The Lunar Observer

A Publication of the Lunar Section of ALPO

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November 2022

In This Issue

Online readers, click on images for hyperlinks

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Lunar Reflections

Greetings to all this November 2022. I hope that this finds you doing well. Thanks to our great contributors, we have another great issue of *The Lunar Observer*. In this issue, we have 165 observations sent in from 33 contributors from 12 countries! Articles this month include tours of lunar topography by Rik Hill, Robert H. Hays, Jr. and Alberto Anunziato. Alberto takes us on a tour of the Eratosthenes region in his Focus-On article. Check that out with its prose, images and drawings. Guillermo Scheidereiter brings up the connection between Werewolves and the Moon in his essay, a most interesting read again. As always, Tony Cook leads us on a tour of Lunar Geologic Change and a study of Buried Basins and Craters. Many thanks to all of these contributor and to all who submitted images and drawings.

As successful as *The Lunar Observer* is and as much as it has grown, we need to consider our future. It has been most welcome to see our contributors Michel Deconinck, Walter Elias and Rik Hill bring up lunar observing that they have done recently with youth and the public at large. As the world gets a bit closer to lunar missions again, it is very important that the public gets excited about space exploration. I can think of nothing that will do this better than getting the public to view the Moon through our telescopes!

Please remember to look through your files to find lunar observations of the crater Petavius. Please send them to Alberto and myself by December 20th. Until then...

Clear skies,
-David Teske

See page 7

Lunar Topographic Studies

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Observations Received

Name	Location and Organization	Image/Article
Jonás Alonso	Oro Verde, Argentina	Images of Rupes Recta and Taruntius.
Alberto Anunziato	Paraná, Argentina	Articles and drawings Brights and Shadows Around Plato, An Impressionists View of Galilaei and Galilaei A and Focus-On: Ever Changing Eratosthenes.
Rafael Benavides	Cordoba, Spain	Images of Eratosthenes (2).
Massimo Bianchi	Sassari, Italy	Drawing of Eratosthenes, images of Eratosthenes (2).
Ioannis (Yannis) A. Bouhras	Athens, Greece	Images of Copernicus and Meton.
Ariel Cappelletti	Córdoba, Argentina	Image of Eratosthenes.
Francisco Alsina Cardinalli	Oro Verde, Argentina	Images of Archimedes and Mare Crisium, Eratosthenes (4).
Jairo Chavez	Popayán, Colombia	Images of 33% Waxing Crescent Moon, 98% Waning Gibbous Moon and 42% Waning Gibbous Moon.
Maurice Collins	Palmerston North, New Zealand	Images of Copernicus, 9-day-old Moon, Sinus Iridum, 10-day-old Moon, Gassendi, 11-day-old Moon, Aristarchus (2) and 13-day-old Moon.
Michel Deconinck	Aquarellia Observatory, Artignosc-sur-Verdon - Provence - France	Drawing of Eratosthenes, images of a 3-D model of Eratosthenes and drawings of the Waxing Crescent Moon (2).
Massimo Dionisi	Sassari, Italy	Images of Gruithuisen, Rümker (2), Kies (3), Herschel, Marius, Reiner, Wollaston, Menelaus, Arago and Capuanus (2).
Walter Ricardo Elias	AEA, Oro Verde, Argentina	Images of Albategnius, Aliacensis, Aristoteles, Aristarchus, South and Beaumont.
István Zoltán Földvári	Budapest, Hungary	Drawings of Hell, Montes Cordillera, Lyot and Gill.
César Fornari	Oro Verde, Argentina	Images of Proclus and Endymion.
Desiré Godoy	Oro Verde, Argentina	Image or Eratosthenes.
Facundo Gramer	AEA, Oro Verde, Argentina	Image of Theophilus.
Marcelo Mojica Gundlach	Cochabamba, Bolivia	Images of Eratosthenes (5).
Robert H. Hays, Jr.	Worth, Illinois, USA	Article and drawing Eratosthenes.

Lunar Topographic Studies

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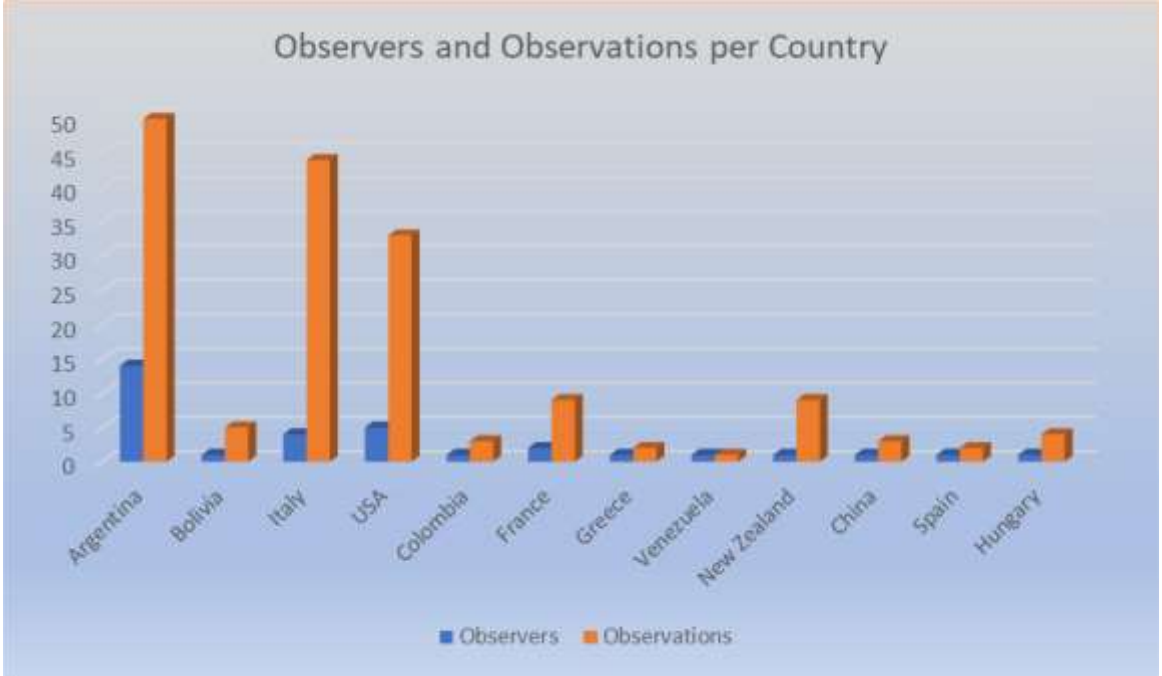
Observations Received

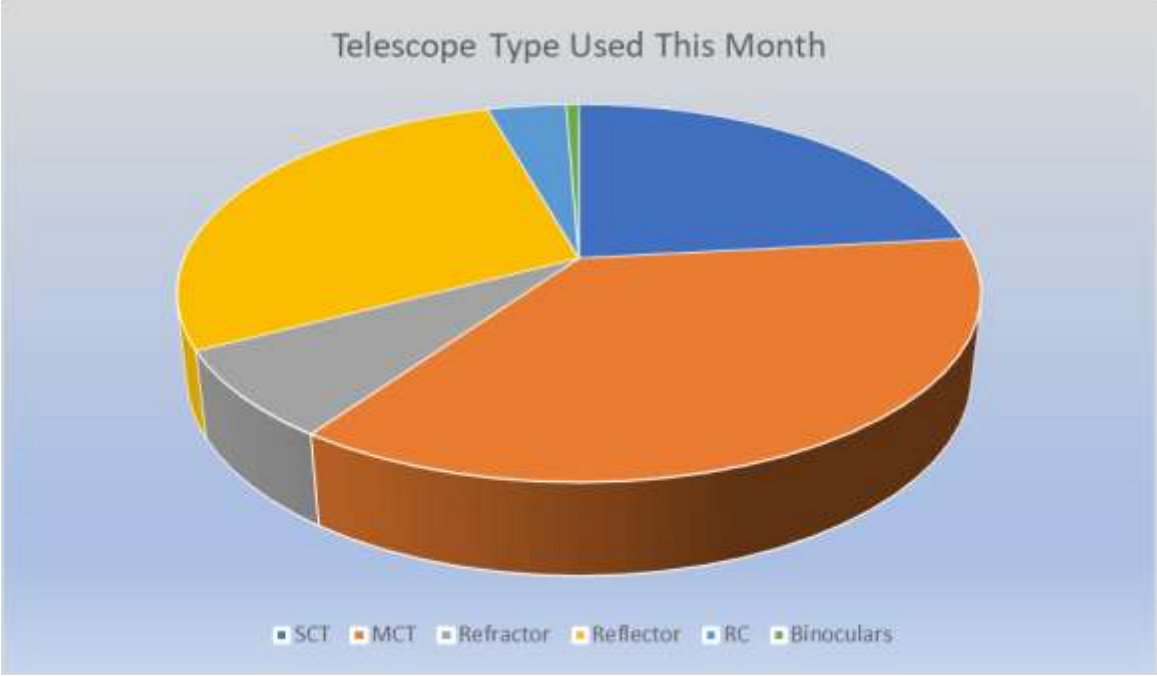
Name	Location and Organization	Image/Article
Rik Hill	Loudon Observatory, Tucson, Arizona, USA	Article and image Mare on the Edge, Vallis Rheita and mages of Eratosthenes (14)
Leguiza, Eva	AEA, Oro Verde, Argentina	Images of Mons Piton and Stöfler.
Ron May	El Dorado Hills, California, USA	Images of waxing crescent Moon and Mercury occultation (4).
KC Pau	Hong Kong, China	Images of Eratosthenes (2), Posidonius and Pallas.
Jesús Piñeiro	San Antonio de los Altos, Venezuela	Image of Eratosthenes.
Raúl Roberto Podestá	Formosa, Argentina	Images of Theophilus (3) and Posidonius.
Eugenio Polito	San Pancrazio Salentino, Italy	Images of Albategnius, Alphonsus, Archimedes, Clavius, Eratosthenes, Gyldén Valley, Maginus, Manilius, Montes Apenninus, Pallas (2), Plato, Triesnecker, Wallace, Walther (2) and Werner.
Erica Reisenauer	Oro Verde, Argentina	Images of Curtius and Alphonsus.
Guido Santacana	San Juan, Puerto Rico, USA	Images of Clavius, Sinus Iridum (2), Eratosthenes (2) and Copernicus.
Germán Savor	Oro Verde, Argentina	Images of Vallis Alpes and Aristoteles.
Guillermo Scheidereiter	LIADA, Rural Area, Concordia, Entre Ríos, Argentina	Images of Eratosthenes (2), Maginus, Proclus, Maurolycus (2), Archimedes, Halley, Endymion, Copernicus, Bullialdus, Clavius, North of Moon, sketch of Bullialdus, and article The Moon and the Werewolf.
David Teske	Louisville, Mississippi, USA	Images of Eratosthenes (11).
Román García Verdier	Paraná, Argentina	Image of Eratosthenes.
Fabio Verza	SNdR, Milan, Italy	Image of the waxing crescent Moon, First Quarter Moon, Clavius, Hainzel, Copernicus, Hayn, Gassendi, Plato, Sinus Iridum and Vallis Alpes.
Christian Viladrich	Nattages, France	Image of Atlas, Lacus Mortis, Posidonius (2), Maskelyne Domes and Mare Crisium.

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

November 2022 *The Lunar Observer*
By the Numbers

This month there were 165 observations by 33 contributors in 12 countries.





Vallis Rheita

Rik Hill

As some of you know, I take telescopes out to show the kids things in the sky. With the Moon, Jupiter and Saturn it should be quite a show. So tonight, I took out the 4" Celestron Mak-Cass to shake out the cob-webs after it had been in just sitting for a year. The Moon gave me a good target and I will set up the Celestron 4", the Celestron 5 and the Questar on Monday night. I urge you all to do this. It's really a thrill when people bring their children who looked through your telescopes when they were children!

Here's one of the images I got with the 4".

Vallis Rheita, *Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2022 October 30 01:23 UT, colongitude 331.2°. 4 inch Celestron Maksutov-Cassegrain telescope, 665 nm filter, SKYRIS 132 M camera. Seeing 7-8/10.*

Note: Even if it isn't Halloween, get those kids out under the stars!

International Observe the Moon Night
October 1, 2022
Contributed by Michel Deconinck

Above, a world map of over 4,000 private and associative participants in the 2022 International Observe the Moon Night..

Right, Bookmark for the first 2012 International Observe the Moon Night painted by Michel Deconinck.

Left, Lunar stamps and lunar sketch. 2017 by Michel Deconinck.

Lunar Topographic Studies

The Moon and the Werewolf

Guillermo Scheidereiter

Don Eusebio was calm drinking mate at the door of his humble adobe house the morning that the town commissioner approached, accompanied by a group of officers and local residents, to notify him of his exile for besieging the fields bordering the jungles of Montiel, turned he into a werewolf. My father was a small child when he witnessed that dantesque scene, where he remembered himself confused by the situation and the dream that refuses to dissipate in the early hours of the morning.

The first complaint at the police station was made by Doña Eulalia who, together with her children, Irma, Domitila and Amado, were returning to the farm by zulky along the rural road, after making purchases in the town store. It was winter and the night had advanced not being more than seven in the evening. The full Moon was rising above the horizon dominating the night scene, appearing and disappearing between clouds behind the trees. Eulalia felt a shiver down her spine when crossing the gate of the Las Achiras rural ranch, near Don Eusebio's house, when she saw the wolf's red eyes and ruffled black mane. The woman and children froze in shock and fear. They only reacted when the horse pounced on its hind legs, neighed and started a wild gallop frightened without the woman having control of the reins; the wolf had emitted a defiant scream, a mixture of howl and warning, which had startled the horse.

It did not take long for the complaints to be added to the town police station. Some claimed to have found the remains of sheep, calves and foals that were prey to the werewolf; others said they had heard the howling that came from Don Eusebio's house on nights with a full moon; and there was also the gaucho who recounted having been attacked by the wolf when he was returning from the tavern after drinking wine with the rural peons from the neighboring ranches. He assured that in the look of the beast he could recognize the eyes of Don Eusebio.

Moon between clouds

[1]Characteristic infusion of Argentina and neighboring countries.
[2]It is not exactly a jungle, but a natural forest with a tangled and thorny appearance that is located in the north center of the Province of Entre Ríos, Argentina.

And it is that the rural peons did not lack reasons to believe that, because history is full of legends about men who become wolves. It can probably be attributed to Petronius (born between 14 and 27 in Massalia, now Marseilles and died between 65 and 66 in Cumae), one of the first literary stories about a soldier who turns into a wolf in the light of the moon, narrated in his work The Satyricon, a novel written in Latin:

"Apoculamus nos circa gallicinia, moon lucebat tamquam meridie. Venimus inter monimenta: homo meus coepit ad stelas facere, sedeo ego cantabundus et stelas numero. Deinde ut respexi ad comitem, ille exuit se et omnia vestimenta secundum viam posuit. Mihi [in] soul in nose they, stabam tamquam mortuus. at ille circumminxit vestimenta sua, et subito lupus factus est. nolite me iocari putare; ut mentiar, nullius patrimonium tanti facio. sed, quod coeperam dicere, postquam lupus factus est, ululare coepit et in silvas fugit."

Which translates to:

"We go out at night, at the first crowing of the rooster; there was such a moonlight that it seemed broad daylight. We arrived at the area of the tombs: my man shot through the funerary steles; I feel myself humming a melody and counting said wakes. Then, turning to my companion, I see that he had undressed and had left all his clothes on the edge of the road. Only a faint breath remained on the tip of my nose; I remained motionless as a dead man. At this, he formed a circle of urine around his clothes and instantly turned into a wolf. Do not think that I play a joke on you; I wouldn't tell a lie for all the gold in the world. But, going back to my story, when he had changed into a wolf, he began to howl and disappeared into the forest."

However, the stories of werewolves go back to Greek and Roman mythologies, to the figure of Lycaon, (from which the word lycanthrope comes), the first werewolf, son of Pelasgus and Melibea and king of Arcadia.

Jupiter and Lycaon, Jan Cossiers, 1636-1638, Museo del Prado

Ovidio Nasón in his work, Metamorfosis, relates that Lycaón serves human meat to Jupiter and this one, full of anger for such impious behavior, turns Lycaón into a wolf:

"territus ipse fugit nactusque silentia ruris exululat frustraque loqui conatur: ab ipso colligit os rabiem solitaeque cupidine caedis vertitur in pecudes et nunc quoque sanguine gaudet. In villos abeunt vestes, in crura lacerti: fit lupus et veteris servat vestigia formae; Canities eadem est, eadem violentia vultus, idem oculi lucent, eadem feritatis imago est."

Whose translation is:

"Terrified he flees and reaching the silences of the field howls and in vain tries to speak; his mouth draws rage from himself, and the desire for his customary slaughter uses it against the herds, and now also in his blood it rejoices. His clothes become hairs, his arms become legs: he becomes a wolf and retains the traces of his old form. The grayness hair is the same, the violence of his face is the same, the eyes look the same, the image is the same as the fierceness."

Pliny the Elder, in Book VIII of his Natural History, relates:

"Evantes, who deserves credit among the authors of Greece, writes that the Arcadians tell that a member of the family of a certain Anto, chosen by lot from among his people, is taken to a lagoon in the region and that, after hanging his dressed as an oak, he goes swimming and goes to some solitary places and transforms into a wolf, uniting with others of the same species for nine years. And they add that, as long as he has kept away from men, he returns to the same lagoon and, after swimming across it, recovers his form, having added to his former appearance the aging of nine years; and even that he recovers the same clothes."

Although the myth seems to reach back to an age as old as humanity itself, there are some common and persistent elements in the legends: the forest, the night and the Moon. Man, perhaps intimidated by the mysterious, menacing, cunning and majestic figure of the wolf and his association with the night (where the Moon always reigns), builds around the fable the settings and spectacular and spectral characteristics that give the forms with which that the myth of the werewolf is known today.

An ancient and diffuse story tells that the Moon descended to Earth to satisfy her curiosity to know the secrets of her older sister. Enchanted by the nocturnal landscapes, the Moon got tangled up in the trees while she played, getting trapped, until a wolf freed her. After a night playing together in the forest, the Moon, in love with the Wolf, returned taking her shadow with her. Since then, the Wolf howls at the Moon imploring for her shadow.

In old legends and in the figure of the wolf "calling" the Moon is, perhaps, where the supposed link between the Moon and the werewolf has its roots. Specifically, the association of the Moon with the transformation of man into a wolf and the influence that it exerts on such a metamorphosis dates back to the 13th century. Indeed, Gervase of Tilbury (1155–1234), wrote in his famous work Otia Imperialia:

"Vidimus enim frequenter in Anglia per lunationes homines in lupos mutari, quod hominum genus gerulfos Galli nominant, Anglici vero werewlf dicunt: were enim Anglice virum sonat, wlf lupum."

Translation:

“In England we have often seen men change into wolves according to the phases of the moon. The Gauls call men of this kind gerulfi, while the English name for them is werewolf, being “were” the English equivalent of vir ['man']."

Among the causes for which a man would become a wolf, there are two related to the Moon: being born in the full moon and sleeping naked in the light of the full Moon. During the middle ages and the modern age, the myth terrified people and the werewolf seems to have stalked them on nights with a full moon on lonely roads. The following engraving was made by Maurice Sand, a French writer, artist and entomologist, in 1857. There you can see a werewolf (Loup-Garou), attacking a man in a night scene. The full Moon rises above the horizon giving light to the scene:

Le Loup-Garou, engraving by Maurice Sand, Magasin pittoresque, 1857.

Although the Middle Ages were marked by ecclesiastical trials of witches and werewolves (suffering from hirsutism was sufficient cause to end up at the stake), its relationship with the Moon does not seem to be very present until modern literature and cinema take up that link, probably rescuing him from Otia Imperialia. In the book “The Werewolf of Paris” (1933), by the American writer Guy Endore, the Moon appears as the protagonist in seven nocturnal scenes. An example is the following:

“But night found him still wandering, unsatisfied, past dark farmhouses where the dogs barked strangely at his passing scent. He sought the shelter of the woods. His body was racked with hunger. He yelped and whined at the moon that glittered coldly, cut by the silhouette of leaves and branches”.

It is fair to say that this great work was preceded (and perhaps inspired) by the short novel by French writers Emile Erckmann and Alexandre Chatrian, "Hugues le loup" (Hugo the Wolf), from 1859, where the lycanthropic bases that Endore would use. The Moon is alluded to in no less than twenty scenes. The following is one of them:

"The window closed again. I had to wait another good quarter of an hour, looking at the deserted street, listening to the weather vanes scream on their rusty axles and, in the distance, the howl of a farm dog serenading the moon."

And it is a sin of indifference not to bring here the myth of the vampire (close to the myth of the werewolf), in the well-known literary figure of Dracula (1897), the famous novel by Bram Stoker, where the Moon is evoked 49 times as the protagonist of the night and source of light, being named five times on the same page and citing it on up to five consecutive pages (the statistical distribution may vary depending on the edition, but not the number of scenes in which it is cited). The following passage from Stoker's work refers to the idea that the Moon exerts a particular influence on the wolf:

"All at once the wolves began to howl as though the moonlight had had some peculiar effect on them."

Precursor of the previous one, "Carmilla", by the Irish writer Joseph Sheridan Le Fanu, is a very short novel written in 1872, where the Moon is directly associated with the coming out of the vampire:

"But a Moravian nobleman who came to study this part of the country, heard about these events and, being an expert in the matter like many of his compatriots, offered to rid the people of that obsession. And here's what he did: One night with a full moon, he climbed the chapel tower shortly after sunset. He stood guard there until he saw the vampire come out of the tomb and. strip off his white shroud to go to the town, in order to torment its inhabitants."

Here, the Moon is referenced eleven times and six of them on the same page. In the following dialogue, a character in the play highlights the influence of the Moon:

"Tonight," he said, *"the moon is full of magnetic influences. See how the windows shine with a silvery glow, as if unseen hands have illuminated the rooms to welcome spectral guests."*

Vampirism and lycanthropy, together with the dominance of the Moon in these transformations, spread in the 20th century, reaching cinema, theater, general narrative, comics, music, etc., to the point that in the today no one would disassociate such figures (werewolf and Moon, vampire and Moon). This shows a deep contradiction with the meaning that the Moon has in painting or in the romantic movement, where the melancholy character of its natural beauty and its link with contemplation and love are exalted.

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[3]Other works probably influential in Endore's were "The White Wolf of the Hartz Mountains" (1839) by Frederick Marryat and "The Mark of the Beast" (1890) by Rudyard Kipling.

The European legends that give rise to the myth, traveled to the new world and mixed with the beliefs of the native inhabitants of America. In Guaraní mythology, the Lobisón (also luisón or lobizón), is a creature half man and half beast, seventh son of Tau and Keraná, who suffered a curse that turned their seven children into monsters. They are: Teyú Yagua, Mbói Tui, Mañai, Jasy Jateré, Kurupí, Ao Ao and, the aforementioned, Luisón. With the arrival of Europeans to the South American continent, it was not long before the werewolf was associated with the lobisón, to the point that, at present, both are synonymous in popular culture; in particular, in Argentina.

Officer Martínez was in charge of escorting Don Eusebio away from the district, until he was sure he was far enough away not to return. The man carried his few belongings and they both started walking. Don Eusebio, with a sad but haughty face, was walking and Martínez on horseback. With the slow walk, night fell and the full moon began to reign over the darkness. Upon reaching the grasslands near the Gualeguay River, where the forests of espinillos, palms and vines give way slowly to the cattails, the surly and strange cry of an animal was heard. Martínez felt a chill run down his back and the snort of the horse confirmed his fear. Don Eusebio, who had been silent for a long time, said: *"No se asuste, oficial, es un zorro potrillo que vi con su pichón hace dos noches atrás cerca de la estancia"* ("Don't be scared, officer, it's a *foal fox* that I saw with his cub two nights ago near the ranch") . At that moment, the clouds covered the Moon and a shadow became entangled in the wind, in the tops of the espinillos and in the thickets of the reeds. Martínez, disoriented in the winter mist, lost sight of Don Eusebio, but a noise in the tangle of the forest bordering the river made his skin crawl and a ray of moonlight made two red eyes shine like blood. Without hesitation, the officer undertook the return at full gallop and a cold fear accompanied him until the next day.

After recounting his story to the bailiff, assuring that Don Eusebio had turned into a wolf when he reached the grassland, near the river, the sheriff decided that he had to end the root problem: look for the werewolf and kill him. This is how an unprecedented company began in the place that they called "the hunting of the lobisón". This bore fruit three nights later when officers and neighbors, carrying flashlights and torches, and with the help of brave hunting dogs, found the beast and killed it with a shot to the forehead. As a precaution, they nailed a silver cross (which they brought from the village church) to the animal's chest. The wolf was large, with reddish fur and black manes. In vain they waited for him to recover the human form of Don Eusebio and ended up burning his remains in a bonfire. The laborers and residents of the farms, as well as the town police, recovered their tranquility and the evenings and nights of the rural countryside returned to normal.

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[4]The maned wolf is known by the names of foal fox, maned wolf or Aguará Guazú.

A long time later, a stranger told my father that, in the vicinity of Laguna del Iberá, in the Province of Corrientes, Argentina, many years ago, he met a farm laborer who was accompanied by a lobo guará pup. Both men ate barbecue, drank mate and fraternally shared stories of gauchos, trips and places. When the moon came out, the meek lobo guará ran and played at night among the trees, affectionately rubbing his owner again, to run again through the forest. The farmhand told him that the mother of his "*aguará guazú*" was killed in Entre Ríos, in the fields bordering the Montiel jungles, near Las Achiras runch. He was always cheerful, running around and emitting his characteristic squawk when there was a full moon. The stranger told my father that the good gaucho from Entre Ríos was called Eusebio and the beautiful specimen of the *lobo guará* responded to the name of Lobisón.

Aguara guazú, maned Wolf, lobo guará or zorro potrillo (foal fox)

Brights and Shadows Around Plato

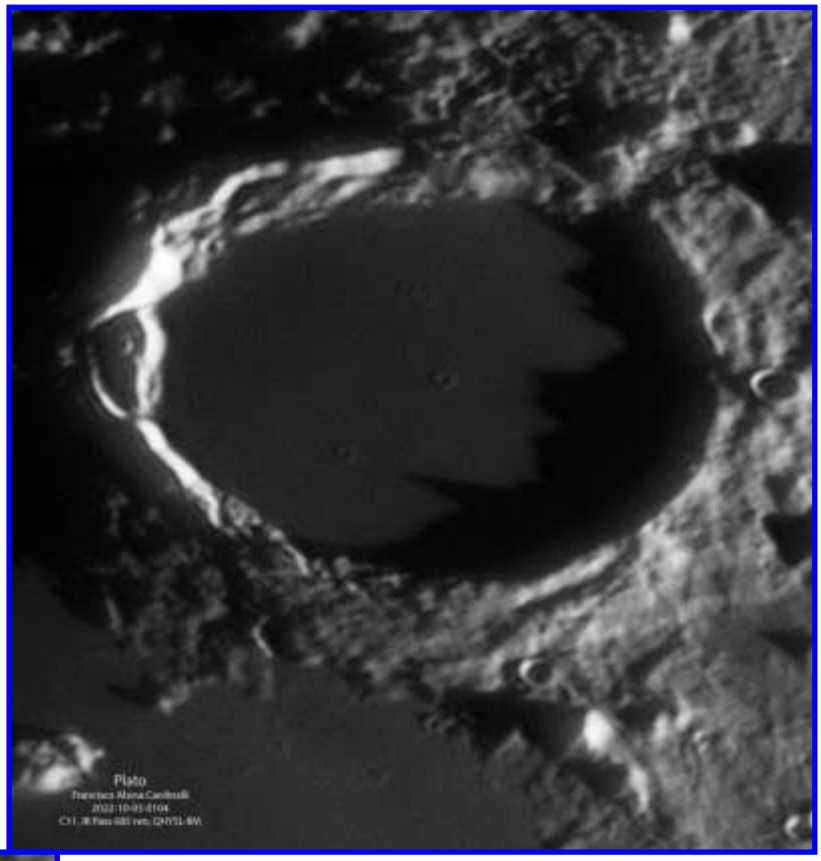
Alberto Anunziato

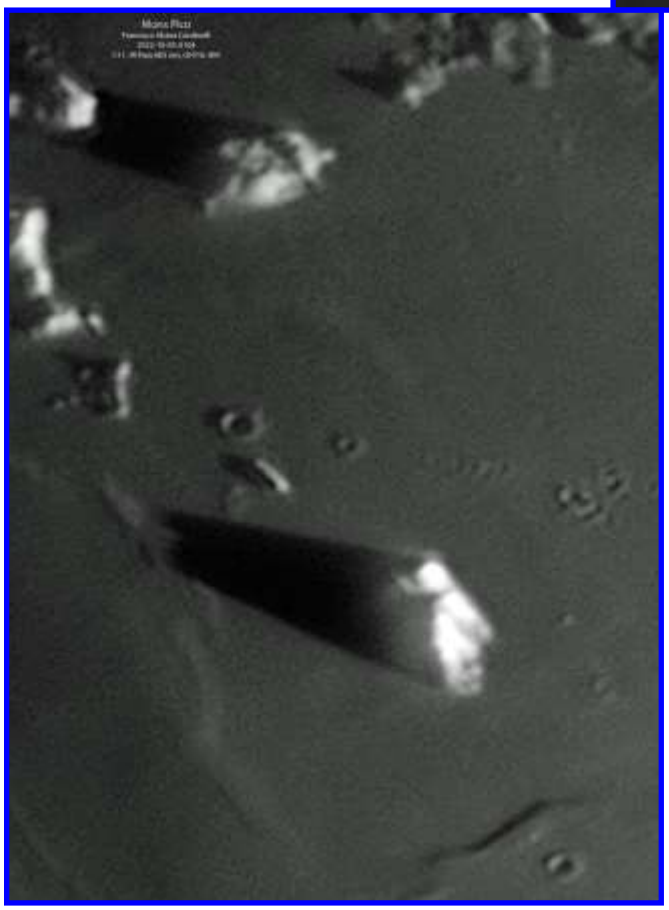
IMAGE 1 was obtained by Luis Francisco Alsina Cardinalli from the Galileo Galilei Observatory in the city of Oro Verde, the most important observatory in my province of Entre Ríos, from the 11-inch secondary telescope. The other images obtained on the night of October 3 can be found in the pages of this edition of our magazine. These images impressed me with the degree of detail that is perceived (for example the mounds on the floor of Proclus, generally canceled by the brightness of the edge). I chose IMAGE 1 to comment from the point of view of visual observation. Yes, visual observation of a photographic image. High-definition images can be enlarged (as if we applied a more powerful eyepiece) and transformed into new "microscopic" images that provide details that the original camera-telescope combination would not allow to capture directly, images that in turn can be enlarged and be still profitable, surely with less quality.

Image 1, Plato, *Francisco Alsina Cardinalli, Oro Verde, Argentina. 2022 October 03 01:04 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*

Lunar Topographic Studies

Plato clearly dominates the scene in our image, and Plato is always a joy to watch, but IMAGE 2 is really interesting. I clarify that in IMAGE 2 I have slightly changed the brightness and contrast of the original IMAGE 1 obtained by Francisco. The 4 largest craterlets on the floor of Plato are clearly perceived, we can even distinguish the walls most illuminated by the Sun. The edge of the characteristic triangle of luminous rim, which occupies much of the west wall, a block disconnected from the sheer edge and which must have slid down in gigantic avalanches whose causes we do not know, it shines brightly, but what I had never observed is that inside it there is what appears to be a crater or, more likely, a landslide that has caused a kind of ravine that, as the highest part, receives the first rays of the Sun. Another detail of IMAGE 2 that surprised me is that it can be distinguished is the peak that causes the extensive shadow in the form of needle on the floor of Plato, if you look at the rim of Plato to the left you will see a brighter area that casts a small shadow on the inside of the rim.



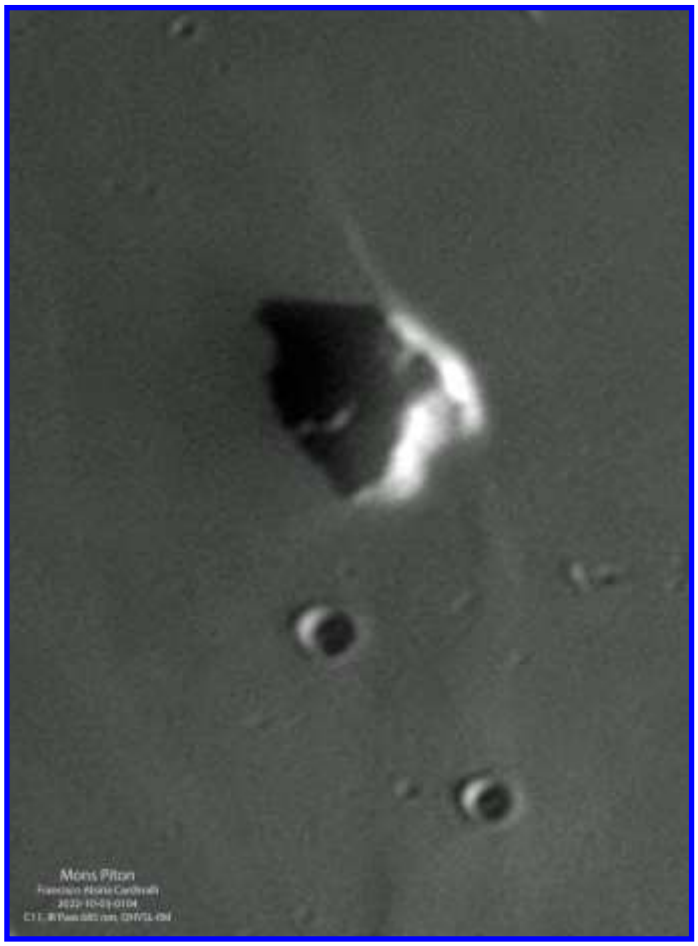


In IMAGE 3 we see Mons Pico. The shadow is very characteristic, who does not remember marveling at the combination between the elongated shadow and the intense brightness of Mons Pico, but seeing this detail was very productive for me as a visual observer. You can see the gradations in brightness that are so difficult (impossible I would say) to represent in a drawing (although you can see them) of these very bright peaks. This great image documents them perfectly. In addition, we can see a kind of gorge around the highest and brightest peak.

Image 2, Plato (above) and Image 3, Mons Pico (left), *Francisco Alsina Cardinalli, Oro Verde, Argentina. 2022 October 03 01:04 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera. These are close-ups of image 1.*

Lunar Topographic Studies

IMAGE 4 is another detail and shows another bright and familiar peak: Mons Piton. With my small telescope Mons Piton looks like two perpendicular bright lines, which we see in this detail as the brightest areas, but we also see other bright areas that mark other secondary peaks. This image showed me which is the highest peak of the complicated Mons Piton, which is the one that points to the south. Finally, IMAGE 5 shows highlights and shadows, high and low, of the monumental ejecta that devastated the intermediate zone between what is now Mare Imbrium and Mare Frigoris when the impact that formed the Imbrium Basin occurred.



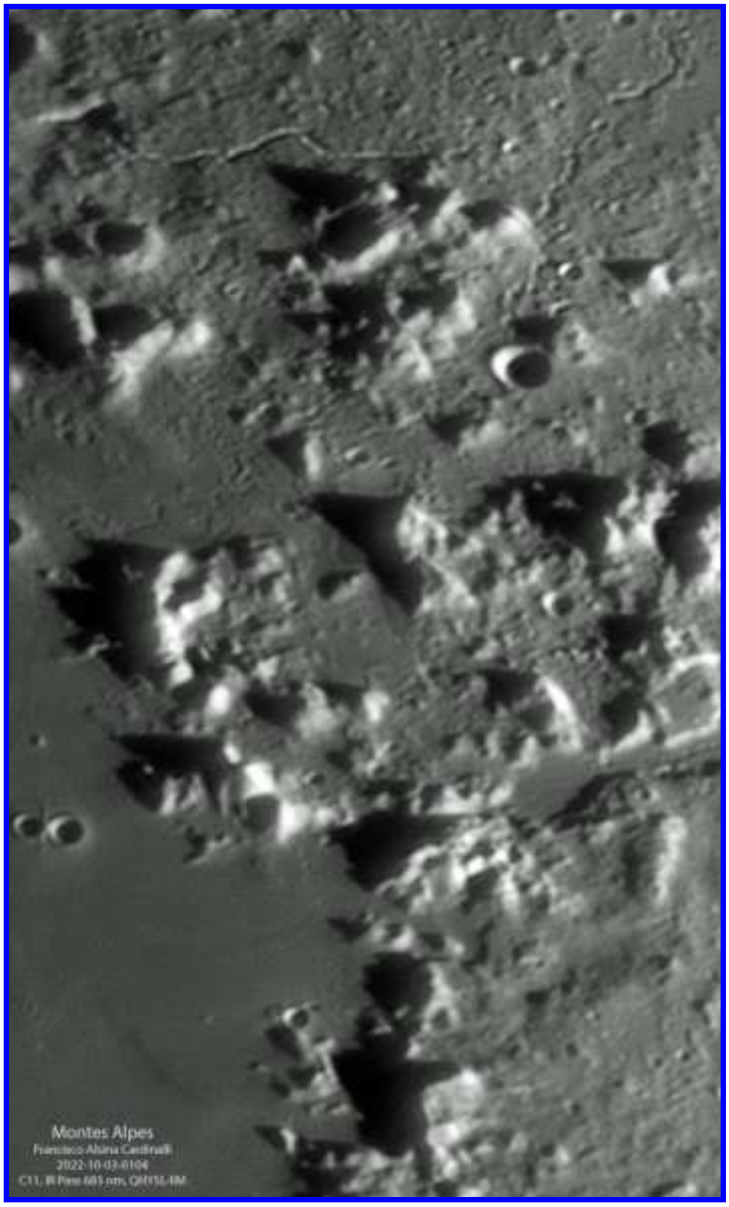


Image 4, Mons Piton (above) and Image 4, Montes Alpes (left), *Francisco Alsina Cardinalli, Oro Verde, Argentina. 2022 October 03 01:04 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera. These are close-ups of image 1.*

Mare on the Edge

Rik Hill

First visible just 3 days after New Moon, Mare Crisium (638 km dia.) is one of the earliest naked eye features that can be spotted every lunation. It's the big quasi-circular dark area that dominates this image. If you look carefully, you'll notice it's actually a rough hexagon. The bright crater on the west (left) side is Proclus (29 km) and as you might expect from all the bright ejecta, is young, of Copernican age (less than 1 billion years old). Notice the rays and the bright fan north and south of the crater. While the brightness may be caused from ejecta made of a lighter colored rock, more likely it's finely pulverized which would by itself increase the albedo (reflectivity) of the material.

Directly above Proclus is the large crater Macrobius (66 km). Moving east, the bright crater on the northeast (upper right) edge of Crisium is Eimmart (48 km) and it sits on the northern edge of a strange mare feature Mare Anguis, shaped like a sideways "W" with Eimmart B (12 km) on its southern end. Moving down the eastern edge of Crisium there is a large crater on the southeast edge of Crisium with dark mare material on the west side of its floor. This is Condorcet (77 km) and it leads to a crater at the bottom of this image with a fully dark floor. This is Firmicus (58 km) and just above this crater is a small dark flat area that is a separately named feature, Lacus Perseverantiae (15x70 km). To the right of Firmicus are patches of mare material that are the northern reaches of Mare Undarum.

Further east (right) is another large area of mare patches, Mare Marginis. Various sources give its *"diameter"* as 358 to 371 km but it is anything but round. The Mare is bounded on the south edge (at the very bottom of this image) by the large crater Neper (144 km) partly cut off by the edge of this image and then above the Mare is a circular dark area that is the large crater Goddard (93 km). We can see these features here because of the libration at the time of this image where this edge of the Moon was tilted towards the earth a little more than usual allowing a peek around the edge so to speak. Learn what the libration is on different dates and you will be able to view up to 59% of the Moon's surface!

Mare Crisium to Mare Marginis, *Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2021 December 12 01:51 UT. 8 inch TEC f/20 Maksutov-Cassegrain telescope, 610 nm filter, SKYRIS 132 M camera. Seeing 7-8/10.*

An Impressionist View of Galilaei and Galilaei A

Alberto Anunziato

Galilaei is a little-known crater, as a tribute to who showed us the true nature of the Moon with the first telescopic observation is quite modest, a rather nondescript crater of 15 kilometers in diameter in the middle of the lavas of Oceanus Procellarum, relatively close to Reiner Gamma. With favorable illumination, I mean the oblique rays of the sun rising over these two craters, and with a small instrument like mine, the impression they gave is that of small bright mounds (IMAGE 1). Only when our eyes got used to the details of the area (visual observation always implies a process of gradual acquisition of information) did we perceive the very subtle shadow that separated the stronger brightness of the crater walls from the weaker brightness of what it looked like the slopes of two elevations on which Galilaei and Galilaei A would be found. The topography between the two craters appeared tortuous with shadows and brighter areas. What looked like a wrinkle ridge ended at the northern end of Galilaei A. Of course, what I most wanted to confirm is whether these craters are in an elevated area, which the maps don't show.

Image 1, *Galilaei and Galilaei A, Alberto Anunziato, Paraná, Argentina. 2022 October 09 04:25-04:45 UT. Meade EX105 mm Maksutov-Cassegrain telescope, 154x.*

The next day I turned to the LROC Quickmap. IMAGE 2 illustrates the area using one of the Filter Layers available with the Lunar Orbiter Laser Altimeter (LOLA) data, the SLDEM2015 Azimuth, which shows the baseline of the surface slope, combined with the indication of the wrinkle ridges in the area (orange lines). If we add the topographic profile (IMAGE 3) we see that, indeed, both craters are higher than the adjacent surface, even higher than the ridge on the left, which is not visible in IMAGE 1 because of the shadows. It seems that this vision of bright mounds is due to the combination of the height at which the craters are located and their eastern walls that receive the first rays of the Sun. This area is very little known. The only complete description is found in the wonderful text and drawing by Robert H. Hays, Jr. in the January 2016 issue of "The Lunar Observer," to which I refer for details of the shadowless area that marked my impressionistic observation.

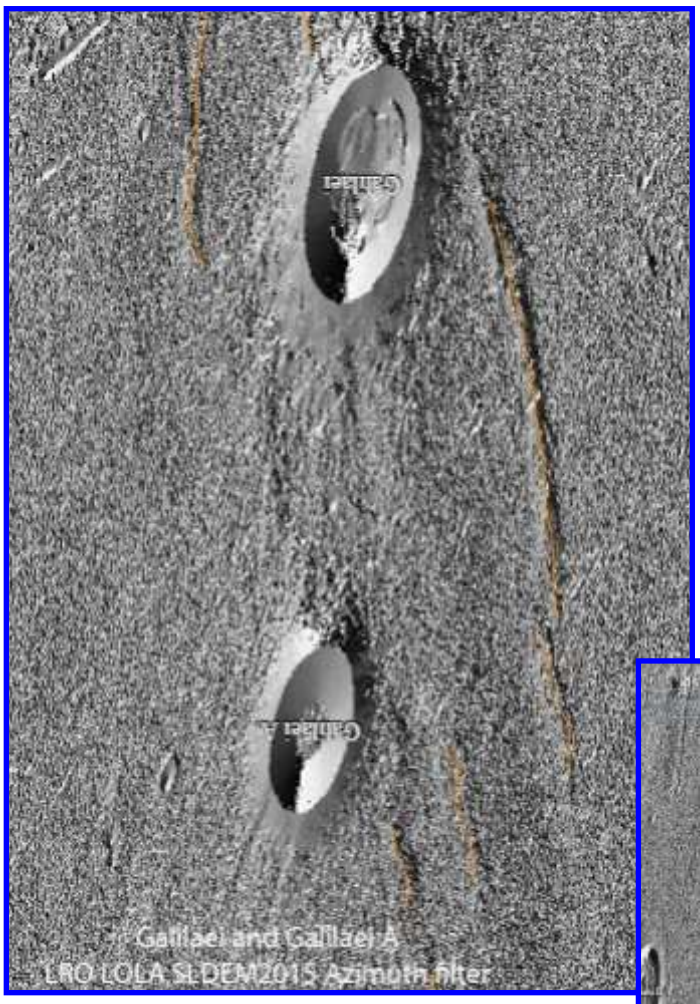


Image 2, Galilaei and Galilaei A*, LRO LOLA SLDEM2015 Azimuth filter. North is down, west is right.*

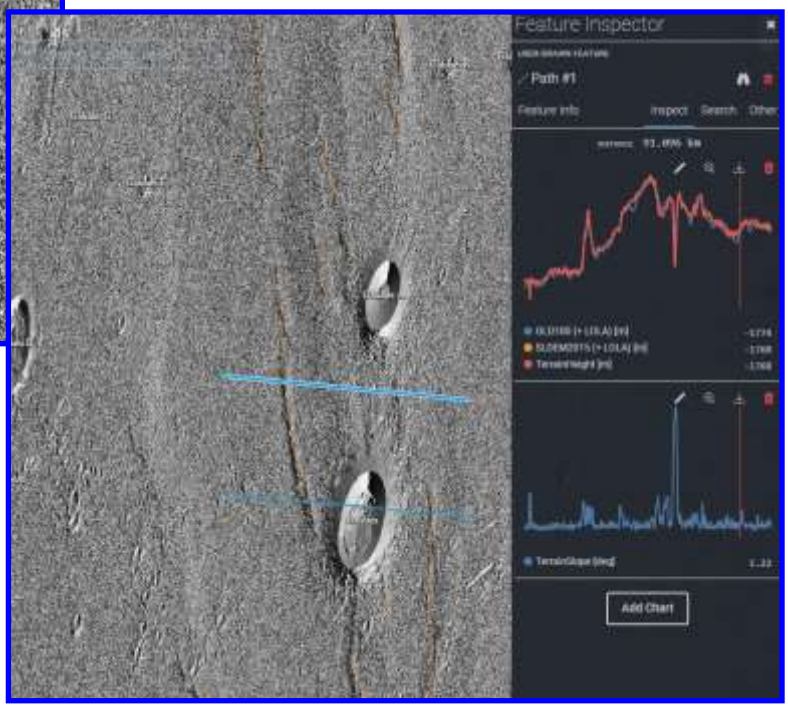


Image 3, Galilaei and Galilaei A*, LRO elevation plot.*

Ever Changing Eratosthenes

Alberto Anunziato

Eratosthenes (59 kms diameter) is a model impact crater, albeit "unfairly" overshadowed by the younger Copernican craters. We'll try to do it some justice.

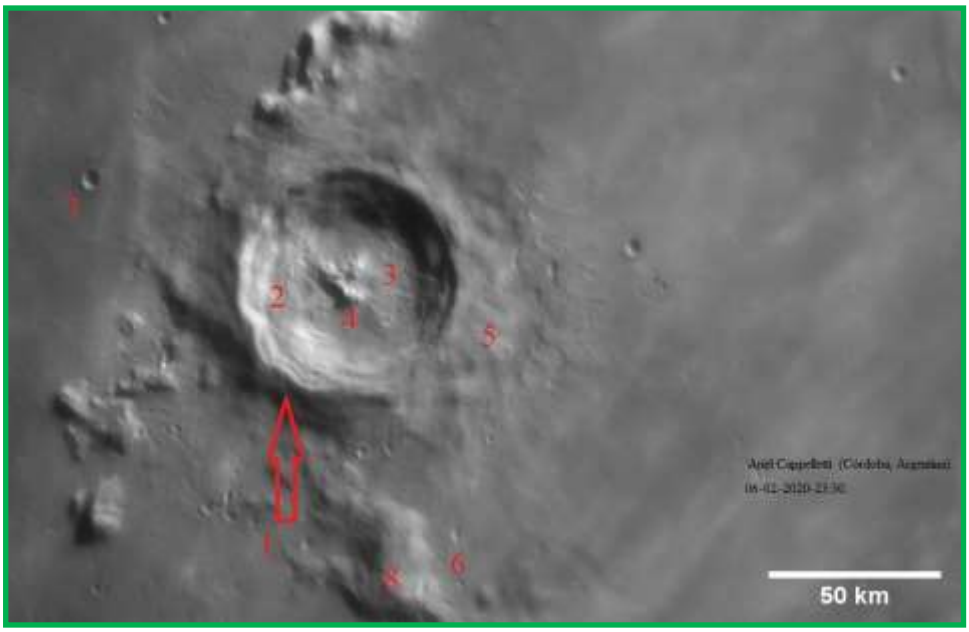


Image 1, Eratosthenes, *Ariel Cappelletti, Córdoba, Argentina. 2020 June 02 23:30 UT. 254 mm Newtonian reflector telescope, ZWO ASI178 MC camera.*

1.- Topography.

Peter Grego (page 150) briefly and precisely describes the topography of the impact crater that is Eratosthenes, which we can see in the IMAGE 1: "It has a sharp rim (1) with wide, internally terraced walls (2) and a hilly floor (3) above which rises a group of three individual mountains (4). Eratosthenes displays a considerable degree of external impact sculpting (5), and radial ridges (6) and secondary impact craters (7) can be traced across the plains of Mare Imbrium to the north and Sinus Aestuum to the southeast. A substantial mountain block (8) links the southwestern flanks of Eratosthenes to the northeastern border of Stadius". In this image, the arrow indicates the area where it is most clearly seen how high the outer edge of the walls of Eratosthenes is and which gives it that deep crater appearance. We can also observe that "On the S. there is a narrow break in the wall, and the S.E. section of it seems to overlap and extend some distance beyond the S.W. section" (Elger, page 69). In IMAGE 2 we can see these features in more detail: the rugged outer edges with shadows and bright spots, the terraced inner walls, and the central peaks in extraordinary detail (including a crater on the rightmost central peak). Elger describes them this way: "The central mountain is made up of two principal peaks, nearly central, from which two bright curved hills extend nearly up to the N.E. wall, -the whole forming a V-shaped arrangement". We also see that "The border on the S.E. is remarkable for the great width of its glacis. Eratosthenes exhibits a marked departure from circularity, especially on the W., where the wall consists of two well-marked linear sections, with an intermediate portion where the crest for 20 miles or more bends inwards or towards the centre". "Glacis" is an old and very descriptive term for the outer rampart of ejecta of craters with more complex morphology, which derives from the sloping part of a fortification wall (remember in "The British grenadiers": "and we with hand grenades, we throw them from the glacis"), which undoubtedly says a lot about what ancient observers saw on the surface of the Moon: a world almost similar to our own. In IMAGE 3 we can compare the complicated structures of the outer slopes of Copernicus and Eratosthenes, which are practically identical and we can predict how Copernicus will degrade by the appearance of Eratosthenes. That there are 3 central peaks is shown by IMAGES 4 to 7.

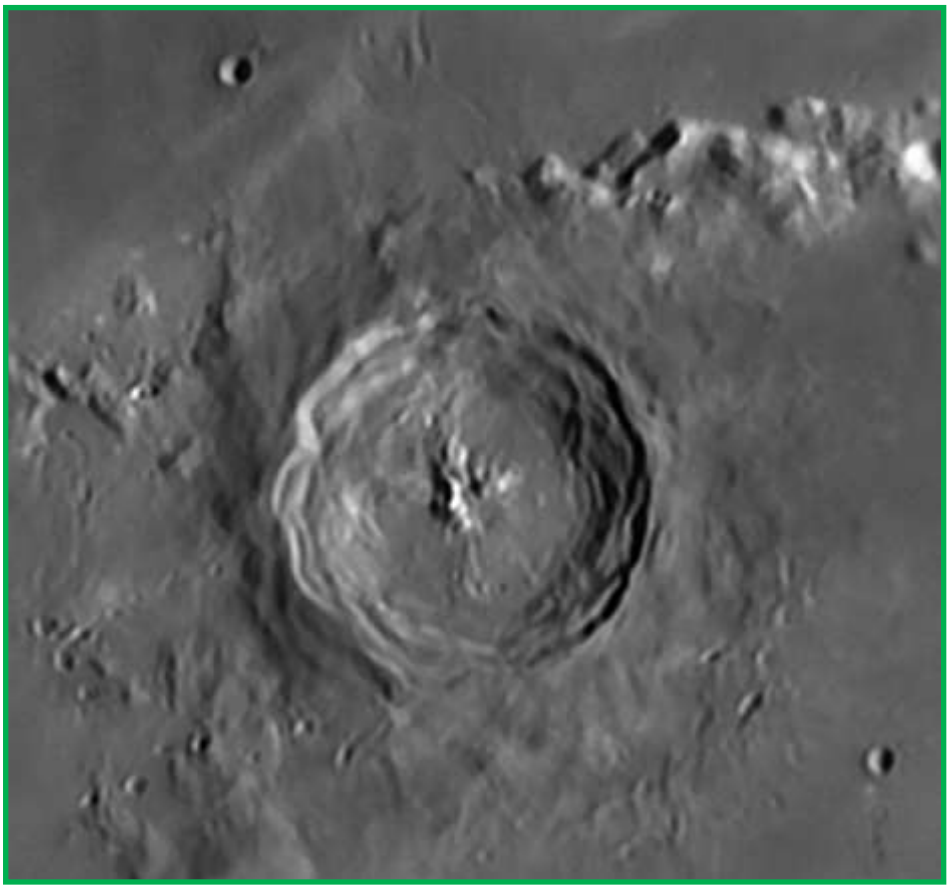


Image 2, Eratosthenes, *Massimo Bianchi, Sassari, Italy. 2022 June 09 17:58 UT. Vixen 260L Maksutov-Cassegrain telescope, Baader CCD green filter, ZWO ASI178MM camera.*

Image 3, Eratosthenes, *Massimo Bianchi, Sassari, Italy. 2021 December 13 17:01 UT. Vixen 260L Maksutov-Cassegrain telescope, Baader R610 nm longpass filter, ZWO ASI178MM camera.*

Focus-On: Ever Changing Eratosthenes

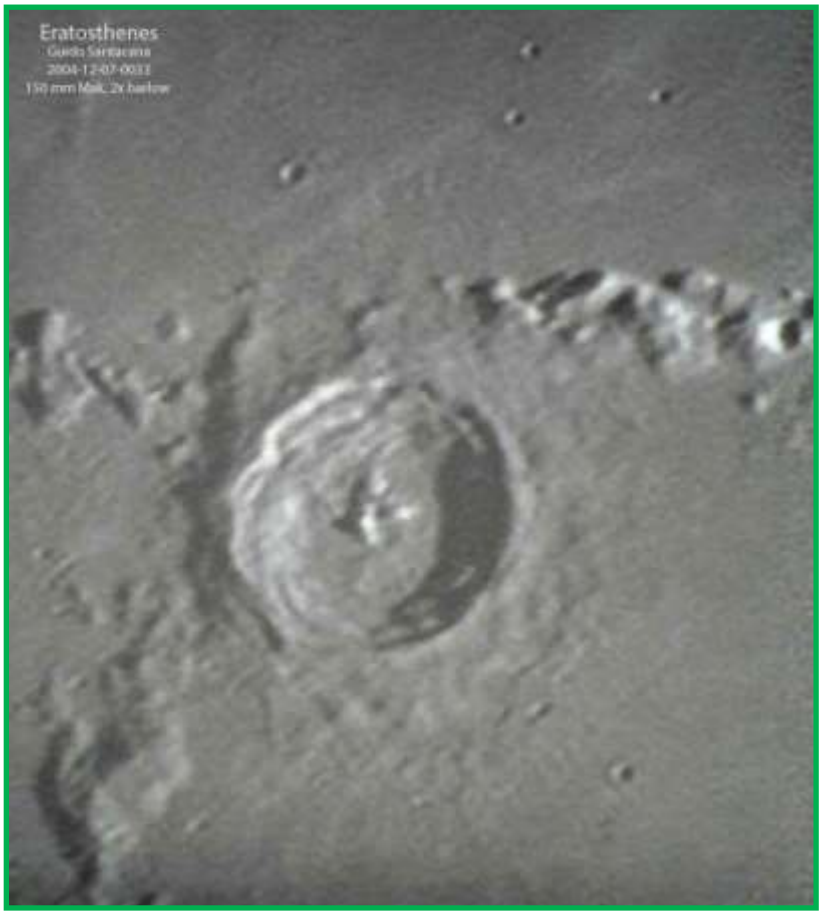


***Image 4, Eratosthenes**, Guido Santacana, San Juan, Puerto Rico, USA. 2007 December 07 00:33 UT. 150 mm f/12 Maksutov-Cassegrain telescope, 2x barlow, Logitech Quickcam Pro 4000 camera.*

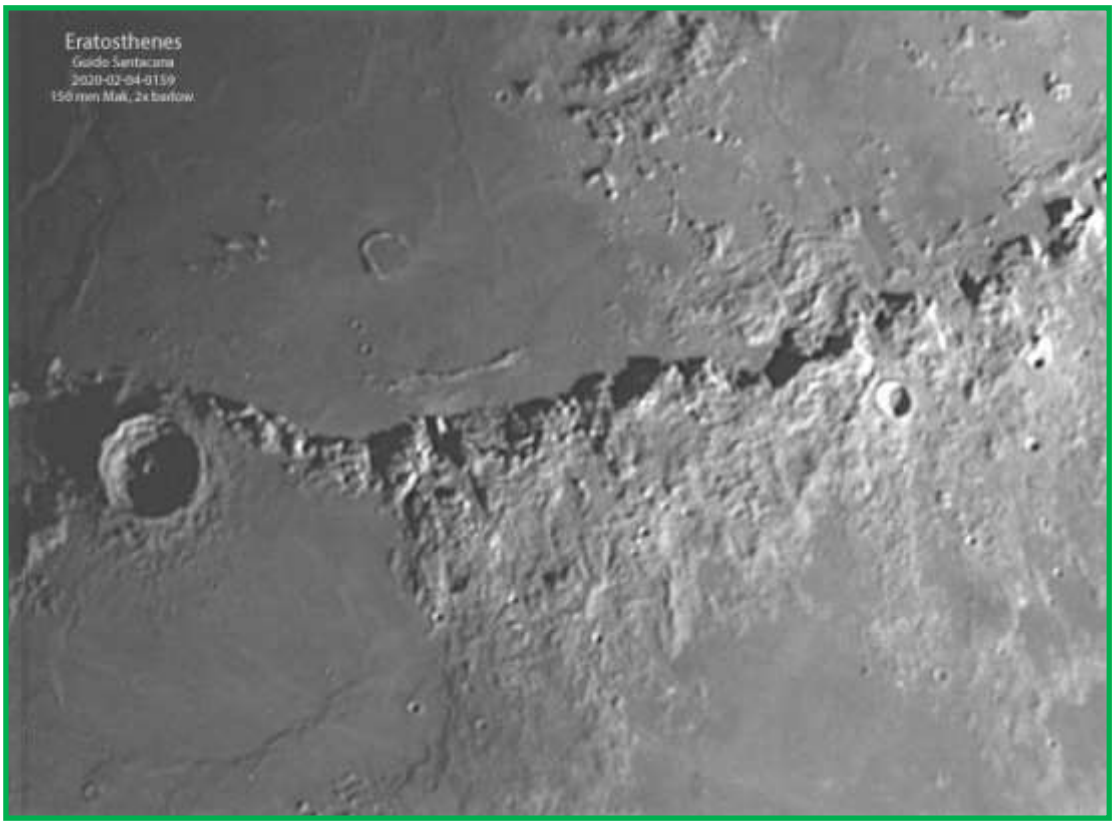


***Image 5, Eratosthenes**, Guido Santacana, San Juan, Puerto Rico, USA. 2020 February 04 01:59 UT. 150 mm f/12 Maksutov-Cassegrain telescope, 2x barlow, Orion Starshoot 5MP 4000 camera.*

Focus-On: Ever Changing Eratosthenes

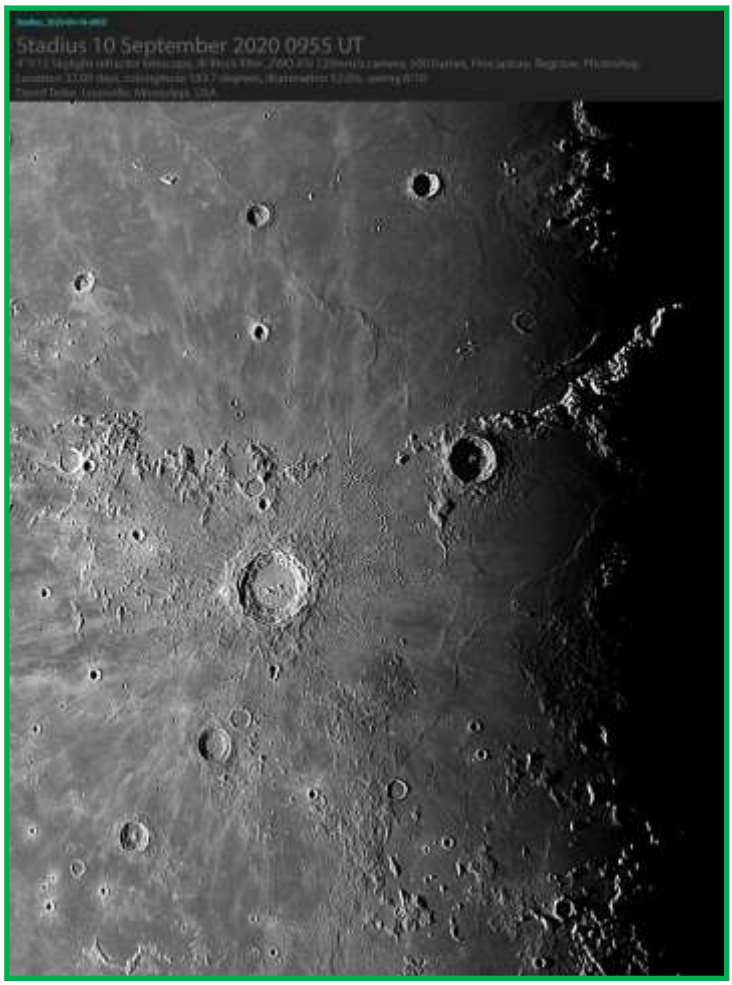


Image 6, Stadius, *David Teske, Louisville, Mississippi, USA. 2020 September 10 09:55 UT, colongitude 183.7 degrees. 4 inch f/15 Skylight refractor telescope, IR block filter, ZWO ASI120mm/s camera.*

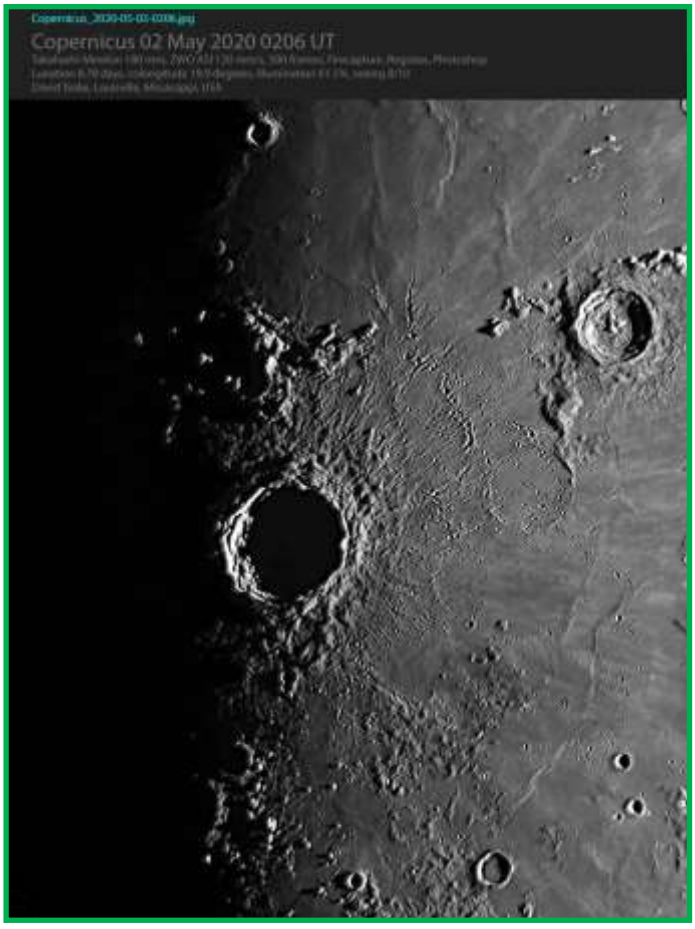


Image 7, Copernicus and Eratosthenes, *David Teske, Louisville, Mississippi, USA. 2020 May 02 02:06 UT, colongitude 19.9 degrees. 180 mm Takahashi Mewlon Dall Kirkham telescope, IR block filter, ZWO ASI120mm/s camera.*

Focus-On: Ever Changing Eratosthenes

IMAGE 8 is a magnificent sketch made with the pastel technique that illustrates the depth and complexity of the topography, especially its internal and external walls. We can enjoy the making of this image in a YouTube video, Michel Deconinck tells us: "Just for fun you can look at a small video I made, how to make a pastel of this very crater in real time. I think that you can ask for subtitle in YouTube: https://youtu.be/3NkknyuE0Y4. And just for fun too, a 3D print support, the web system of Nasa that I use was: https://trek.nasa.gov/moon/. I add a view of the STL file support (to print in 3D) and 4 photography's of the final result. (IMAGES 9 to 13).

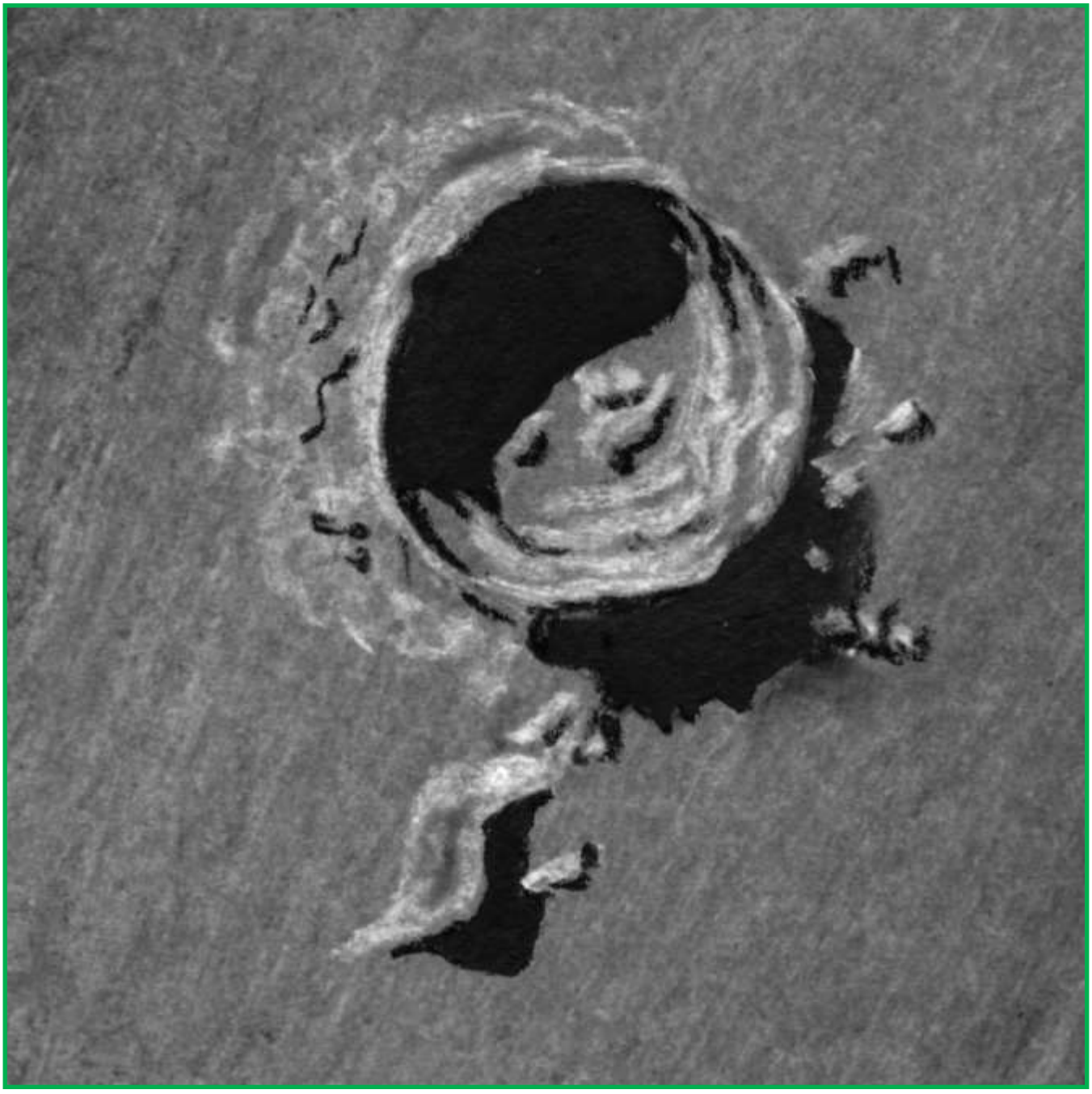
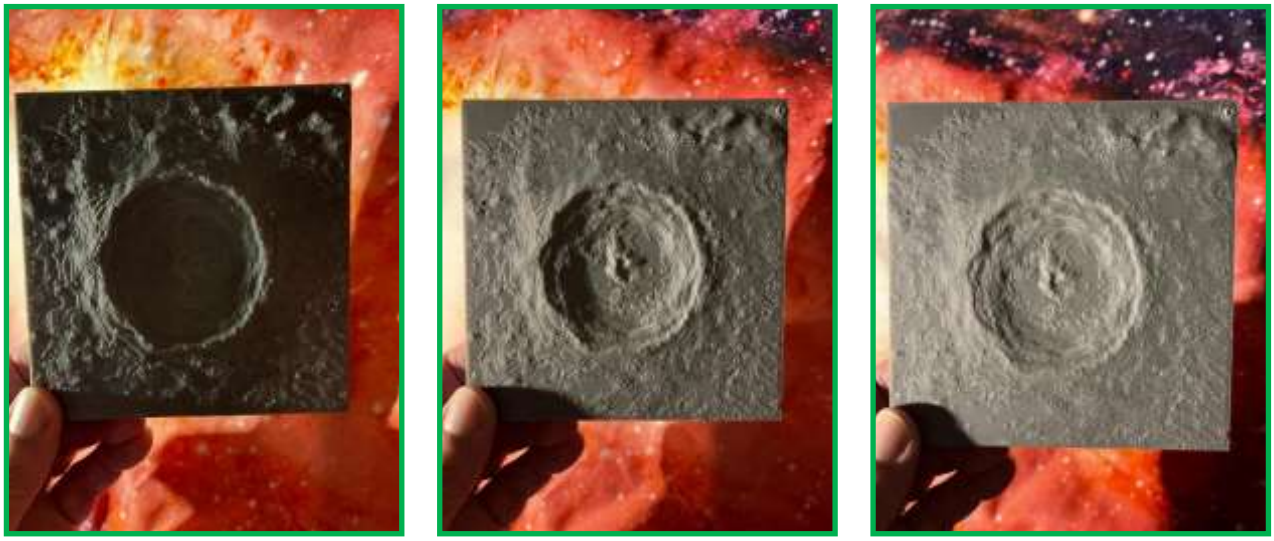
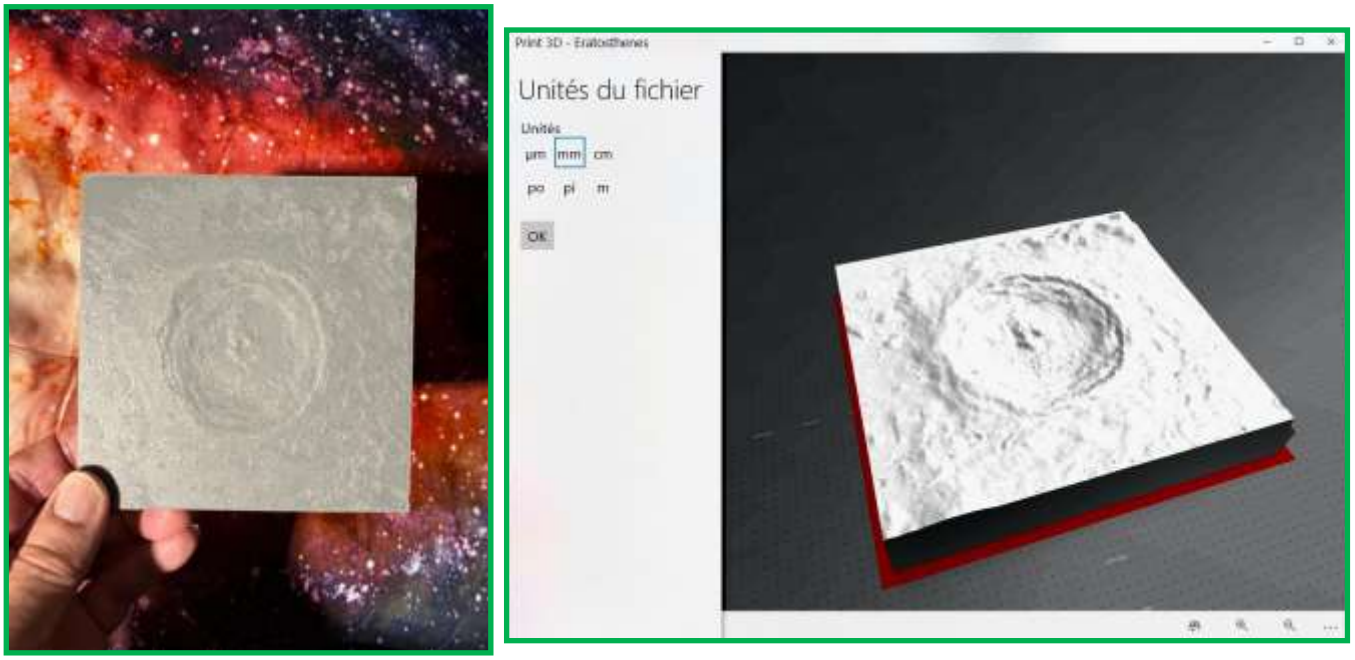


Image 8, Eratosthenes, *Michel Deconinck, Aquarellia Observatory, Artignosc-sur-Verdon - Provence - France. 2018 March 25 21:30 UT. Bresser 6 inch f/8 refractor telescope, Tele Vue Delos 10 mm eyepiece, 120x.*

Focus-On: Ever Changing Eratosthenes





Images 9-13, Eratosthenes in 3D, *Michel Deconinck, Aquarellia Observatory, Artignosc-sur-Verdon - Provence - France. And just for fun too, a 3D print support, the web system of Nasa that I use was: https://trek.nasa.gov/moon/I add a view of the STL file support (to print in 3D) and 4 photography's of the final result.*

Focus-On: Ever Changing Eratosthenes

Eratosthenes is a deep crater (almost 4 kms deep), which could be seen with frontal illumination (IMAGE 14) and with oblique illumination, when it appears as a slightly disturbing pit (IMAGE 15). Finally, an excellent description of the topography of Eratosthenes is found in the text by Robert H. Hays, Jr. that appears in this same issue.

Image 14, Eratosthenes, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2018 July 22 23:48 UT. 150 mm refractor telescope, Orion V-block filter, SWO CMOS camera. North is to the right, west is down.*

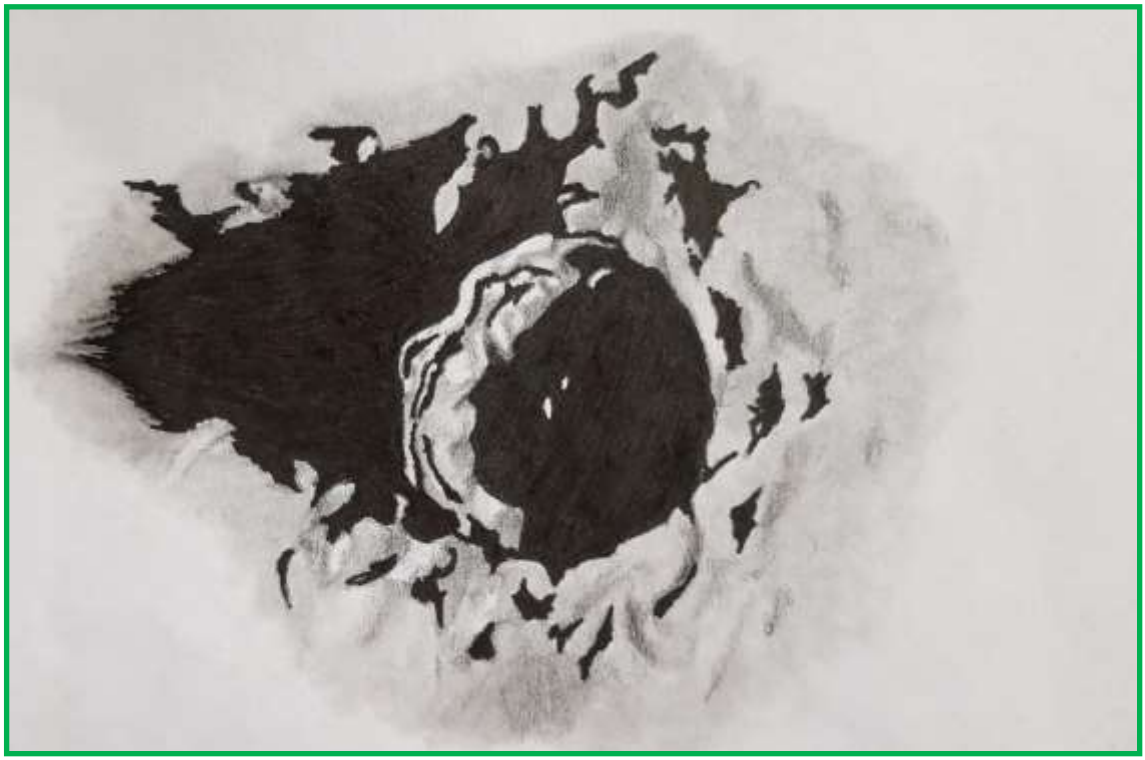
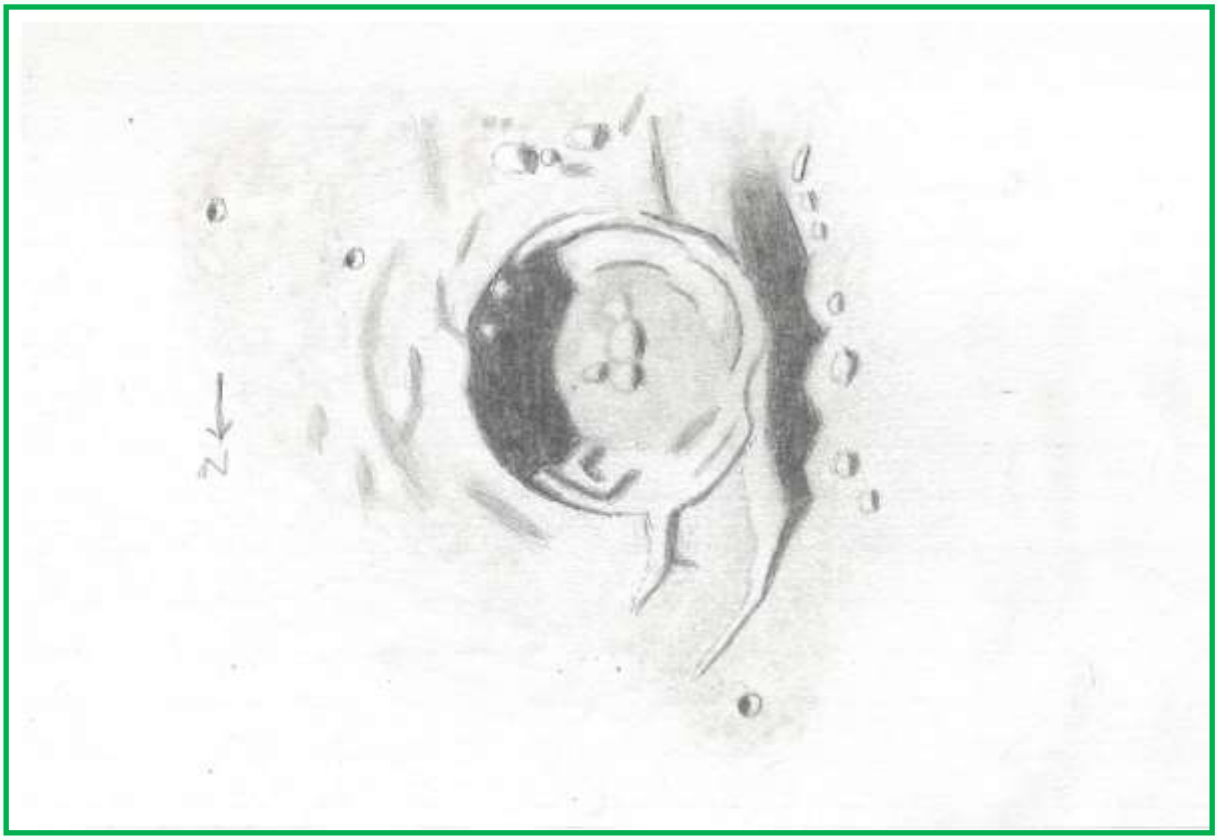


Image 15, Eratosthenes, *Massimo Bianchi, Sassari, Italy. 2021 October 14 18:46 UT. Vixen 260L Maksutov-Cassegrain telescope, 330 x. Seeing 5/10, transparency 4/6.*

Focus-On: Ever Changing Eratosthenes

Eratosthenes

Robert H. Hays, Jr.



Eratosthenes, *Robert H. Hays, Jr., Worth, Illinois, USA. 2006 January 09 00:15-00:55 UT. 15 cm reflector telescope, 116 x, seeing 6-7/10, transparency 6/6.*

I drew this crater and vicinity on the evening of January 8/9, 2006. This conspicuous crater in Mare Imbrium is near the western end of the Apennine Mts. It is generally round with considerable terracing on its inside walls. Its eastern side is quite smoothly curved with only some small irregularities. The western side, however, appears pushed in so that it looks like a small lunar notch during a solar eclipse. Its southwest rim also has some flat sides giving it a polygonal appearance there. It has four peaks in a tight group near center. The largest one is at center with smaller peaks to the north, east and south. The southern peak appears to be much lower than the other three. The eastern interior shadow of Eratosthenes was very dark at this time with a couple of bright points sticking out. The small pits Eratosthenes KB and K are to the southeast. A variety of peaks and shadowing was noted to the south and drawn. A strip of very dark shadowing was to the west. This shadowing abutted the southwest rim of Eratosthenes, but not at the aforementioned notch or farther north. It had several sharp points, hinting at a serrated rim or ridge on the crater's west side. I drew several detached peaks just beyond this shadow, and there was chaotic terrain farther west which I did not draw. The heavy shadowing merged with a narrow ridge near the small crater Eratosthenes C. A short ridge casting a Y-shaped shadow is on the north rim. The eastern flank of Eratosthenes had some ill-defined patches of shadowing and a speckled appearance, probably from rugged terrain. This speckling was difficult to draw; it was like trying to sketch a rich star cluster. The Apennines begin a short distance to the east.

Focus-On: Ever Changing Eratosthenes

2.-Landscape from Eratosthenes.

Eratosthenes is a fascinating crater in many ways. First of all is its privileged location: on the shore of Mare Imbrium, near what is probably the most spectacular crater on the Moon (Copernicus) and at the end of the most prominent mountain range (Montes Apenninus). From the high walls of Eratosthenes, and with the help of some optical instrument, let's take a hypothetical tour of the landscape near our crater. If we look north (IMAGE 16) we find a scenery of the wrinkle ridges both to the north (top), to the east (left) and to the west, a series of small peaks, parallel to the Montes Apenninus, to the left of these mountains we find Wallace, crater almost completely flooded, on the right the two craters that barely appear from the shadows are Lambert (upper) and Pytheas (lower). In the center of IMAGE 16 we find a kind of small Eratosthenes: Timocharis (35 km diameter, almost half the diameter of Eratosthenes), which has almost the same topography (in fact, both belong to the same Eratosthenian period), although the floor of Timocharis is completely in shadow (it is closer to the terminator), we can see its interior in IMAGE 17. And in IMAGE 18 Timocharis seems to still have some rays to the left. In these last 2 images we see the view that we would see to the east and to the west: to the east the end of the Montes Apenninus chain and beyond the Montes Carpatus; and to the west all the majesty of the Apenninus (IMAGE 19 AND 20). IMAGE 21 shows the landscape to the south beyond Sinus Aestuum and Sinus Medii to Ptolemaeus. Surely the most spectacular scenery is the one seen to the west with the giant Copernicus in the background and the capricious lines of the chains of secondary impact craters (IMAGE 22 TO 25). Personally, my favorite scenery to view from the top of Eratosthenes would be the tortuous lines of wrinkle ridges that crisscross Sinus Aestuum, a landscape that changes according to the illumination, as illustrated by the series of images that make up IMAGE 26.

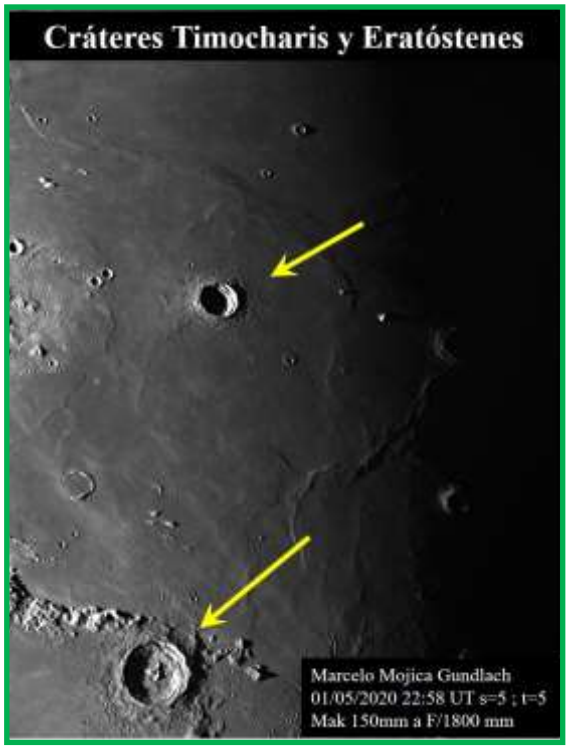


Image 16, Eratosthenes and Timocharis, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2020 May 01 22:58 UT. 6 inch Skywatcher Maksutov-Cassegrain telescope, ZWO ASI178B/W camera. North is up, west is right.*

Image 17, Eratosthenes, *Francisco Alsina Cardinalli, Oro Verde, Argentina, 2016 December 09 03:47 UT. Meade LX 200 10 inch Schmidt-Cassegrain telescope, Astronomik ProPlanet 742 nm IR pass filter.*

Focus-On: Ever Changing Eratosthenes

***Image 18, Copernicus and Eratosthenes**, Román García Verdier, Paraná, Argentina. 2021 July 19 00:32 UT. 180 mm reflector telescope, QHY5-II camera.*

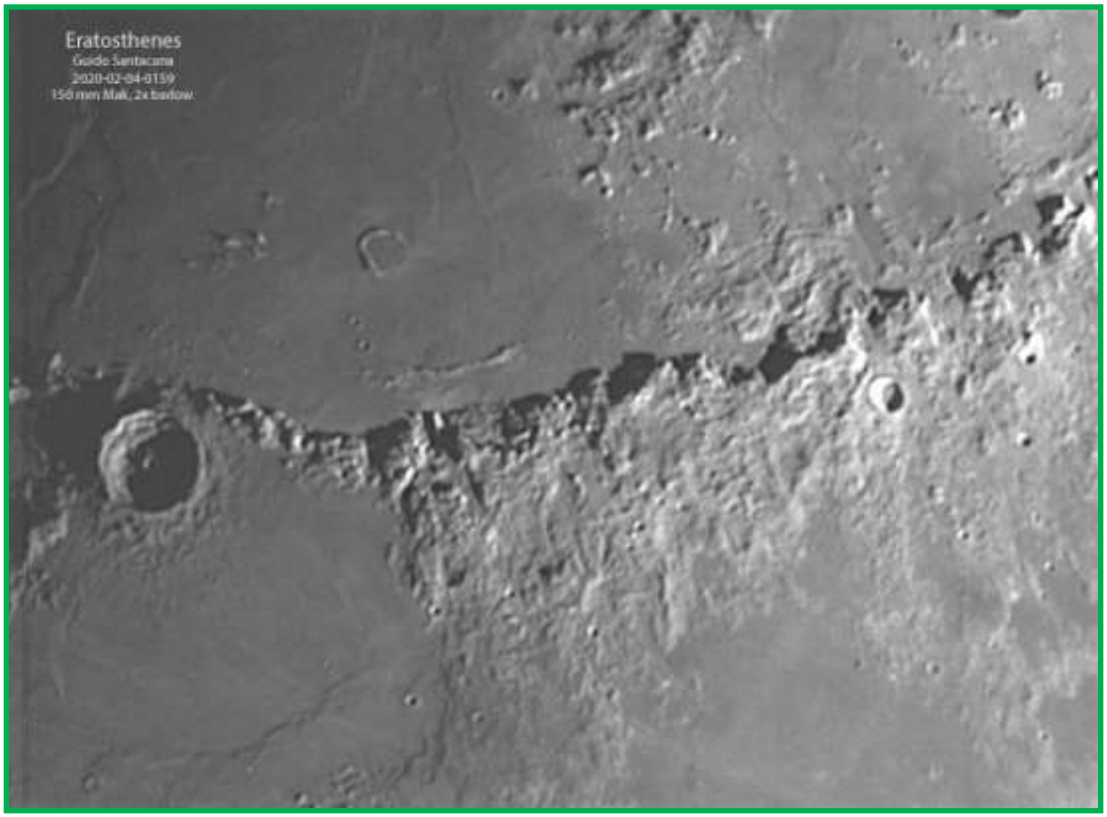


***Image 19, Eratosthenes**, Guido Santacana, San Juan, Puerto Rico, USA. 2020 February 04 01:59 UT. 150 mm f/12 Maksutov-Cassegrain telescope, 2x barlow, Orion Starshoot 5MP 4000 camera.*

Focus-On: Ever Changing Eratosthenes

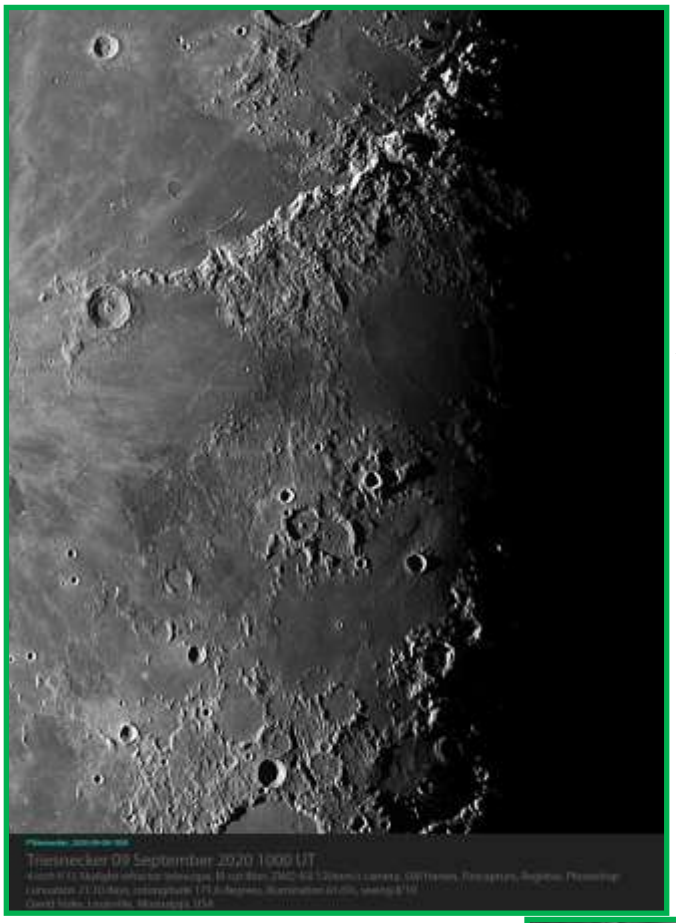


Image 20, Triesnecker Region, *David Teske, Louisville, Mississippi, USA. 2020 September 09 10:00 UT, colongitude 171.6 degrees. 4 inch f/15 Skylight refractor telescope, IR block filter, ZWO ASI120mm/s camera. Seeing 8/10.*

Image 21, Eratosthenes*, Desiré Godoy, Oro Verde, Argentina. 2019 November 08 01:57UT. 200 mm Newtonian reflector, QHY5L-II-M camera. Orth is to the left, west is down.*

Focus-On: Ever Changing Eratosthenes

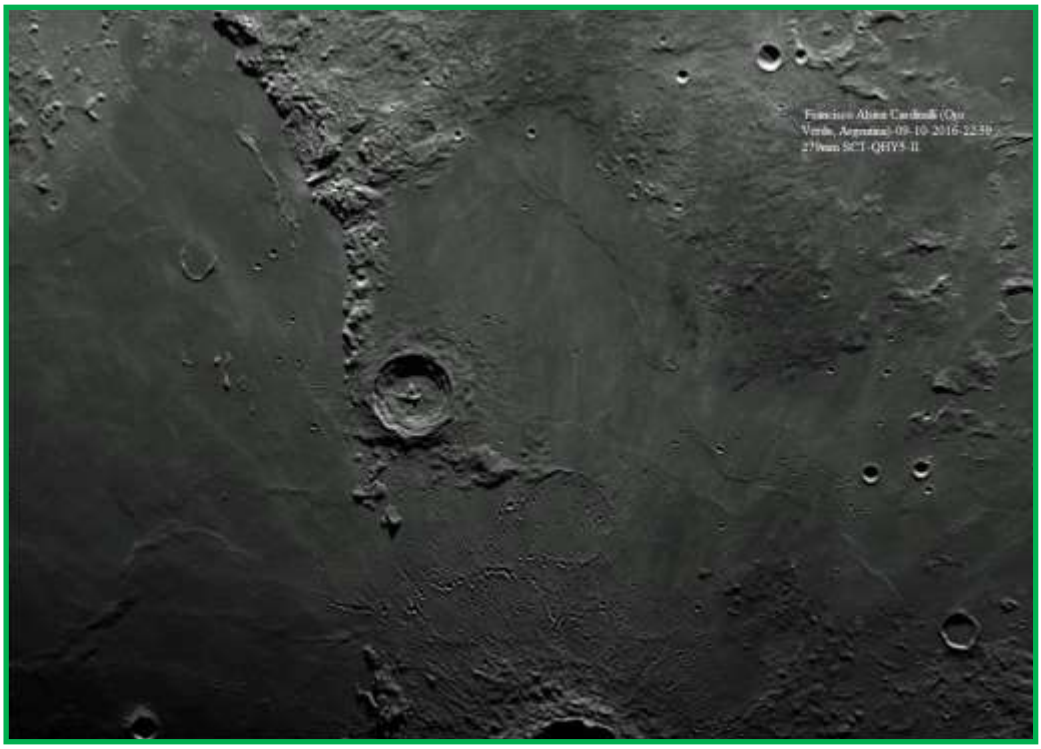


Image 22, Eratosthenes, *Francisco Alsina Cardinalli, Oro Verde, Argentina, 2016 September 10 22:59 UT. Celestron 11 inch Edge HD Schmidt -Cassegrain telescope, QHY5-II. North is left, west is down.*

Image 23, Eratosthenes, *Jesús Piñeiro, San Antonio de los Altos, Venezuela. 2020 November 24 22:48 UT. 90 mm Maksutov-Cassegrain telescope, IR Pass 807 nm filter, ZWO ASI462MC camera. North is to the lower right and west is to the upper right.*

Focus-On: Ever Changing Eratosthenes

Image 24, Eratosthenes, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 05 00:08 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*

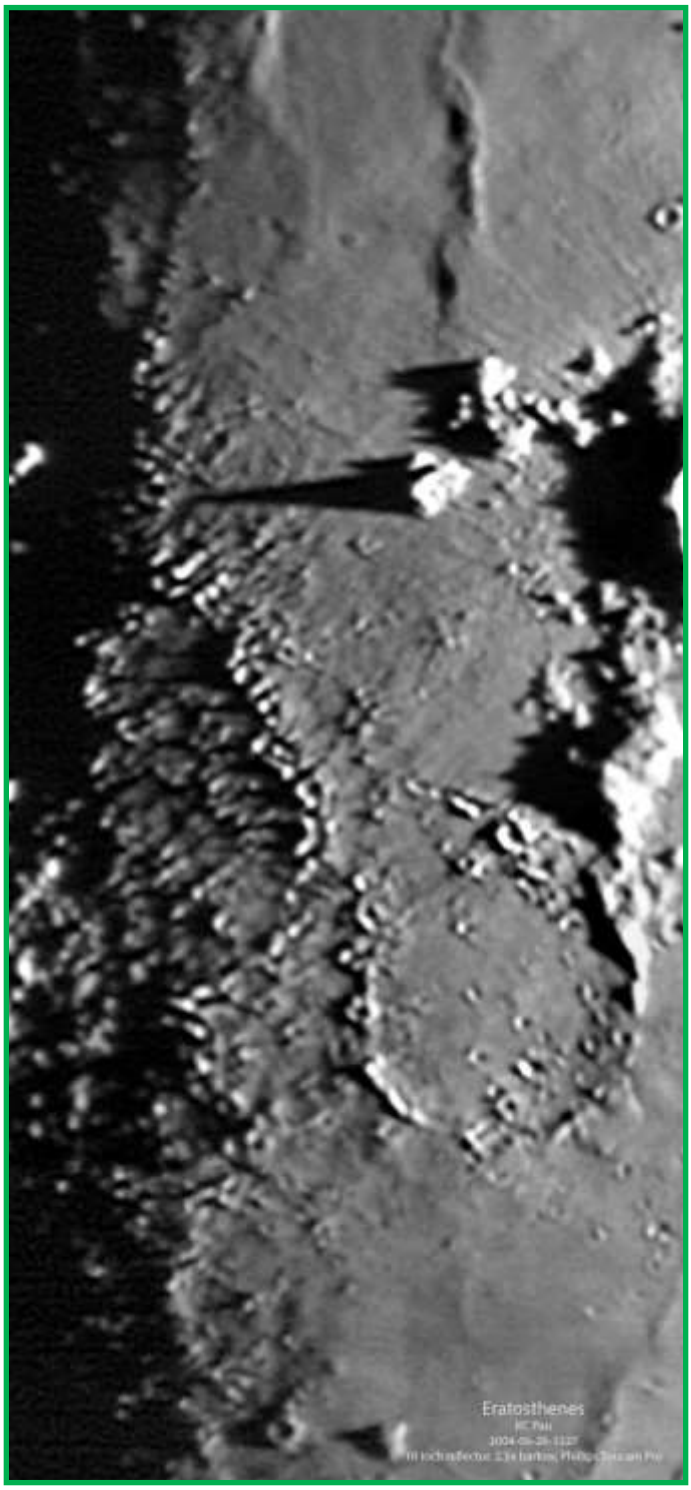


Image 25, Eratosthenes, *KC Pau, Hong Kong, China. 2004 June 26 12:27 UT. 10 inch reflector telescope, 2.5 x barlow, Phillips Toucam Pro camera.*

Focus-On: Ever Changing Eratosthenes

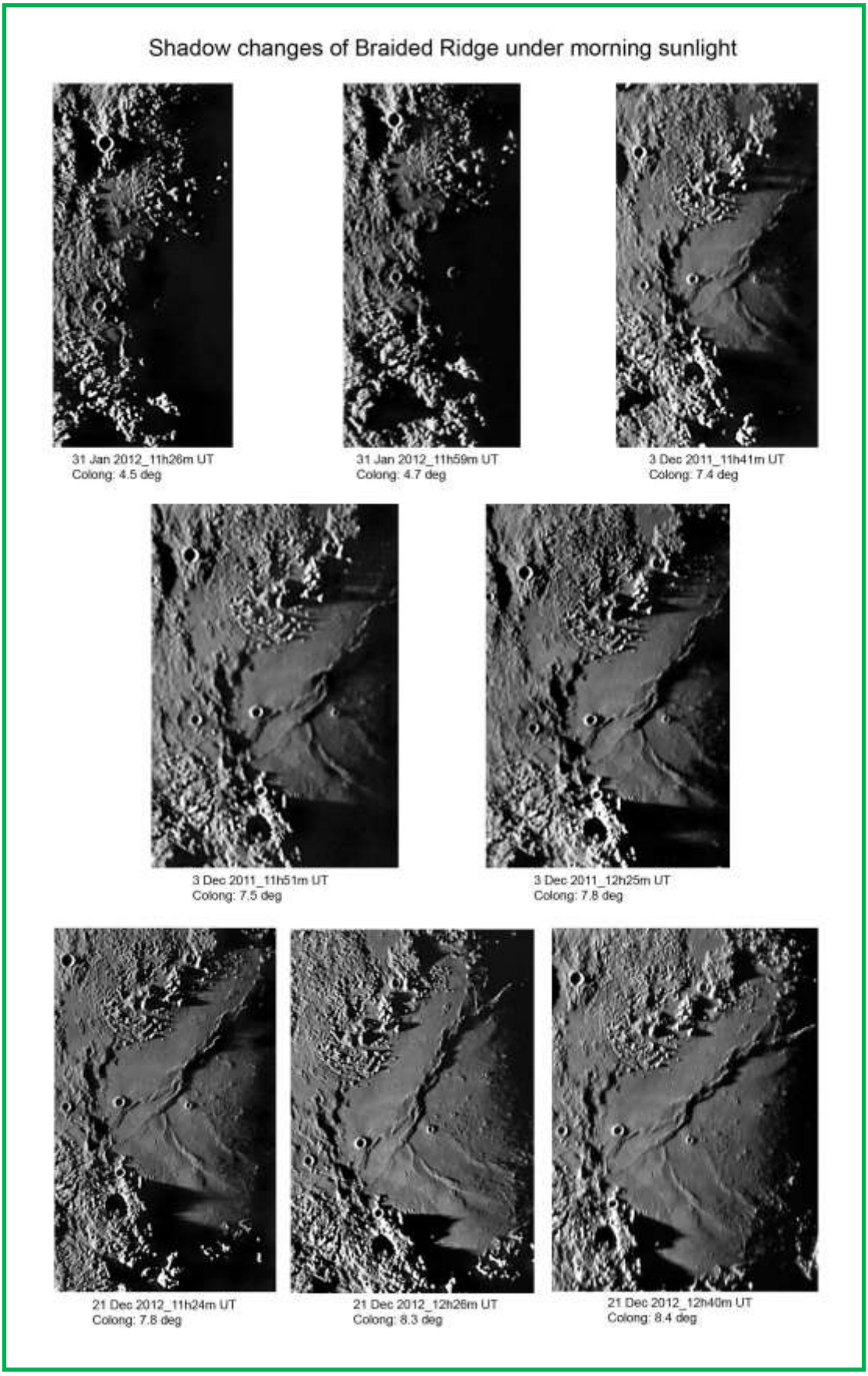


Image 26, Pallas, wrinkle ridges, *KC Pau, Hong Kong, China. 10 inch f/6 reflector telescope, 2.5 x barlow, DMK 31AF03.AS camera.*

Focus-On: Ever Changing Eratosthenes

3.-Bright Rays.

The main characteristic of the Eratosthenian craters is the lack of bright rays or rather a significant system of bright rays. We have fairly bright ray craters like Langrenus to craters that lack bright rays altogether, and among them would be Eratosthenes. But Eratosthenes has bright rays, although they don't belong to it, but to the neighboring Copernicus. We grouped in a slightly theatrical progression 3 images. In IMAGE 27 we see the huge difference between the massive Copernicus ejection field (Copernicus not shown) and the few rays that cross Eratosthenes. It is likely that some of the short rays that appear to emanate from the eastern rim of Eratosthenes actually belong to this crater and not to Copernicus. The well-preserved impact crater topography would be compatible with a residual bright ray system, but the close proximity of the recent giant Copernicus would make it impossible to distinguish these hypothetical faint rays from the later, brighter Copernicus bright rays. In IMAGE 28 the eastern rim of Copernicus already appears and also a dark halo around Eratosthenes, similar to the one presented by Tycho (as we saw in the previous Focus On). In IMAGE 29 we already have Copernicus complete and we appreciate the brightest areas of Eratosthenes, 5 bright points seem to be distinguished in the center of its floor and the north wall appears brighter than the others. The photographs show us what we cannot see with our eyes: at full Moon Eratosthenes practically disappears, covered by the bright Copernicus ejecta. However, if we look carefully at IMAGE 3: don't you think you can see the appearance of faint rays coming from the south wall?

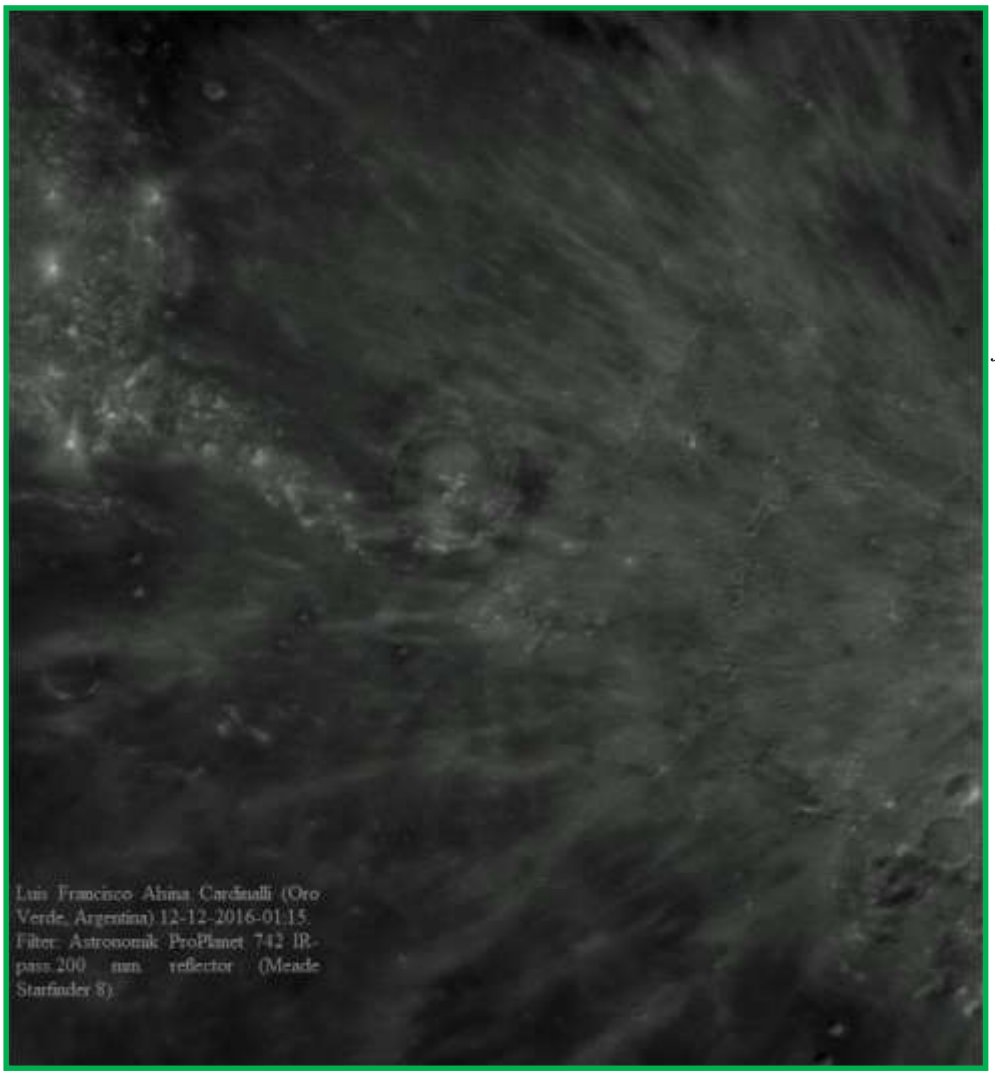


Image 27, Eratosthenes, *Francisco Alsina Cardinalli, Oro Verde, Argentina, 2016 December 12 01:15 UT. Meade Starfinder 8 inch reflector telescope, Astronomik ProPlanet 742 nm IR pass filter. North is down, west is right.*

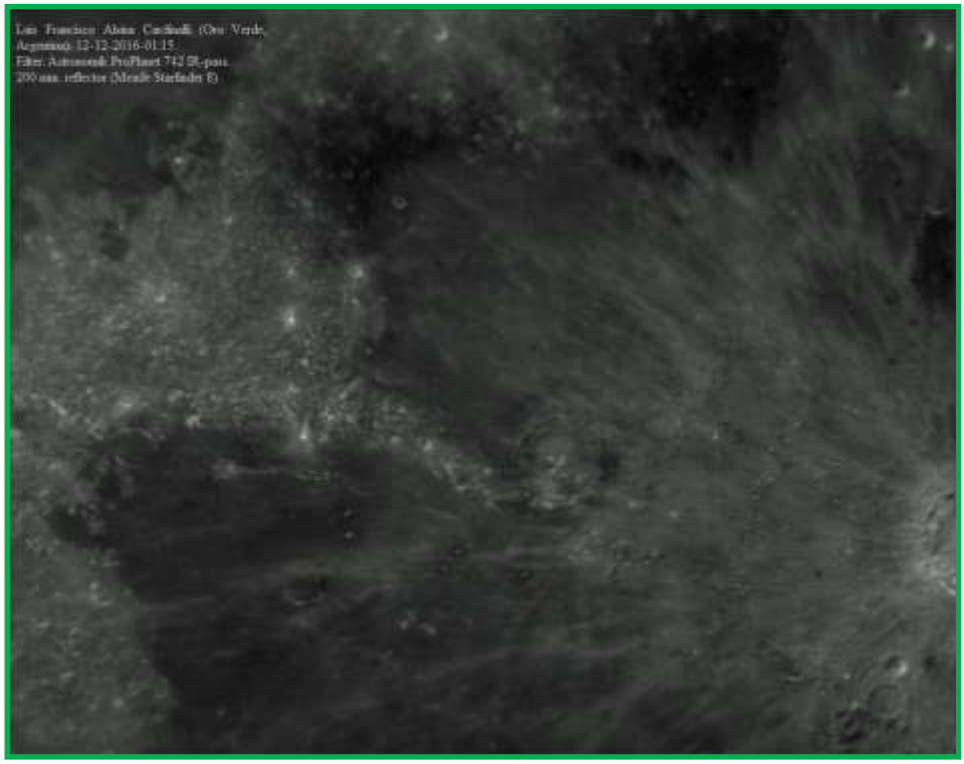
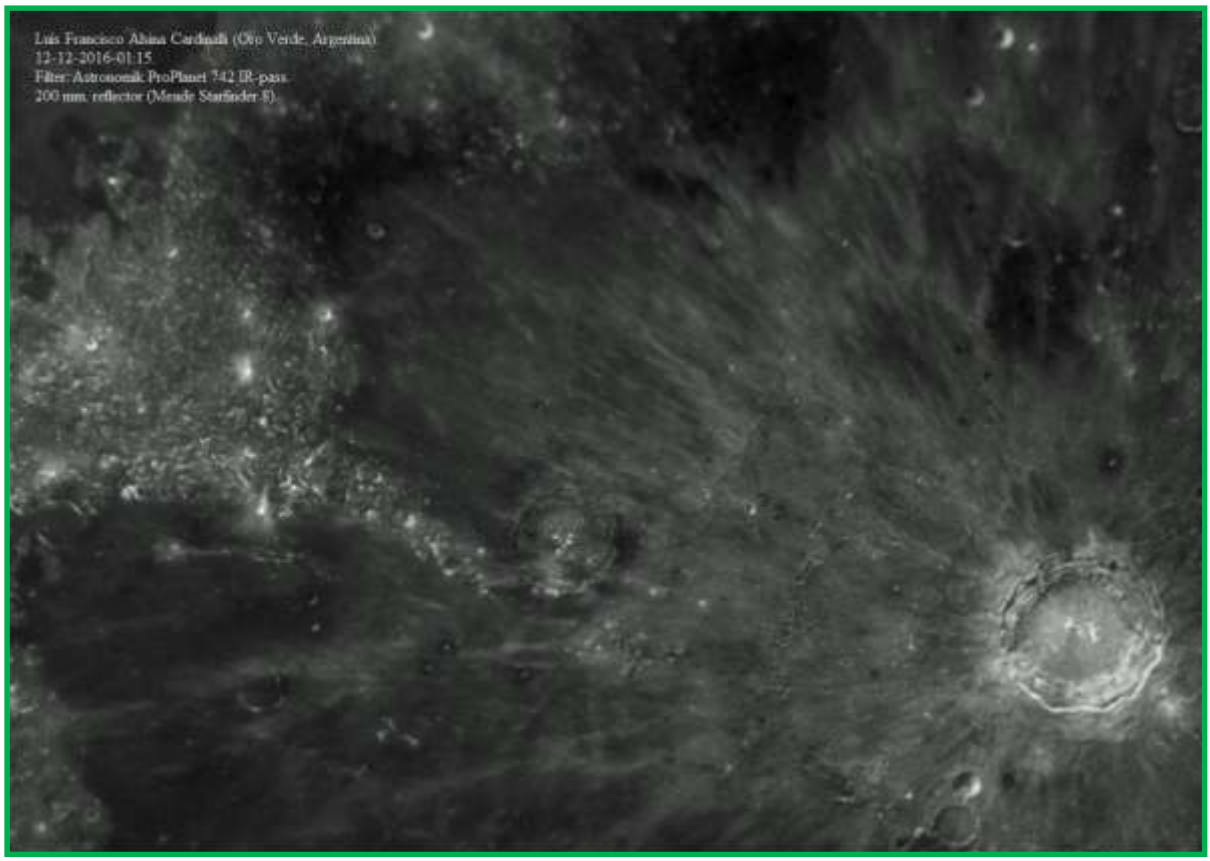


Image 28, Eratosthenes, *Francisco Alsina Cardinalli, Oro Verde, Argentina, 2016 December 12 01:18 UT. Meade Starfinder 8 inch reflector telescope, Astronomik ProPlanet 742 nm IR pass filter. North is down, west is right.*

Image 29, Eratosthenes, *Francisco Alsina Cardinalli, Oro Verde, Argentina, 2016 December 12 01:18 UT. Meade Starfinder 8 inch reflector telescope, Astronomik ProPlanet 742 nm IR pass filter. North is down, west is right.*



Focus-On: Ever Changing Eratosthenes

4.-Illumination.

A deep-looking crater like Eratosthenes shows different aspects as light illuminates it from the west, from crescent to full moon. In IMAGES 30 to 33 we are close to sunrise in Eratosthenes, only the west wall is shining, IMAGE 34 shows the panorama with the sun a little higher over our crater, in IMAGE 15 the two highest central peaks are already shining. Let's see a progression from IMAGE 35 to IMAGE 51, as Eratosthenes lights up and the shadows recede to the east, revealing the highest parts of the ground. In IMAGE 52 and 53 the illumination is reversed with a waning moon.

Image 30, Eratosthenes, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 03 23:28 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*

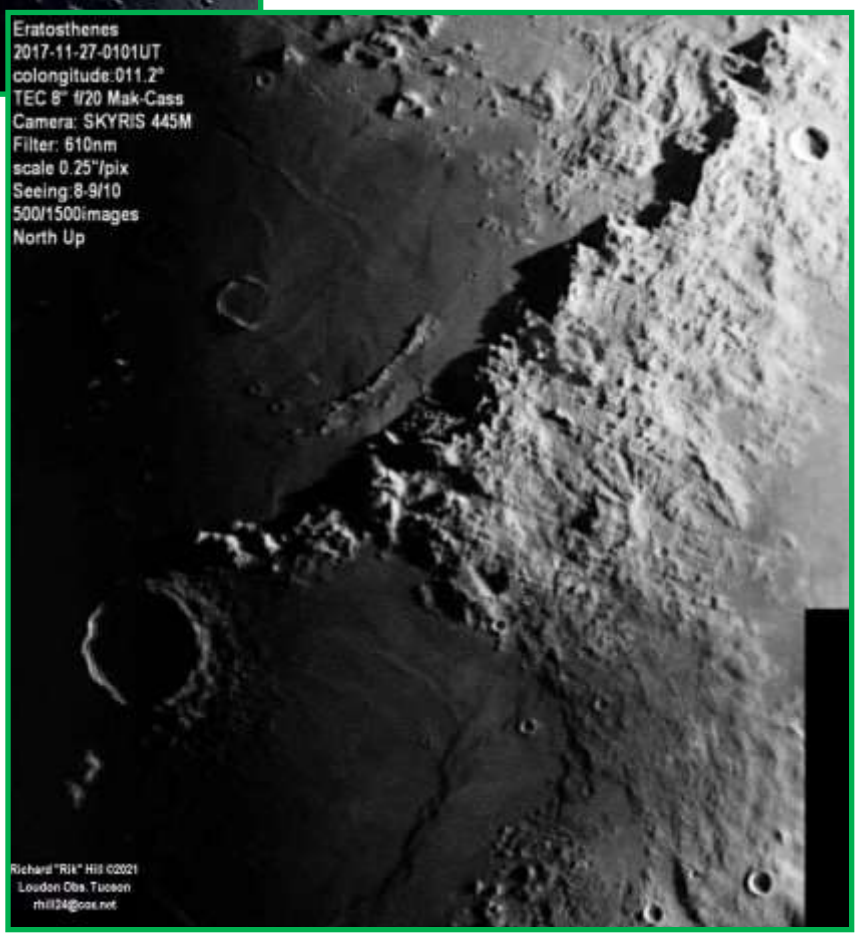


Image 31, Eratosthenes*, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2017 November 27 01:01 UT, colongitude 11.2º. TEC 8 inch f/20 Maksutov-Cassegrain telescope, 610 nm filter, SKYRIS 445M Seeing 8-9/10.*

Focus-On: Ever Changing Eratosthenes

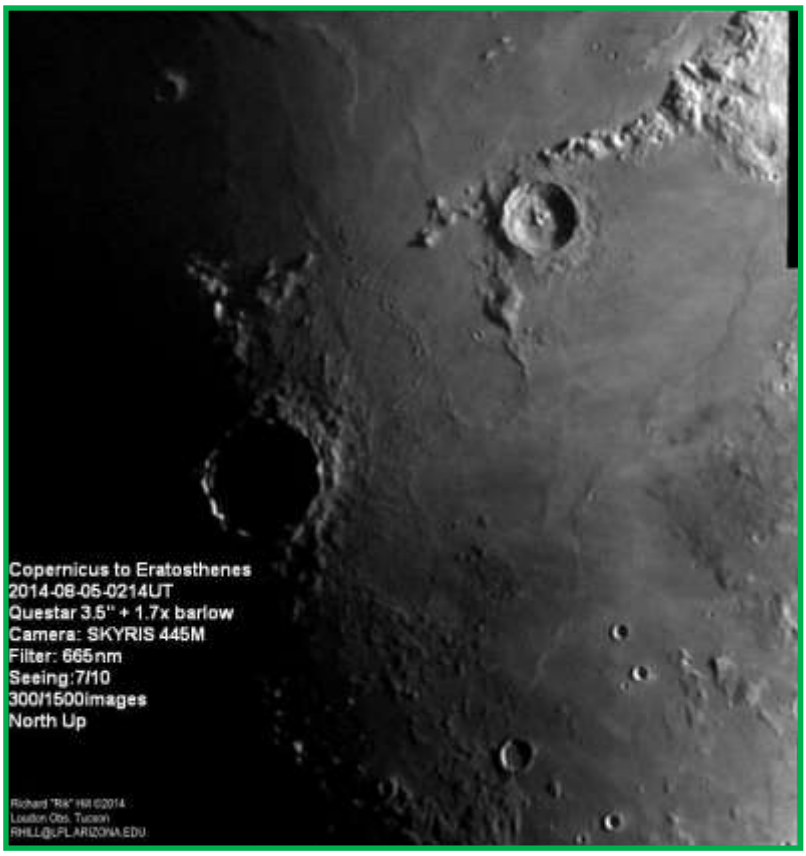
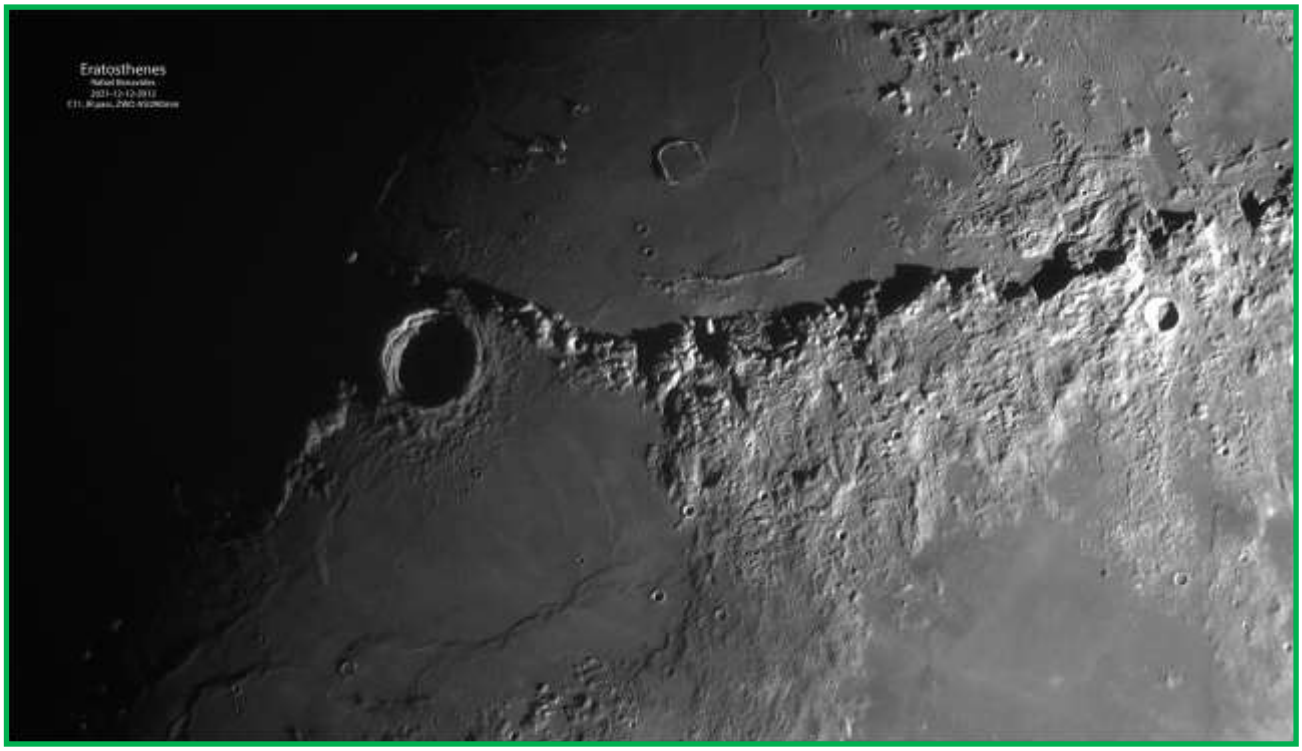


Image 32, Copernicus to Eratosthenes*, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2014 August 05 02:14 UT. Questar 3.5 inch Maksutov-Cassegrain telescope, 1.7x barlow, 665 nm filter, SKYRIS 445M camera. Seeing 7/10.*

Image 33, Eratosthenes, *Rafael Benavides Palencia, Posadas, Cordoba, Spain. 2021 December 12 20:12 UT. Celestron 11 inch Schmidt-Cassegrain telescope, Baader Planetarium IR pass filter, ZWO ASI290mm camera. Seeing 7/10, transparency 5/6.*



Focus-On: Ever Changing Eratosthenes

Image 34, Eratosthenes, *KC Pau, Hong Kong, China. 2020 June 29 12:14 UT. 10 inch reflector telescope, 2.5 x barlow, QHYCCD290M camera.*

Image 35, Eratosthenes*, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2021 December 13 00:47 UT. TEC 8 inch f/20 Maksutov-Cassegrain telescope, 610 nm filter, SKYRIS 132M Seeing 8/10.*

Focus-On: Ever Changing Eratosthenes

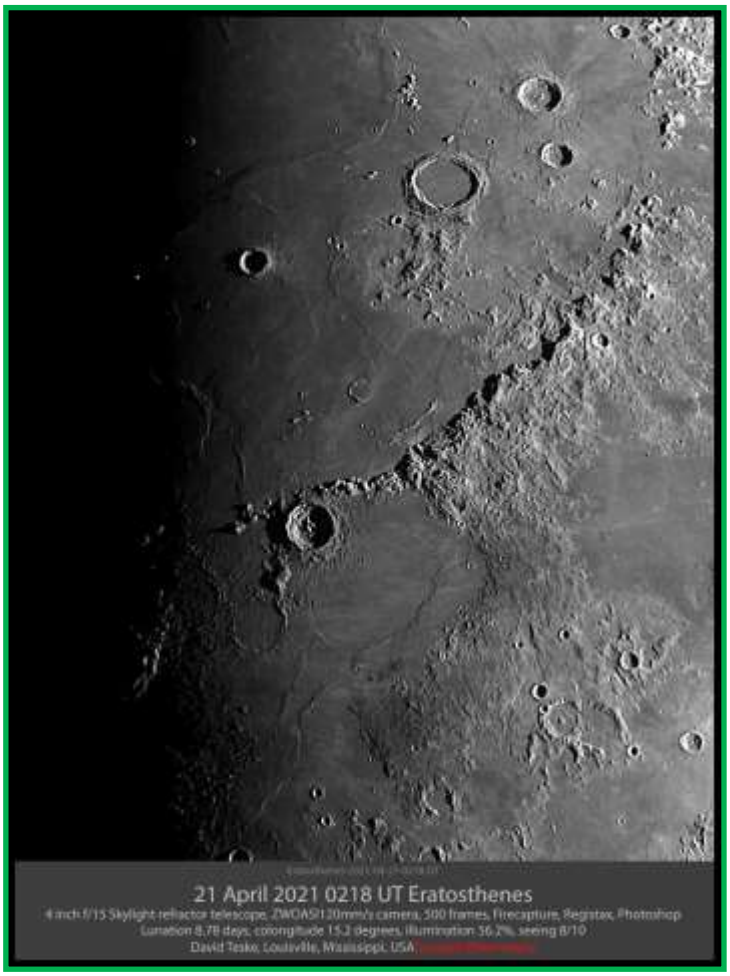


Image 36, Triesnecker Region, *David Teske, Louisville, Mississippi, USA. 2021 April 21 02:18 UT, colongitude 15.2 degrees. 4 inch f/15 Skylight refractor telescope, IR block filter, ZWO ASI120mm/s camera. Seeing 8/10.*

Image 37, Eratosthenes, *Francisco Alsina Cardinalli, Oro Verde, Argentina, 2015 December 20 00:36 UT. Meade LX200 10 inch Schmidt-Cassegrain, Canon EOS Digital Rebel XS camera.*

Focus-On: Ever Changing Eratosthenes

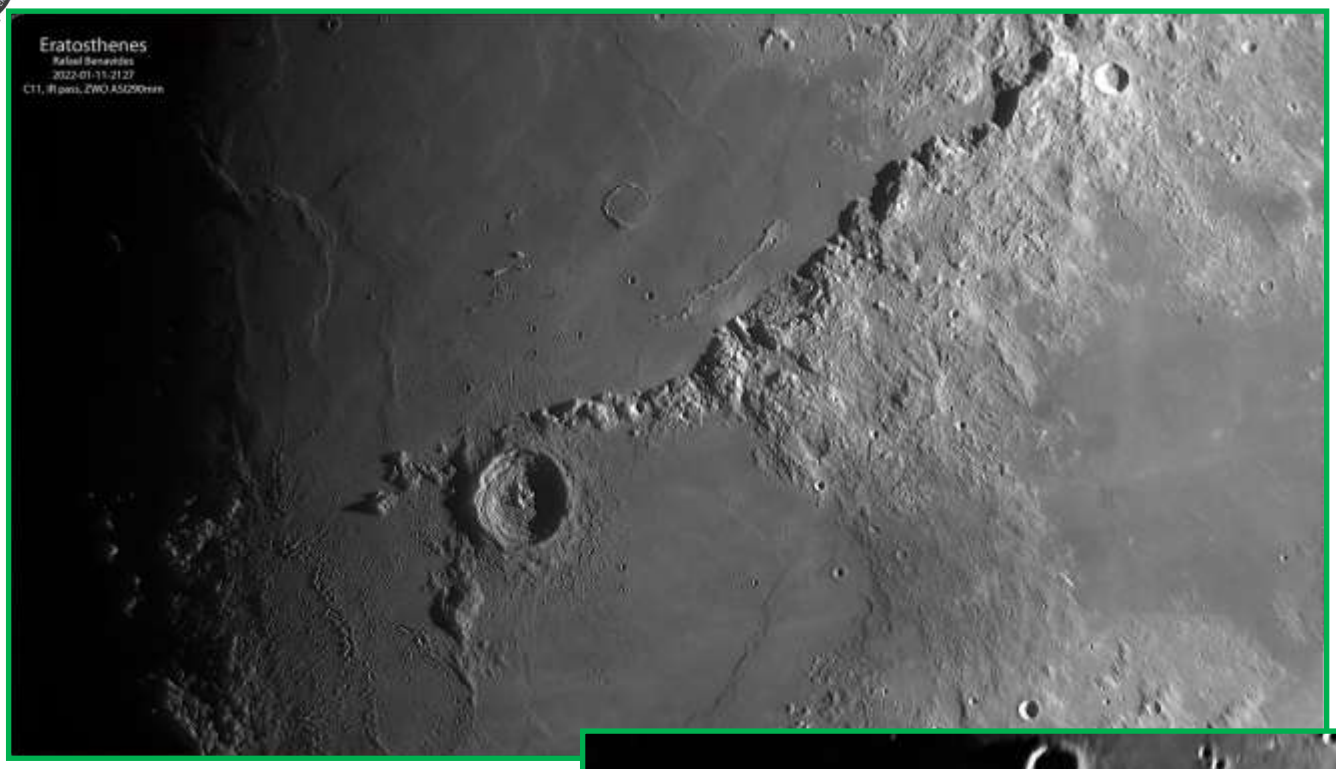


Image 38, Eratosthenes, *Rafael Benavides Palencia, Posadas, Cordoba, Spain. 2022 January 11 21:27 UT. Celestron 11 inch Schmidt-Cassegrain telescope, Baader Planetarium IR pass filter, ZWO ASI290mm camera. Seeing 6/10, transparency 5/6.*

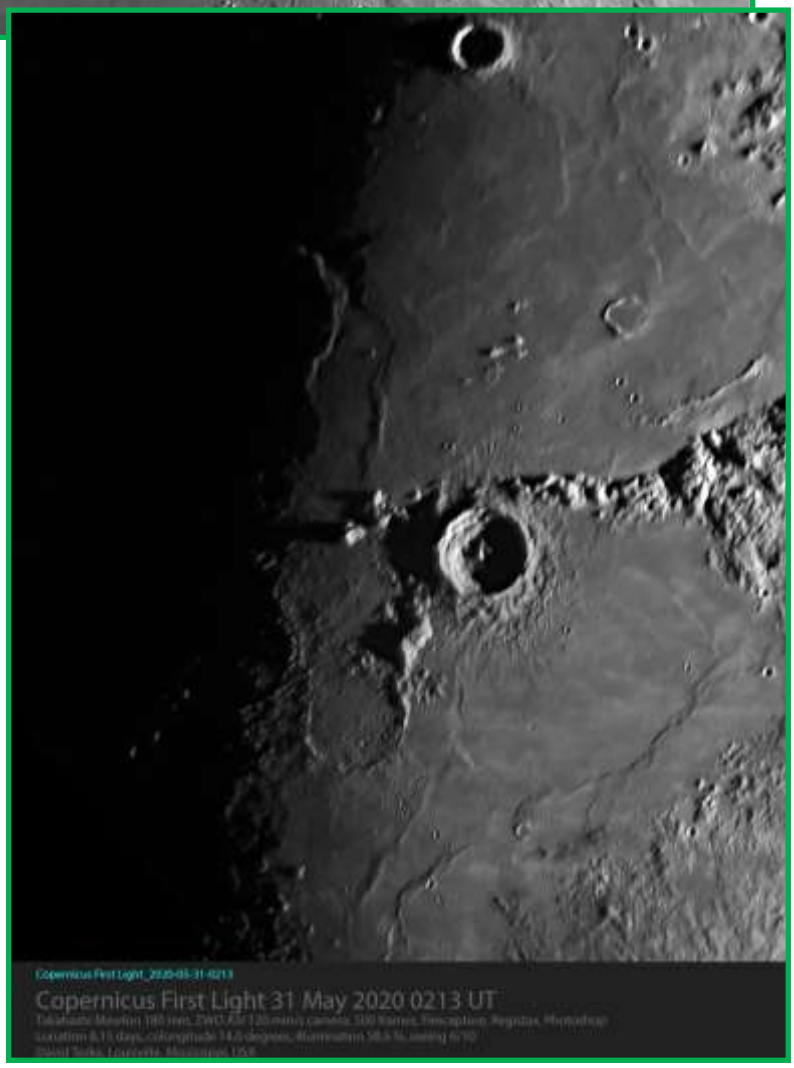


Image 39, Eratosthenes, *David Teske, Louisville, Mississippi, USA. 2020 May 31 02:13 UT, colongitude 14.0 degrees. 180 mm Takahashi Mewlon Dall Kirkham telescope, IR block filter, ZWO ASI120mm/s camera. Seeing 6/10.*

Focus-On: Ever Changing Eratosthenes

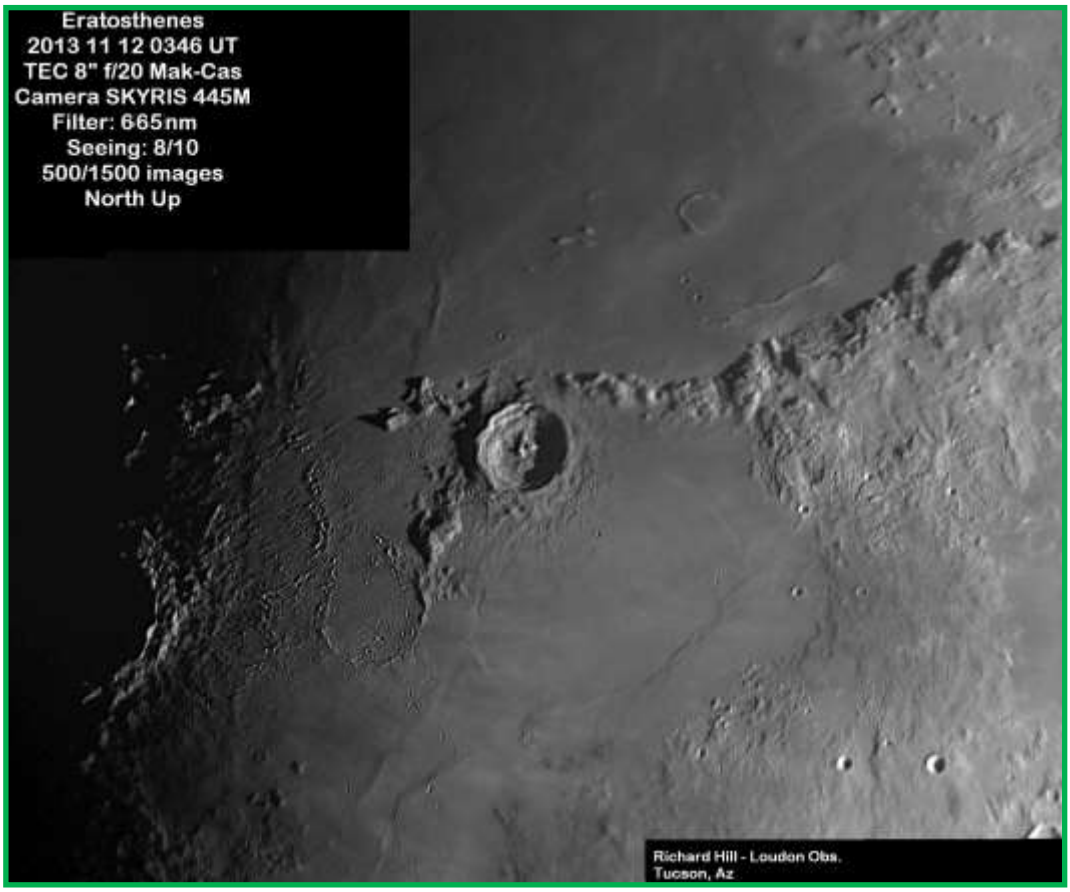


***Image 40, Eratosthenes**, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2013 November 12 03:46 UT. TEC 8 inch f/20 Maksutov-Cassegrain telescope, 665 nm filter, SKYRIS 445M Seeing 8/10.*

***Image 41, Copernicus to Eratosthenes**, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2019 April 14 02:33 UT, colongitude 21.1°. TEC 8 inch f/20 Maksutov-Cassegrain telescope, 610 nm filter, SKYRIS 445M Seeing 8/10.*

Focus-On: Ever Changing Eratosthenes

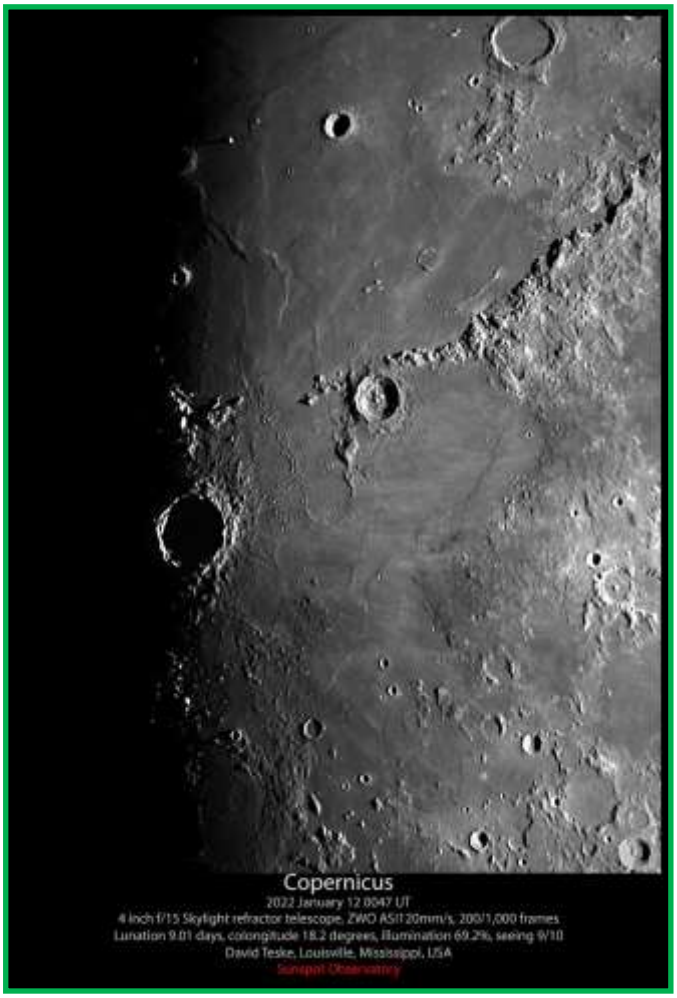


Image 42, Copernicus, *David Teske, Louisville, Mississippi, USA. 2022 January 12 00:47 UT, colongitude 18.2 degrees. 4 inch f/15 Skylight refractor telescope, IR block filter, ZWO ASI120mm/s camera. Seeing 9/10.*

Image 43, Copernicus, *David Teske, Louisville, Mississippi, USA. 2022 March 13 02:31 UT, colongitude 29.2 degrees. 3.5 inch Questar Maksutov-Cassegrain telescope, IR block filter, ZWO ASI120mm/s camera. Seeing 8/10.*

Focus-On: Ever Changing Eratosthenes

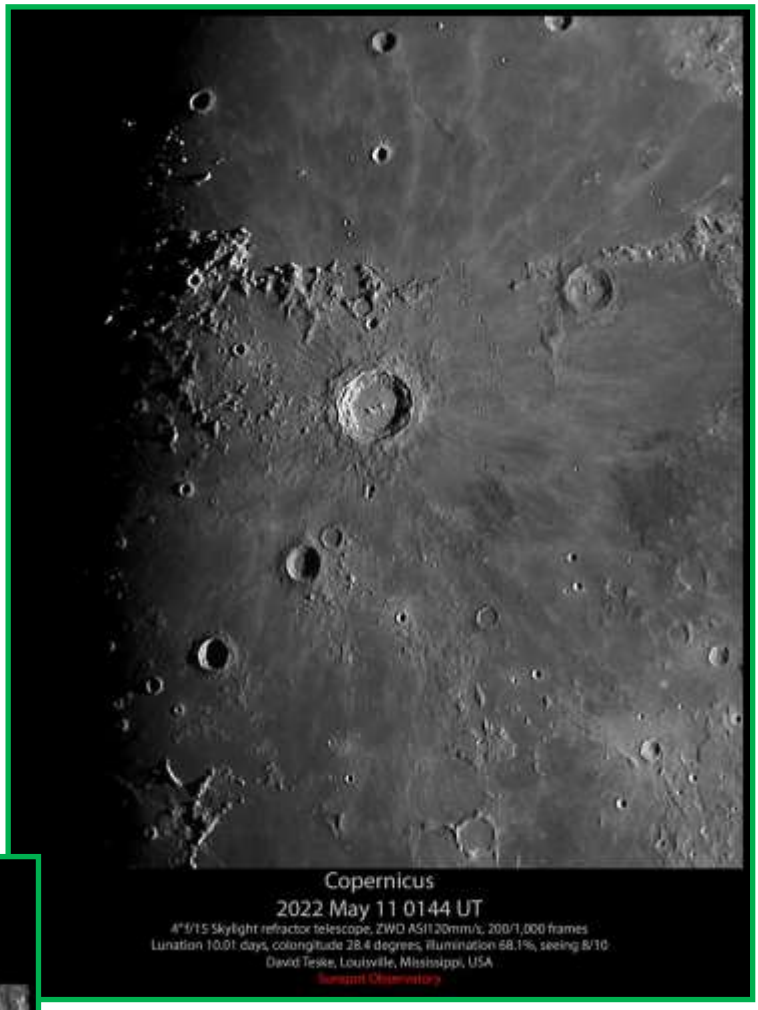


Image 44, Copernicus, *David Teske, Louisville, Mississippi, USA. 2022 May 11 01:14 UT, colongitude 28.4 degrees. 4 inch f/15 Skylight refractor telescope, IR block filter, ZWO ASI120mm/s camera. Seeing 8/10.*

Image 45, Copernicus, *David Teske, Louisville, Mississippi, USA. 2021 November 14 01:53 UT, colongitude 21.3 degrees. 4 inch f/15 Skylight refractor telescope, IR block filter, ZWO ASI120mm/s camera. Seeing 7/10.*

Focus-On: Ever Changing Eratosthenes

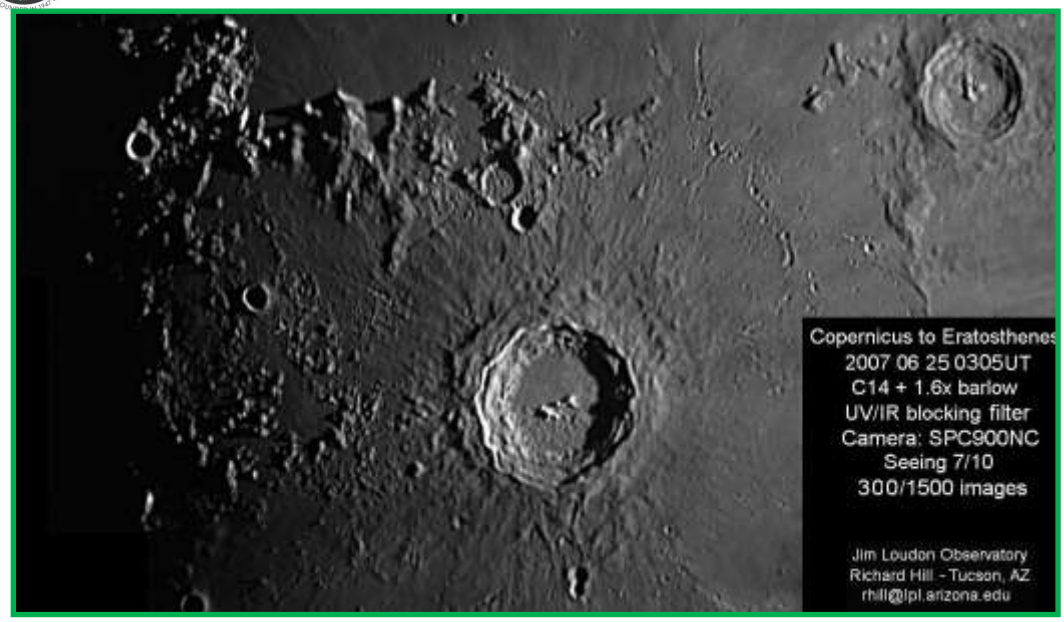


Image 46, Copernicus to Eratosthenes*, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2007 June 25 03:05 UT. Celestron 14 inch Schmidt-Cassegrain telescope, 1.6x barlow, UV/IR blocking filter, SPC900NC camera. Seeing 7/10.*

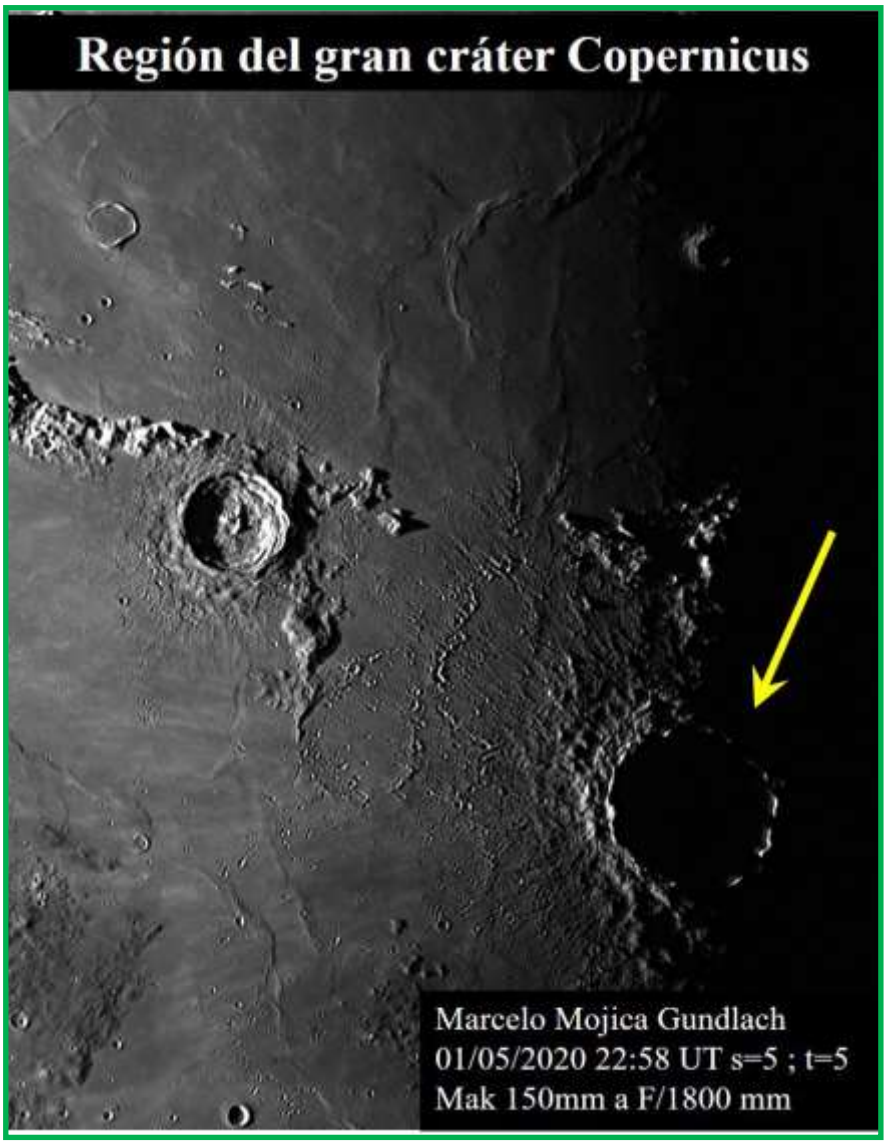


Image 47, Eratosthenes and Copernicus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2020 April 30 22:58 UT. 6 inch Skywatcher Maksutov-Cassegrain telescope, ZWO ASI178B/W camera. Seeing 5/10, transparency 5/6. North is up, west is right.*

Focus-On: Ever Changing Eratosthenes

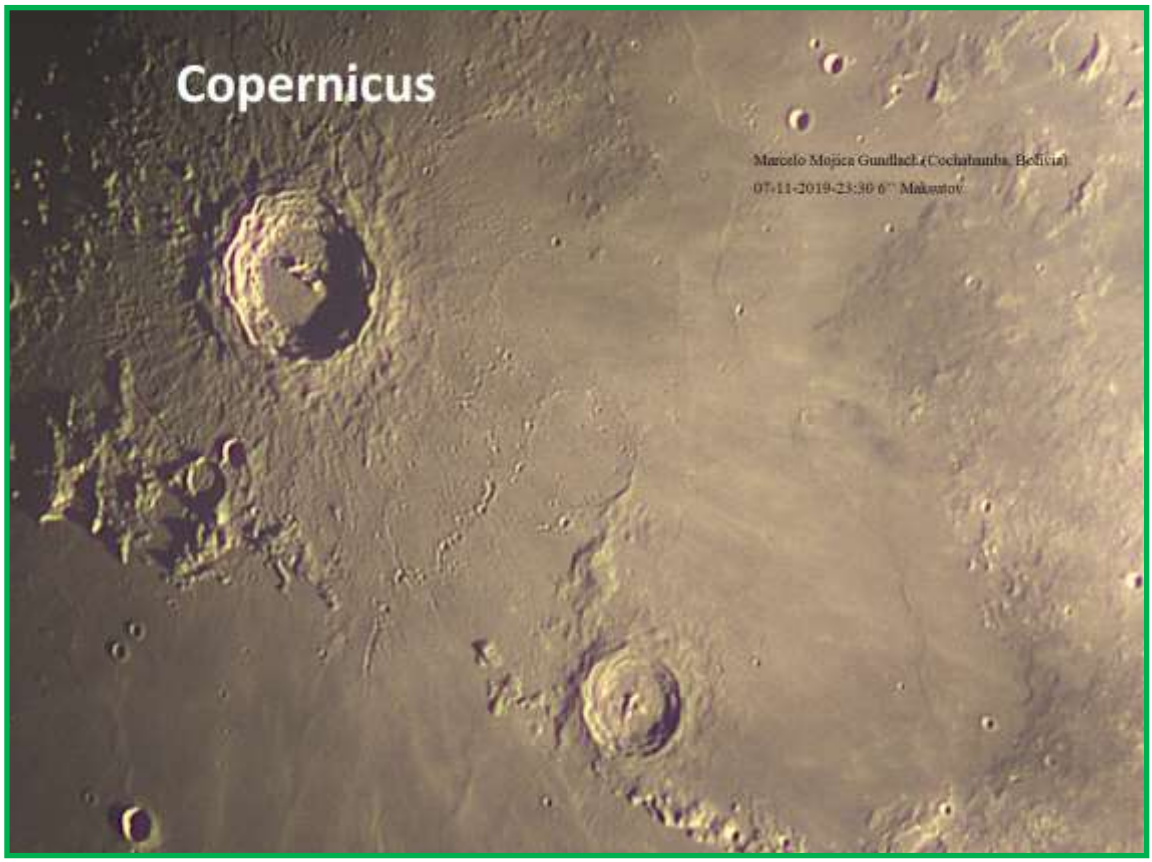


Image 48, Eratosthenes and Copernicus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2019 July 11 22:30 UT. 6 inch Skywatcher Maksutov-Cassegrain telescope, ZWO ASI120 camera. North is down, west is left.*

Image 49, Eratosthenes, *Francisco Alsina Cardinalli, Oro Verde, Argentina, 2015 November 21 04:30 UT. Meade LX200 10 inch Schmidt-Cassegrain, Phillips SPC900NC webcam.*

Focus-On: Ever Changing Eratosthenes

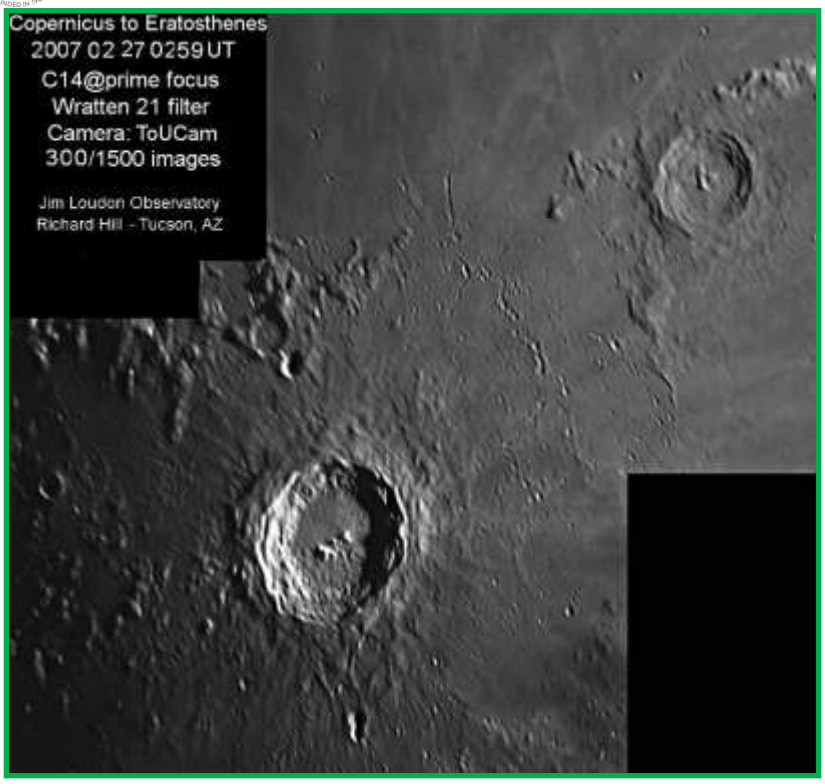


***Image 50, Copernicus to Eratosthenes**, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2007 February 27 02:59 UT. Celestron 14 inch Schmidt-Cassegrain telescope, Wratten 21 filter, ToUCam.*

***Image 51, Eratosthenes**, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2022 May 11 02:00 UT, colongitude 30.7°. TEC 8 inch f/20 Maksutov-Cassegrain telescope, 665 nm filter, SKYRIS 132M Seeing 8/10.*

Focus-On: Ever Changing Eratosthenes

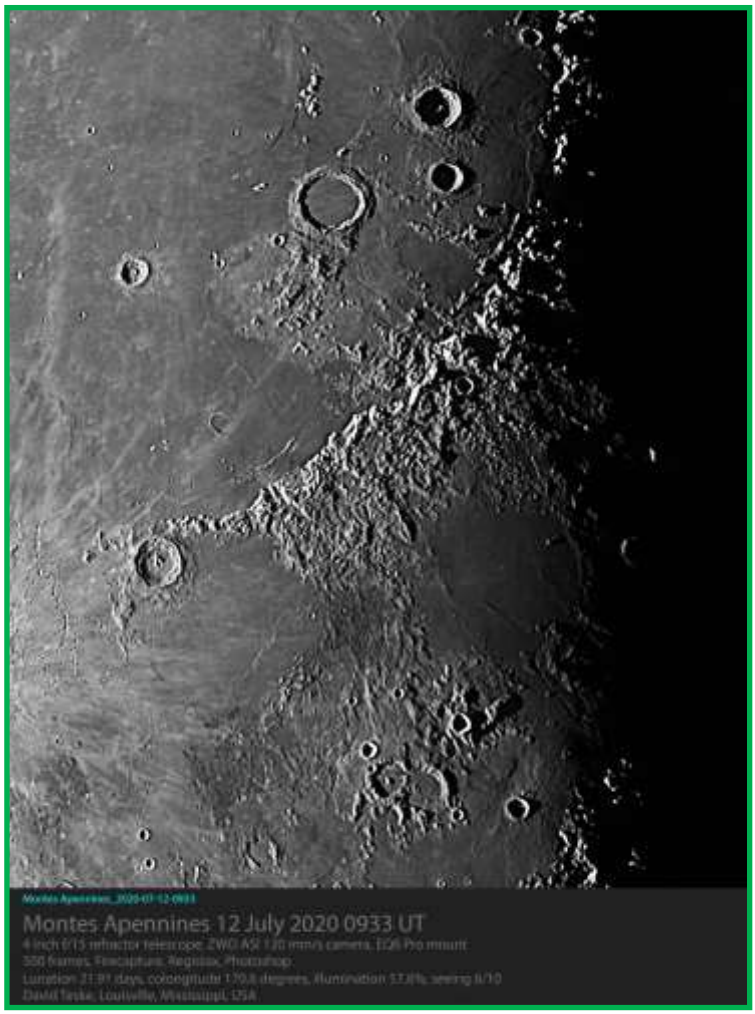


Image 52, Montes Apenninus, *David Teske, Louisville, Mississippi, USA. 2020 July 12 09:33 UT, colongitude 170.6 degrees. 4 inch f/15 Skylight refractor telescope, IR block filter, ZWO ASI120mm/s camera. Seeing 6/10.*

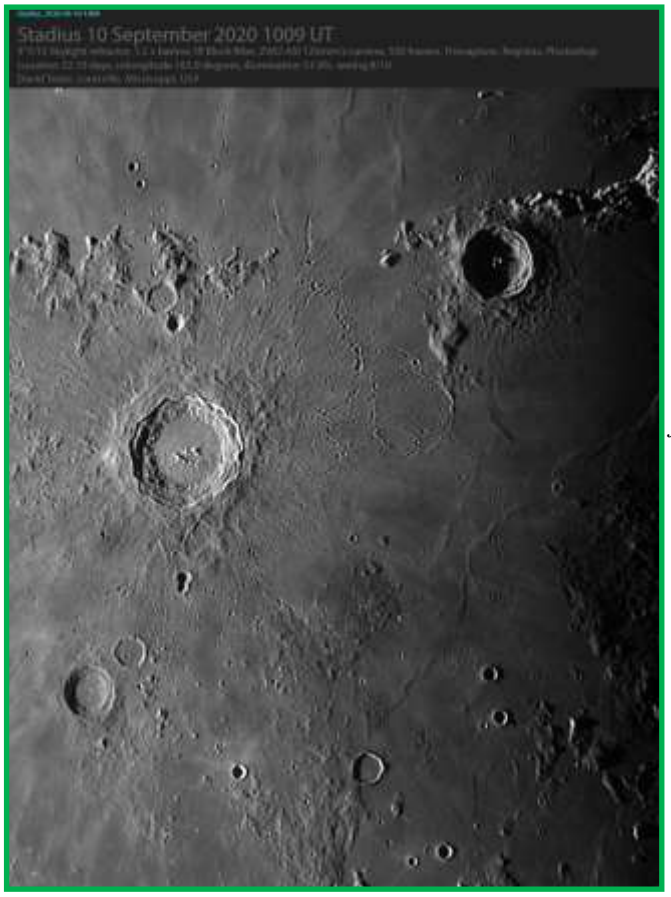


Image 53, Stadius, *David Teske, Louisville, Mississippi, USA. 2020 September 10 10:09 UT, colongitude 183.9 degrees. 4 inch f/15 Skylight refractor telescope, 1.5x barlow, IR block filter, ZWO ASI120mm/s camera. Seeing 8/10.*

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5.-The Eratosthenes Oasis.

Have you ever heard of "Eratosthenes Gardens" or "Eratosthenes Oasis"? It is a fascinating story, a cautionary tale about the wrong paths that obsessive visual observation can lead us down. William Henry Pickering (1858-1935) is the protagonist of our story. Sheehan and Dobbins define him in "Epic Moon" as an astronomer who "evokes both admiration and ridicule (…) a wide-ranging man of ideas and a diligent observer (…) also so prone to rash and unconventional interpretations of his data that most astronomers of his day and historians since have had a hard time taking him seriously" (page 235). According to Patrick Moore "As the sun rises over Eratosthenes, dark areas are seen upon the floor, and appear to develop during the lunar day (whether this development is real or only apparent is another matter)" (page 134). Based on his claims about the existence of a thin lunar atmosphere, Pickering stated, in a long series of articles for the magazine "Popular Astronomy", that the dark areas on the ground of Eratosthenes, which are observed far from the terminator and therefore both with frontal illumination (at noon, say) were not derived from the topography of the crater floor but were "large areas of vegetation surround the crater, particularly on the west and north, those areas being nearly invisible (…) after sunrise on the Moon. If the lunar vegetation has leaves, we must consider that only the twigs and the branches are visible near sunrise and sunset. Its form is of course quite unknown to us (…) the lunar vegetation is not green. It is gray like our sage brush and some of our cacti, and black like our lichens" (pages 580/581). The explanation has to do with the composition of the materials that make up the soil of Eratosthenes, when Pickering tells us that similar cases occur in Atlas and Alphonsus, famous for their visible dark spots near the full Moon (due to volcanic deposits), we realize: "Every month as the Sun rises higher and the lunar shadows disappear, its familiar outlines are replaced by a confuse array of streaks and splotches with little obvious relationship with the formation's topography relief. Pickering drew a veritable maze of dusky linear features intersecting in dark spots "practically identical in appearance with those seen upon the planet Mars" (…) Pickering mapped the changes in these "pseudo shadows" in obsessive detail, changes which, he found, occurred with predictable regularity. The initial small darkening near the center of the crater proceeded to spread outward toward the crater's periphery, advanced up the inner slopes and spilled over the ramparts, then rapidly faded out again with the approach of evening shadows. Seemingly capricious minor changes in this cycle of development in what he called the "Gardens of Eratosthenes" would occupy much of his attention in coming years" (Sheehan and Dobbins, page 250), both in his years at the Arequipa Observatory in Peru, and in his years of scientific exile in Mandeville, Jamaica (hence the title of the fascinating chapter on his life in "Epic Moon": "The Madman of Mandeville"). It would be seasonal vegetation that had a seasonal growth cycle, which reached its maximum when the area received more heat from the Sun and then decreased. It is interesting to go through, with a mixture of admiration for his tenacity and his skills as an observer and sorrow for the valuable time he wasted, the series of articles in "Popular Astronomy" (we have already mentioned the first), in which he obsessively analyzes these spots, to which he gave the name of plants and flowers, the result of his observations (already with a small telescope) in Jamaica. The last of the series ("Eratosthenes Nº6. Migration of the plats") deals with the "non-seasonal" changes of the spots in "the Eratosthenes oasis. (…) small dark areas that we can watch actually moving about over the Surface of the Moon. While some are stationay, several are known to travel over appreciable distances" (page 393) with speeds up to "2.0 feet per minute" (page 397). As vegetation don't move, according to Pickering "these moving dark objects on the Moon are really swarms of animal life" (página 401). What would the migrations of terrestrial animals look like from the Moon? Pickering wonders, well, similar to what he observed from Earth, although according to his calculations by speed and size of the migrating spots: "we might believe that the lunar insects, if we may so call them, were fully equal in size to the ants" (page 402). It is interesting to note how Pickering's ideas about Eratosthenes, although discredited at the time, continued to have influence after his death, for example in Walter Haas's 1942 text "Does anything ever happened on the Moon?" (pages 11 and 12). Walter Haas made observations with Pickering at Mandeville in 1935 and it is understandable that he continued to observe Eratosthenes, although he is careful not to relate the changes to life of any kind.

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Patrick Moore's text that we quote is also interesting, in 1955 he does not subscribe to Pickering's theses and he is right, a little intuitively: “undoubtedly the patches extend as the sun rises, but there is a differece between “extending” and “moving”, and it seems to me probable that the variations are due to the texture of the ground altering in hue as it is heated” (page 135). But in those years, when visual observation still reigned and we had not yet reached the Moon, the possibility (albeit remote) that Pickering was not wrong existed: “If Pickering’s plants in Eratosthenes exist at all, they must depend upon gas emitted from the ground” (page 135). “At the moment we can do no more than say that while the weight of scientific evidence seems to be rather against the existence of plant life of any kind, it remains an intriguing possibility, and one that we cannot totally ignore” (page 137). That no one can predict the future, despite the fact that many currently do so by telling us how technology will develop in the coming years, is an undeniable historical fact: in 1955 Patrick Moore told us that Pickering's was a hypothesis that would be resolved when man reached the Moon "in the centuries to come" and in reality we had to wait no more than a few years.

Have you seen the dark spots of Eratosthenes? It takes Pickering's visual acuity to perceive them at Full Moon (or his faith in them). In IMAGE 54 to 58 we can accurately distinguish our crater floor with frontal illumination, all the shadows seem to correspond with the topography. It's a matter of searching.

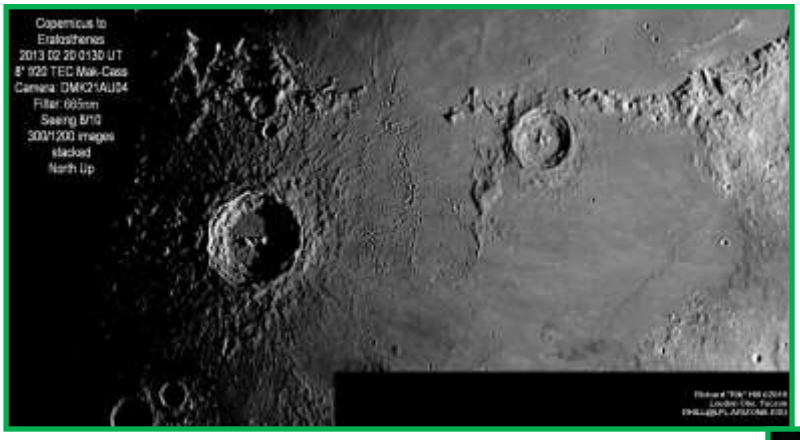

Image 54, Copernicus to Eratosthenes*, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2013 February 20 01:30 UT. TEC 8 inch f/20 Maksutov-Cassegrain telescope, Wratten 23 filter, DMK21AU04 camera. Seeing 8/10.*

Image 55, Copernicus to Eratosthenes*, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2014 August 05 02:14 UT. Questar 3.5 inch Maksutov-Cassegrain telescope, 1.7x barlow, 665 nm filter, SKYRIS 445M camera. Seeing 7/10.*

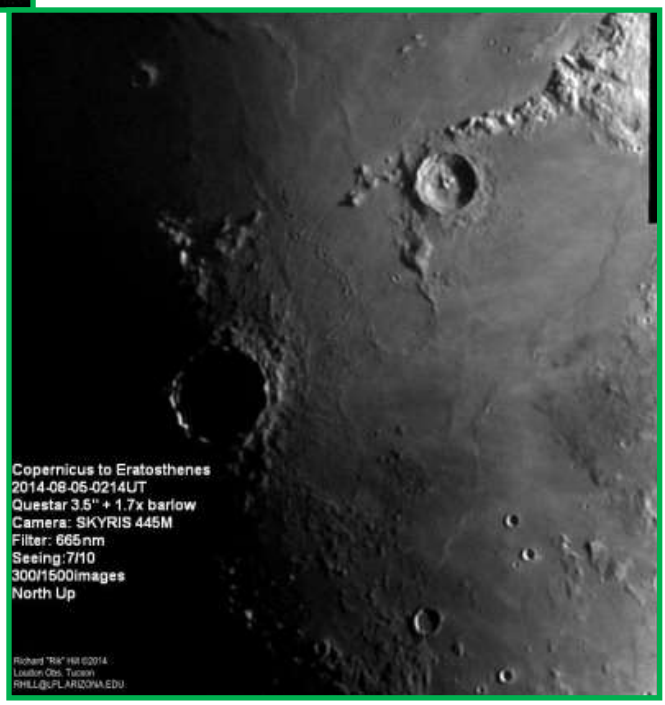

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***Image 56, Eratosthenes**, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2017 January 07 01:21 UT. TEC 8 inch f/20 Maksutov-Cassegrain telescope, 665 nm filter, SKYRIS 445M Seeing 8/10.*

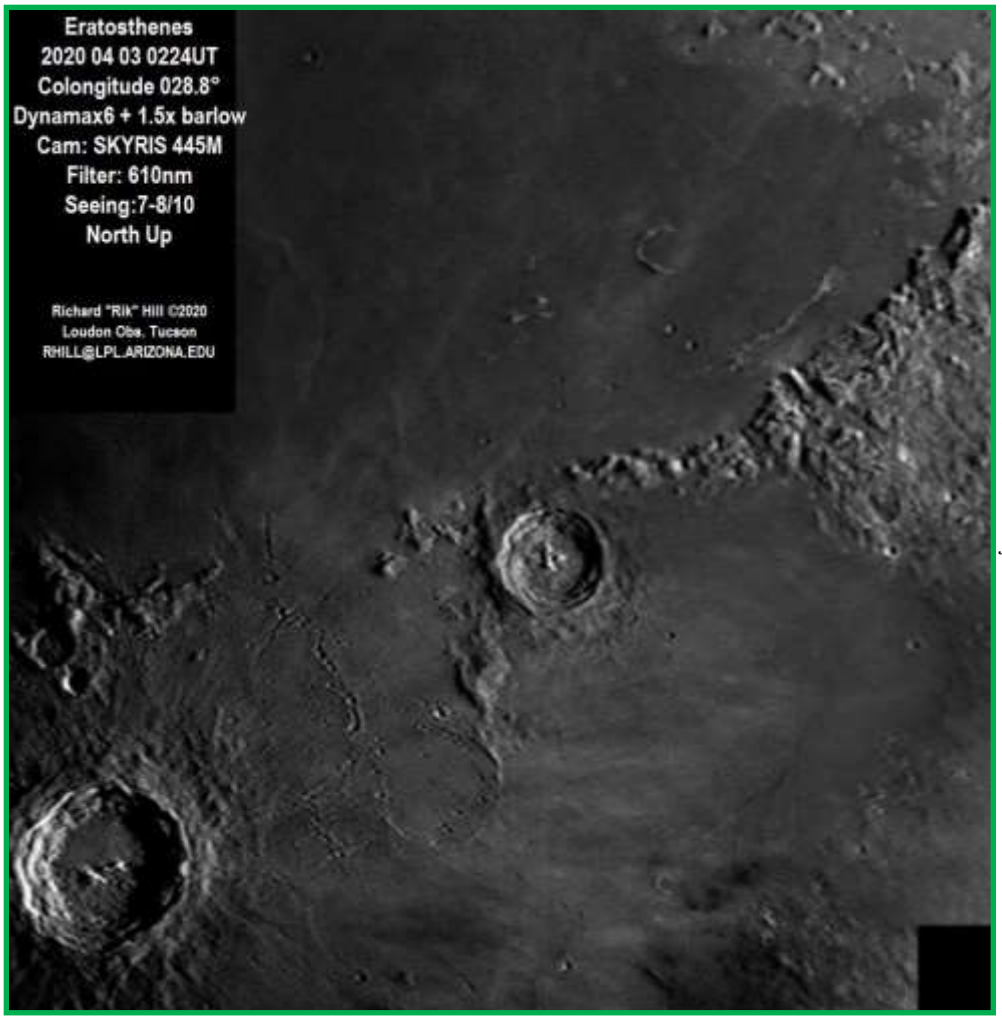

***Image 57, Eratosthenes**, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2020 April 03 02:24 UT, colongitude 28.8°. Dynamax 6 inch Schmidt-Cassegrain telescope, 1.5x barlow, 610 nm filter, SKYRIS 445M Seeing 7-8/10.*

Focus-On: Ever Changing Eratosthenes

Image 58, Eratosthenes*, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2022 May 11 02:00 UT, colongitude 30.7°. TEC 8 inch f/20 Maksutov-Cassegrain telescope, 665 nm filter, SKYRIS 132M Seeing 8/10.*

Focus-On: Ever Changing Eratosthenes

6.-Geological marker.

Finally, Eratosthenes is also famous for having given his name to the longest geological period in the history of the Moon. Don E. Wilhelms (page 249) tells that Shoemaker and Hackman (1962) "established the craters Eratosthenes and Copernicus as the type areas of the Moon's two youngest time-stratigraphic systems because of stratigraphic relations evidente on telescopic photographs. Ejecta of Eratosthenes is superposed on the nearby mare material, whereas rays of Copernicus are superposed on Eratosthenes". Thus was created the first lunar geological map based on stratigraphic principles. In IMAGE 59 we have a wide field that allows us to appreciate this privileged area for the comparative study that led to the classification of the geological periods of our satellite as we know them today. Charles Wood says (page 53): "Copernicus was clearly the youngest major impact deposit because its bright rays and secondary craters drape over the surrounding maría, the Carpathian Mountains, the nearby crater Eratosthenes, and everything elese nearby" (Copernicus is number 1 in IMAGE 59). "Eratosthenes itself is clearly older than Copernicus but it is relatively young, as indicated by its small secondary craters, which cover the nearby lavas of Mare Imbrium (…) Shoemaker and Hackman identified the lava Surface of Mare Imbrium as the next oldest stratigraphic unit, since it was the material beneath Eratosthenes's secondary craters". In IMAGE 59 we indicate Eratosthenes, Timocharis and Lambert with the numbers 2, craters located on the lavas of Mare Imbrium (number 3), "the rough terrain near Archimedes (number 4) -the Apennine bench-is embayed by Imbrium lavas and thus must be older than them. And the next older units are the Apennine, Carpathian, and other Imbrium-surrounding mountains that form the basin's rim" (number 5).

Eratosthenes, because of his similarity to Copernicus, and because he was so close, allowed the initial comparison that would lead to the current understanding of the Moon's geological history.

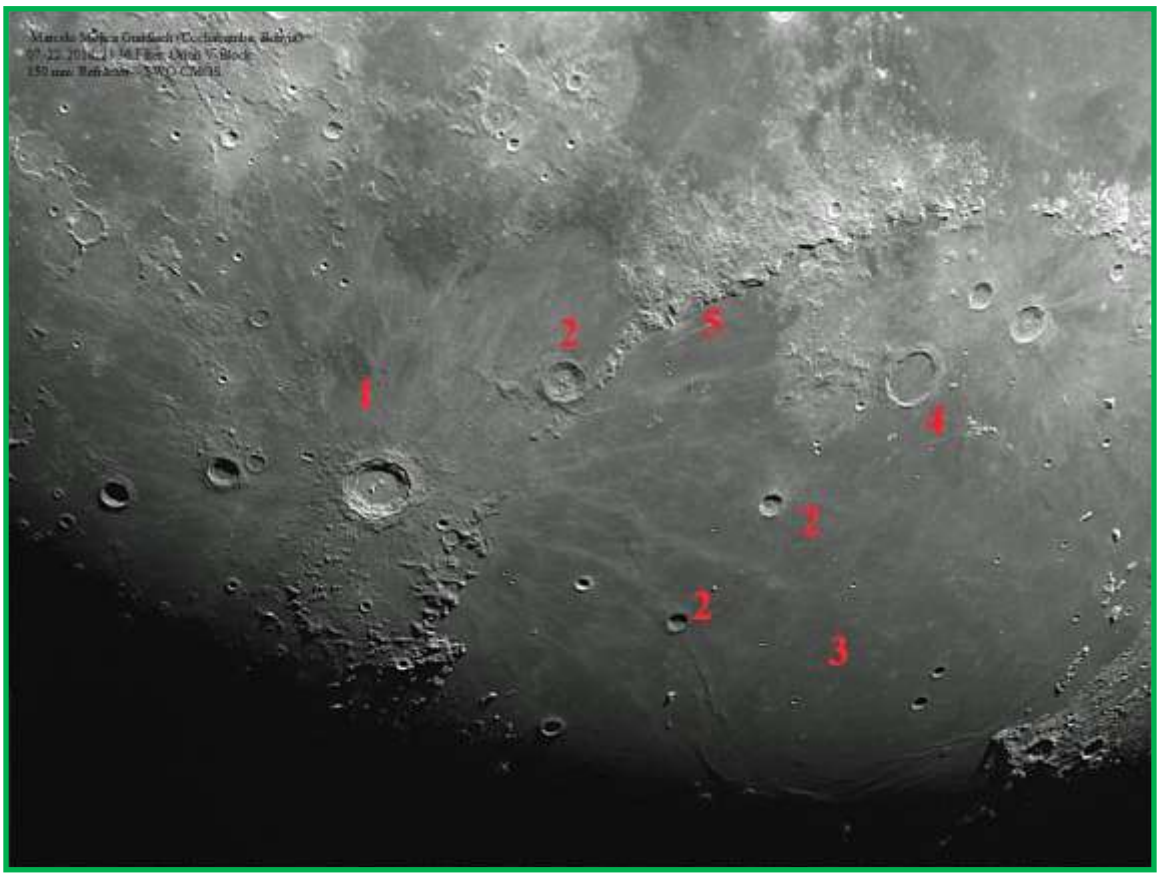

Image 59, Eratosthenes and Copernicus, *Marcelo Mojica Gundlach, Cochabamba, Bolivia. 2018 July 22 23:36 UT. 150 mm refractor telescope, Orion V-Block filter, SWO CMOS camera. North is right, west is down.*

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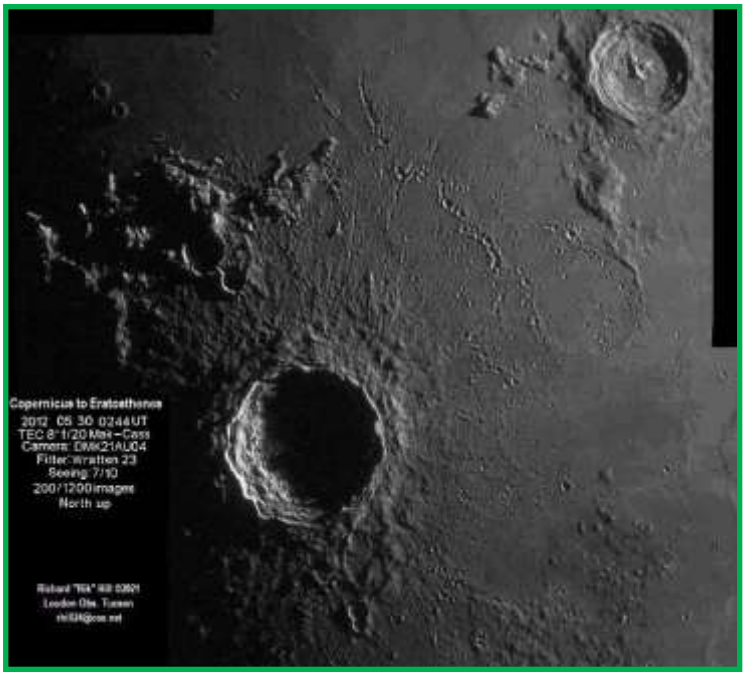
***Eratosthenes**, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2015 March 29 02:28 UT. TEC 8 inch f/20 Maksutov-Cassegrain telescope, 665 nm filter, SKYRIS 445M Seeing 8/10.*



***Copernicus to Eratosthenes**, Richard Hill, Loudon Observatory, Tucson, Arizona, USA. 2012 May 30 02:44 UT. TEC 8 inch f/20 Maksutov-Cassegrain telescope, Wratten 23 filter, DMK21AU04 camera. Seeing 7/10.*

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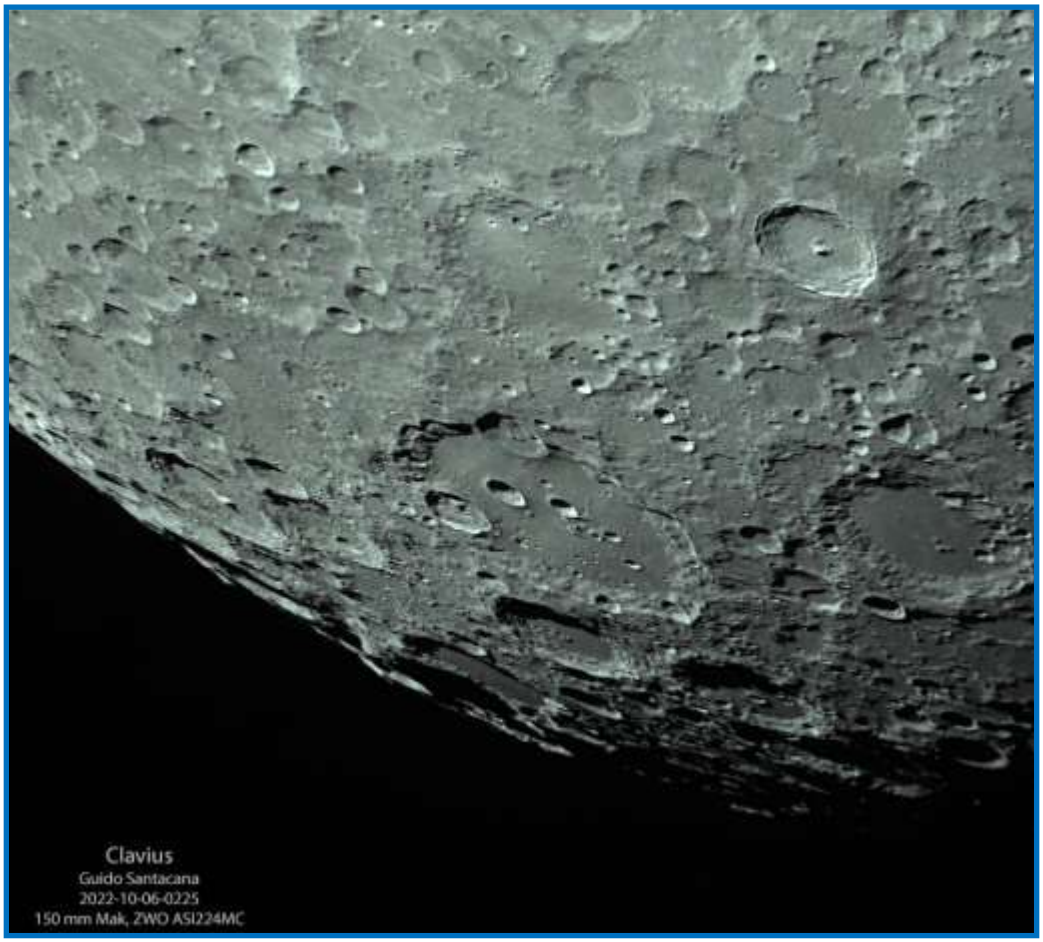
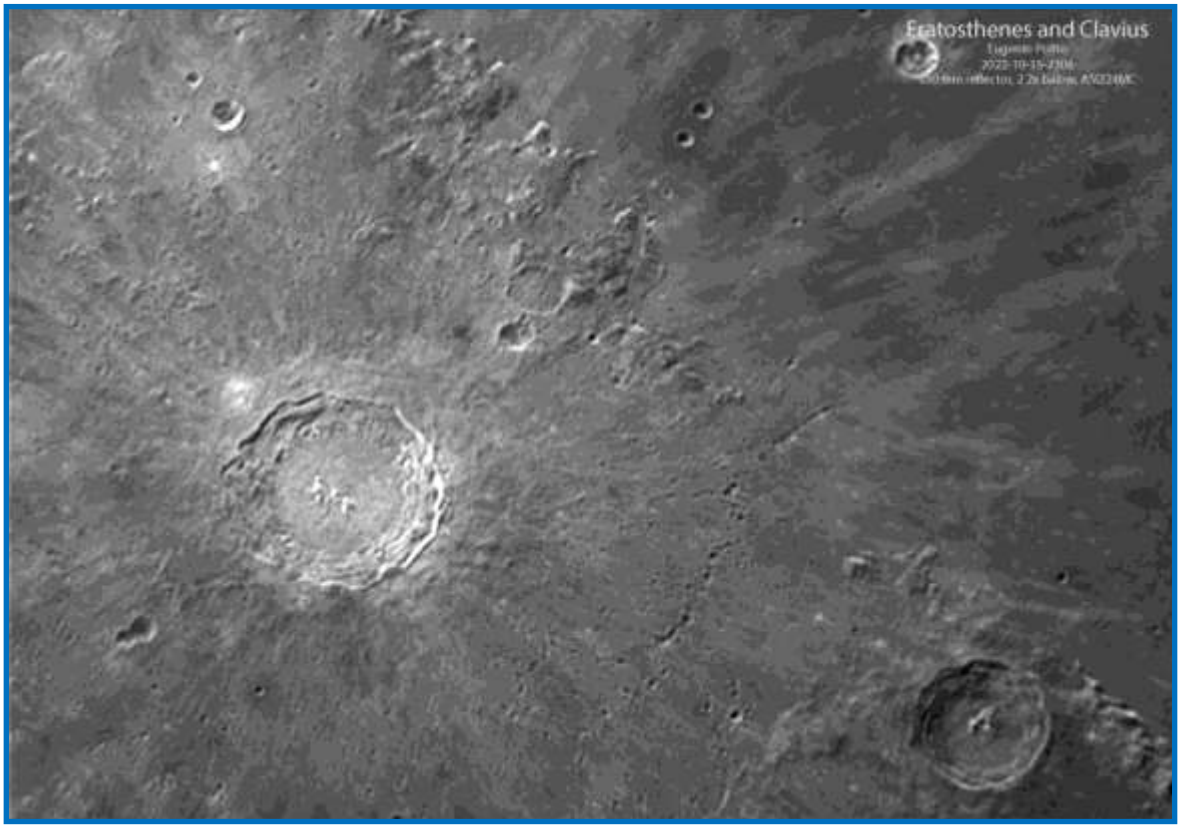
Mare Crisium and Proclus, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 03 23:32 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*



Clavius, *Guido Santacana, San Juan, Puerto Rico, USA. 2022 October 06 02:25 UT. 150 mm f/12 Maksutov-Cassegrain telescope, ZWO ASI224MC camera.*

Recent Topographic Studies

Maurolycus, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 02 00:15 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*



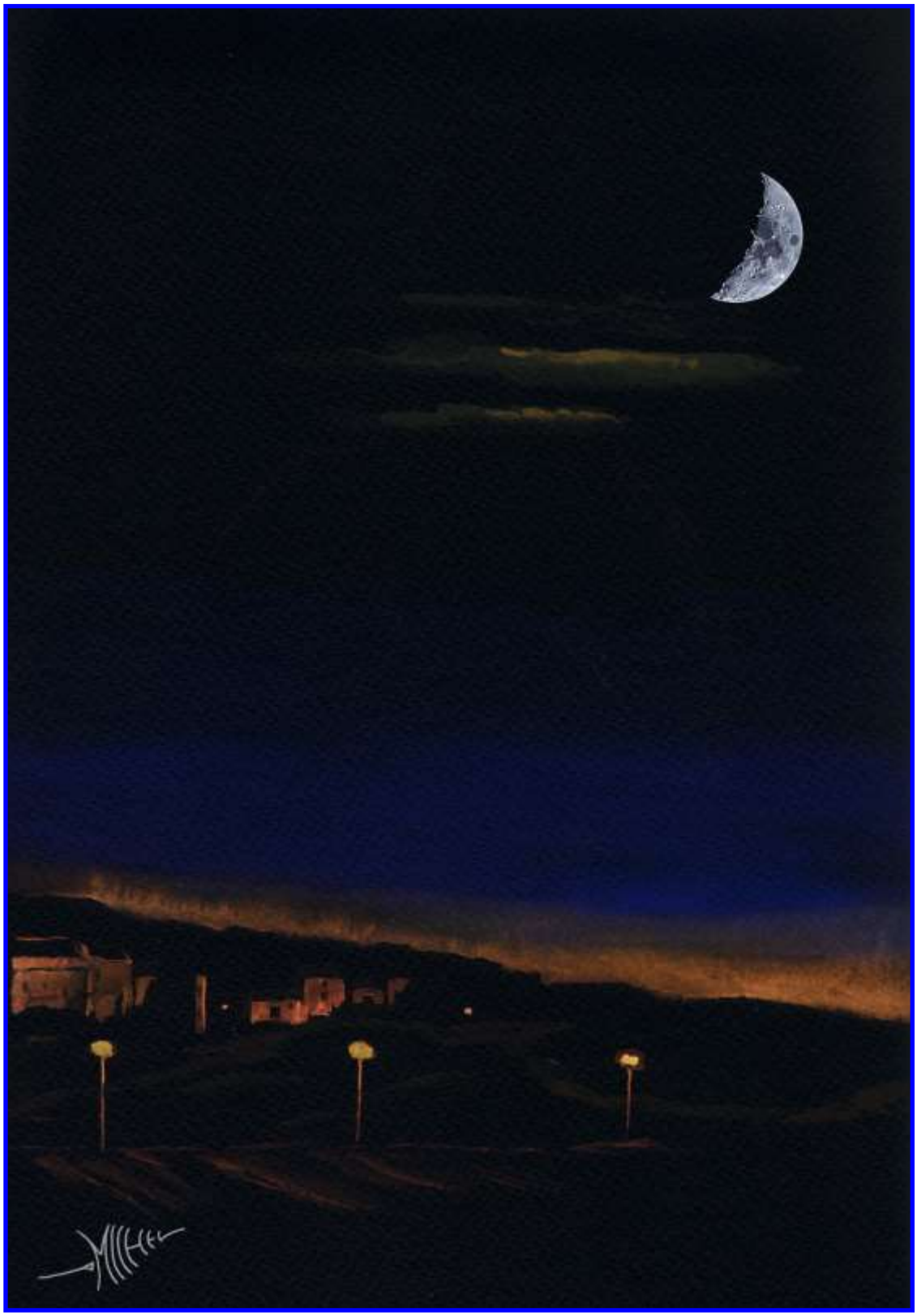
Eratosthenes and Copernicus, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 23:06 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Recent Topographic Studies

Maurolycus, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 03 23:28 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*

Sinus Iridum*, Guido Santacana, San Juan, Puerto Rico, USA. 2022 October 06 02:19 UT. 150 mm f/12 Maksutov-Cassegrain telescope, 2x barlow, ZWO ASI224MC camera.*

Recent Topographic Studies



Waxing Crescent Moon, *Michel Deconinck, Aquarellia Observatory, Artignosc-sur-Verdon - Provence - France. 2022 October 01. I made a quick watercolor from my terrace - Artignosc-sur-Verdon, (just adding the pastel view of the moon after digitalization).*

Recent Topographic Studies

Waxing Crescent Moon, *Fabio Verza, SNdR, Milan, Italy. 2022 October 01 17:46 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 0.5x reducer, Astronomik ProPlanet IR742 nm filter, iOptron CEM70G mount, ZWO ASI290mm camera, 1.3x barlow.*

Copernicus, *Maurice Collins, Palmerston North, New Zealand. 2022 October 05 07:06 UT. Meade EXT90 Maksutov-Schmidt-Cassegrain telescope, QHY5III462C camera.*

Recent Topographic Studies

Waxing Crescent Moon, *Michel Deconinck, Aquarellia Observatory, Artignosc-sur-Verdon - Provence - France. 2022 October 01. Michel adds "the pastel I made directly through the eyepieces (28mm) of my 126mm Vixen binocular, I don't made any modification on the pastel in my workshop after the observation, just scan. The sketch diameter size of our satellite on the Canson paper is a CD one."*

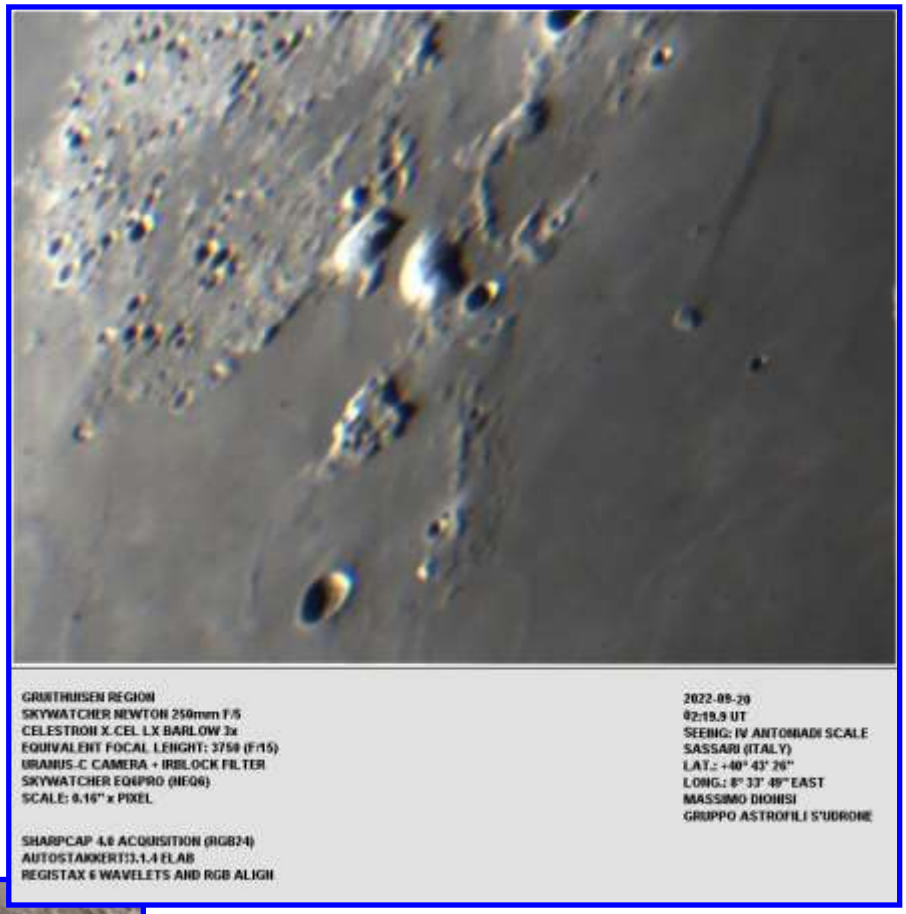
Copernicus and Eratosthenes, *Ioannis (Yannis) A. Bouhras, Athens, Greece. 2022 October 05 16:19 UT. Skywatcher SkyMax 180 Pro Maksutov-Cassegrain telescope, IR filter, ASI224mc camera.*

Recent Topographic Studies

Hainzel, *Fabio Verza, SNdR, Milan, Italy. 2022 October 06 21:08 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 1.3x barlow, IR filter, iOptron CEM70G mount, QHY5III462C camera.*

Archimedes, Aristillus and Autolycus, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 03 23:45 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*

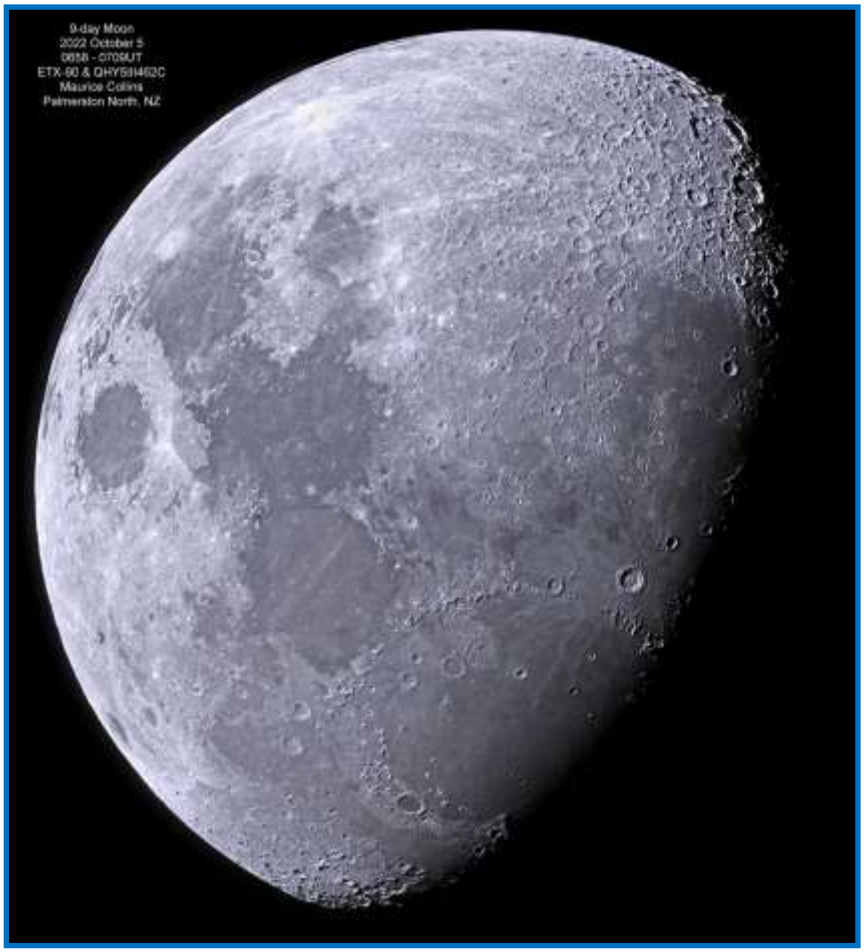
Recent Topographic Studies



Gruithuisen Region, *Massimo Dionisi, Sassari, Italy. 2022 September 20 02:19 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

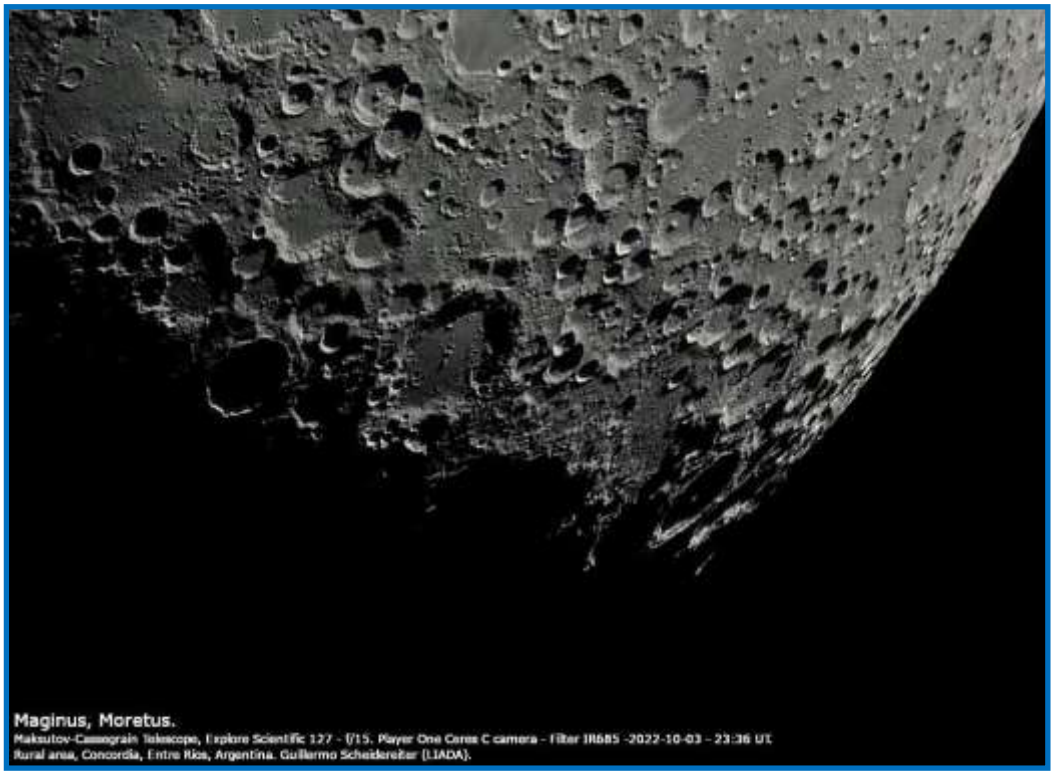
Clavius, *Fabio Verza, SNdR, Milan, Italy. 2022 October 06 21:05 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 1.3x barlow, IR filter, iOptron CEM70G mount, QHY5III462C camera.*

Recent Topographic Studies



9-day old Moon, *Maurice Collins, Palmerston North, New Zealand. 2022 October 05 06:58-07:09 UT. Meade EXT90 Maksutov-Schmidt-Cassegrain telescope, QHY5III462C camera. North is down, west is right.*

Maginus and Moretus, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 03 23:36 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*



Recent Topographic Studies

Rümker, *Massimo Dionisi, Sassari, Italy. 2022 October 07 18:44 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Endymion, Hercules and Atlas, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 03 23:52 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*

Recent Topographic Studies

Wollaston, *Massimo Dionisi, Sassari, Italy. 2022 October 07 19:25 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Copernicus, *Fabio Verza, SNdR, Milan, Italy. 2022 October 06 20:15 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 1.3x barlow, IR filter, iOptron CEM70G mount, QHY5III462C camera.*

Recent Topographic Studies

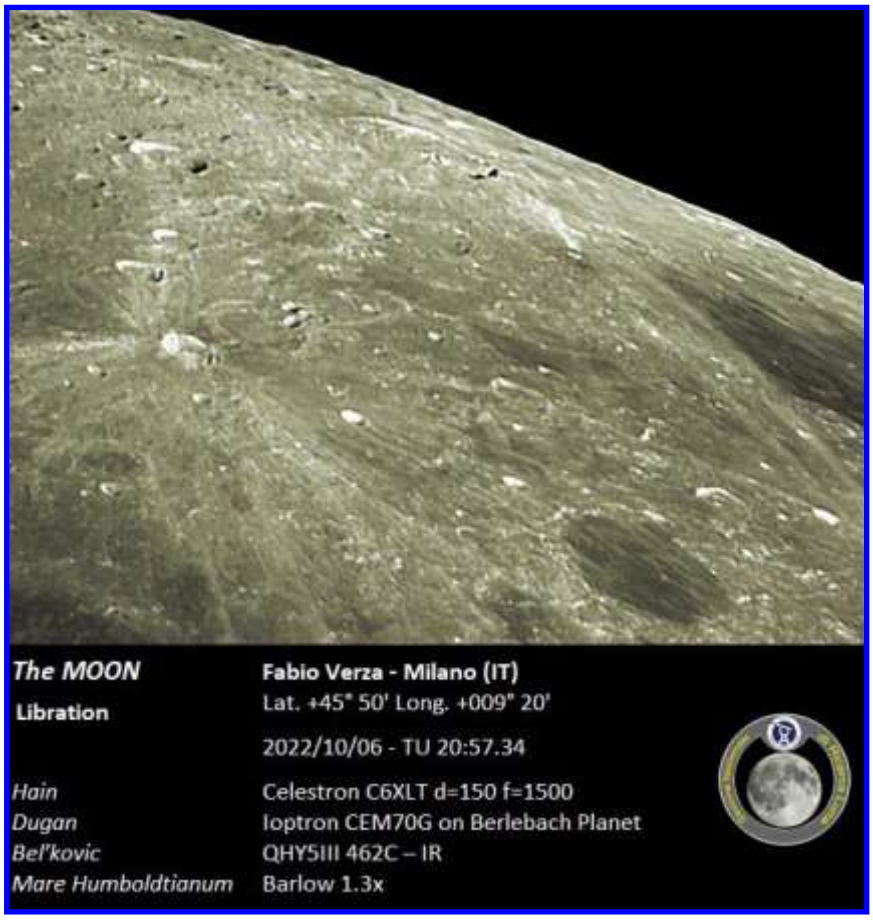
First Quarter Moon, *Fabio Verza, SNdR, Milan, Italy. 2022 October 02 17:40 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 0.5x reducer, IR filter, iOptron CEM70G mount, QHY5III462C camera.*

Halley, Hind, Hipparchus and Albategnius, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 03 23:38 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the upper left, west is to the lower left.*

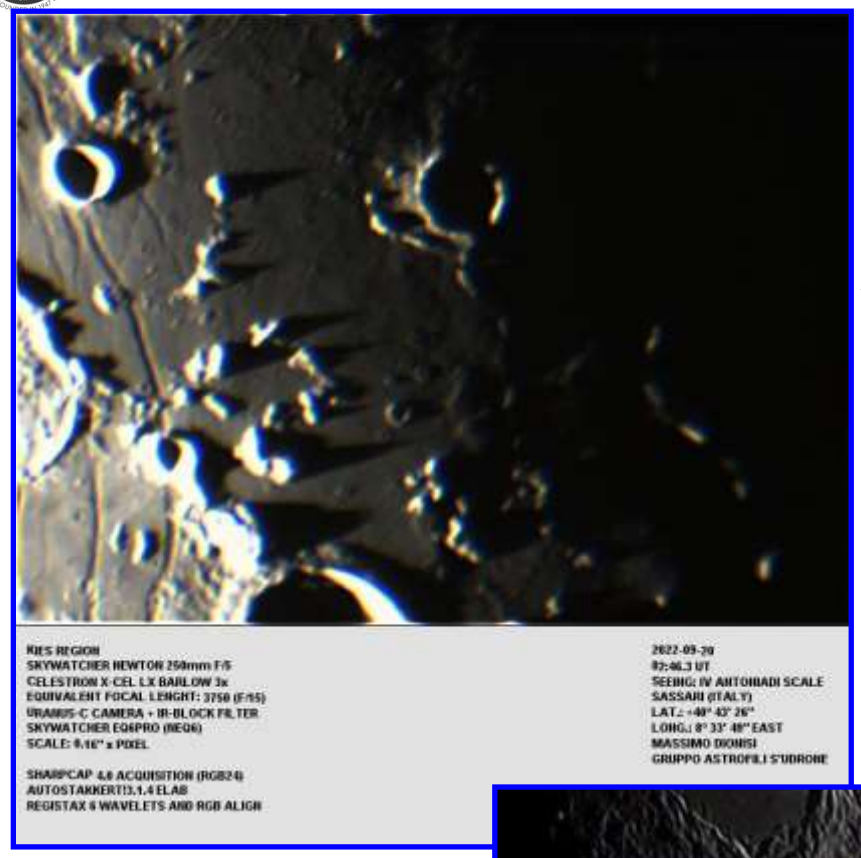
Recent Topographic Studies

Sinus Iridum, *Maurice Collins, Palmerston North, New Zealand. 2022 October 06 07:23 UT. Meade EXT90 Maksutov-Schmidt-Cassegrain telescope, QHY5III462C camera.*

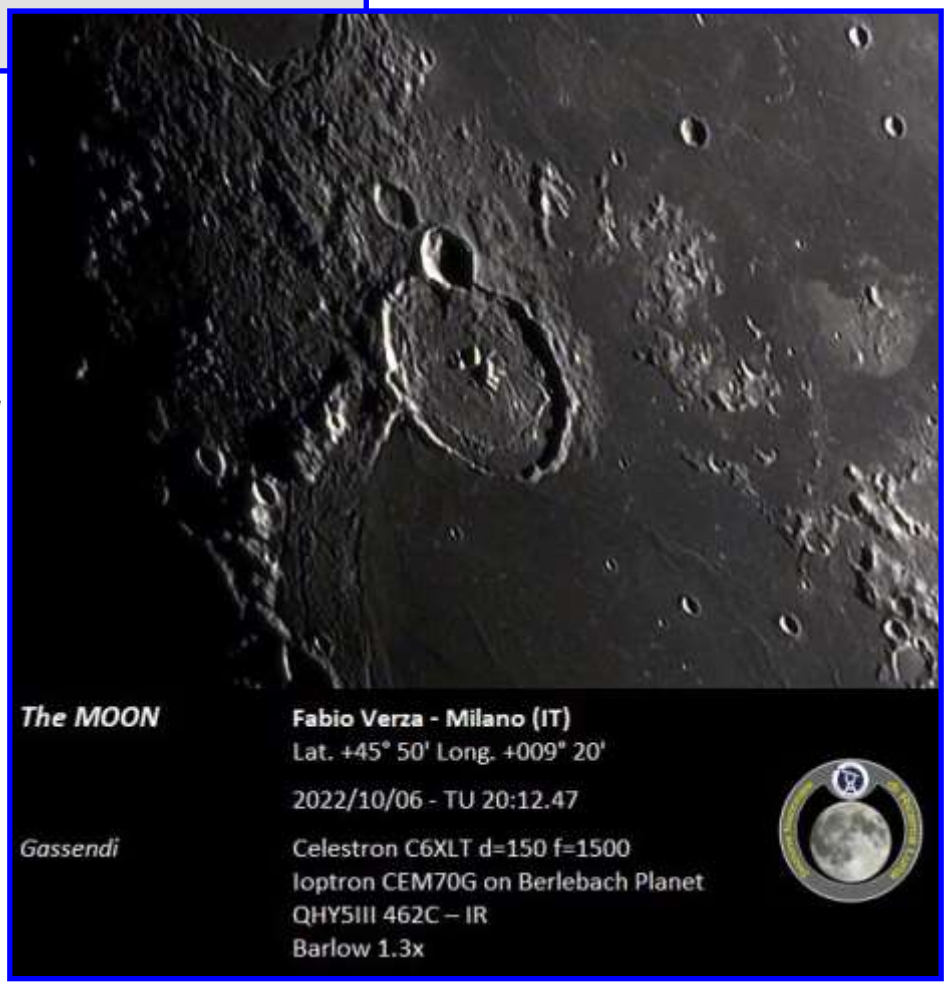
Hayn, *Fabio Verza, SNdR, Milan, Italy. 2022 October 06 20:57 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 1.3x barlow, IR filter, iOptron CEM70G mount, QHY5III462C camera.*



Recent Topographic Studies



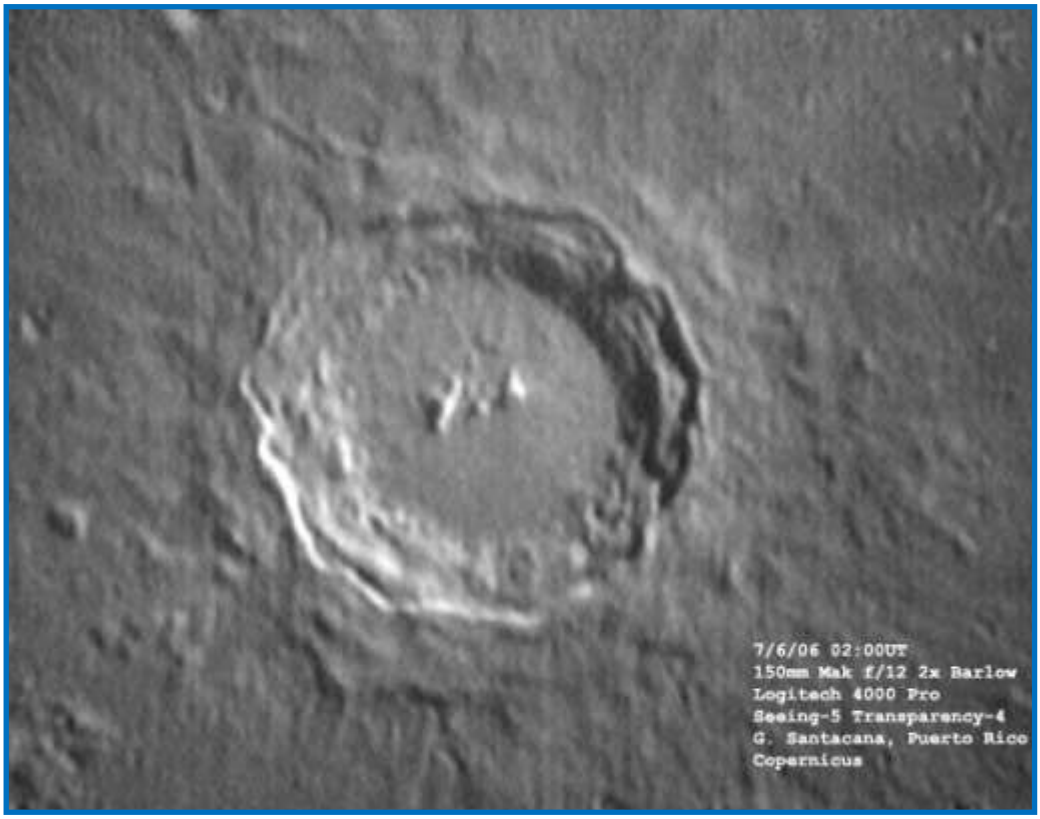
Kies Region, *Massimo Dionisi, Sassari, Italy. 2022 September 20 02:46 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*



Gassendi, *Fabio Verza, SNdR, Milan, Italy. 2022 October 06 20:12 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 1.3x barlow, IR filter, iOptron CEM70G mount, QHY5III462C camera.*

Recent Topographic Studies

Marius Region, *Massimo Dionisi, Sassari, Italy. 2022 October 07 19:00 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*



Copernicus*, Guido Santacana, San Juan, Puerto Rico, USA. 2006 July 06 02:00 UT. 150 mm f/12 Maksutov-Cassegrain telescope, 2x barlow, Logitech Quickcam Pro 4000 camera.*

Recent Topographic Studies

Bullialdus, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 05 00:14 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the left, west is down.*

Sinus Iridum*, Guido Santacana, San Juan, Puerto Rico, USA. 2022 October 06 02:22 UT. 150 mm f/12 Maksutov-Cassegrain telescope, ZWO ASI224MC camera.*

Recent Topographic Studies

Reiner Region, *Massimo Dionisi, Sassari, Italy. 2022 October 07 19:10 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

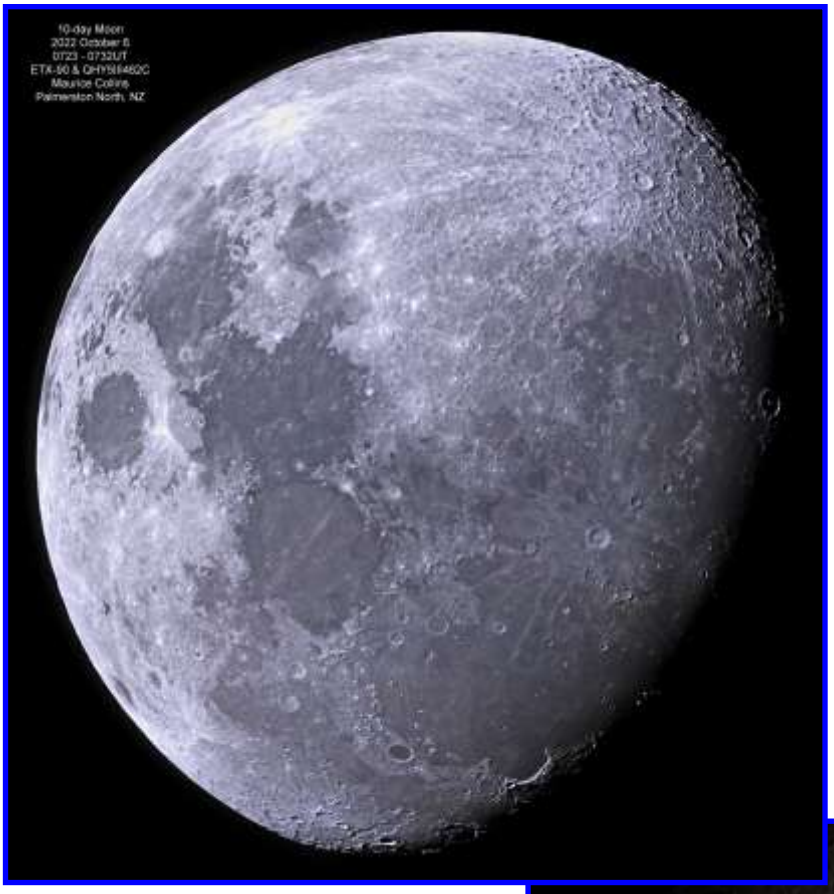
13.5-day old Moon, *Maurice Collins, Palmerston North, New Zealand. 2022 October 09 08:02-08:1 UT. Meade EXT90 Maksutov-Schmidt-Cassegrain telescope, QHY5III462C camera. North is down, west is right.*

Recent Topographic Studies

North of the Moon, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 05 00:19 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the left, west is down.*

Menelaus, *Massimo Dionisi, Sassari, Italy. 2022 October 15 23:22 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 2x Meade Series 4000 barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Recent Topographic Studies

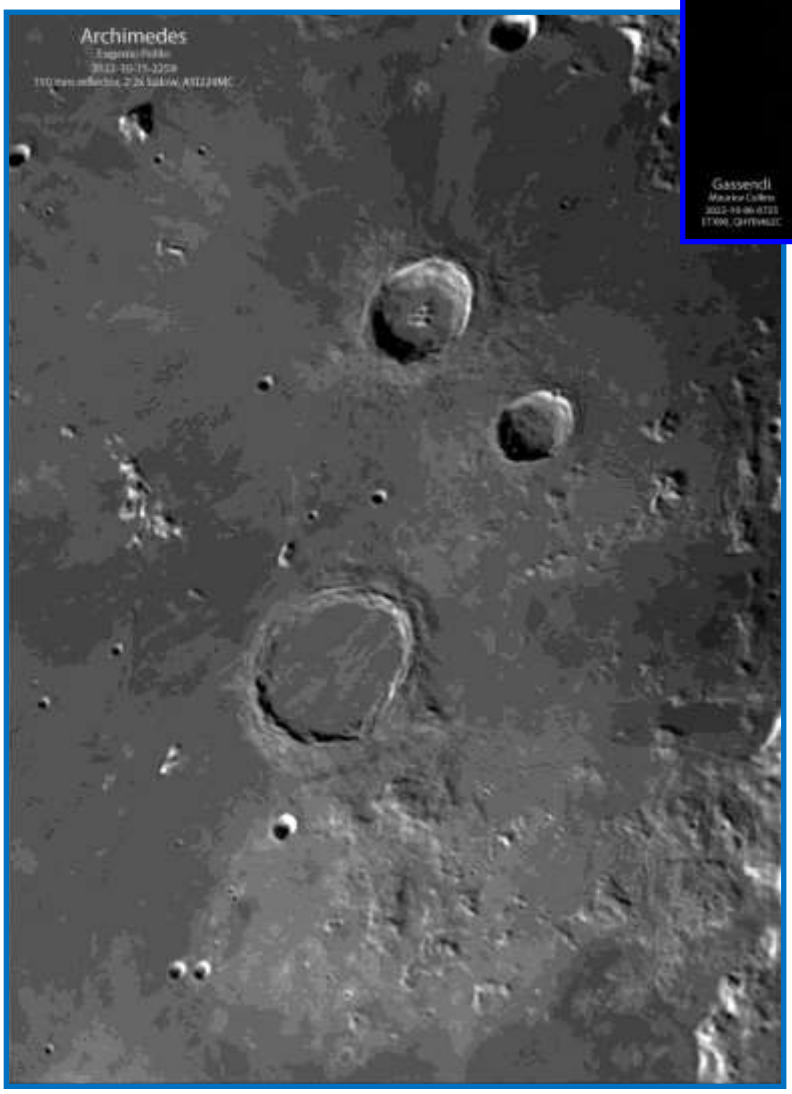


10-day old Moon, *Maurice Collins, Palmerston North, New Zealand. 2022 October 06 07:23-07:32 UT. Meade EXT90 Maksutov-Schmidt-Cassegrain telescope, QHY5III462C camera. North is down, west is right.*

Sinus Iridum, *Fabio Verza, SNdR, Milan, Italy. 2022 October 06 19:57 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 1.3x barlow, IR filter, iOptron CEM70G mount, QHY5III462C camera.*

Recent Topographic Studies

Gassendi, *Maurice Collins, Palmerston North, New Zealand. 2022 October 06 07:25 UT. Meade EXT90 Maksutov-Schmidt-Cassegrain telescope, QHY5III462C camera.*

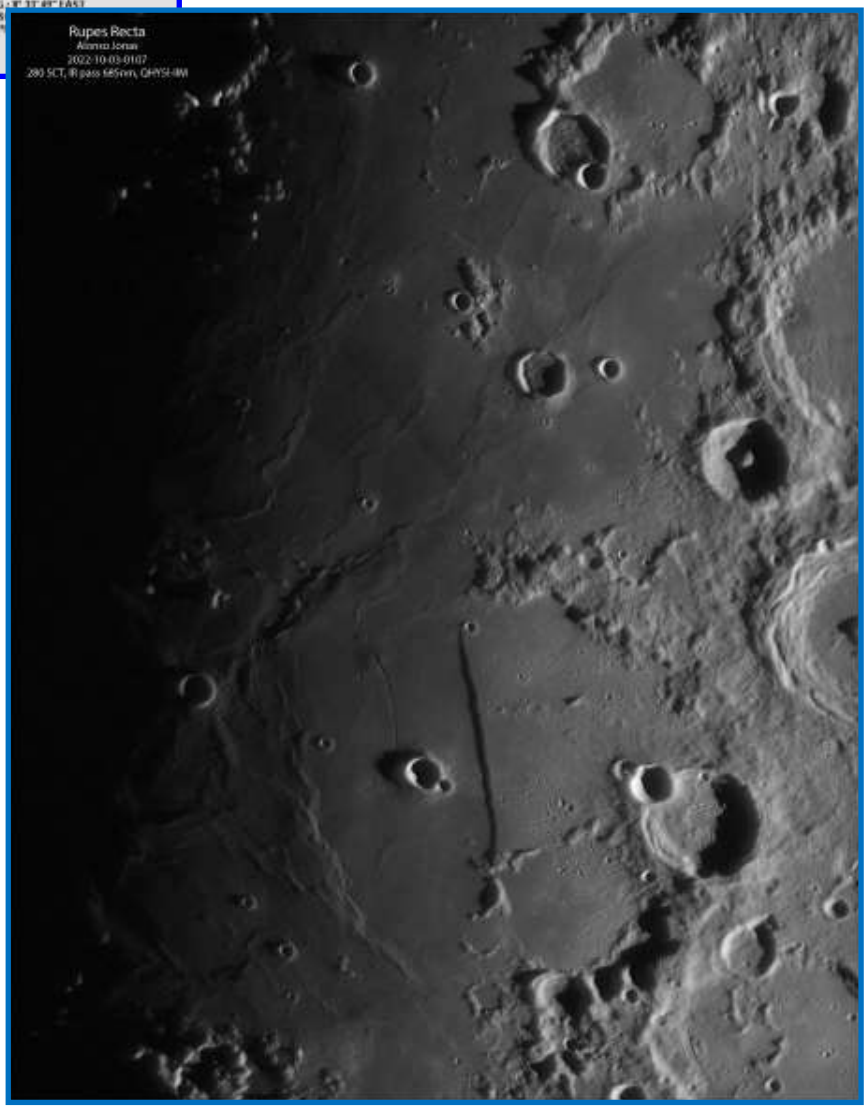


Archimedes, Aristillus and Autolycus, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:59 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

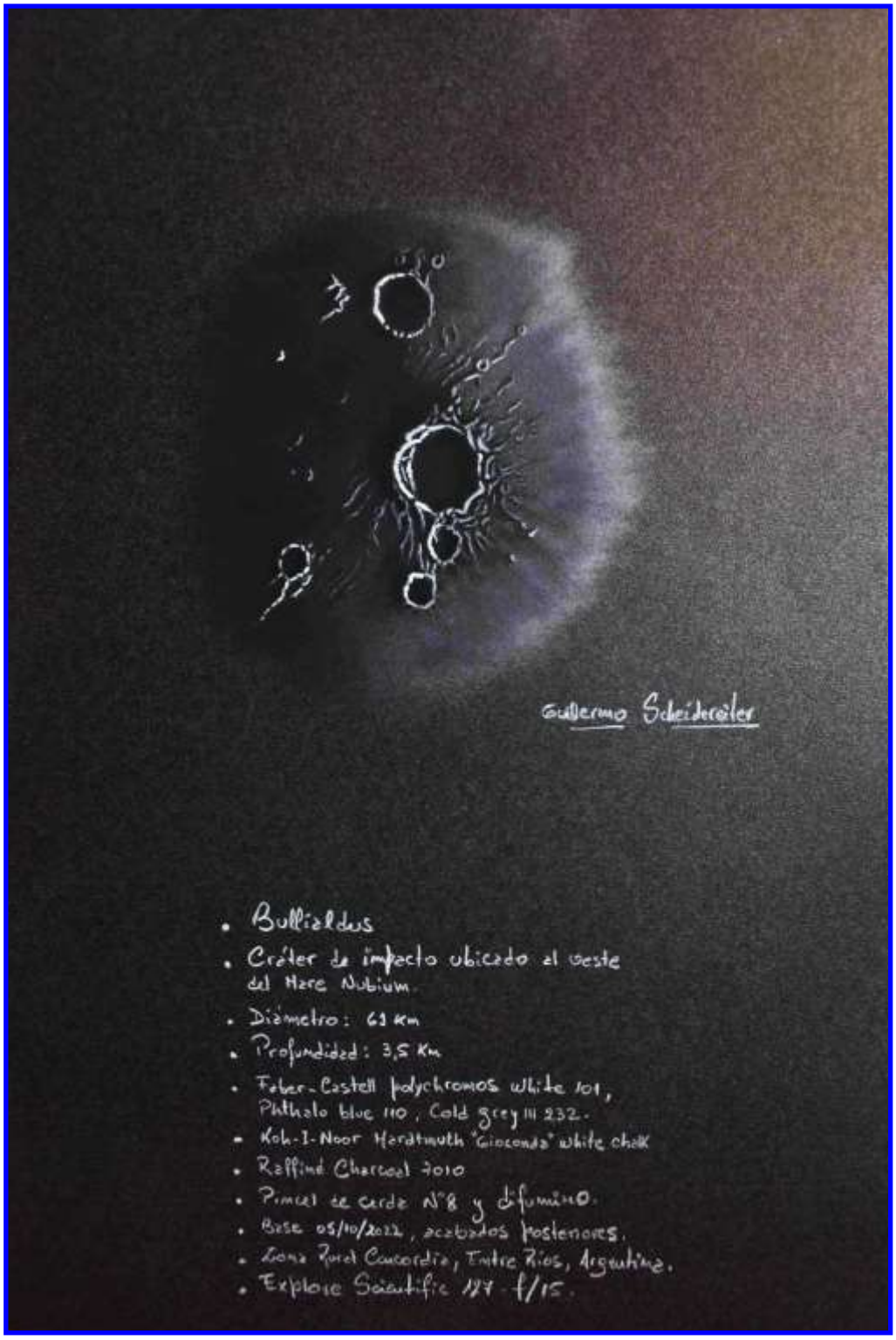
Recent Topographic Studies

Rümker, *Massimo Dionisi, Sassari, Italy. 2022 October 07 18:46 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Rupes Recta, *Jonás Alonso, Oro Verde, Argentina. 2022 October 03 01:07 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*



Recent Topographic Studies

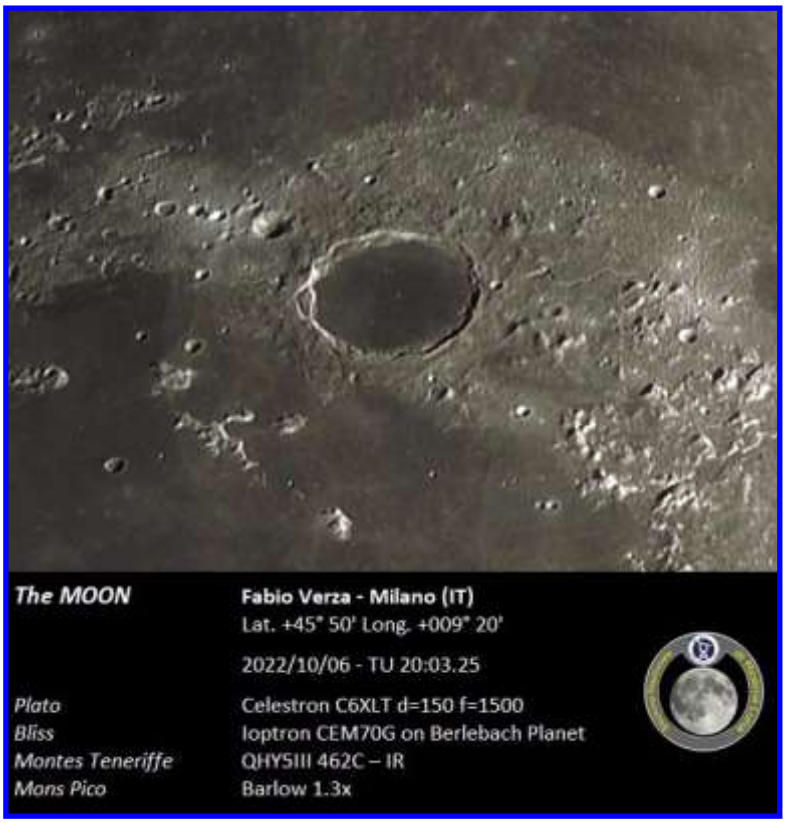


Bullialdus, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 04 23:00 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope.*

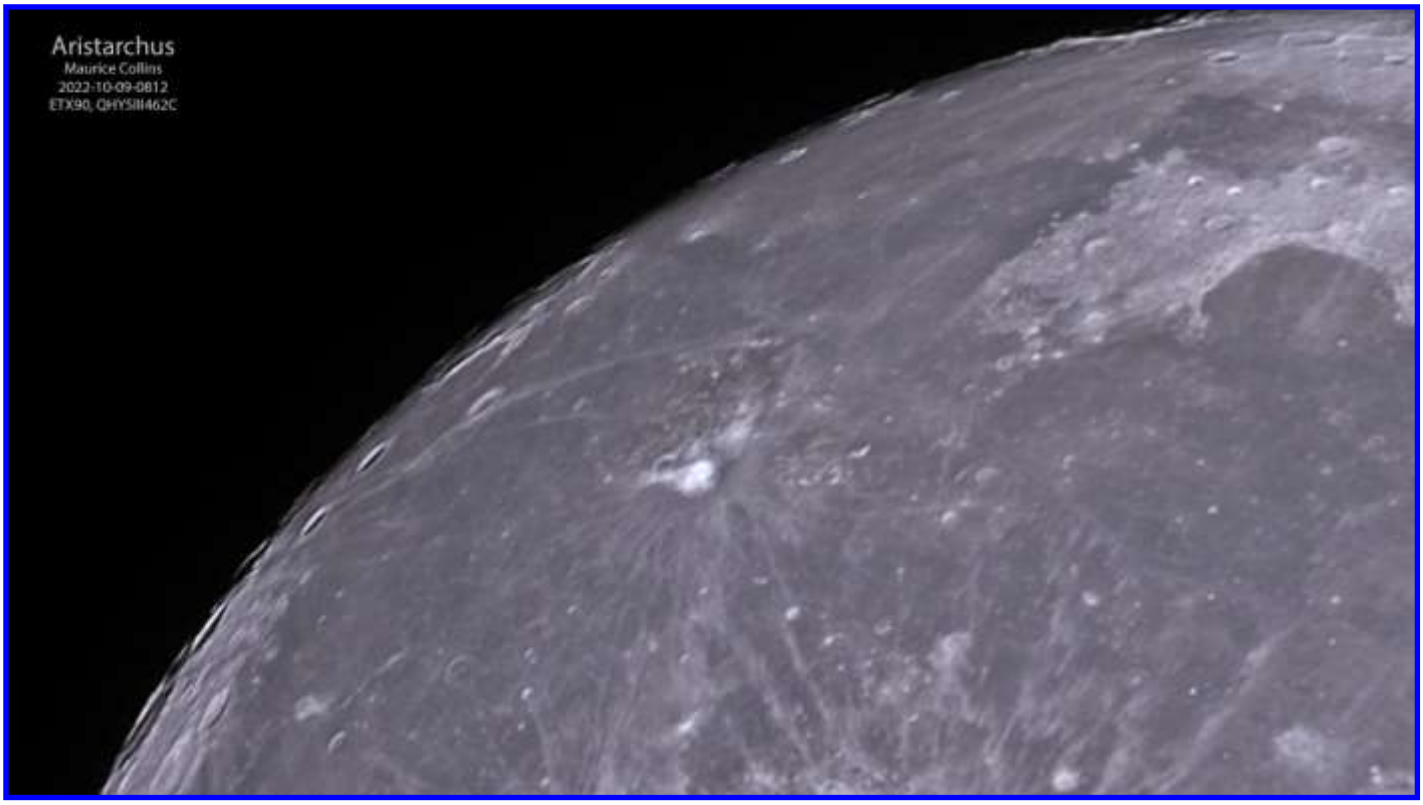
*Guillermo adds: "*I start all my drawings at the foot of the telescope where I make the outlines of the craters and determine the positions, perspectives, areas of light and darkness. Sometimes I even make up to four or five sketches until I am satisfied and I use a LED flashlight covered with red paper and two eyepieces, one 15mm and one 8mm with which I reach 237.5x! But I always record a video before the drawing and another one after the drawing. With these videos (which I sometimes turn into images), I finish the laborious details, such as the reliefs on the slopes of the craters or I accentuate the edges that receive more amount of light, etc. Sometimes I work on my sketches for up to two weeks or more, using brushes, smudgers, charcoal and chalk pencils, etc. (polychromos are the best). Also, before the drawing, I define the lunar area where I will work, I read about the craters and I look at many images. Hence the clarification that the drawing is artistic, not descriptive. I don't think I'm a good cartoonist but it's something that relaxes and entertains me."

Recent Topographic Studies

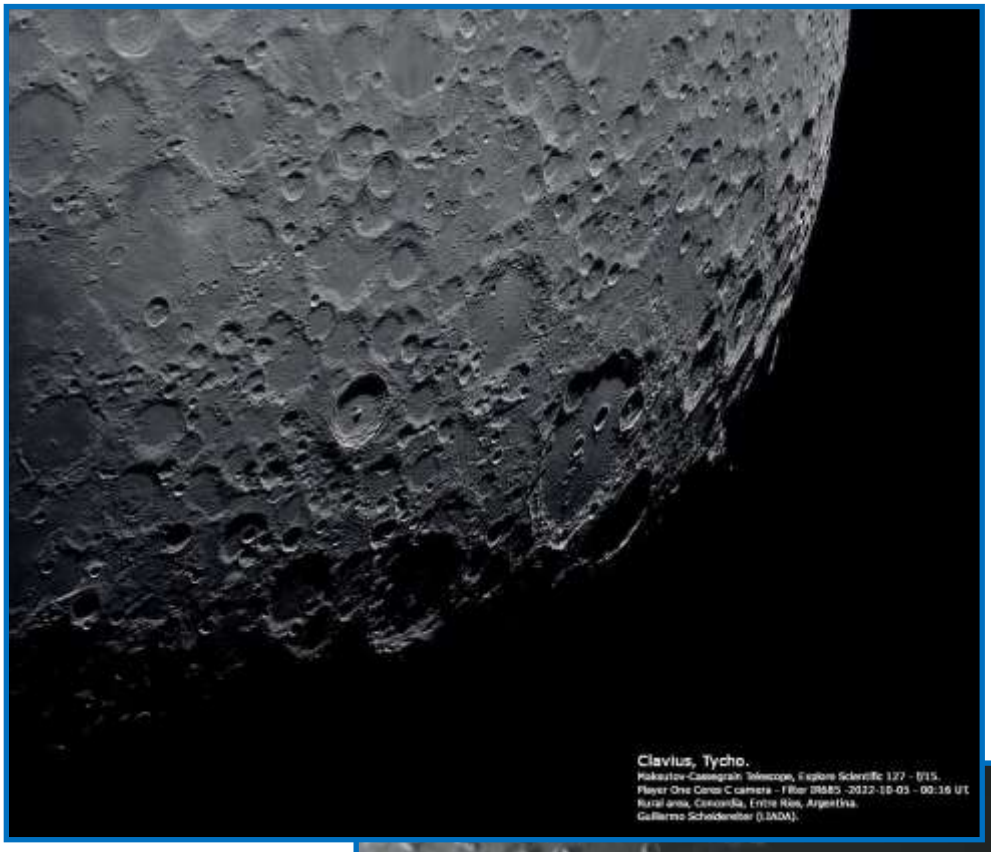
Plato, *Fabio Verza, SNdR, Milan, Italy. 2022 October 06 20:03 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 1.3x barlow, IR filter, iOptron CEM70G mount, QHY5III462C camera.*



Aristarchus, *Maurice Collins, Palmerston North, New Zealand. 2022 October 09 08:12 UT. Meade EXT90 Maksutov -Schmidt-Cassegrain telescope, QHY5III462C camera.*



Recent Topographic Studies



Clavius and Tycho, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 05 00:16 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the left, west is down.*

Arago, *Massimo Dionisi, Sassari, Italy. 2022 October 15 22:57 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 2x Meade Series 4000 barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Recent Topographic Studies

11-day old Moon, *Maurice Collins, Palmerston North, New Zealand. 2022 October 07 07:31-07:46 UT. Celestron 8 inch Schmidt-Schmidt-Cassegrain telescope, QHY5III462C camera. North is down, west is right.*

Meton, *Ioannis (Yannis) A. Bouhras, Athens, Greece. 2022 October 05 16:30 UT. Skywatcher SkyMax 180 Pro Maksutov-Cassegrain telescope, IR filter, ASI224mc camera. Seeing 8/10, transparency 4/6.*

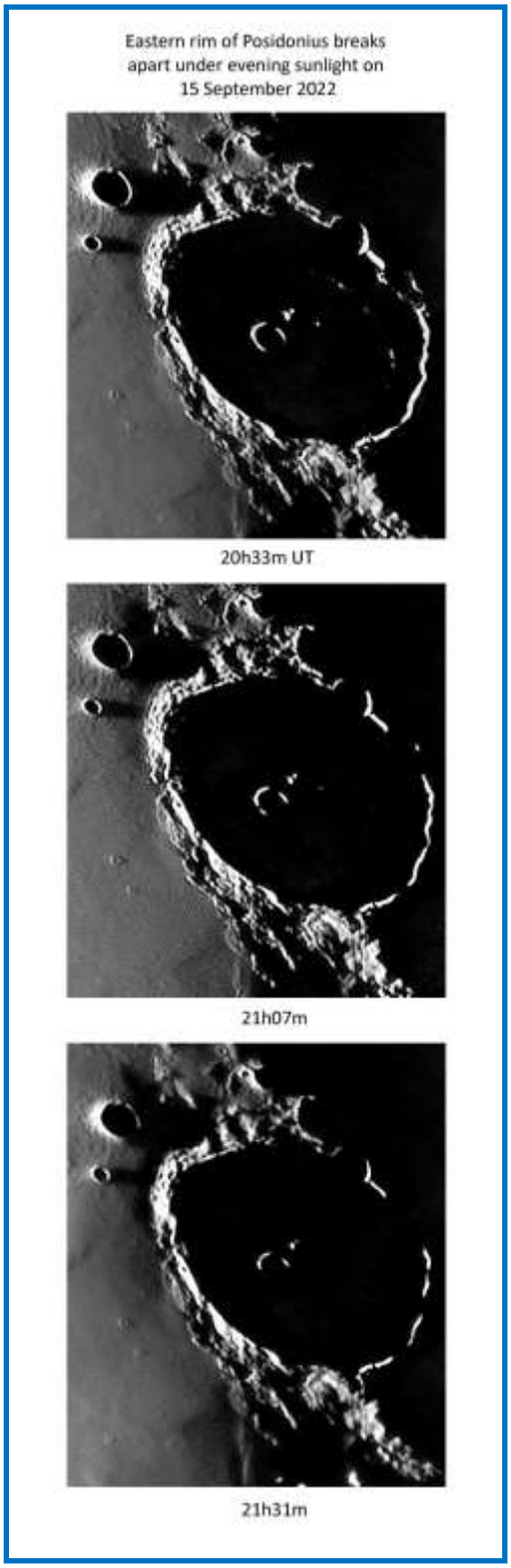
Recent Topographic Studies

J. Herschel, *Massimo Dionisi, Sassari, Italy. 2022 October 06 18:51 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Gyldén Valley, Herschel, Ptolemaeus and Alphonsus, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:50 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Recent Topographic Studies

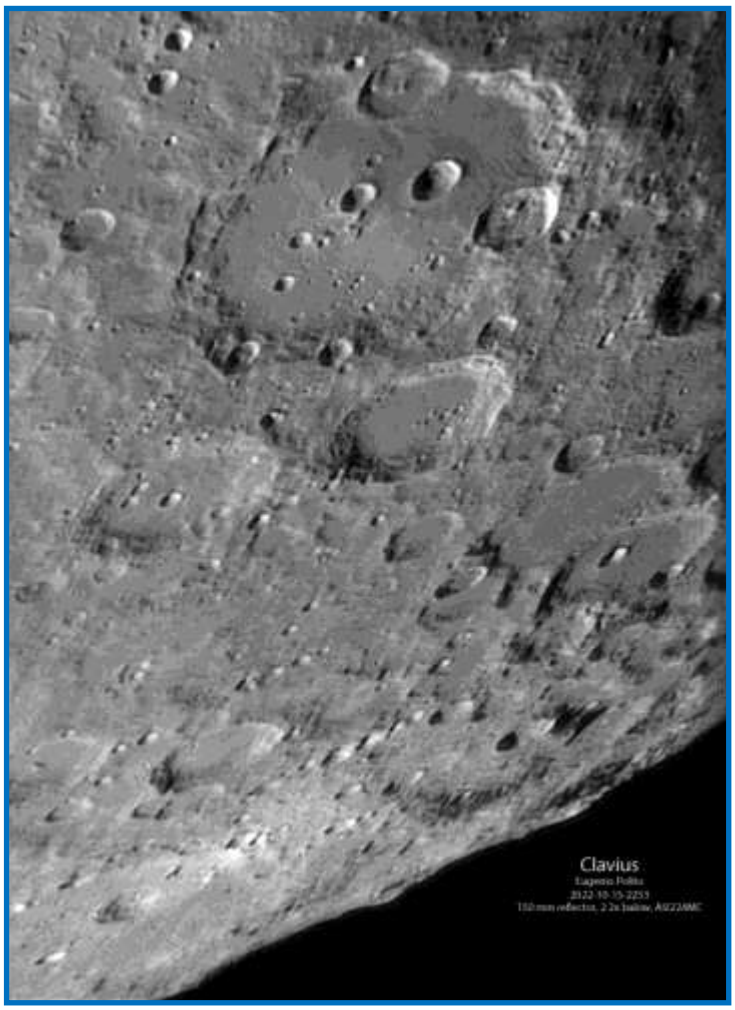
Vallis Alpes, *Fabio Verza, SNdR, Milan, Italy. 2022 October 06 20:59 UT. Celestron 6 inch Schmidt-Cassegrain telescope, 1.3x barlow, IR filter, iOptron CEM70G mount, QHY5III462C camera.*



Posidonius Rim Break*, KC Pau, Hong Kong, China. 2022 September 15. 10 inch reflector, 2.5x barlow, QHYCCD290m camera.*

Recent Topographic Studies

Copernicus, *Guillermo Daniel Scheidereiter, LIADA, Rural Area, Concordia, Entre Ríos, Argentina. 2022 October 05 00:11 UT. Explore Scientific 127 mm Maksutov-Cassegrain telescope, IR685 nm filter, Player One Ceres C camera. North is to the left, west is down.*



Clavius, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:53 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Recent Topographic Studies

Aristarchus, *Maurice Collins, Palmerston North, New Zealand. 2022 October 07 07:45 UT. Celestron 8 inch Schmidt-Schmidt-Cassegrain telescope, QHY5III462C camera.*

Taruntius, *Jonás Alonso, Oro Verde, Argentina. 2022 October 03 01:10 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*

Recent Topographic Studies

Hell and Hell A, *István Zoltán Földvári, Budapest, Hungary. 2016 April 16, 20:57-21:13 UT, colongitude 25.6°. 80 mm refractor telescope, 900 mm focal length, 150 x. Seeing 6/10, transparency 3/6.*

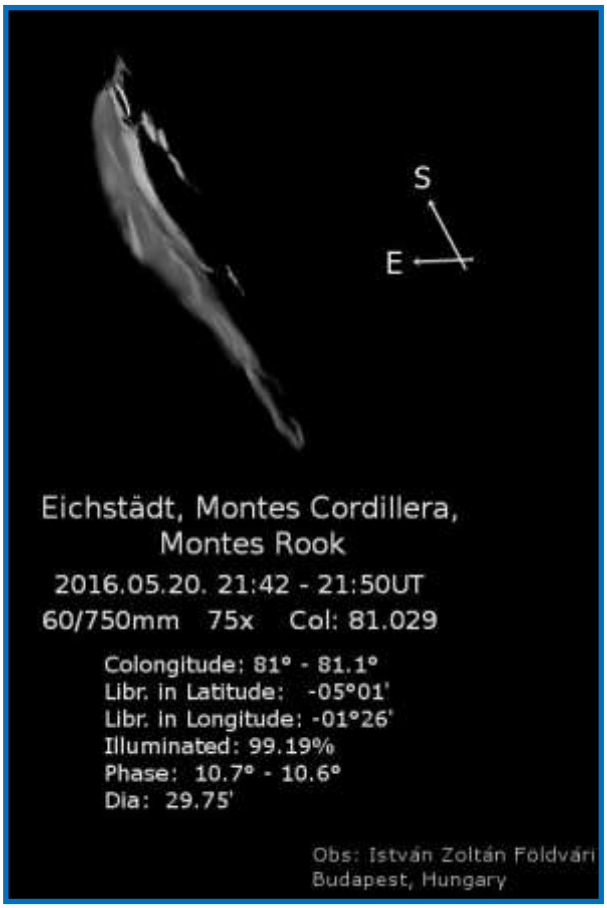
Proclus, *César Fornari, Oro Verde, Argentina. 2022 October 03 01:22 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*

Recent Topographic Studies

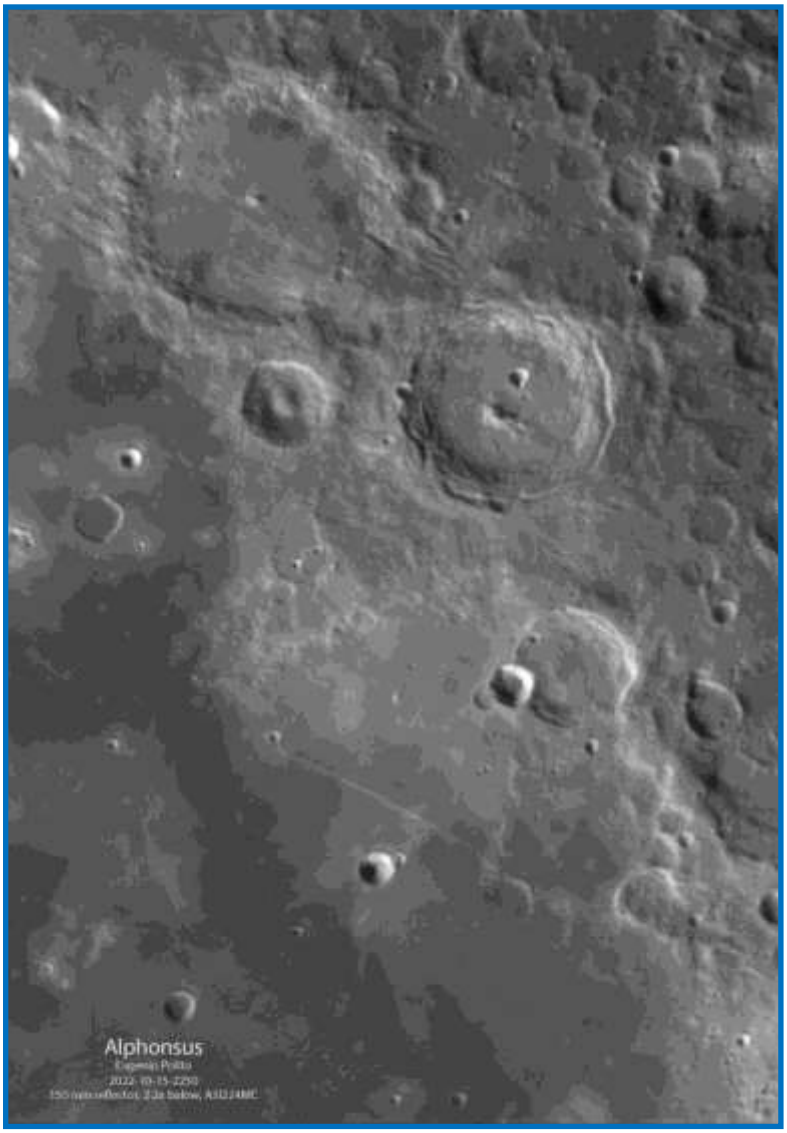
Posidonius, *Christian Viladrich, Nattages, France. 2022 October 13 00:33 UT. 500 mm Ritchey Chretien telescope, red filter, ASI 1600 camera. Scale 0.085"/pixel.*

Posidonius, *Christian Viladrich, Nattages, France. 2022 October 15 00:47 UT. 500 mm Ritchey Chretien telescope, red filter, ASI 1600 camera. Scale 0.085"/pixel.*

Recent Topographic Studies

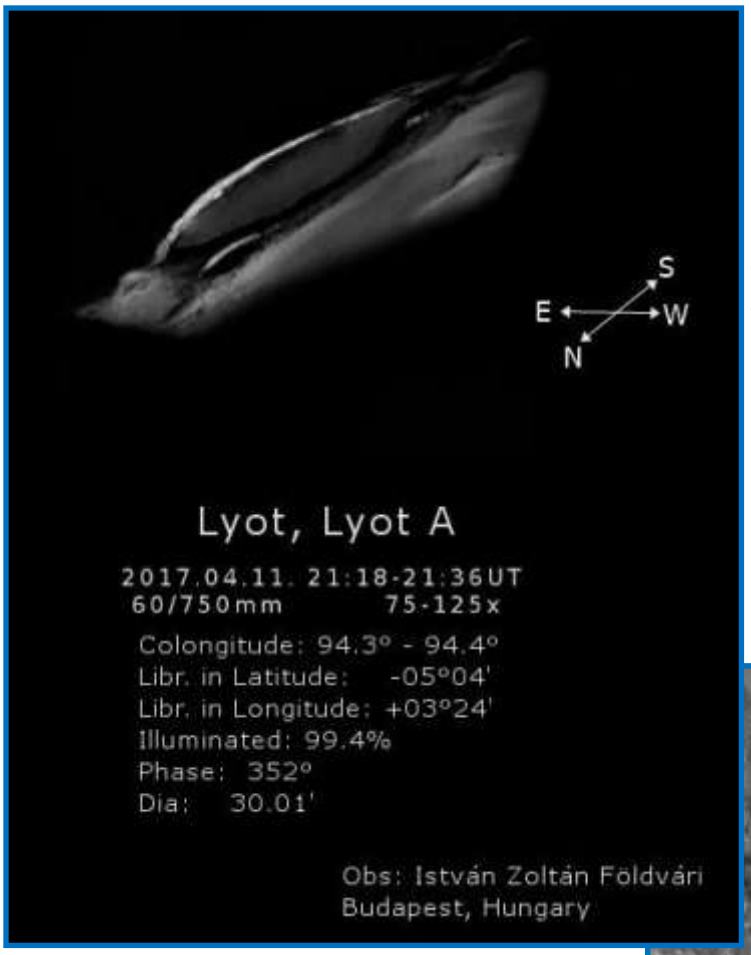


Eichstädt, Montes Cordillera and Montes Rook, *István Zoltán Földvári, Budapest, Hungary. 2016 May 20, 21:42-21:50 UT, co-longitude 81.0°-81.1°. 60 mm refractor telescope, 750 mm focal length, 75 x. Seeing 6/10, transparency 4/6.*

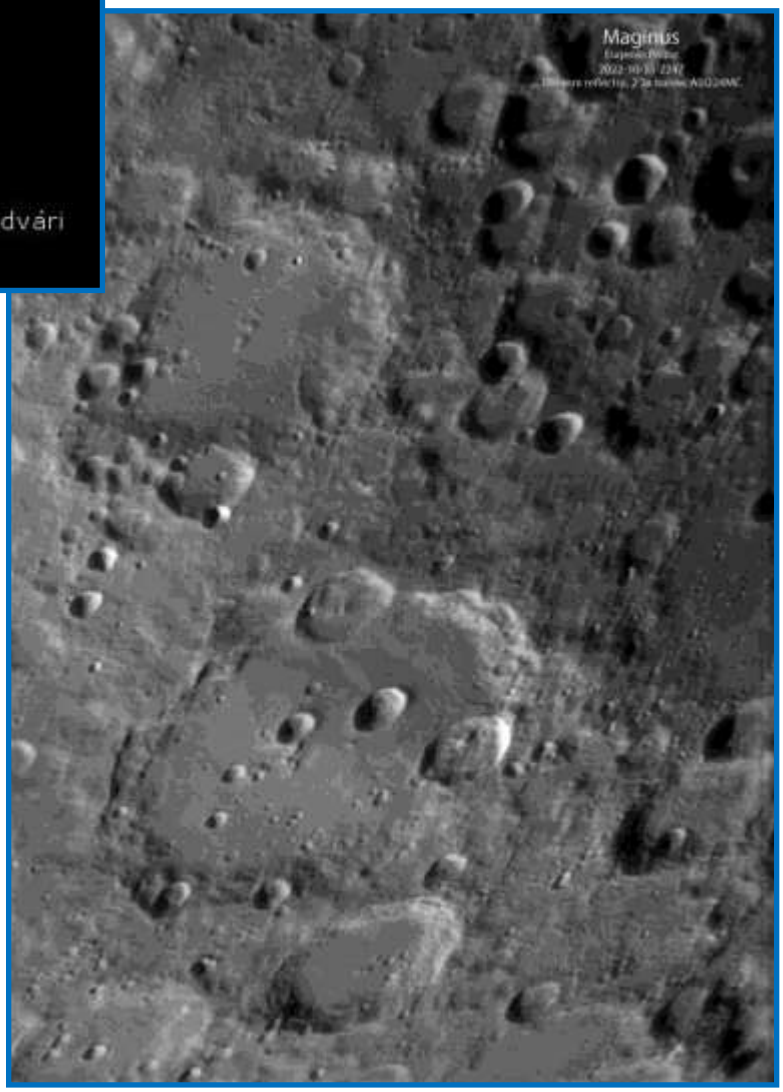


Alphonsus, Arzachel, Thebit and Rupes Recta, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:50 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Recent Topographic Studies



Lyot, Lyot A, *István Zoltán Földvári, Budapest, Hungary. 2017 April 11, 21:18-21:36 UT, colongitude 94.3°-94.4°. 60 mm refractor telescope, 750 mm focal length, 75x-125x.*



Maginus and Clavius, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:47 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

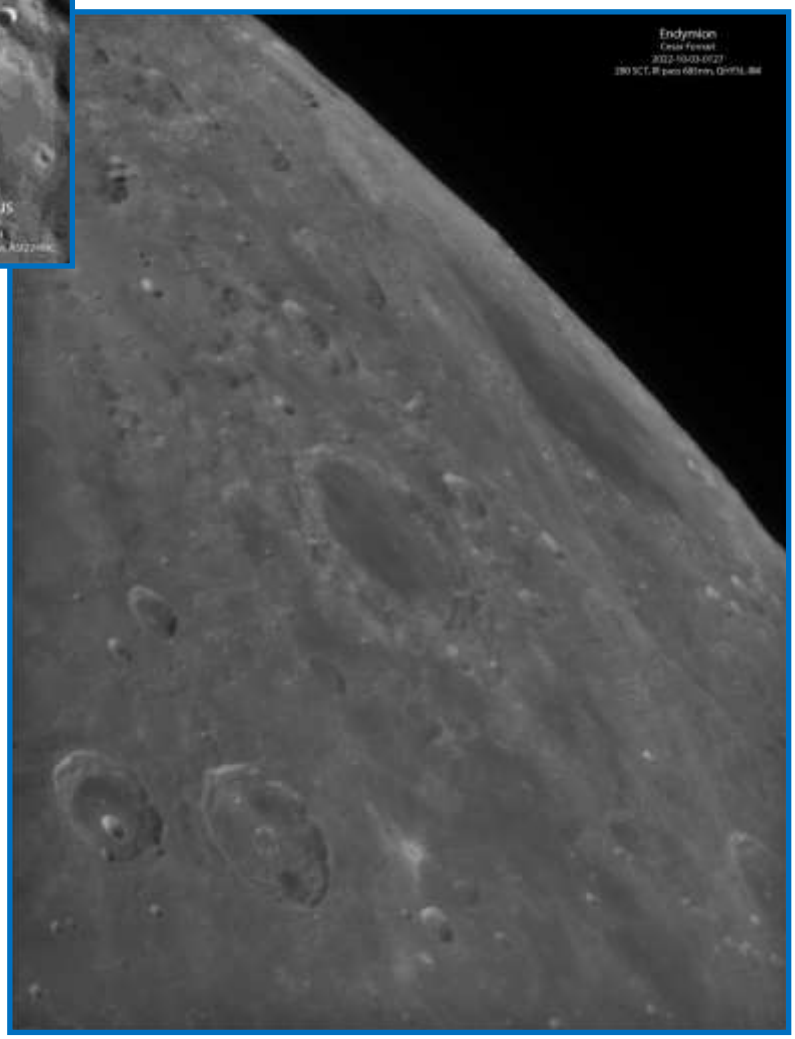
Recent Topographic Studies

Gill, *István Zoltán Földvári, Budapest, Hungary. 2017 April 11, 21:42-22:10 UT, colongitude 94.5°-94.7°. 60 mm refractor telescope, 750 mm focal length, 75x-125x. Seeing 3/10, transparency 4/6.*

Manilius, Rimae Hyginus, Rimae Triesnecker, Triesnecker, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 23:13 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

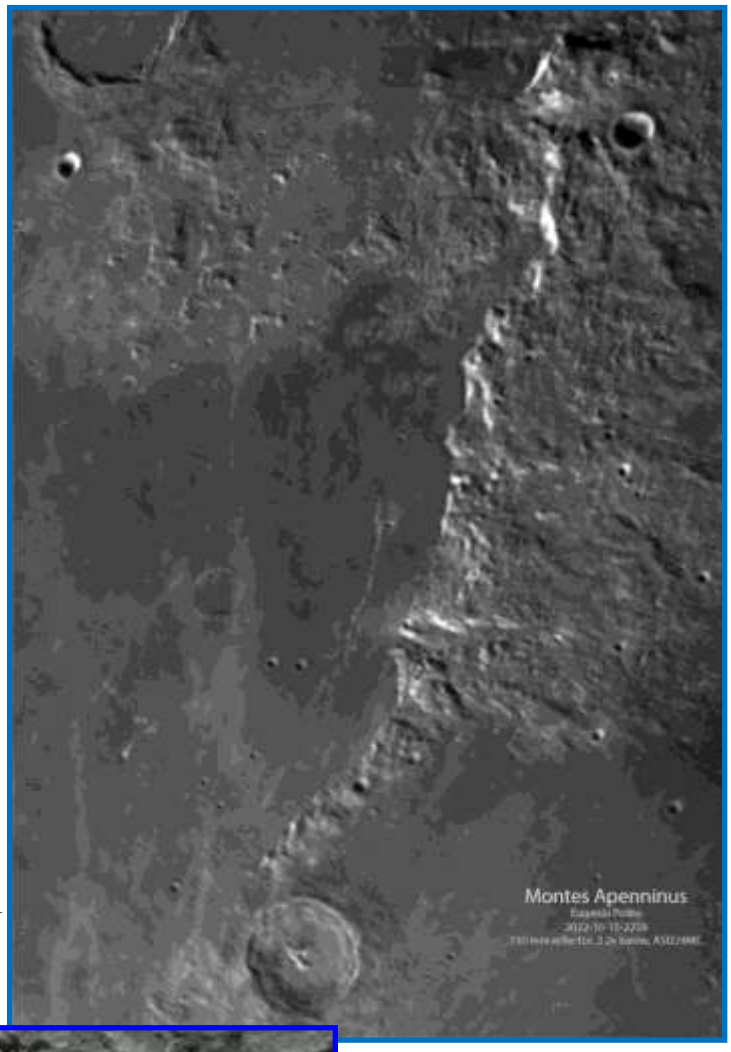
Recent Topographic Studies

Albategnius, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:44 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*



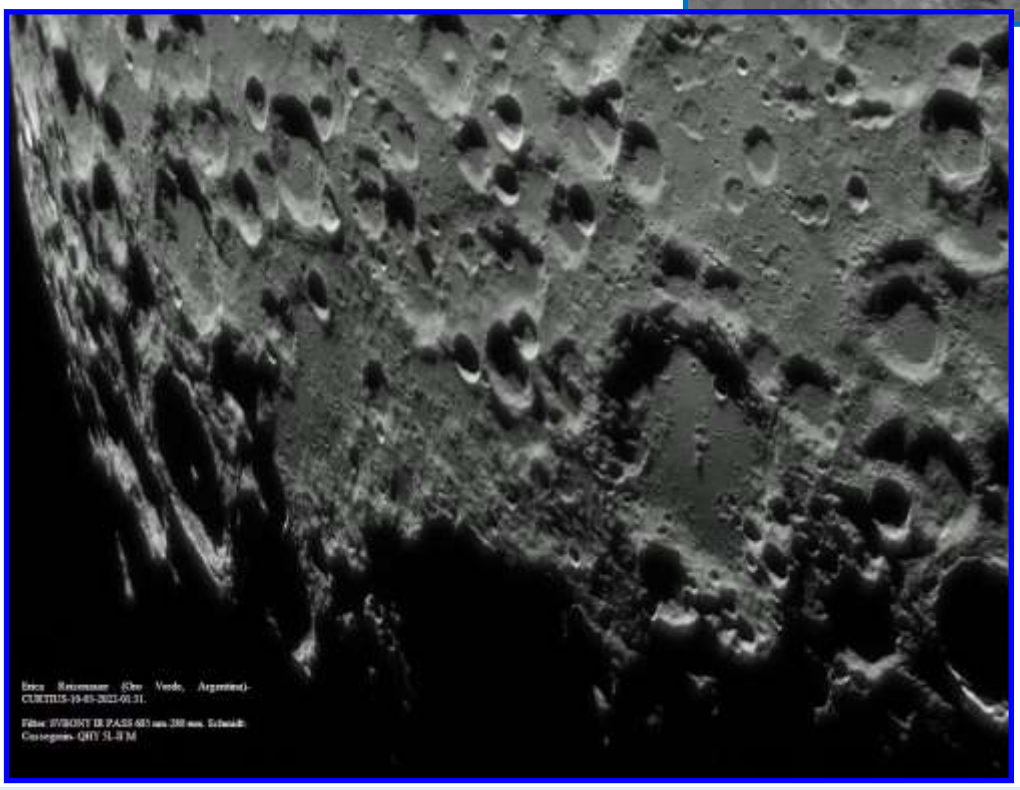
Endymion, *César Fornari, Oro Verde, Argentina. 2022 October 03 01:27 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*

Recent Topographic Studies



Montes Apenninus, Wallace and Eratosthenes, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:58 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Curtius, *Erica Reisenauer, Oro Verde, Argentina. 2022 October 03 01:31 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera. North is right, west is down.*



Recent Topographic Studies

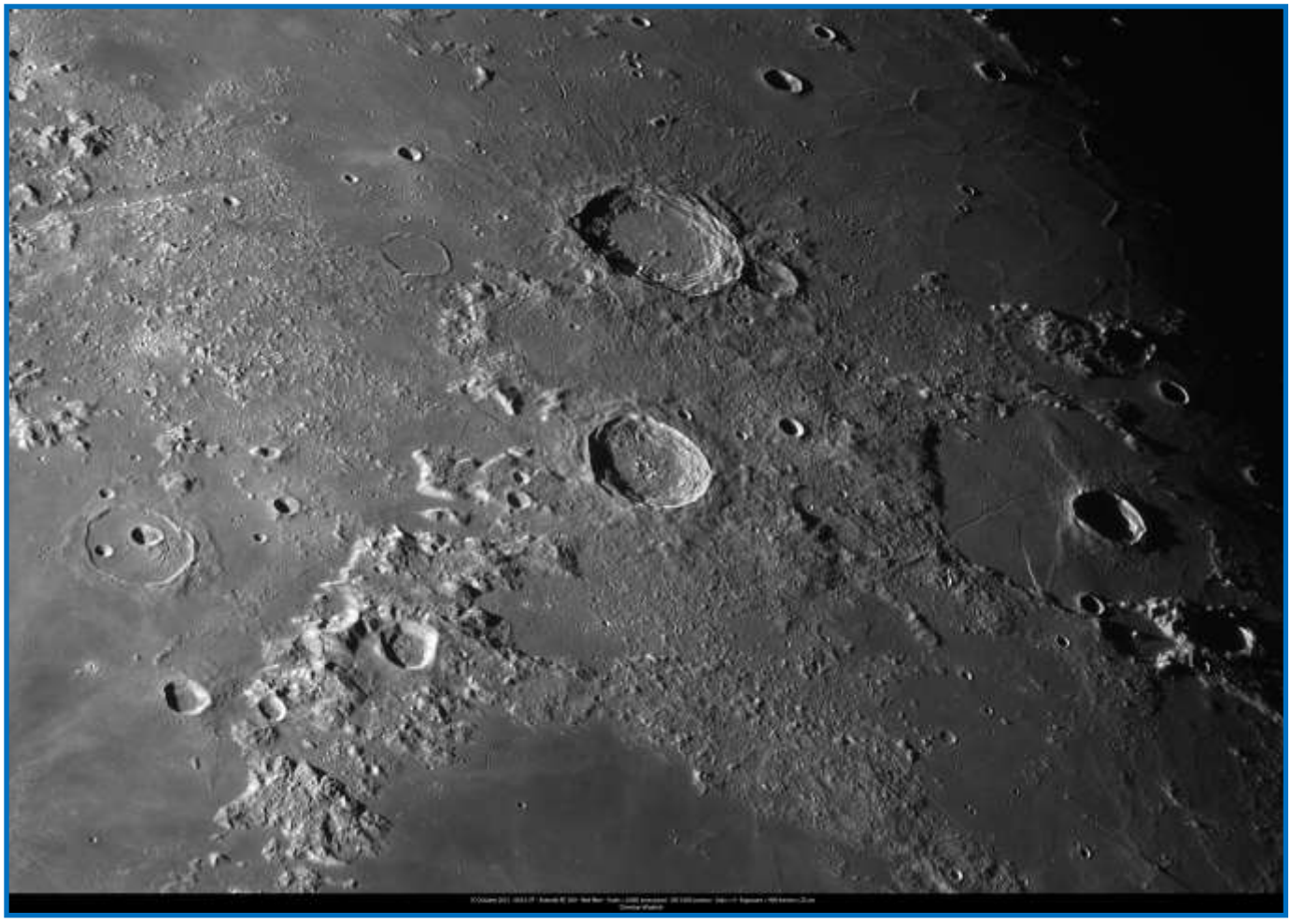
Pallas, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:57 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Vallis Alpes, *Germán Savor, Oro Verde, Argentina. 2022 October 03 01:48 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*

Recent Topographic Studies

Posidonius, *Raúl Roberto Podestá, Formosa, Argentina. 2022 October 01 23:26 UT. 127 mm Maksutov-Cassegrain telescope, ZWO ASI178MC camera. North is to the right, west is down.*

Atlas, *Christian Viladrich, Nattages, France. 2022 October 15 00:32 UT. 500 mm Ritchey Chretien telescope, red filter, ASI 1600 camera. Scale 0.085"/pixel.*

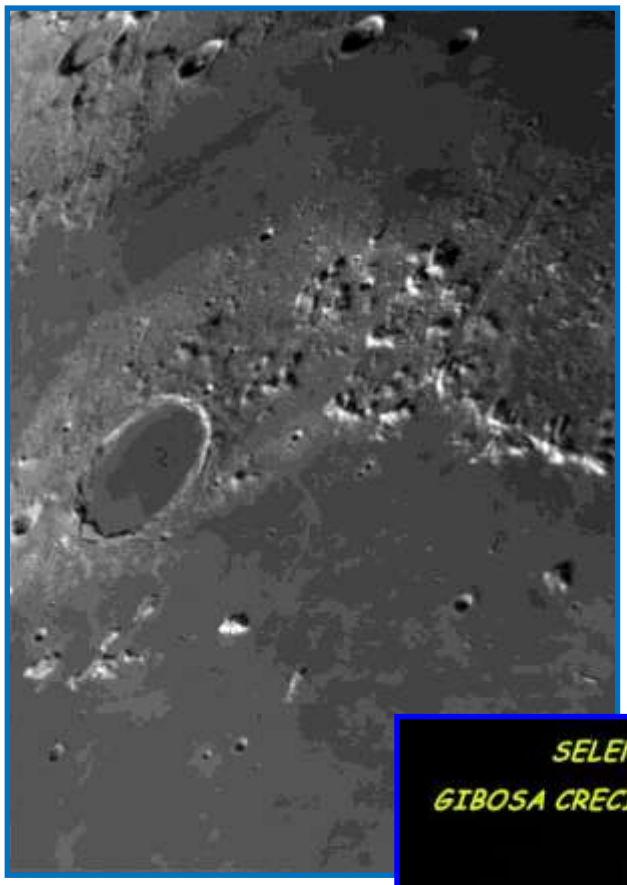


Recent Topographic Studies

Pallas, Murchison, Triesnecker, Rimae Triesnecker, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:51 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Archimedes, *Francisco Alsina Cardinalli, Oro Verde, Argentina. 2022 October 03 01:52 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*

Recent Topographic Studies



Plato, Montes Alpes, Vallis Alpes, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 23:00 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

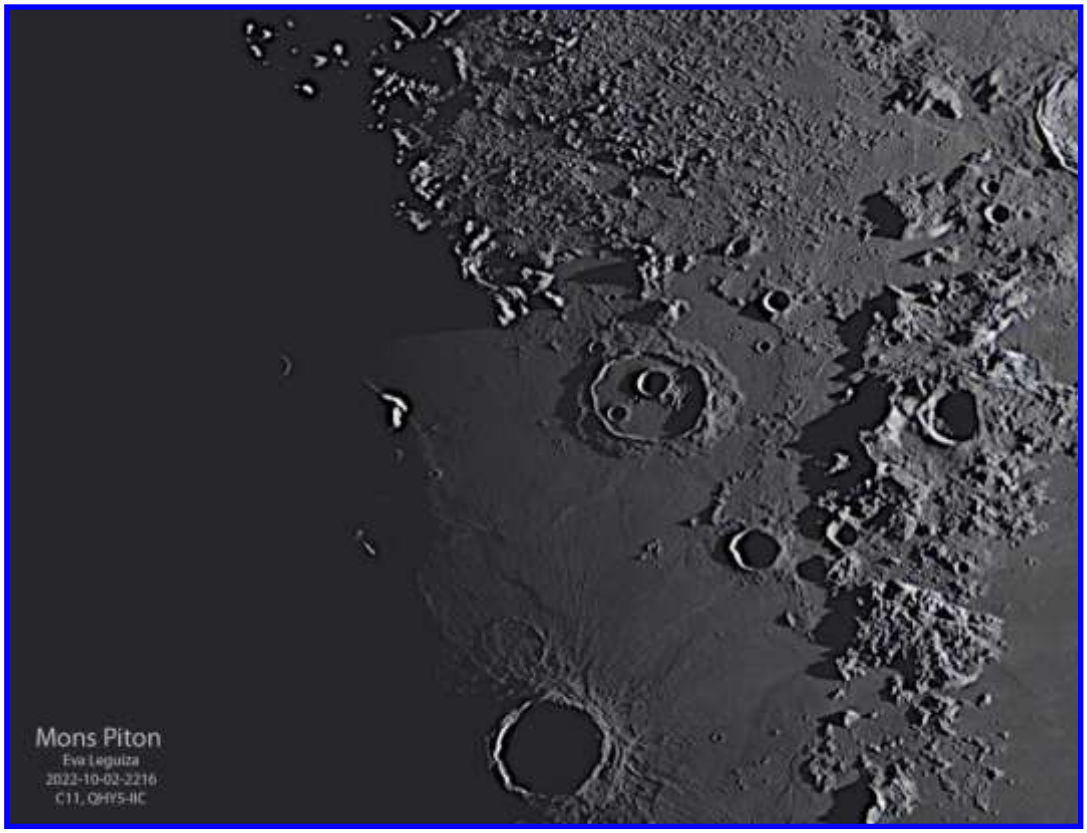
33% Waxing Crescent Moon*, Jairo Chavez, Popayán, Colombia. 2022 October 01 23:00 UT. 311 mm truss reflector telescope, Moto E5 Play camera. North is lower left, west is lower right.*

Recent Topographic Studies

Triesnecker, Rimae Triesnecker and Sinus Medii, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 23:10 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Alphonsus, *Erica Reisenauer, Oro Verde, Argentina. 2022 October 03 01:33 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*

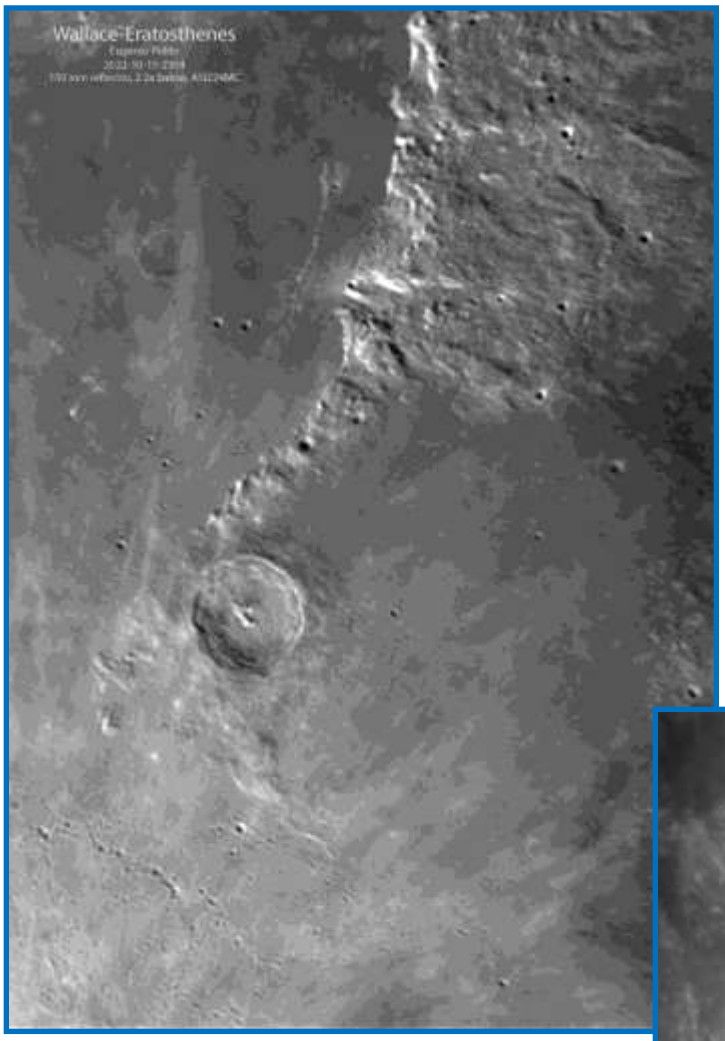
Recent Topographic Studies



Mons Piton, *Eva Leguiza, AEA, Oro Verde, Argentina. 2022 October 02 22:16 UT. Celestron CPC 1100 11 inch Schmidt-Cassegrain telescope, QHY5-IIC camera.*

Aristarchus, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2022 October 06 23:26 UT. Celestron CPC 1100 11 inch Schmidt-Cassegrain telescope, QHY5-IIC camera.*

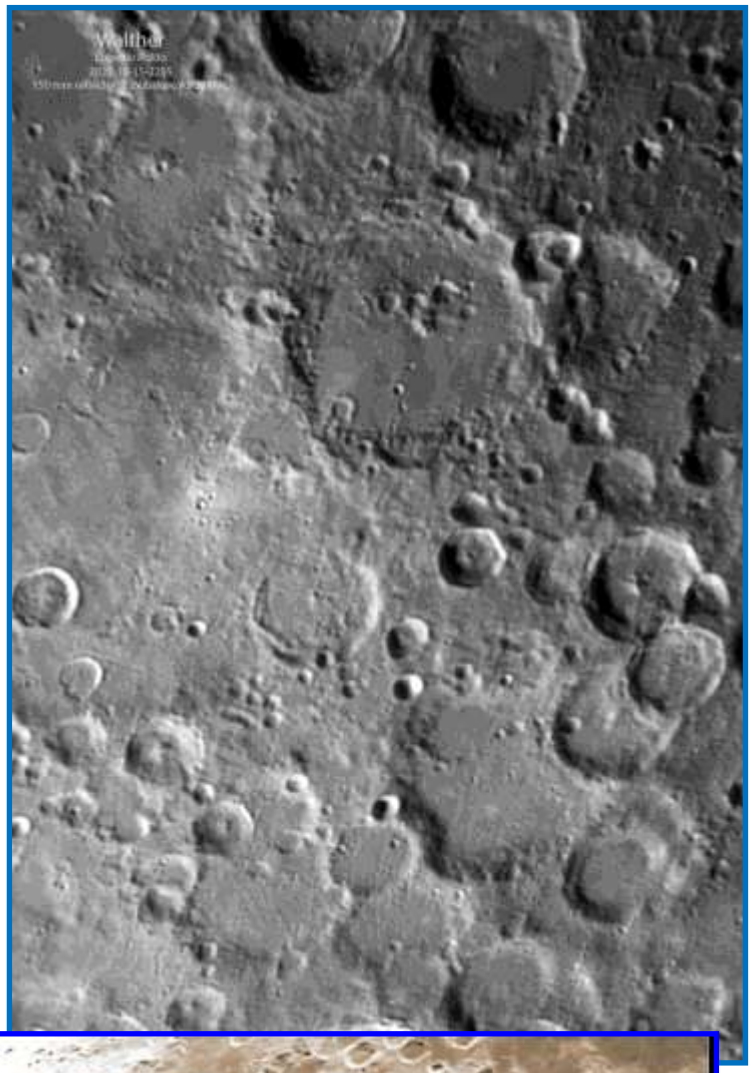
Recent Topographic Studies



Wallace and Eratosthenes, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 23:04 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Mare Crisium, *Francisco Alsina Cardinalli, Oro Verde, Argentina. 2022 October 03 01:53 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*

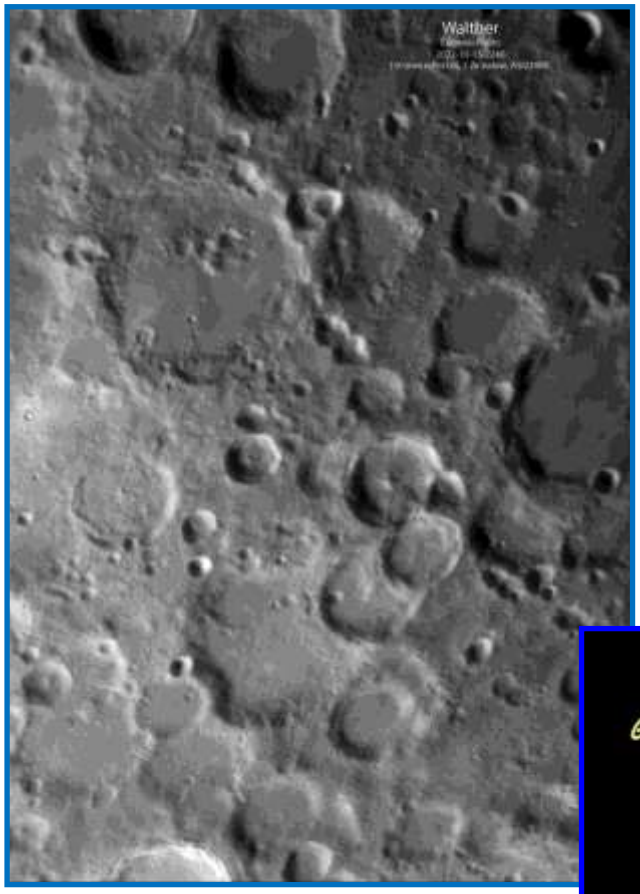
Recent Topographic Studies



Walther, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:55 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Theophilus, *Raúl Roberto Podestá, Formosa, Argentina. 2022 October 01 23:26 UT. 127 mm Maksutov-Cassegrain telescope, ZWO ASI178MC camera. North is to the right, west is down.*

Recent Topographic Studies



Walther, Huggins, Nasireddin and Miller, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:46 UT. Sky-watcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

98% Waning Crescent Moon*, Jairo Chavez, Popayán, Colombia. 2022 October 10 02:10 UT. 311 mm truss reflector telescope, Moto E5 Play camera. North is lower right, west is upper right.*

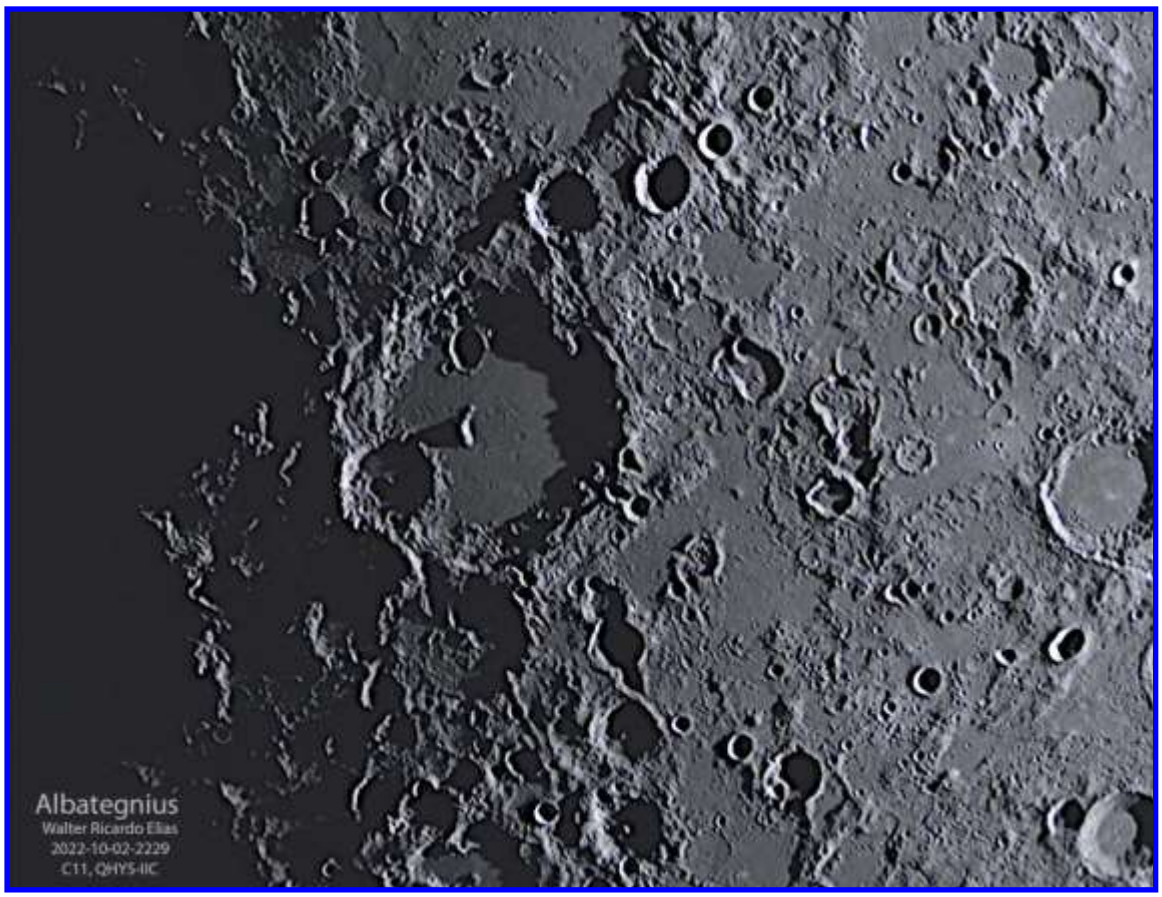
Recent Topographic Studies

Werner, Aliacensis and Walther, *Eugenio Polito, San Pancrazio Salentino, Italy. 2022 October 15 22:49 UT. Skywatcher 150 mm Newtonian telescope, 750 mm fl, EQ3 Pro mount, 2 2x acro barlows, IR cut filter, ASI224MC camera.*

Theophilus, *Raúl Roberto Podestá, Formosa, Argentina. 2022 October 01 23:23 UT. 127 mm Maksutov-Cassegrain telescope, ZWO ASI178MC camera. North is to the right, west is down.*

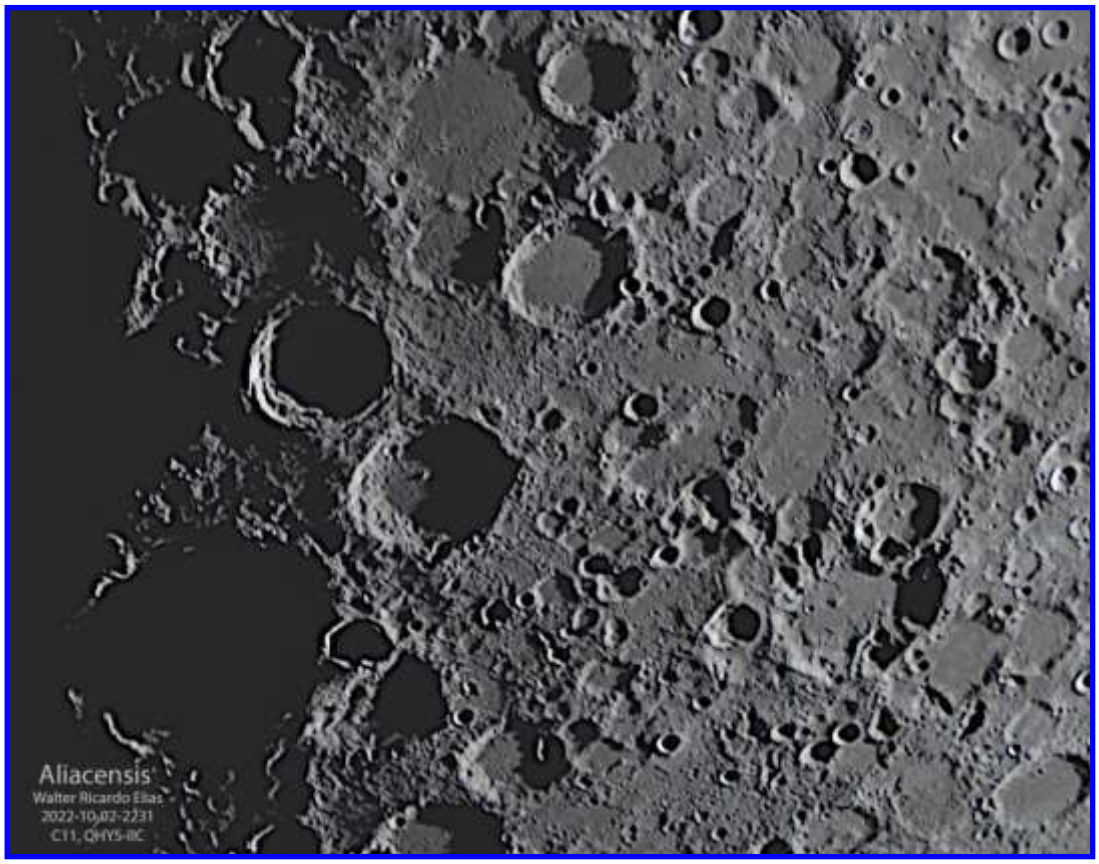
Recent Topographic Studies

Maskelyne Domes, *Christian Viladrich, Nattages, France. 2022 October 15 01:09 UT. 500 mm Ritchey Chretien telescope, red filter, ASI 1600 camera. Scale 0.085"/pixel.*



Albategnius, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2022 October 02 22:29 UT. Celestron CPC 1100 11 inch Schmidt-Cassegrain telescope, QHY5-IIC camera.*

Recent Topographic Studies



Aliacensis, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2022 October 02 22:31 UT. Celestron CPC 1100 11 inch Schmidt-Cassegrain telescope, QHY5-IIC camera.*

Mare Crisium, *Christian Viladrich, Nattages, France. 2022 October 13 00:20 UT. 500 mm Ritchey Chretien telescope, red filter, ASI 1600 camera. Scale 0.085"/ pixel.*

Recent Topographic Studies

Capuanus, *Massimo Dionisi, Sassari, Italy. 2022 October 19 01:43 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

*Massimo adds "*I am sending you four more lunar images taken in the very early hours of October 19th. The framed regions are two: the one near the Kies crater and the one around the Capuanus crater. For both regions I took two different shots, one using only the Celestron Barlow 3x (X-CEL LX) and the other also combining an ADC (TecnoSky brand) in an attempt to obtain a cleaner image but, above all, to force magnification. In the first case I obtained an equivalent focal length of about 3600 mm, with a resolution of 0.16 "x pixel; with the second optical configuration I should have reached about 5800 mm, therefore about 0.10" x pixel. However, I had many difficulties in processing these images, as the result I was obtaining with Registax 6 did not satisfy me; I then resorted to Astrosurface, downloading the latest version (T7 Titania) and trying to process everything with this software. Overall, the result does not seem completely despicable, however I assure you that it is always better than the one that came out of Registax 6."

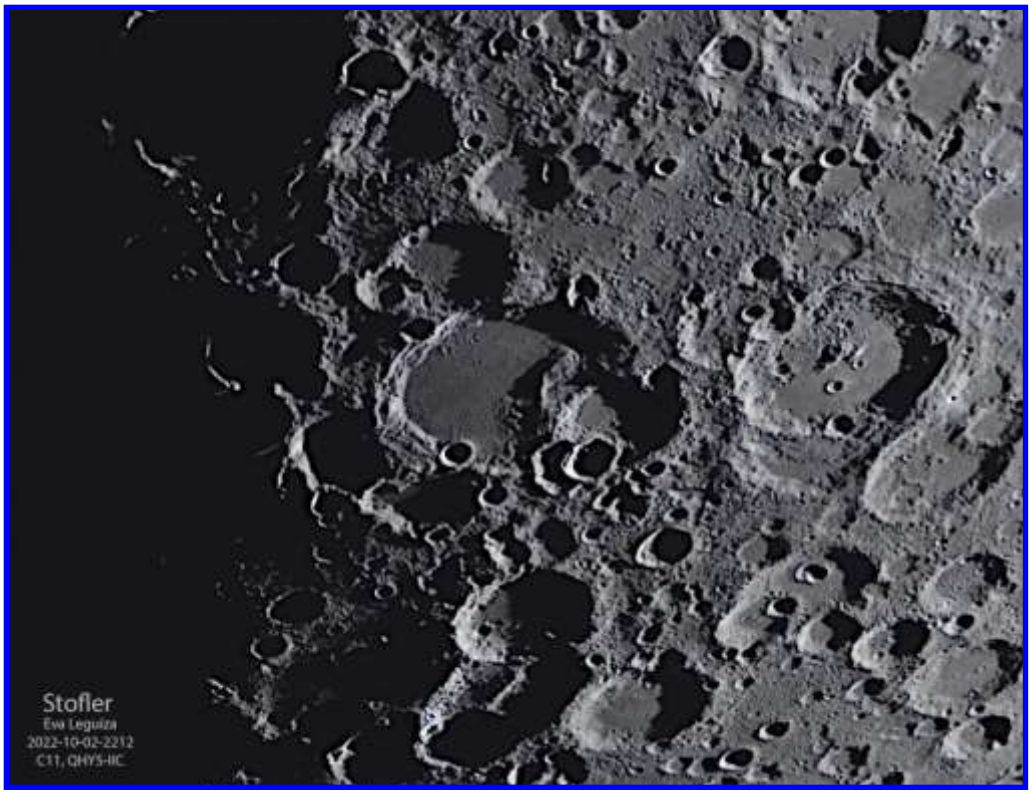
Capuanus, *Massimo Dionisi, Sassari, Italy. 2022 October 19 02:06 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Recent Topographic Studies

Kies, *Massimo Dionisi, Sassari, Italy. 2022 October 19 01:32 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Capuanus, *Massimo Dionisi, Sassari, Italy. 2022 October 19 01:56 UT. Skywatcher 250 mm f/5 Newtonian reflector telescope, 3x Celestron X-cel barlow, IR Block filter, Skywatcher EQ6Pro mount, Uranus C camera.*

Recent Topographic Studies



Stöfler, *Eva Leguiza, AEA, Oro Verde, Argentina. 2022 October 02 22:12 UT. Celestron CPC 1100 11 inch Schmidt-Cassegrain telescope, QHY5-IIC camera.*

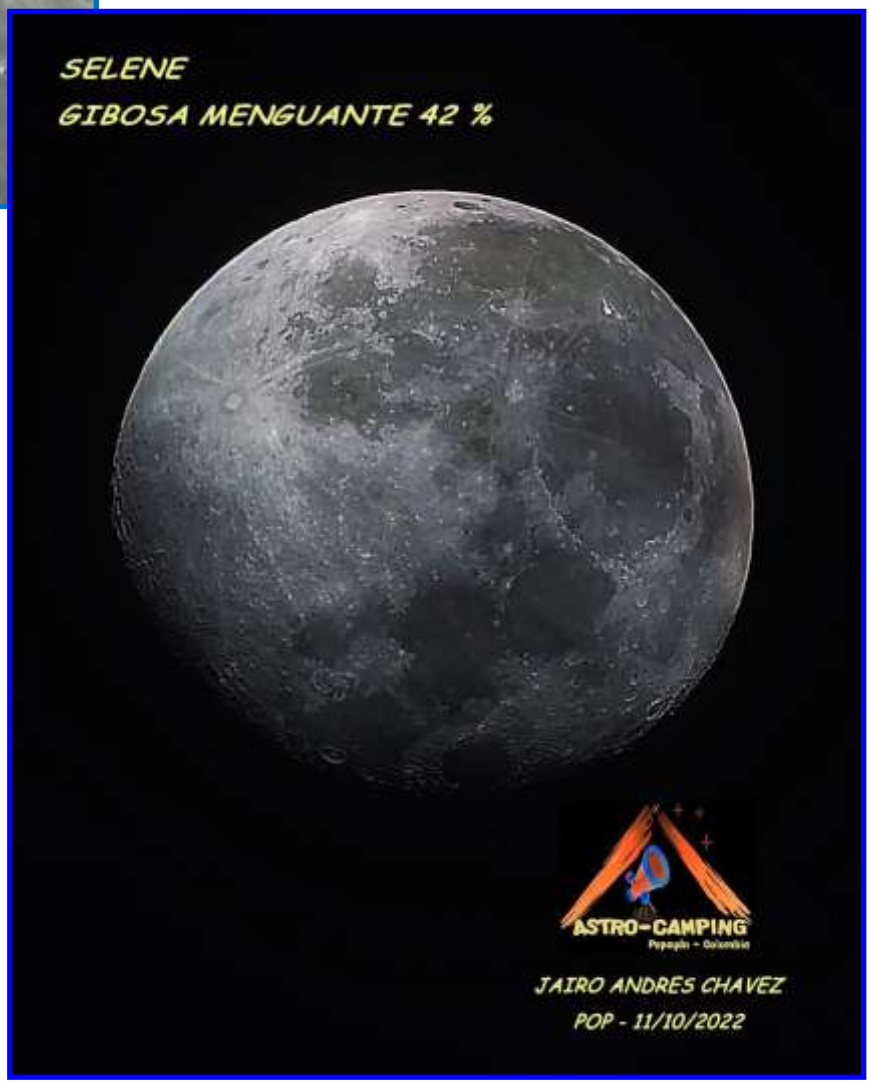
South, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2022 October 06 00:22 UT. Celestron CPC 1100 11 inch Schmidt-Cassegrain telescope, QHY5-IIC camera.*

*Walter adds: "*Work carried out in conjunction with students of the Geomatics chair of the Faculty of Engineering, National University of Entre Ríos."

Lets hear it for more outreach!

Recent Topographic Studies

Aristoteles, *Germán Savor, Oro Verde, Argentina. 2022 October 03 01:50 UT. 280 mm Schmidt-Cassegrain telescope, SVBONY IR Pass filter 685 nm filter, QHY5L-II M camera.*



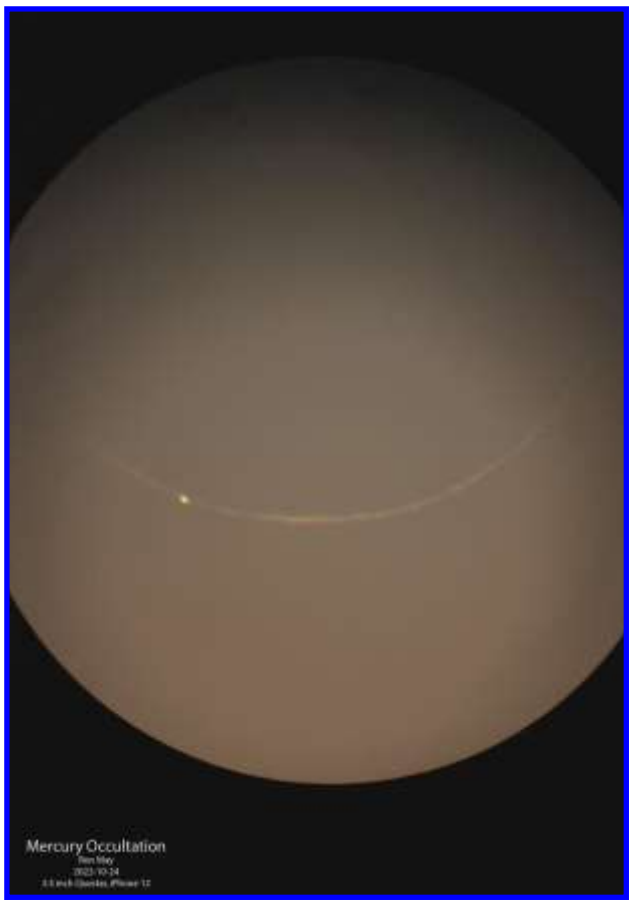
Waning Crescent Moon*, Jairo Chavez, Popayán, Colombia. 2022 October 12 03:11 UT. 311 mm truss reflector telescope, Moto E5 Play camera. North is lower right, west is upper right.*

Recent Topographic Studies

Moon Verses Mercury

A tiny, thin waning crescent Moon occults Mercury! *Ron May, El Dorado Hills, California, USA. 3.5 inch Questar Maksutov-Cassegrain telescope, iPhone 12 handheld. Ron adds "According to my app, the moon was 0.9145% full; the image was taken using my iPhone 12 Pro in the Live mode and was not very well focused. However, I used my wife's iPhone to capture a slo-mo video of the Live image, and was then able to freeze a frame that looked a bit better. That frame is below, along with another image captured only moments later.*

I'd be interested in knowing if 0.9145% is any sort of record/ threshold, but I thought you'd like to see these. Both shots taken handheld (no mount) iPhone 12 Pro to Questar 3.5."



Furthermore "sorry it looks like it was closer to 0.92-0.93…"

I was able to parse that live image into segments, which allowed me to isolate the best grab, which is below. For TLO I want you to have the best image I can provide, and I think this is it. (to the right).

Recent Topographic Studies

Theophilus, *Raúl Roberto Podestá, Formosa, Argentina. 2022 October 01 23:26 UT. 127 mm Maksutov-Cassegrain telescope, ZWO ASI178MC camera. North is to the right, west is down.*

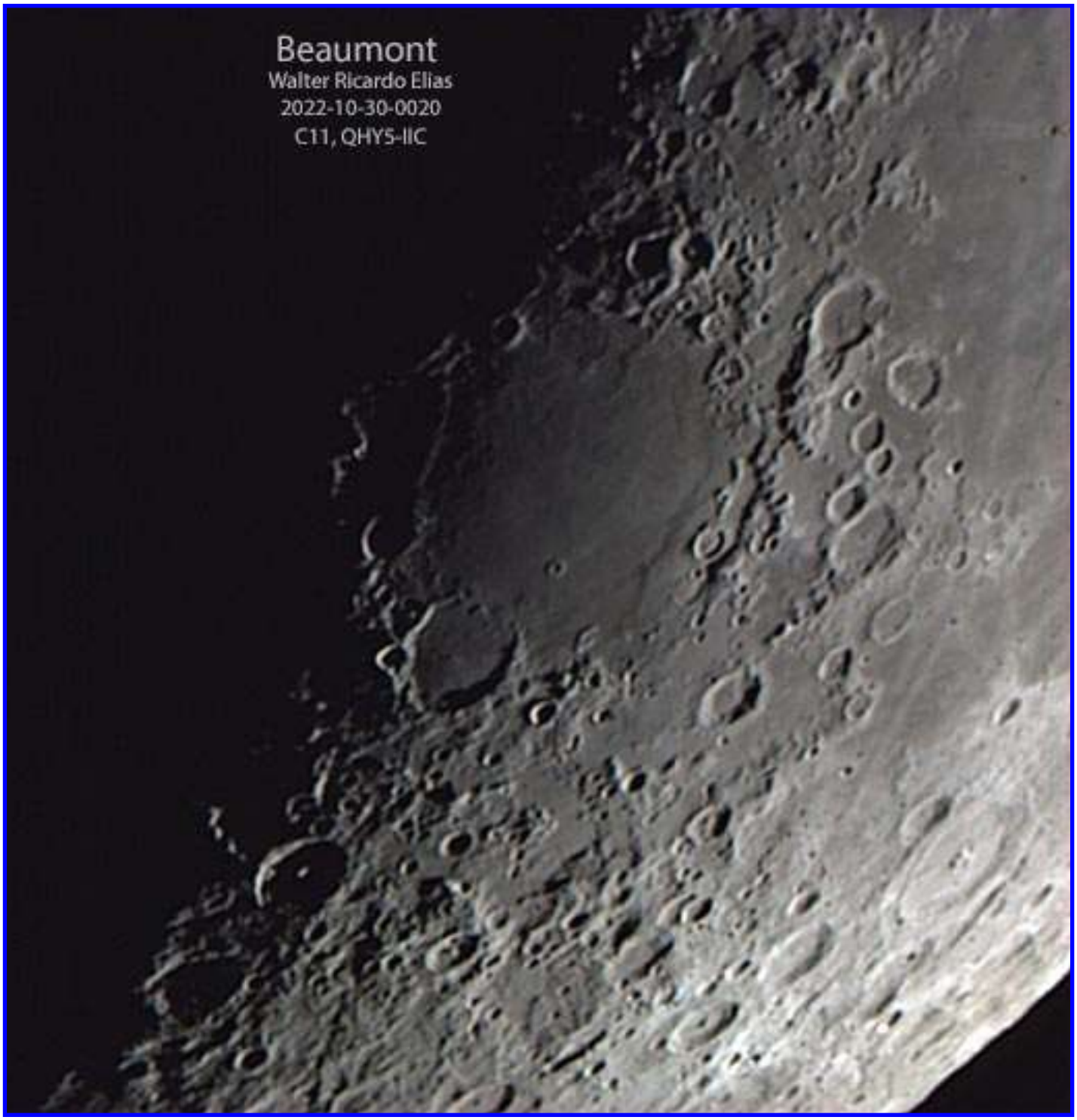
Atlas, *Christian Viladrich, Nattages, France. 2022 October 13 00:47 UT. 500 mm Ritchey Chretien telescope, red filter, ASI 1600 camera. Scale 0.085"/pixel.*

Recent Topographic Studies

Theophilus, *Facundo Gramer, AEA, Oro Verde, Argentina. 2022 October 02 19:09 UT. Celestron CPC 1100 11 inch Schmidt-Cassegrain telescope, QHY5-IIC camera.*

Aristoteles, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2022 October 02 22:20 UT. Celestron CPC 1100 11 inch Schmidt-Cassegrain telescope, QHY5-IIC camera.*

Recent Topographic Studies



Beaumont, *Walter Ricardo Elias, AEA, Oro Verde, Argentina. 2022 October 30 00:20 UT. Skywatcher 150 mm reflector telescope, QHY5-IIC camera.*

Recent Topographic Studies

Lunar Geologic Change Detection Program

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

2022 November

LTP reports: Alberto Anunziato (SLA) was observing Herodotus on 2022 Sep 27 UT 23:25-23:50, as part of a lunar schedule request to see if he could detect two light spots on the floor of the crater that were seen originally by Raffaello Lena (GLR) in 2002, where two light spots were seen on the floor of Herodotus: the southern-most one had a hill like appearance, the second spot was NW of the crater center (See Fig 1 – Left).

Figure 1. *Sketches of Herodotus orientated with south towards the top.* ***(Left)*** *A sketch by Raffaello (GLR) made on 2002 Sep 18 UT 22:00 – obtained from the GLR web site.* ***(Center)*** *A location map with labels added by Alberto Anunziato (SLA) made on 2022 Sep 27 UT 23:25-23:50.* ***(Right)*** *A sketch by Alberto Anunziato of the floor or Herodotus made on 2022 Sep 27 UT 23:25-23:50.*

When Alberto observed, he was using a Meade EX 105 at a magnification of x154. Alberto noted that the craterlet Herodotus N was very bright on the NW rim of Herodotus. Further south, close to the shadow of the east wall a slightly bright dot was seen, with a slight shadow. However, Alberto was very clear to stress that he was observing at the limits of his telescope's resolution, and could have had some observational bias as in that he was looking for light spots and probably would not have noticed anything if he had not known what to look for. He therefore only considers this as significant if anybody else was observing at the same time. Unfortunately, as far as I am aware nobody else was observing. I think for now we shall assign this a weight of 1, and encourage high resolution imaging as an independent way to conform whether this, and indeed the Lena report, are real effects? We have covered a previous repeat illumination event for the 2002 report in the 2020 Dec newsletter.

The following report came to light on the BAA observer's forum. David Totney wrote: *"This happened a while ago now, but I was wondering if anyone had logged something similar on the same night. On Saturday, 5 August 2017, 2:00 – 3:00am, I saw a bright flash of light right in the center of Grimaldi. I was using a 130mm Newtonian and about a 220x magnification. It may have been a meteor strike. Interestingly I discovered that focusing in the general area of Grimaldi was difficult for several minutes afterwards. It wasn't elsewhere. Suggesting some sort of ejecta."*. I still have to contact David, at the time of writing, but from the UK, for the day and UT given, the Moon would have been a couple of days before full and would have been very low down and so it could possibly be a red navigation light from a very distant aircraft? I will try to find out.

News: Concerning the Trevor Smith about Mons Piton on 2022 Aug 04 UT 19:41-20:10, after seeing my SWIR image of the same area, but earlier than his observation, Trevor commented that the mountain looked a lot brighter to him at visible wavelengths that in the image I showed in last month's newsletter.

1725 Plato LTP Report: Maurice Collins emailed me a study that he had been doing in conjunction with Chuck Wood, on a LTP seen by Bianchini on 1725 Aug 16 UT 19:39, concerning a red streak seen on the shadowed floor of the crater. Maurice, has produced a simulated LTVT image of what it would have looked like, so you can compare the Bianchini sketch (Fig 2 – Left) to the LTVT simulation (Fig 2 – Right). Indeed we can see a light streak on the floor of Plato, however it does not appear to cover the whole of the floor as it did in Bianchini's image. Maurice ran some simulated times for before and after this, but his time of 19:10 UT seems to be the closest in appearance to the Bianchini sketch. The difference I suppose could be due to artistic license on behalf of Bianchini, or maybe just simply inaccuracies in his drawing? Another aspect of the 1725 report, that needs explaining is the red color to the streak. It should be white, like all the light streaks from gaps in the rim of Plato, are. Bianchini's telescope was an "aerial telescope", of 110 feet in length – although you might think that this could lead to severe chromatic aberration problems, and this might explain the red color, this is not necessarily the case as telescope makers of the time found that the chromatic aberration fell well inside the large diffraction pattern of objects in focus (see: *"Galileo's telescope - Chromatic aberration"*. *Museo Galileo - Istituto e Museo di Storia della Scienza. Retrieved 5 March 2012.) for very long focal length refractors.*

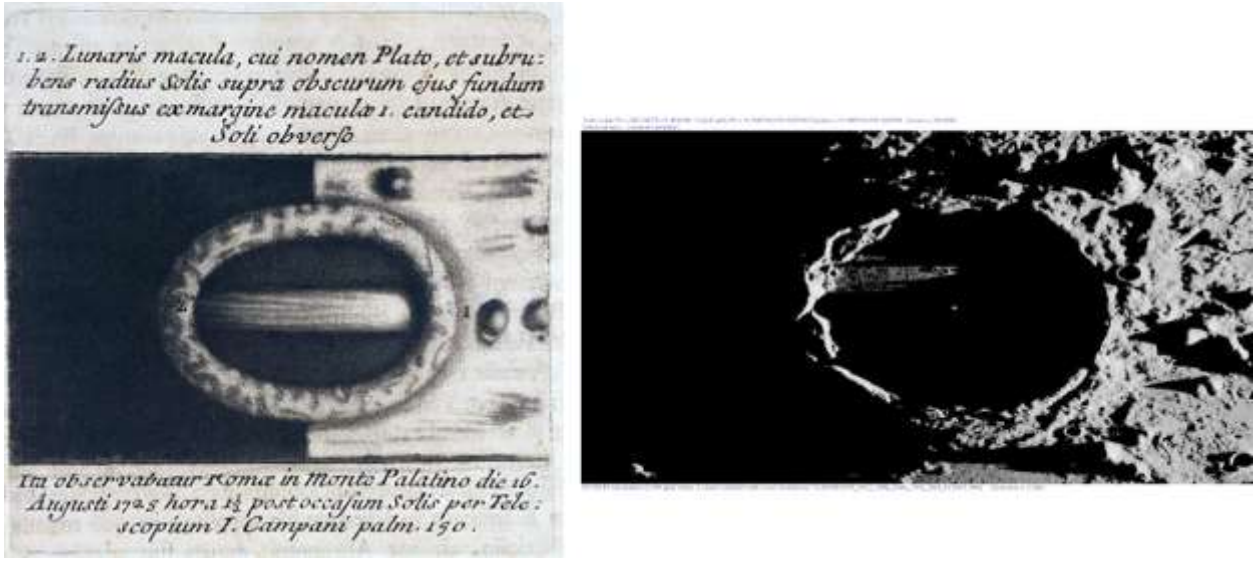


Figure 2. *Plato orientated with north towards the top.* ***(Left)*** *A sketch by Bianchini made on 1725 Aug 16 UT 19:39 – from the Linda Hall Library of Science: Engineering: Technology.* ***(Right)*** *An LTVT simulation of Plato for 1725 Aug 16 UT 19:10*

So, the current weight of the 1725 Plato LTP is 2 and we shall leave it at that for now. The LTVT simulation technique does show promise for shadow related LTP, so if you get clouded out, try producing a simulation of a prediction and email that to me instead – so long as you say whether it is a real observation or simulated!

Routine Reports received for September included: Jay Albert (Lake Worth, FL, USA – ALPO) observed: Eudoxus, Jansen, Plato, Posidonius, and Proclus. Alberto Anunzatio (Argentina – SLA) observed: Aristarchus, Eimmart, Herodotus, Mare Crisium, Mons Pico, Montes Apenninus, Proclus and Secchi. Maurice Collins (New Zealand – ALPO/BAA/RASNZ) imaged: Aristarchus, Marius, Mons Rumker and several features. Anthony Cook (Newtown, UK – ALPO/BAA) imaged: several features in the Short-Wave IR (1.5-1.7 microns). Massimo Giuntoli (Italy – BAA) observed: Cavendish E. Bob & Sophie Stuart (Rhayader, UK – BAA) imaged: Cusanus, Mare Humboldtianum, Meton and Several Features.

Analysis of Reports Received:

Plato: On 2022 Sep 06 UT 01:10-01:30 Jay Albert observed the crater visually at similar illumination to the following report:

On 1975 Mar 22 at UT22:10-22:25 T.Flynn (Edinburgh, UK, 30cm Newtownian, x75) observed 3 large areas on the floor of Plato to be delicately darker in the blue filter. There were of different darkness. He did not regard these as LTP, but permanent blinks. This is a BAA report. The ALPO/BAA weight=1.

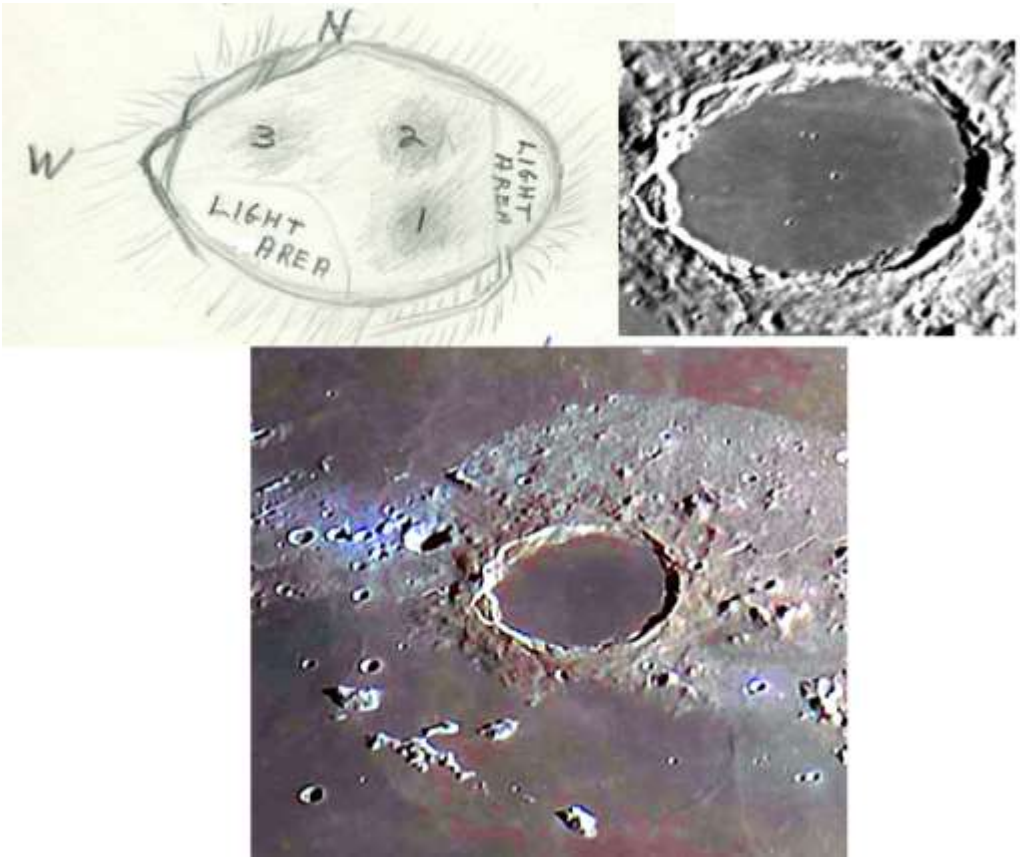


Figure 3. *Plato, orientated with north towards the top.* ***(Top Left)*** *A sketch by Tom Flynn made on 1975 Mar 22 UT 22:10-22:25. Sketch rotated so that north is up and annotation rotated so that it is readable.* ***(Top Right)*** *An image taken by Brendan Shaw on 2013 Feb 20 UT 17:29 – this has been contrast stretched to bring out detail on the floor.* ***(Bottom)*** *A section of a color image mosaic by Rolf Hempel taken on 2012 Feb 02 UT 18:13-19:05. Color saturation increased to 70%.*

Jay was using a Celestron NexStar Evolution 8" SCT (x290). Transparency dropped from 3rd magnitude to 2nd magnitude and seeing was 7-8/10. Jay noted that the crater was fully lit with only a thin shadow along the interior E wall – this agrees with the original LTP report and the two other repeat illumination images in Fig 3. Jay found that the central, N pair and S craterlets were all easily seen, again agreeing with the images in Fig 3. Some slight variations in brightness were seen as ill-defined strips running E-W across the floor. An 80A blue filter improved the contrast enough to make these horizontal strips a little easier to see.

It is interesting to note that the Flynn LTP report does not describe Jay's "ill-defined strips" running E-W across the floor, but you can certainly see them in Brendan Shaw's image in Fig 3 (Top Right). I pushed the color saturation in Ralph Hempel's image to see if I could detect Flynn's delicate blue color patches on the floor but had no luck. Tom Flynn regarded these as permanent blinks and not a LTP, however we have not been able to replicate his observation. We shall therefore leave the weight at 1 for now.

Aristarchus: On 2022 Sep 08 UT 07:28-07:44 Maurice Collins imaged the crater under similar illumination to the following three reports:

On 2002 Sep 19 at UT 06:31-07:22 R. Gray (Winnemucca, NV, USA) found that the bright areas of the crater floor, and the east facing part of the west rim, were brighter noticeably in red (Wratten 25) or white light, than in blue (Wratten 38A). The observer suspects that the apparent LTP was more to do with the relative densities of the filters and the contrast in Aristarchus than a real event. This was partly confirmed after checks on other craters, though it did not work everywhere. The ALPO/BAA weight=1.

Aristarchus 1963 Oct 30 UT 01:50-02:15 Observed by Greenacre and Barr (Flagstaff, AZ, USA, 24" Clark Refractor) observed 2 ruby red spots - one just to the SW of the cobra's Head and the other on a highland area east of Vallis Schroteri. A pink color formed converting the SW rim of Aristarchus. Effects present with or without Yellow Wratten 15 filer. Similar effects checked for elsewhere on other craters but not seen. So presumed not to have been due to chromatic aberration or atmospheric dispersion. Effect not seen in 12" refractor, but this may have been a resolution issue. The NASA catalog ID No. is #778. The NASA catalog weight is 5. ALPO/BAA weight=4.

On 2006 Jun 08 at UT 20:30-20:45 C.Brook (Plymouth, UK, 60mm refractor x75) found that Aristarchus was "shining exceptionally bright during daylight on a gibbous moon". The ALPO/BAA weight=1.

Figure 4. *Aristarchus as imaged by Maurice Collins on 2022 Sep 08 UT 07:32 and orientated with north towards the top.* ***(Left)*** *The original image.* ***(Right)*** *Image after color normalization and having its color saturation increased to 90%.*

Fig 4, although a bit over exposed inside the crater, does not show any of the red spots near the Cobra's Head and Vallis Schroteri, so the Greenacre and Barr report from 1963 should stay at a weight of 4. It does show the rectangular plateau NW of Aristarchus as nice and brown and mauve on the ejecta blanket W-N-E outside Aristarchus. For the Robin Gray observation from 2002 (See 2015 Mar and 2017 Jan newsletters for past repeat illumination observations), it is difficult to judge about this from Maurice's image so we shall leave this at a weight of 1.

Figure 5. *The gibbous Moon. A photo-mosaic by Maurice Collins on 2022 Sep 08 UT 07:28-07:44.*

Figure 5 shows quite clearly that to a visual observer, Aristarchus might look exceptionally bright at this phase, but of course it is just a contrast effect with respect to the terminator and the surrounding dark Mare Imbrium material. The original LTP observation was made with a small aperture scope. We have covered repeat illumination observations before in the 2017 Jan and 2020 Dec newsletters. It seems appropriate to lower the weight of the 2006 Brook report from 1 to 0 and remove it from the LTP database.

Cavendish E: On 2022 Sep 08 UT 21:00 Massimo Giuntoli (BAA) observed visually this crater to check if it was going to repeat an earlier observation where they had seen it unusually bright. A 20cm Newtonian was used with a magnification of x250. Seeing was Antoniadi III. Selenographic colongitude was 68.0°, sub-solar latitude was +1.3° and topocentric libration was 1° 52' in longitude and 7° 20' in latitude. Massimo comments that the northern floor of Cavendish E was bright (normal appearance) but not brilliant. I think we should keep an eye on this crater and monitor it from time to time in case it brightens up again – you can see a finder chart in Fig 6.

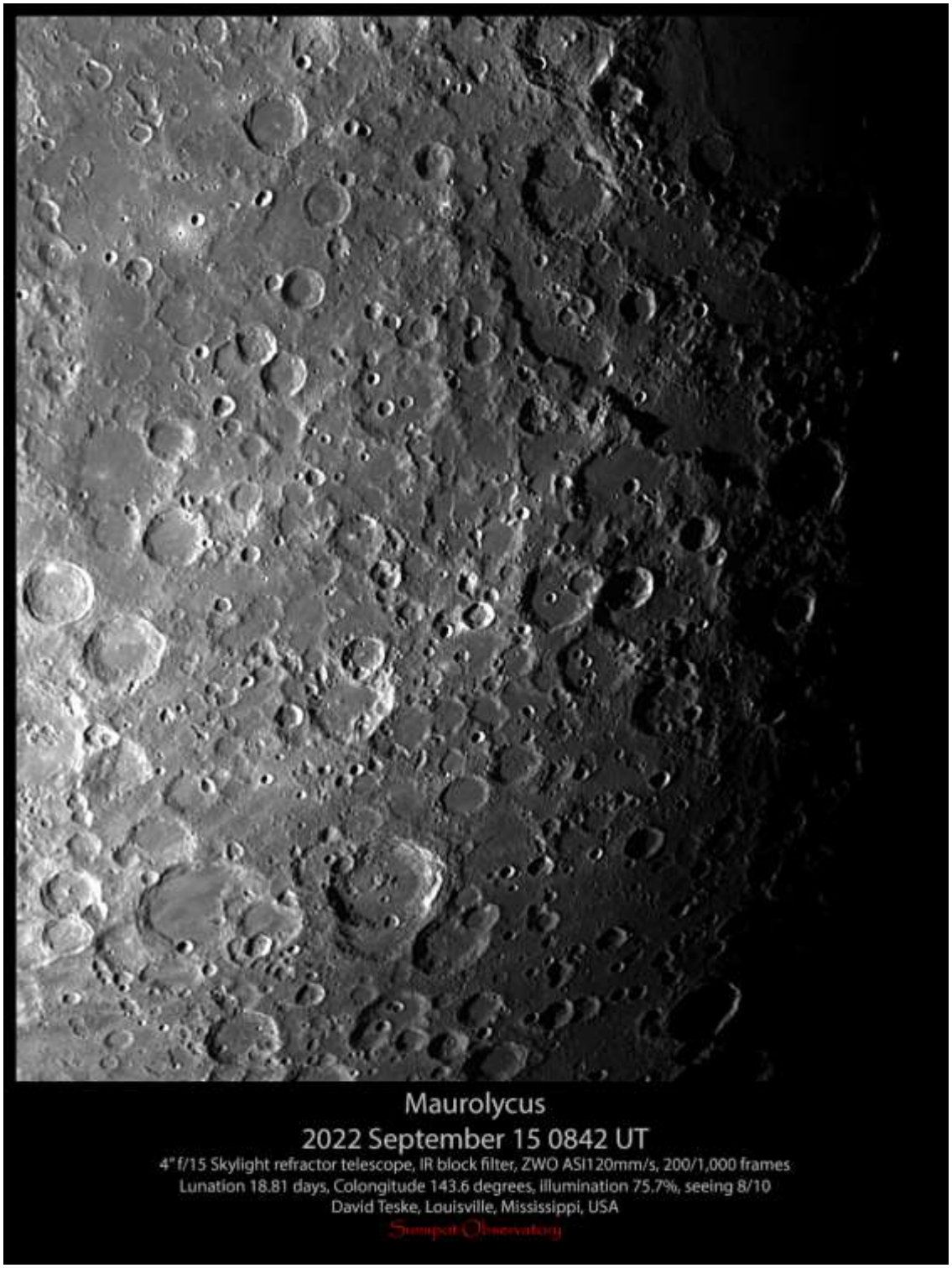
***Figure 6**. the location of Cavendish E, indicated by the two white tick marks. Image from the NASA LROC Quickmap web site.*

General Information: For repeat illumination (and a few repeat libration) observations for the coming month - these can be found on the following web site: http://users.aber.ac.uk/atc/lunar_schedule.htm . By re-observing and submitting your observations, only this way can we fully resolve past observational puzzles. To keep yourself busy on cloudy nights, why not try "Spot the Difference" between spacecraft imagery taken on different dates? This can be found on: http://users.aber.ac.uk/atc/tlp/spot_the_difference.htm . If in the unlikely event you do ever see a LTP, firstly read the LTP checklist on http://users.aber.ac.uk/atc/alpo/ltp.htm , and if this does not explain what you are seeing, please give me a call on my cell phone: +44 (0)798 505 5681 and I will alert other observers. Note when telephoning from outside the UK you must not use the (0). When phoning from within the UK please do not use the +44! Twitter LTP alerts can be accessed on https://twitter.com/lunarnaut .

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

Basin and Buried Crater Project

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



Only one observation has been received this month. David Teske (ALPO) has sent in a nice image of the Werner-Airy basin – visible in the left half of the image. This was taken at an evening selenographic colongitude of 143.6°. The previous image we have of this basin, that I took on 2021 Dec 24 UT 00:04-00:11

(See 2022 May newsletter), had a selenographic colongitude of 149.5°. So, at the moment we can say that the Werner-Airy basin is best visible, in its evening apparition, at around a selenographic colongitude range of 143-150°. I will update the impact basin database.

If you think that you have discovered a new impact basin, or unknown buried crater, please check whether it has been found previously on the following web site, and if not email me its location and diameter so that I can update the list:

https://users.aber.ac.uk/atc/basin_and_buried_crater_project.htm.

Alternatively, if you want an observational challenge, try to see if you can image one of more of the basins or buried craters at sunrise/set and establish what colongitude range they are best depicted at.

Tony Cook

Lunar Calendar November 2022

Date	UT	Event
1	0637	First Quarter Moon
1	2100	Saturn 4° north of Moon
2		North limb most exposed +6.8°
3	0800	Juno 1.0° north of Moon, occultation Antarctica, Polynesia
4		Jupiter 2° north of Moon
7		East limb most exposed +5.3°
8	1102	Full Moon/**TOTAL LUNAR ECLIPSE**
8	1300	Uranus 0.8° south of Moon, occultation Asia, Canada
11	1400	Mars 2° south of Moon
13		Greatest northern declination +27.4°
14	0000	Pollux 1.7° north of Moon
14	0700	Moon at apogee 404,921 km
16	1327	Last Quarter Moon
16		South limb most exposed -6.8°
20		West limb most exposed -6.1°
23	2257	New Moon lunation 1236
26	0200	Moon at perigee 362,826 km
26		Greatest southern declination -27.3°
29	0500	Saturn 4° north of Moon
29		North limb most exposed +6.7°
30	1436	First Quarter Moon

The Lunar Observer welcomes all lunar related images, drawings, articles, reviews of equipment and reviews of books. You do not have to be a member of ALPO to submit material, though membership is highly encouraged. Please see below for membership and near the end of *The Lunar Observer* for submission guidelines.

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: Land of Cracks: Petavius

Focus on is a bi-monthly series of articles, which includes observations received for a specific feature or class of features. The subject for the January 2023, will be Eratosthenes. 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 Petavius Focus-On article is December 20, 2022

FUTURE FOCUS ON ARTICLES:

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

Subject	TLO Issue	Deadline
Petavius	**January 2023**	**December 20, 2022**
Mare Nubium	**March 2023**	**February 20, 2023**
Reiner Gamma	**May 2023**	**April 20, 2023**
Mons Rümker	**July 2023**	**June 20, 2023**

Focus-On Announcement

LAND OF CRACKS: PETAVIUS

Petavius is a venerable antiquity, think how beautiful it must have been, hundreds of millions of years ago, when he would have looked like a super-grown Copernicus. Then it has lived through a whole geological history that has transformed it. Petavius is an opportunity to learn about the remains of its primitive grandeur, its massive, terraced walls, its mighty central peaks, and its ejecta field; and its more recent geological history: its uplifted ground and the rilles that later fractured it, including its best-known and most beautiful feature: Rimae Petavius, "the great cleft," as Elger called it.

JANUARY 2023 ISSUE – Due December 20, 2022: PETAVIUS
MARCH 2023 ISSUE-Due February 20, 2023: MARE NUBIUM
MAY 2023 ISSUE-Due April 20th, 2023: REINER GAMMA
JULY 2023 ISSUE-Due June 20th, 2023: MONS RÜMKER

Rik Hill

Focus-On Announcement

Expedition to Mare Nubium

Mare Nubium is small, not very large, but it has an incredible variety of features: an impact crater beauty, not very fresh but incredibly preserved as Bullialdus, strangely shaped craters like Wolff, giants like Pitatus, almost disappeared craters like Kies or Gould, the most conspicuous concentric crater (Hesiodus A), domes, rilles, wrinkle ridges, the bright rays of distant Tycho, and one of the most beautiful features, Rupes Recta. We will share the lunar images of our observers to dream of an expedition through the sea of clouds.

JANUARY 2023 ISSUE – Due December 20, 2022: PETAVIUS
MARCH 2023 ISSUE-Due February 20, 2023: MARE NUBIUM
MAY 2023 ISSUE-Due April 20th, 2023: REINER GAMMA
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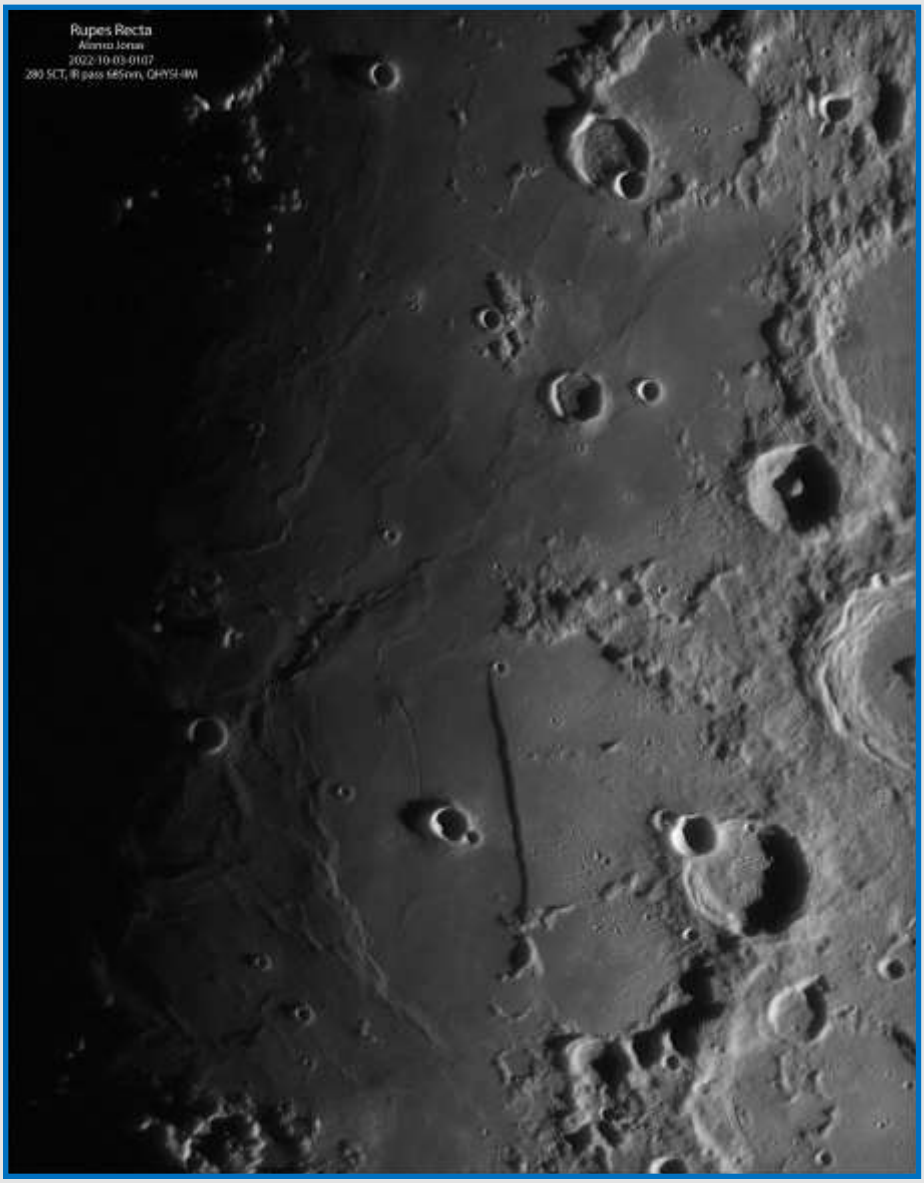
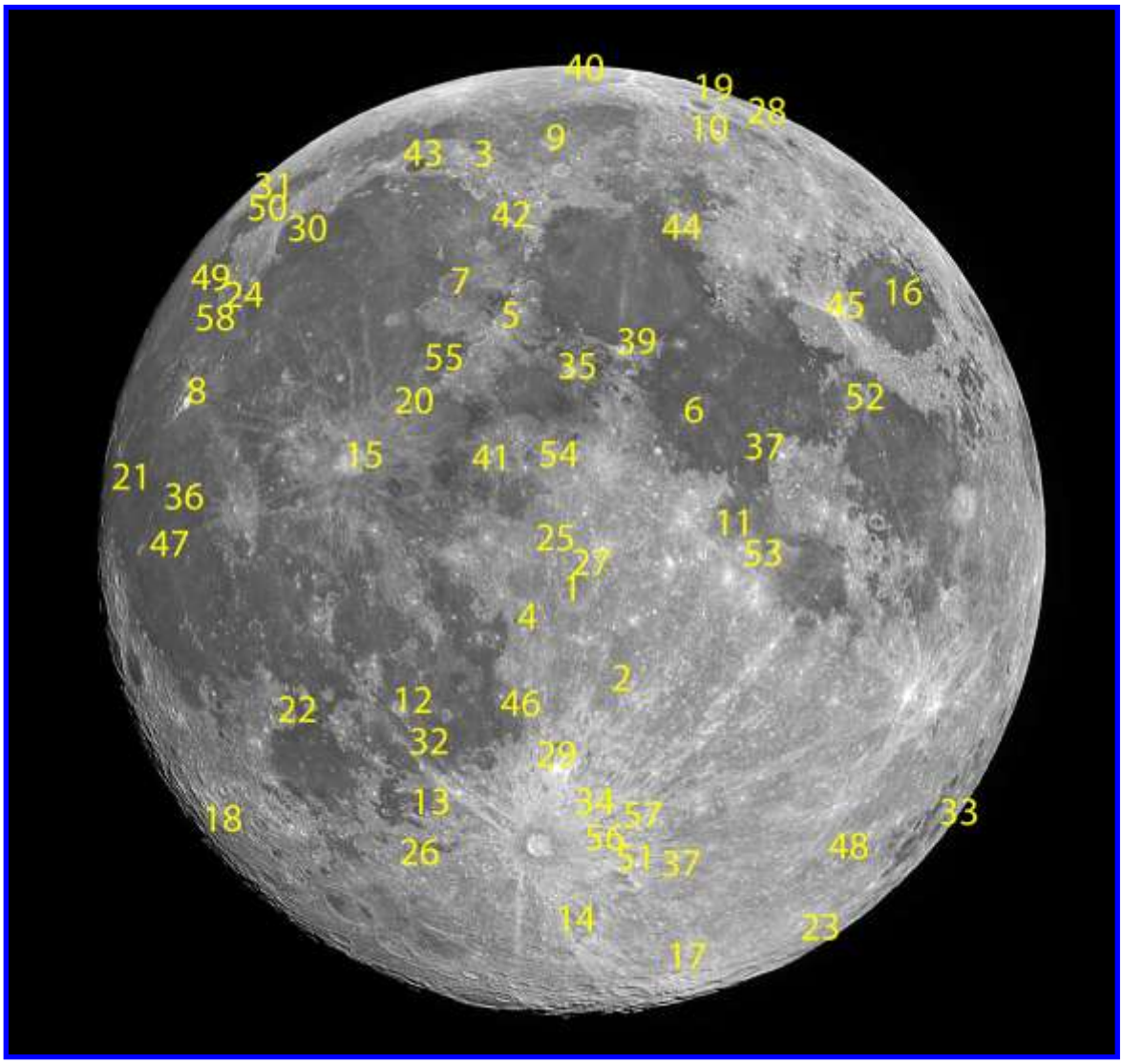


Jonás Alonso

Key to Images In This Issue



1. Albategnius
2. Aliacensis
3. Alpes, Vallis
4. Alphonsus
5. Apenninus, Montes
6. Arago
7. Archimedes
8. Aristarchus
9. Aristoteles
10. Atlas
11. Beaumont
12. Bullialdus
13. Capuanus
14. Clavius
15. Copernicus
16. Crisium, Mare
17. Curtis
18. Eichstädt
19. Endymion
20. Eratosthenes
21. Galilaei
22. Gassendi
23. Gill
24. Gruithuisen
25. Gyldén Valley
26. Hainzel
27. Halley
28. Hayn
29. Hell
30. Iridium, Sinus
31. J. Herschel
32. Kies
33. Lyot
34. Maginus
35. Manilius
36. Marius
37. Maskelyne
38. Maurolycus
39. Menelaus
40. Meton
41. Pallas
42. Piton, Mons
43. Plato
44. Posidonius
45. Proclus
46. Recta, Rupes
47. Reiner
48. Rheita, Vallis
49. Rümker
50. South
51. Stöfler
52. Taruntius
53. Theophilus
54. Triesnecker
55. Wallace
56. Walther
57. Werner
58. Wollaston