


Cauchy, Rima Cauchy and Rupes Cauchy, *István Zoltán Földvári, Budapest, Hungary. 2018 September 28, 20:54-21:29 UT, colongitude 139.9º. . 80 mm refractor telescope, 900 mm focal length, Circle-T Japan Ortho 6 mm eyepiece, 150x. Seeing 7/10, transparency 5/6.*

Piccolomini to Torricelli mosaic, *Raffaello Lena, Rome, Italy. 2023 April 25 19:04 UT. 18 cm Maksutov-Cassegrain telescope. North is down, west is right.*

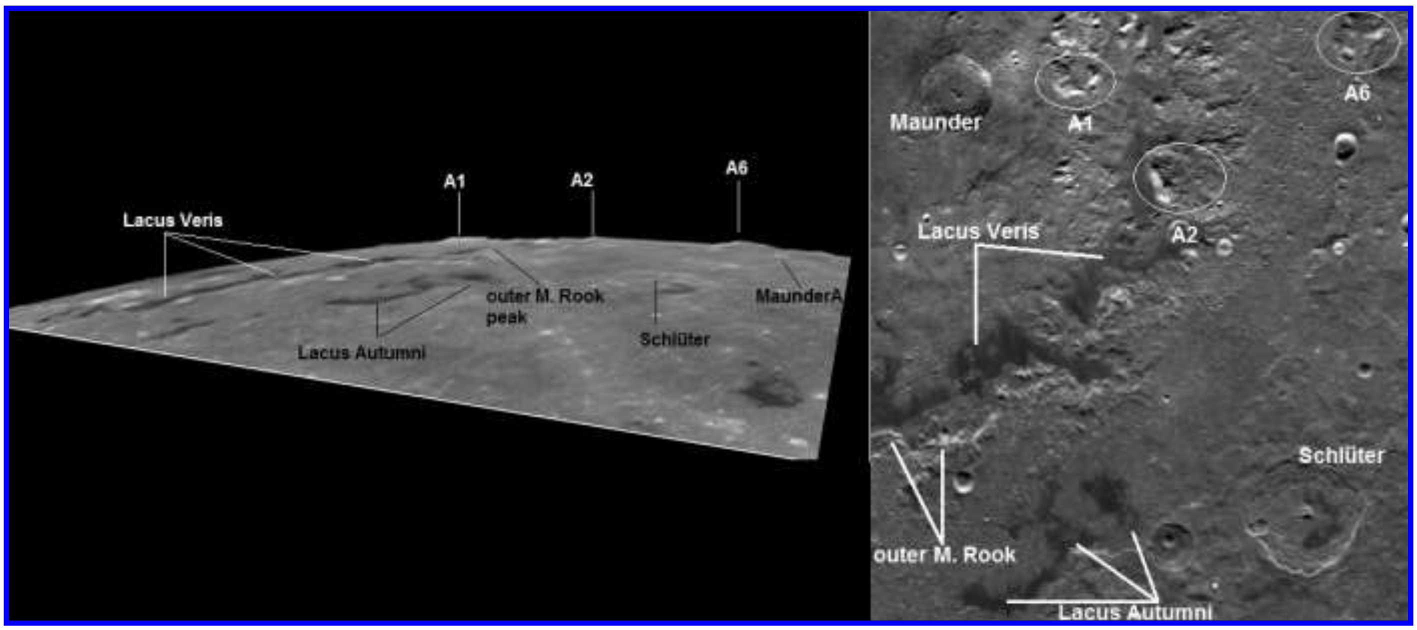
Recent Topographic Studies

Drygalski region, *Jeff Grainger, Cumbria, UK. 2022 October 18 04:02 UT, colongitude 6.2°. Celestron 11 Edge HD inch Schmidt-Cassegrain telescope, 685 nm filter, ZWO ASI290 camera. Libration very favorable, 6.2° at PA 185°. Below is a labeled version of this image. North is down, west is right.*

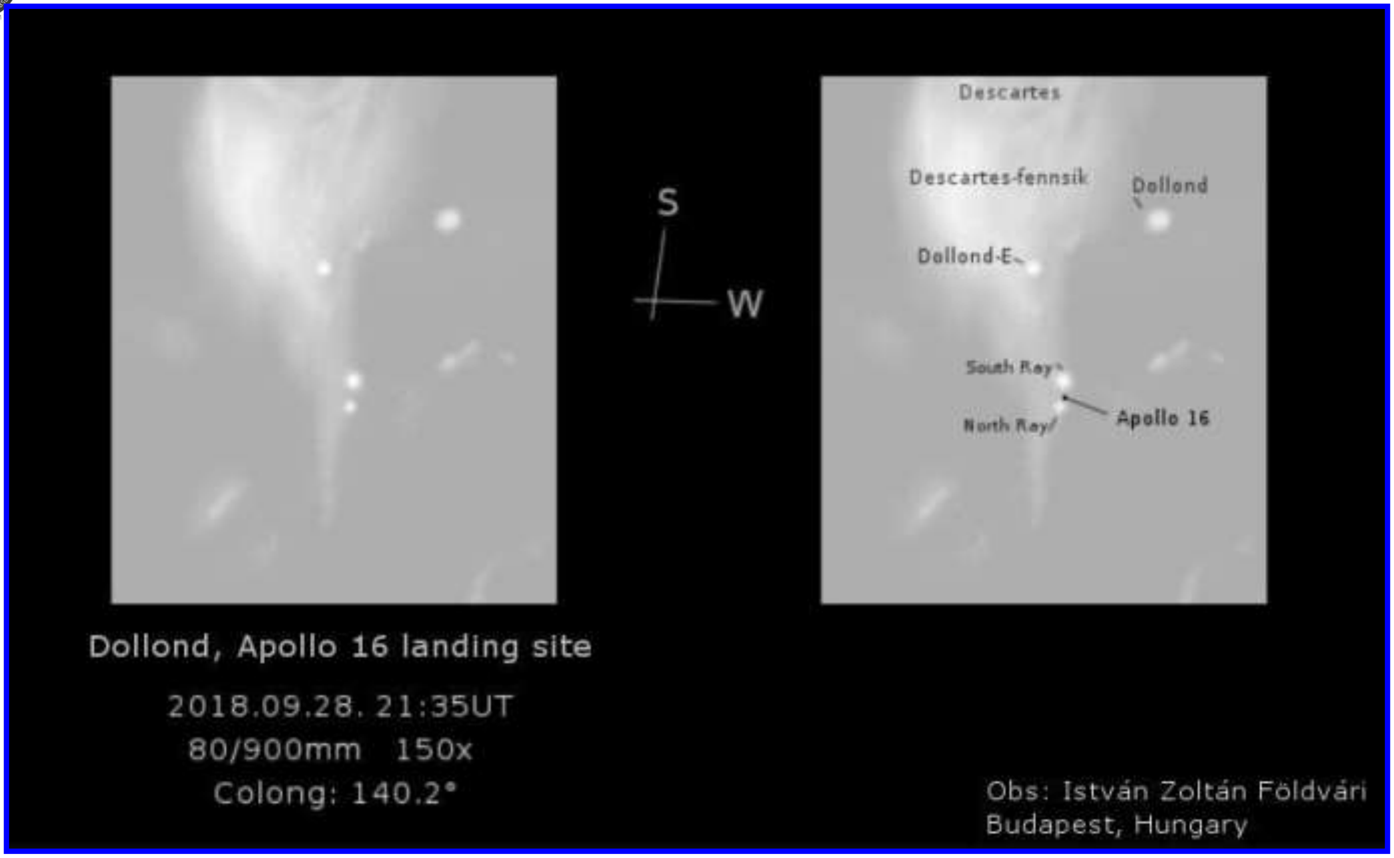


Recent Topographic Studies

Lacus Veris to Lacus Autumni, *Raffaello Lena, Rome, Italy. 2023 May 06 00:10 UT. 18 cm Maksutov-Cassegrain telescope. North is right, west is up.*



Recent Topographic Studies



Dolland and the Apollo 16 landing site, *István Zoltán Földvári, Budapest, Hungary. 2018 September 28, 21:30-21:50 UT, colongitude 140.2°. 80 mm refractor telescope, 900 mm focal length, Circle-T Japan Ortho 6 mm eyepiece, 150x. Seeing 7/10, transparency 5/6.*

Tycho, *Raffaello Lena, Rome, Italy. 2023 May 06 00:44 UT. 18 cm Maksutov-Cassegrain telescope. North is down, west is right.*

Recent Topographic Studies

Julius Caesar Region, *Massimo Dionisi, Sassari, Italy. 2023 May 11 02:14 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III-IV Antoniadi Scale.*

Posidonius, *Raffaello Lena, Rome, Italy. 2023 April 25 19:22 UT. 18 cm Maksutov-Cassegrain telescope.*

Recent Topographic Studies

Piccolomini, *Jeff Grainger, Cumbria, UK. 2022 September 14 01:20 UT. Celestron 11 inch Edge HD Schmidt-Cassegrain telescope, 685 nm filter, ZWO ASI290 camera.*

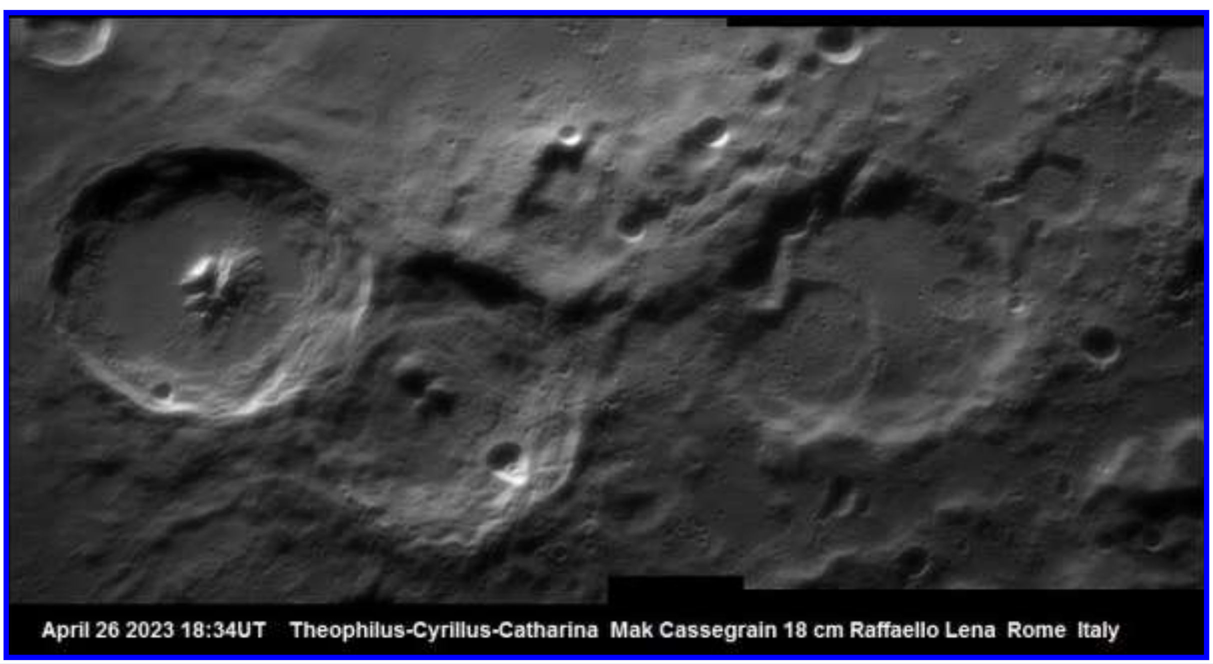
Piccolomini, *Jeff Grainger, Cumbria, UK. 2023 April 28 20:21 UT. Celestron 11 inch Edge HD Schmidt-Cassegrain telescope, 685 nm filter, ZWO ASI290 camera.*

Recent Topographic Studies

Piccolomini, *Jeff Grainger, Cumbria, UK. 2023 April 26 19:40 UT. Celestron 11 inch Edge HD Schmidt-Cassegrain telescope, 685 nm filter, ZWO ASI290 camera.*

On the above series of three images, Piccolomini and a ridge south of it are of interest. Jeff Grainger who took these wonderful images was in communication with John Moore (Craters of the Near Side Moon) who said the ridge used to be called the Piccolomini-Brenner scarp. It's been suggested that it's an old crater chain, but he (Moore) thinks it's more likely a fault - and says these images back this up. Radial to Nectaris, so crust shrinkage was another old idea. See also in this issue Rik Hill's article Janssen to Rheita.

Theophilus, *Raffaello Lena, Rome, Italy. 2023 April 26 18:34 UT. 18 cm Maksutov-Cassegrain telescope. North is left, west is down.*

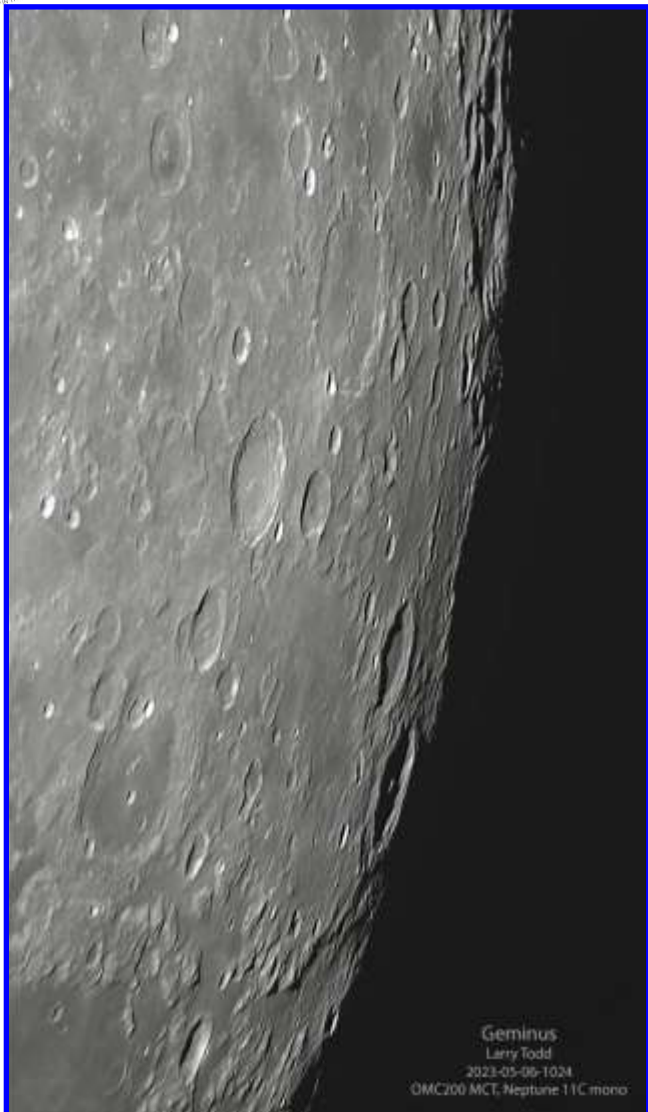


Recent Topographic Studies

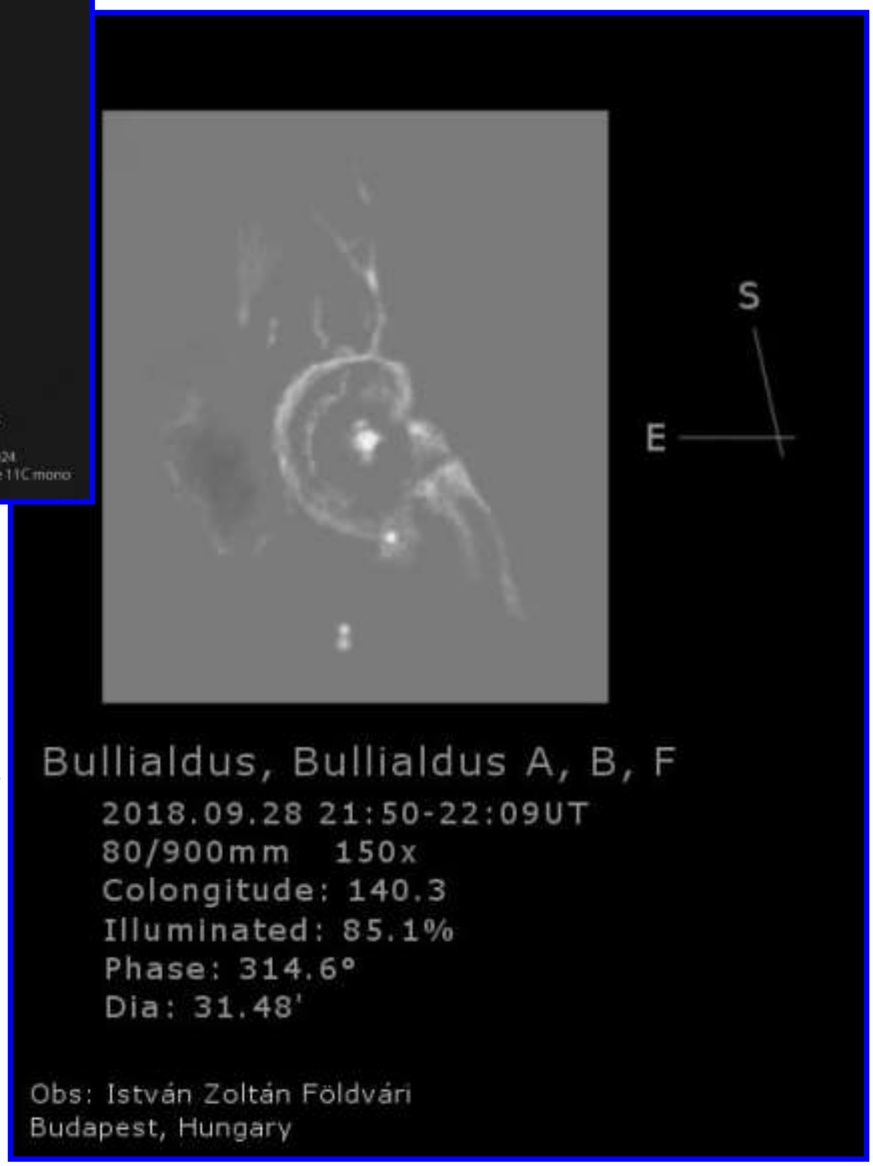
Eddington, *Larry Todd, Dunedin, New Zealand. 2023 May 04 08:14UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*

Liebig, *István Zoltán Földvári, Budapest, Hungary. 2018 September 21, 20:06-20:25 UT, colongitude 54.4°. 70 mm refractor telescope, 500 mm focal length, 10 mm Plossl, GSO 2x barlow, 100x. Seeing 6/10, transparency 5/6.*

Recent Topographic Studies



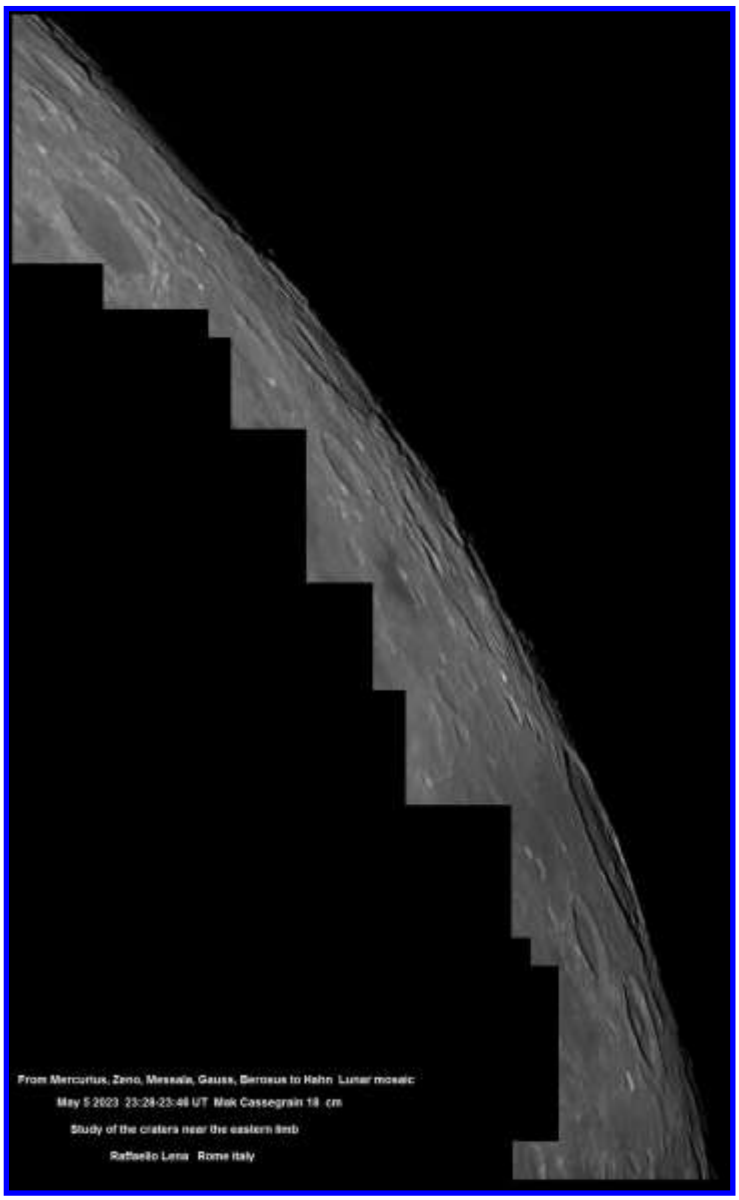
Geminus, *Larry Todd, Dunedin, New Zealand. 2023 May 06 10:24 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*



Bullialdus in full light, *István Zoltán Földvári, Budapest, Hungary. 2018 September 28, 21:50-22:09 UT, colongitude 140.3º. 80 mm refractor telescope, 900 mm focal length, Circle-T Japan Ortho 6 mm eyepiece, 150x. Seeing 7/10, transparency 5/6.*

Recent Topographic Studies

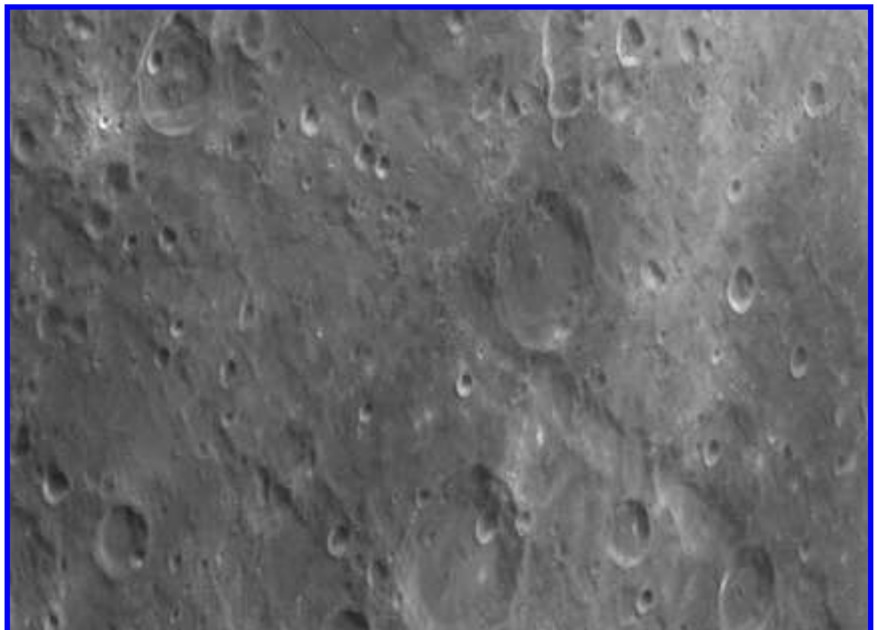
Mare Crisium, *Larry Todd, Dunedin, New Zealand. 2023 May 06 09:52 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*



Mercurius to Hahn mosaic, *Raffaello Lena, Rome, Italy. 2023 May 05 23:28-23:45 UT. 18 cm Maksutov-Cassegrain telescope.*

Recent Topographic Studies

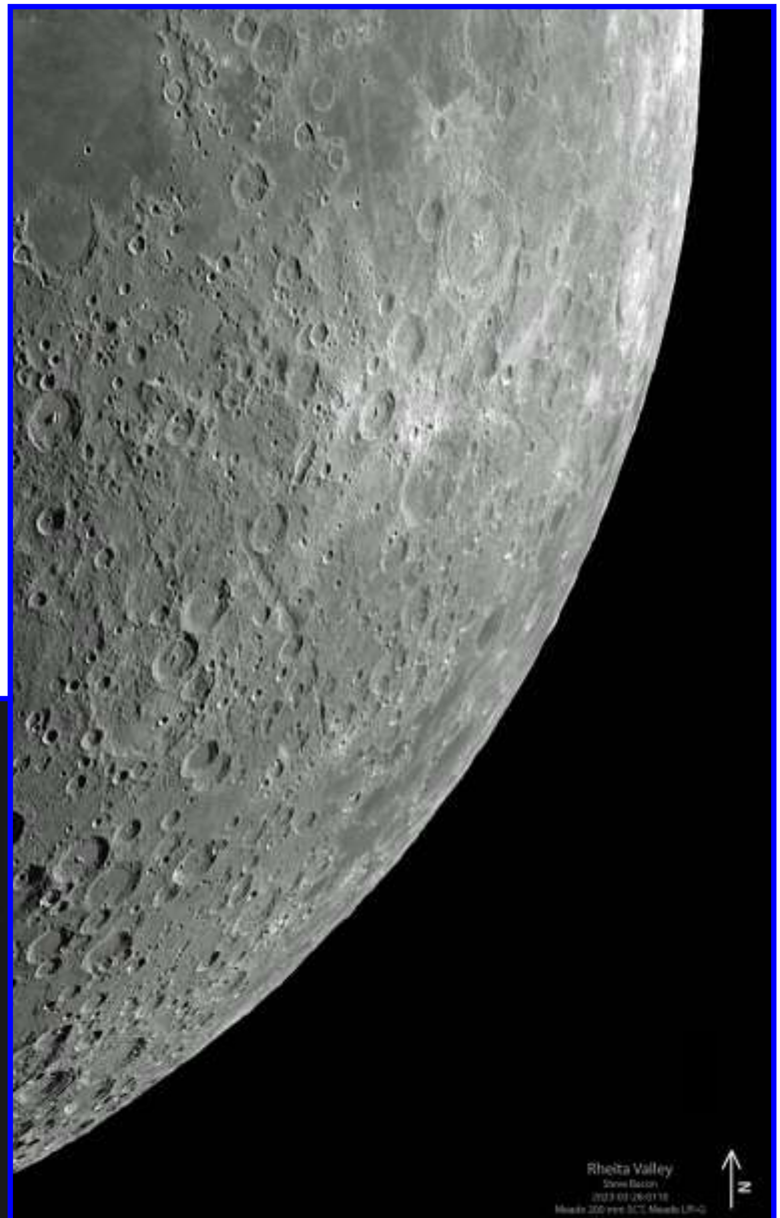
Petavius, *Larry Todd, Dunedin, New Zealand. 2023 May 06 10:07 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*

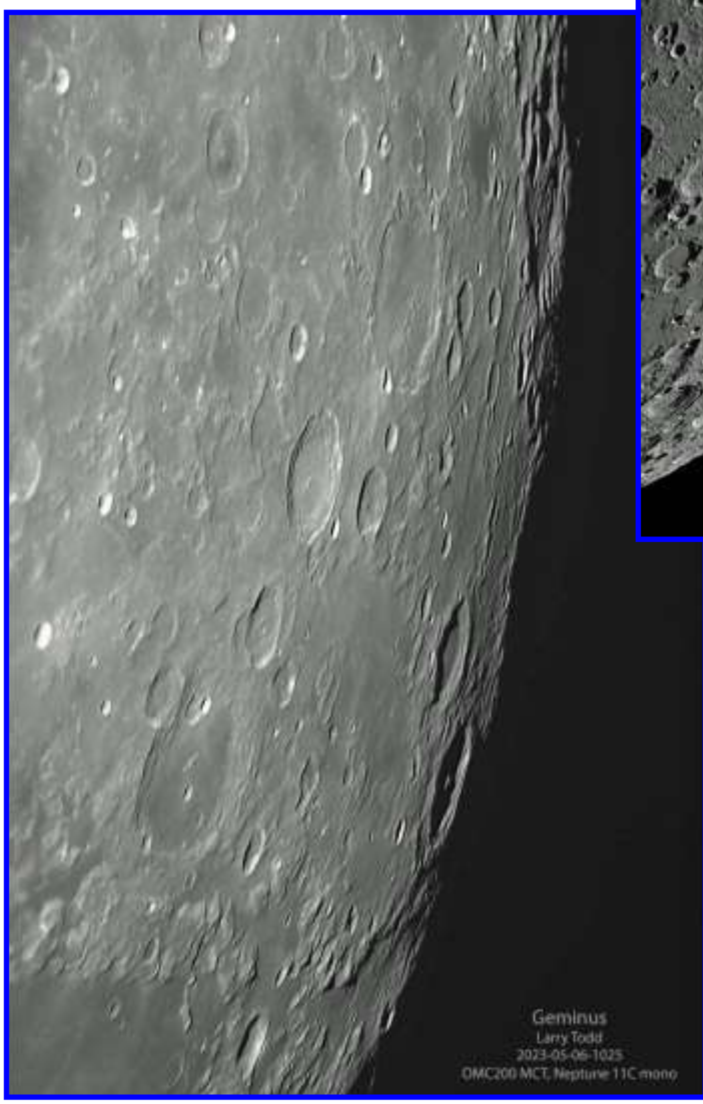


Fabricius, *Steve Bacon, Molly Brown Observatory, Killen, Alabama, USA. 2023 March 29 02:12 UT. Meade 8 inch Schmidt-Cassegrain telescope, Celestron 3x barlow, f/30, Meade LPI-G advanced monochrome camera.*

Recent Topographic Studies

Rheita Valley, *Steve Bacon, Molly Brown Observatory, Killen, Alabama, USA. 2023 March 28 01:10 UT. Meade 8 inch Schmidt-Cassegrain telescope, f/10, Meade LPI-G advanced monochrome camera.*





Geminus, *Larry Todd, Dunedin, New Zealand. 2023 May 06 10:25 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*

Recent Topographic Studies

Atlas, *Larry Todd, Dunedin, New Zealand. 2023 May 06 10:20 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*

Waning Gibbous Moon, *89%, Jairo Chavez, Popayán, Colombia. 2023 April 09 03:22 UT. 311 mm truss Dobsonian reflector telescope, MOTO E5 PLAY camera.*

Recent Topographic Studies

***Grimaldi,** Larry Todd, Dunedin, New Zealand. 2023 May 04 08:17 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*

***First Quarter Moon,** Jairo Chavez, Popayán, Colombia. 2023 April 28 00:19 UT. 311 mm truss Dobsonian reflector telescope, MOTO E5 PLAY camera.*

Recent Topographic Studies

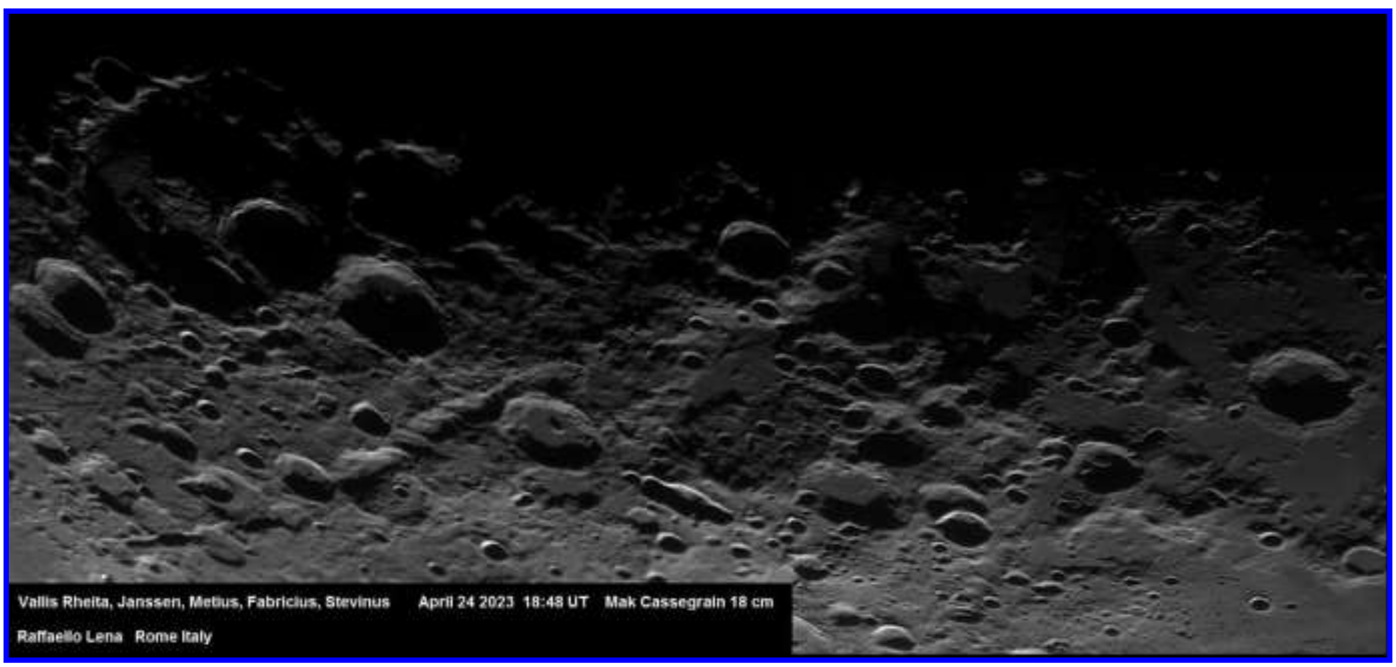
Manilius Region, *Massimo Dionisi, Sassari, Italy. 2023 May 11 02:08 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III-IV Antoniadi Scale.*

Mare Humorum, *Larry Todd, Dunedin, New Zealand. 2023 May 15 18:48 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*

Recent Topographic Studies

Aristillus Region, *Massimo Dionisi, Sassari, Italy. 2023 May 11 02:00 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III-IV Antoniadi Scale.*

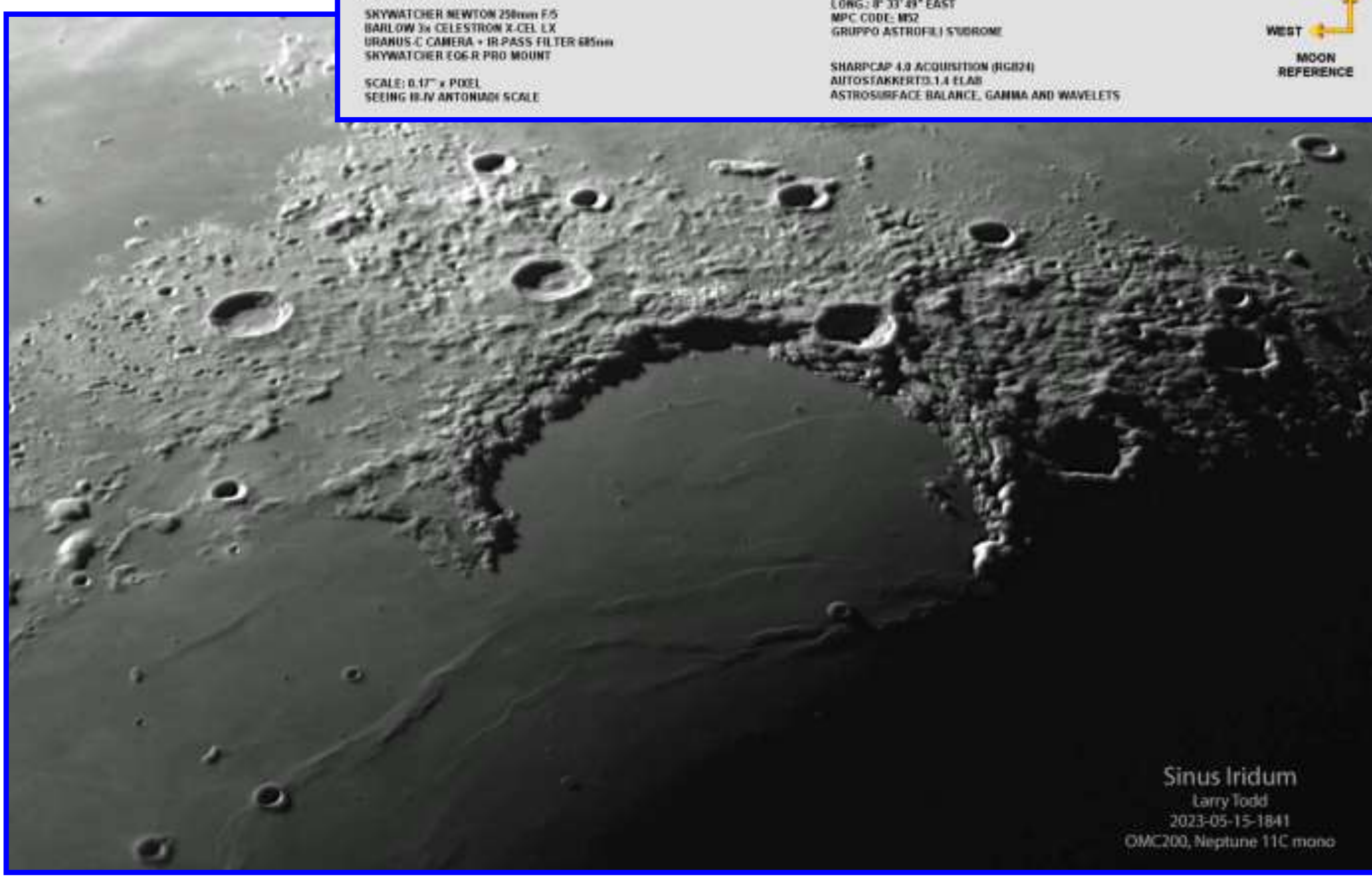
Vallis Rheita, *Raffaello Lena, Rome, Italy. 2023 April 24 18:48 UT. 18 cm Maksutov-Cassegrain telescope.*



Recent Topographic Studies

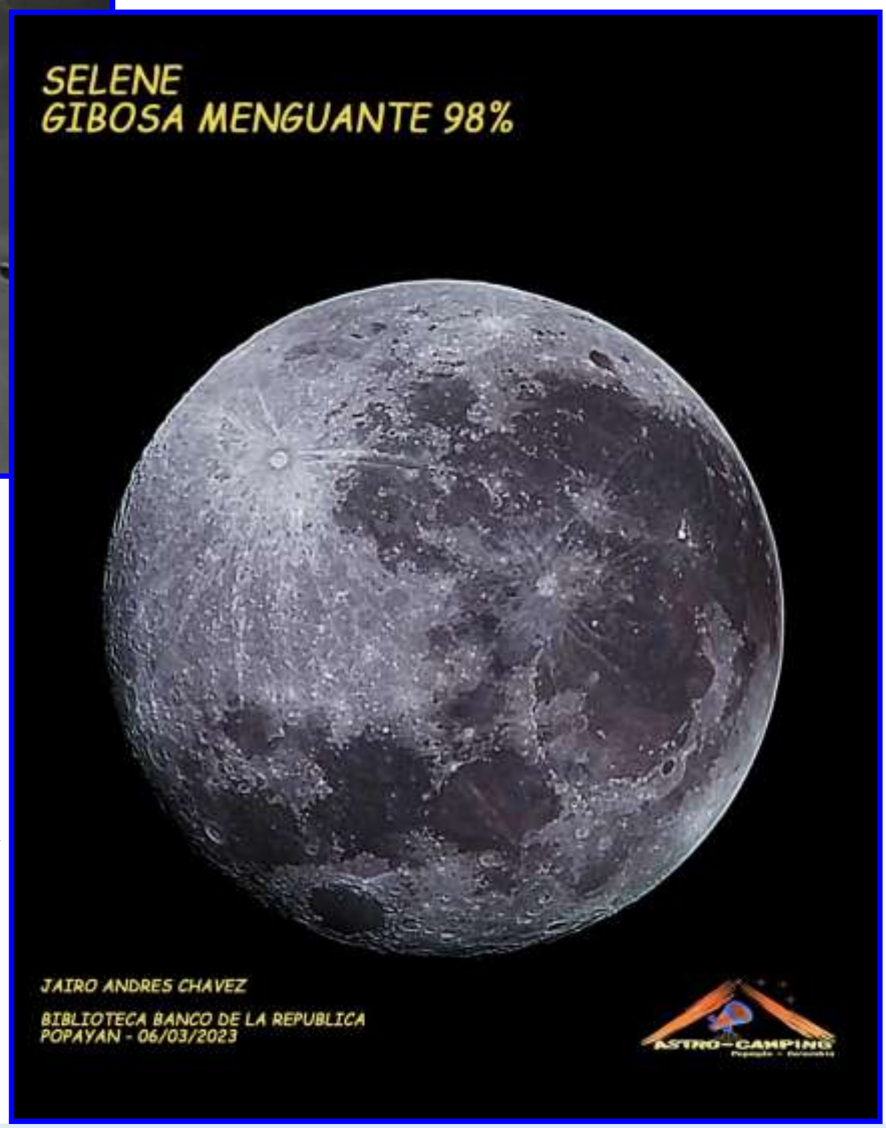
Cassini Region, *Massimo Dionisi, Sassari, Italy. 2023 May 11 01:53 UT. Sky Watcher 250 mm f/5 reflector telescope, 3x barlow, IR pass filter 685nm, Uranus C camera. Seeing III-IV Antoniadi Scale.*

Sinus Iridum, *Larry Todd, Dunedin, New Zealand. 2023 May 15 18:41 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*



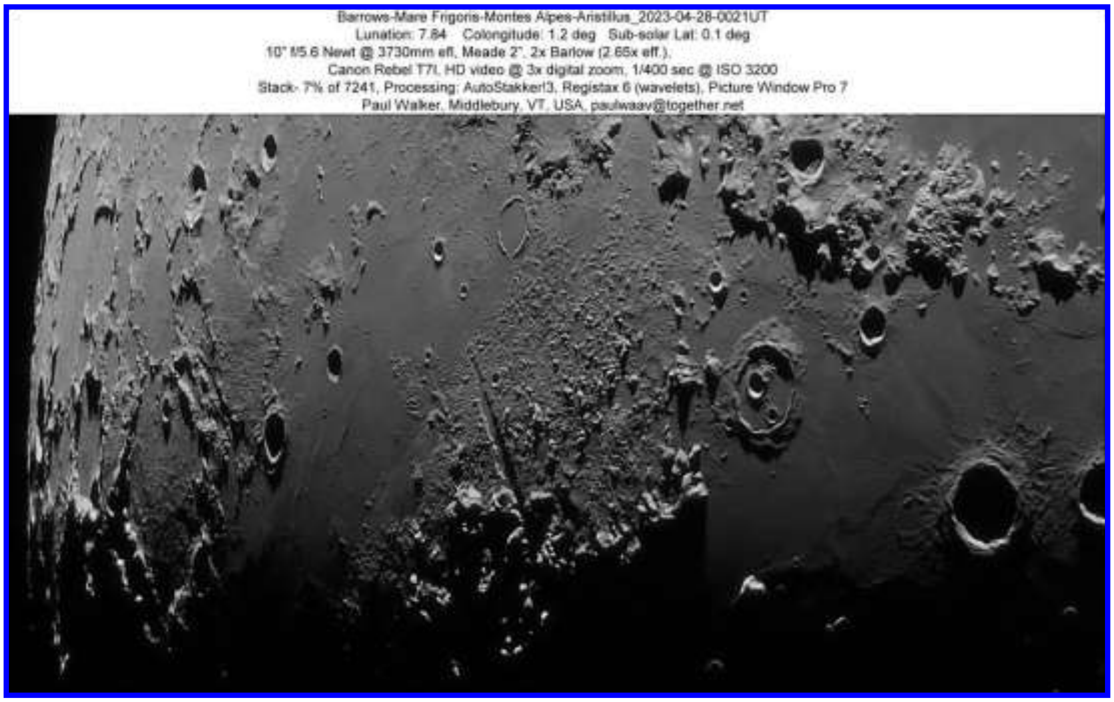
Recent Topographic Studies

Delisle and Diophantus with Aristarchus, *Larry Todd, Dunedin, New Zealand. 2023 May 15 18:44 UT. OMC200 Maksutov-Cassegrain telescope, Neptune 11C mono camera.*



Waning Gibbous Moon, *98%, Jairo Chavez, Popayán, Colombia. 2023 April 07 03:01 UT. 311 mm truss Dobsonian reflector telescope, MOTO E5 PLAY camera. North is down, west is right.*

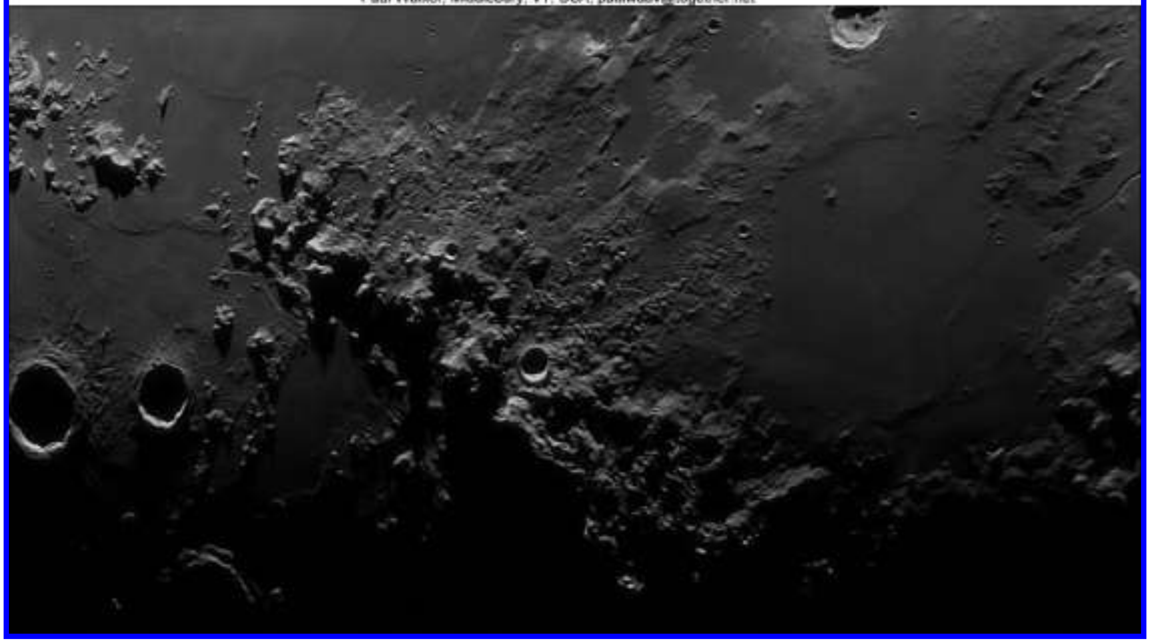
Recent Topographic Studies



***Barrow, Mare Frigoris, Montes Alpes and Aristillus**, Paul Walker, Middlebury, Vermont, USA. 2023 April 28 00:21 UT, colongitude 1.2°. 10 inch f/5.6 Newtonian reflector telescope, efl 3,730 mm, Meade 2x barlow, Canon Rebel T7i. North is left, west is down. Paul adds:* "Of note in this image is the rille in Vallis Alpes which is just visible. They may be other features of note, I'm just not yet knowledgeable enough to point out :) Like those rilles in the upper right which I did not know existed. According to the Lunar Astronautical Chart (LAC) Series the farthest to the right is Rimae Theaetetus. Next, below Theaetetus, is the barely visible Rima Theaetetus III. Then left of that and up, above Cassini is an an unnamed (on the LAC) rille system. Time it get better and more modern maps."

***Waxing Gibbous Moon,** 90%, Jairo Chavez, Popayán, Colombia. 2023 May 03 01:57 UT. 311 mm truss Dobsonian reflector telescope, MOTO E5 PLAY camera. North is down, west is right.*

Recent Topographic Studies



Aristillus-Montes_Apenninius-Mare_Vaporum_2023-04-28-0021UT
Lunation: 7.84 Colongitude: 1.2 deg Sub-solar Lat: 0.1 deg
10" f/5.6 Newt @ 3730mm efl, Meade 2", 2x Barlow (2.65x eff.),
Canon Rebel T7i, HD video @ 3x digital zoom, 1/400 sec @ ISO 3200
Stack- 7% of 7306, Processing: AutoStakker!3, Registax 6 (wavelets), Picture Window Pro 7
Paul Walker, Middlebury, VT, USA, paulwaav@together.net

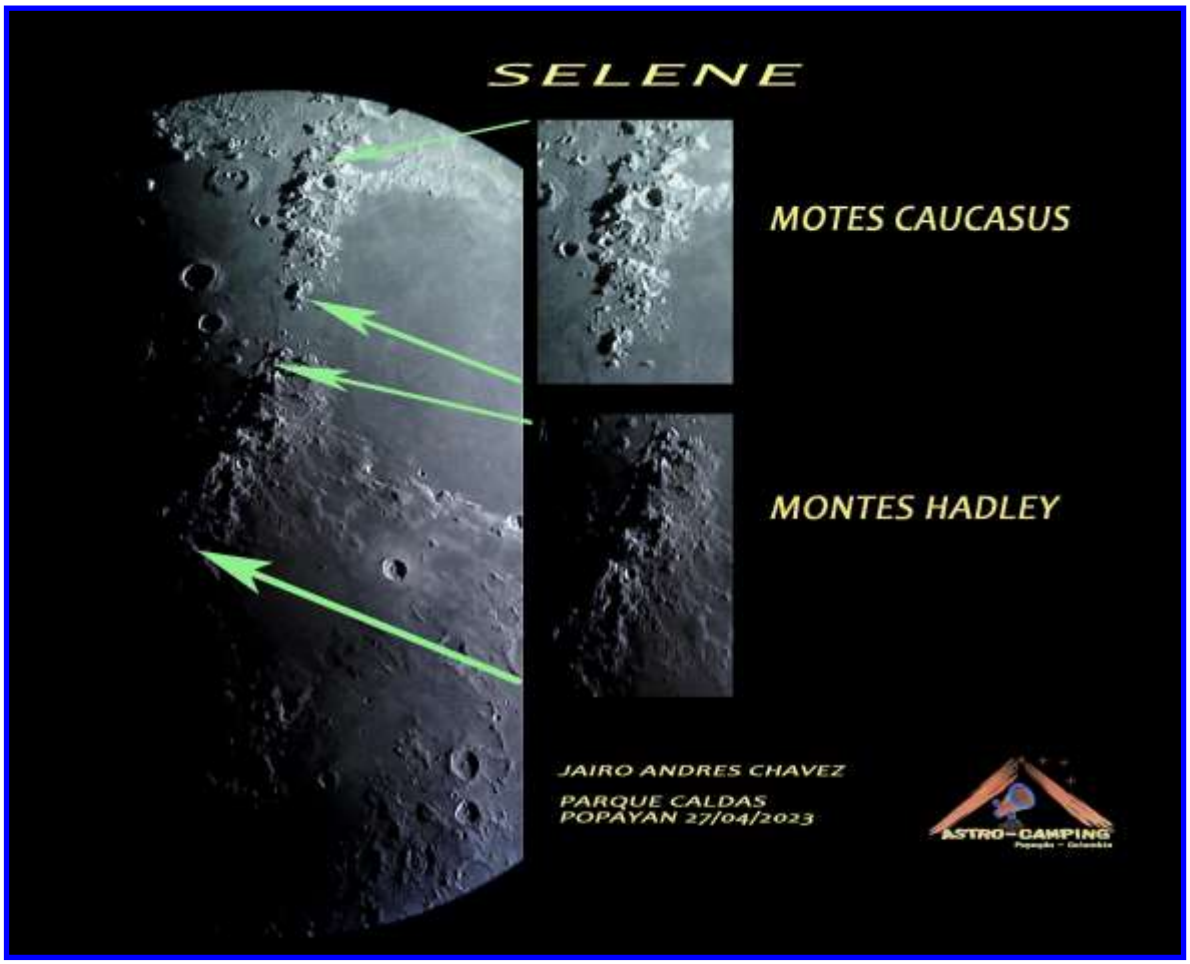
***Aristillus, Montes Apenninus, Mare Vaporum**, Paul Walker, Middlebury, Vermont, USA. 2023 April 28 00:21 UT, colongitude 1.2º. 10 inch f/5.6 Newtonian reflector telescope, efl 3,730 mm, Meade 2x barlow, Canon Rebel T7i. North is left, west is down. Paul adds:* "Hadley Rille may be hiding in the dark here but the Fresnel rilles are looking good. Rimae Theaetetus is visible in this image as well, on the far left."

***Maurolycus,** Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 01:51 UT, colongitude 349.9º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

MAUROLYCUS. Wayne Bailey, Three Points, Arizona USA. February 8, 2022 01:51 UT, Seeig 7/10, Transparecy 6/6, Colongitude 349.9 deg. 8" f/12 Classical Cassegrain. W58 Green filter, Skynyxx_2-1M.

Recent Topographic Studies

Rima Hyginus, Triesnecker and Hipparchus*, Paul Walker, Middlebury, Vermont, USA. 2023 April 28 00:51 UT, colongitude 1.4°. 10 inch f/5.6 Newtonian reflector telescope, efl 3,730 mm, Meade 2x barlow, Canon Rebel T7i. North is left, west is down. Paul adds: "*On the same night, visually, I got brief glimpses of most of Triesnecker rille system that is visible in this image. Paul adds: "Left of center Seegiler S, Rima Reaumur, part of Rima Oppolzer and Seeliger 1 are visible. Visually I could catch them all in moments of best seeing".



Montes Caucasus and Montes Hadley*, Jairo Chavez, Popayán, Colombia. 2023 April 28 00:24 UT. 311 mm truss Dobsonian reflector telescope, MOTO E5 PLAY camera.*

Recent Topographic Studies

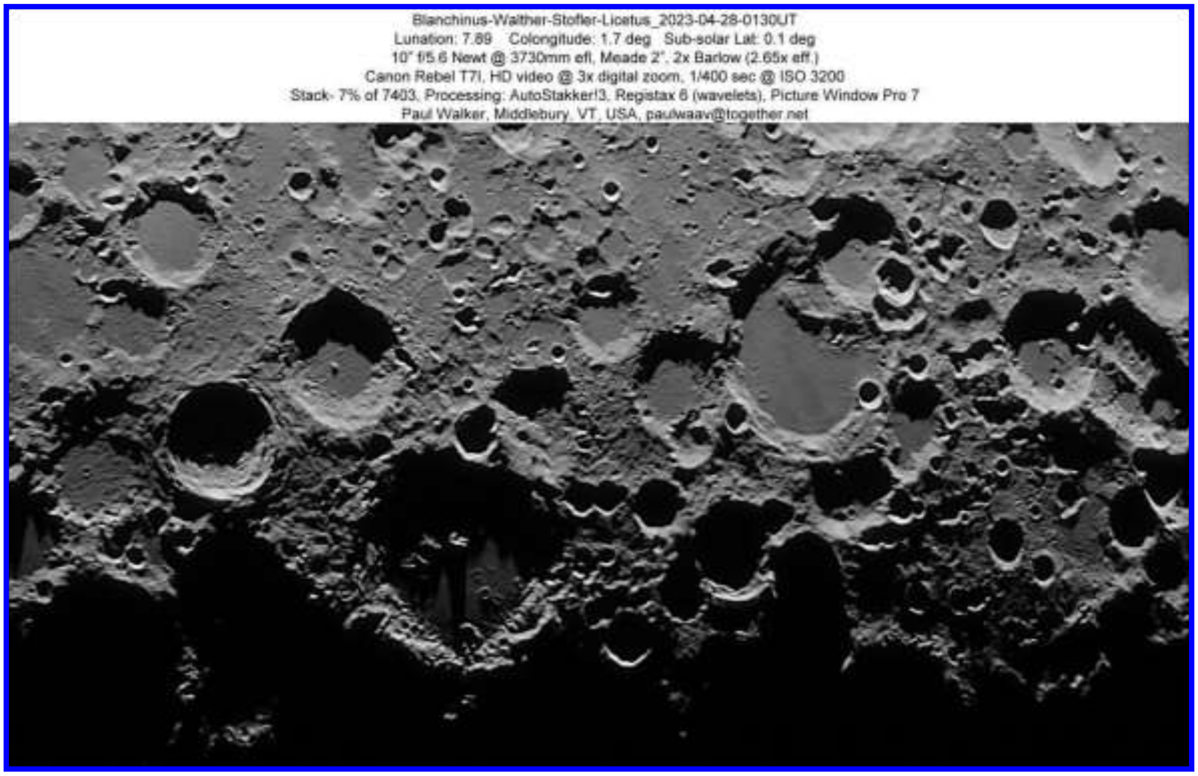
Hipparchus, Albategnius, Playfair G and Blanchinus, *Paul Walker, Middlebury, Vermont, USA. 2023 April 28 00:56 UT, colongitude 1.4°. 10 inch f/5.6 Newtonian reflector telescope, efl 3,730 mm, Meade 2x barlow, Canon Rebel T7i. North is left, west is down. Paul adds: "*On the same night, visually, I got brief glimpses of most of Triesnecker rille system that is visible in this image. Paul adds: "This image has some interesting striations, that if I venture a guest and looking at the Virtual Moon Atlas, were created by material thrown out when Mari Imbrium was created. It also has a modest sized crater (Blanchinus) on the far right side a just below center that caught my eye with what appears to be material splashed across it's bottom, maybe from the fresher looking crater just to it's lower left (La Caille) or more likely the much fresher crater (Werner) to it's south (right) which is just partly visible."


MESSALA. Wayne Bailey, Three Points, Arizona USA. February 8, 2022 01:30 UT, Seeig 7/10, Transparecy 6/6, Colongitude 349.7 deg. 8" f/12 Classical Cassegrain. W58 Green filter, Skynyxx_2-1M.

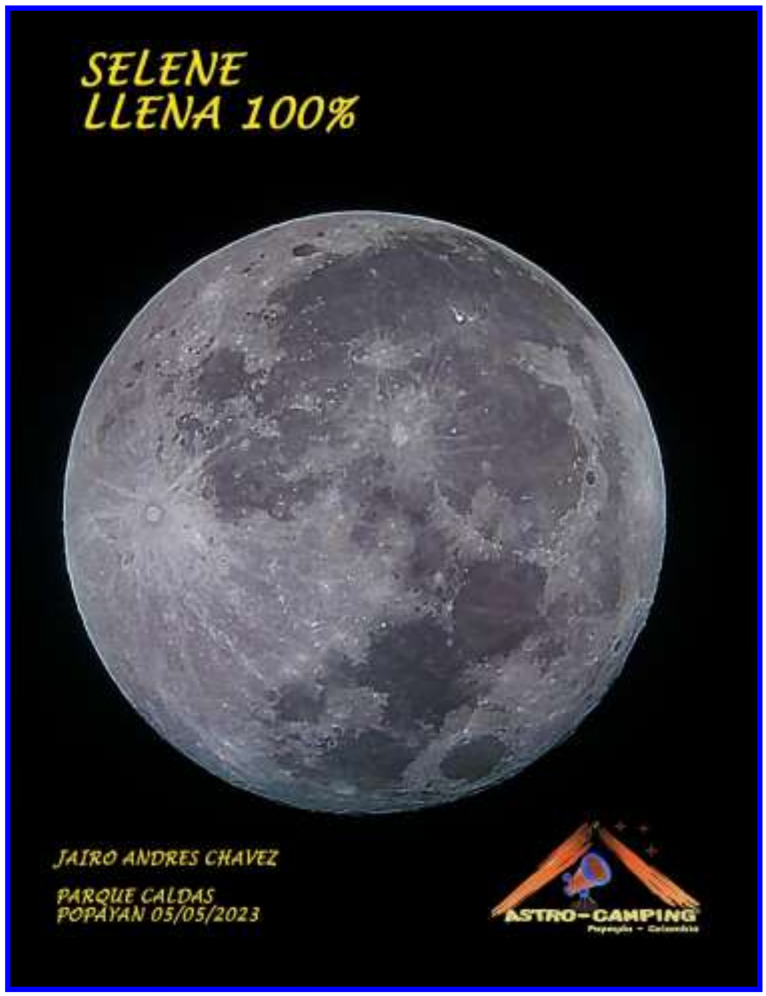
Messala, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 01:30 UT, colongitude 349.7°. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

Recent Topographic Studies

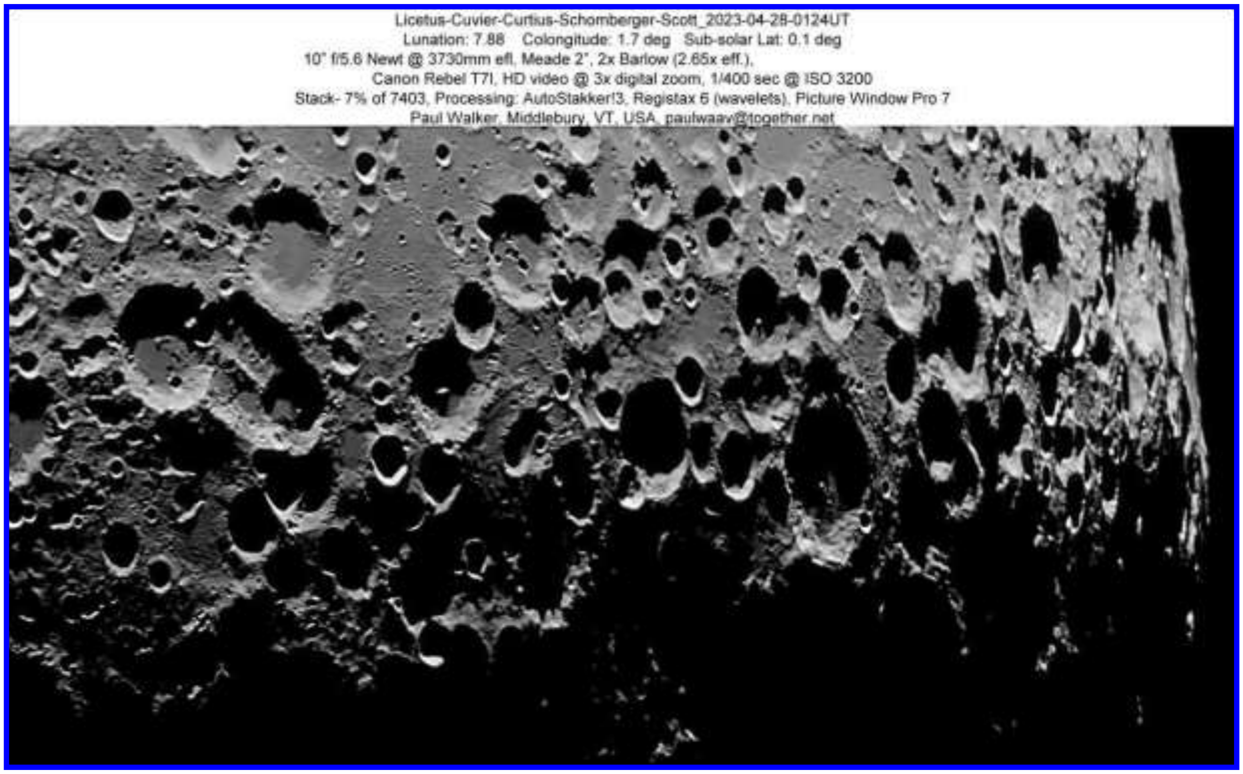
Blanchinus, Walther, Stöfler and Licetus, *Paul Walker, Middlebury, Vermont, USA. 2023 April 28 01:30 UT, colongitude 1.7°. 10 inch f/5.6 Newtonian reflector telescope, efl 3,730 mm, Meade 2x barlow, Canon Rebel T7i. North is left, west is down. Paul adds:* "Here we again have Blanchinus (on the far left). The splashed material in the crater Aliacensis to the upper right of Werner appears to also come from Werner, leading me believe the top layer of material in Blanchinus is indeed from Werner. I noticed a dark streak on the bottom of Stöfler and wondered what caused it. I was thinking maybe from the lava that filled the crater. But looking at wider shots it's not a dark streak per say the effect of lighter material on either side laid down by the impact that created Tycho".



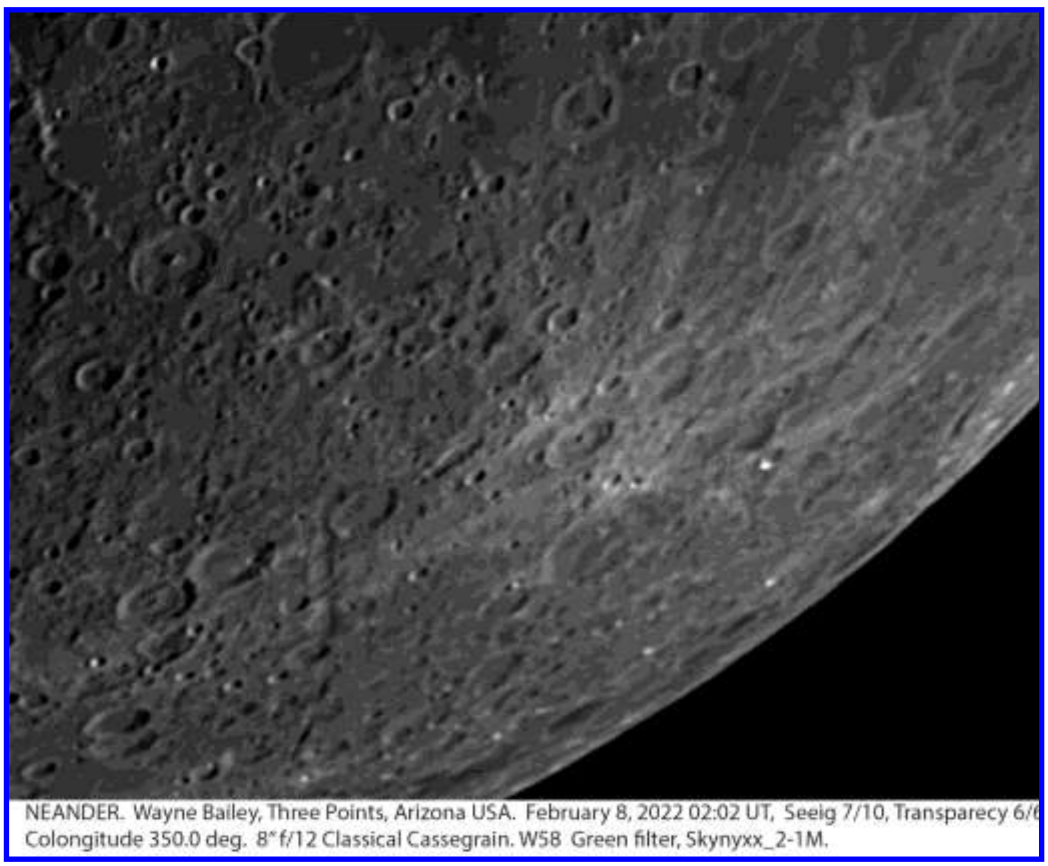
Full Moon, *Jairo Chavez, Popayán, Colombia. 2023 May 06 02:00 UT. 311 mm truss Dobsonian reflector telescope, MOTO E5 PLAY camera. North is right, west is up.*



Recent Topographic Studies



Licetus, Cuvier, Curtis, Schomberger and Scott, *Paul Walker, Middlebury, Vermont, USA. 2023 April 28 01:24 UT, colongitude 1.7º. 10 inch f/5.6 Newtonian reflector telescope, efl 3,730 mm, Meade 2x barlow, Canon Rebel T7i. North is left, west is down. Paul adds: "*Looking at the bottom center there is a bunch of peaks poking out of the darkness. Through the telescope it reminded me of looking down on the lights of a town from an airplane. This image doesn't do that view justice. In a video I took an hour later with more of the topography showing, the effect was gone."



Neander, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 02:02 UT, colongitude 350.0º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

Recent Topographic Studies

Copernicus, *Fernando Surá, San Nicolás de los Arroyos, Argentina. 2023 April 29 23:00 UT. 127 Maksutov-Cassegrain telescope, Canon Revel T7i Reflex camera. North is down, west is right.*

Ross, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 01:41 UT, colongitude 349.8º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

Recent Topographic Studies

***Plato,** Fernando Surá, San Nicolás de los Arroyos, Argentina. 2023 April 29 23:00 UT. 127 Maksutov-Cassegrain telescope, Canon Revel T7i Reflex camera. North is down, west is right.*

SCHICKARD. Wayne Bailey, Three Points, Arizona USA. February 14, 2022 05:19 UT. Seeing 7/10, Transparency 6/6, Colongitude 64.5 deg. 8" f/12 Classical Cassegrain, IR72 filter, Skynyx 2-1M.

***Schickard,** Wayne Bailey, Three Points, Arizona, USA. 2022 February 14 05:19 UT, colongitude 64.5°. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

Recent Topographic Studies

Sirsalis, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 14 05:12 UT, colongitude 64.5º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

SIRSALIS. Wayne Bailey, Three Points, Arizona USA. February 14, 2022 05:12 UT. Seeing 7/10, Transparency 6/6, Colongitude 64.5 deg. 8" f/12 Classical Cassegrain, IR72 filter, Skynyx 2-1M.

*Tycho****,*** *Raúl Roberto Podestá, Formosa, Argentina. 2023 April 29 23:11 UT. 130 mm reflector telescope, ZWO ASI178MC camera.*

Recent Topographic Studies

WARGENTI2. Wayne Bailey, Three Points, Arizona USA. February 14, 2022 05:22 UT. Seeing 7/10, Transparency 6/6, Colongitude 64.6 deg. 8" f/12 Classical Cassegrain, IR72 filter, Skynyx 2-1M.

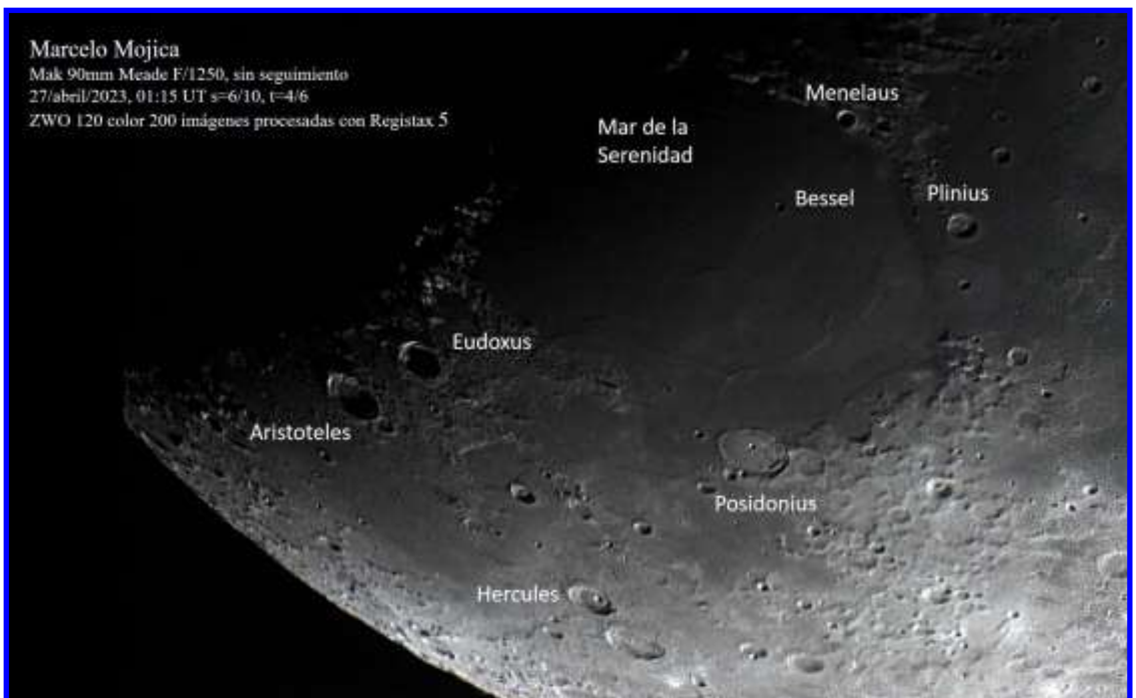
Wargentin, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 14 05:22 UT, colongitude 64.5°. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

Manzinus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 27 01:15 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR cut filter, ZWO ASI120 camera. Seeing 6/10, transparency 4/6. North is down, west is left.*

Recent Topographic Studies

Abulfeda, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 01:47 UT, colongitude 349.8º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

ABULFEDA. Wayne Bailey, Three Points, Arizona USA. February 8, 2022 01:47 UT. Seeig 7/10, Transparecy 6/6, Colongitude 349.8 deg. 8"f/12 Classical Cassegrain. W58 Green filter, Skynyxx_2-1M.



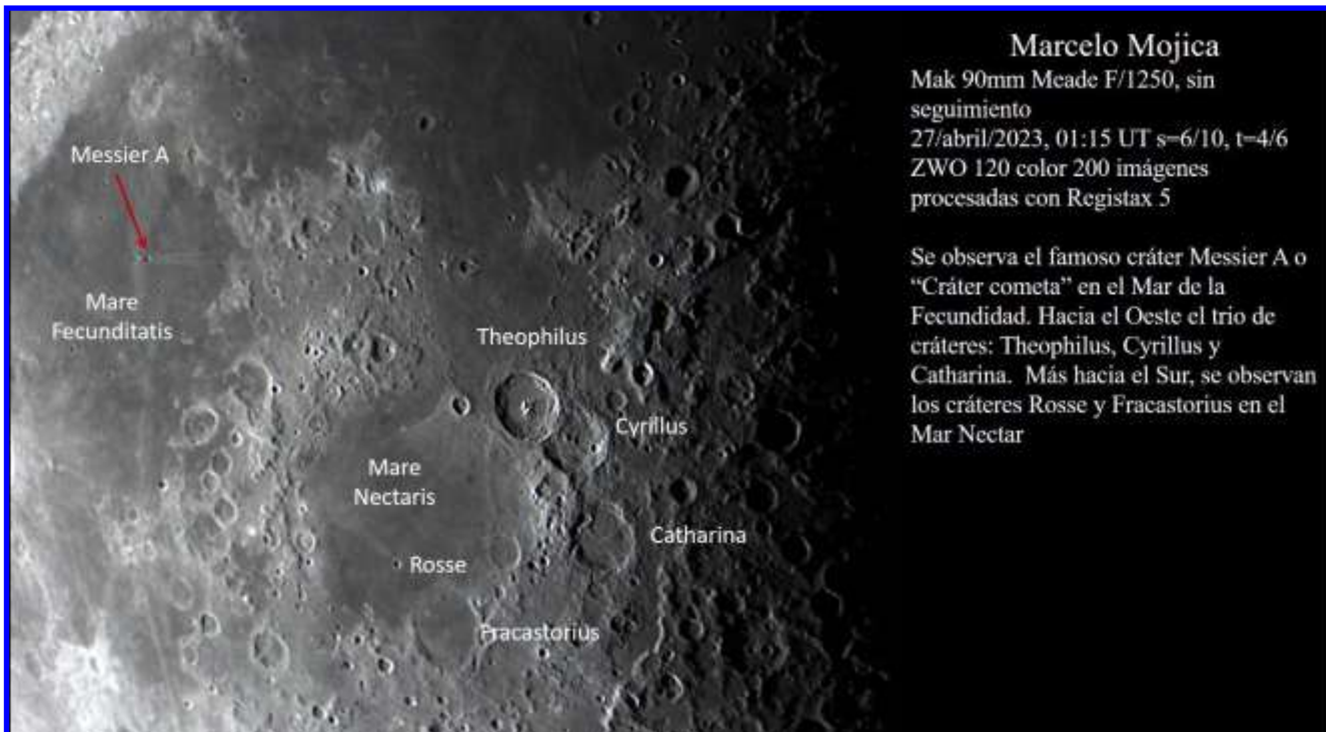
Posidonius, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 27 01:15 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera. Seeing 6/10, transparency 4/6. North is left, west is up.*

Recent Topographic Studies

ARISTARCHUS. Wayne Bailey, Three Points, Arizona USA. February 14, 2022 04:55 UT. Seeing 7/10, Transparency 6/6, Colongitude 64.3 deg. 8" f/12 Classical Cassegrain, W58 Green filter, Skynyx 2-1M.

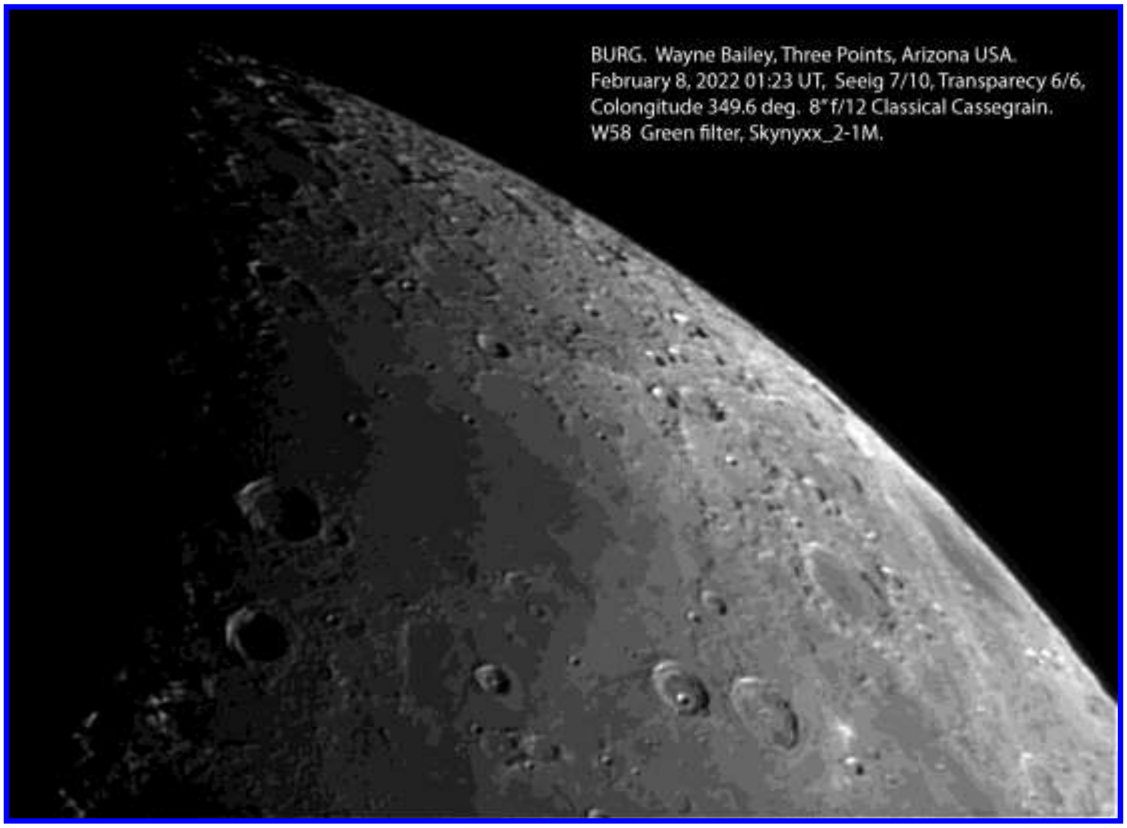
Aristarchus, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 14 04:55 UT, colongitude 64.3º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

Theophilus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 27 01:15 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera. Seeing 6/10, transparency 4/6. North is up, west is right.*



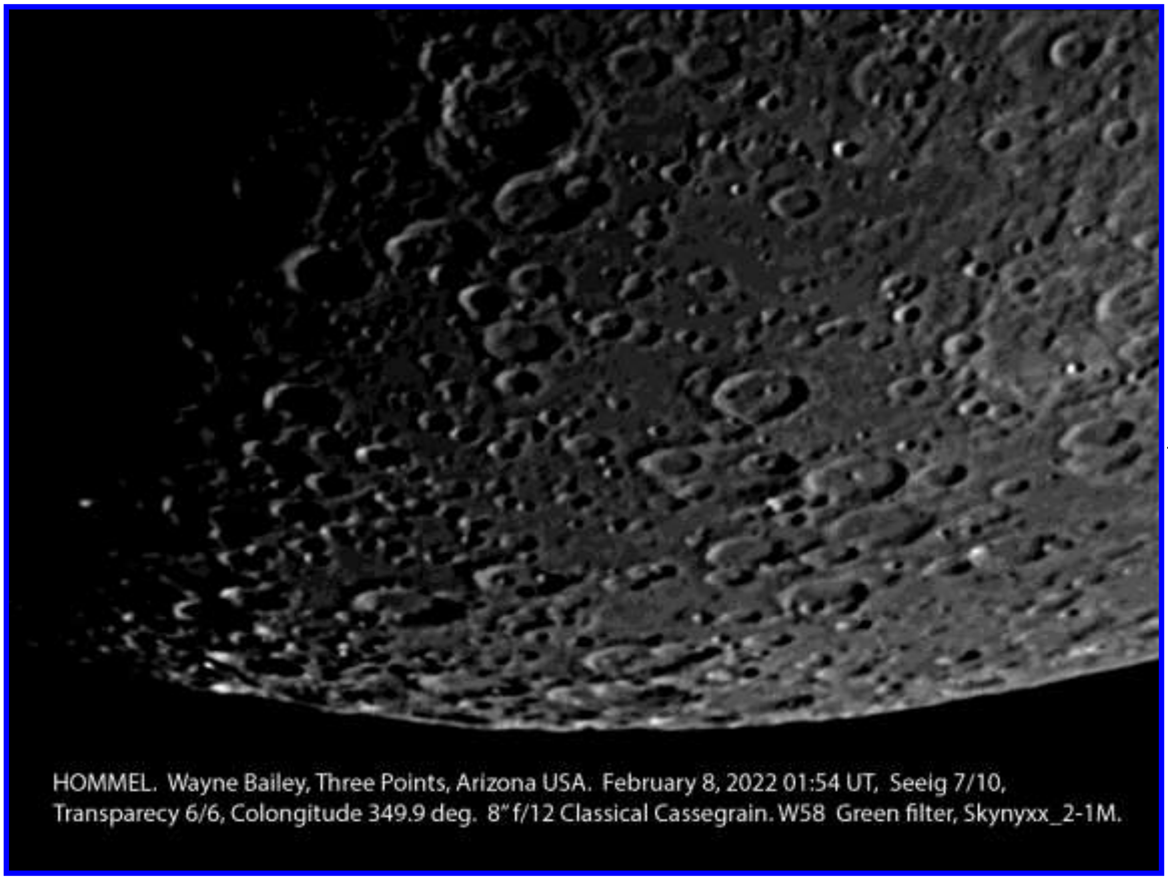
Recent Topographic Studies

Bürg, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 01:23 UT, colongitude 349.6°. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

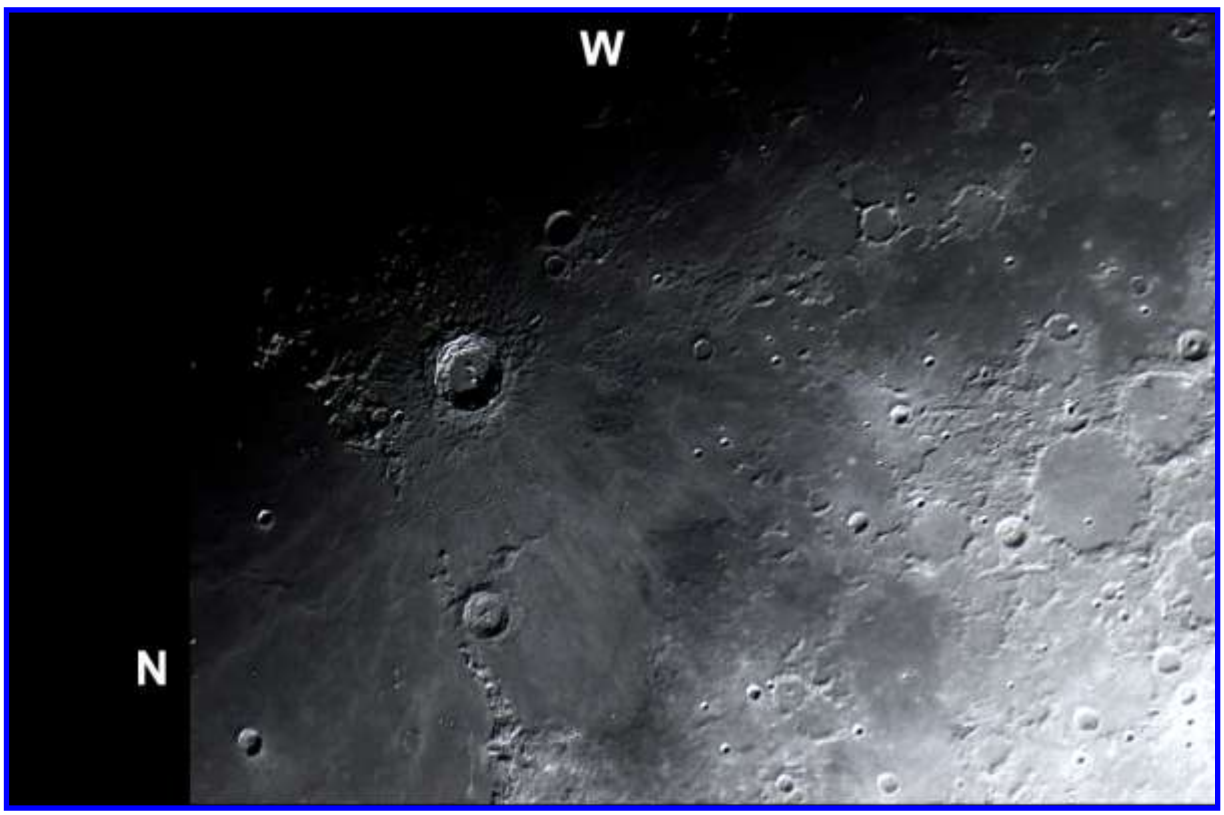


Tycho, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera. North is left, west is down.*

Recent Topographic Studies



Hommel, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 01:54 UT, colongitude 349.9°. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*



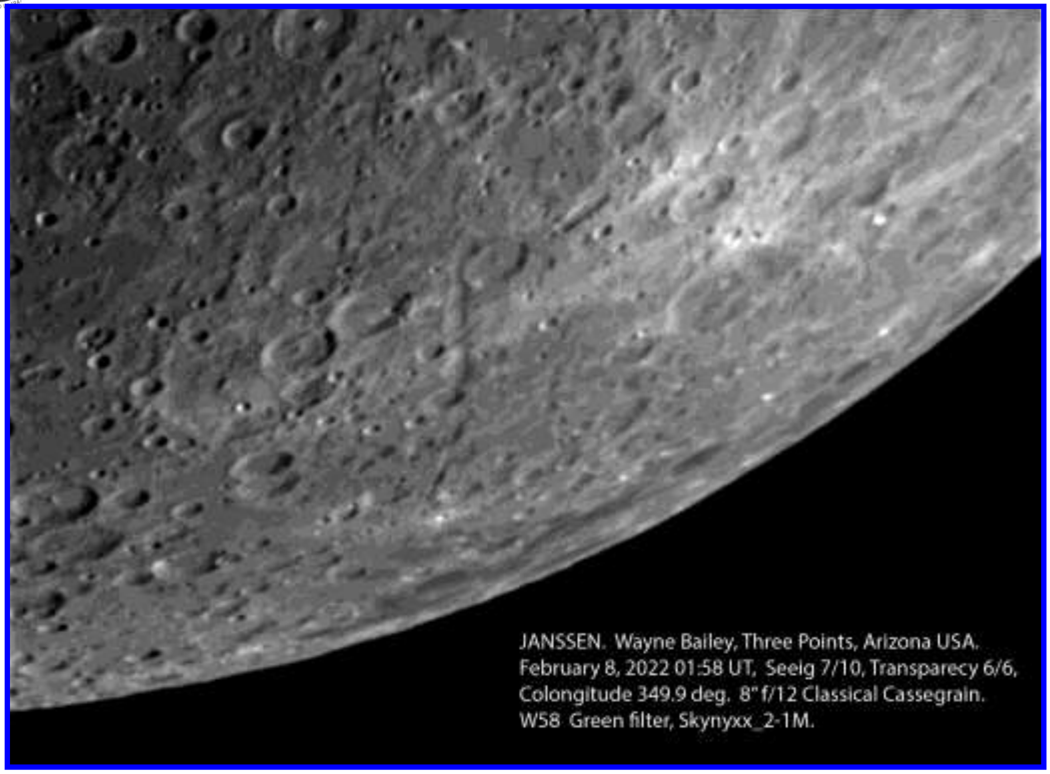
Copernicus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera. North is left, west is up.*

Recent Topographic Studies

J Herschel, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 14 04:49 UT, colongitude 64.3º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

Plato, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera. North is left, west is up.*

Recent Topographic Studies

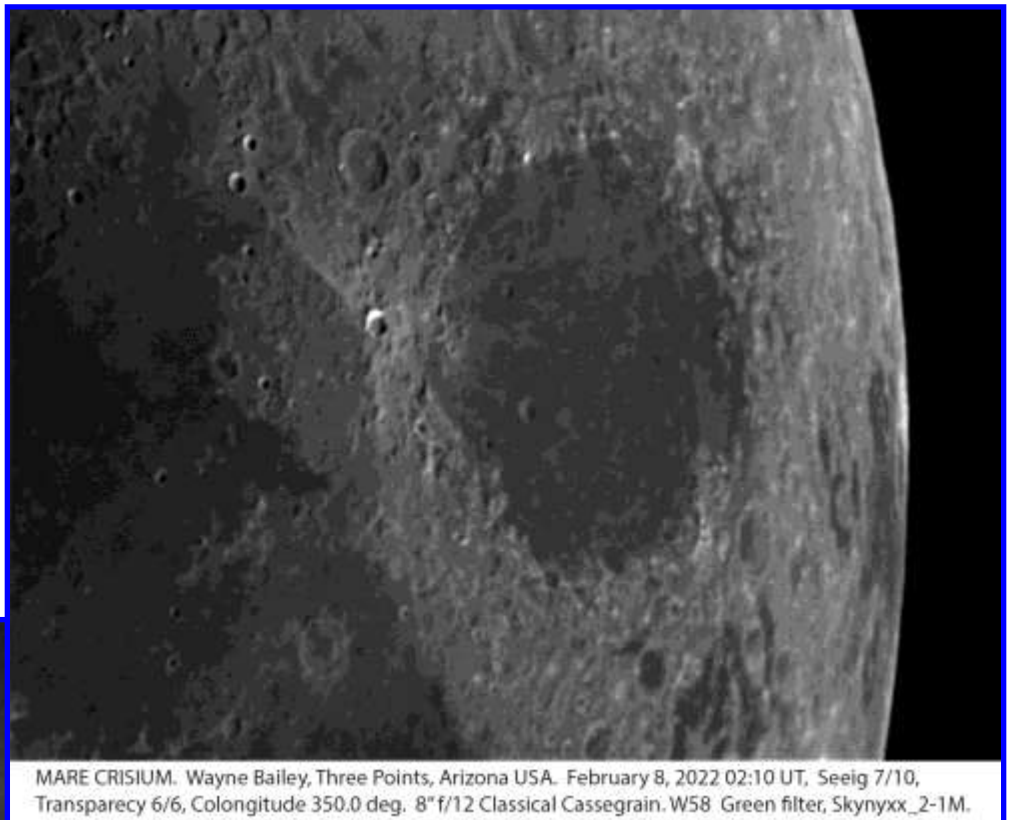


Janssen, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 01:58 UT, colongitude 349.9º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

Ptolemaeus, *Raúl Roberto Podestá, Formosa, Argentina. 2023 April 29 23:48 UT. 130 mm reflector telescope, ZWO ASI178MC camera.*

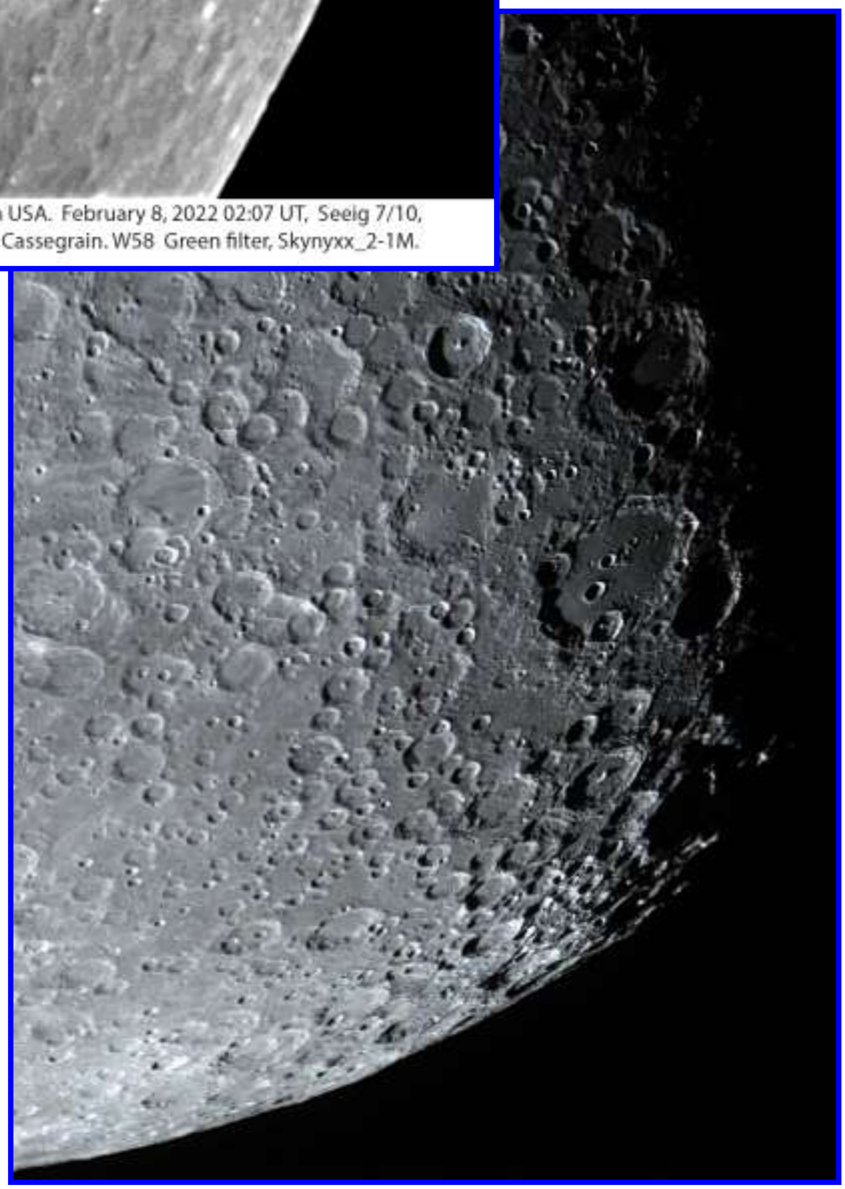
Recent Topographic Studies

Mare Crisium, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 02:10 UT, colongitude 350.0°. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*



Montes Apenninus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera.*

Mare Fecunditatis, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 02:07 UT, colongitude 350.0º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*



Tycho, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera.*

Recent Topographic Studies

Mare Serenitatis, *Wayne Bailey, Three Points, Arizona, USA. 2022 February 08 01:26 UT, colongitude 349.7º. 8 inch f/12 Classical Cassegrain telescope, W58 green filter, Skynyxx_2-1M camera. Seeing 7/10, transparency 6/6.*

MARE SERENITATIS. Wayne Bailey, Three Points, Arizona USA. February 8, 2022 01:26 UT, Seeig 7/10, Transparecy 6/6, Colongitude 349.7 deg. 8" f/12 Classical Cassegrain. W58 Green filter, Skynyxx_2-1M.

Copernicus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera.*

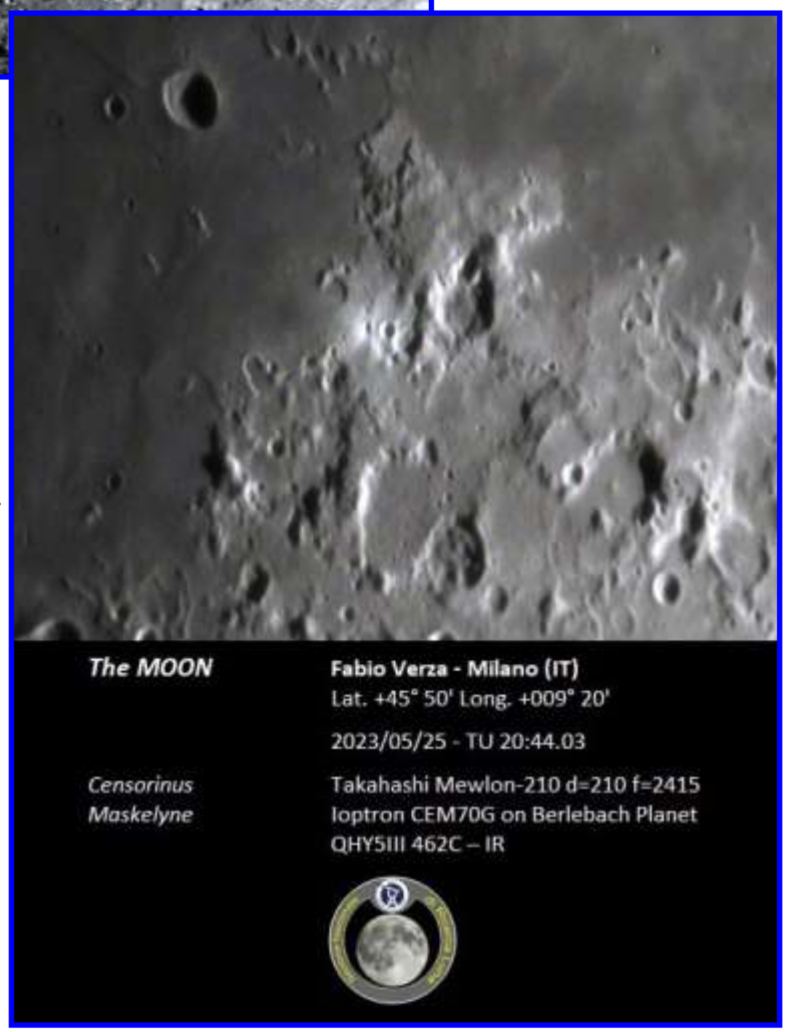
Recent Topographic Studies

Mare Serenitatis, Raúl Roberto Podestá, Formosa, Argentina. 2023 April 29 23:05 UT. 130 mm reflector telescope, ZWO ASI178MC camera.

Rupes Recta, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera.*

Recent Topographic Studies

Tycho, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera.*



Censorinus, *Fabio Verza, SNdR, Milan, Italy. 2023 May 25 20:44 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, IR filter, QHY5III 462C camera.*

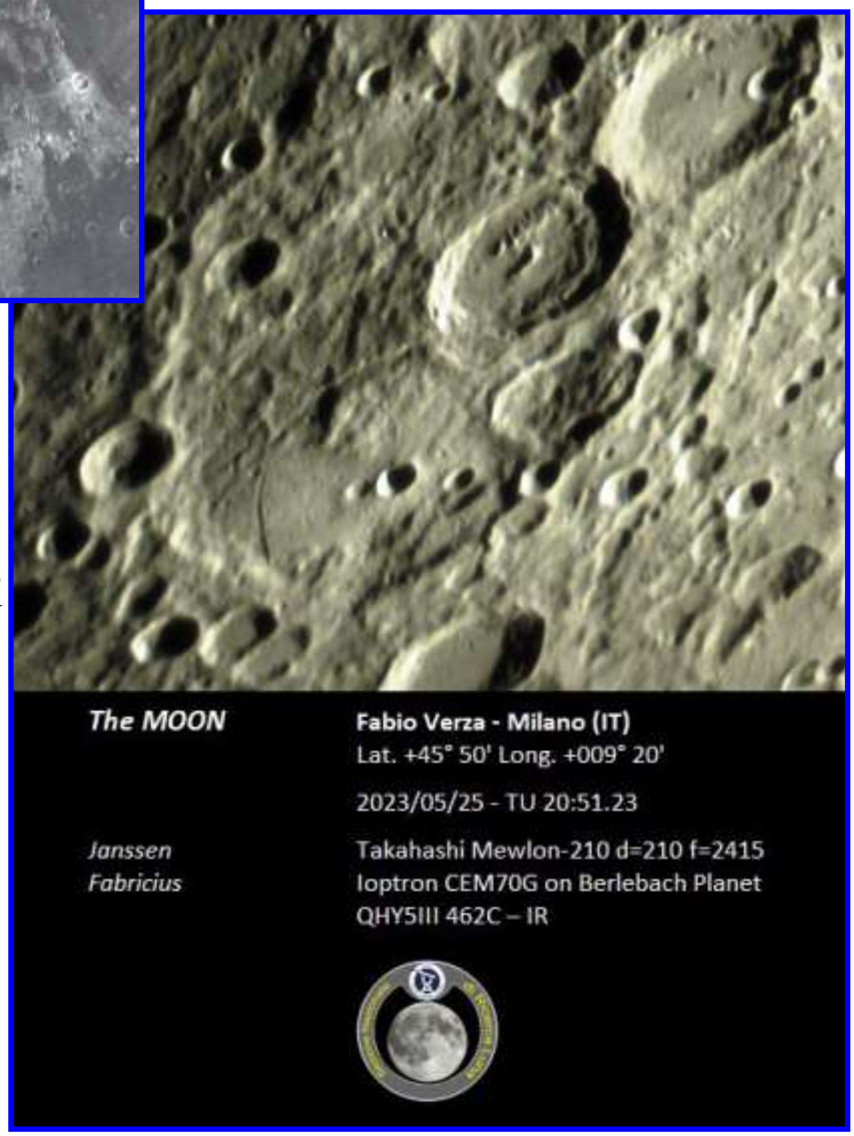
Recent Topographic Studies

Theophilus, *Raúl Roberto Podestá, Formosa, Argentina. 2023 April 29 23:49 UT. 130 mm reflector telescope, ZWO ASI178MC camera.*

Plato, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera.*

Recent Topographic Studies

Montes Apenninus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera.*



Janssen, *Fabio Verza, SNdR, Milan, Italy. 2023 May 25 20:51 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, IR filter, QHY5III 462C camera.*

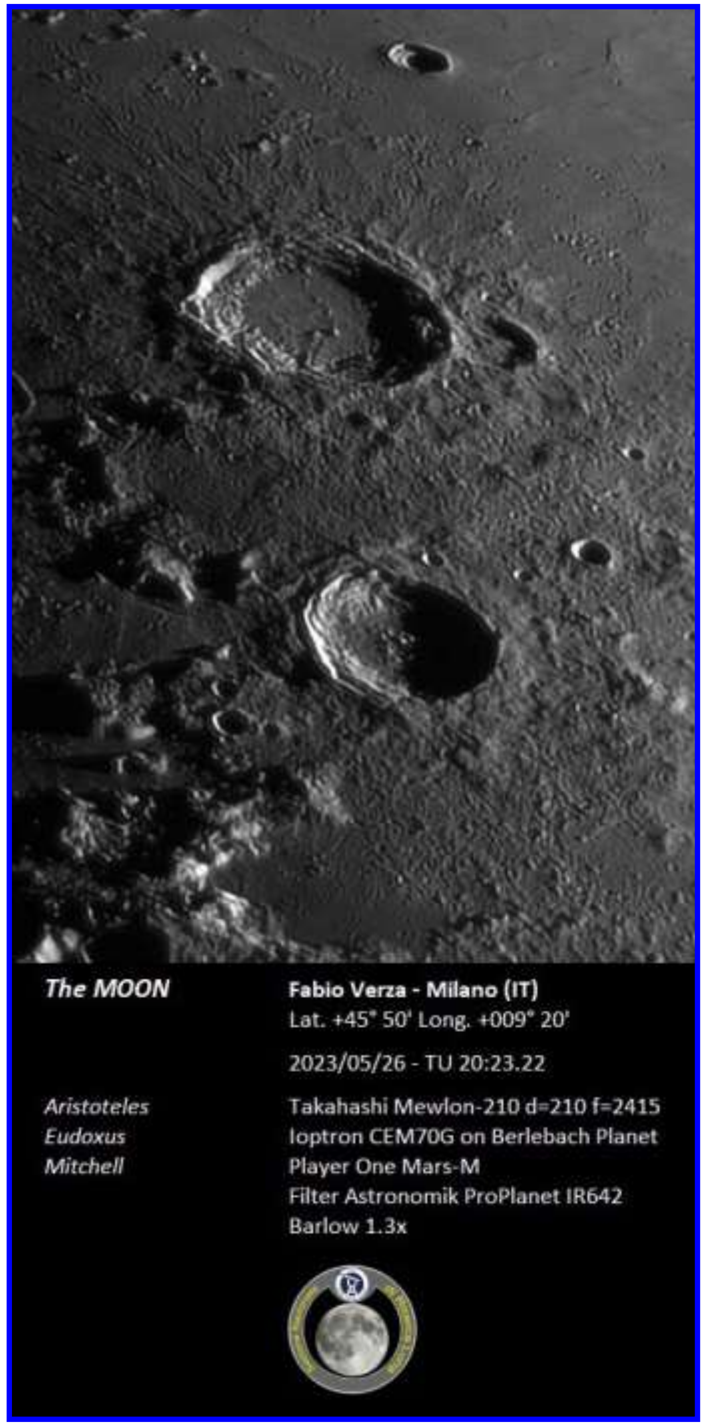
Rupes Recta, *Raúl Roberto Podestá, Formosa, Argentina. 2023 April 29 23:56 UT. 130 mm reflector telescope, ZWO ASI178MC camera.*

Rupes Recta, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2023 April 30 02:00 UT. 90 mm Maksutov-Cassegrain telescope, Meade IR block filter, ZWO ASI120 camera.*

Recent Topographic Studies

Theophilus, *Fabio Verza, SNdR, Milan, Italy. 2023 May 25 20:47 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, IR filter, QHY5III 462C camera.*

Aristoteles, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:23 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 1.3x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*



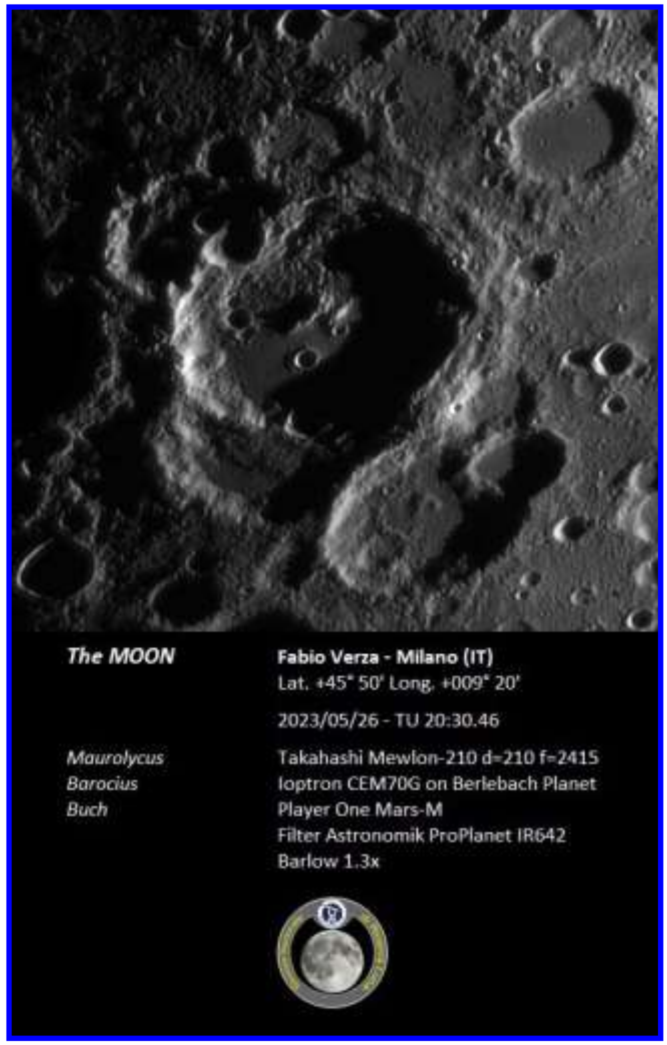
Recent Topographic Studies

Atlas, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:41 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 1.3 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*

Endymion, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:41 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 1.3 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*

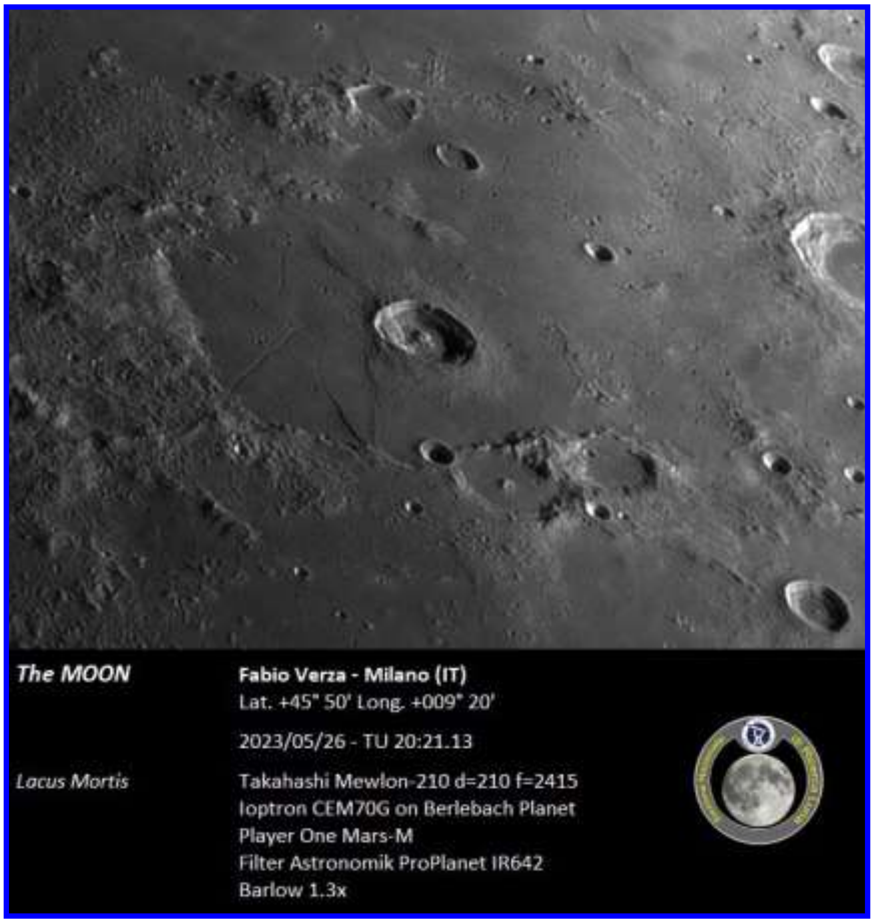
Recent Topographic Studies

Maurolycus, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:30 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 1.3 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*



Posidonius, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:27 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 1.3 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*

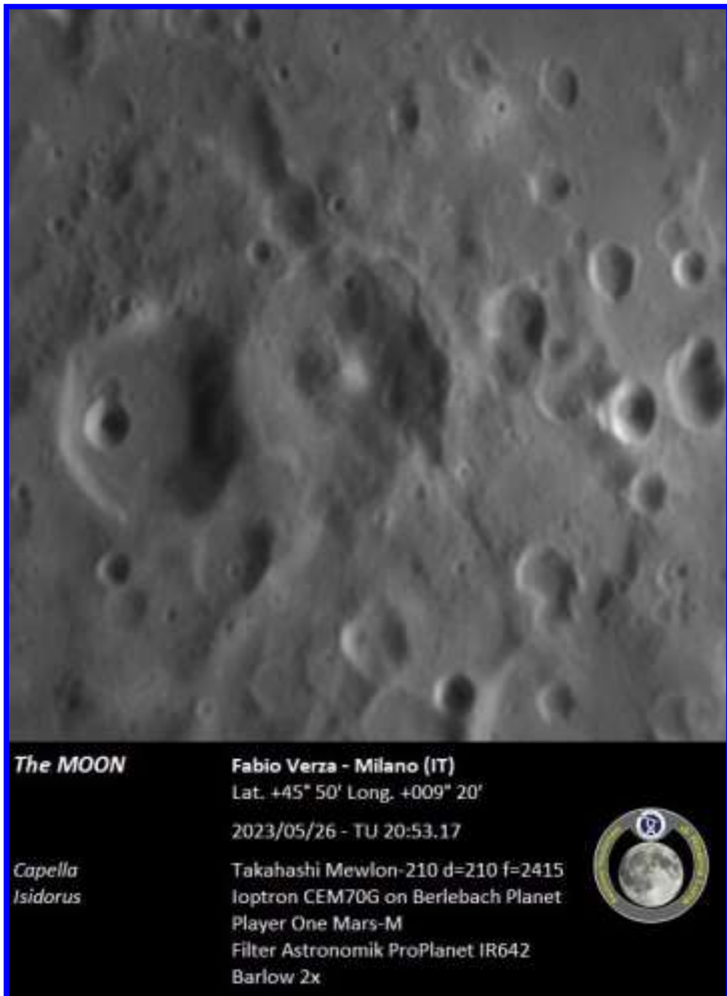
Recent Topographic Studies



Lacus Mortis, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:21 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 1.3 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*

Proclus, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2023 May 27 23:18 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl., QHY5 II C camera.*

Recent Topographic Studies

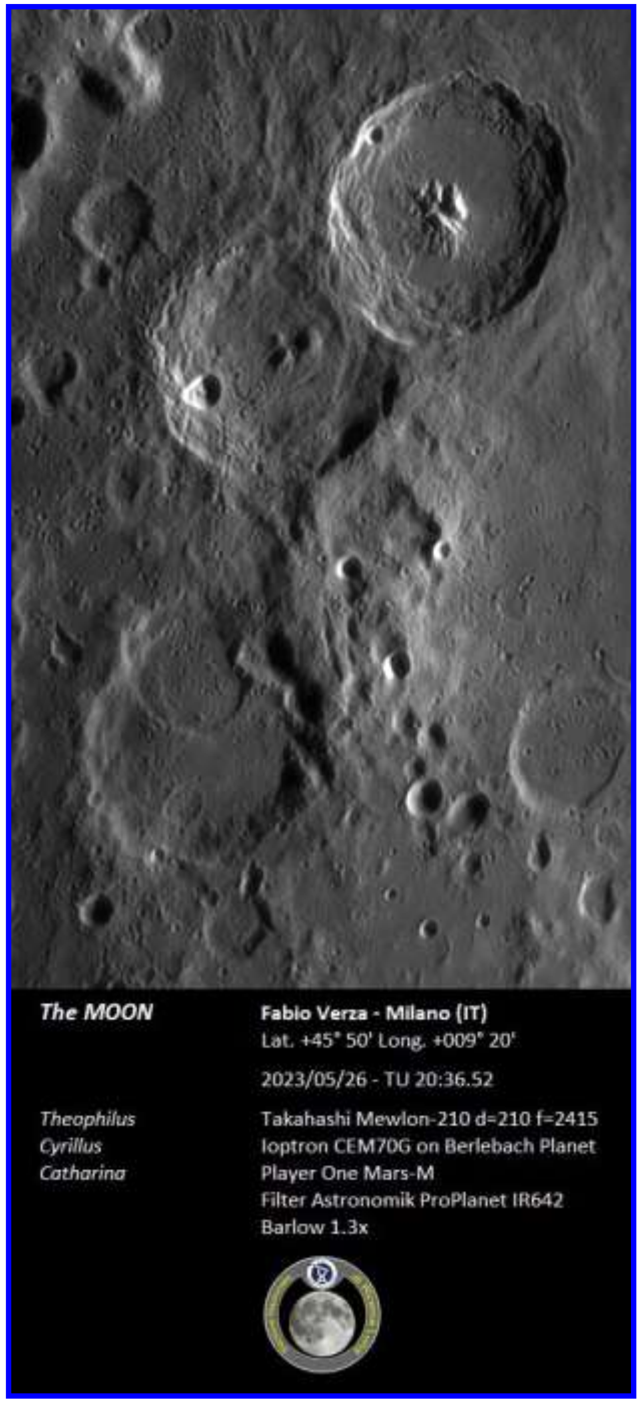


Capella, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:53 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 2 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*

Proclus, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2023 May 27 23:18 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl., QHY5 II C camera.*

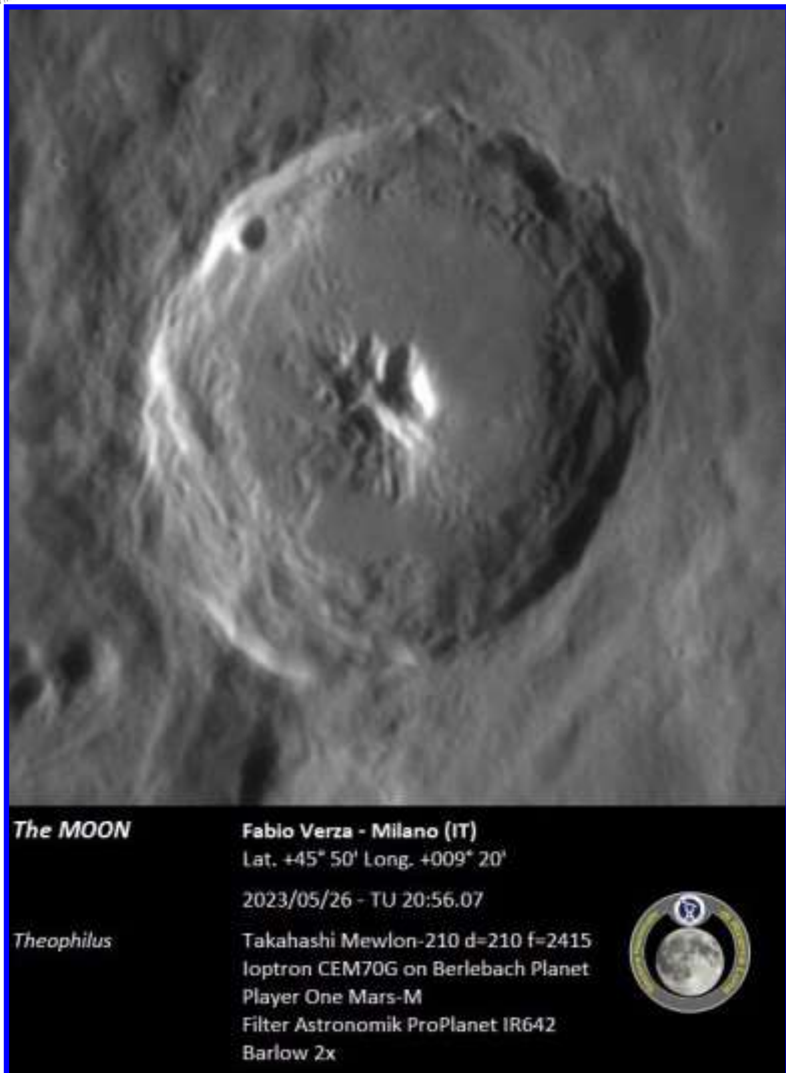
Recent Topographic Studies

Theophilus, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:36 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 1.3 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*



Gutenberg, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 21:02 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 2 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*

Recent Topographic Studies



Theophilus, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:56 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 2 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*

Plato, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2023 May 28 21:57 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl., 3x barlow, Canon T1i camera.*

Recent Topographic Studies

Piccolomini, *Fabio Verza, SNdR, Milan, Italy. 2023 May 26 20:59 UT. Takahashi Melon 210 mm Dall-Kirkham telescope, 2 x barlow, Astronomik ProPlanet IR642 filter, Player One Mars-M camera.*

Eratosthenes, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2023 May 28 21:57 UT. Sky Watcher 150 mm reflector telescope, 750 mm fl., 3x barlow, Canon T1i camera.*

Recent Topographic Studies

Lunar Calendar June 2023

Date	UT	Event
1	0623	Moon at descending node
1		West limb most exposed (-6.2°)
3	2200	Antares 1.5° south of Moon
4	0342	Full Moon
6		Greatest southern declination (-27.8°)
6	2300	Moon at perigee 364,861 km
8		North limb most exposed (+6.6°)
9	2000	Saturn 3° north of Moon
10	1931	Last Quarter Moon
11	0800	Neptune 2.0° north of Moon
14	0005	Moon at ascending node
14	0700	Jupiter 1.5° south of Moon
14		East limb most exposed (+5.4°)
15	1000	Uranus 2° south of Moon
16	0100	Moon 1.8° south of Pleiades
18	0437	New Moon, lunation 1243
19		Greatest northern declination (+27.8°)
20	1000	Pollux 1.7° north of Moon
21		South limb most exposed (-6.7°)
22	0100	Venus 4° south of Moon
22	1000	Moon 4° south of Moon
22	1900	Moon at apogee 405,385 km
26	0750	First Quarter Moon
28	1222	Moon at descending node
29		West limb most exposed (-7.1°)

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: Mons Rümker, the Olympus of the Moon

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 July 2023, will be Mons Rümker. 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 Mons Rümker Focus-On article is June 20, 2023

FUTURE FOCUS ON ARTICLES:

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

Subject	TLO Issue	Deadline
Mons Rümker	July 2023	June 20, 2023
Floor-Fractured Craters	September 2023	August 20, 2023
Dorsa Smirnov	November 2023	October 20, 2023
Sinus Iridum	January 2024	December 20, 2023
Lacus Mortis	March 2024	February 20, 2024

Focus-On Announcement
MONS RÜMKER, THE OLYMPUS OF THE MOON

Because of its location near the western limb, Mons Rümker is very hard to observe. What better reason to add it to our Focus On Section? Mons Rümker is a volcanic complex, on the surface of which numerous individual domes can be distinguished, a unique selenographic feature, as we can see in Rik Hill's image. We will try to elucidate as many details of this fascinating mountain in our July issue.

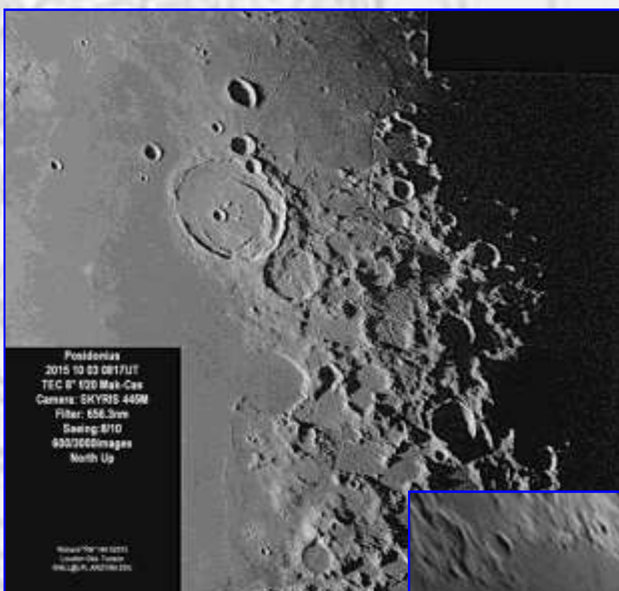
MAY 2023 ISSUE-Due April 20th, 2023: REINER GAMMA
JULY 2023 ISSUE-Due June 20th, 2023: MONS RÜMKER
SEPTEMBER 2023 ISSUE-Due August 20th 2023: FLOOR FRACTURED CRATERS
NOVEMBER 2023 ISSUE-Due October 20th 2023: DORSA SMIRNOV
JANUARY 2024 ISSUE-Due December 20th 2023: SINUS IRIDUM
MARCH 2024 ISSUE: Due February 20th 2024: LACUS MORTIS

Rik Hill

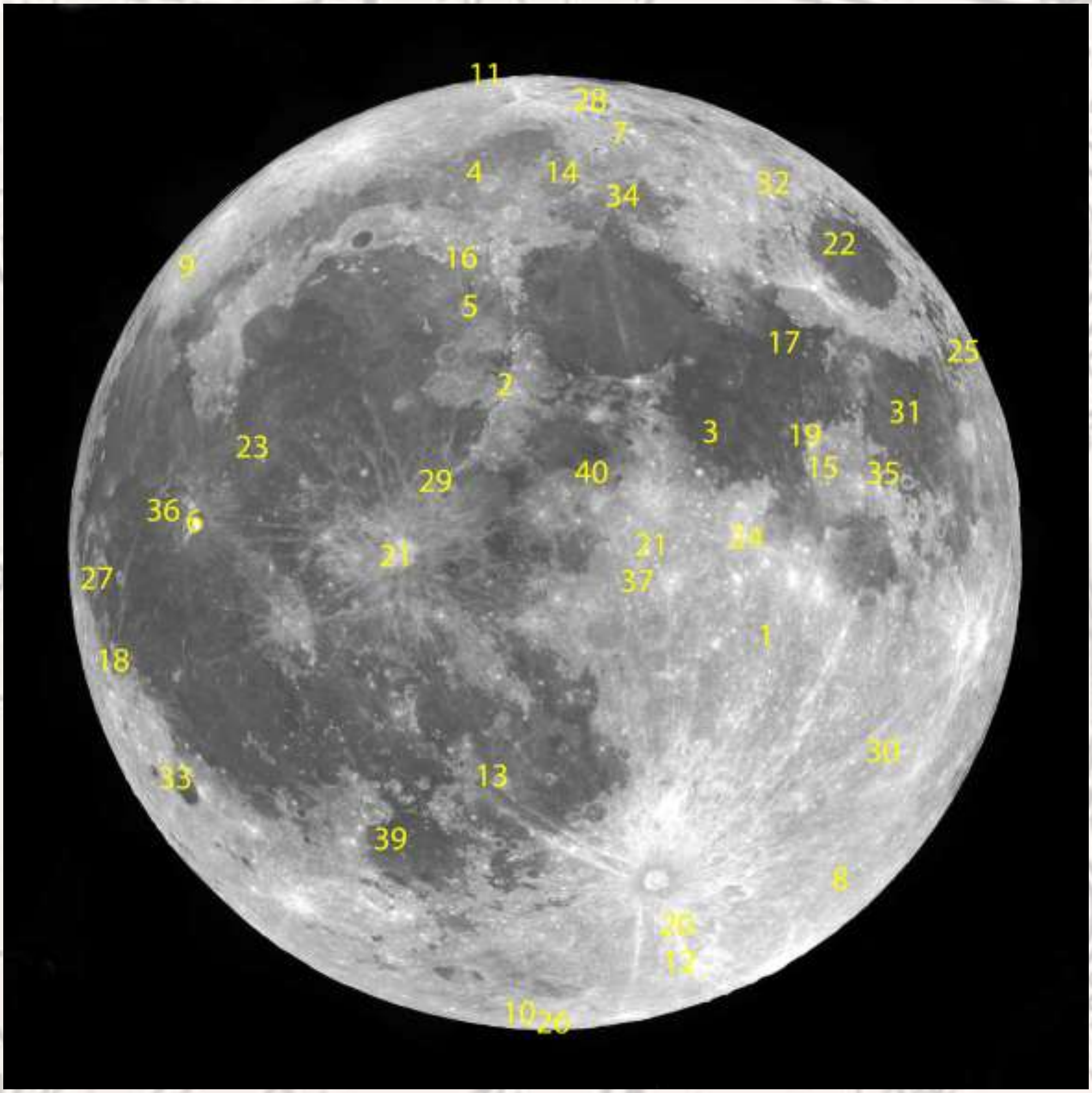
Focus-On Announcement
Floor-Fractured Craters

Floor-Fractured Craters are a relatively recent category of craters, which have undergone a modification of their floor after their formation by an impact: their higher floors are smooth, with fractures, ridges, hills and other features. We have spectacular craters like Posidonius or Taruntius or lesser known craters like Le Verrier or Letronne. We will use Robert Garfinkle's "Luna Cognita" catalog and typology for a monograph on these very special and diverse craters. Please check your files for images of these spectacular craters and forward them by August 20, 2023 to Alberto Anunziato and David Teske.

JULY 2023 ISSUE-Due June 20th, 2023: MONS RÜMKER
SEPTEMBER 2023 ISSUE-Due August 20th 2023: FLOOR FRACTURED CRATERS
NOVEMBER 2023 ISSUE-Due October 20th 2023: DORSA SMIRNOV
JANUARY 2024 ISSUE-Due December 20th 2023: SINUS IRIDUM
MARCH 2024 ISSUE: Due February 20th 2024: LACUS MORTIS

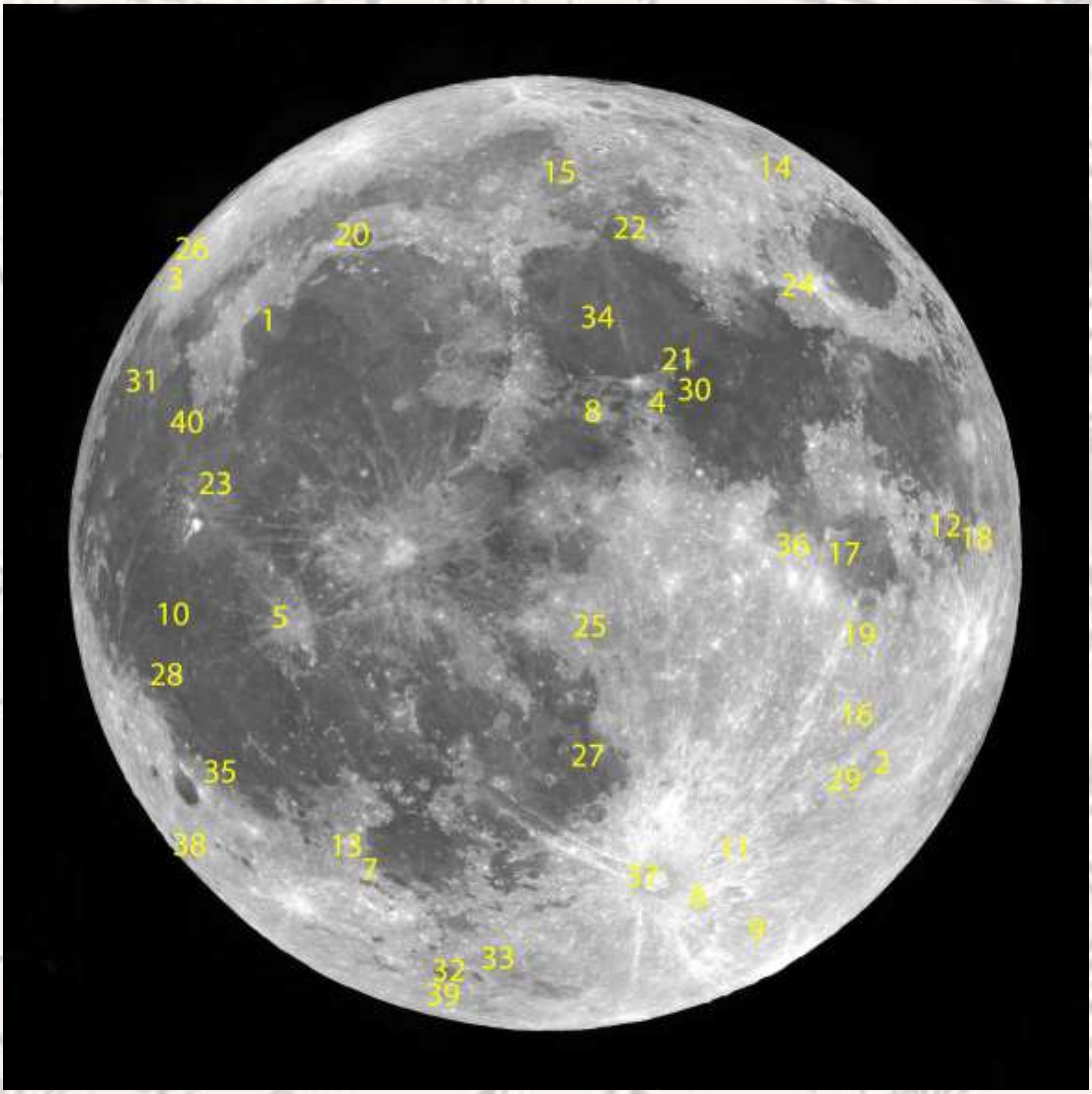


Key to Images In This Issue #1



1. Abulfeda
2. Apenninus, Montes
3. Arago
4. Aristarchus
5. Aristillus
6. Aristoteles
7. Atlas
8. Asclepi
9. Babbage
10. Bailly
11. Barrow
12. Blanchinus
13. Bullialdus
14. Bürg
15. Capella
16. Cassini
17. Cauchy
18. Cavalerius
19. Censorinus
20. Clavius
21. Copernicus
22. Crisium, Mare
23. Delisle
24. Dollond
25. Dubiago
26. Drygalski
27. Eddington
28. Endymion
29. Eratosthenes
30. Fabricius
31. Fecunditatis, Mare
32. Geminus
33. Grimaldi
34. Grove
35. Gutenberg
36. Herodotus
37. Hipparchus
38. Hommel
39. Humorum, Mare
40. Hyginus, Rima

Key to Images In This Issue #2



1. Iridum, Sinus
2. Janssen
3. J Herschel
4. Julius Caesar
5. Kepler
6. Licetus
7. Liebig
8. Manilius
9. Manzinus
10. Marius
11. Maurolycus
12. McClure
13. Mercurius
14. Messala
15. Mortis, Lacus
16. Neander
17. Nectaris, Mare
18. Petavius
19. Piccolomini
20. Plato
21. Plinius
22. Posidonius
23. Prinz
24. Proclus
25. Ptolemaeus
26. Pythagoras
27. Recta, Rupes
28. Reiner Gamma
29. Rheita Valley
30. Ross
31. Rümker, Mons
32. Schickard
33. Schiller
34. Serenitatis, Mare
35. Sirsalis
36. Theophilus
37. Tycho
38. Vertis, Lacus
39. Wargentin
40. Wollaston