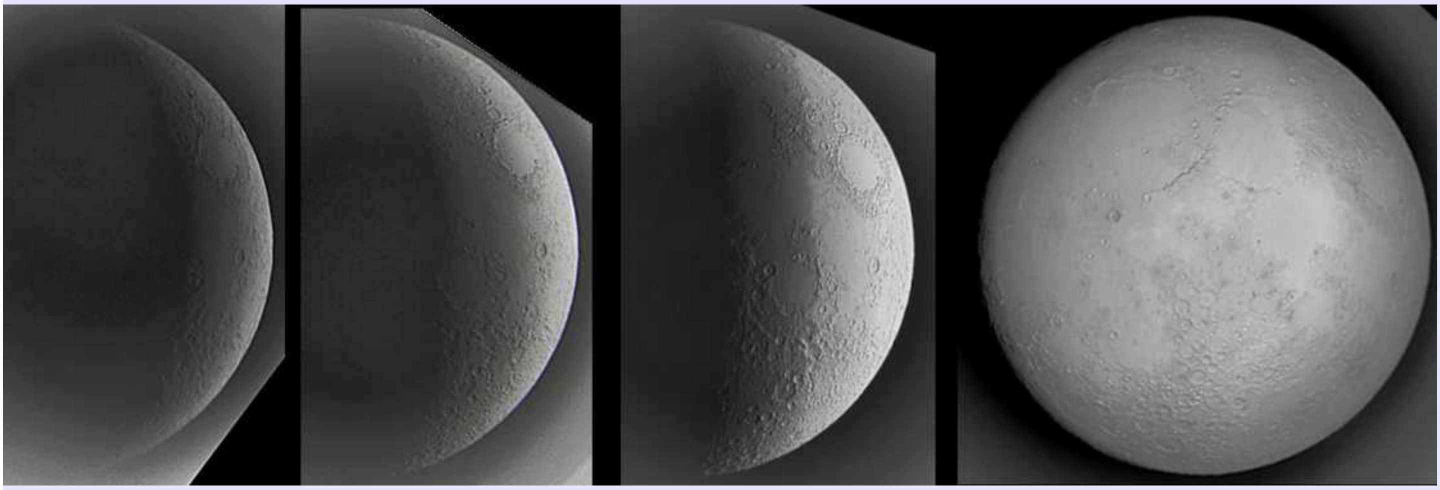
FROM THE DIRECTOR

The Thermal Moon



Thermal images of the Moon (White=hot and black=cold) from Left to Right: 2025 Mar 03 UT 18:29, 2025 Mar 04 UT 19:40, 2025 Mar 05 UT 19:12, 2025 Apr 11 UT 22:26.

Although astronomers have been producing thermal heat maps of the Moon since 1960 using raster scanning thermocouple devices, in the last few years thermal imaging cameras for mobile phones have become available that can be adapted by amateurs. This will work only for Newtonian and Cassegrain telescopes as anything like an SCT, with glass anywhere in the light path (even an eyepiece) is totally opaque in the thermal IR.

Unfortunately most of these thermal IR cameras for phones come with a fixed lens, and most people know that placing a camera, at Newtonian focus, will not give an image. At optical wavelengths, we would just stick a mobile phone lens up to an eyepiece and take a photo, but we cannot do this with ordinary glass in the thermal IR. So instead I found that one can order up a short focal length laser cutter lens, which are transparent to the thermal IR, and put this in front of the thermal camera lens and use that as an eyepiece. The results (not shown here) are just about usable with some craters and shadows and temperature variations being glimpsed.

A better approach is to remove the lens from the thermal IR camera, and use a thermal IR window instead – this produces an improvement, but one is at risk of damaging the camera. Professional thermal IR cameras can cost many thousands, if not tens of thousands of pounds from companies in western countries. However, I have found that the Chinese are now selling thermal imaging cameras for drones at a fraction of these prices. I bought an iTL621R Thermal camera for drones (640x500 pixels, 30 frames per sec, with USB-C connector, 21x23x35mm in size) and had access to a 30mm focal length thermal IR thermal camera lens made of germanium, which I used as an eyepiece. On my 16 inch Newtonian you can just about get the whole Moon into the field of view, and although the image scale is poor at approx. just 8” per pixel or 16 km/pixel, it can tell you a lot, as you can see by the four different phase angle images of the Moon above.

The hottest part of the Moon is about 90 degrees away from the terminator, and rather obviously near local noon and the poles are a little cooler. At the early stage of the lunar cycle, the Moon does not look too dissimilar to what we see in visible light, but as the phase progresses, rather noticeably Mare Crisium does not look dark, as it does at visible wavelengths, but bright, i.e. warmer than the adjacent highlands. This is because being dark basalt, it absorbs and re-radiates the heat more freely than the more insulated higher albedo highlands. Closer to Full Moon, all the mare are glowing hotter (brighter) than their surrounds, and oddly you can almost still see shadow, such as the Montes Apenninus and even the inner eastern rim of Copernicus. However this is not shadow, it’s just that shadow was present here for slightly longer and these regions have not heated up as fast as the surrounds which formerly had less shadow. The eastern side of the Moon is slightly darker which means that it is cooling off faster than the western side is warming up. Another curious fact is that very few rays can be seen in the thermal IR compared to in the visible – this is because ray material is usually just a thin coating with minimal thermal properties,

If anybody would like help and advice with exploring the Moon in the thermal infrared, please just drop me a line.

Lastly, our web coordinator, James Dawson has kindly set up a survey for the Lunar Section. Feel free to try it out on: https://forms.office.com/r/mcVUXZiyhv . We will keep the form open for a couple of months and report some preliminary findings in the June circular. All feedback is anonymous. Please do take part as your opinions are important to us and could shape the variety of material we show in the circular and the way we run things to make it better for our members.

Tony.

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Lunar Occultations May 2025 by Tim Haymes.

Time capsule: 50 year ago: in Vol 10 No.5
[With thanks to *Stuart Morris* for the LSC archives.]
*P Moore: Aristarchus event (TLP) – reports continued
*G W Amery: Occultation news: Poor weather effects observations.

Journal for Occultation Astronomy (JOA)
Issue-2 of 2025 can be downloaded from the IOTA-ES web pages. In this issue, the importance and purpose of lunar occultations is discussed. https://www.iota-es.de/joafree.html

Observation of double stars occulted by the Moon.
This is of current interest, perhaps more so as scientific interests develop. Amateurs provide a large proportion of these observations via their routine occultation reports. Its also reported that the historic Hooker 100-inch and 60-inch might become available for such projects by citizens and institutes.

For us lesser mortals there is the double-star feed in OccultWatcher. This alerts us to observing opportunities. Alex Pratt and myself receive updates from the organisation OLED to which we hope to contribute.The web pages (https://sites.google.com/aam.org.es/oled) are most informative – recommended reading.

"*OLED is an observational project proposed by the Federación de Asociaciones Astronomicas de España and the Société Astronomique de France, aimed at amateur observers interested in measuring lunar occultations of double stars and using photometric techniques applied to these events. These techniques allow one to obtain the light curve of a double star occultation, and from it, the measurement of its separation and position angle, with data obtained from two or more observers*."

The Pleiades passage on 2025 April 1st
Graze of 20 Tau on Apr 01, 2140UT. Northern Limit. CA 7N – successfully observed.
In the previous Circular, I had found a suitable location from which to observe the graze which was 1.8 Km SW of the mean limb. After some thought I decided to use a "plan-B" location that was 2.3 Km inside. The same number of contacts were predicted by GRAZPREP, but with the advantage that there was more "sky" available to allow timing of other cluster members. There was also more wind which I hadn't planned for !
I recorded 3 total occultations prior to 20 Tau. The 23 Tau event shows a clear step in the light curve and playback.
RD events on April 01:

SAO 76167, 78N, 2122 47.83s	O-C = -0.08	
SAO 76169 80N, 2123 14.79s	O-C = -0.04	
Merope (23Tau) 2124 31.35s	O-C = 0.0	step event (0.24s)

23 Tau (Merope) light curve, and the observing location near Charlbury, Oxfordshire.

This field entrance offered easier access from the road and some screening from headlamps. The azimuth of the Moon was behind the street view camera.

Setting up a mobile telescope for occultations.

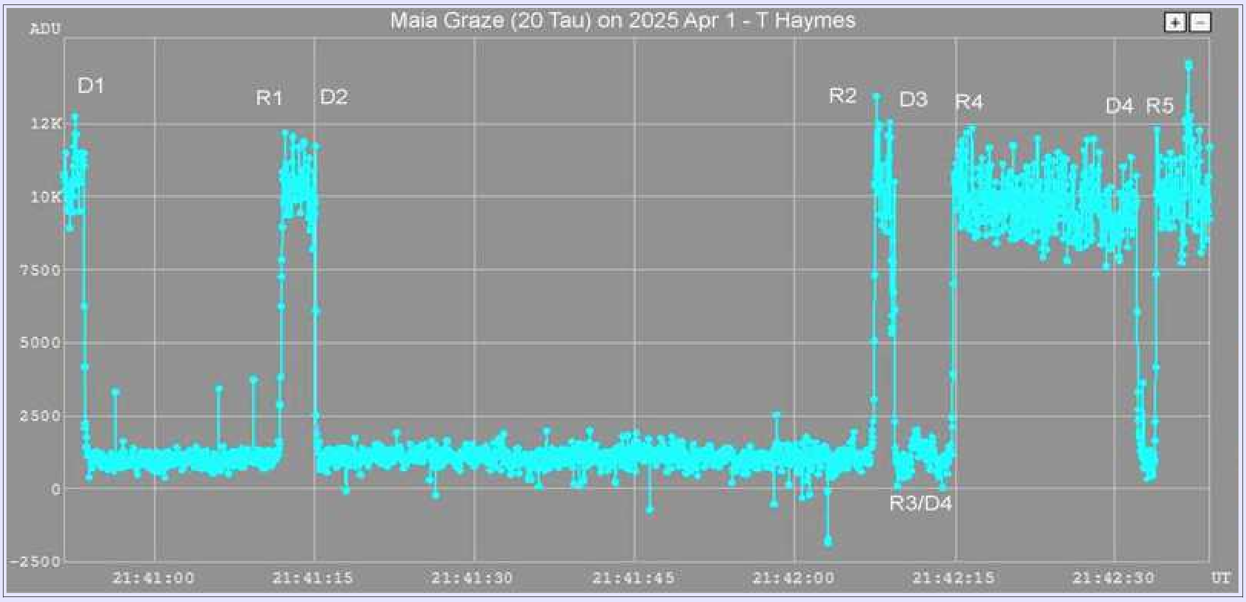
I allow one hour to set up the instrumentation. It is mostly routine to align the OTA and control with EQMOD as a goto from Sky Map Pro. The Moon is bright enough not to require much "finding", but with a planetarium program I have confidence in stars of interest appearing near the middle of the frame. The tripod is adjusted to be horizontal with a spirit level and the azimuth set with a compass. I don't fiddle about with the polar axis finder. For the short time of the recording there is little drift at prime focus (FL 800mm at F/4). Its effectively a one star alignment and sync.

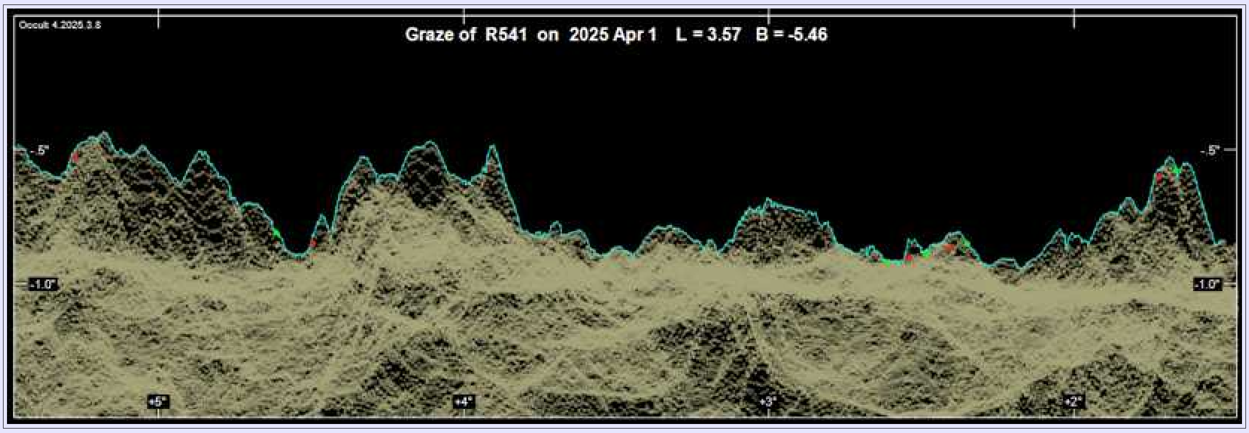
The camera and recording equipment comprised:
WAT-910HX/RC (25fps gain 20dB) > GPSBOXSPRITE2u (video time insertion) > Pinnacle Dazzle (digitiser) > USB3 (laptop) > IOTA video capture (as AVI).

The video was not compressed, but the Largarith Lossless Codec can be installed to do this.
The graze video can be seen on YouTube: https://youtu.be/9LrXYd8polY

Setting up the telescope.

Video Analysis
The AVI was played back with Tangra using one of the other Pleiades stars as a comparison. Gusts of wind caused some shaking, but I could suppress the worst vibration by holding my finger against the OTA.
Eight contact were recorded All were non-instantaneous. The D4 event was slow.
Occult displays the reported times on the LOLA limb: (Before LOLA we had Watts limb profile.)





From the Occult4 report file, an analysis and limb display are produced. On the above LOLA limb projection, RED = Disappearance, GREEN = Reappearance.

Further Pleiades Reports:

Interim reports have been received from Brian Mills (Total occultations) and Robin Scagell (Graze).

Imaged by Alan Tough: https://britastro.org/observations/observation.php?id=20250403_093849_904d4732e3e50752

Andy Wilson: https://britastro.org/observations/observation.php?id=20250402_093123_e7ad96a5d9bc5ea1

Occultations this month:

May-03, 2300UT: Moon, Mars and M44 within 5 degrees

May-13/14 0 Hr: Full Moon near Antares, low in the South - colourful?

Occultation predictions for 2025 May (Times at other locations will +/- a few minutes)

Oxford: E. Longitude -001 18 47, Latitude 51 55 40

Filter: Moon above 8 deg alt. Magnitude brighter than 8.5, Sun Alt below -5

yy	mmm	day d	h	Time m	s	Ph	Star No	D*	Sp	Mag v	Mag r	% ill	Elon	Sun Alt	Moon Alt	Moon Az	CA o	Notes
25	May	1	20	57	13.7	D	78480	c	K5	7.5	6.7	22+	56	-12	31	277	47N	
25	May	1	22	18	53.4	D	1013	c	G0	7.0		22+	57		19	291	41S	
25	May	2	0	3	33.5	D	78641		M0	8.3	7.5	23+	58		5	309	62N	
25	May	2	0	8	35.0	D	1028		G8	7.5	7.1	23+	58		5	309	48S	
25	May	2	20	24	33	m	79495	d	A2	8.3	8.3	32+	69	-8	43	257	12N	
25	May	2	23	53	46.4	D	79610		F8	7.2	7.0	33+	70		12	295	17S	
25	May	4	21	3	17.0	D	1392	c	G0	7.3		53+	93	-12	46	234	29N	
25	May	4	21	10	11	Gr	1392	c	G0	7.3		53+	93	-11	44			** GRAZE: BAAH #6 CA 13.0N; Dist. 90km in az. 55deg
25	May	4	21	15	31.2	D	98554		K2	7.1	6.3	53+	93		44	237	55S	
25	May	6	21	58	18.1	D	118602		F8	8.4	8.1	73+	117		39	217	82S	
25	May	9	23	58	58.3	D	1888		K5	6.0	5.2	94+	150		23	211	44N	50 Vir
25	May	20	2	33	38.4	R	3197		K3	6.4	5.6	54-	95	-11	8	130	88S	
25	May	22	2	54	4	m	3465	S	F8	6.5	6.2	32-	69	-9	8	107	6N	
25	May	28	21	43	30	m	77987		B9	8.5	8.5	5+	25	-11	6	309	15N	
25	May	29	21	11	35.6	D	1089		K0	6.7	6.1	10+	38	-8	17	291	75N	
25	May	29	22	40	59.5	D	79206	c	F8	8.5		11+	38		5	307	34S	
25	May	30	22	1	40.7	D	1239		A4	6.6	6.5	18+	51	-12	16	288	80S	
25	May	31	23	8	23.2	D	1366		K2	8.1	7.3	28+	64		10	287	39N	

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Communications Received.

The following was sent in by John Robbins regarding his new book The Detailed Topographic Lunar Atlases.

In late March, Oculum Verlag published a two-volume set of exceptionally detailed lunar atlases entitled, *The Detailed Topographic Lunar Atlas* (for short: DTLA). One volume covers the near side; and a second volume covers the far side. Each atlas consists of 1204 chart pages, on 14.5 x 14.5 inch sheets, each is complete with full index. Covers of each atlas are seen in Figure 1. Due to the high page counts, the atlases are only available in e-reader/PDF formats (each at 1GB+ in size). Oculum web pages for each atlas are:

Near Side Far Side

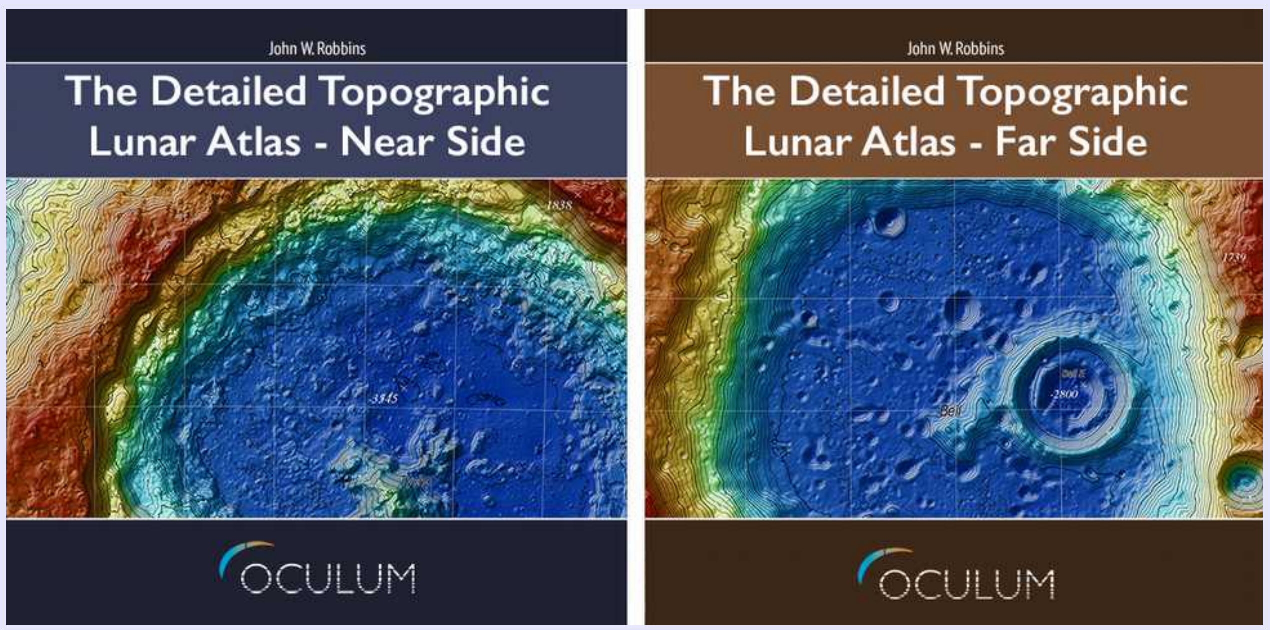

Figure 1. Cover art for the two atlases published by Oculum Verlag.

To purchase, one simply clicks the "add to shopping cart" which leads to a check-out page. Once the transaction is complete, an e-mail will arrive with a download link. Patience is needed during downloading, each atlas is quite large, but with sufficient storage, they can be placed on smart phones and tablet readers.

Source Data

SLDEM2015 digital elevation models (DEM), publicly available through NASA's Planetary Geology, Geophysics and Geochemistry Lab web site, were used to create a portion of the atlas between latitude limits of ±60°. The grids come in several resolutions that are described in terms of the number of pixels per degree (PPD). The 256 PPD resolution model, in binary IMG format, was downloaded, then reformatted into files easily ingested by software that was written to make the maps (NetCDF).

SLDEM2015 was created by personnel in NASA's Lunar Reconnaissance Orbiter (LRO) Project, the Planetary Geology and Geophysics Program, and JAXA. This DEM is based on Lunar Orbiter Laser Altimeter (LOLA) data consisting of ~4.5 billion individual range measurements observed from September 2009 through July 2013. The observations were co-registered with 43,200 stereo-derived DEMs (each 1° x 1°) from the Terrain Camera (TC) on-board the Japanese SELENE spacecraft, acquiring images between 2008 and 2014.[1]

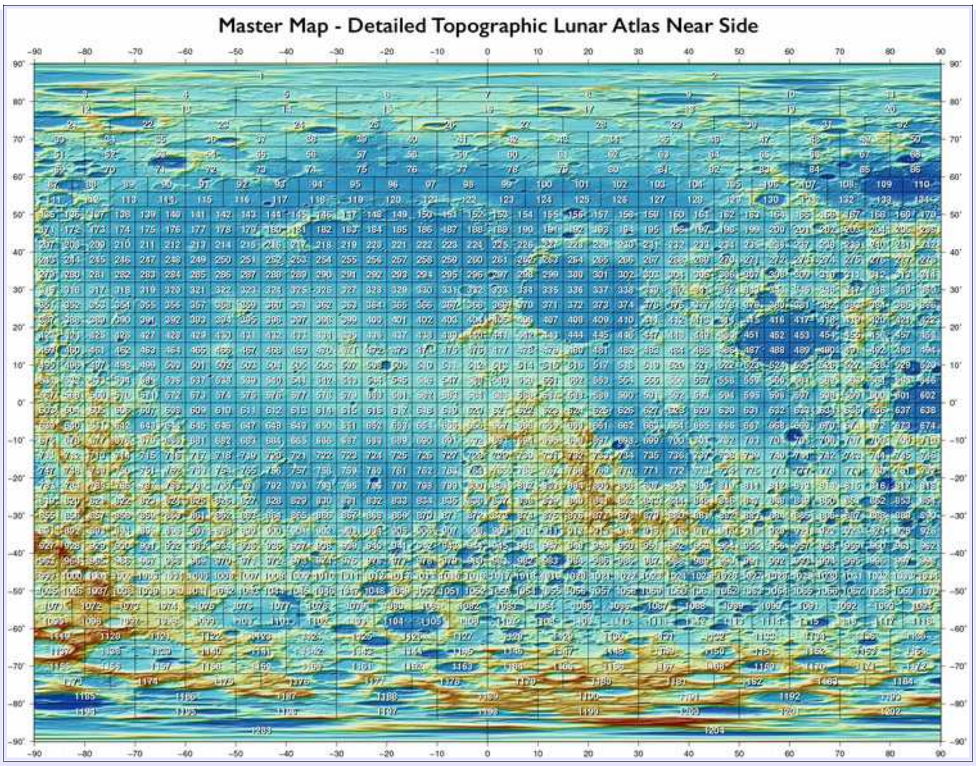

Figure 2. An overall chart index for the DTLA Near Side atlas.

For higher latitudes, beyond ±60°, other sets of DEMs were used. For the latitude band from 60° to 80°, and from -60° to -80°, a single-sourced LOLA DEM was used. This particular DEM possesses occasional ground-track artifacts and/or poorly constrained interpolations between tracks. Nonetheless, the DEM presents the surface features with remarkable detail.

Between latitudes ±80° the 256 PPD resolution model was used (one pixel is 1/256° across), equivalent to a horizontal resolution of about 118 meters at the moon's equator.

Polar regions, north of 80° and south of -80°, are based on a high-resolution LOLA 20-meter DEM, specific to each polar region[2]. This DEM was transformed into a geographic coordinate grid with a resolution of 5 arcsecs; equivalent to a horizontal resolution of 132 meters.

In all cases, the base datum for the elevation each grid cell represents, is that adopted by the IAU, defined as a sphere with a radius of 1737.4 kilometres.

Names for craters, mare and mountain features originate from the official IAU nomenclature lists provided by the USGS planetary website.

A non-IAU approved list of lunar domes[3] produced by the Geologic Lunar Research (GLR) group was also used. Many labeled domes can be associated with plainly evident topographic features; many may not be so apparent; these latter cases may fall into the category of being questionable in their validity.

Development of the Atlas

When the effort was started, maps were made rather non-systematically and mostly highlighted specific features of interest. On occasion, a few early examples were posted on the Cloudy Nights Forum. Friends encouraged me (just enough) to develop a full-blown atlas. The early questions that were raised included:

What map scale(s) to use?
What colour tables to adopt?
What artificial relief shading parameters should be adopted?
Is it better to adopt a single set of colours applied across whole atlas or use independent colour scales tailored for each chart?
What contour interval works best, globally? What line thicknesses work best for the contours?
What sheet size helps to convey sufficient detail?

Many of these questions were answered by trial and error, after coding was underway. The mapping system was developed largely as a Unix script that makes calls to various calculation utilities (awk and bc) as well as a toolset called the Generic Mapping Tools (GMT)[4]. The main graphics script is about 430 lines long and, for the purpose of making the atlases, is directed by a driving script that makes each individual chart.

The first draft of the near-side atlas came out in February 2024. It was placed on 8.5 x 11 inch sheets, in landscape mode, with adjacent page numbering shown along the margins of each sheet. It was a good first try, weighing in at 1334 pages. But the contour lines were too heavy and fonts for feature names were sometimes not very readable. A second draft of the near side was made in May 2024, along with a first draft of the far side atlas. These were both placed on landscape, 8.5 x 11 inch sheets.

In late May 2024, I contacted Ronald Stoyan at Oculum Verlag about the possibility of publishing atlases for the near and far sides of the Moon. We finalized an agreement to publish in September. Subsequent drafts of both side atlases were made, and map scales were formally adopted placing charts on a final adopted page size of 14.5 x 14.5 inches. An iterative process ensued to refine each atlas page, taking the utmost care to prevent any text from overlapping. This meant tweaking (rather painstakingly) the locations of feature names and duplicating their names across map sheets for features that spanned more than one sheet. Within one of those draft iterations, it was decided to add a buffer between map sheets so that readers could easily transition from one map to an adjacent map. A NW artificial illumination was selected to provide the shading of the relief.

Final versions were produced in February and early March of this year. Sales went on-line, live, on the Oculum-Verlag.com website around mid-March.

The longitudinal span of each map varies by latitude. Polar maps have been placed on a polar stereographic projection and span 90° in longitude and extend 6° in latitude, from the poles. All other maps have been placed on Lambert Conformal Conic Projections and span longitudes that fit within each page, with all maps extending 4° in latitude. The standard latitudes, where the scale is exact, is set (and noted) for each map sheet to reduce the amount of distortion introduced by the projection. A scale of 1:500,000 was adopted for all maps, excepting the polar maps, which were set at 1:800,000.

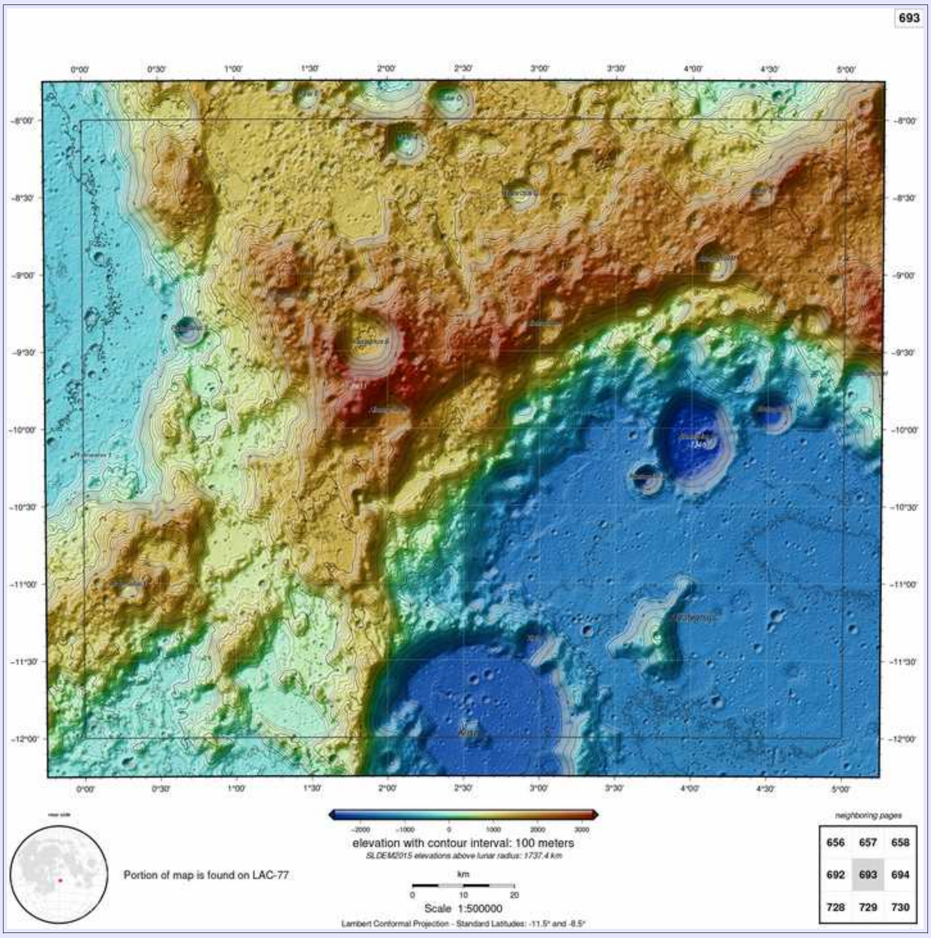

Figure 3. Sample chart of the NW portion of Albategnius Crater.

A small reference map is found at the lower left of each sheet, with the area covered by the map shown in red and gray features being the main lunar maria (seas). At the bottom right of each sheet, is a small grid providing page numbers for adjacent maps. Maps left and right are typically previous and next pages, respectively. A 20km distance scale, colour bar and reference to the corresponding LAC map sheet was placed on each chart in the atlas. Reduced resolution sample pages can be found on the Oculum website. The chart index for the Near Side atlas is seen in Figure 2.

Atlas Utility & Summary

Among the goals of lunar observers is to obtain detailed views and, for some, highly resolved images of the lunar surface and its features. The DTLA near side atlas can be of great value when attempting to correlate features seen through the eyepiece or in images, when compared to their corresponding topographical signatures as found in the atlas.

Every issue of The Lunar Section Circular contains amazing samples of images, each of which are interesting to study using the atlas as a guide. For example, in last month's issue, two wonderful images were included of the crater Albategnius (pages 12 & 13). Figure 3 shows a map of the NW portion of the Crater as found on page 693 in the DTLA Near Side. Due to chart boundaries and the location of Albategnius, it takes four charts to cover the whole crater (pages 693, 694, 729, 730). Nonetheless, every rise and dip seen in the image can be traced and studied with its corresponding chart, including the tiny crater on the top of the central peak.

Hopefully, the PDF version of the DTLA will be embraced by this and other amateur and professional astronomical communities as a useful and worthy resource, especially for those desiring to understand and appreciate the varied topography of the Moon (the far side is considerably different than the near side). Occasionally, pages of the atlas may appear rather lack-luster on first sight (e.g., across Mare Imbrium), but when zoomed-in, even in relatively flat zones, fascinating structures become evident, like domes and small crater chains.

A printed version would require very expensive production costs (and matching purchase prices), and if each atlas were printed as single volumes, on heavyweight glossy paper, its weight would be stressful for most coffee tables to bear. Personally, I don't own very many 1230 page tomes, but lifting such a thing would be rather strenuous (let alone shipping cartons containing multiple copies). The PDF version has no weight and can be zoomed-in to meet higher levels of detail. As the author, I hope many will at least consider obtaining a copy.

References

[1] Barker, M. K., E. Mazarico, G.A. Neumann, M.T. Zuber, J. Haruyama, and D.E. Smith, A new lunar digital elevation model from the Lunar Orbiter Laser Altimeter and SELENE Terrain Camera, *Icarus*, 273, 346-355, 2016, https://doi.org/10.1016/j.icarus.2015.07.039.

[2] Barker, M.K., E. Mazarico, G. A. Neumann, Mt. Zuber, D. E. Smith and J. W. Head, Improved LOLA Elevation Maps for South Pole Landing Sites: Error Estimates and Their Impact on Illumination Conditions, *Planetary & Space Science*, Volume 203, 105119, 2020, https://doi.org/10.1016/j.pss.2020.105119.

[3] Kapral, C. A. and R. A. Garfinkle, GLR Catalog of Lunar Domes, 2005, https://digilander.libero.it/glrgroup/kapralcatalog.pdf. Also see http://www.glrgroup.org.

[4] Wessel, P., Luis, J. F., Uieda, L., Scharroo, R., Wobbe, F., Smith, W. H. F., & Tian, D. (2019). The Generic Mapping Tools version 6. *Geochemistry, Geophysics, Geosystems*, 20, 5556–5564. https://doi.org/10.1029/2019GC008515.

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Images and Drawings.

Sinus Asperitatis, Torricelli and surroundings.

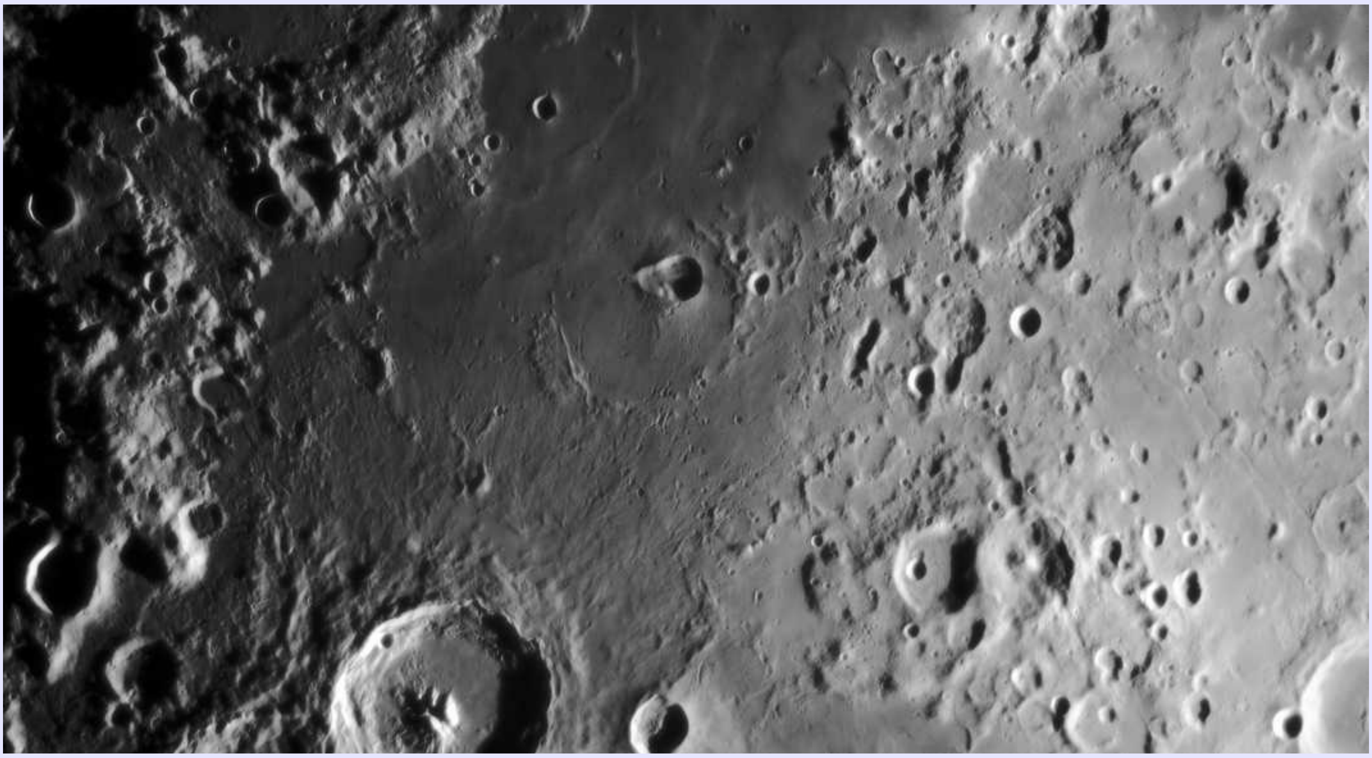
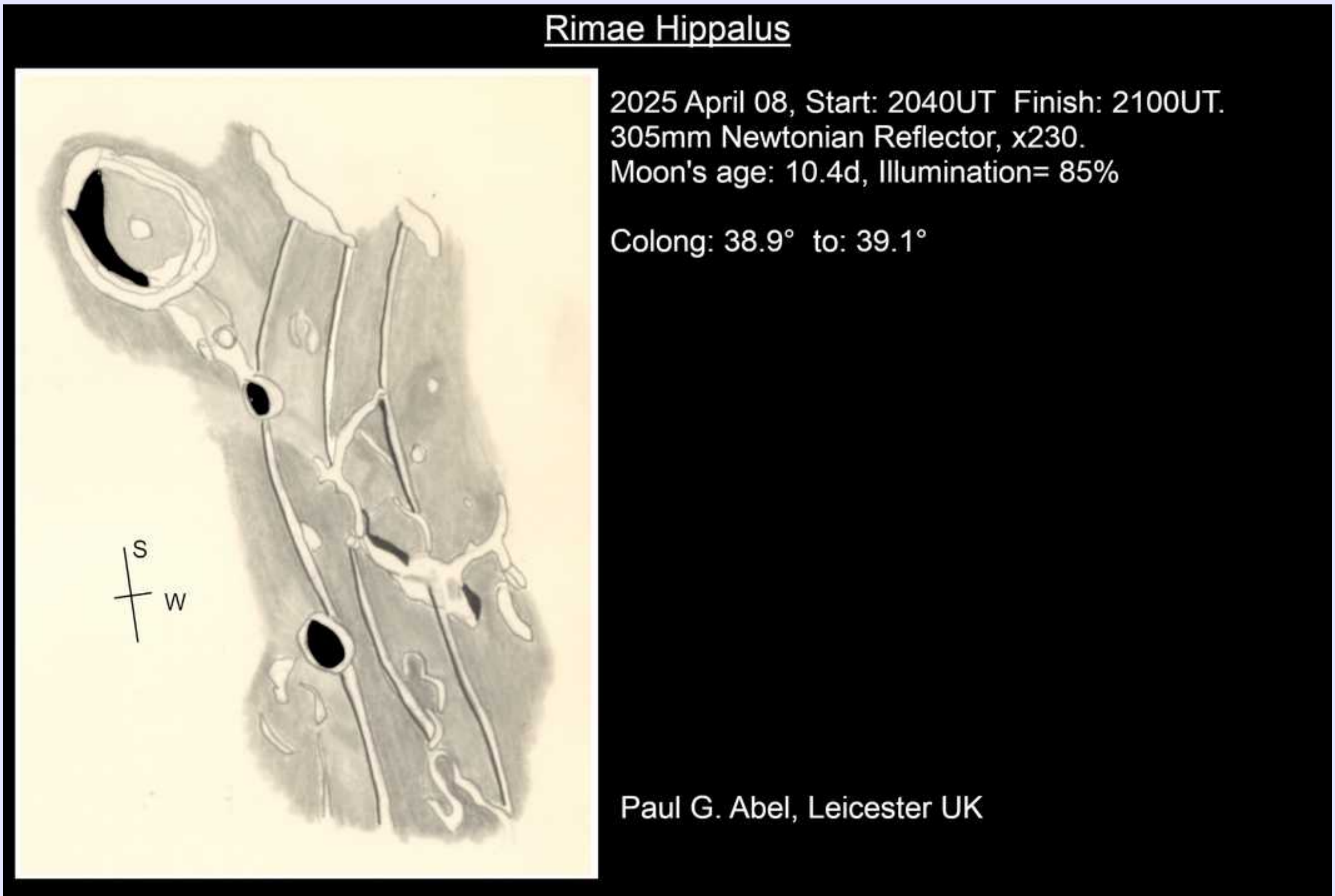


Image from the BAA Gallery, and taken by James Dawson on 5th March 2025 at 16:26hrs using a Celestron C14, ASI 585 MC, 2x PowerMate and ProPlanet 807nm filter.

Rimae Hippalus.



Drawing by Paul Abel made on the 8th April 2025 at 21:00 using a 305mm Newtonian Reflector, x230

The Moon and Pleiades.

Image by Steve Brown and from the BAA Gallery. Taken on 1st April 2025 at 20:26 using a Canon 250D and Evostar 72ED.

Steven Commented: '*I got this shot of the Moon just before it started crossing in front of the Pleiades open cluster on 1 April. I was setting up to do a time-lapse sequence of the event, which worked out well. I wasn't able to capture it all though, as the Moon set behind a rooftop towards the end of the event. It was a wonderful thing to see though. The view through binoculars of the crescent Moon just sitting in the middle of the Pleiades was amazing.*'

89 Leo Occultation.

Image by Mazin Younis and from the BAA Gallery. Taken on August 7th 2024 at 21:43 using a Personal Remote Telescope in Morocco (Sky-watcher Quattro 8 f/4 and ASI 2600MC Duo)

Mazin commented: '*I love occultations. Captured today this double-occultation; 89 Leo close to moon, and the lunar mountains occulted by terrestrial peaks in southern Morocco*.'

Pitatus.

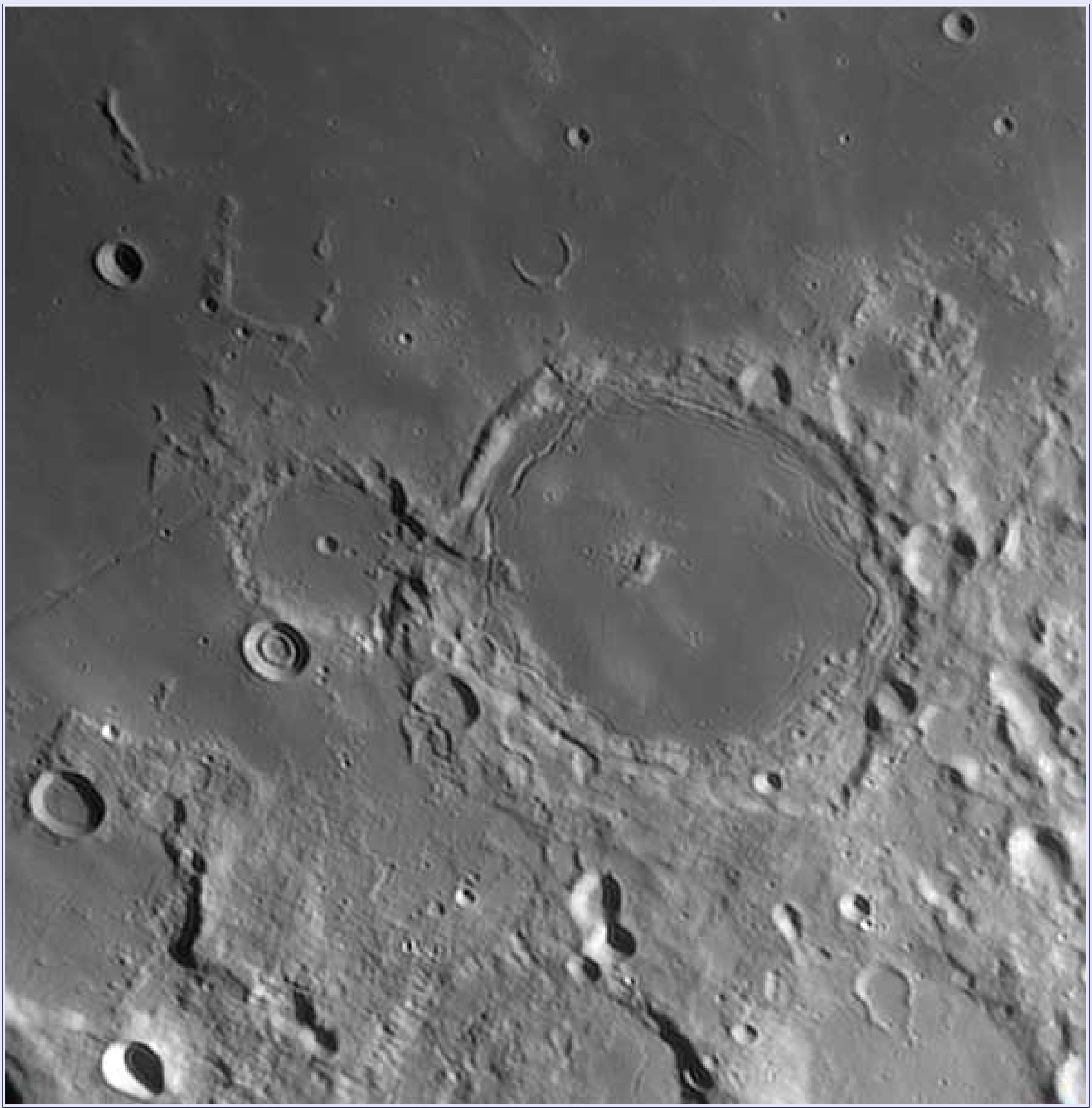
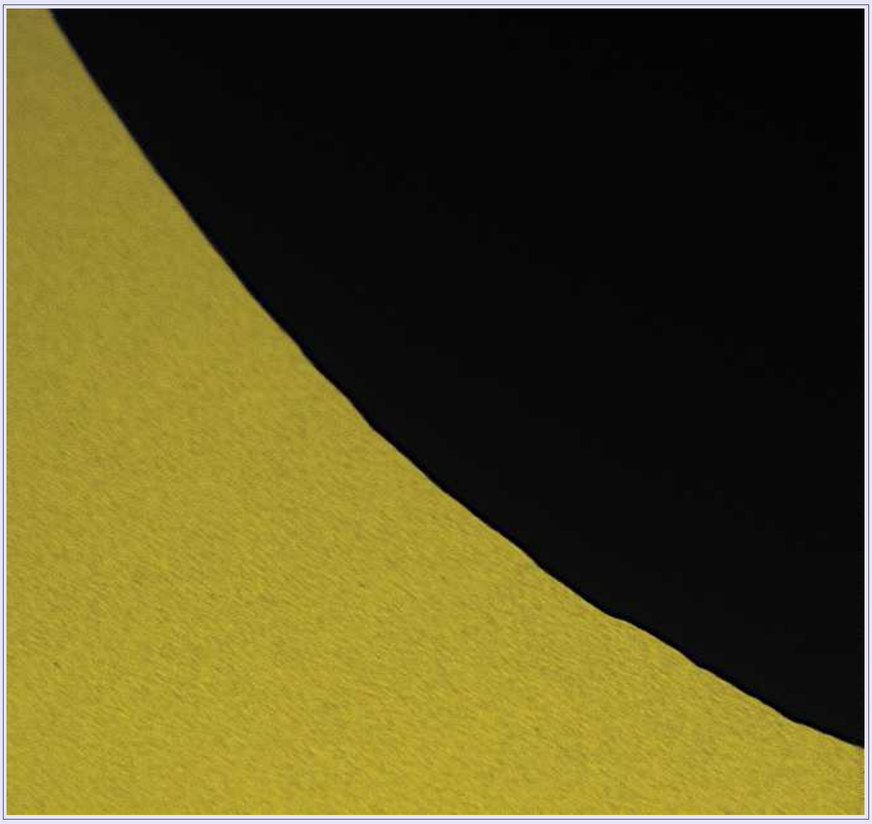
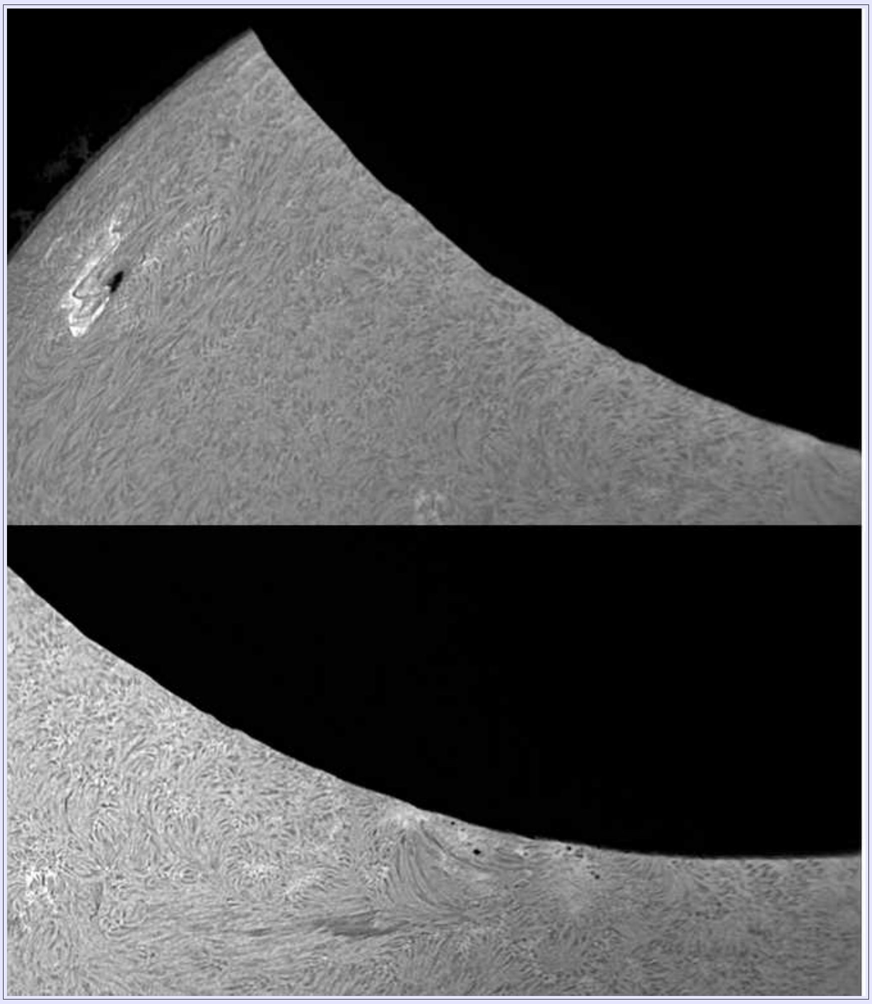


Image by Bill Leatherbarrow taken on 9th March 2025 at 22:46.

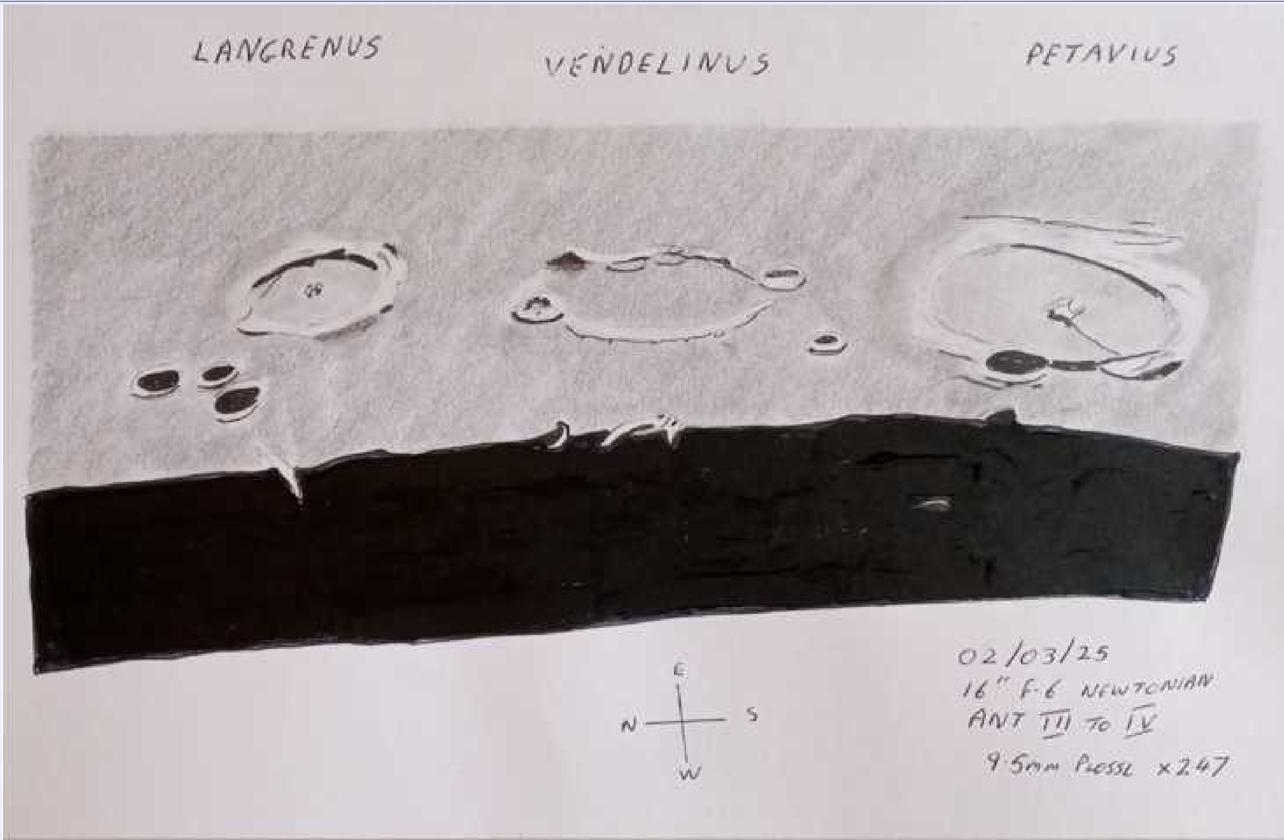
Lunar Limb during the 29th March Eclipse in Hα and white light.





Images sent in by Brian Halls.

Drawing by Trevor Smith.



LANGRENUS, PETAVIUS AND VENDELINUS

TREVOR SMITH.

THE NIGHT OF 02/03/25 SAW THREE LOVELY GIANT CRATERS OF LANGRENUS, PETAVIUS AND VENDELINUS RESPLENDENT IN THE LUNAR MORNING SUN. JUST A HINT OF BLACK SHADOW COOLED THEIR EASTERN INNER RIMS SHOWING THEM TO BE IN THE LAST STAGE OF LATE LUNAR MORNING. WITH NO APPRECIABLE ATMOSPHERE IT MAKES THE CASUAL EARTHBOUND OBSERVER WONDER WHAT THE DRAMATIC DIFFERENCE IN TEMPERATURE WOULD BE LIKE FOR SOME FUTURE LUNAR HIKER ON OUR CELESTIAL ORB!

Sinus Iridum

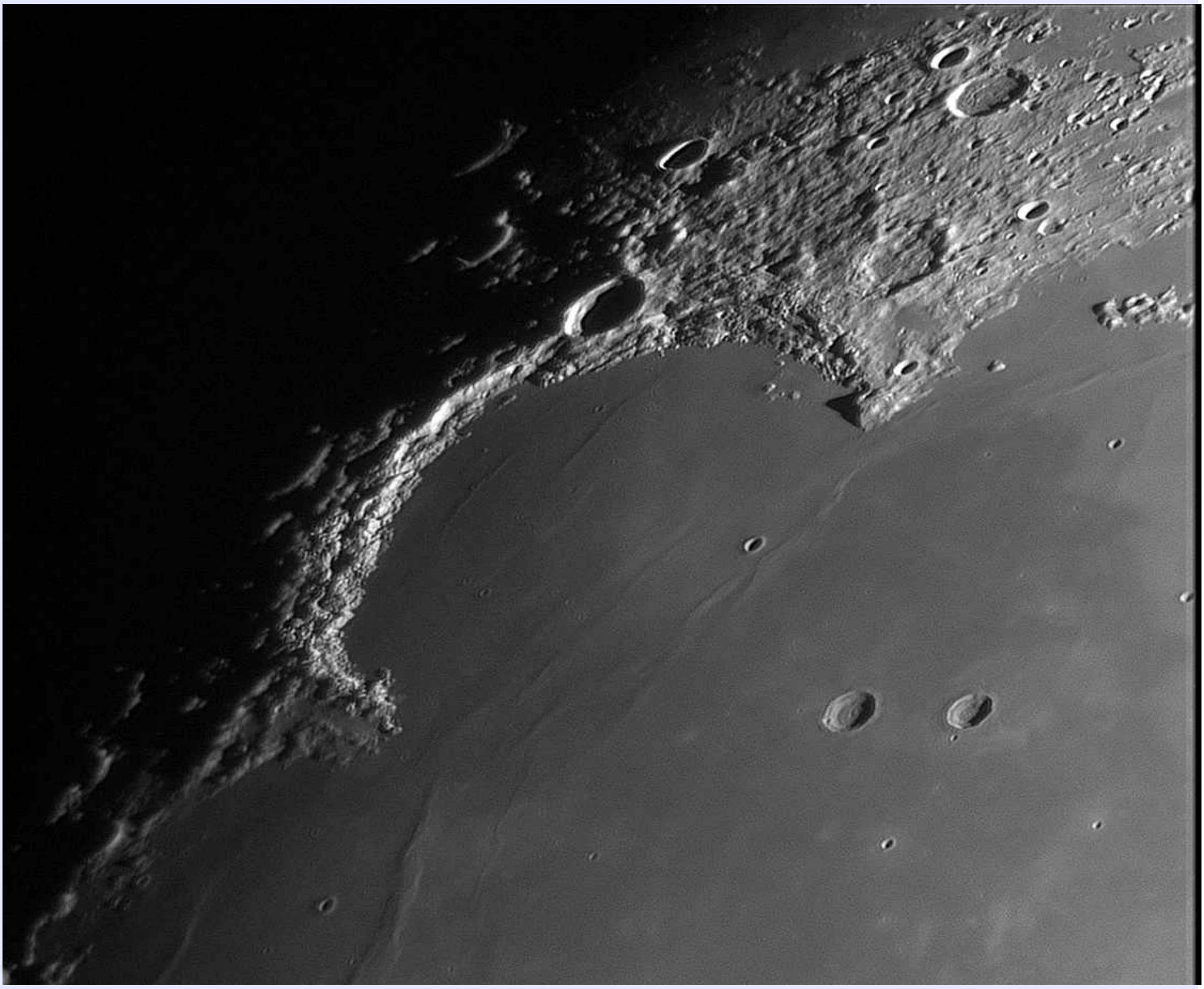


Image from the BAA Gallery, and taken by Alun Halsey on 8th April 2025 at 21:15 using an Orion Optics UK VX8L f/6 Newtonian (1/6PV mirror) Player one Neptune-M (IMX178), ZWO IR pass 850nm filter and Mesu-200 Mk1.

Southern Limb under favourable libration.

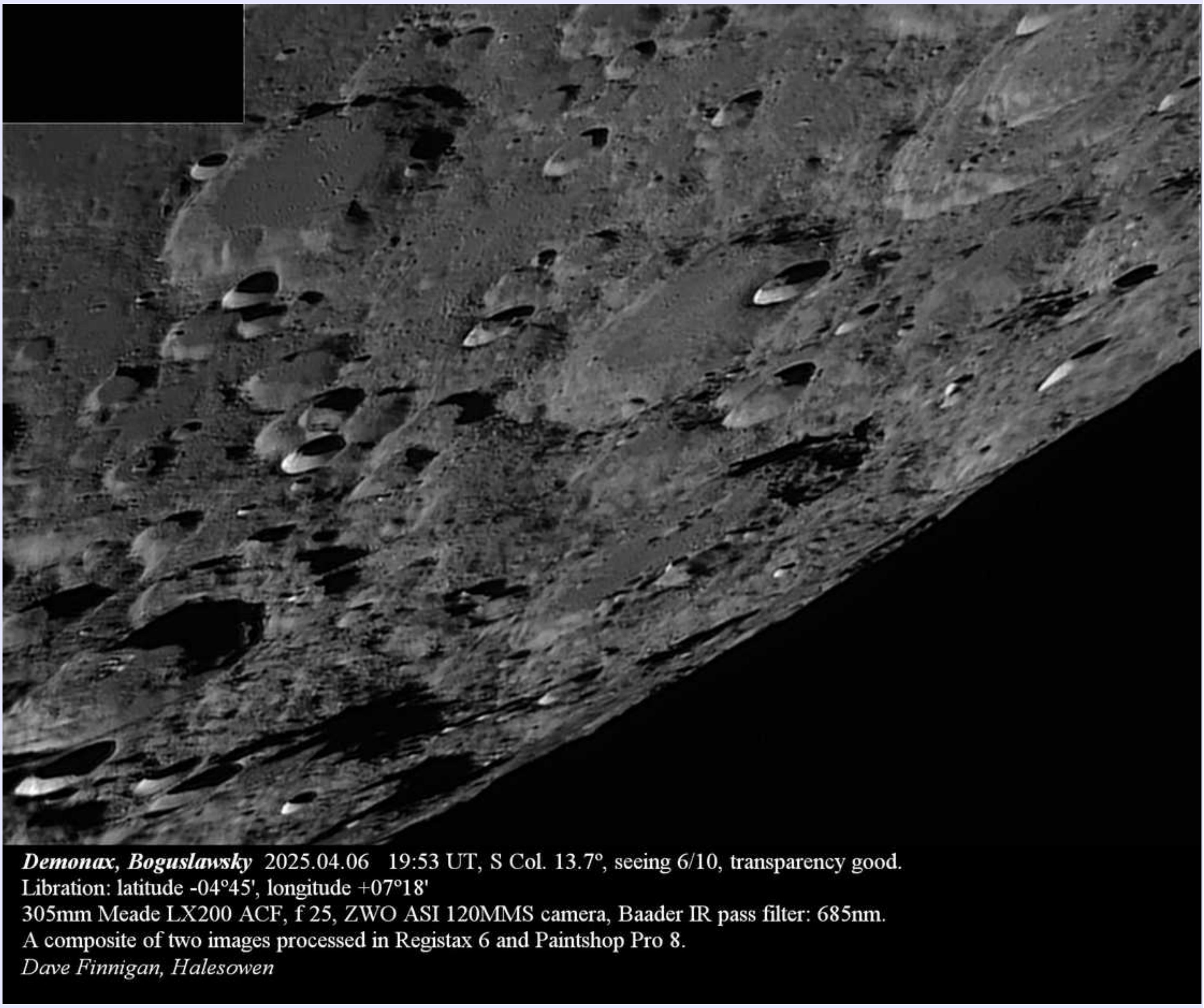


Image by Dave Finnigan with details as shown.

Rima Birt?

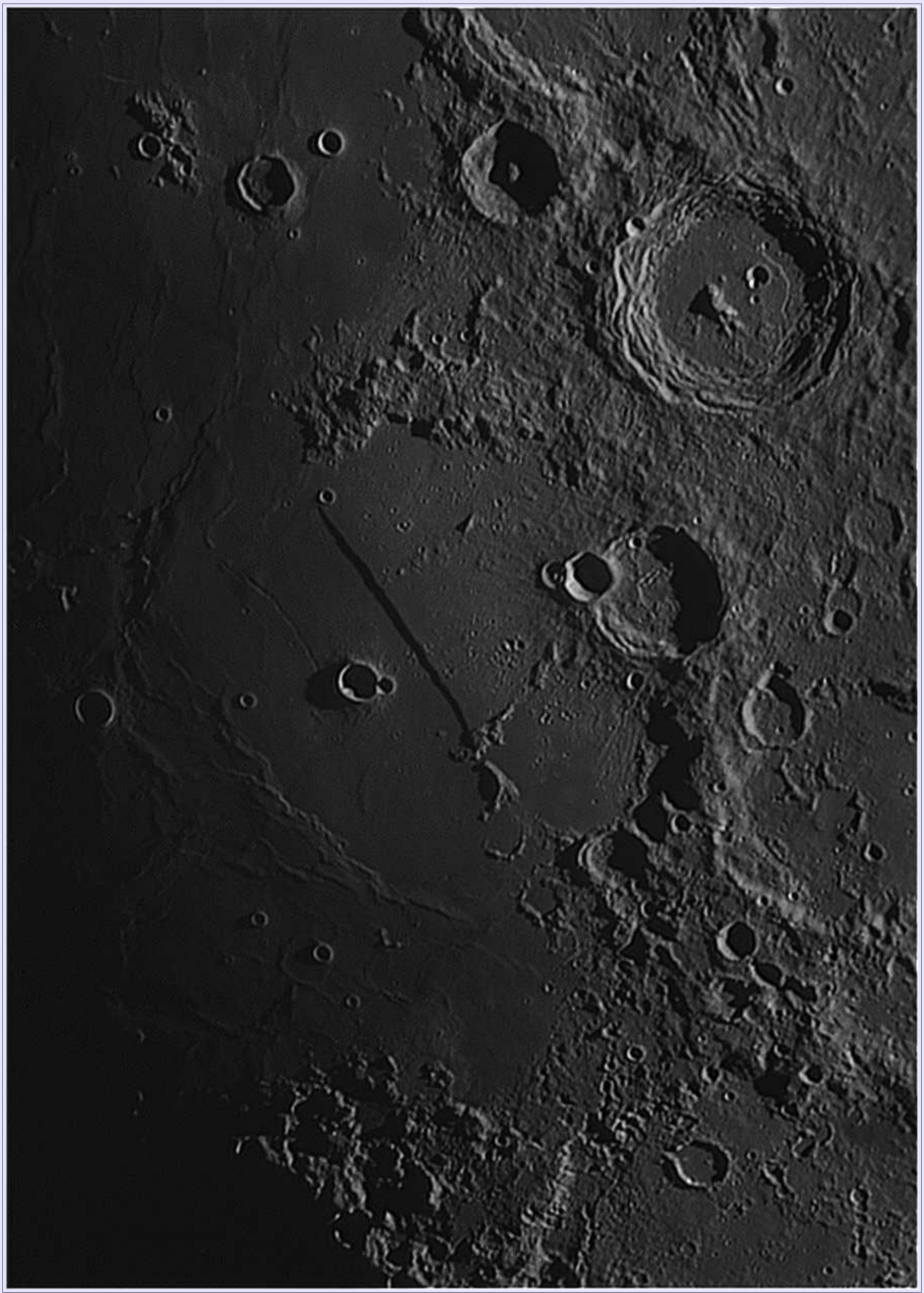
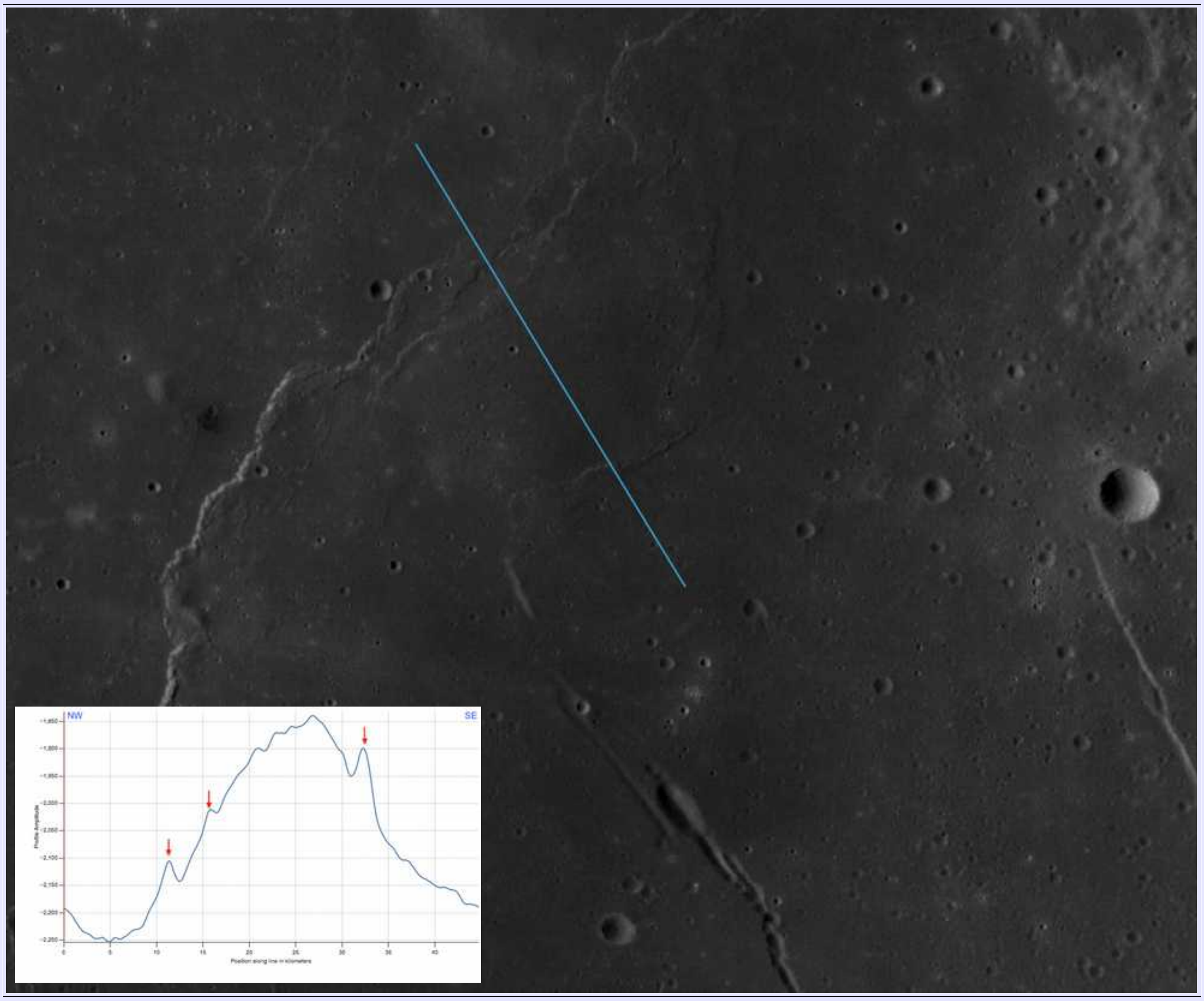


Image details: Taken on 06/04/2025 at 18:38 UT using a 25cm F6.3, ASI 174MM with 850nm filter and Televue 3 x Barlow. Processed AS3!

Ed.Comments: Bob Stuart sent in this image of Rima Birt and asked the following question:

'It looks a bit like the Rima Birt sort of connects to the wrinkle (very sinuous) ridge immediately by it (top). Is it possible this wrinkle is the top of a "tube" that has not yet fallen in?'

You can see what he means from this image, and I am moderately sure that some wrinkle ridges do transform along their length in to sinuous rille like structures – is that what is going on here?

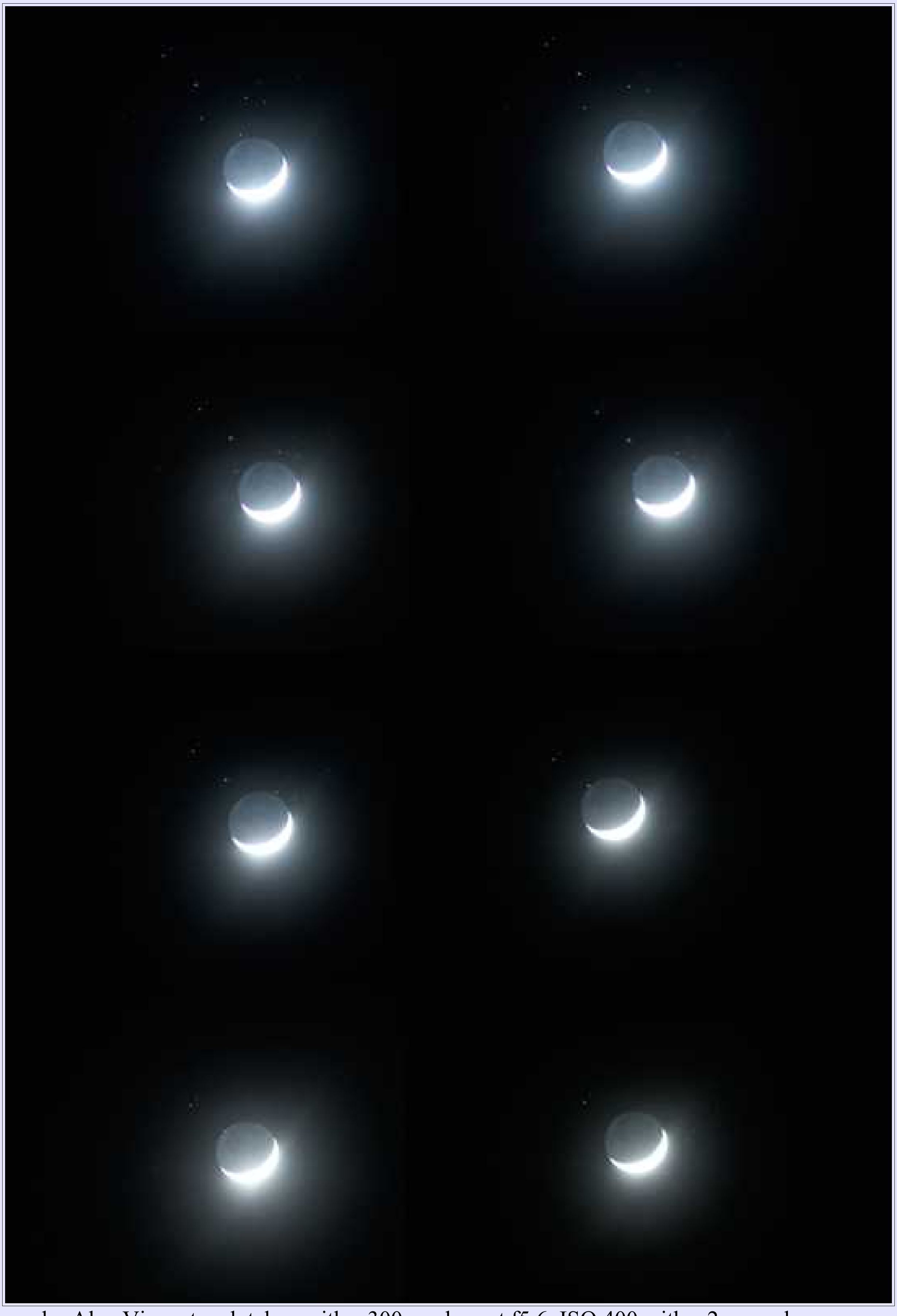


In this case I think the wrinkle ridge is a wrinkle ridge and the apparent connection between the short, offset and straight section of Rima Birt (just to the west of Birt E) is just a coincidence. Firstly, if you look at the cross section shown in the inset of the LRO picture (above) you can see that the red arrows mark the position of the ridges (the one Bob spotted is the one on the right) on the dorsa that marks the northern rim of the *Ancient Thebit,* these sharper, superimposed ridges are characteristic of the flanks of these broad swells – indicating a tectonic origin.

Secondly Rima Birt is, rather than being a lava channel or sinuous rille, a series of pits arranged along a fissure which is probably of volcanic origin, and may represent the surface manifestation of an ascending volcanic dike. Many of the pits seem to be collapse pits, where the surface regolith has drained away into subsurface voids, but the eruption of pyroclastic material has clearly taken place around Birt E, from part of the offset section just to the west of Birt E, and probably from Birt F. These have built up (apart from around Birt F) low mounds of pyroclastic deposits, and Bob's image shows these up. There are no indications of lava flows associated with any of these features, and the volcanism involved appears to be explosive ashy type eruptions only.

It is worth looking out for these situations where one feature (sinuous rille) appears to morph into another (wrinkle ridge) as I think there are examples on the Moon that show this happening, with a particularly fine example just to the east of Lamont at Lat 4.660 Long 26.212 and 125kms to the NW of Maskelyne.

Moon occulting The Pleiades on the night of April 1st 2025.



Images by Alex Vincent and taken with a 300mm lens at f5.6, ISO 400 with a 2 second exposure.

Alpine Valley.

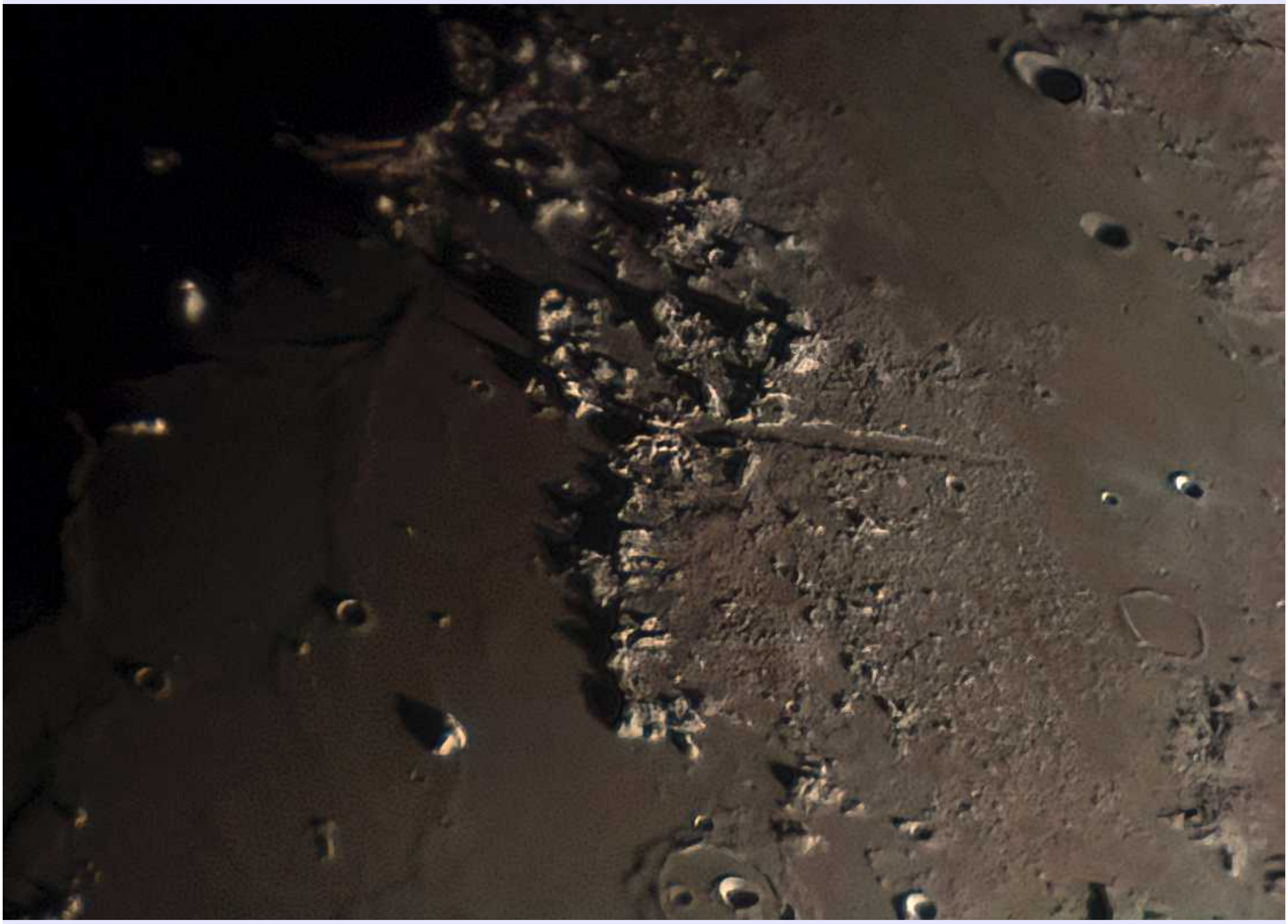


Image by Chris Longthorn and taken on 7th January 2025 using a 200mm RC Cassegrain, using a 2x Teleconverter and my ZWO ASI224MC camera.

Of course, the star of the show in this image should be the Alpine Valley or maybe Mons Piton, so you could be forgiven for overlooking the small 12km diameter crater Egede A which you can find by following the line of the Alpine Valley northwards (or in this case towards the right). As you can see from the enlargement of Chris's image (Fig.1,left), Egede A has a faint but distinct bluish halo or ray system surrounding it which shows up nicely in the LRO Colour Hapke-Norm overlay (Fig.1,right). The crater is a young crater and you would expect the ray system to be bright as it is composed of freshly exposed and unweathered rocks, but in this case the rays are conspicuous due to their composition. Fig.2 shows a Clementine UVVIS derived iron abundance (wt% FeO) image on the left and a Clementine UVVIS Colour ratio image on the right, which shows that the rays have a lower FeO content than the surroundings Mare Frigoris lavas. This is not surprising as Egede A has punched a hole 2000m deep through the Mare Frigoris basalts and has probably excavated bright rocks of a highland composition lying beneath.

The youthful age of Egede A is attested to by the extremely well preserved impact melt channels flowing outwards from the crater rim, many with prominent leveed channels as well as flows with prominent bulbous snouts. The proximal ejecta is also coated with cracked and fractured melt deposits – this can be seen as a dark ring just outside the crater rim in the LRO Colour Hapke-Norm image in Fig.1 (right). If you have a spare moment it is well worth exploring these melt deposits using the LRO Quickmap website, as there are many interesting features to be seen both outside and inside the crater, where a large impact melt pool on the floor hosts what may be a collapse pit of the type that may prove useful as shelter for future lunar explorers. The melt sheets also have numerous small craters superimposed on their otherwise smooth surfaces. Many of these are undoubtedly 'self secondaries', caused by material ejected from the crater on almost vertical trajectories which re-impacted the surface *after* the melt deposits had been emplaced. These 'self secondaries' pepper many of the melt sheets surrounding Copernican aged craters.

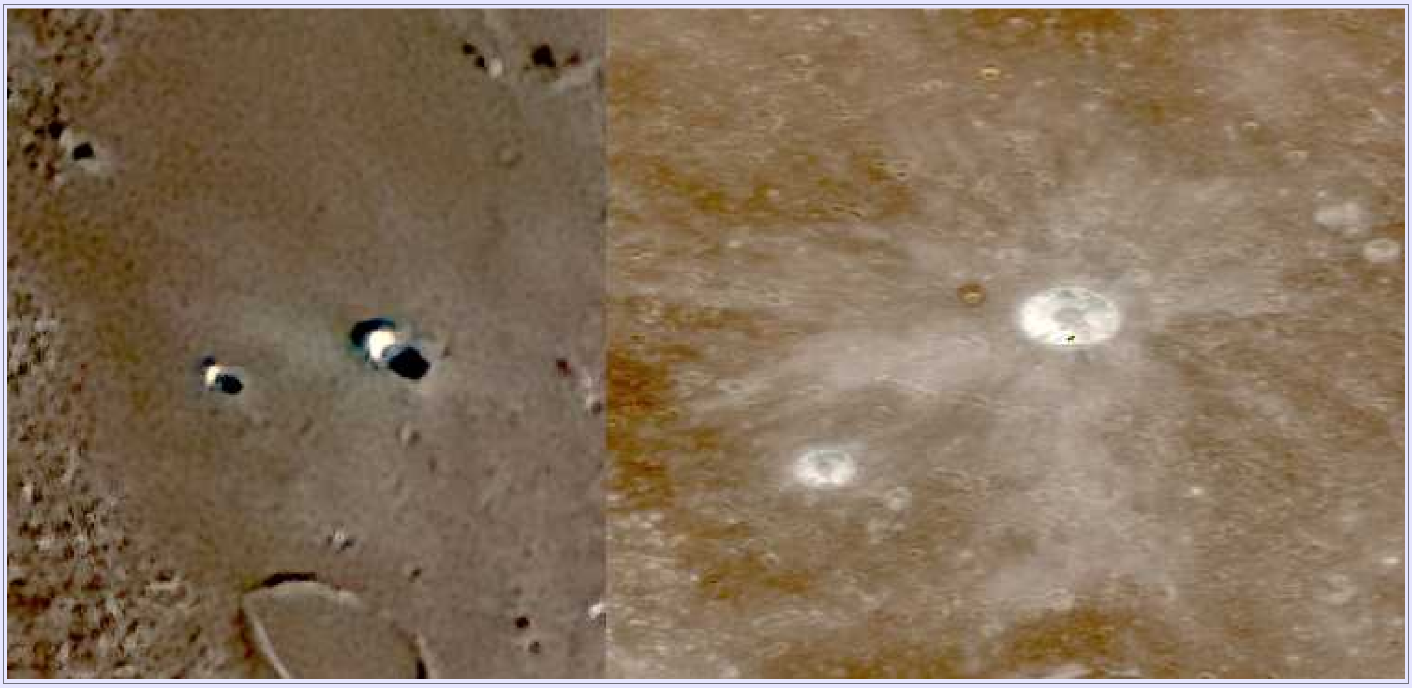


Fig.1 An enlargement of Chris's image showing Egede A with a faint but distinct bluish ray system (left) and LRO Colour Hapke-Norm overlay (right).

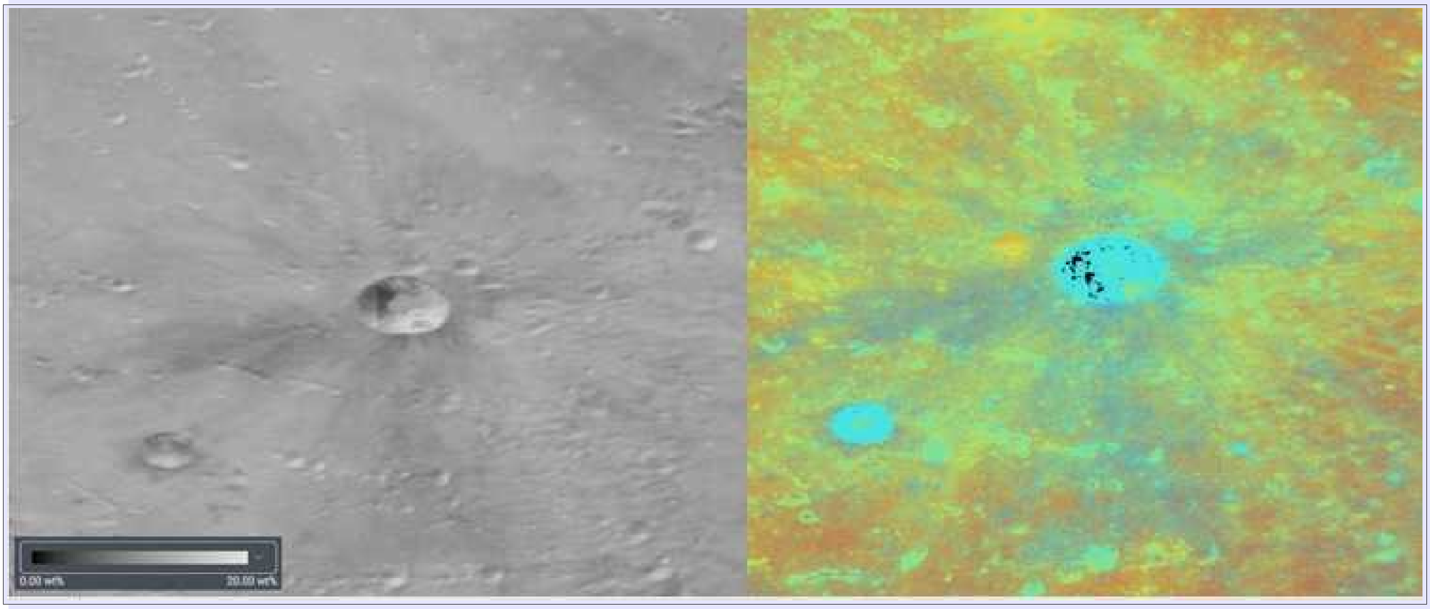


Fig.2 Clementine UVVIS derived iron abundance (wt% FeO) image (left) and a Clementine UVVIS Colour ratio image (right).

If you look at the right hand panels in Figs 2 and 3, you will probably spot the small 1.4km diameter crater just to the west of Egede A. It shows up as a dark ring in Fig.1 and an orange ring in Fig.2. This ring like halo is probably a consequence of the crater excavating down through the lighter low FeO content rays, and excavating the mare composition basalts beneath. This would suggest that this small crater is younger than Egede A and its ejecta. Fig's 3 and 4 show this small crater in a little more detail, with the LRO image in Fig.3 hinting at the dark halo surrounding it which shows up clearly in the LRO Colour Hapke-Norm overlay in Fig.4.

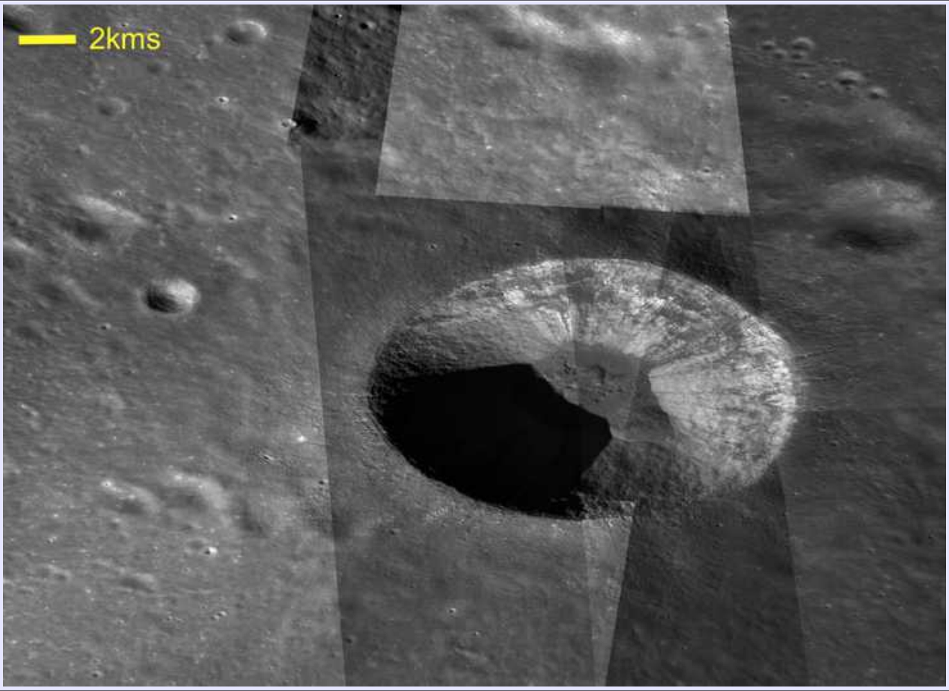


Fig.3 LRO image of Egede A showing the location of the small crater which lies some 6kms to the WNW.

Fig.4 LRO Colour Hapke-Norm overlay of Egede A showing the dark halo surrounding the crater that indicates the presence of impact melt deposits and the small crater with the orange halo to the WNE. Note the asymmetry in the shape of this halo.

Something to note is the asymmetry in the shape of this halo, with it being much wider to the NW and quite restricted on the side facing Egede A. Fig 5 shows a more detailed view of this small crater, and as you can see it is surrounded by rope like ridges and grooves that form part of Egede A's ejecta blanket and are termed *crater concentric ridges*. Clearly, these formed during the excavation of Egede A, and if they lie on top of a surface then that surface must be older than A.

If you look at our small crater it has a bouldery rim, a very rocky interior wall and even a tiddly melt pool pond on its floor, showing it is a very young crater. But curiously there is not much in the way of secondary craters or structures that belong to this crater beyond its rim – we have the coloured halo visible in Fig.4 but no pits. ridges or rays. What we do have however is one of the ridges of the Egede A ejecta blanket lying on top of the rim of the small crater as you can see in Fig.5. The ridge snakes in from the right of the frame and can be seen to cover the rim of the small crater – and significantly there are no boulders along this part of the crater wall, maybe because they have been covered up by the material in this ejecta ridge.

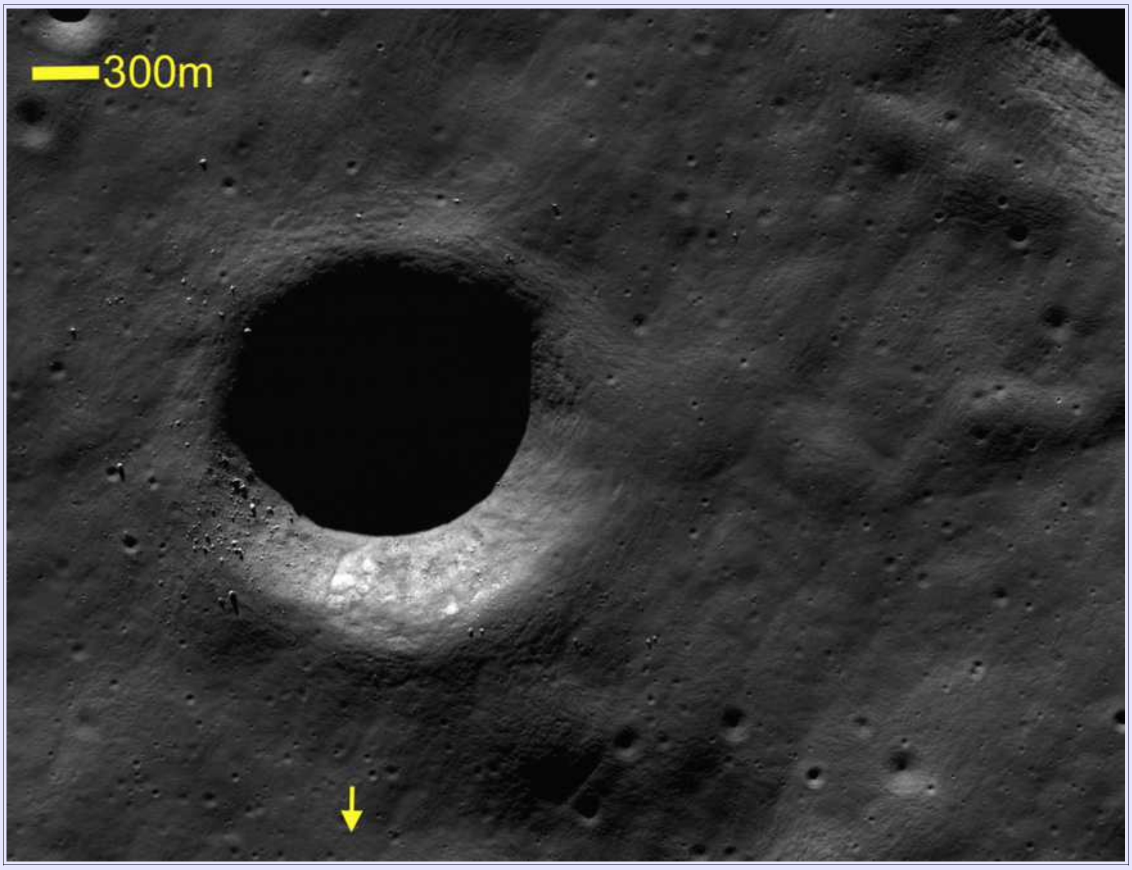


Fig.5 Low angle illumination NAC image of small crater showing bouldery rim and the sinuous ridge of ejecta from Egede A running from the right of the frame and over the crater rim obscuring any underlying boulders.

The only explanation for this that I can think of is that both Egede A and this small crater formed simultaneously as the result of the impact of a large asteroidal body that had a small moonlet in tow – as this would account for the presence of the halo around the small crater lying on top of the main ejecta blanket of Egede A *and* the presence of ejecta from the larger crater lying on top of the smaller crater. There may be other explanations but this seems the most plausible to me, especially as we now see from robotic explorers that very many asteroids are binary objects. If this is the case here, the main body was clearly much larger than its companion, and the separation sufficient for both bodies to produce a crater – a close contact binary would probably only produce a single crater, pretty well indistinguishable from that formed by a single body.

There are probably a lot more examples of binary craters out there and it would be worth bearing this in mind if you find yourself idling the odd dull afternoon away scanning the lunar surface with Quickmap. It may be of value in estimating the number of binary asteroids out there, they are probably a lot more frequent than we though.

Dubyago and environs.

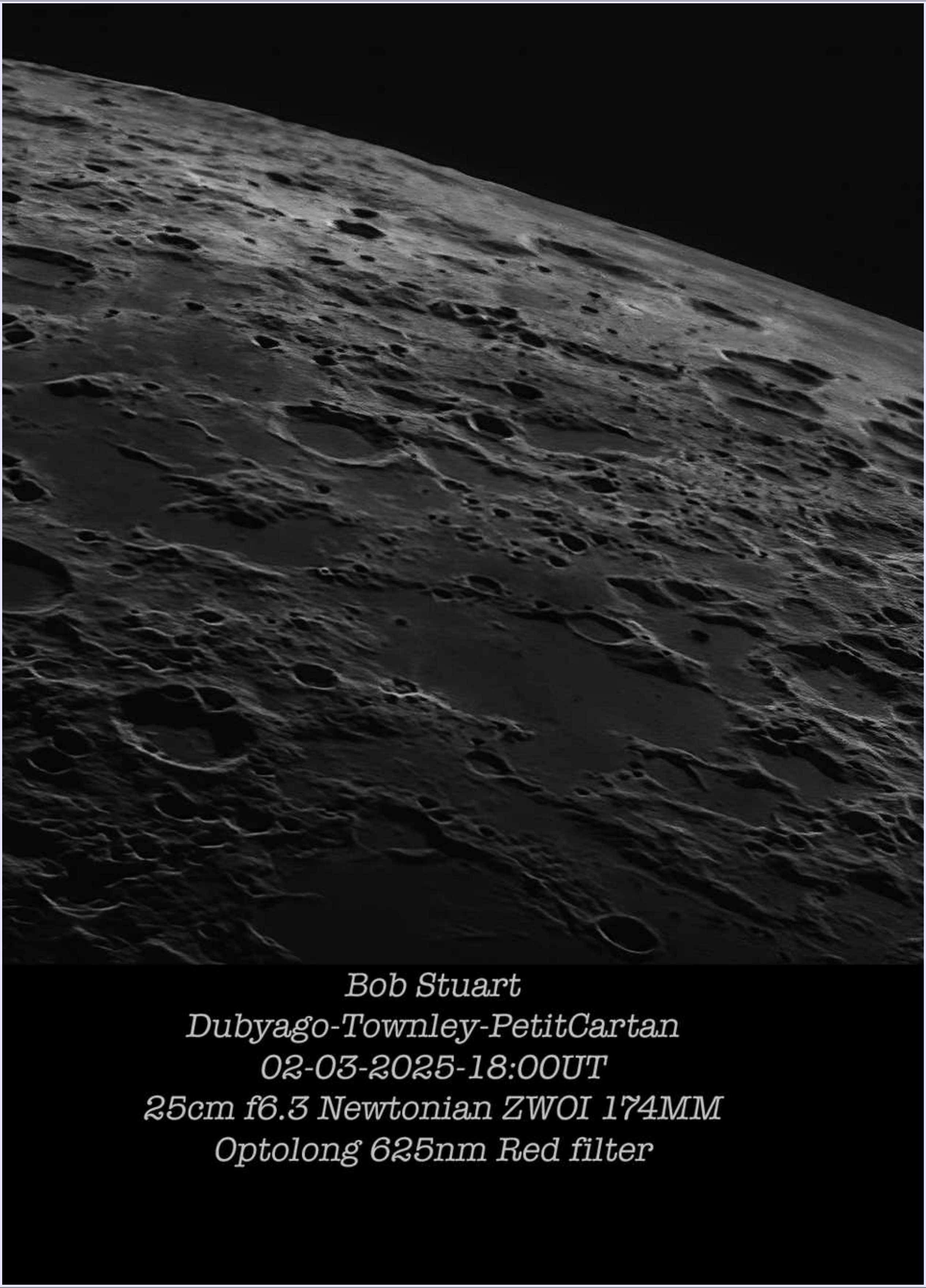


Image by Bob Stuart with details as shown.

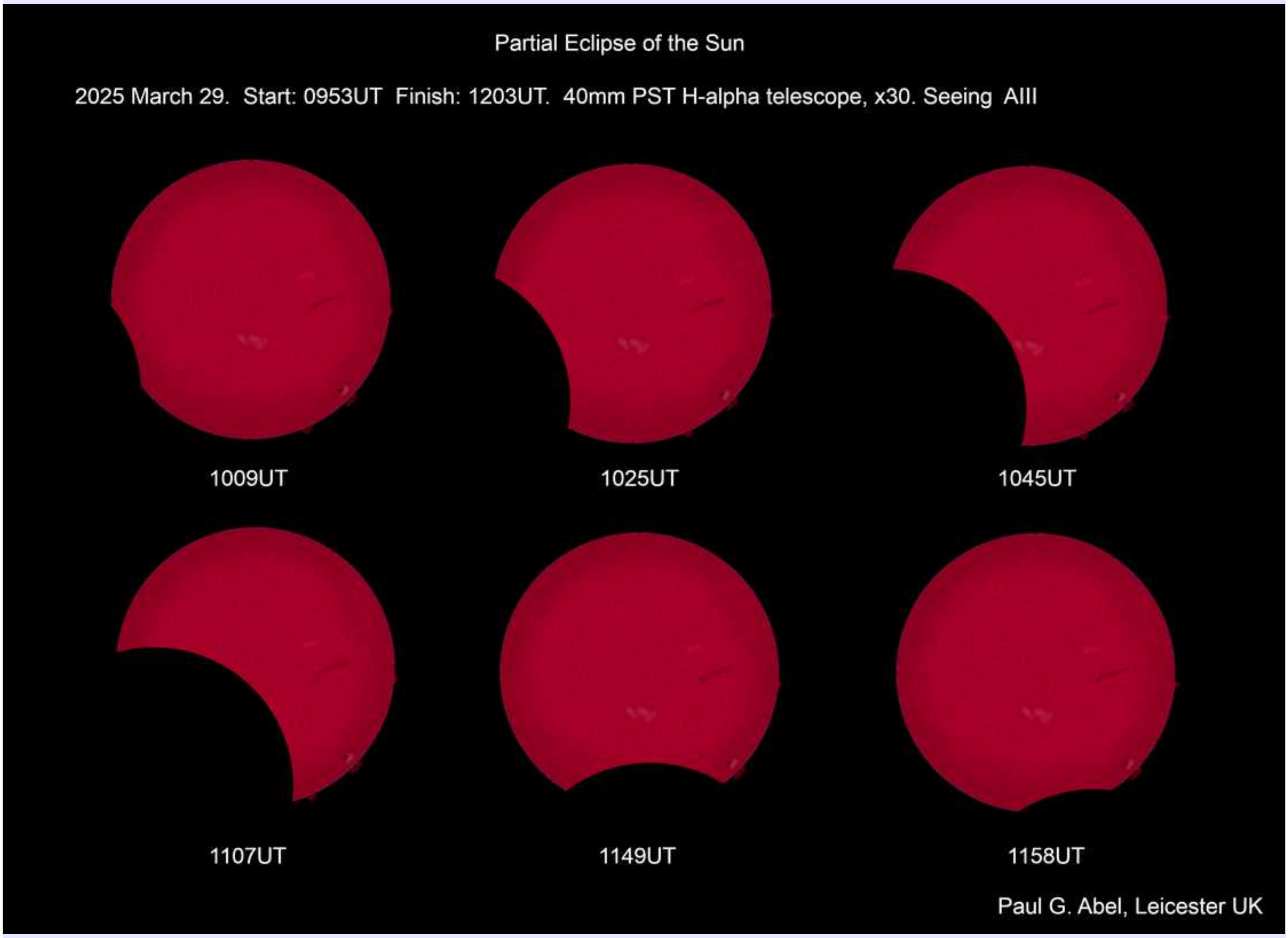
Ynyslas moon and Pleiades, 01/04/2025.

Image and notes below by Bob Bowen.

I'd already taken a shot of the moon, both on it's own and also included in the post sunset sky, when I then saw some postings of the moon in the area of the Pleiades. So I decided to have a shot at it myself. We are over at the van on the coast, so all I had was my Canon 7D Mk2 DSLR, fitted with my usual Tamron 16-300mm lens. No tripod and no shutter release cable, so simply hand-held, leaning against the van's decking.The resulting photo was a shot of the moon placed right in the middles of the Pleiades - more by luck than judgement, as I could not see it with my naked eye.

ISO 10,000, 1/5 sec, f6.3, 300mm.
Cropped & sharpened on MacBook Pro's Preview program.
Photo logged at 22:54hrs BST, 01/04/2025.

Partial Eclipse in Hα.



Images and notes below sent in by Paul Abel.

We had fair conditions today for the partial eclipse. I made a time series showing the progress of the eclipse which I observed with a 40mm PST H-alpha telescope. There was some high cloud present at times.

Southern Highlands and Waxing Gibbous Moon.

Image taken from the BAA Gallery and taken by Neil Webster on 11th April 2025 at 22:12 using an AA115mm APO, EQ6 R mount, ZWO ASI290MM and Astronomik Filter (642 - 840nm)

Lunar Occultation of Alcyone.

Image by Alan Tough and taken from the BAA Gallery. Details as shown.

Burg.

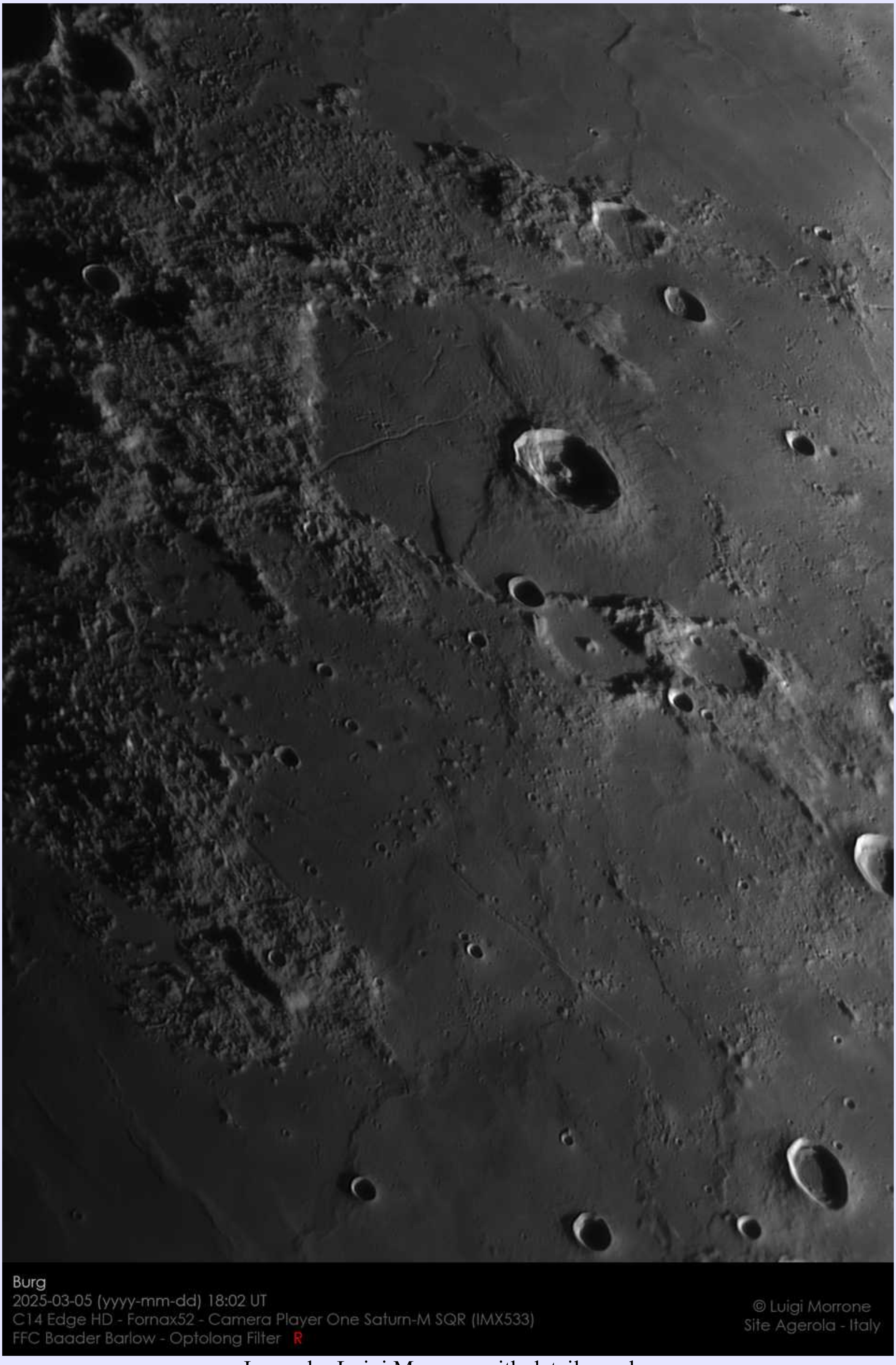


Image by Luigi Morrone with details as shown.

6.8 Day old Moon from New Zealand.

Image by Maurice Collins with details as shown.

Atlas & Hercules.

Image and text below by Rik Hill.

Only 5 days after new moon eager lunar observers will be drawn to two craters that are on the northern terminator. The larger one is Atlas (88km dia.) and the one right next to it to the west (left here) is Hercules (70km) with crisp terraced interior walls, the large Hercules G (14km) on its floor and slightly smaller Hercules E (10km) on its southern wall. Of the two, Hercules is the younger of Eratosthenian Age (formed some -3.2 billion to -1.1 billion years ago) versus Imbrian (formed between -3.8 billion to -3.2 billion years ago) for Atlas. The relative youth of Hercules is demonstrated in the radial splash pattern that extends over a crater diameter forming the large ejecta blanket. Atlas, with a tighter ejecta blanket, is called a fractured floor crater riddled with thin rimae some of which can be seen in this image and much better seen in the LROC QuickMap.

To the left of these craters are two more side by side craters near the terminator with long dramatic shadows on their floors. The crater on the right is Mason (33km) with the very polygonal remnants of its original crater walls. The crater on the left with the central peak is Plana (42km). Note the crater on the south side of the central peak. Undoubtedly in the pre-Apollo days this would have been considered evidence of volcanism. Both craters are south of the shadow filled Burg (41km), the central crater of Lacus Mortus.

Between and south of Mason and Plana is a smaller and obviously younger sharp rimmed crater Mason B (10km). Then, just a little further south is the Dome Mason, just above the marker. As with most domes and other low relief features, you have to catch it at the right sun angle. This is the best image I have ever gotten of this dome. It's actually a double dome with a smaller one (or portion) to the north again seen in LROC.

Moretus (with comments by Barry Fitz-Gerald)

Bill Leatherbarrow sent in the image of Moretus shown in Fig.1 and said "*I am puzzled by what appears to be a long linear feature passing right across the frame and close to the southern rim of Moretus itself. I have seen this on other images and it is not a processing artefact. A quick look at QuickMap shows nothing corresponding, and I am tempted to conclude that it might be an illusion created by chance alignments and the extreme foreshortening at these latitudes*".

The linear feature Bill mentions is clear in Fig.1, and the same linear feature can be seen in Fig.2 which is another Moretus image this time by Mike Greenhill-Hooper – in this case emerging from the bottom right corner and extending across the southern rim of Moretus. This effect is enhanced by the slab like southern inner wall facing the observer which is a whacking 3000m high and which seems to line up with the linear feature entering the frame from the right.

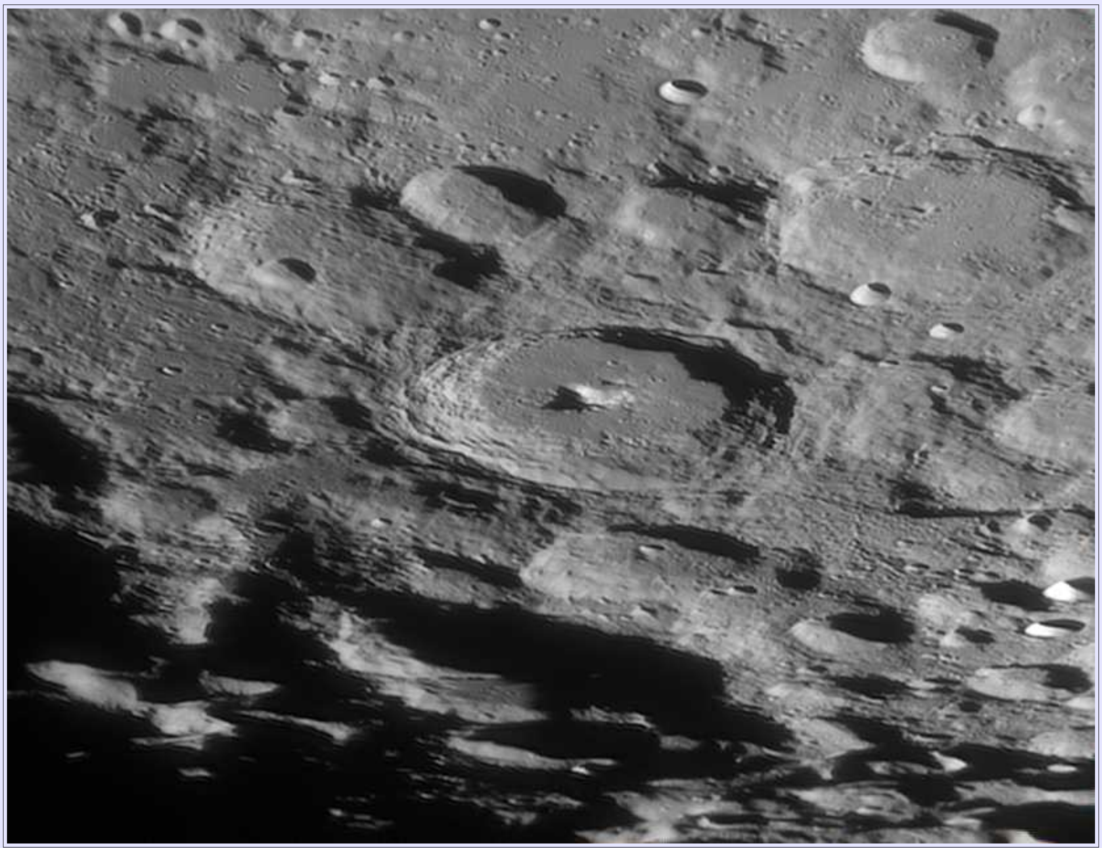


Fig.1 Image by Bill Leatherbarrow taken on the evening of 9 March 2025.

So is there a geological or topographic feature that can explain this apparent impression, or is Bill correct in that it is just an illusion. This question reminds me of the Lunar grid hypothesis which was popular some years ago which proposes a global system of roughly orthogonal fractures, crater chains and ridges that has a strong influence on lunar topography, imparting something of a 'grain' to the surface when viewed telescopically. This hypothesis seems to have a marginal significance in present academic lunar studies, and is rarely if at all mentioned, but I am sure that many visual observers have come away with the strong impression that some form of 'grain' is evident to the lunar surface, especially under grazing illumination. The high resolution spacecraft imagery now available rarely reveals anything that could be related, but of course these are taken under limited illumination angles and subtle landforms are practically invisible - unless you already know they are there on the basis of telescopic observations.

In the case of Moretus, I would agree with bill, the LRO imagery (Fig.3) shows nothing that immediately screams fault of fracture – as mentioned there is a rough alignment between what appears to be the southern edge of a mountain massif to the east of the crater and the slab like face on Moretus's inner wall, but not much else.

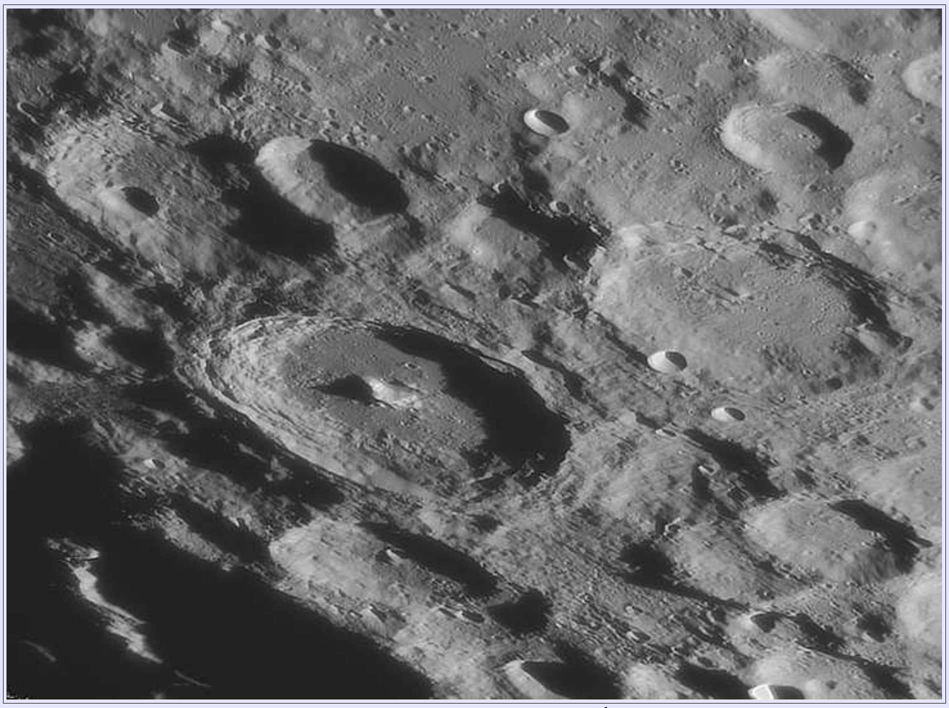


Fig.2 Image by Mike Greenhill-Hooper 19th March 2024 at 20:15.

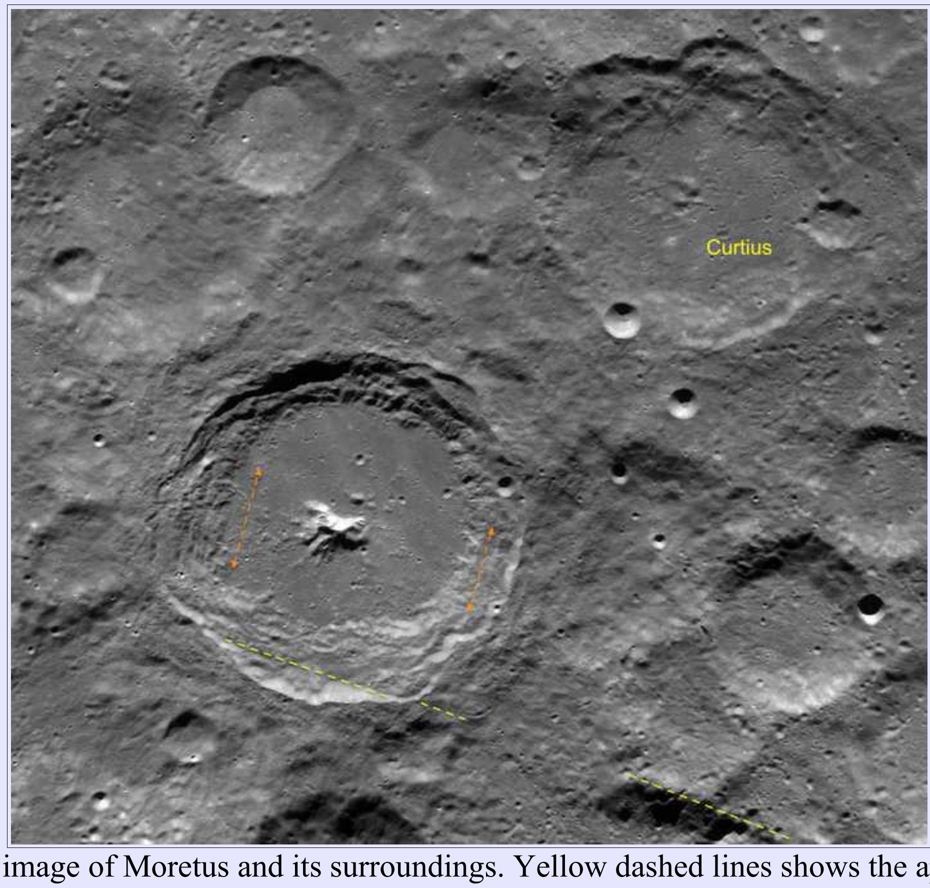


Fig.3 LRO WAC image of Moretus and its surroundings. Yellow dashed lines shows the approximate line of Bill's linear feature, and orange lines show the orientation of the E and W terraces of the crater.

But maybe the clue lies in the slab like face – why do we see this spectacular cliff and not the usual stepped terraces such as we see in the likes of Tycho and Copernicus? Well, maybe what we are seeing here is in fact a fault – present in the pre-Moretus surface – that has been exposed by the impact and has produces a line of weakness along which the inner crater rim has collapsed. In fact this image also shows that the inner walls to the east and west also have a striking linear configuration, not the curved scallops seen elsewhere, something that may also be related to collapse along pre-existing faults. Lineations are visible on the adjacent surfaces, such as outside the eastern rim of Moretus, but there is a real danger of joining up unrelated dots here – particularly within the crater ejecta - to create lineations where none in fact exist. But, to return to Bill's original question, even though there is no *obvious* feature that could explain his observation, there is plenty to suggest that the crust around Moretus is heavily fractured with many of them oriented orthogonally, that is at 90° to each other, that could well have an influence on topography, but one that is subtle and requiring precise illumination and viewing angle to become visible.

I have had a brief search through the BAA Gallery to try and find a telescopic view that reflects this possibility, but the best I have found is a rather striking mage by Wes Higgins and that featured in the 'Astronomy Picture of the Day' website from 2007 which can be viewed at:

http://www.star.ucl.ac.uk/~apod/apod/image/0708/MoretusCurtius_higgins.jpg

…...............the apparent groves and lineations appear to stand out in this image giving the surface a very 'boxy' appearance. If you have any images that show this type of appearance please send them in and we can include them in a later LSC. From this you can see quite clearly where the grid hypothesis came from, and if you want to delve deeper into the subject you could refer to Gilbert Fielder's book *'Secrets of the Moon: Understanding and Analysing the Lunar Surface'* (CRC Press; 1st edition 7 Jan. 2022) but you might have to raid the piggy-bank to get a hard copy version.

It is tempting to suggest that the proximity of this region to the South Pole-Aitken Basin has something to do with these lineations, if that is they are real and not illusory.

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Vallis Rheita.

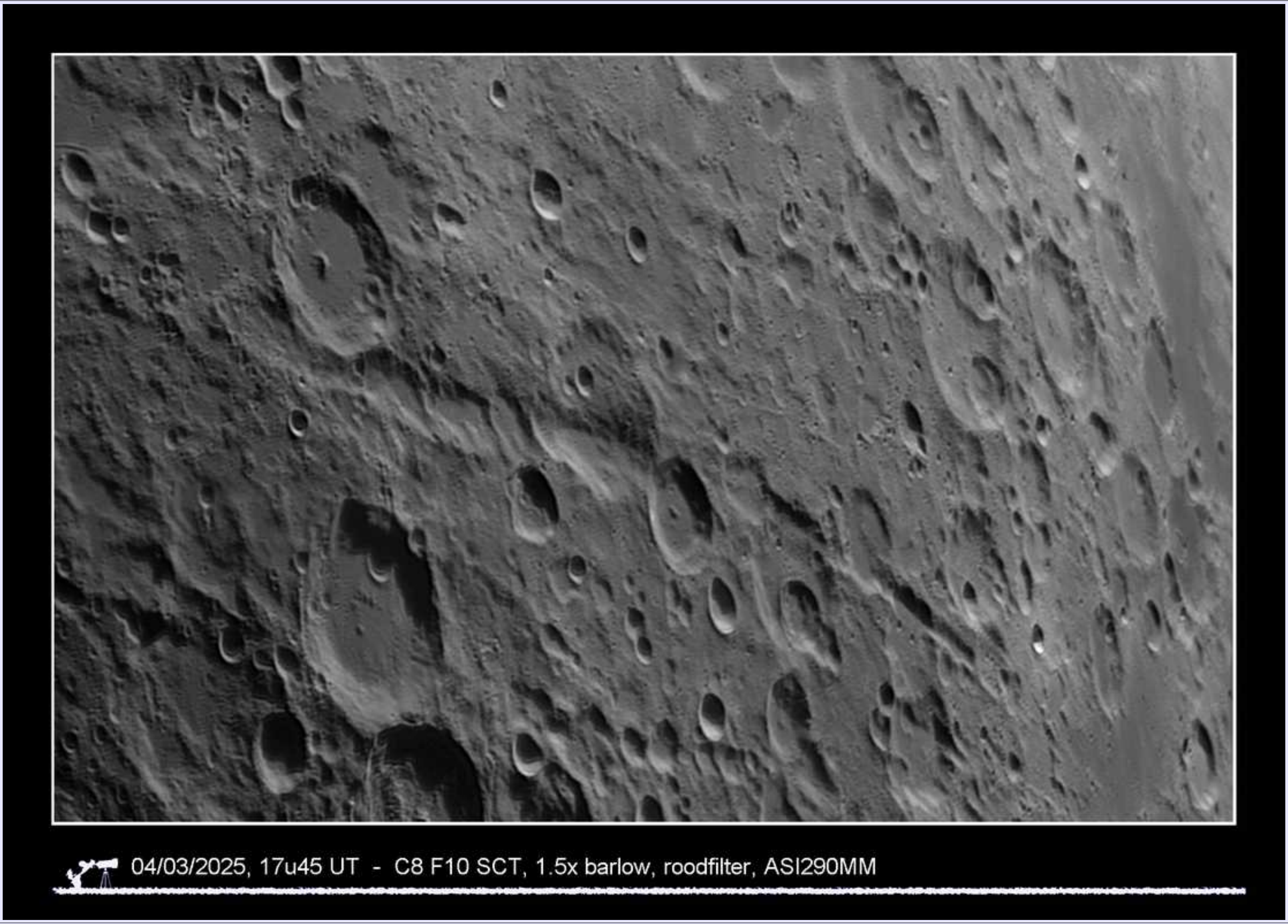

Image by Alexander Vandenbohede with details as shown.

This image really captures the rather peculiar nature of Vallis Rhieta, which is widely thought to be a secondary crater chain formed during the formation of Mare Nectaris. As you can see the northernmost stretch of the vallis (~240kms) from just north (left of frame) of Rheita to Young D is orientated approximately NW-SE whilst the section to the south of Young D (~230kms) deviates distinctly to the west, giving the vallis a bit of a dog-leg appearance. Secondary crater chains do not have to conform to the radial straight line configuration that might be expected from debris ejected from a crater or basin – you only have to look at Rima Stadius to see that, but there seems to be something else going on here, and the two sections of Vallis Rhieta almost look as if they are separate and unrelated. I do recall reading somewhere that one possibility for this kink is that whilst one part of the chain is related to Nectaris, the other is in fact related to the Imbrium Basin – but this might be too much of a coincidence.

Fig.1 is from the USGS Geological Map of The Rhieta Quadrangle of the Moon*and the muddy brown represents Janssen Formation which is interpreted as ejecta from Nectaris, and Vallis Rhieta is located within this terrain – note that these deposits partially overlap the northern part of the crater Janssen (hence the name) whilst the younger gaudily coloured Fabricius is superimposed on these deposits. Vallis Rhieta is not alone here however, you can get a hint of striations in the lunar surface parallel to the vallis in Alexander's image, and a peek at the LRO Quickmap coverage will show that the Janssen formation hereabouts is sculpted by many subdued crater chains that respect this alignment and are therefore more than likely to be Nectaris secondaries as well. Of course there is also the slightly less spectacular 640km long Vallis Snellius which runs south of Petavius and which is more than likely related to Nectaris as well.

Fig.1 Geological Map of the Vallis Rhieta area showing the extent of the Janssen Formation which is believed to be Nectaris ejecta.

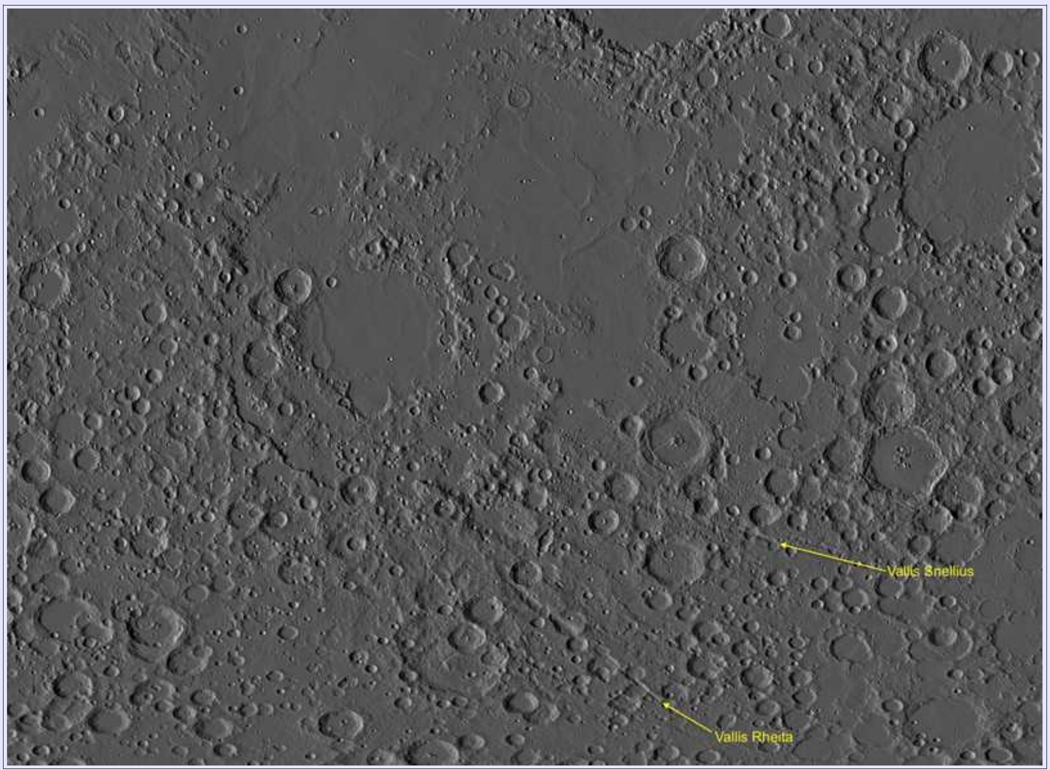

Fig.2 LRO TerrainHillshade view of Nectaris showing the positions of Vallis Rhieta and Vallis Snellius.

Now, having said that secondary crater chains do not necessarily have to be radial to their parent crater of basin, the orientation of these chains around Nectaris has always seemed a bit peculiar to me, and this got me wondering about the nature of the Nectaris Basin itself. One possible explanation could be that Nectaris formed as a result of a low angle impact, and a consequence of this could be an asymmetric fan like distribution of ejecta and crater chains as opposed to a more symmetrical one.

A good example of a low angle basin is Mare Crisium, which is elongate W-E as a result of a low angle impact from the W. It has a number of features that are a consequence of this, but one of the salient ones here is the apparently fan shaped swarm of gravity anomalies extending away to the east from its eastern margin, and in the downrange direction. These show up in the GRAIL Bouguer gravity gradient Overlays in Quickmap (Fig.3) and may represent crustal fractures originating during the basin forming event and which were subsequently filled with dense lavas. However similar but *radial* gravity anomalies around the Orientale Basin have been associated with secondary crater chains and radial ejecta, and are therefore surface anomalies rather than deep seated tectonic ones – so the interpretation is open to debate**. Whatever their exact nature, the point is that in the case of Crisium at least they appear concentrated on the downrange side of the basin.

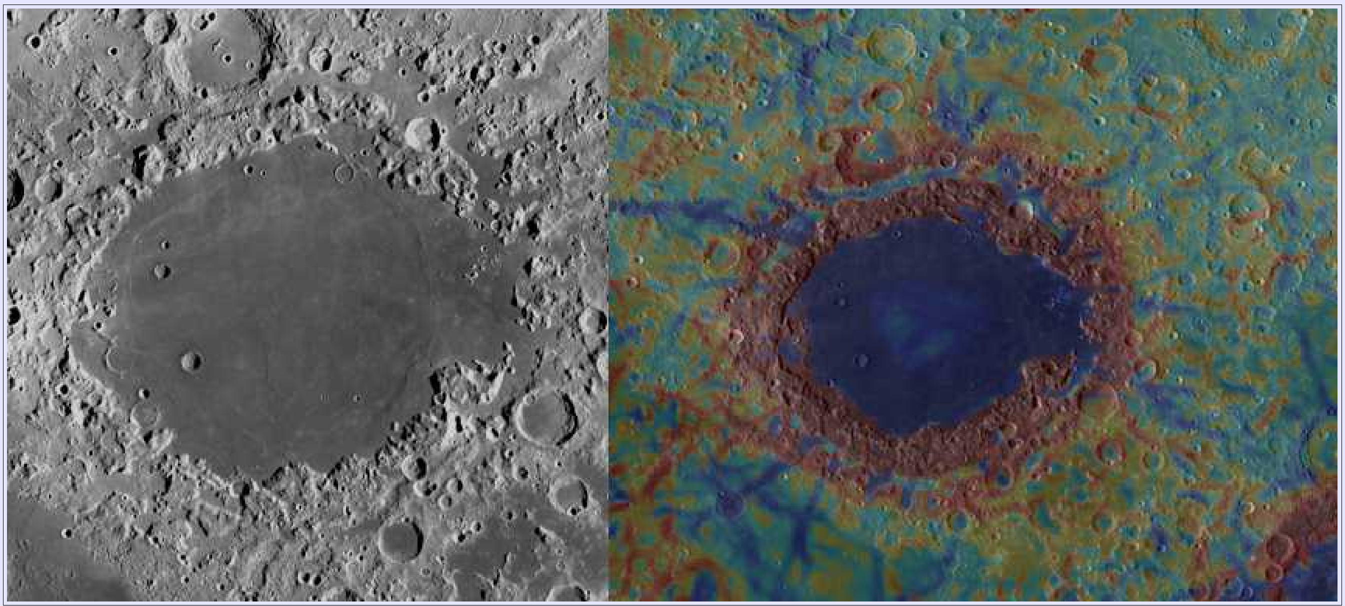

Fig.3 WAC image of Mare Crisium (left) and a Bouguer gravity gradients derived from GRAIL overlay (right) showing a fan like arrangement of anomalies extending away from the eastern rim in the downrange direction of this low angle impact basin.

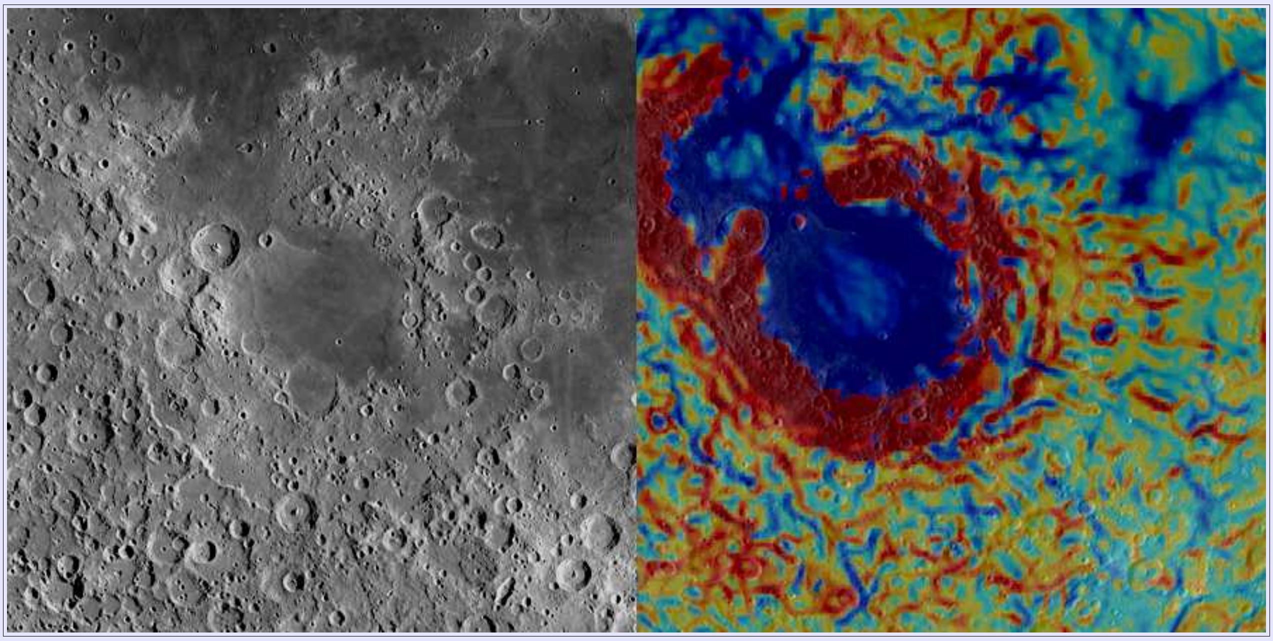

Fig.4 A similar view as seen in Fig.3 but of Nectaris, showing a similar fan like arrangement of gravity anomalies to the east of the basin – evidence of a low angle impact from the west?

If we compare what we see in Crisium with Nectaris (Fig.4) we can see something similar with a fan like suite of gravity anomalies to the east of the basin – so could this also suggest that this basin was also formed by a low angle impact from the west (or WNW)?

This is where we come back to the odd orientation of Vallis Rhieta, as during low angle impacts ejecta is concentrated in the downrange direction and in a fan like pattern – just think of the case of Messier A's comet tail rays and you will get the picture. If this is the case the ejecta fan from Nectaris would be orientated towards the east, and what we see with Vallis Rhieta, Vallis Snellius, and the other crater chains is the southern part of the fan, with the northern part being less conspicuous, possibly smothered by the lavas of southern Mare Fecunditatis or the ejecta of Petavius and Langrenus. But why the offset in Vallis Rhieta, I hear you say – well, in low angle impacts the initial ejecta spray is focused strongly along the impactor trajectory whilst later ejecta fans out more. So crater chains formed at different times may not share the same orientation, with earlier formed ones lined up with the impactor trajectory and later ones angled more widely – could this explain the dog-leg?

I am not prepared to fight to the death over this scenario – and am open to any ideas you might have or have read about regarding this peculiar crater chain.

* https://pubs.usgs.gov/imap/0694/plate-1.pdf

** Jansen, J. & Andrews-Hanna, J. & Milbury, Colleen & Li, Y. & Melosh, Jay & III, J. & Sooderblom, J. & Zuber, M.. (2016). Radial Gravity Anomalies Associated with Secondary Crater Chains Surrounding the Orientale Basin Found in GRAIL Data.

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Lunar domes (part XC): Aligned cones near the crater Mösting
By Raffaello Lena.

In a previous work published in this LS circular "Lunar domes (part LXXXIV): cones on the Moon and on the Earth" I examined volcanic cones, produced by explosive activities, and which can be either isolated or even aligned with each other.

Cones and domes may form differently on the Earth and Moon. On the Earth, cinder cones form when small explosive eruptions pile up pieces of lava around a central vent. On the Moon, however, such eruptions will throw things much further, leaving little to pile up near the vent (Mcnair, 2023; Hategekimana et al., 2024). In this note I describe 5 identified lunar cones near the crater Mösting and recently described also in an article I published in JALPO.

The features reported by Coute (personal communication, 2024) have been identified in our archives, which include hires telescopic images. Christian Viladrich has imaged the examined region on October 28, 2021 at 5:19 UT (Fig. 1), using a 500 mm Ritchey-Chrétien telescope.

On the same night, but at 4:09 UT, Teodorescu has imaged the same region using a 355 mm Newtonian telescope (Fig. 2).

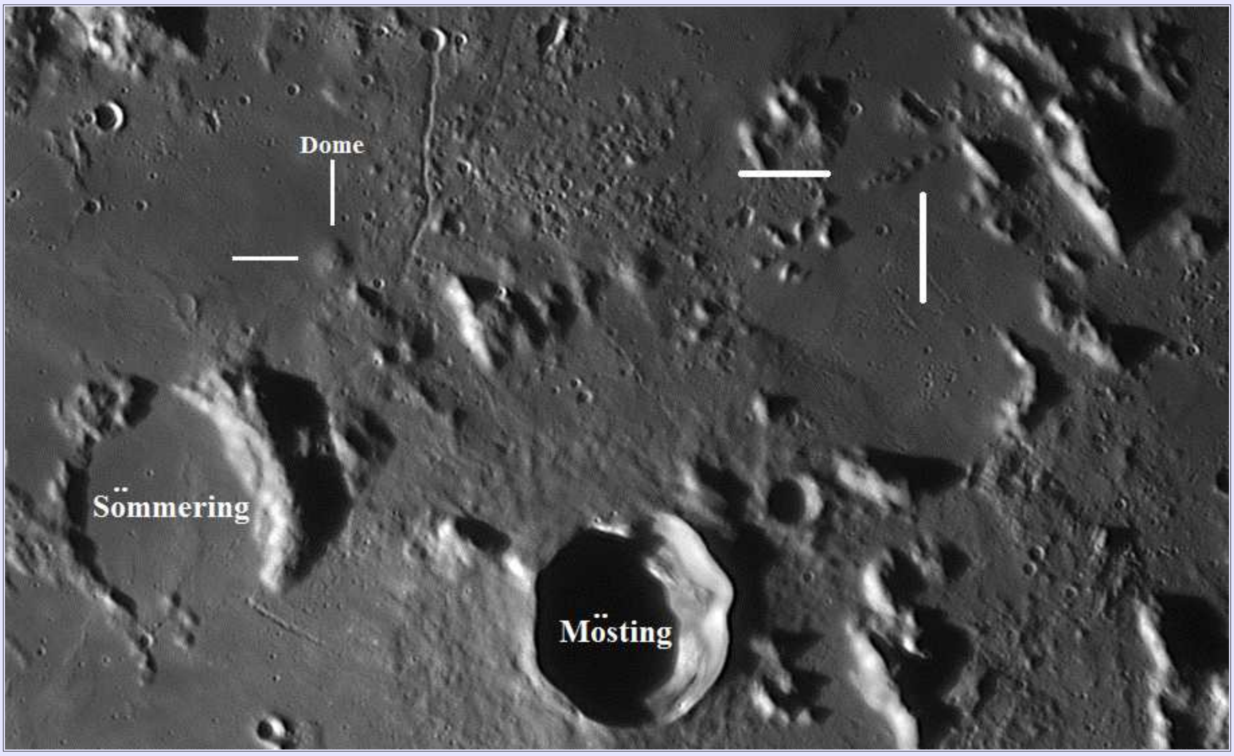

Figure 1: Lunar region imaged by Viladrich on October 28, 2021 at 5:19 UT. The aligned features named as Mösting 1-5 are marked with white lines. A dome is located to the NE of Sömmering, which we named Sömmering 1 (Lena & Fitz-Gerald, 2024).

Figure 3 displays the WAC imagery for comparison with the telescopic terrestrial images.

Morphometric data have been obtained from the LRO LOLA instrument with a grid size of 1/1024 degrees. Figure 4A displays the elevation of the examined small cones on the digital terrain model (DTM). Figure 4B displays the aligned volcanic cones based on Terrain hill shade derived using ACT react quick map.

The 3D reconstructions of these features are shown in Figures 4C and D. These 3D maps show five small features which have a conical shape.

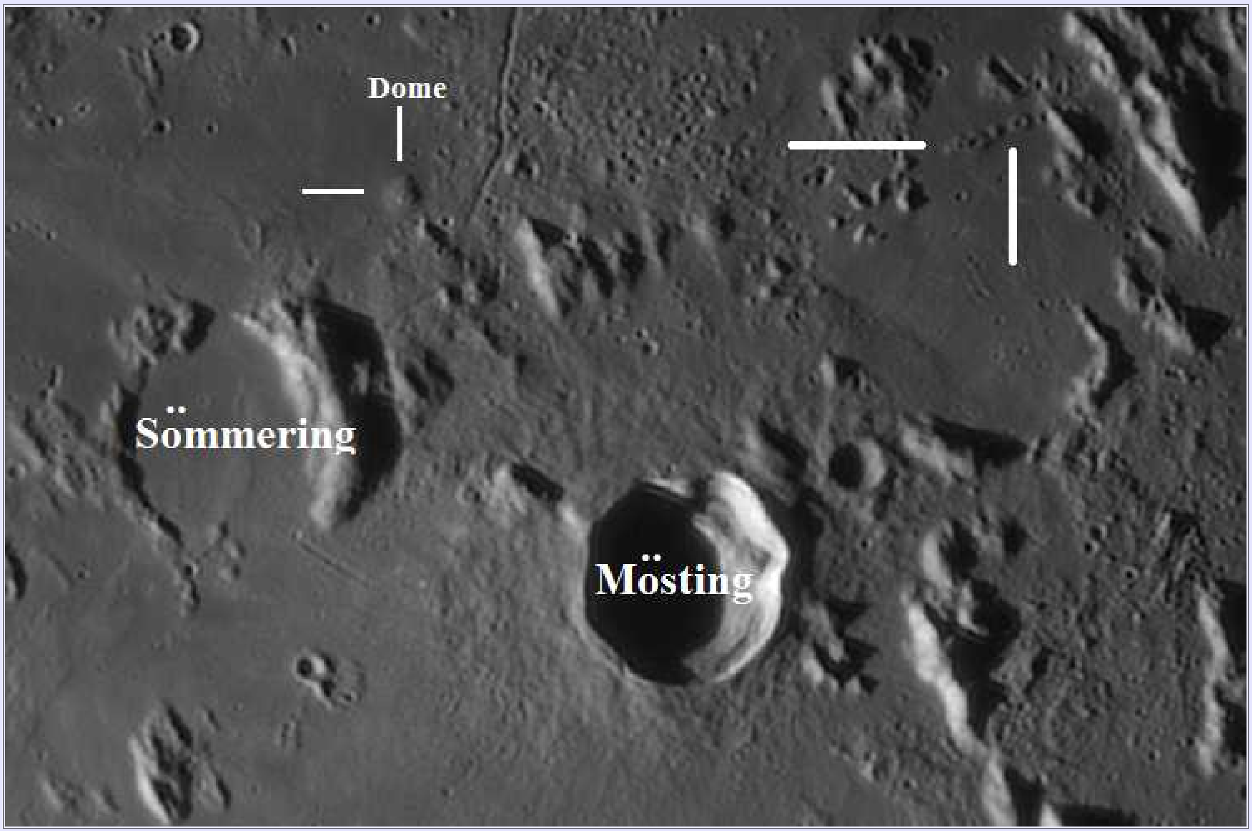

Figure 2: Lunar region under study imaged by Teodorescu on October 28, 2021 at 4:09 UT. The aligned features named as Mösting 1-5 are marked with white lines. A dome is located to the NE of Sömmering, which we named Sömmering 1 (Lena & Fitz-Gerald, 2024).

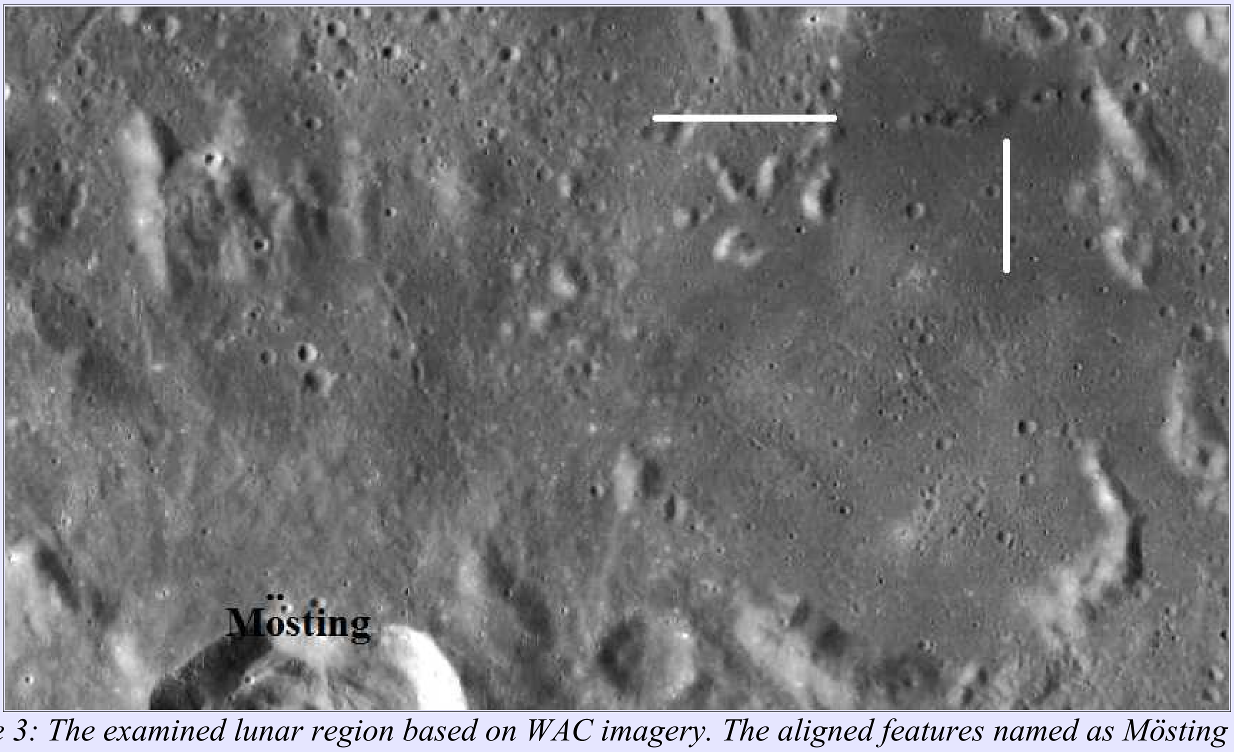

Figure 3: The examined lunar region based on WAC imagery. The aligned features named as Mösting 1-5 are marked with white lines and identified to be lunar cones.

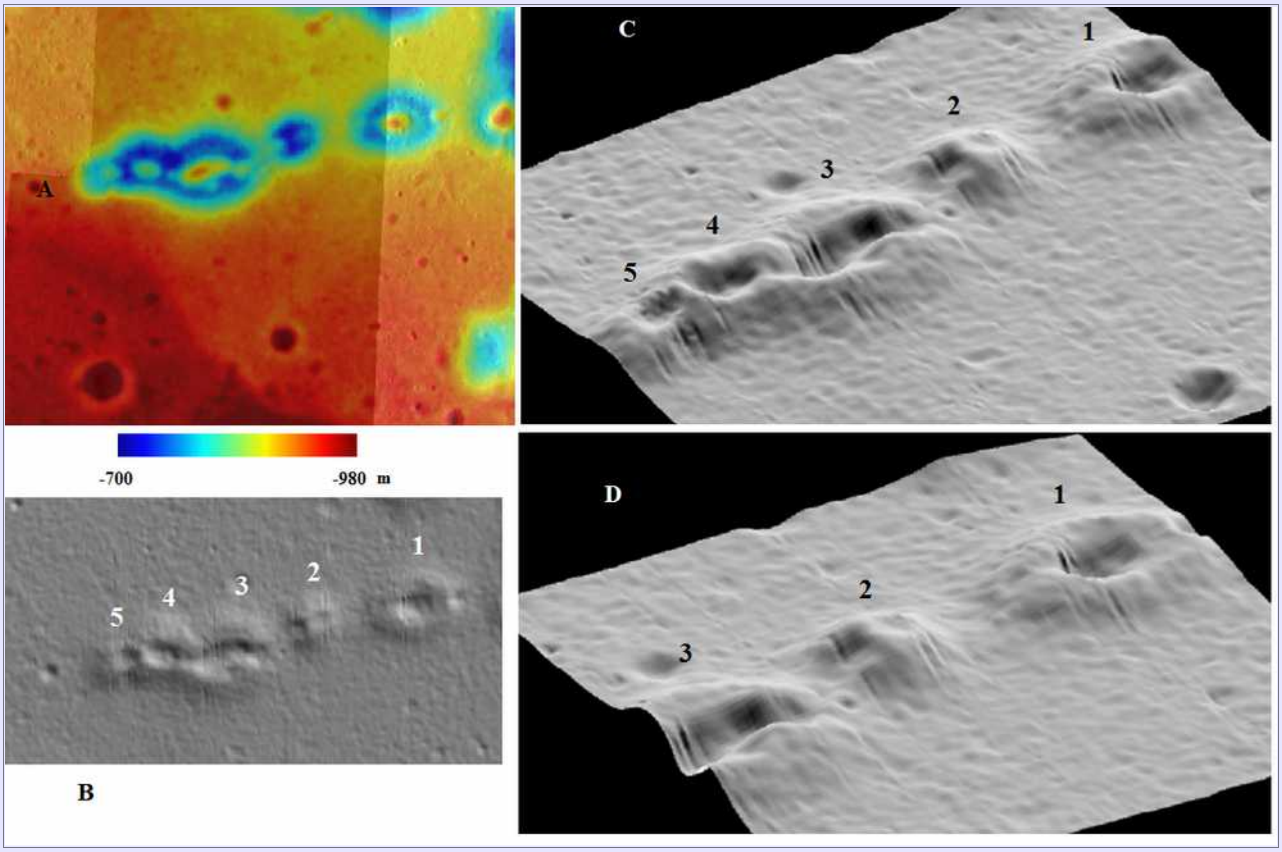

Figure 4: (A) digital terrain model (DTM). (B) The aligned constructs based on Terrain hill shade. (C and D) 3D reconstructions of these five small features which have a conical shape.

The examined cones are reported in Table 1. Note that the flank slope and the diameter derived for these cones is an average value since the profile of most these constructs is somewhat asymmetric.

Features	Long [°]	Lat [°]	D [Km]	h [m]	Slope [°]
Mösting 1	0.84	-4.22	2.9 ± 0.1	100 ± 10	4.0 ± 0.1
Mösting 2	0.83	-4.35	2.0 ± 0.1	110 ± 10	6.2 ± 0.1
Mösting 3	0.81	-4.44	3.0 ± 0.1	125 ± 10	4.7 ± 0.1
Mösting 4	0.80	-4.50	2.6 ± 0.1	120 ± 10	5.3 ± 0.1
Mösting 5	0.79	-4.54	2.1 ± 0.1	115 ± 10	6.1 ± 0.1

Table 1: Morphometric properties and coordinates of Mösting 1-5. Data derived by Quickmap LRO global basemap.

A realistic view based on NAC digital elevation-QuickMap Terrain Shadows- displays the shape of the examined lunar cones. The corresponding 3D reconstructions based on NAC imagery are shown in Figs. 5-7.

Crater elongation is normally parallel to the underlying magma-feeding fracture (Hategekimana et al., 2024). Feeder dikes indicate the regional tectonic stress orientation at the time of the dike intrusion and the stress orientation during the formation of a pre-existing fault (SW-NE direction). A morphology analysis provides valuable insights into the subsurface magma-feeding fractures and stress in the substrate, both of which are primary factors controlling the morphology of volcanic cones, which are identified near the crater Mösting. Magma-feeding fracture of the examined Mösting 1-5 volcanic cones was consistently oriented to SW-NE direction as evidenced by the cone alignments.

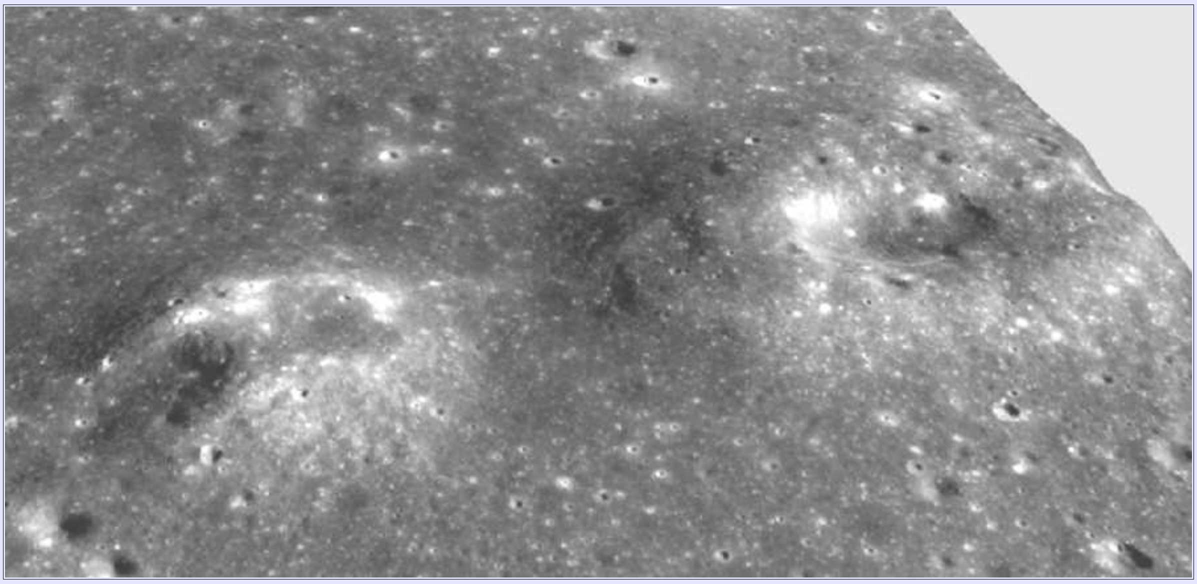

Figure 5: Mösting 1 (to the east) and Mösting 2 (to the west). ACT REACT Quick Map tool-3D reconstruction using NAC imagery and the tool QuickMap Terrain Shadows. The cones are very apparent in this NAC 3D reconstruction.

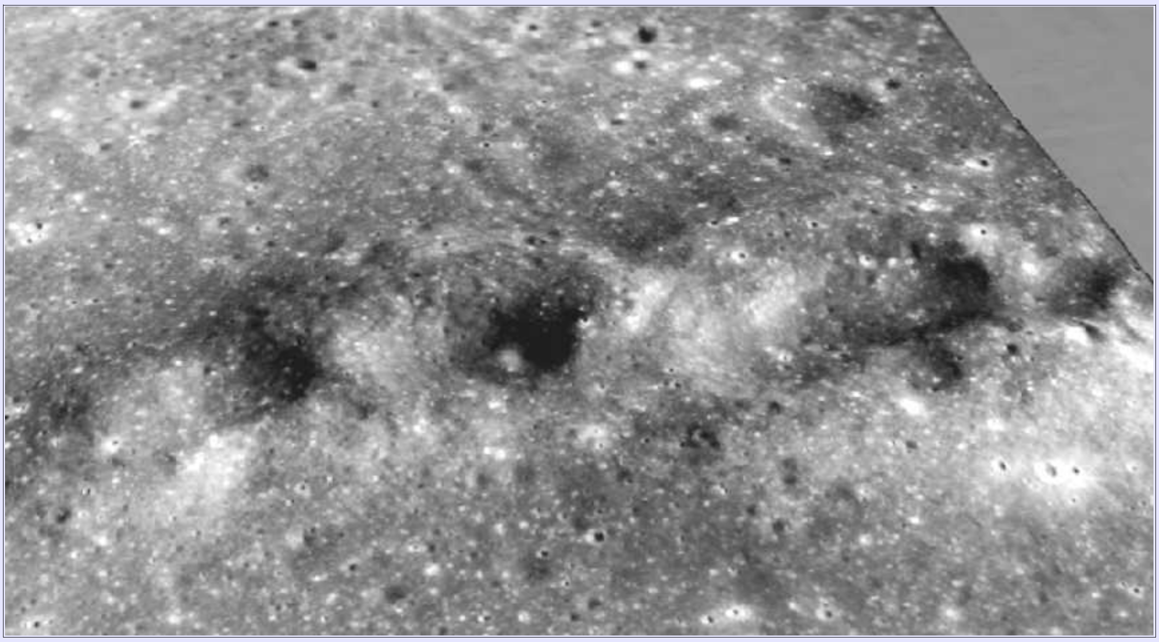

Figure 6: Mösting 3 (to the east), Mösting 4 (to the middle) and Mösting 5 (to the west). ACT REACT Quick Map tool-3D reconstruction using NAC imagery and the tool QuickMap Terrain Shadows. The cones are very apparent in this NAC 3D reconstruction.

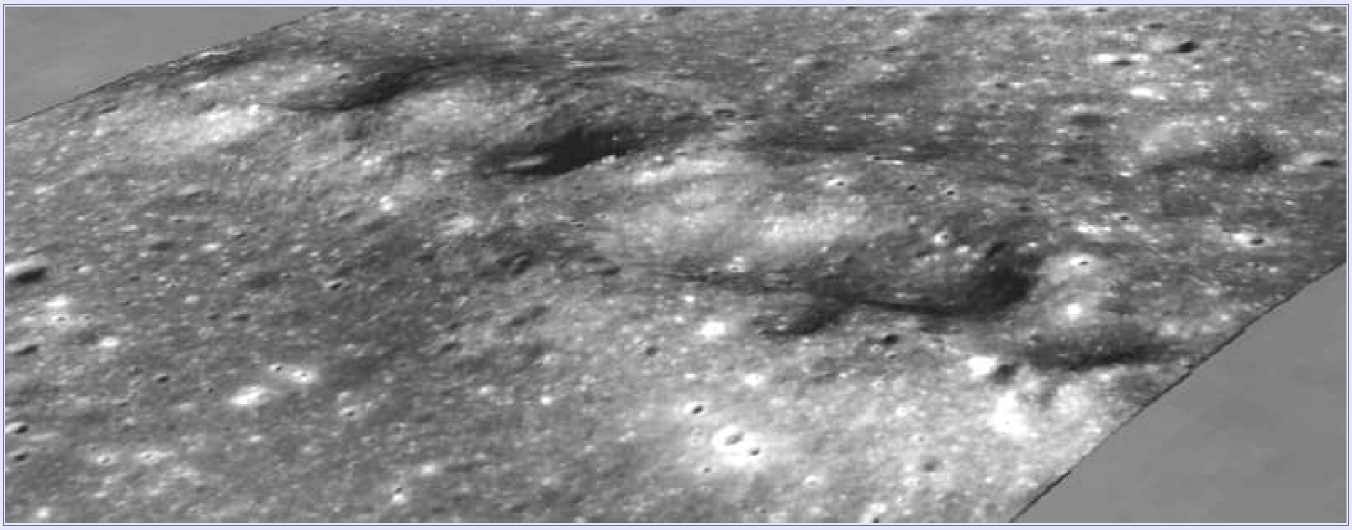

Figure 7: Mösting 3 (to the east), Mösting 4 (to the middle) and Mösting 5 (to the west) as seen from the eastern direction. The alignment of these lunar features, proposed as lunar cones, is apparent.

Conclusion: An interesting project could be the identification based on LRO WAC/NAC imagery of further lunar aligned cones for full study and eventual publication.

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LUNAR GEOLOGICAL CHANGE DETECTION PROGRAMME

TLP Reports: No TLP reports were received for April.

Additional Routine reports received for February included: Valerio Fontani (Italy – UAI) imaged: Eratosthenes, Ptolemaeus, and Torricelli. Eugino Polito (Italy – UAI) imaged: Eratosthenes. Aldo Tonon (Italy – UAI) imaged: Eratosthenes and Ptolemaeus. Alas due to time constraints with the newsletter production deadline, we do not have time to do a full analysis but they will go into our archives and be used in future analysis.

Routine reports received for March included: Paul Abel (Leicester, UK - BAA) observed: the partial solar eclipse in Hydrogen Alpha. Maurice Collins (ALPO/BAA/RASNZ) imaged: Archimedes, Gassendi, the lunar eclipse, Mare Imbrium, Ptolemaeus, Triesnecker, Vallis Alpes, and several features. Anthony Cook (Newtown, UK – ALPO/BAA) imaged: the earthshine, partial solar eclipse and several features on the Moon – the latter being in visible, SWIR and LWIR. Valerio Fontani (Italy – UAI) imaged: Plato. Brian Halls (UK – BAA) imaged: the partial solar eclipse. Rik Hill (Tucson, AZ – ALPO/BAA) imaged: Atlas and Mare Crisium. Ken Kennedy (Dundee, Scotland, UK – BAA) imaged: Mare Imbrium. Bill Leatherbarrow (Sheffield, UK – BAA) imaged: Birt, Bullialdus, Clavius, Copernicus, Mercator, Moretus, Pitatus, Ramsden, Sinus Iridum, and Tycho. Luigi Morrone (Italy – BAA) imaged: Atlas, Carrel, Janssen, Langrenus, Mare Crisium and Posidonius. Melania Sandron (Worthing – UK) imaged the nearly total lunar eclipse. Trevor Smith (Codnor, UK – BAA) observed: Aristarchus, Deseilligny, Mare Orientale and several features. Bob Stuart (Rhayder, Wales, UK – BAA) imaged: Adams, Ansgarius, Apollonaris, Barkla, Behaim, Boussingault, Cannon, Dubyago, Gilbert, Gill, Hano, Helmholtz, Kapteyn, Krogh, Langrenus, Palitzsch, Peirescius, Petavius, Plato, Pomortsev, Stevinus, Vega, Vendelinus, and several features. Alan Tough (Elgin, Scotland, UK – BAA) imaged the nearly total lunar eclipse. Alexander Vandenbohede (Belgium) imaged: Albategnius, Bessel, Boussingault, Demonax, Descartes, Deslandres, Fracastorius, Humboldt, Lacus Mortis, Littrow, Maginus, Mare Smythii, mare Tranquillitatis, Moretus, Oken, Purbach, Schomberger, Sinus Asperitatis, Stofler, Theophilus, and Vallis Rheita. Gonzalo Vega (Argentina – AEA) imaged the total lunar eclipse. Alex Vincent (Worthing, UK – BAA) imaged the almost total lunar eclipse.

Analysis of Reports Received (March): Note that academic time constraints imposed on the author, don't allow us to do any analysis in full this time, so please just take a look at the images and the reports and make your own judgement as to whether what happened in the past and was regarded as a TLP is recurring under these repeat illumination windows or was something unique that was seen. Its for a similar reason that I have left off the solar and lunar eclipse reports – hopefully these will be covered elsewhere in the BAA Lunar Section circular.

Deseilligny: On 2025 Mar 05 UT 18:25 Alexander Vandenbohede imaged and 19:37-19:55 Trevor Smith observed this crater under similar illumination (±1˚) and similar viewing angles (±1˚) to the following report:

Near Desseilgny in Mare Serenitatis (29E, 25N) 1971 Feb 01 UT 19:40-20:15 Observed by Persson (Hvidore, Denmark, 2.5" refractor, x100, S=G) "Obscur. (blurred & dark) starting between Plinius & Menelaus moving towards Posidonius. Normal after 2 min. A little crater (white spot) periodically disappeared for several secs regularly every few min. There was haze above only this spot. A tiny crater SE of it was invis. till 2015h then became clear & steady. Colour was reddish-brown. Drawing. (Apollo 14 watch)." NASA catalog weight=2 (low). NASA catalog ID 1293.

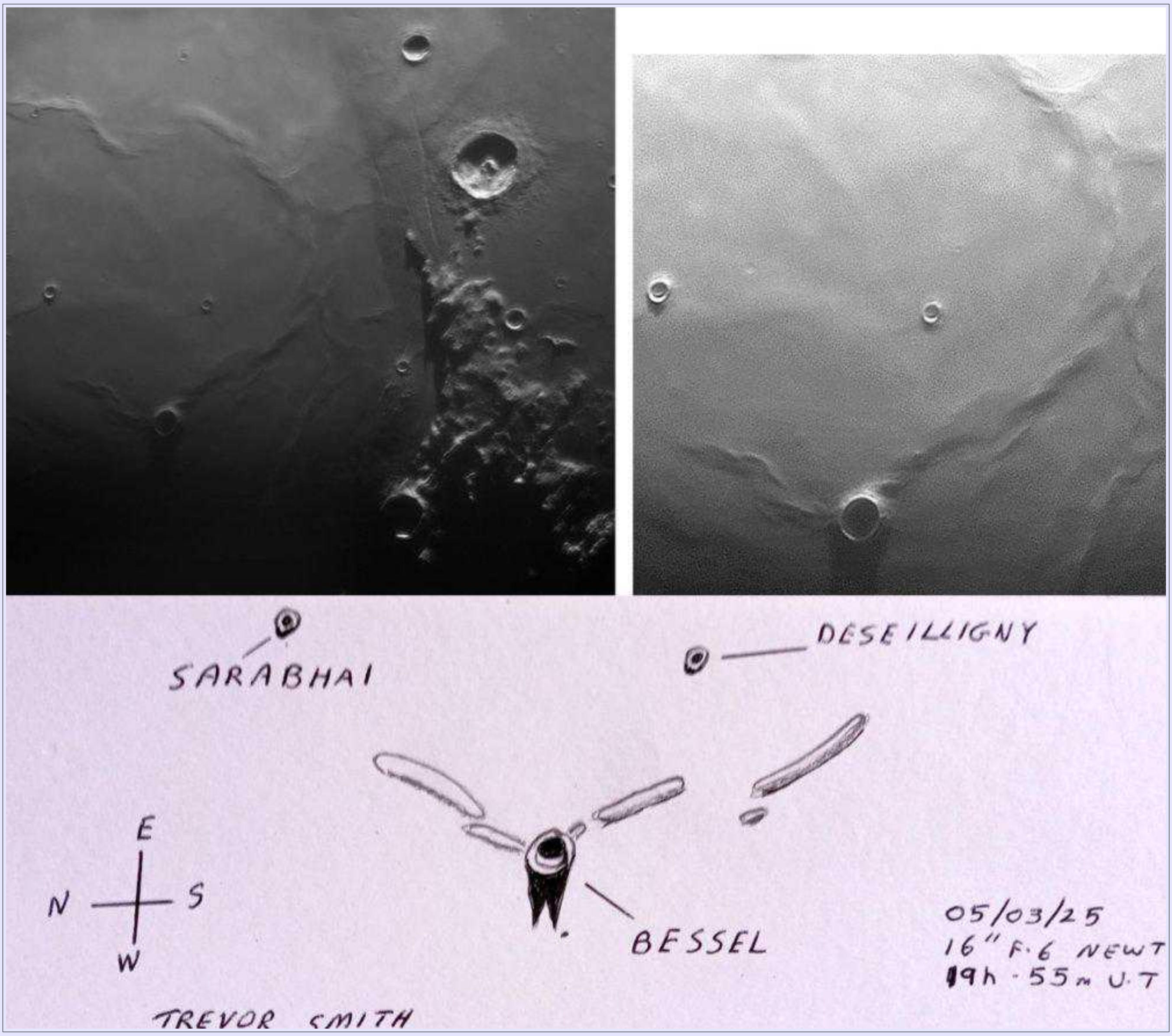

Figure 1. Bessel, Sarabhai and Deseilligny observations made on 2025 Mar 05 and orientated with north towards the left. **(Top left)** image by Alexander Vandenbohede image taken at 18:25 UT. **(Top Right)** an enlargement with some contrast stretching. **(Bottom)** A sketch by Trevor Smith at the UT quoted in the sketch.

Trevor commented that he "observed from 19:37-19:55UT but saw no obscuration. Deseilligny is a small 6.6 km diameter crater and tonight in rather poor seeing it looked to 'Blink' on and off in the turbulent air. Apart from this turbulence Deseilligny and its environs looked normal."

Maginus: On 2025 Mar 07 UT 18:25 Alexander Vandenbohede imaged this crater under similar illumination to the following report:

On 1975 May 18 at UT2115-2145 C. Lord (St Annes-on-sea, Lancashire, UK, 76mm f/16 refractor, x170, Wratten 25, and 44a Moon blink filters used, Transparency 4.5/5, no wind, S=F). The west flank of Maginus, and the interior, appeared to be partly obscured. No other features in a similar position along the terminator were obscured. No colour blink was detected with the filters, though a pronounced red/white light blink was noted; the device employed a N.D. x4 filter. By 21:45UT the floor was no longer obscured and only Maginus G was masked in a white haze; however immediately adjacent to the terminator was an ill defined misty patch lying where the outer flank of Maginus would have been visible. The rest of the terminator was sharp. The obscuration was only seen to advantage in *blue and int. light, and the blue/int blink was only very slight. Findlay and McDonnell observed 21:30-23:00 using a 25cm refractor (Seeing II-III) but failed to see anything unusual. NASA catalog weight=3. NASA catalog ID #1407. ALPO/BAA weight=2.*

Figure 2. Maginus as imaged by Alexander Vandenbohede on 2025 Mar 07 UT 18:25 and orientated with north towards the top.

Plato: On 2025 Mar 07 UT Valerio Fontani (UAI) imaged this crater under similar illumination to the following two past TLP reports:

Plato 1886 Sep 06 UT 19:00? Observed by Valderama (Italy?) "Streak of light on dark floor of crater in shadow. (sunlight between peaks on walls?)" NASA catalog weight=0 (most unlikely to be a TLP). NASA catalog ID #251. ALPO/BAA catalog weight=1.

Plato 1967 Apr 18 UT 03:10-04:00 Observed by Kelsey (Riverside, CA, USA, 8" reflector x300, S=8, T-4-5). "Streak on floor showed slight enhancement in red filter comp. to blue. Later, a 2nd streak formed. Probably the sun shining thru a valley in the rim. Red enhancement permanent? (Wise suspected a blink here 6h earlier)." NASA catalog weight=3. NASA catalog ID #1027. ALPO/BAA weight=1.

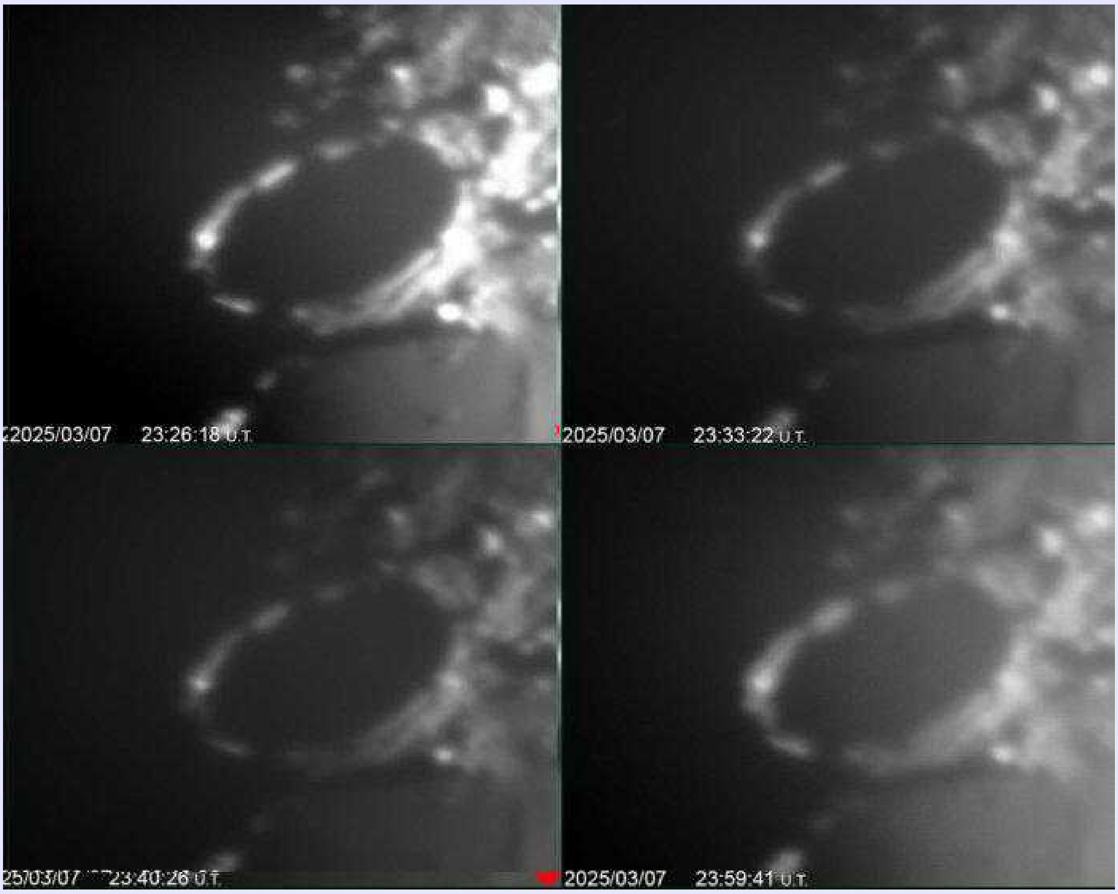

Figure 3. Plato as imaged by Valerio Fontani (UAI) with north towards the top. Dates and UTs are given in each image.

When studying these images, please bear in mind that the predictions for similar illumination are only good to a tolerance of ±0.5° and under shallow sunrise or sunset conditions the appearance of shadows can change considerably.

Sinus Iridum: On 2025 Mar 09 UT 23:10 Bill Leatherbarrow imaged this area under similar illumination to the following report:

On 1987 Oct 03 at UT 01:0?0-02:00 R. Manske (Brooklyn, WI, USA, 8" reflector, x226) observed sunlight glinting of the walls in spectacular display of colours. White (even gold) was seen at the centre, and blue on the top most part of the rim. The white (or gold) band was thin in comparison to other bands. The observer suspects that this effect was terrestrial atmosphere related. Cameron 2006 catalog ID=307 and weight=0. ALPO/BAA weight=1.

Although the image is in monochrome, it could be used to model atmospheric spectral dispersion to try to mimic what Manske saw in 1987.

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

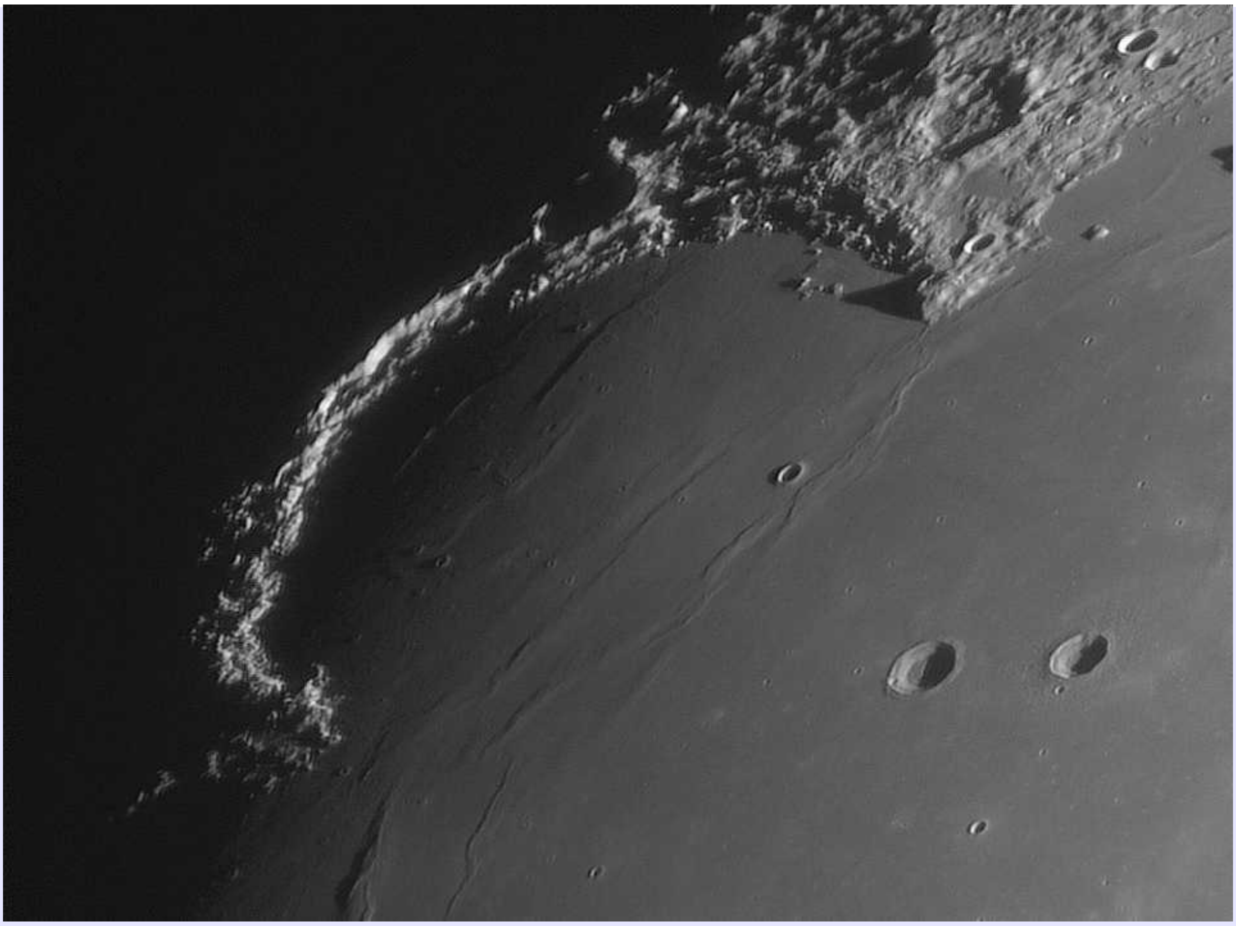

Figure 4. Sinus Iridum as imaged by Bill Leatherbarrow on 2025 Mar 09 UT 23:10 and orientated with north towards the top.

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