



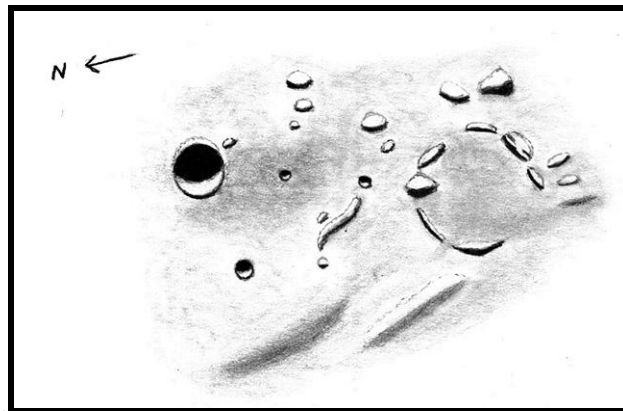
ASSOCIATION OF LUNAR &
PLANETARY OBSERVERS
ALPO
Founded in 1947

THE LUNAR OBSERVER

A PUBLICATION OF THE LUNAR SECTION OF THE A.L.P.O.
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17 Autumn Lane, Sewell, NJ 08080
RECENT BACK ISSUES: http://moon.scopesandscapes.com/tlo_back.html

FEATURE OF THE MONTH – MAY 2014

LUBINIEZKY E & DARNEY C



Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA

February 10, 2014 03:06-03:34, 03:56-04:04 UT, 15 cm refl, 170x, seeing 8-9/10

I sketched this area on the evening of Feb. 9/10, 2014. This area is northwest of Bullialdus near where Mares Nubium, Cognitum and Humorum merge. Lubiniezký E is a broken ring of seven distinct segments. These segments are only approximately aligned with a circular ring. The large segment on the east side is Lubiniezký pi, and Lubiniezký tau is the largest of three segments to the south and west. The largest gap in Lubiniezký E is south of pi. Somehow, the major peak on the north side of Lubiniezký E does not have a designation on the Lunar Quadrant map. There are three short ridges or wrinkles south of Lubiniezký E, and two substantial peaks to the east. These two may be part of the broken ring Lubiniezký A. The pit north of E is Lubiniezký EA, and Lubiniezký chi is the double-curved ridge northwest of EA. Several other peaks are in this area; the small one just west of chi is probably Lubiniezký theta. Darney C is the largest intact crater on this sketch. This is a round symmetric crater with no noticeable irregularities. A small peak is just south of this crater. Darney B is the small pit between Darney C and Lubiniezký EA, and is very similar to the latter. Darney D is the larger crater to the west. Two long, vague strips of shadowing are west of Darney D and Lubiniezký E; these may be wrinkles. A trio of peaks is east of Darney B and south of C. The LQ map indicates that one of them is Lubiniezký psi.

ALPO ANNUAL MEETING

The ALPO annual meeting will be held in conjunction with the Astronomical League's ALCON 2014 (alcon2014.astroleague.org) July 10-12, 2014 at the San Antonio Airport Hilton (1-888-728-3031 www.sanantonioairport.hilton.com). Registration forms and accommodation information is on the website. Reservations must be made by June 14th to receive the ALCON convention rate at the Airport Hilton. Register before May 21st to receive an ALCON 2014 commemorative lapel pin.

The following information on submitting a paper is from the ALPO Journal:

ALPO 2014 Call for Papers

This year, only a selection of several ALPO papers will be presented as part of the main program; the remainder of the ALPO papers will be presented, as usual, at a separate room near the main presentation hall.

Participants are encouraged to submit research papers, presentations, and experience reports concerning various aspects of Earth-based observational astronomy. Suggested topics for papers and presentations include the following:

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

The preferred format is Microsoft PowerPoint, though 35mm slides are also acceptable. The final presentation should not exceed 20 minutes in length, to be followed by no more than five (5) minutes of questions from the audience. A hard-copy version of the paper should be made available for future web site publication.

Please submit by June 1, 2014, the following:

- Title of the paper being presented.
- A four- or five-sentence abstract of each paper.
- The format in which the presentation will be.
- A 100-word biography and a recent photograph of the presenter for posting on the ALCon 2013 website and inclusion in the printed program guide.

E-mail is the preferred method for contact:

ken .poshed/y@apo-astronomyorg

If regular mail must be used, address all materials to:

ALCon 2014
c/o Ken Poshedly
1741 Bruckner Court
Snellville, Georgia 30078 USA

All fees and other details are listed in the registration form.

LUNAR CALENDAR

MAY-JUNE 2014 (UT)

May	01	15:51	Moon-Aldebaran: 2.1° S
	02	15:59	Moon North Dec.: 19° N
	06	10:22	Moon Apogee: 404300 km
	07	03:15	First Quarter
	11	13:32	Moon-Mars: 3.2° N
	12	12:47	Moon-Spica: 1.8° S
	12	22:06	Moon Ascending Node
	14	12:41	Moon-Saturn: 0.6° N
	14	19:16	Full Moon
	16	20:10	Moon South Dec.: 19° S
	18	11:58	Moon Perigee: 367100 km
	21	12:59	Last Quarter
	25	15:43	Moon-Venus: 2.4° S
	25	17:56	Moon Descending Node
	28	18:40	New Moon
	30	00:38	Moon North Dec.: 19° N
Jun	03	04:25	Moon Apogee: 405000 km
	05	20:39	First Quarter
	08	00:44	Moon-Mars: 1.7° N
	08	22:05	Moon-Spica: 1.9° S
	09	05:36	Moon Ascending Node
	10	19:11	Moon-Saturn: 0.6° N
	13	04:11	Full Moon
	13	06:03	Moon South Dec.: 19° S
	15	03:34	Moon Perigee: 362100 km
	19	18:39	Last Quarter
	21	20:30	Moon Descending Node
	24	12:54	Moon-Venus: 1.4° N
	25	06:22	Moon-Aldebaran: 2.1° S
	26	08:34	Moon North Dec.: 19° N
	27	08:08	New Moon
	30	19:09	Moon Apogee: 405900 km

AN INVITATION TO JOIN THE A.L.P.O.

The Lunar Observer is a publication of the Association of Lunar and Planetary Observers that is available for access and participation by non-members free of charge, but there is more to the A.L.P.O. than a monthly lunar newsletter. If you are a nonmember you are invited to join our organization for its many other advantages.

We have sections devoted to the observation of all types of bodies found in our solar system. Section coordinators collect and study members' observations, correspond with observers, encourage beginners, and contribute reports to our Journal at appropriate intervals.

Our quarterly journal, **The 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.

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

Size and type of telescope used

Magnification (for sketches)

Filter (if used)

Medium employed (for photos and electronic images)

Orientation of image: (North/South - East/West)

Seeing: 1 to 10 (1-Worst 10-Best)

Transparency: 1 to 6

Full resolution images are preferred-it is not necessary to compress, or reduce the size of images. *Additional commentary accompanying images is always welcome.* **Items in bold are required. Submissions lacking this basic information will be discarded.**

Digitally submitted images should be sent to both

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

and Jerry Hubbell – jerry.hubbell@alpo-astronomy.org

CALL FOR OBSERVATIONS:

FOCUS ON: Banded Craters

Focus on is a bi-monthly series of articles, which includes observations received for a specific feature or class of features. The subject for the **July 2014** edition will be **Banded Craters**. Lists and finding charts of banded craters can be downloaded from: <http://moon.scopesandscapes.com/alpo-bcp.htm>.

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 this to your observing list and send your favorites to (both):

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

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

Deadline for inclusion in the Banded Craters article is June 20, 2014

FUTURE FOCUS ON ARTICLES:

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

<u>Subject</u>	<u>TLO Issue</u>	<u>Deadline</u>
Altai Scarp (Rupes Altai)	September 2014	August 20, 2014

FOCUS ON: MARE VAPORUM

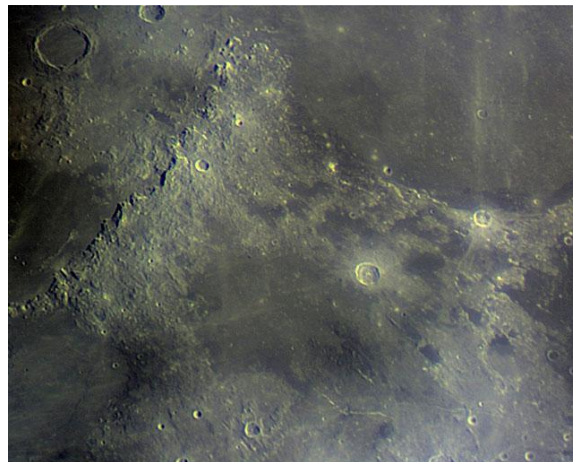
By Jerry Hubbell

Acting Assistant Coordinator: Lunar Topographical Studies

Mare Vaporum (Sea of Vapors), although one of the smaller maria, is very interesting in that it contains several unusual formations worthy of extended study. Located to the west of Mare Tranquilitatis, southwest of Serenitatis, southeast of Mare Imbrium adjacent to Montes Apenninus, and directly north of Sinus Medii, this small mare is well placed for study near the center of the visible surface of the Moon at 4 degrees N, 4 degrees E.

Figure 1. Mare Vaporum, Conon Howard Eskildsen, Ocala, FL, 2007-11-20-0104 UT. Meade 152mm f/8 refractor, 2x Barlow, Orion Starshoot II CCD Camera. Seeing 6/10, Transparency 5/6

The lunar material surrounding Mare Vaporum is from the Lower Imbrium epoch, and the mare material is from the Eratosthenian epoch. Named by Giovanni Battista Riccioli in 1651, the mare is 245 kilometers (152 mi) in diameter and 55,000 km² (21,000 sq mi) in area.



Several prominent formations surround Mare Vaporum, including Rima Hygenius to the south, crater Manilius to the east, and crater Yangel to the north. On the southeast side of Mare Vaporum is a very interesting formation of hills and mountains that appears to be a part of a plateau. This formation is a large pyroclastic area covering 10,000 km². This area seems to be related to the Rima Hyginus formation. This area of the Moon is best observed during the first quarter or 6 days after full Moon close to last quarter.

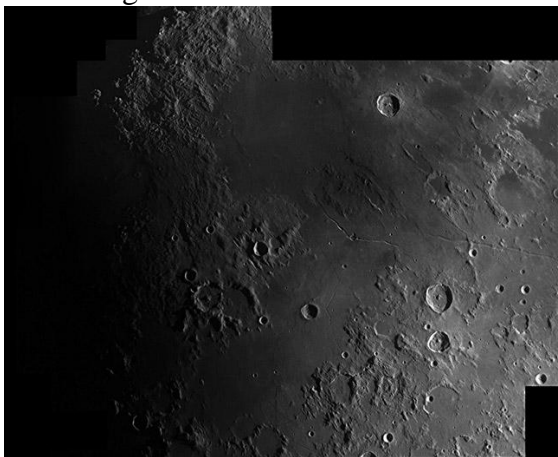


Figure 2. Mare Vaporum & Sinus Medii. Richard Hill, Tucson, AZ, 2014-04-08-0211 UT, TEC 8-inch f/20 Mak-Cas. SKYRIS 445M CCD Camera, 656.3nm Filter, Seeing: 8/10, North Up.

Lunar pyroclastic deposits are low-albedo units that are thought to mark the source regions of ancient volcanic eruptions on the Moon. Quenched iron-bearing glass and crystallized beads with volatile-element coatings are major components of several of the larger pyroclastic deposits.

Figure 3. Hyginus to Triesnecker. Richard Hill, Tucson, AZ, 2010-06-20-0234 UT, C14+2xBarlow f/22. DMK21AU04 CCD Camera, UV/IR Filter, Seeing 9/10, North Up.

Because of the small size of the mare, there has been speculation about whether Mare Vaporum is a basin or simply a crater. Chuck Wood discussed this possibility on the Lunar Photo of the Day website on August 21, 2004. Here are some excerpts from his comments:

"...The edge of the mare clearly defines a circle about 230 km in diameter—in between Schickard (206 km) and Clavius



(245 km) in size. Arcuate—i.e. curved—mare ridges on the western portion of Vaporum suggest a possible 125 km wide inner ring (similar to the far-side peak ring basin Schrodinger) and a ridge near the eastern side makes the idea just tenable...."

This seems to indicate that Mare Vaporum is actually a crater with a well-defined edge.

"...At its southeast end, Vaporum's dark mare basalts cover older, lighter material. You can see that the northwestern end of the Hyginus Rille terminates because it is covered by younger Vaporum lavas, and the lavas oozed southeastward into the graben near Hyginus W..."



Figure 4. Sea of Vapors – Color Enhanced. John Duchek, St. Louis, MO. 2010-03-24, 0300 UT Telescope 8" Criterion Dynascope (F/8). Seeing was 5, Transparency 2, North is to the upper left.

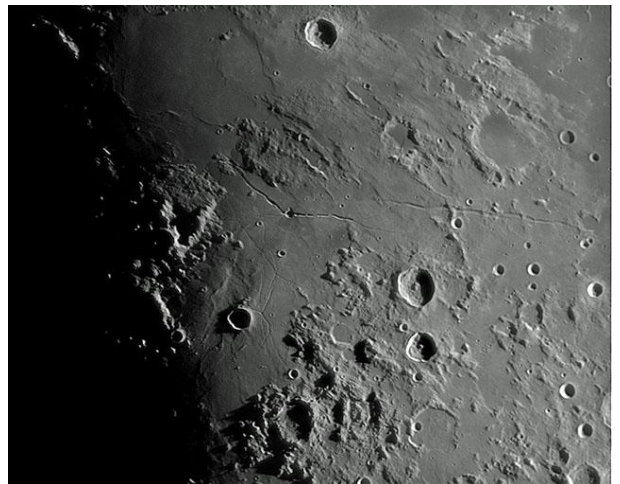
This seems to indicate that when the crater was formed, lava flowed and obscured features and other formations toward the southeast.

"...The dome next to Beta is just one of the many volcanic features in this area (notice the dark halo crater—DHC on the mouseover), but other than the veneer of dark pyroclastic material to the SE and W, most of the features are too small to see from Earth..."

Finally, there is an abundance of volcanic features in the area that may or may not be related to the "crater" Vaporum. Further study is warranted to perhaps come to a definitive conclusion.

Figure 5. Hyginus Region. Howard Eskildsen, Ocala, FL, 2012-01-31-0039 UT. 6" f/8 Explore Scientific refractor, 2x Barlow, IR and V-block filter, DMK41AU02.AS CCD Camera. Seeing 8/10, Transparency 5/6.

CCD images of Mare Vaporum around the time of the first quarter show a wealth of detail and interesting items ripe for further study. The pyroclastic region on the southeast side of Mare Vaporum is a prime target for high-resolution CCD imaging and should be a priority target when observing Mare Vaporum. Images taken 6 days past full Moon would also be needed for comparison studies with the first quarter images. These images would provide additional data to help determine the true character of the pyroclastic deposits. In addition, regional studies that include Rima Hyginus would possibly help to determine a timeline for these formations and help discover the geological relationship among the various objects in the region.



In summary, further study of Mare Vaporum and in particular, the pyroclastic region southeast of it should provide an opportunity to further expand our understanding of the nature of this most interesting mare and its relationship to the volcanic formations to the south.

ADDITIONAL READING

- Bussey, Ben and Paul Spudis. 2004. *The Clementine Atlas of the Moon*. Cambridge University Press, New York.
- Byrne, Charles. 2005. *Lunar Orbiter Photographic Atlas of the Near Side of the Moon*. Springer-Verlag, London.
- Chong, S.M., Albert C.H. Lim, and P.S. Ang. 2002. *Photographic Atlas of the Moon*. Cambridge University Press, New York.
- Chu, Alan, Wolfgang Paech, Mario Wigand, and Storm Dunlop. 2012. *The Cambridge Photographic Moon Atlas*. Cambridge University Press, New York.

Gaddis, Lisa R., et al., 2002. *Compositional Analyses of Lunar Pyroclastic Deposits*. Academic Press, ScienceDirect.
 Gillis, Jeffrey J. ed. 2004. *Digital Lunar Orbiter Photographic Atlas of the Moon*. Lunar & Planetary Institute, Houston. Contribution #1205 (DVD). (http://www.lpi.usra.edu/resources/lunar_orbiter/).
 Grego, Peter. 2005. *The Moon and How to Observe It*. Springer-Verlag, London.
 North, Gerald. 2000. *Observing the Moon*, Cambridge University Press, Cambridge.
 Rukl, Antonin. 2004. *Atlas of the Moon*, revised updated edition, ed. Gary Seronik, Sky Publishing Corp., Cambridge.
 Schultz, Peter. 1972. *Moon Morphology*. University of Texas Press, Austin.
 The-Moon Wiki. <http://the-moon.wikispaces.com/Introduction>
 Wlasuk, Peter. 2000. *Observing the Moon*. Springer-Verlag, London.
 Wood, Charles. 2003. *The Moon: A Personal View*. Sky Publishing Corp. Cambridge.
 Wood, Charles and Maurice Collins. 2012. *21st Century Atlas of the Moon*. Lunar Publishing, UIAI Inc., Wheeling.

LUNAR TOPOGRAPHICAL STUDIES

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

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

OBSERVATIONS RECEIVED

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 5(3) day Moon, Mare Nectaris & Posidonius.

JOHN DUCHEK – St. LOUIS, MISSOURI, USA. Digital image of Mare Vaporum.

HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Mare Imbrium & Sinus Iridum.

ROBERT HAYS - WORTH, ILLINOIS, USA. Drawings of Hercules A & Lubiniezky E–Darney C.

RICHARD HILL – TUCSON, ARIZONA, USA. Digital images of Archimedes, Areadaeus(2), Ariadaeus-Ptolemaeus, Ariadaeus-Triesnecker, Hyginus-Tresnecker, Hyginus-Ritter, Triesnecker(2), Triesnecker-Ariadaeus, Triesnecker-Hyginus(3) & Mare Vaporum.

DAMIAN PEACH-SELSEY, WEST SUSSEX, UNITED KINGDOM. Digital images of Gassendi, Kepler, Petermann & Philalaus..

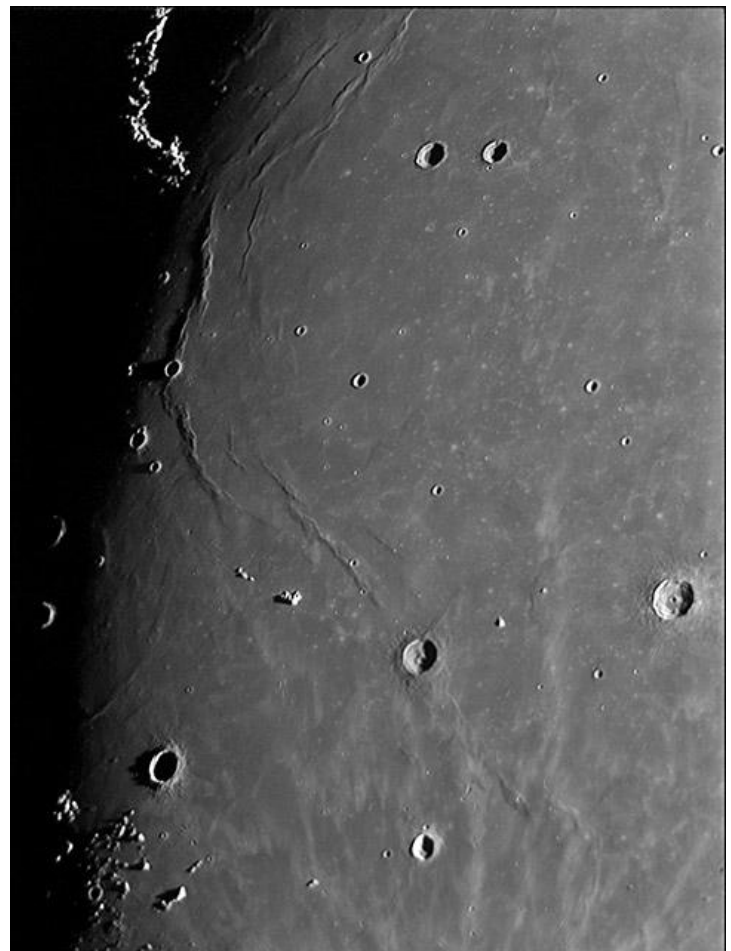
RECENT TOPOGRAPHICAL OBSERVATIONS



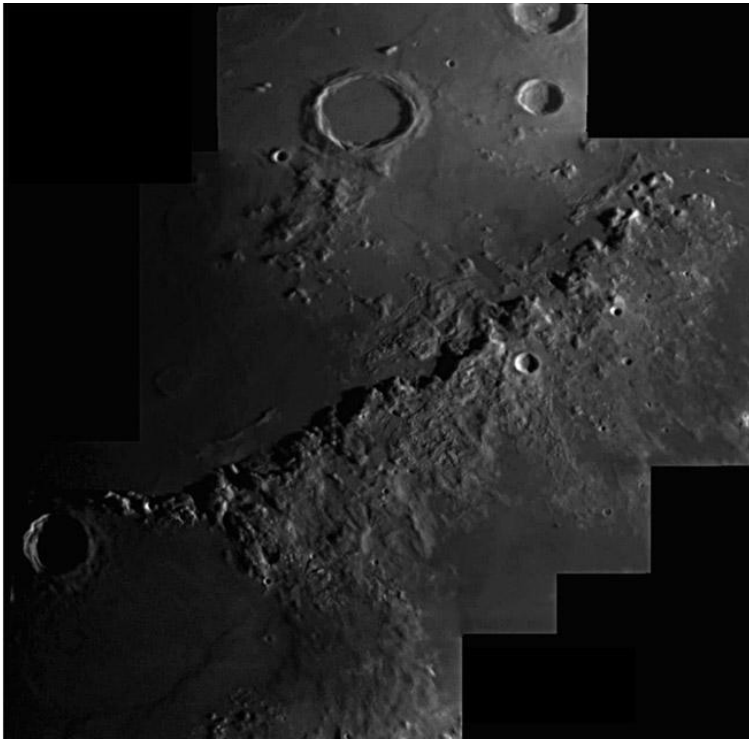
POSIDONIUS - Maurice Collins-Palmerston North, New Zealand. April 5, 2014 07:03 UT. FLT-110, f/14, ASI120MC. North down.

MARE IMBRIUM - Howard Eskildsen-Ocala, Florida, USA. February 9, 2014 23:55 UT. Seeing 5/10, Transparency 4/6. Mewlon 250, 2x barlow, DMK 41AU02.AS, IR block filters.

Three craters form a line across the lower image from left to right: Euler, Lambert, and Timocharis. Below Euler the crater Pytheas lies among the sprawling rays from Copernicus. From the region of Lambert wrinkle ridges arc towards the left of the image before curving back towards the central top of the image. Isolates peaks known as Mons La Hire arise to the left of and slightly above Lambert. Directly across the wrinkle ridge from Mons La Hire lobes of lava flows are visible angling towards the upper right. Subtle significance marks this region of the moon.



RECENT TOPOGRAPHICAL OBSERVATIONS



ARCHIMEDES – Richard Hill – Tucson, Arizona, USA March 10, 2014 01:40-01:52 UT. Seeing 6/10. TEC 8" f/20 MAK-CASS, SKYRIS 445. 656.3 nm filter.

The same night I tried the Skyris camera on the Questar I also used the TEC. The results were very pleasing. As Howard said, how can you get tired of this mountain range? I was easily able to see the old "Hadley Rille" or Rima Hadley in modern parlance.

I particularly enjoy the Montes Archimedes and like to imagine what it would be like to stand in some of those passes in that range. What a site. Note Eratosthenes coming out of shadow catching the first rays of the sun on its far wall.

PHILOLAUS–Damian Peach –Selsey, West Sussex, United Kingdom. March 12, 2014.

http://www.damianpeach.com/lunar14/philolaus_2014_03_12dp.jpg



ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

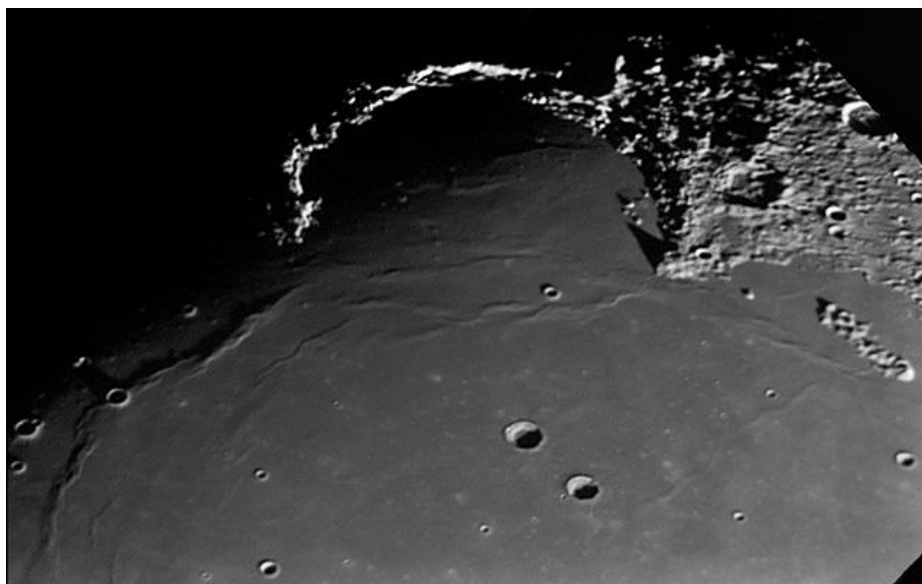


MARE NECTARIS - Maurice Collins-Palmerston North, New Zealand. April 5, 2014 07:05 UT. FLT-110, f/14. ASI120MC, North down.

SINUS IRIDUM - Howard Eskildsen-Ocala, Florida, USA. February 9, 2014 23:59 UT. Seeing 5/10, Transparency 4/6. Mewlon 250, DMK 41AU02.AS, IR block filters.

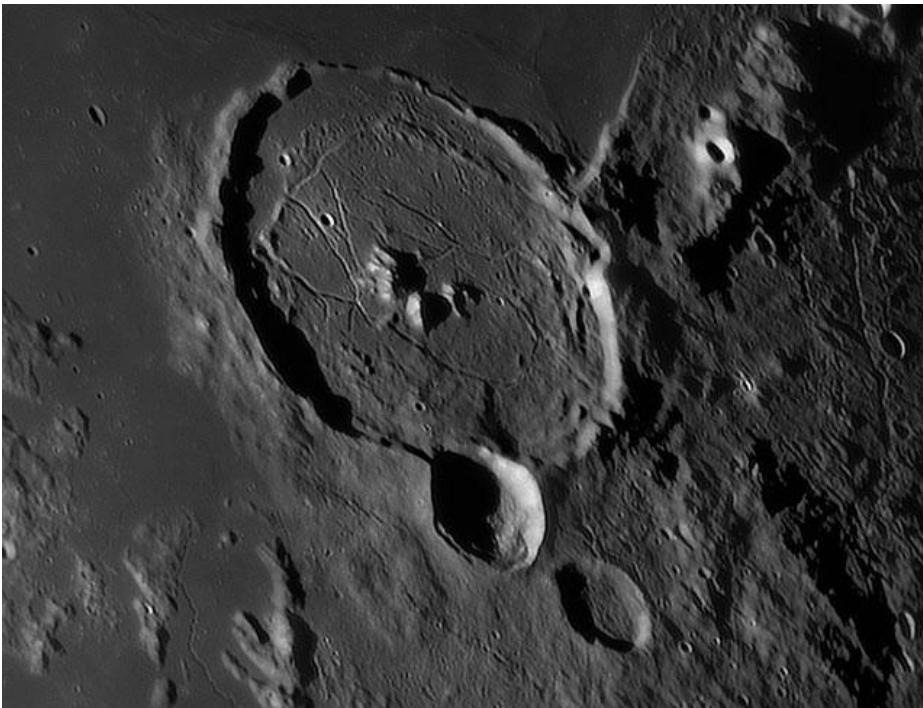
While looking at the moon last month I saw this hovering arc of Montes Jura, the northern rim of Sinus Iridum (bay of rainbows), I thought: Wow that really looks like a rainbow. Could this view have inspired the early lunar observer who gave the bay of rainbows its name? And why not, they both hover over Mare Imbrium, the "sea of showers."

BTW: Seeing was so bad that I could not use the Barlow, so this image was taken at prime focus. Also the image is rotated clockwise from its true orientation for artistic effect.



ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

ARIADAEUS-PTOLEMAEUS – Richard Hill – Tucson, Arizona, USA June 1, 2009 03:28 UT. Seeing 7/10. Questar 3.5", 2x barlow, SPC900NC.



GASSENDI–Damian Peach – Selsey, West Sussex, United Kingdom. March 12, 2014.
http://www.damianpeach.com/1unar14/gassendi_2014_03_12d_p.jpg

LUNAR TRANSIENT PHENOMENA

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

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

LTP NEWSLETTER – MAY 2014

Dr. Anthony Cook - Coordinator

Observations for May were received directly, or indirectly (forwarded onto me), from the following observers: Jay Albert (Lake Worth, FL, USA - ALPO) observed Aristarchus, Earthshine, Aristarchus, Moltke, Snellius, the S.E. lunar limb, and Torricelli B. Maurice Collins (New Zealand) imaged Agrippa, Alphonsus, Aristoteles, Bullialdus, Clavius, Copernicus, Gassendi, Mons Gruithusen, Plato, Sinus Iridum, Theophilus, Tycho, and took several images of the whole Moon. Mike Brown (Huntingdon, UK – BAA) imaged Copernicus. Tony Cook (Newtown, UK – ALPO/BAA) imaged several parts of the Moon with a color webcam. Marie Cook (Mundesley, UK - BAA) observed Agrippa, Promontorium Laplace, and Theophilus. Peter Grego (St Dennis, UK – BAA) sketched Petavius. Rik Hill (Tucson, AZ – ALPO) imaged Archimedes, Montes Apenninus, and several other features. Kevin Kilburn (Manchester, UK – BAA) imaged Langrenus and the whole lunar disk. Nigel Longshaw (Oldham, UK – BAA) sketched Plato. Brendan Shaw (UK - BAA) imaged Atlas, Aristarchus, Cassini, Censorinus, Langrenus, Mare Anguis, Mare Crisium, Mons Piton, Plato, Proclus, Promontorium Agassiz, Rimae Triesnecker, Sulpicius Gallus, and Theophilus. Franco Taccogna (Italy - UAI) imaged Albateginus, Aristarchus, Gassendi, Herodotus, Langrenus, Plato, Posidonius, Proclus, and Torricelli B. Claudio Vantaggiato (Italy – UAI) observed Plato.

News: On 2014 Apr 17 10:59p.m. Pacific Daylight Time, NASA's LADEE website announced that the Lunar Atmospheric and Dust Explorer mission had crashed into the lunar surface. This had always been intended as the satellite had been running low on fuel, and was unable to maintain a decaying orbit. During the latter stage of the mission the orbit was lowered so as to study the lunar exosphere gas and dust content as close to the surface as possible. It had also been using its star tracker cameras to image the lunar limb, trying to replicate the sightings of streamers seen by the [Apollo 17 astronauts](#). An example from LADEE's star tracker camera can be seen on: <http://www.nasa.gov/ames/ladee-project-scientist-update-the-legacy-lives-on/>. However so far nothing quite like what the Apollo 17 astronauts saw has been captured – only zodiacal light and the solar corona. Flying low above the surface though LADEE did detect considerably more dust, and a previously undetected gas species. These results however are preliminary and LADEE scientists will be completing a full study in the months to come.

At this year's European Geophysical Congress, a paper, by Speyerer, Wagner and Robinson (<http://meetingorganizer.copernicus.org/EGU2014/EGU2014-12252.pdf>) will be presented on detecting changes on the lunar surface using NASA's LRO spacecraft LROC images down to metre scale resolution. They have been comparing imagery from 2009-2010 with present day imagery and have so far found evidence for 650 surface changes including 19 resolvable newly formed craters. Interestingly they have adopted a similar approach to the LTP group, namely comparing observations under similar illumination from past and present eras, though in their case the illumination tolerance is 2° (we use $\pm 0.5^\circ$ for repeat illumination, and $\pm 1^\circ$ for repeat illumination & viewing angle) and of course they are examining the surface on a much smaller scale than we do.

Following last month's analysis on 1996 Dec 24/25 LTP in Aristarchus as seen by Patrick Moore, Gerald North has commented that Patrick Moore was known to have poor blue sensitivity (this had been proven under laboratory conditions), and possibly was the reason why he did not recognize atmospheric spectral dispersion on the night in question. Gerald says that he (Gerald) definitely saw spectral dispersion, yellow-orange, along the southern rim and extending along southern boundary of the main ray extending towards Herodotus and blue towards the north – albeit more faintly seen due to lower contrast from extra

atmospheric scattering in blue light. As to the variability of the color, Gerald puts this down to the Moon's altitude, with the color being strongest when the Moon was lowest. Gerald states: *"I cannot be emphatic, but I can say that I very strongly suspect all Patrick saw was spurious color and not any genuine LTP"*. Now this does not quite explain the hint of color seen by Patrick Moore when the Moon was at a higher altitude of 47°, nor the lack of orange/yellow on other similarly contrasty features on the Moon (with the exception of Mons Pico) however in view of Gerald's neat color sensitivity explanation, and the fact that Patrick himself suspected atmospheric spectral dispersion might have had something to do with it, I have decided to take this LTP out of the ALPO/BAA catalog as there are plenty of other more convincing observations to study, and Patrick Moore thought it was probably not a LTP.

LTP Reports: March has been a quiet month with no LTP reports emerging, although three queries came in during the writing of this report. On 2014 Mar 10 UT 19:29 and 19:39 Mike Brown (BAA, UK) imaged Copernicus and detected some illuminated terrain on the inside of a shadowed wall. However this was discussed in the last BAA Lunar Section Circular and was suspected to be sunlit terraces or scattered light illuminating slope faces inside the shadowed wall. On 2014 Mar 16 UT 00:50-01:20 Peter Grego noted that the SW inner rim of Pythagoras was perhaps slightly less brighter than he would have expected (it compared in brightness to the inner western wall of Pythagoras D), though having examined some images of the area, I am not so convinced; however Peter was right to bring this to my attention. On 2014 Apr 11 UT 22:21 Federico Cardona (a German based SPA observer) observed the crater South to have a curious dark linear formation on the east side of the crater. Again a quick check on the Hatfield lunar atlas, showed that this was normal and just shadow on a lineated rim of this crater – it still looks pretty spectacular though.

Routine Reports: Here is a selection of reports received for March that can help to re-assess some past LTP observations. As you can see some of the original LTP reports are perhaps not as clear cut as they should have been. This is why we now have a checklist for observers to run through in future if they spot a LTP, and this should help to eliminate some mistakes or poor quality observing that have happened in the past. This can be found on: <http://users.aber.ac.uk/atc/alpo/ltp.htm> .

Plato: On 2014 Mar 09 two repeat illumination and one repeat libration condition events were observed by Nigel Longshaw and Brendan Shaw. The crater was observed under the same illumination/topocentric libration (to within +/-1°) to a LTP reported in 1972 Jun 19 and to within +/-0.5° in illumination to LTP's seen by Brenner and Fauth in 1895 May 02 and to de Spessens in 1887 Nov 23:

Plato 1887 Nov 23 UT 20:00? Observed by de Speissens (France?) "Luminous triangle on floor. Klein says it was sunlight affect. (but similar to Klein's own obs., #190. Fort says never seen before nor since)." NASA catalog weight=0. NASA catalog ID #256. ALPO/BAA weight=1.

Plato 1895 May 02 UT 20:45-23:45 Observed by Brenner and Fauth (Germany?) "Streaks of light (Brenner) bright parallel bands in center Fauth (indep. confirmation?)." NASA catalog weight=5. NASA catalog ID #284. ALPO/BAA weight=2.

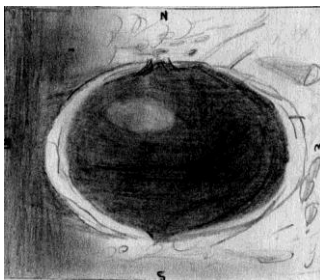


Figure 1. Plato as sketched by S.A. Jones on 1972 Jun 19 UT 21:40-22:30 with north towards the top.

Plato 1972 Jun 19 UT 21:40-22:30 Observed by S.A. Jones (Swansea, Wales, 12" reflector x150) and Moore (Selsey, England, 12.5" reflector x450) "Noted a bright

area in the NW part of the floor. Moore noted nothing unusual & he tho't obs. saw one of permanent light patches" NASA catalog weight=0. NASA catalog ID #1336. ALPO/BAA weight=1

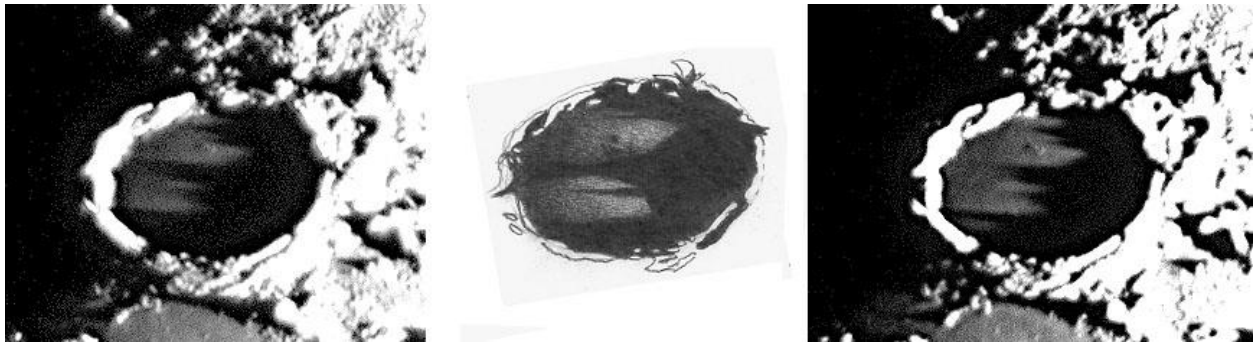


Figure 2: Plato from 2014 Mar 09 – North is towards the top. (Left) Image by Brendan Shaw from 19:41UT. (Centre) Sketch made by Nigel Longshaw at 19:50-20:05UT. (Right) Image by Brendan Shaw from 20:15UT.

Nigel observed under Antoniadi II seeing conditions with transparency being average and a little hazy, using a 4" telescope, x160. Nigel comments: *"I was observing a little later I think, sketch attached, but much of the floor of Plato was in shadow, the only two features I could make out were a couple of dark spots, very difficult, on the edge of the larger shadow spire which I take to be the two more prominent craters on the floor which are close together. I assume the larger central crater would have been in shadow at this time, is the LTP date correct?"*. Nigel noted a marked fall off in brightness on the crater floor approaching the western wall areas of floor. Near the centre/shadow spires the floor was lighter and wondered if this was a contrast effect (Brendan's results though confirm this is a real effect). Nigel glimpsed a dark spot on northern central floor – it was not at all easy to see visually and seemed to be associated with two other darker shaded features between the spot and central shadow spire.

Now the correct predicted time to observe the repeat illumination for the S. A. Jones LTP report (to +/- 1° solar illumination & topocentric libration) would have been 18:05-19:55 UT and for repeat illumination (only) prediction would have been 18:58-19:48 UT. So Brendan Shaw's 19:41UT image was the closest, but still 18 min later than the predicted mid repeat illumination time of the 1972 LTP. This possibly explains the difference in shadow. So I am curious - if members could please check their observational records for a similar appearance in the shadow on the floor of Plato between selenographic colongitudes of 10.1° and 10.5° - then we can safely remove this report from the LTP database. As it is the BAA/ALPO weight is presently only a low value of 1.

Concerning the 1887 and 1895 LTP reports – these seem to be most likely explained away by the shadow spires. Though I am not sure what the luminous triangle refers to in 1887 – however as the time is uncertain, one could imagine a transition between a S.A. Jones type of oval and a more angular region segmented by shadow spires? The 1887 report already has a low weight of 1, and we can no longer justify the 1895 observation remaining at a weight of 2, as the gaps between shadow spires fits the puzzle well, so therefore I am lowering the weight of this LTP to 1, at least until we come across some of the original observations to compare against.

Agrippa: On 2014 Mar 10 UT20:45-20:55 Marie Cook observed this crater under the same illumination conditions to Bartlett's LTP from 1966 listed below. On 2014 Mar 11 UT07:25-08:03 Maurice Collins imaged Agrippa under the same illumination conditions to the second of Bartlett's LTP's listed below – from 1962 though:

Agrippa 1966 Sep 24 UT 02:08-02:27 Observer Bartlett (Baltimore, MD, USA, 5" reflector x283) "Shadow of c.p. abnormally light & grayish. Wall shadow normal black." S=5-3, T=5-0. NASA catalog weight=4. NASA catalog ID #979.

In 1962 Sep 09 at UT 01:42-02:00 Bartlett (Baltimore, MD, USA, 5" reflector, x180, S=5-4, T=3) observed in Agrippa the shadow of the central peak to be grayish, not much darker than the floor, estimated at 3deg bright, whereas on 1962 Jul 12, at col 28deg, in the 5" telescope the shadow was a normal black and sharply defined against the floor which was 3 deg bright. The Cameron 1978 catalog ID=768 and the weight=4. The ALPO/BAA weight=2.



Figure 3: Agrippa from a lunar mosaic by Maurice Collins from 2014 Mar 10 UT 07:25-08:03 – with north towards the top.

Marie found the crater to have a normal black shadow associated with the central peak, under Antoniadi III seeing conditions and good transparency. As you can see from Fig. 3 Maurice Collins also recorded a black shadow associated with the central peak. So it is not clear why Bartlett observed a grey shadow on these two occasions in the 1960's. Bartlett was well known for instigating the largest number of LTPs in our collection. However despite attracting much criticism for this, he generally recorded what he saw reasonably accurately. It was just his interpretation of whether something appeared abnormal that was often in disagreement with our more careful approach of today. As to what to do about revising these weights of 1 for the two LTP, I might be tempted to raise them to a 2 as the shadow should not be gray at these stages in illumination. However because we cannot rule out glare issues in his optics, and we have no information on whether he checked other craters, then these reports will remain at weights of 1 for now.

Plato: On 2014 Mar 12 UT 17:36 and 17:58 Franco Taccogna, and at UT22:05 Claudio Vantaggiato (UAI), observed Plato under similar illumination to the following LTPs - Franco covered the first one, and Claudio covered the second:

Plato 1966 Sep 25 UT 23:12-23:35 Observed by Moseley (Armagh, Northern Ireland, 10" refractor, x140) "Eng. moon blinksys. blinks inside the crater. Very dubious due to low alt. of moon." NASA catalog weight=1. NASA catalog ID #982.ALPO/BAA weight=1.

On 1981 Aug 11 at UT21:05 G. North (England, 46cm reflector, seeing: III, falling to IV) saw a triangular patch on the floor of Plato (see Fig 5 (Left)). Central craterlet visible as a hazy white spot, but other invisible. By 20:33 floor detail was difficult to discern through a yellow filter. At 20:28 when a green filter was tried, the contrast of the floor to the surroundings became very marked with the floor being very dark indeed with no floor patches seen at all, though towards 20:29 the central craterlet appeared twice in quick succession. A break from observing occurred 20:30-20:43 to alert other observers. By 20:45 again through a green filter no interior detail could be seen, but the floor was not quite as dark as before. By 20:49 the seeing had worsened, and no interior detail could be seen even without a filter. At 20:53, again through a green filter, the appearance was the same as at 20:45 UT. Between 20:55 and 21:06 other areas were checked, but nothing else out of the ordinary was seen, though Plato was still a little darker than expected, but not as dark as at 20:45 UT. J-Hedley Robinson (Teignmouth, Devon, UK) observed 21:05-21:40UT and detected on the SSE rim (inner and beyond) a triangle that appeared hazy in a wide range of filters at 21:05UT. However at 21:36UT it was only hazy in green and blue light. No similar effect was seen elsewhere. The Cameron 2006 catalog ID=150 and weight=5. The ALPO/BAA weight=3.

The 1966 repeat illumination, captured by Franco shows no unusual color inside the crater, though there is some natural color present, for example brown/orange on parts of the rim, and steep surface slopes and young craters showing up light blue. The floor of Plato is a mix of dark blue and green-brown, similar to some parts of the adjacent mare areas in Frigoris and Imbrium. In view of the fact that the Moon was between 14° and 13° above the horizon, it is quite likely that the low altitude of the Moon contributed, though Moon Blink devices should be largely immune from atmospheric spectral dispersion, so I am not quite sure why a blink was detected in 1966. I shall keep this at a weight of 1 for now, though it will probably be a good idea to do a review sometime in the future re-assessing all low altitude LTPs.

The repeat illumination observation by Claudio for the 2nd LTP is interesting and highlights some major differences between his sketch and those by North and Robinson. Claudio comments (please excuse inaccuracies in the Google Translation) that the bottom of Plato appeared smooth and, more like Mare Imbrium and Frigoris. Claudio suspects that the explanation for the darkness in the green filter may have been due to the floor of the crater being coated in rich silicate material. Although color can be attributed to mineral compositional differences (and degrades over time due to space weathering effects) and may offer a partial answer, it does not quite explain the transient nature of what was seen back in 1981. So Claudio's explanation may offer a partial answer. However the altitude of the Moon during the 1981 LTP was 17° above the horizon at the start of Gerald North's observation, only a few degrees higher than the 1966 LTP. By the time Hedley Robinson was observing, it was lower still, the seeing was IV, the observatory wall was obscuring half the aperture of the telescope, and the seeing eventually turned V. So I am slightly sceptical of what we see in Hedley's sketch. Nevertheless Gerald's observation is sufficiently different to Claudio's sketch that I think that the weight of this 1981 report should remain at a 3.

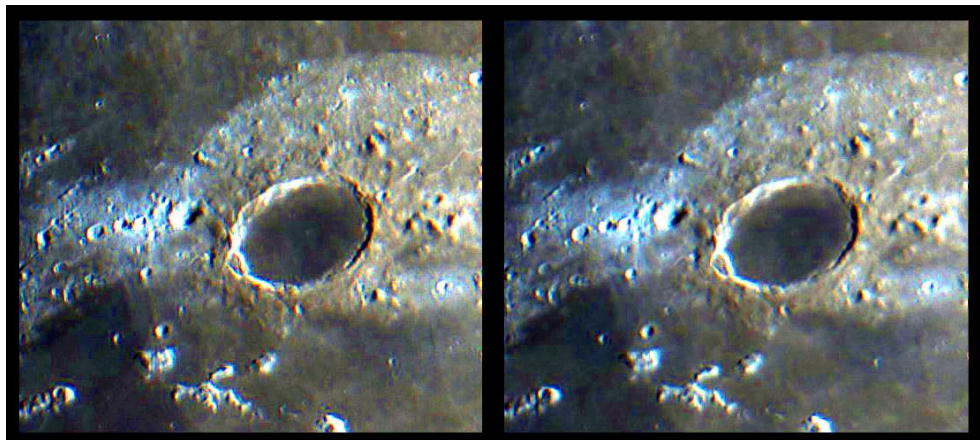


Figure 4. The following images, were taken by Franco Taccogna, have been color normalized, had their color saturation increased to 70%, and contrast stretched to enhance colors. They are with north at the top and west on the right. **(Left)** Image taken at UT 17:36. **(Right)** Image taken at 17:58.

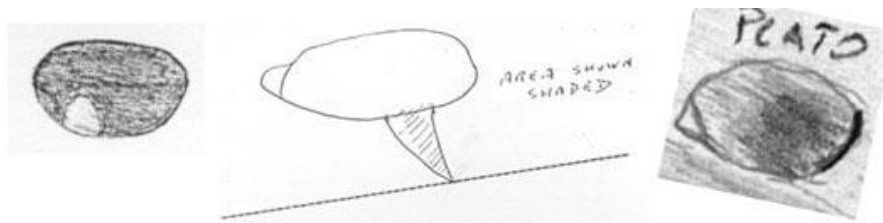


Figure 5. The following images have been orientated with north at the top and west on the right. **(Left)** Gerald North's sketch from 1981 Aug 11 UT 20:12. **(Centre)** J. Hedley-Robinson's sketch from 1981 Aug 11 UT 21:05-21:40. **(Right)** Claudio Vantaggiato's sketch from 2014Mar 12 UT 22:05 under similar illumination to the Gerald North sketch.

Langrenus Limb Mountain: On 2014 Mar 13 UT18:11,18:56,19:10,19:50-19:51 Franco Taccogna, 21:55UT Kevin Kilburn and Brendan Shaw 20:43-20:53 & 21:43, took some images that matched a repeat illumination/topocentric libration to a LTP seen by Richard Baum from 1947. I also took some images with an 8" Dobsonian using a color webcam.

*SE of Langrenus 1947 Aug 28 UT 21:00 Observed by Baum (Chester, UK, 3" refractor, x90)
A long mountain mass, on limb to the SE of Langrenus crater, had a decidedly bluish cast. To the north, on the limb, were several ordinary peaks appearing in profile and some were sharp and pointed. NASA catalog ID=498. NASA catalog weight=3. ALPO/BAA weight=3.*

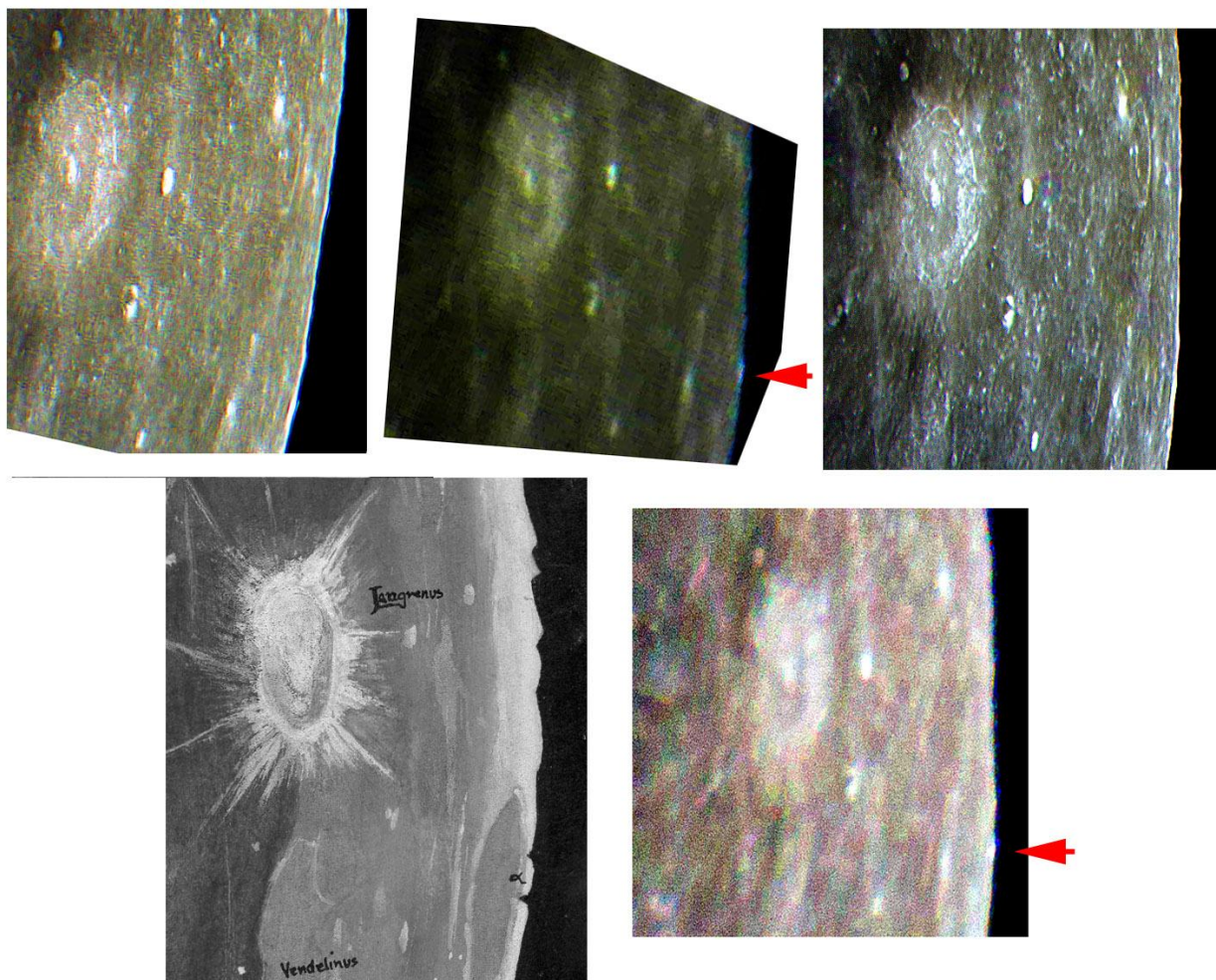


Figure 6. The lunar limb to the east of Langrenus with north towards the top. All observations were taken on 2014 Mar 13, unless mentioned otherwise – a red arrow shows the location of the mountain observed by Richard Baum. The color images have been color normalised and undergone color saturation enhancement. **(Top Left)**. Image by Franco Taccogna UT 19:10. **(Top Centre)** Color web camera image by Tony Cook, extracted from video taken during the repeat illumination/libration time slot. **(Top Right)** Image by Brendan Shaw at 20:43-20:49UT. **(Bottom Left)** The original water color drawing by Richard Baum, made on 1947 Aug 28 UT 21:00, with the location of the blue tinged mountain depicted by “ α ”. **(Bottom Right)** an image by Kevin Kilburn at 21:55UT – just outside the repeat illumination/libration window.

The above images show that Richard’s water color is reasonably accurate for a 3” refractor, although some of the geometrical aspects differ, the topological placements of the features matches up with the present day images. All of the images from March 2014 show the limb mountain, though interestingly the lower resolution ones by myself and Kevin Kilburn show the mountains south east of Langrenus best. Only my own image has any resemblance of a blue mountain on the limb – but this most likely comes from chromatic

aberration in the optics, or the color filter pattern on the webcam CCD chip – other limb mountains (not shown here) have some blue color. In communication with Richard Baum, he points out that the observation was made in his early days of observing, and so may not be up to the same accuracy as his later observations. I also note that the Moon was only 12° above the horizon at the time, and it is also possible that his refractor optics may have contributed some color too. Although we have not solved this mystery of why the limb mountain was blue, categorically, we have at least identified the mountain, and come up with some non-LTP explanations. I will therefore lower the weight of this LTP from a 3 to a 2.

Moltke and Torricelli B: On 2014 Mar 15 UT01:05-01:55 Jay Albert (ALPO) observed these two craters under the same illumination conditions to Marie Cook’s LTP report from 2007 Apr 30:

2007 Apr30 UT: M.Cook (Mundesley, UK, seeing III, transparency moderate) noted some variability in the brightness of Torricelli B and Moltke. This observation has an ALPO/BAA LTP weight of 3.

Jay commented that he did not see any variability in brightness initially. Moltke was very bright, smaller, but with surface brightness initially almost equal to Censorinus. Torricelli B was a tiny bright ring, but much less bright than Moltke. Both were in the same 167x and 214x fields. He never saw any brightness variation in Torricelli B either, but Moltke suddenly seemed to noticeably dim about 01:40. This could have been seeing and transparency effects caused by passing clouds. It remained dimmer until the sky completely clouded over at 01:55UT. However because cloud was not an issue in the 2007 LTP, this shall remain at a weight of 3.

Suggested Features to observe in May: For repeat illumination (and a few repeat libration) LTP predictions for the coming month, these can be found on the following web site: <http://users.aber.ac.uk/atc/ttp/ttp.htm>. By re-observing and submitting your observations, we will get a clear understanding of what the feature ought to have looked like at the time. Only this way can we really fully analyze past LTP reports.

If you would like to join the LTP telephone alert team, please let me know your phone No. and how late you wish to be contacted. If in the unlikely event you see a LTP, advice on tests to carry out can be found on: <http://users.aber.ac.uk/atc/alpo/ltp.htm> . If you are still convinced it is a LTP then please give me a call on my cell phone: +44 798 505 5681 and I will alert other observers. Twitter LTP alerts can also be accessed on <http://twitter.com/lunarnaut>.

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KEY TO IMAGES IN THIS ISSUE

1. Agrippa
2. Archimedes
3. Ariadaeus
4. Gassendi
5. Langrenus
6. Lubiniezky
7. Mare Imbrium
8. Mare Nectaris
9. Philolaus
10. Plato
11. Posidonius
12. Ptolemaeus
13. Sinus Iridum

FOCUS ON targets

X = Mare Vaporum (May)

Banded Craters (July)

Y = Altai Scarp (September)

