THE LUNAR OBSERVER

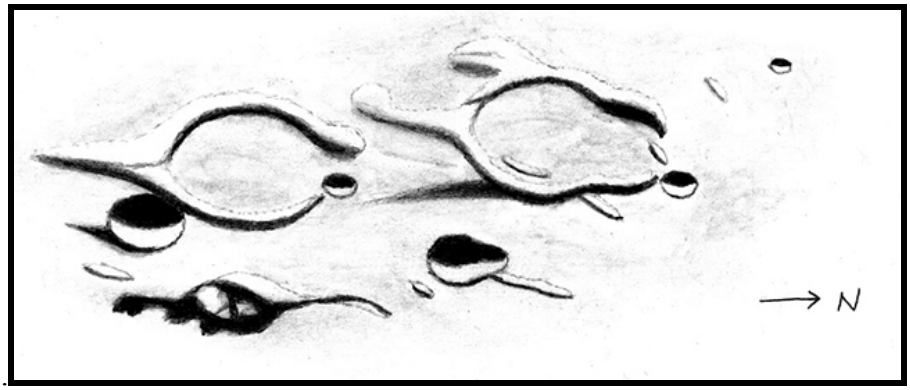
A PUBLICATION OF THE LUNAR SECTION OF THE A.L.P.O.

EDITED BY: Wayne Bailey wayne.bailey@alpo-astronomy.org
17 Autumn Lane, Sewell, NJ 08080

RECENT BACK ISSUES: http://moon.scopesandscapes.com/tlo_back.html

FEATURE OF THE MONTH – APRIL 2014

HOOKE & SHUCKBURGH



Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
November 20, 2013 03:46-04:20 UT, 15 cm refl, 170x, seeing 7-8/10

I sketched these craters and vicinity on the night of Nov. 19/20, 2013 after watching three occultations. This area is well north of Mare Crisium and east of Lacus Somniorum. Hooke is the more southerly of the two main craters. It has a wide rim with a gap in its north end. The rim has a substantial hill on the west side of the gap, and a modest crater sits at the gap's east side. (This crater is not shown on the Lunar Quadrant map.) Hooke is a fairly shallow crater with no detail noted on its floor. A long ridge extends southward from Hooke, tapering to a point. Hooke D is the large, deep crater abutting the southeast rim of Hooke. There is exterior shadowing east and south of Hooke D, tapering to a point south of this crater. This might indicate a short ridge or slope parallel to the long ridge south from Hooke. Another short ridge is just east of Hooke D, and a confusing area of shadow is east of Hooke nearer to the terminator. A crater might be involved within this shadowing, and the LQ map does show an unlabelled crater there. The southern strip of shadow (nearest Hooke D) appears to result from substantial peaks, but I saw no sunlit slopes there. The shadow strip to the north showed a sunlit slope near the 'maybe' crater, then it appears sunlit on its east side near its northern tip. This particular area was the most difficult to draw that night.

Shuckburgh is the other main crater in this sketch, and it somewhat resembles Hooke. It also is a fairly shallow crater with a wide rim and a gap in its north end. The gap in Shuckburgh's rim contains a short ridge that is not aligned with the main rim, and, like Hooke, there is a crater by the gap's east side. This is shown as

Shuckburgh C on the LQ map. The rim of Shuckburgh is highest and/or steepest on its northwest side, just west of the gap. A long ridge extends southward from Shuckburgh (much as with Hooke), but this one ends with a low mound. This mound is near the hill on the north side of Hooke. Two more strips of shadow are also south of Shuckburgh, and a short ridge extends from its northeast rim, south of C. There is also a wide knob bulging out from its southwest rim. The only detail noted on its floor is a short, curved ridge inside the southeast rim and concentric to it. The sides of Shuckburgh are pinched in, hinting that it may be the remains of two overlapping craters. Shuckburgh A is the deep crater to the southeast, and it also appears to be an overlapping pair. Shuckburgh A is a smaller, deeper version of Shuckburgh. A short ridge extends outward from the northeast side of Shuckburgh A, and an isolated peak is southeast of this crater. The small pit northwest of Shuckburgh is Chevallier K, and a small ridge is between that crater and Shuckburgh.

****

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.

There will be sessions specifically for ALPO papers, but I don't have any information on how to submit a paper yet. Stay tuned for more information.

LUNAR CALENDAR

APRIL-MAY 2014 (UT)

April	01	02:30	Moon Descending Node
	04	06:52	Moon-Aldebaran: 2.1° S
	05	07:12	Moon North Dec.: 19° N
	07	08:31	First Quarter
	08	14:52	Moon Apogee: 404500 km
	14	18:24	Moon-Mars: 3.7° N
	15	03:56	Moon-Spica: 1.8° S
	15	07:42	Full Moon
	15	07:47	Total Lunar Eclipse
	15	13:23	Moon Ascending Node
	17	07:42	Moon-Saturn: 0.4° N
	19	12:55	Moon South Dec.: 18.9° S
	22	07:52	Last Quarter
	23	00:27	Moon Perigee: 369800 km
	25	23:16	Moon-Venus: 4.5° S
	28	11:36	Moon Descending Node
	29	06:04	Annular Solar Eclipse
	29	06:14	New Moon
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

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: MARE VAPORUM

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 **May 2014** edition will be **Mare Vaporum.** 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 Mare Vaporum article is April 20, 2014

FUTURE FOCUS ON ARTICLES:

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

Subject	TLO Issue	Deadline
Banded Craters	**July 2014**	**June 20, 2014**

Lists and finding charts of banded craters can be downloaded from:
http://moon.scopesandscapes.com/alpo-bcp.htm

LUNAR TOPOGRAPHICAL STUDIES

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

Assistant Coordinator – William Dembowski - dembowski@zone-vx.com

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

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

OBSERVATIONS RECEIVED

JEAN-FRANÇOIS COLIAC – MARSEILLE, FRANCE. Digital images of Atlas(8) & Theophilus(8).

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 6(2), 7, 9, 10(2), 11 & 12 day Moon, Agrippa, Alphonsus, Alpine Valley-Plato, Aristarchus Aristoteles, Bullialdus, Clavius, Clavius-Tycho, Copernicus(3), Gassendi, Mare Serenitatis, Mons Gruithuisen γ & δ, Plato, Sinus Iridum, Theophilus & Tycho..

ED CRANDALL – LEWISVILLE, NORTH CAROLINA, USA. Digital images of Archimedes-Cassini & Plato-Valles Alpes

HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Conon(2), Conon-Arago(2), Hyginus(3), Ina, Lanrenus-Furnerius, Mare Undarum, Montes Apenninus(2), Sinus Aestuum-Mare Vaporum, Mare Vaporum-Sinus Medii, Oceanus Procellarum & Waning Crescent..

PETER GREGO – ST. DENNIS, CORNWALL, UK. Drawing of Pythagoras.

RICHARD HILL – TUCSON, ARIZONA, USA. Digital images of Aristarchus, Montes Apenninus & Sinus Medii..

DAMIAN PEACH-SELSEY, WEST SUSSEX, UNITED KINGDOM. Digital image of Humboldt.

MARNIX PRAET – STEKENE, BELGIUM. Digital image of Mare Vaporum.

****

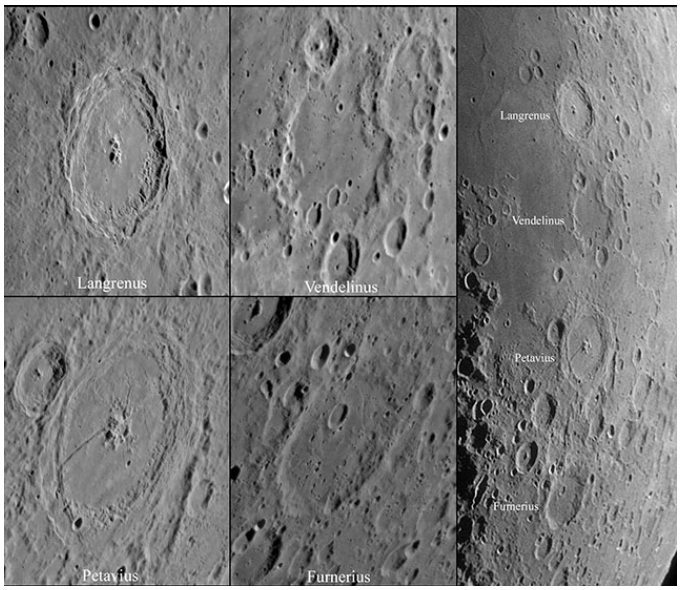
UNCHAINED MEDLEY

Howard Eskildsen

The "Western Chain" arcs across the southeastern limb of the Moon and is a relic of times past. It was once used as an argument in favor of the volcanic origin of craters as if the component craters were extruded from a long, common fault. At that time this was also considered the western edge of the moon, but the conventions changed with the Apollo program and east and west were reversed to their current orientation. As for the idea of a fracture in the crust of the moon that led to the volcanic formation of the craters, work by Dr Ralph Baldwin proved the craters to be of impact origin, not volcanic action, though his work was unappreciated for a decade or more after its publication.

Close examination of the craters shows that they are of greatly differing ages. Langrenus looks fresh with distinct terraces and prominent central peaks, though its rays have all but faded from view. Petavius has similarly prominent central peaks, but its terraces have softened from weathering, suggesting greater age then Langrenus. Also its floor shows evidence of uplift with cracks or rilles belying modification from intrusive magma below the surface. Both Vendelinus and Furnerius show extensive erosion, suggesting that they are by far the oldest craters of the "chain." They also have been peppered with subsequent craters, and their floors have been filled to the point that the central peaks have vanished in the case of Vendelinus, and are barely distinguishable in Furnerius.

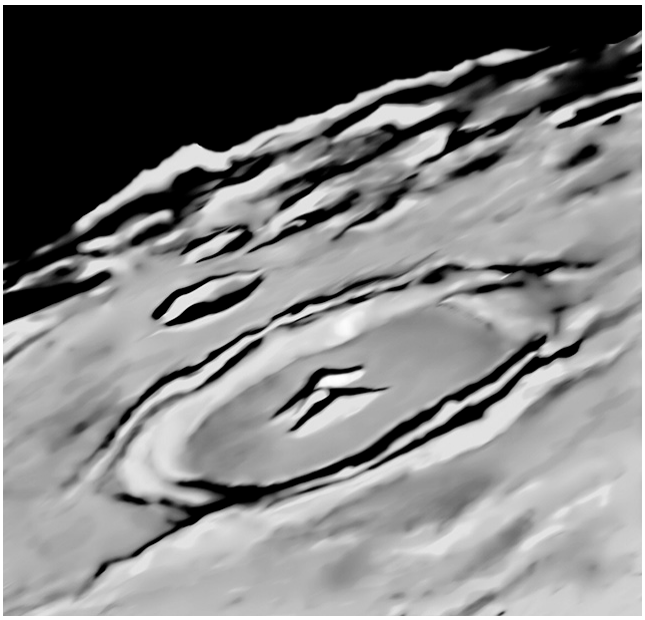
So the "Western Chain" now resides on the eastern side of the moon due to change in convention, and the craters are not linked by a common deep crustal fault, but are a collection of random impacts over a very long period of time. To me it matters not which hypothesis of the origin of craters eventually proved correct, but rather that it was scientific observation that led to the definitive and proper conclusion.



LANGRENUS-FURNERIUS *- Howard Eskildsen- Ocala, Florida, USA.* ***Individual images:*** *January 5, 2012 UT. Mewlon 250, 2x barlow, DMK 41AU02.AS, IR block filters.* ***Overview image:*** *May 2, 2006 UT. 6" f/8 refractor, Nikon Coolpix 4300.*

PYTHAGORAS

Peter Grego

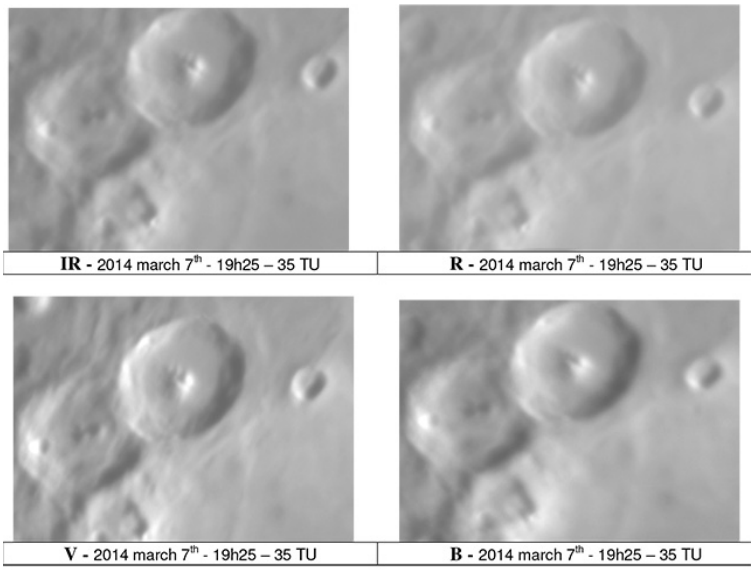


PYTHAGORAS *- Peter Grego, St. Dennis, Cornwall, UK. March 16, 2014 00:50-01:20 UT. Seeing AIII-IV. 300 mm Newtonian, 200x. Colongitude 86.0-86.3 º.*

Despite the poor seeing conditions, transparency was excellent and there was no wind, and there was an opportunity to observe the crater Pythagoras under good morning lighting under very good conditions of libration. Pythagoras was well-presented, having emerged from the morning terminator more than two days earlier. Its interior was exposed to sunlight, save for a narrow shadow cast by the eastern rim. Clearly visible was Pythagoras' prominent central peak system, three components of which were discerned. The eastern most peak, in the foreground, appeared strongly pyramidal, and it was more pointed and a little less bright than the westernmost peak. The crater floor south of the central peaks appeared duskier than in the north. The inner western wall was well-illuminated and complicated in appearance, notably terraced. A small portion of the wall, directly above the central peaks, was (along with the westernmost peak) the most brilliant area in the region depicted. On comparing the observation with various images on file and on the Internet, the brightness of the southern inner western wall appears less pronounced than that depicted. My estimate is that this part of the wall appeared around the same brightness as the inner western wall of Pythagoras D. The area north and west of Pythagoras was highly cratered, Pythagoras D being prominent. The outline of the illuminated rims of the craters Boole and Cremona were on the terminator, their junction being marked by a notable peak. This region is not depicted particularly accurately owing to the poor seeing conditions, and there were fleeting, tantalising glimpses of great detail here, and in the walls of Pythagoras, suggesting that a revisit would be very much desirable under better conditions.

RECENT TOPOGRAPHICAL OBSERVATIONS

THEOPHILUS – Jean-François Coliac – Marseille, France. March 7, 2014 19:25-19:35 UT. Seeing 5/10. Colongitude 348º. 100mm f/13.7 MAK, 3x barlow, PL1M. Meade filters as labeled.



MONS GRUITHUISEN γ & δ - Maurice Collins- Palmerston North, New Zealand. March 23, 2014 08:00 UT. FLT-110, f/21. North down.

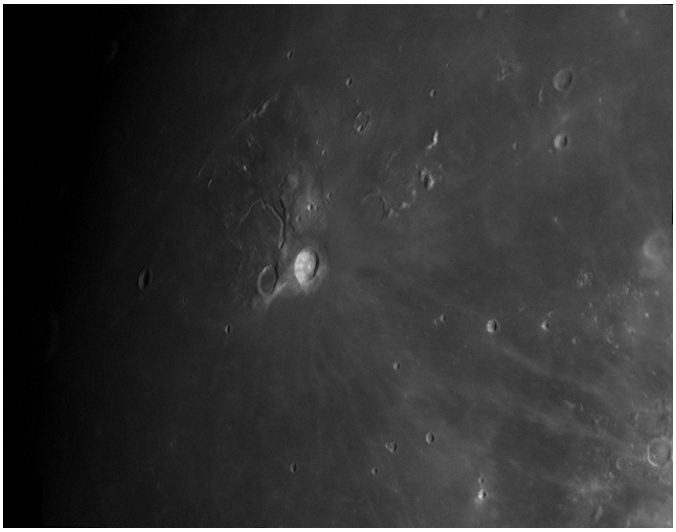
ARCHIMEDES-CASSINI – Ed Crandall – Lewisville, North Carolina, USA. November 11, 2013 23:50 UT. 110 mm f/6.5 APO, 3x barlow, ToUcam.

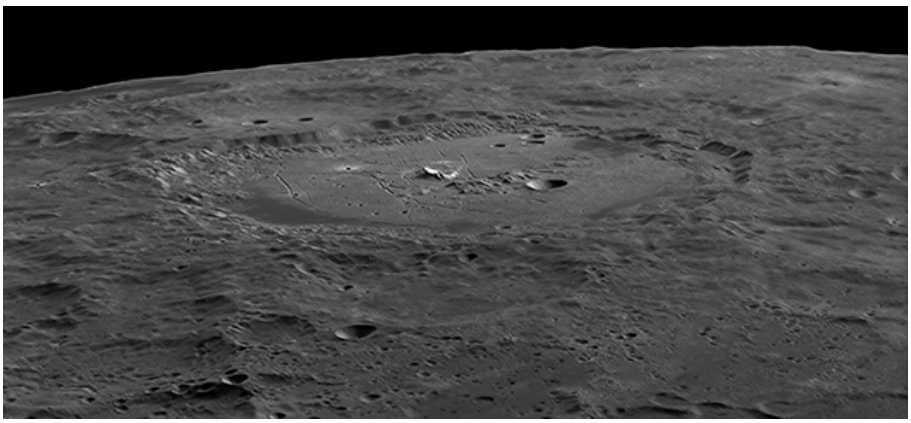
RECENT TOPOGRAPHICAL OBSERVATIONS

MONTES APENNINUS - Howard Eskildsen-Ocala, Florida, USA. March 2, 2012 01:01 UT. Seeing 9/10, Transparency 5/6. 6" APO refractor, Explore Scientific Lens, 2x barlow, DMK 41AU02.AS, IR & V-block block filters.

ARISTARCHUS – Richard Hill – Tucson, Arizona, USA January 14, 2014 04:25 UT. Seeing 6/10. TEC 8" f/20 MAK-CASS, SKYRIS 445. 656.3 nm filter.

Remember when you had your first good telescope and turned it on the nearly full moon and saw this view? The Aristarchus Plateau and breathtaking Vallis Schroteri on the terminator in the vast Oceanus Procellarum cannot fail to be impressive especially to the beginning amateur astronomer. I hope that it's not lost its wonder as the years have gone by. This is by far not my best resolution image of this area but nonetheless pleasing in its expanse and worth sharing. I had to use unsharp masking to bring out the interior of Aristarchus, being one of the brighter features on the moon.





HUMBOLDT–Damian Peach – Selsey, West Sussex, United Kingdom. March 5, 2014. http://www.damianpeach.com/lunar14/humboldt_2014_03_05dp.jpg

RECENT TOPOGRAPHICAL OBSERVATIONS

MARE VAPORUM–Marnix Praet– Stekene, Belgium. December 24, 2013 UT. 10" Newtonian, 3x barlow, DMK21AU618, red interference filter .

****

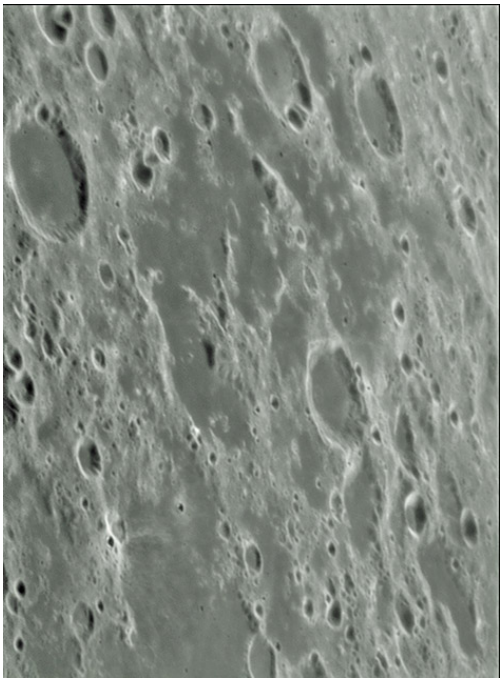
ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

GASSENDI - Maurice Collins-Palmerston North, New Zealand. March 12, 2014 07:55 UT. FLT-110, f/21. North down.

BULLIALDUS- Maurice Collins-Palmerston North, New Zealand. March 12, 2014 08:10 UT. FLT-110, f/21. North down.

ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

PLATO-VALLES ALPES– Ed Crandall – Lewisville, North Carolina, USA. November 11, 2013 23:52 UT. 110 mm f/6.5 APO, 3x barlow, ToUcam.

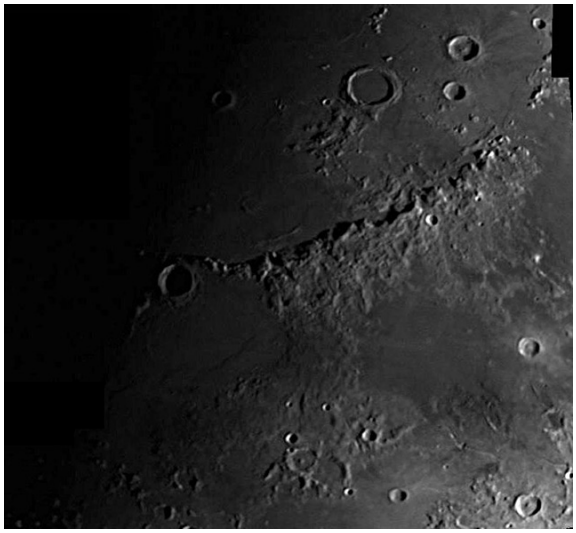


MARE UNDARUM - Howard Eskildsen-Ocala, Florida, USA. January 5, 2012 23:06 UT. Seeing 9/10, Transparency 4/6. Mewlon 250, 2x barlow, DMK 41AU02.AS, IR block filters.

Mare Undarum; is there a more forgettable name or place on the Moon? I took this photo with low expectations. After all what of interest could be there? Then I noticed the concentric crater, Apollonius N. I had been aware of its location while preparing a paper for last year's ALCON convention. Then it dawned on me that other concentrics were in the general area. I began searching, and sure enough, the concentric craters near Schubert N and by Dubyago were also visible on the same frame.

Then the obvious concentric crater Firmicus C popped into view. It had not been on my list of craters for the ALCON presentation; how did I miss it? Closer scrutiny of the area along with some internet surfing, plus a little reviewing of the LROC ACT-REACT QuickMap revealed two other possible concentric craters which are marked by arrows with question marks. Wow! There are four concentric craters in a single high-resolution frame plus two other possible concentric craters. Mare Undarum has turned out to be quite an interesting place after all.

Concentric craters have much shallower depths than normal craters of similar size and appear to have been modified by pressures under the surface that elevated their floors and created the inner rim or toroid. Close scrutiny of the QuickMap hints that other small craters in the area also have had their original depths and interiors modified without the development of the inner toroid. It makes me wonder if concentric craters are only part of a spectrum of crates of similar size and age that were modified by volcanic intrusion some time after their formation.



MONTES APENNINUS – Richard Hill – Tucson, Arizona, USA March 10, 2014 02:17 UT. Seeing 6/10. Questar 3.5", f/13.5, SKYRIS 445. 656.3 nm filter.

I have another Questar image today. This is entitled Montes Apenninus but covers the region from Hyginus to Eratosthenes up to Aristillus. That's a lot of real estate with many interesting features like Pallas and Murchison at the bottom to Archimedes and Montes Archimedes at top. Also contained in the confines of this image is the Apollo 15 landing site, where Falcon set down by the "Hadley Rille" now known as Rima Hadley. Hadley C (6km dia.) is easily seen however I could not make out the rima in this image but heck, this is a 3.5" telescope!

LUNAR TRANSIENT PHENOMENA

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

LTP NEWSLETTER – APRIL 2014

Dr. Anthony Cook - Coordinator

Observations for February were received from the following observers: Jay Albert (Lake Worth, FL, USA - ALPO) observed Aristarchus, Gutenberg, Macrobius, Proclus, the South Pole area, and the West Limb. Maurice Collins (Palmerston North, New Zealand) imaged Aristarchus, Mare Orientale, and the whole lunar disk, Marie Cook (Mundesley, UK - BAA) observed Alphonsus, Archimedes, Aristarchus, Atlas, Endymion, Herodotus, Plato, Proclus, Promontorium Agarum, and Vallis Schroteri. Brendan Shaw (UK - BAA) imaged Calippus, Gassendi, Plato and Proclus.

News: The latest news from NASA's LADEE mission is that they have found the amount of lunar Argon-40 has possibly decreased since the last comprehensive set of measurements during the Apollo era. Argon of course freezes on the surface during the cold lunar night and boils off as the temperature rises during the morning. I would like to add that Argon is also a tracer gas as it can tell us if there has been some out-gassing. I think that tentatively, this might explain why so many TLPs were seen during the late 1960's and early 1970's and less so in more recent time. However a more likely explanation could be that the Apollo instruments were surface experiments, and LADEE measures from orbit, and so Argon concentrations quite likely vary with altitude. Also a more plausible explanation for changes in frequency of TLP with era is that during the Apollo programme there was a band wagon effect with too many inexperienced observers set lose observing the Moon, which in turn caused an excess of TLP seen then. Only by studying the ration of TLP to routine non-TLP reports can we get a better understanding of observational bias.

LADEE has also detected Neon-20 and Helium, and these gases are supplied largely from the solar wind. Helium is imparted to the lunar surface from the Sun during the day and boils off as the surface heats up, but interestingly its supply is quenched during passages through the Earth's magneto tail around Full Moon time. Sodium has also been detected in the lunar exosphere, and the amount present increases towards Full Moon and decreases towards New Moon. LADEE has confirmed that dust in the exosphere increases dramatically as one gets closer to the lunar surface and there is a very clear signature of a higher dust density above the morning terminator, confirming Apollo surface measurements and also theoretical and laboratory models. The mission will terminate in mid-April when they run so low on fuel that they will have to impact the spacecraft onto the surface at a target location (to be announced). Because of the historic importance of Apollo landing sites, no lunar orbiter is now allowed to crash anywhere on the surface, but has to be brought down far away from Apollo sites so as not to damage these. Please check the web link below to see when LADEE will be made to impact the lunar surface, as there might be a chance to see the flash produced by the impact if this occurs on the night side of the Moon or during this month's lunar eclipse?

Concerning why preliminary LADEE results did not detect dust kicked up by the Chang'e 3 lander, the LADEE scientists now think that this was because it happened during the Geminid meteor shower, and this probably masked any residual dust from the Chinese landing. However by studying water, carbon monoxide, and carbon dioxide in the lunar exosphere, before, during and after the landing, they may have now detected a candidate signature for the emission of these gases from the robotic landing. More about the mission can be found on the LADEE website on: http://www.nasa.gov/mission_pages/ladee/main/index.html . How these latest findings affect LTP, and how we should study LTP in future, we shall have to wait (at least a year for full LADEE analysis) and see what size the dust particles are, and whether sufficient density can be found along the path through the exosphere from the Sun to the surface to have enough absorption, or scattering effects, to be detected from Earth. This of course would limit LTP to the sunrise terminator – if they

exist, and if dust was the primary cause. Hence why I suggested doing a review on if and how we should undertake LTP studies, after LADEE scientists have finished their analysis.

We are presently encouraging observers to video the Earthshine looking for impact flashes, and submitting any images of detections found to ALPO's Brian Cudnik (cudnik@sbcglobal.net) also see: http://www.pvamu.edu/physics/cosmic-corner/ and http://alpo-astronomy.org/lunarupload/lunimpacts.htm . I am aware that UAI Lunar Section director, **Antonio Mercatali, has started experimenting with the** ASI 120MM, astronomical video camera, **for imaging impact flashes, another useful possible participant for this observing programme. Still on the subject of impact flashes, i**t is interesting to note that on 2013 Sep 11 UT 20:07 Spanish observers captured the brightest confirmed impact flash ever at 3rd magnitude – about as bright as Polaris, and it lasted about 8 seconds and would have been bright enough to see with the naked eye – to find out more see: http://www.bbc.co.uk/news/science-environment-26325934 . Were any of you observing then? If this had been seen on the dayside of the Moon, then it would have been easily visible too through a telescope. Perhaps this explains some short duration dayside LTP, and ties in nicely with the Leon Stuart lunar flare from 1953 Nov 15. Finally on April 15th a total lunar eclipse can be seen with first penumbral contact at 05:46UT, first umbral contact at 06:46UT, mid eclipse at 07:46UT, last umbral contact at 08:46UT, and last penumbral contact at 09:46UT. Please note that the date and time are in UT and visibility will depend upon your geographical location. Eclipses can be a good time to look for impact flashes.

Jill Scambler has kindly mailed me some maps showing the distribution of LTPs in different lunar quadrants, which I am studying. She previously wrote an interesting article on the lack of correlation between LTP and the sunspot cycle – something which had been known about before by Middlehurst, but had been brought up to date by more recent data see: http://www.universetoday.com/101387/mysterious-moon-flashes-transient-lunar-phenomena-could-be-linked-to-solar-cycle/

Concerning Brendan Shaw's image from last month, of the repeat illumination of Ross D (See Fig 1 below) which matched the 1969 May 25 LTP observation by Gene Cross:

Ross D 1969 May 25 UT 04:34-04:38 Observed by Cross (Las Cruces, NM, USA, 6" f/17 refractor) "Bright spot adjacent to NE segment of crater, 1.5-2" at greatest extent & much brighter than rim of Ross D. Fuzziness here & extensive obscur. of detail E. of Ross D (Apollo 10 watch)" NASA catalog weight=3, NASA catalog ID #1147. ALPO/BAA weight=3.

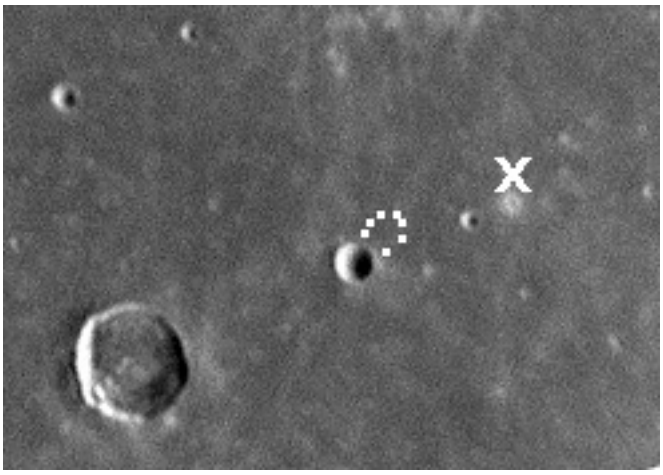


Figure 1. Ross D (just south of centre) as imaged by Brendan Shaw on 2014 Jan 10 UT 00:04 through a green filter with north towards the top. The image has been sharpened and contrast enhanced. The X refers to a white halo crater as described in the last news letter, but should be ignored as it seems to be normal. The dashed area encloses the region described in the original 1969 report.

Gene has kindly added the following comments concerning the fuzzy ringed spot I previously mentioned - see slightly up and far right of Ross D in Fig 1 (see below X): "*that is not the Ross D albedo*

anomaly referred to by Daniel Harris and me.". The correct area, I have attempted to depict in Fig 1 above, with a dotted line. The area contained within is clearly not much different to the surrounding mare, and so I plan to keep the weight of this LTP at 3, as it was in the 1978 NASA catalog, though the difference in appearance between Brendan's image and the 1969 observation might suggest a 4, but I would like a few more repeat illumination (and libration if possible) images to be sure.

Interestingly the day before on 1969 May 24, Gene Cross and Daniel Harris, reported for this same feature… "*The size and intensity (slightly brighter than the maria to much brighter than the maria and varying in size) varies with time, on time scales of a few minutes (e.g., 5-15 minutes) to hours. At 05:38 UT, Daniel notes the bright [anomaly] is better [more easily seen] with a red filter [probably Wratten 25A (or less likely Wratten 23)]. The 21-inch f/15 Cassegrain telescope at Steward Observatory, on main campus of U of Arizona, was used, mostly at 315X*". So perhaps we should time from time monitor Ross D and make it a target area for capturing high resolution images?

LTP Reports: February has been a quiet month with no LTP reports emerging.

Routine Reports: Here is a selection of reports received for Febuary 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 .

Gutenburg: On 2014 Feb 04 UT 01:00-01:16 Jay Albert observed this crater under the same illumination conditions to a LTP seen by Persson from 1972:

> *Gutenburg 1972 Apr 17 UT 20:10-20:45 Observed by Persson (Hvidore, Denmark, 2.5" refractor x58 & x100, seeing=good) "Pale spot on floor of dark yellow color. No changes. Obs. does not call it an LTP. Color is abnormal, chrom. aberr. ?)" NASA catalog ID #1329. NASA catalog weight=1. ALPO/BAA weight=1.*

Jay Albert was observing with a 6" SCT with transparency at opaque to 3rd magnitude, depending upon cloud cover. His seeing was initially 4/10 but declined to 2/10. He notes that: "*The pale, slightly yellowish spot mentioned in the LTP report was seen just N of the center of the crater's shadow-filled floor. The crater's inner W wall was bright and the outer E wall was dull grey. The spot rising out of the shadow appeared to be part of the central peaks complex. I observed using 120x and 167x from 01:00 to 01:16UT*". I therefore will lower the weight of this LTP from 1 to 0, or non-LTP status, and this concurs with the original observers opinion. It is interesting though that we have yet another example of natural color that we can see on the Moon, something that observers with color web cameras can try to detect.

Herodotus: On 2014 Feb 07 UT 18:55-19:05 Marie Cook, using a 90mm Questar telescope, observed Herodotus under the same illumination (to within +/-0.5º) to two observations of a pseudo peak at the centre of the floor of Herodotus crater as seen by Bartlett in 1950 and 1966:

> *Herodotus 1950 Jun 27 UTC 02:30 Bartlett (Baltimore, MD, USA) reported a bright point in crater. This is mentioned in the Middlehurst LTP catalog but not in the Cameron catalog. The source comes from a Strolling Astronomer article. ALPO/BAA weight=3.*
>
> *Herodotus 1966 Jun 30 UTC 03:10-03:35 Observed by Bartlett (Baltimore, MD, USA) described in the NASA catalog as: "Bright pseudo-peak again vis. within floor shadow. Peak est. 5 bright. Had seen it at successive lunations in '66" 4" x280 refractor used. NASA catalog weight=4. NASA catalog LTP ID No. #950. ALPO/BAA weight=3.*

Marie reported seeing no central spot on the floor of the crater, although her observing conditions were very hazy, and seeing at IV (poor). For now we will keep the weights at 3. An article in the BAA Lunar Section's Occasional Notes from Dec 2012 (See: http://www.baalunarsection.org.uk/themoon.htm) reviews all cases of observations of a central bright spot here. The most likely explanation was possibly Bartlett

mistaking a dimple in the shadow for a central peak poking through the shadow, but it does not explain other observers reporting a central peak here from time to time too. There is of course no central peak, which makes the many accounts of observing such a feature interesting. So let us please keep on observing this crater under a colongitude range of 52.6°-60.5° and 92.7°-114.9° until the effect either shows up again, or atmospheric seeing or image flare type artifacts produce something analogous. Also do not get mistaken by a light spot on the southern floor, which is normal; we are just interested in a central spot, or pseudo peak effect.

Proclus: On 2014 Feb 10 UT 23:23 Brendan Shaw imaged Proclus under the same illumination (to within +/- 0.5º) to a LTP reported in 1988 by American Lunar Society (ALS) Observer Bill Davis:

> *On 1988 Jul 25 at UT03:15 Davis (Madison, WI, USA, 6" refractor, x250, seeing 5/10) stated that Proclus was normal apart from a "slightly darker area in SW corner. The NW rim of the crater was the brightest part." The Cameron 2006 catalog ID=334 and the weight=0. The ALPO/BAA weight=1.*

In Fig 2 you can see a direct comparison between Brendan Shaw's image and the sketch from Bill Davis. There is some slightly darker shaded area on the floor of Proclus close to the southern rim in Brendan's image, but it is more curved and covers a larger arc than the Davis sketch. Also it is odd that in the Davis sketch that the bright area on the rim is drawn on the W and not on the NW as the description says. In fact, it almost looks that the sketch needs to rotated by as much as 90° clockwise, to tie up with the image? Although Cameron gives this observation a weight of 0, I am tempted to wait until a repeat illumination and repeat libration viewing session before we can be sure that this dark marking is unusual, so will keep the weight at 1, though my instinct is that this probably is not a LTP.

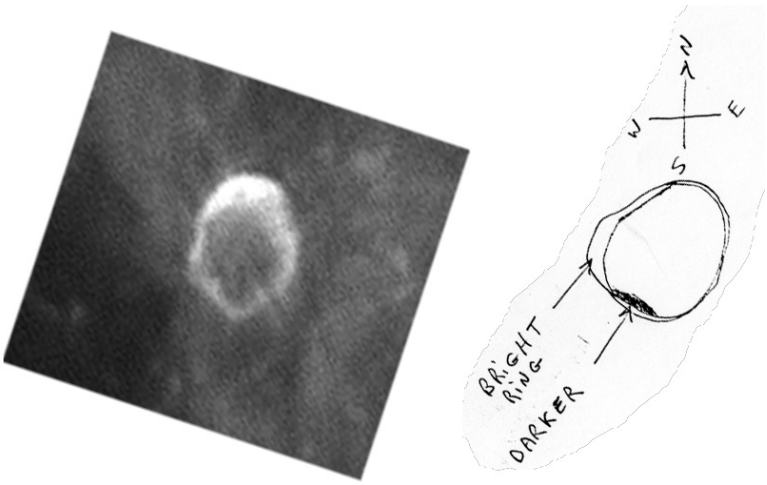


Figure 2. Proclus **(Left)** taken by Brendan Shaw on 2014 Feb 10 UT23:23.
(Right) An ALS observation by Bill Davis from 1988 Jul 25 UT 03:15

Aristarchus: On 2014 Feb 14 UT 09:34 Maurice Collins imaged Aristarchus under the same illumination (to within +/-0.5º) to a LTP reported in 1976 by LeCroy and by Moore in 1991:

> *On 1976 Feb 14 at UT23:35-0053 LeCroy (Springfield, VA, USA, 4.5" reflector, x75, S=6 and T=4.5). A blue haze was seen on the east side of Aristarchus and red haze on the west side. At 00:00UT details were more clear and at 00:24UT Aristarchus and Herodotus, were separated. At 00:34UT colors were gone. At 00:35UT blue was on Aristarchus and the area was bright, but was black in a red filter. At 00:53UT the features were clear and the color gone and the brightness had decreased to 9. Cameron comments that the color was not due to temp. inversion because of being dark in the red filter, implying a medium). The Cameron 1978 catalog LTP ID is 1428 and the weight=1. This is an ALPO report. The ALPO/BAA weight=1.*
>
> *On 1996 Dec 24/25 at 18:12-00:02 & 02:30UT P. Moore (Selsey, UK, using a 15" reflector x250-360, and seeing III) saw a strong orange color on the south wall and floor of Aristarchus. He suspected it to be spurious color but could not detect colors on any other craters. The color remained but at 18:12 UT he suspected a trace*

on color on Mons Pico but was not sure. However he reported it to the LTP coordinator of the BAA Lunar Section. The orange in Aristarchus gradually faded and had almost vanished by 00:20UT when seeing was too bad to continue observing. At 02:30UT he was able to re observe again and there was still a very very slight hint of orange in Aristarchus - but he comments that if he had not been looking for it he might not have noticed. ALPO/BAA weight=1.

In the case of the LeCroy observation, one is tempted to say spectral dispersion would explain blue on the east and red on the west (The Moon's altitude was (17° to 32° above their horizon), however the observer did check through a red filter and found the later blue color seen was "black" in a red filter. This sounds a very obvious color difference, and somewhat unusual to see something as black through a red filter? However Cameron gives a low weight of 1, and she is usually more lenient in weight allocation. The comment about Aristarchus and Herodotus being "separated" seems very odd to say the least as clearly they are distinct in the repeat illumination image . So there is a mystery about some of the quoted observer descriptions. So for now I will leave this weight at a 1, and will keep a look out for any evidence, if the original report can be found, which might clarify some of the above issues. If any of our more senior members know of this observer then please get in contact with me as I would like to learn more about them.

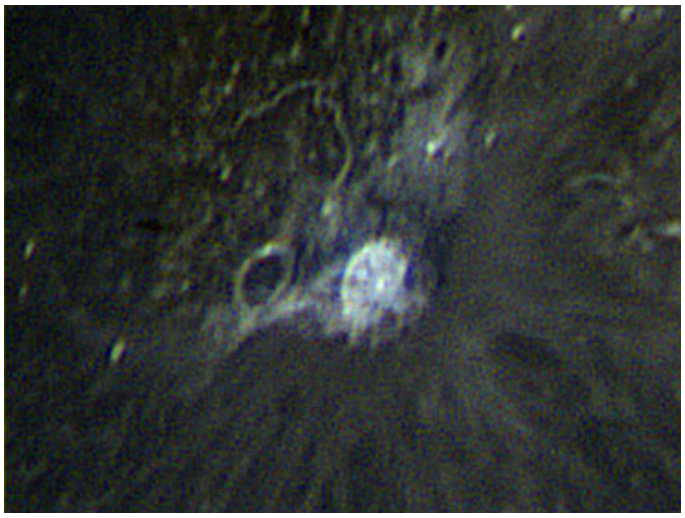


Figure 3. Aristarchus taken on 2014 Feb 14 UT by Maurice Collins. Image has had spectral dispersion removed, been sharpened and had saturation increased.

The Patrick Moore observation again sounds a little like spectral dispersion, however there is no mention by him of blue on the opposite wall of the crater, and although the Moon started off at an altitude of 14°, the last mention of orange color was when the Moon was as high as 47°. I ran a spectral dispersion simulation on the computer, and one would definitely expect blue on the opposite side of the crater. He checked for color elsewhere on the Moon and did not see any, apart from a hint on Mons Pico. Also the color faded, but was again just visible much later when the Moon was at a very high altitude. Other observers were looking during this time as a telephone alert had been issued. Gerald North observed from 20:12-20:25UT and found blue to the N-NE and orange to the S-SW, however his seeing was V or very poor. Gerald observed again 20:29-20:37, 20:45-20:54, 20:56-21:04, and 21:16-21:25UT but reported that all seemed normal, though seeing was hovering around IV-V. Orange was also seen along the bright streak towards Herodotus. Marie Cook found red spurious color on the SW rim at 18:45-19:00 (seeing IV-V), a bright reddish area on the south interior wall of the crater at 19:35UT (but no spurious color and seeing III), and by 21:35 it had gone (seeing II). Marie used a 90mm Questar telescope. There is no doubt that Gerald had spectral dispersion, and Marie reported it too, but only Patrick did not report blue on the opposite wall of the crater and did not see color elsewhere on the Moon apart from a hint on Mons Pico. So the only point to agree on is maybe some orange (red?) on the S interior rim of the crater around 19:45UT as confirmed by Marie Cook and Patrick Moore, but as you can see the evidence contradicts at 18:45-19:00, and 19:35 and 21:35UT. Whether Gerald's

observations made under poor/very poor seeing can be used to judge the observations made under better seeing conditions is open to question. For now this LTP will remain at a low weight of 1, but I suspect that Patrick Moore's view on spurious color might be right, but we cannot entirely eliminate it.

Suggested Features to observe in April: 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/tlp/tlp.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.

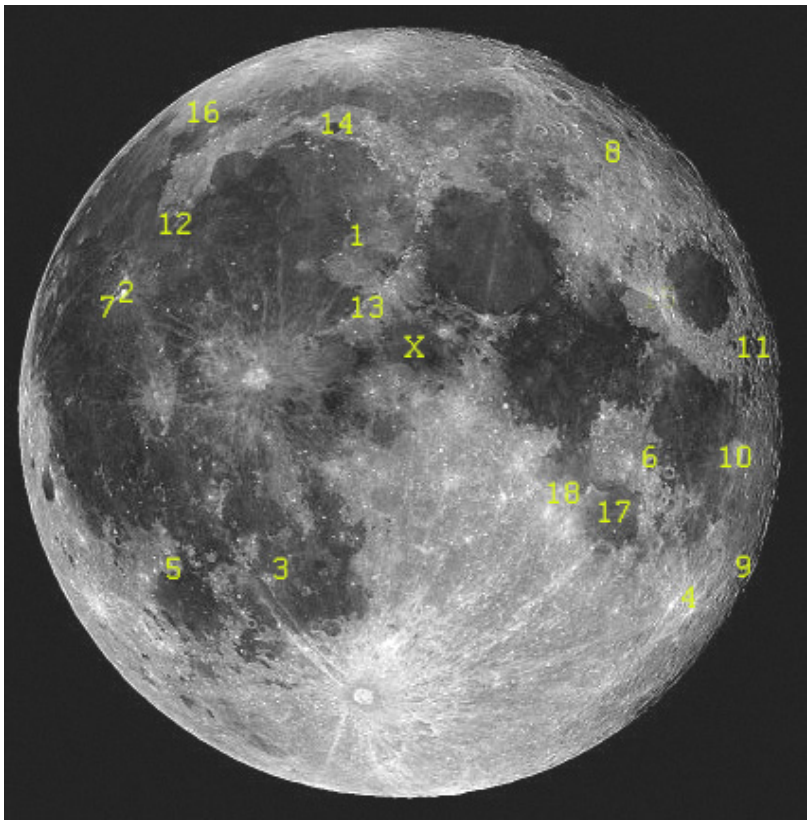
If you would like to join the LTP telephone alert team, please let me know your phone No. and how late you wish to be contacted. If in the unlikely event you see a LTP, advice on tests to carry out can be found on: http://users.aber.ac.uk/atc/alpo/ltp.htm . If you are still convinced it is a LTP then 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.

Dr Anthony Cook, Institute of Mathematical and Physical Sciences, University of Wales Aberystwyth, Penglais, Aberystwyth, Ceredigion, SY23 3BZ, WALES, UNITED KINGDOM. Email: atc @ aber.ac.uk.

****

KEY TO IMAGES IN THIS ISSUE

1. **Archimedes**
2. **Aristarchus**
3. **Bullialdus**
4. **Furnerius**
5. **Gassendi**
6. **Gutenburg**
7. **Herodotus**
8. **Hooke**
9. **Humboldt**
10. **Langrenus**
11. **Mare Undarum**
12. **Mons Gruithuisen**
13. **Montes Apenninus**
14. **Plato**
15. **Proclus**
16. **Pythagoras**
17. **Ross**
18. **Theophilus**



FOCUS ON targets

X = Mare Vaporum (May)
Banded Craters (July)