



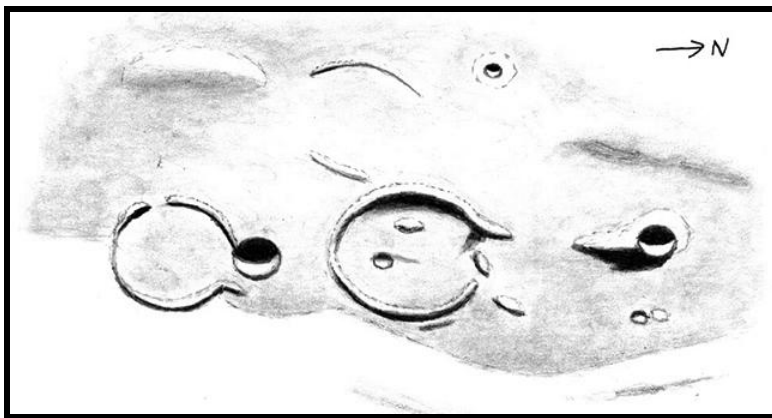
ASSOCIATION OF LUNAR &  
PLANETARY OBSERVERS  
ALPO  
Founded in 1947

# THE LUNAR OBSERVER

**A PUBLICATION OF THE LUNAR SECTION OF THE A.L.P.O.**  
**EDITED BY: Wayne Bailey [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)**  
**17 Autumn Lane, Sewell, NJ 08080**  
**RECENT BACK ISSUES: [http://moon.scopesandscapes.com/tlo\\_back.html](http://moon.scopesandscapes.com/tlo_back.html)**

## FEATURE OF THE MONTH – DECEMBER 2013

### BOHNENBERGER



**Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA**  
**August 24, 2013 07:12-07:44, 08:04-08:14 UT, 15 cm refl, 170x, seeing 8/10**

I sketched this crater and vicinity on the morning of Aug. 24, 2013 when the moon hid 60 and 62 Piscium. This area is in eastern Mare Nectaris near a fault identified as Montes Pyrenaeus. Bohnenberger is a fairly shallow crater with a gap in its north rim. This gap is partly filled by a short ridge that is not aligned with the crater's curvature. Another short ridge is just northeast of Bohnenberger, and a projecting point extends from its rim west of the gap. There is a small pit inside Bohnenberger, southeast of center, adjacent to a short strip of shadow. A low ridge or hill is inside the west rim of Bohnenberger. This west rim appears to be higher than Bohnenberger's east rim. Bohnenberger A is nearly as large as Bohnenberger, but looks to be even shallower. This crater has breaks in its west and north rims, and a projecting point at the north gap. Bohnenberger G is the deep crater on the north edge of A. This is a crisp-looking feature unlike its neighbors. There is a tiny pit with halo west of Bohnenberger. A barely noticeable ghost ring is also in this area. Its east part is a low ridge near Bohnenberger, and its west part is a fine, delicate feature that is widest at the south end. Bohnenberger F to the north is a slightly smaller version of J. A large, wide projecting ridge extends southward from F, and points at the spur projecting north from Bohnenberger. This wide ridge spreads out to an apron along the west and north sides of Bohnenberger F. Bohnenberger J is the small crater east of F, and a small bright spot is to its north. Low wrinkles are west of Bohnenberger F and A (north and south of the ghost ring). The edge of Mare Nectaris is well-defined as the curving boundary east of Bohnenberger, intersecting Bohnenberger A near but not at the projecting spur on its north rim. The interiors of Bohnenberger and Bohnenberger A are the same tint as the mare, but Bohnenberger F and G have bright interiors.

# **LUNAR CALENDAR**

## **DECEMBER 2013 (UT)**

Dec. 01	08:00	Moon 1.5 Degrees SW of Saturn
Dec. 01	23:00	Moon 0.53 Degrees NE of Mercury
Dec. 03	00:21	New Moon (Start of Lunation 1125)
Dec. 03	16:42	Extreme South Declination
Dec. 04	10:16	Moon at Perigee (360,063 km – 223,733 miles)
Dec. 04	24:00	Moon 1.8 Degrees N of Pluto
Dec. 05	22:00	Moon 7.5 Degrees N of Venus
Dec. 08	15:00	Moon 5.4 Degrees NNW of Neptune
Dec. 09	15:12	First Quarter
Dec. 11	04:00	Moon 3.3 Degrees NNW of Uranus
Dec. 17	01:06	Extreme North Declination
Dec. 17	09:28	Full Moon
Dec. 19	04:00	Moon 5.0 Degrees SSW of Jupiter
Dec. 19	23:50	Moon at Apogee (406,267 km – 252,443 miles)
Dec. 25	13:49	Last Quarter
Dec. 25	24:00	Moon 4.4 Degrees SSW of Mars
Dec. 29	00:00	Moon 0.98 Degrees SSW of Saturn
Dec. 31	04:48	Extreme South Declination

## 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.alpoastronomy.org/index.htm](http://www.alpoastronomy.org/index.htm) 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.**

**CALL FOR OBSERVATIONS:**  
**FOCUS ON: ARISTARCHUS**

*Focus on* is a bi-monthly series of articles, which includes observations received for a specific feature or class of features. The subject for the **January 2014** edition will be **Aristarchus**. 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:

**Wayne Bailey - [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)**

**Deadline for inclusion in the Aristarchus article is December 20, 2013**

**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>
<b>Mare Frigoris</b>	<b>March 2014</b>	<b>February 20, 2014</b>

# LUNAR TOPOGRAPHICAL STUDIES

Coordinator – Wayne Bailey - [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)

Assistant Coordinator – William Dembowski - [dembowski@zone-vx.com](mailto:dembowski@zone-vx.com)

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

## OBSERVATIONS RECEIVED

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 3, 5, & 10 day Moon, Boussingault-Demonax, & Theophilus.

ED CRANDALL – LEWISVILLE, NORTH CAROLINA, USA. Digital images of Arzachel, Eratosthenes, & Werner-Purbach.

ROBERT HAYS - WORTH, ILLINOIS, USA. Drawings of Euler  $\beta$ , & la Condamine B.

RICHARD HILL – TUCSON, ARIZONA, USA. Digital images of Aristarchus(2), Aristoteles, Eratosthenes, & Schickard.

RAFFAELLO LENA-ROME, ITALY. Digital images of Lacus Mortis, & Mare Nectaris.

DAMIAN PEACH-SELSEY, WEST SUSSEX, UNITED KINGDOM. Digital images of Arago, Aristoteles, Pitiscus, & Ritter-Sabine.

MARNIX PRAET – STEKENE, BELGIUM. Digital images of Mare Frigoris(2).

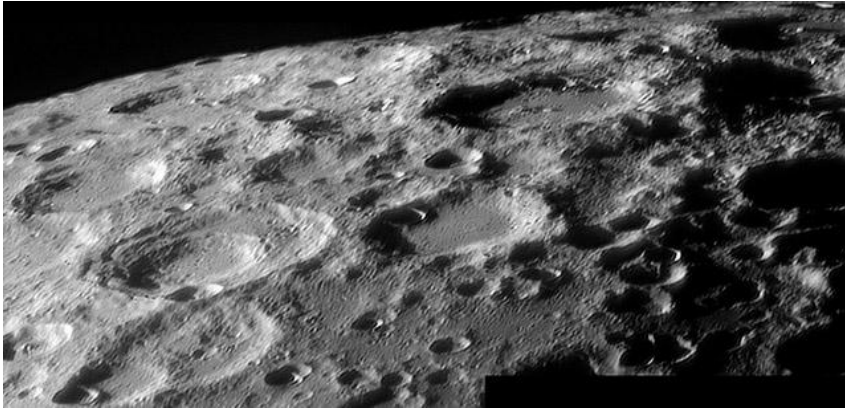
ROBERT REEVES-SAN ANTONIO, TEXAS, USA. Digital image of Aristoteles-Eudoxus, Hyginus-Lamont, Lacus Mortis(2), Nectaris Basin, & Posidonius-Serpentine Ridge.

ORLANDO BENITEZ SANCHEZ-CANARY ISLANDS, SPAIN. Digital images of Anaxagorus(2), Aristarchus(2), Byrgius A, Clavius, Cleomedes, Copernicus(3), Dorsa Euclides, Fra Mauro, J Herschel, Lacus Autumni, Mare Crisium, Mare Humboldtianum, Mare Humor, Mare Serenitatis, Mare Spumans, Mons Huygens, Montes Alpes, Montes Jura, Montes Pyrennaes, Montes Secchi, Piccolomini, Plato-Mare Frigoris, Promontorium Agassiz, Rima Cauchy, Schiller, Seleucus, Sinus Iridum, Tobias Mayer, Tycho Walther

MICHAEL SWEETMAN – TUCSON, ARIZONA USA. Digital images of Aristarchus(2), & Ptolemaus(4).

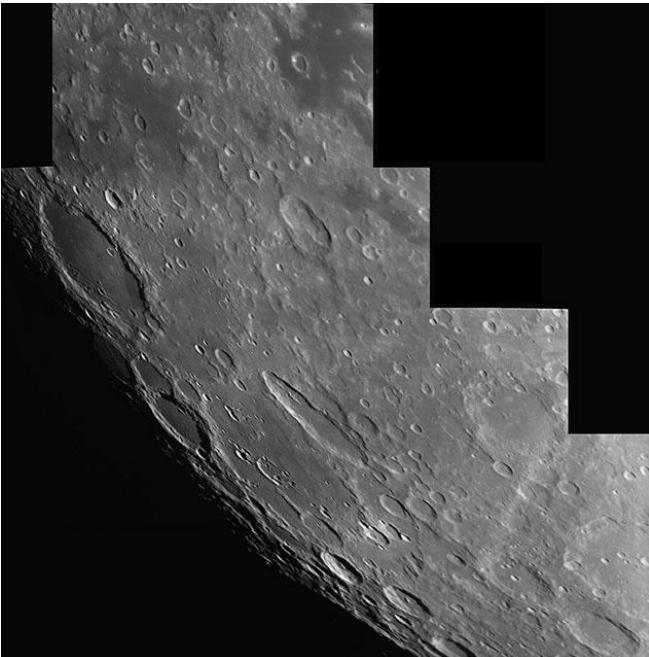
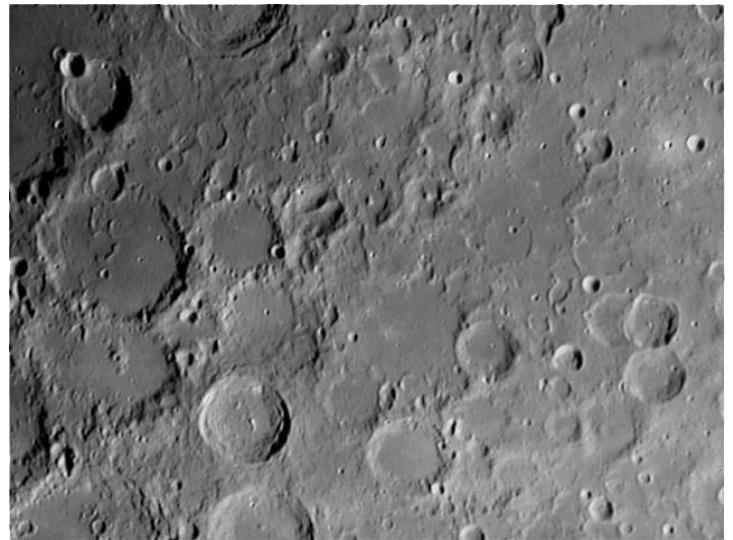
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# RECENT TOPOGRAPHICAL OBSERVATIONS



**BOUSSINGAULT-DEMONAX** -  
Maurice Collins-Palmerston North,  
New Zealand. November 9, 2013  
08:54 UT. C-8, f/30(3x barlow)"  
ASI120MC. North down.

**WERNER-PURBACH** – Ed Crandall – Lewisville,  
North Carolina, USA. November 11, 2013 23:43  
UT. 110 mm f/6.5 APO, 3x barlow, ToUcam.

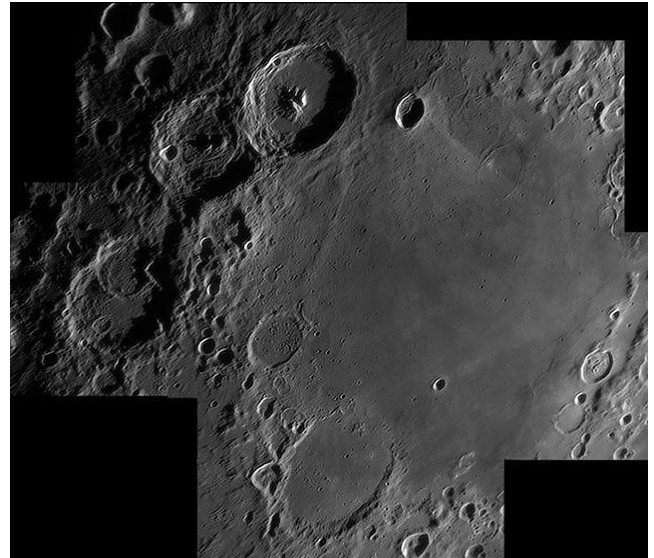


**SCHICKARD** – Richard Hill – Tucson, Arizona, USA  
October 17, 2013 04:28 UT. Seeing 8/10. TEC 8" f/20  
MAK-CASS, SKYRIS 445. 656.3 nm filter.

Here we have a terminator shot just a couple days before full moon. Schickard is just coming into the light and Wargentini below it is still in shadow. Schiller is in the center with lots of small secondary cratering surrounding. Forming an equilateral triangle with Schickard and Schiller is Hainzel and Epimenides in a keyhole shape.

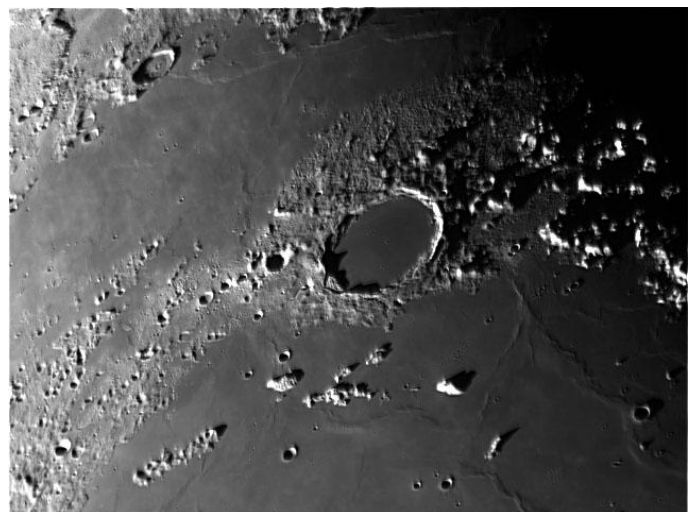
# RECENT TOPOGRAPHICAL OBSERVATIONS

**MARE NECTARIS**-Raffaello Lena-Rome, Italy. March 28, 2012 19:03 UT. 18 cm Mak-Cass.



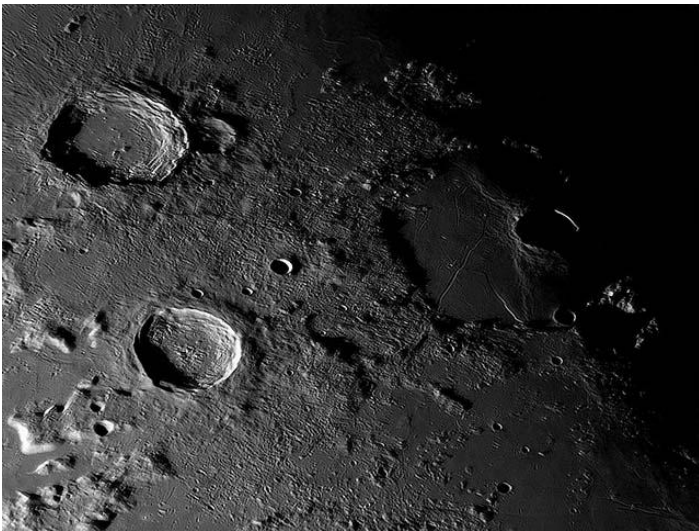
**ARAGO**-Damian Peach -Selsey, West Sussex, United Kingdom. September 24, 2013.

**MARE FRIGORIS**-Marnix Praet-Stekene, Belgium. April 24, 2013 UT. 12" Newtonian, 3x barlow, DMK21AU618, red interference filter .





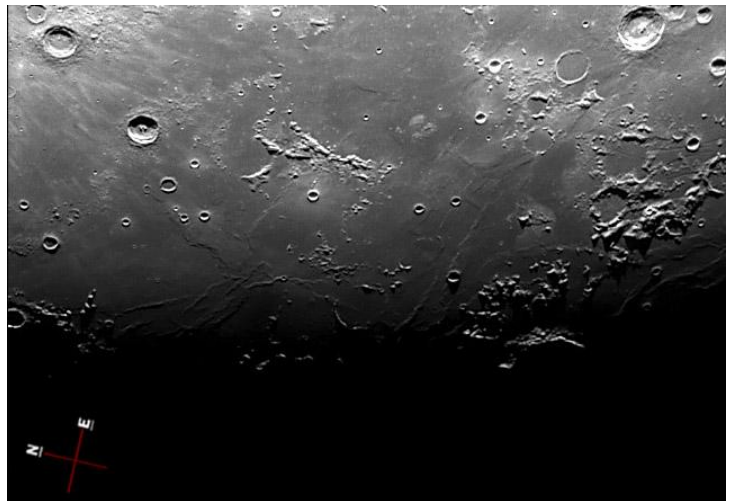
# RECENT TOPOGRAPHICAL OBSERVATIONS



**LACUS MORTIS**-Robert Reeves-San Antonio, Texas USA. October 24, 2013 UT. C-11 Edge HD SCT, f/25, SKYRIS 274.

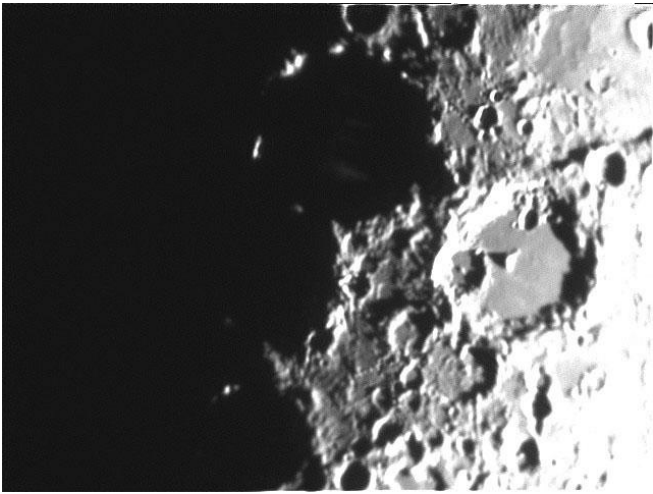
I can never get enough of Lacus Mortis. With Berg plopped in the middle of it, it looks like a huge bullseye. It is a shame that it remains, by tradition, classified as a "lake" because it is actually a whopper of a lava-flooded floor-fractured crater. The rille system within it is fascinating. And Aristoteles and Eudoxus just west of Lacus Mortis are no slouches either. Nice craters!

**DORSA EUCLIDES** - Orlando Benitez Sanchez-Canary Islands, Spain. December 12, 2012 21:10 UT. Seeing 7/10, Transparency 5/10, Colongitude 37°. 235mm SCT, f/6.3, DMK21AU04.AS, IR cut filter.

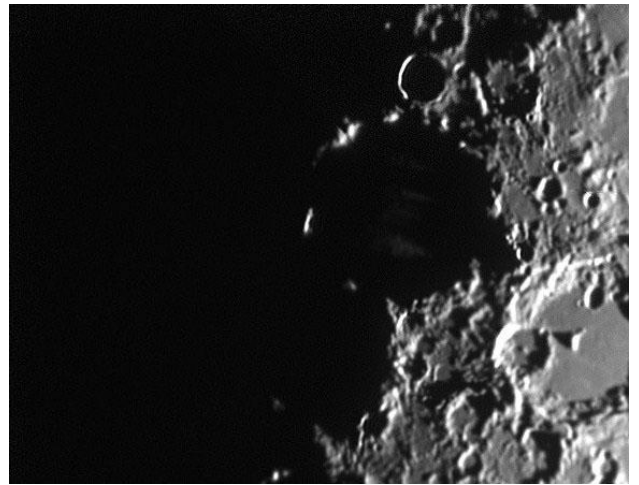




# RECENT TOPOGRAPHICAL OBSERVATIONS



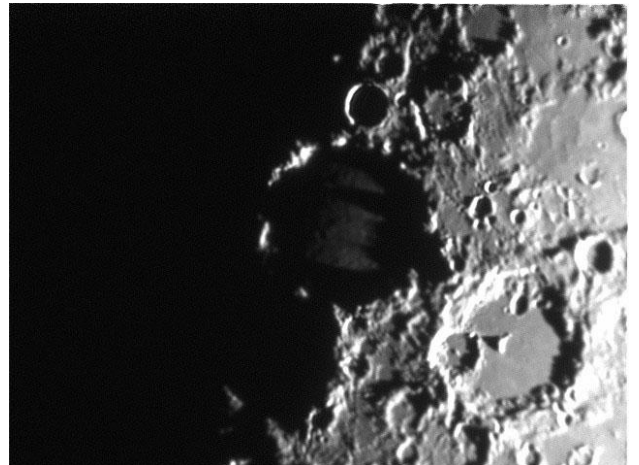
04:14 UT



04:22 UT



04:41 UT



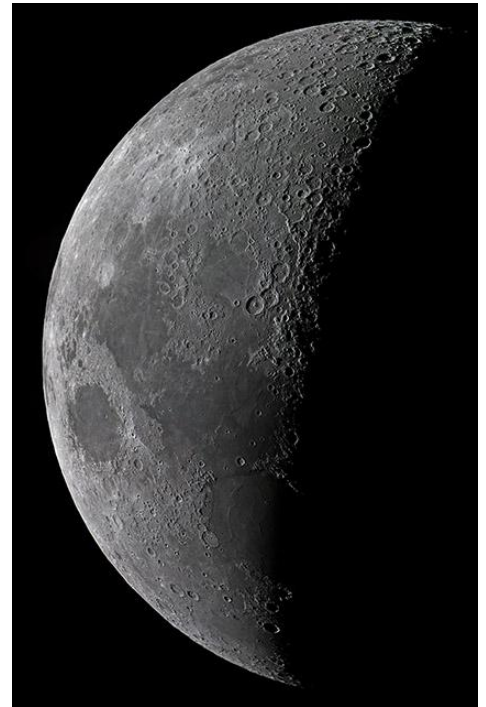
05:00 UT

**PTOLEMAEUS** - Michael Sweetman, Tucson, Arizona, USA, October 12, 2013 UT. Seeing 3/10, transparency 3/6. 4" refractor, f/20. DMK21 Baader fringe killer filter.

Not all has been a bust here. I did get out on October 12 to do some imaging and showed the grandson some of the wonders of the moon. After, I was scanning the surface just to enjoy some visual treats and assess the seeing conditions. I noticed four amorphous streaks across the floor of Ptolemaeus. It was really eye catching. I thought I would hook up the camera and just image what I could. I took the four images attached with the first two spaced 8 minutes apart, the next two at 19 minutes. All four were taken over a period of 46 minutes. I used the same camera settings and processed them all the same in RegiStax 5.1. I have never seen such rapid changes in illumination in any lunar feature before. If nothing else it was fun.

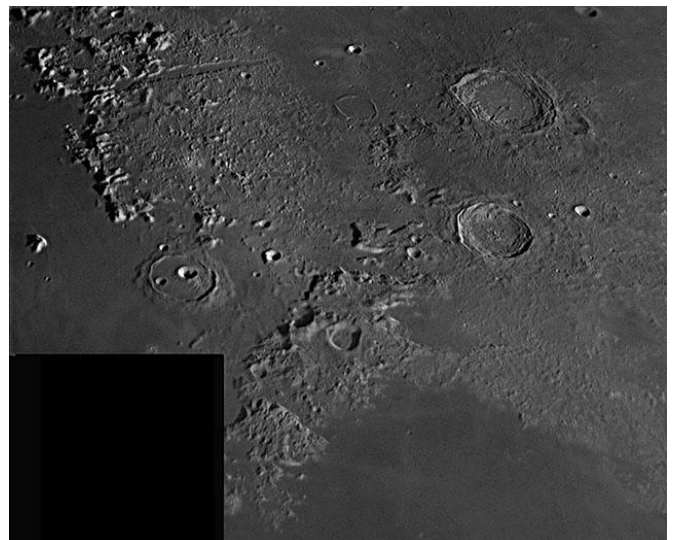
# ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

**5 day MOON** - Maurice Collins-Palmerston North, New Zealand.  
November 9, 2013 08:04-08:22 UT. C-8 ASI120MC. North down.

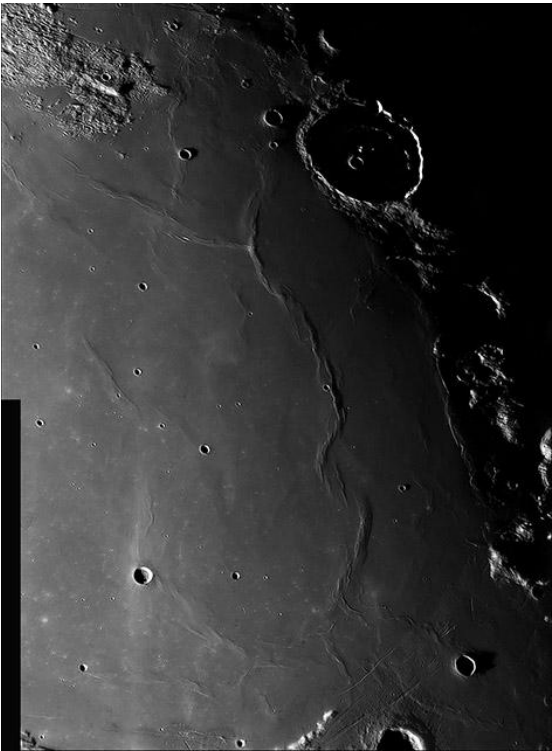


**ERATOSTHENES** – Ed Crandall – Lewisville, North Carolina, USA. November 11, 2013 23:45 UT. 110 mm f/6.5 APO, 3x barlow, ToUcam.

**ARISTOTELES** – Richard Hill – Tucson, Arizona, USA September 12, 2013 02:59 UT. Seeing 7/10. TEC 8" f/20 MAK-CASS, SKYRIS 445M, 656.3nm filter .



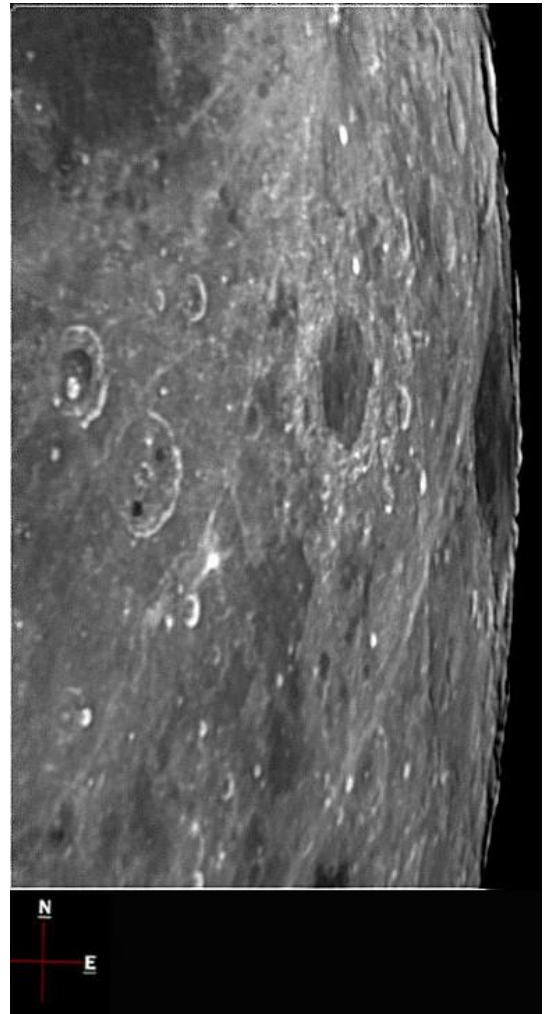
# ADDITIONAL TOPOGRAPHICAL OBSERVATIONS



**POSIDONIUS-SERPENTINE RIDGE**-Robert Reeves-San Antonio, Texas USA. October 24, 2013 10:00 UT. C-11 Edge HD SCT, f/10, SKYRIS 274.

I love how I was able to catch the curved floor-fracture ridge within Posidonius. Another few minutes and it would have sunk into the sunset and been gone.

When I was imaging Posidonius and watching the live image on my laptop, my thoughts were that it looked like a crown laying on black velvet. Even my artist wife loved it, through she said to loose the mountains to the west. That's "creative differences" for you



**MARE HUMBOLDTIANUM** - Orlando Benitez Sanchez- Canary Islands, Spain. May 6, 2012 01:29 UT. Seeing 7/10, Transparency 7/6, Colongitude 89.0°. 235mm SCT, f/10, DMK21AU04.AS, polarizing filter.

# **BRIGHT LUNAR RAYS PROJECT**

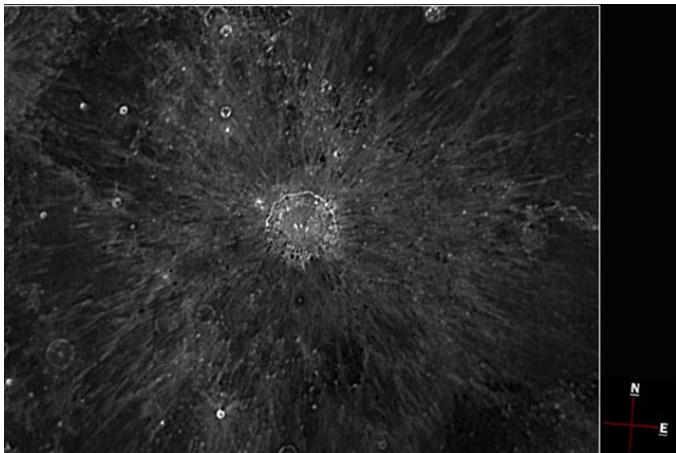
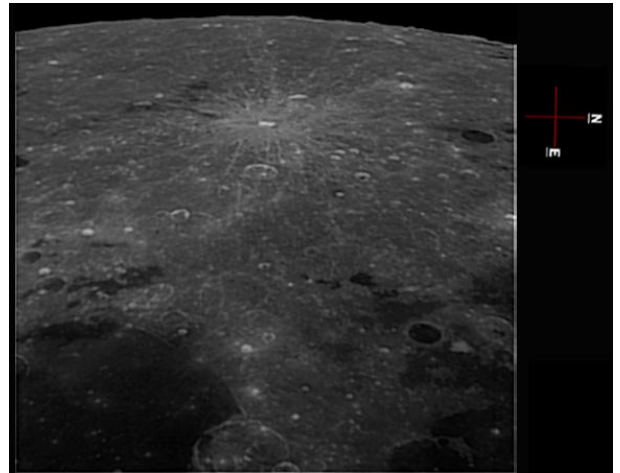
Coordinator – Wayne Bailey – [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)

Assistant Coordinator – William Dembowski – [dembowski@zone-vx.com](mailto:dembowski@zone-vx.com)

Bright Lunar Rays Website: <http://moon.scopesandscapes.com/alpo-rays.html>

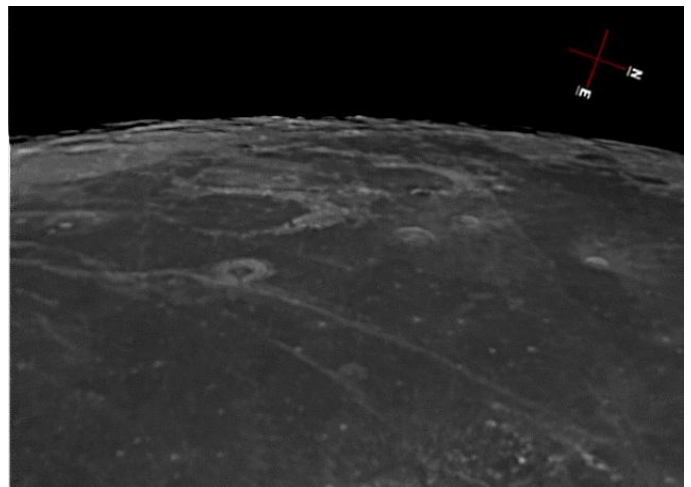
## **RECENT RAY OBSERVATIONS**

**BYRGIUS A** - Orlando Benitez Sanchez-Canary Islands, Spain. May 6, 2012 02:14 UT. Seeing 7/10, Transparency 7/6, Colongitude 89.4°. 235mm SCT, f/6.3, DMK21AU04.AS, polarizing filter.



**COPERNICUS** - Orlando Benitez Sanchez-Canary Islands, Spain. May 6, 2012 02:20 UT. Seeing 7/10, Transparency 7/6, Colongitude 89.4°. 235mm SCT, f/6.3, DMK21AU04.AS, polarizing filter.

**SELEUCUS** - Orlando Benitez Sanchez-Canary Islands, Spain. May 6, 2012 01:17 UT. Seeing 7/10, Transparency 5/7, Colongitude 88.9°. 235mm SCT, f/10, DMK21AU04.AS, polarizing filter.





# **LUNAR TRANSIENT PHENOMENA**

**Coordinator – Dr. Anthony Cook – [atc@aber.ac.uk](mailto:atc@aber.ac.uk)**

**Assistant Coordinator – David O. Darling - [DOD121252@aol.com](mailto:DOD121252@aol.com)**

## **LTP NEWSLETTER – DECEMBER 2013**

**Dr. Anthony Cook - Coordinator**

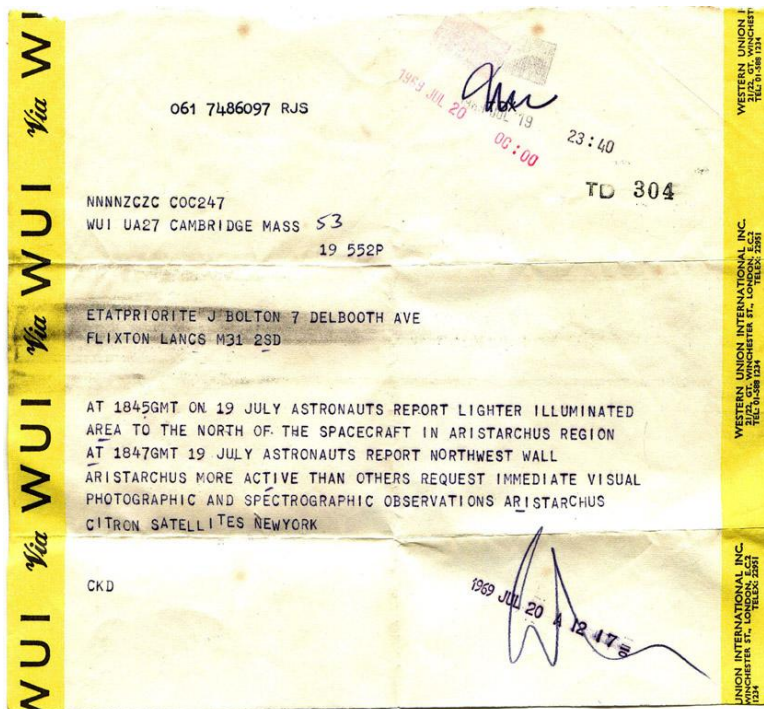
A very Happy Holidays to our readers. Observations for October were received from the following observers: Jay Albert (Lake Worth, FL, USA - ALPO) observed: Alphonsus, Aristarchus, Earthshine, Eratosthenes, Gassendi, Plato, Proclus, Tycho, and several features.. Marie Cook (Mundesley, UK - BAA) observed Aristarchus, Plato, Proclus, and Tycho. Rik Hill (Tucson, AZ, USA – ALPO) imaged Aristarchus, Clavius, Copernicus, Tycho, and several features. Robert Reeves (San Antonio, TX, USA) imaged Cauchy, Lacus Mortis, Posidonius, Rima Ariadaeus, and several features. Andre Munoz imaged several features. Brendon Shaw (UK) imaged Aristarchus, Gassendi, and Proclus.

**News:** The delayed NASA LADEE webinar about coordination of amateur observations of impact flashes with the dust detection experiments onboard the spacecraft will now take place on Thu Dec 5<sup>th</sup> at 20:00 UT on: <http://connect.arc.nasa.gov/lmi/> and is specifically aimed at amateur astronomers interested in this type of observing. If you want to take part in observing lunar impact flashes, and have light sensitive cameras, such as those used in occultation or meteor studies, please get in contact with Brian Cudnik ([cudnik@sbcglobal.net](mailto:cudnik@sbcglobal.net)) or visit his web site on: <http://alpo-astronomy.org/lunarupload/lunimpacts.htm> .

The revised [Hatfield SCT atlas](#) is now available, and users of SCT scopes will find this essential if they are trying to identify craters outside at the telescope because it has mirror images of the surface, like what you see through these types of SCT telescopes. In the back of the atlas are a couple of useful tools for LTP observers, firstly a series of flow charts of what to check for if you think you have discovered a LTP – so as to avoid common mistakes in interpretation. Secondly 32 charts of selected features showing their appearance at sunrise and sunset at 3° intervals – as LTP are sometimes seen under these conditions, hopefully these visualizations will help avoid misinterpretation that have sometimes occurred in the past.

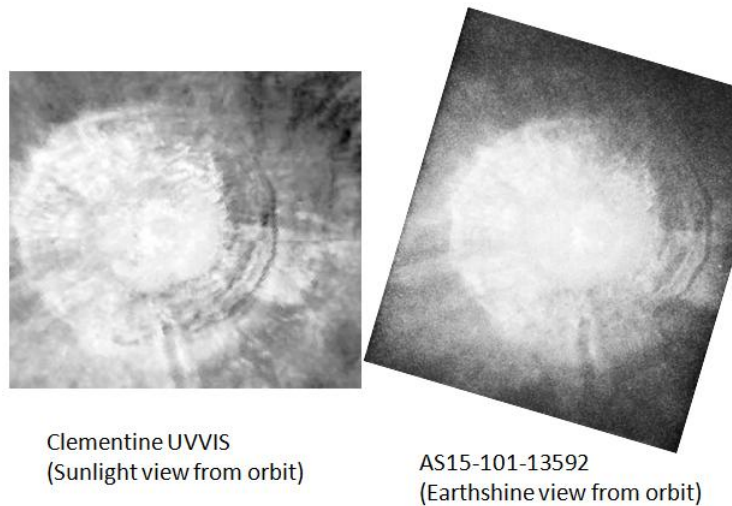
Kevin Kilburn has sent me a copy of a telegram sent concerning the Apollo 11 astronauts Aristarchus LTP from: 1969Jul19 UT 18:45-18:47. Kevin wrote: *“In March 2008 I had a rare opportunity to ask a question of Buzz Aldrin. He was then at Pontefract (UK) and had an audience of about 250. My question was, ‘Did you see any color on the moon from lunar orbit?’ I had assumed he would have said something about the relative surface color of the mare. His reply was not as expected. He said that prior to lunar descent he and Armstrong had seen a bright aspect to the inner wall of Aristarchus. End of story.... What Buzz didn't know when I asked the question at that lecture was that on the evening before the first moon landing, observers including John Bolton in the LION project (Lunar Intensive Observation Network) at the Godlee observatory, Manchester, home of the Manchester AS, had seen a brightening in the wall of Aristarchus and had sent a telegram to NASA to forward to Apollo 11. The reply is attached. Buzz didn't know that I knew of this communication (and I didn't have it in mind when I asked about surface color) but he obviously recalled seeing something odd in Aristarchus”*. As to what it was the Apollo 11 astronauts saw, this is somewhat open to question. The interesting word to word transcript can be read on: [http://www.hq.nasa.gov/office/pao/History/alsj/a11/a11transcript\\_tec.html](http://www.hq.nasa.gov/office/pao/History/alsj/a11/a11transcript_tec.html) , and you should scroll down to page 222 and beneath. As you can see expressions like *“an area that is considerably more illuminated than the surrounding area. It just has - seems to have a slight amount of fluorescence to it. A crater can be seen, and the area around the crater is quite bright”* sound impressive, but it could also mean that the crater was just being seen well in Earthshine. Nevertheless amateur astronomers on Earth: Prusse and Witte (Bochum, Germany, 6” reflector and binoculars) had reported brightness variations in the NW wall of the crater at the

same time. This LTP had been given a weight by Cameron of 5, however the ALPO/BAA weight is a more modest 3.



**Figure 1.** A telegram from the Apollo 11 mission LION Network. Courtesy of Kevin Kilburn, via John Bolton's widow.

Efforts were made with Apollo 15 to photograph Aristarchus in Earthshine, and thanks to Mary Ann Hager from the Regional Planetary Image Facility (RPIF) of the Lunar and Planetary Institute a copy of the photograph has now been scanned and made available (See Fig 2 right). Although a study of the Earthshine



**Figure 2.** Two view of Aristarchus from lunar orbit (**Left**) from Clementine under direct sunlight (local noon). (**Right**) From Apollo 15 under Earthshine illumination (close to zero phase angle). NASA/RPIF images.

photographs was made by Jim Head in the 1970's (Now a famous planetary Professor at Brown University) and found that the albedo values for the floor of Aristarchus seemed anonymously high relative to the surround terrain, a 1990's era Clementine image taken at local noon in sunlight (Fig 2 left) reveals a similar

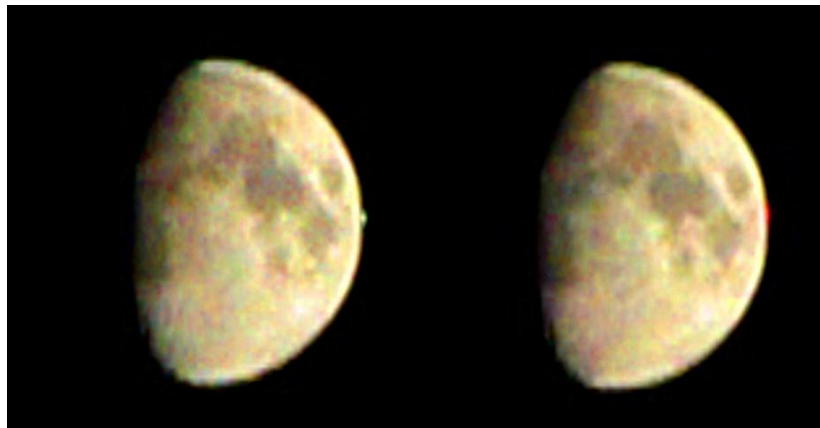


appearance – so in effect Aristarchus was perfectly normal in appearance in Earthshine for similar illumination albeit from the Earth and not from the Sun.

Maurice Collins, myself and Bob O’Connell have started a project to look for changes on the Moon between Apollo imagery and present day LROC imagery.

Lastly, Takeshi (Ken) Sato of Hiroshima, Japan, has been in contact with me over the shallow depression that he detected from photographs, and his colleagues observed in 1960 NE of Aristarchus. Ken has sent me a copy of the paper that discusses this, and I will mention more about this in due course after I have investigated the GRAIL gravity data to see if it, and indeed other sunken (flooded) craters show up, in the newly released gravity maps. If not it might make an interesting new project for the Lunar Section to use low relief illumination images, and/or LTVT type programs to map out buried craters.

**LTP Reports:** One report was received in October, and although not a LTP, it is worth mentioning due to the extraordinary efforts of the observer concerned to prove that it was not a LTP, despite the apparent oddity of what was seen.



**Figure 3.** The Moon as imaged by Kurt Eberhardt on 2013 Oct 14 with north towards the top. (Left) the first effect seen off the eastern limb. (Right) Red effect seen off the eastern limb.

On 2013 Oct 14 UT 00:23-00:24 Kurt Eberhardt (Warsaw, IN, USA) was videoing the Moon using a Canon Powershot SX120IS at 40x with the intent of capturing an Iridium satellite flare – this should have gone from north to south past the Moon, but was not seen. What was recorded instead was a light blob form above the east limb and this then merged into the limb. Some 45 sec later, at the same place a dull faintly visible red blob appeared and then vanished as the Moon moved past it. He confirmed that there were no trees or obstructions in the way. To test out the theory that this was some kind of internal reflection, Kurt waited and did a repeat imaging session in November under a similar lunar phase and got exactly the same effect. We do not know exactly how to explain this effect – and it may have had some additional facts to do with combination of optical and digital zoom, internal reflection, or indeed the image compression. However Kurt should be congratulated on being so “level headed” about this, and under taking some repeat experiments to confirm its non-LTP nature.

**Routine Reports:** Here is a selection of reports received for October that can help to re-assess some past LTP observations.

**Alphonsus:** On 2013 Oct 12/13 Jay Albert UT 23:45-00:05, and on Oct 13 UT 00:26-00:50, observed Alphonsus with a 6” SCT under 6-7 seeing conditions but under a hazy sky with a limiting magnitude of 2. Both the illumination and topocentric libration conditions were the same for the following couple of LTP reports to within  $\pm 1.0^\circ$  and for a third LTP below, the illumination was similar to within  $\pm 0.5^\circ$ .

*Alphonsus 1990 Feb 03 UT 18:00-18:23 Observed by A.C. Cook(Frimley, UK, CCD video camera, seeing III-IV). At 18:06 W and SE dark floor patches, equally dark, but at 18:10 and 18:23 the W dark patch was the darker of the two? Between 18:06 and*

18:23 and a bright patch to the north of the central peak brightened slightly wrt its surroundings. However seeing conditions worsened as the observing session progressed, and in view of this the ALPO/BAA weight=1.

Alphonsus 1990 Feb 03 UT 20:05-21:22 Observed by Brook (Plymouth, UK, 10" reflector). "Brightness variance noted". The Cameron 2006 catalog does not have an entry for this observation. The ALPO/BAA weight=2.

Alphonsus 1966 Apr 28 UT 21:58 Observed by Smith (England, 10" reflector) and Corralitos Observatory (Organ Pass, NM, USA, 24" reflector+Moon Blink) "Reddish patches, (not confirmed at Corralitos with MB tho they give feature as Gassendi in their report)." NASA catalog weight=2. NASA catalog ID #930. ALPO/BAA weight=2.

Jay comments that for the 1990 Alphonsus LTP that the W dark spot was much darker than the SE dark spot. A prominent craterlet was seen inside the W spot. The bright patch N of the central peak appeared to be the top of a sunlit ridge next to a brighter craterlet. It is possible that atmospheric transparency conditions in 2013 and the seeing conditions back in 1990 could make direct comparisons difficult to interpret, so therefore the weight shall remain at 1. At least we know more about the SE dark spot, and the bright patch to the north of the central peaks. For the 2006 Alphonsus LTP, Jay saw no variations in brightness – so this will remain at a weight of 1 as seeing variations seem the most likely explanation, but we cannot be sure. No “reddish patches” or other colors were seen anywhere in or around the crater for the 1966 LTP. If it was not for the Corralitos non-confirmation, this LTP might merit a weight increase to a 3, though it is possible that Corralitos were examining the wrong feature, or more likely long after the events seen in England had finished.

**Gassendi:** On 2013 Oct 15 Brendan Shaw UT 21:30-23:21 took a series of images of Gassendi through different filters. These matched the illumination conditions of the following LTP reports for Gassendi to  $\pm 0.5^\circ$ :

*Gassendi 1966 May 01 UT 19:30-00:21 was observed by Sartory (England, 8.5" reflector, x500, S=G, Moon Blink device used), Moore and Moseley (Northern Ireland, 12.5" reflector x300 and x350, S=E but handicapped by haze and drifting cloud), and Ringsdore (England, observing under excellent conditions). The NASA catalog weight=5. NASA catalog ID #932. The ALPO/BAA weight=4. The specific time line for events was as follows:*

UT	Observation
19:30-19:37	<i>Sartory detects a large and definite blink on the crater floor east of the central mountains, triangular in shape with its apex almost touching the mountains and its base near the wall – it faded quickly at the end of this time period.</i>
19:34	<i>Moseley suspected a tint of orange on the east wall and the central peaks (East slopes).</i>
19:46	<i>Moore also suspected it too.</i>
19:51	<i>Moore suspects a patch on the outer SE wall</i>
19:52	<i>Moore and Moseley report cloud cover now hopeless</i>
20:15-20:23	<i>Ringsdore reports the wedge shaped streak.</i>
21:25-21:32	<i>Sartory observes the blink in the same place as his previous sighting, only fainter.</i>
21:50—21:56	<i>Sartory observes a small blink under the east wall, near to the wall shadow.</i>
22:20-22:50	<i>Sartory: At 22:20 a large blink was seen in the original position, getting denser until 22:25, after which it spread out and became diffuse: nothing was seen without filters but there was the impression of an obscuration in the area. At 22:36 the blink became a pointed oval lying NE/SW between the wall and the mountains. At 22:40 it was fading, and by 22:50 had gone.</i>
23:00	<i>Sartory ends observations.</i>
23:30-23:33	<i>Moore (12.5" reflector) saw a wedge shaped streak from the E wall to the S extremity of the central mountains. This was immediately confirmed by Moseley but then had gone after three minutes.</i>
23:43-00:08	<i>Moseley suspected a patch on the E wall.</i>
23:47-23:58	<i>Moore suspects the above patch too.</i>
??:??-00:20	<i>Moseley and Moore note a fading orange-rust cast on the central peak, at intervals, but this has gone by the end of this period.</i>
00:21	<i>Moseley and Moore clouded out.</i>

*Gassendi 1976 Oct 04 UT 20:55-20:58 Observed by Robinson (Devon, England) - observer noted that the east outside wall was bright in red and normal in blue. Note that the Moon was 30 deg above the horizon at the time of the observation. The crater returned to normal at 20:58. Also seen by Moore (Selsey, UK) and Foley (Kent, UK). At 21:25-21:50 D. Sims (Dawlish, UK, 25cm reflector, x300, seeing IV and some cloud at times) noticed a possible obscuration over the southern part of Gassendi. He had been observing earlier at 18:40-19:30 but had not detected a LTP in Gassendi then. 22:11UT Robinson notices that the spot outside the east wall is again bright in red., though by 22:25 it had faded and was gone by 22:28UT. The Cameron 1978 catalog further quotes: "Vivid red spots & general red color seen around rim by 2 obs. At 2209h blood red small area was seen. 1h later the most westerly (IAU?) of the peaks had become hazy white all other areas were sharp. (Indep. confirm.)." Cameron 1978 catalog weight=5 and catalog ID #1454. ALPO/BAA weight=4.*

Brendan's image (See Figure 4) shows no unusual red areas on the floor of Gassendi, no orange-rust color to the central peak (though they are saturated in the processed version that I have used), nor any wedge-shaped streak on the floor- though there is a triangular wedge of terrain between two radial cracks in the floor, however this does not lie in the correct location. The south-east outer wall is very slightly orange, but this could be due to color image alignment problems. None of the redness seen by Robinson and Moore in 1976 could be seen either. I was tempted to lower the 1966 LTP weight from a 4 to a 3 because none of the effects seen, were confirmed from different observer locations; this was because the observers were not really observing at the same time. Even when Moseley was observing at the same time as Sartory, he failed to detect the orange wedge on the floor, though does report a tint of orange on the east wall and the central peaks instead – but this might be because he was not using a Moon Blink? However because many of these effects were short term (the wedge effect was difficult to explain by atmospheric spectral dispersion as it was seen with Sartory's Moon Blink), and also because Moore and Moseley (although at the same observing site), were



*Figure 4 Gassendi color image by Brendan Shaw with north towards the top. The image has undergone 70% color saturation. The red component was taken at 23:10, the green component at 23:21, and the blue component at 23:15.*

both experienced observers and were seeing similar effects to each other, I have decided to keep the weight at a 4. However I would be happy to lower this if other information came to light. For the 1976 Robinson LTP, there is less information to go on, however the Sims obscuration effect is doubtful in view of their local seeing conditions. Nevertheless based upon the apparent confirmation given in the NASA catalog, the vividness the colors, the experience of the observers, and the short term nature of the effects seen I will also keep this LTP at a weight of 4, though feel slightly less certain than the 1966 event. '

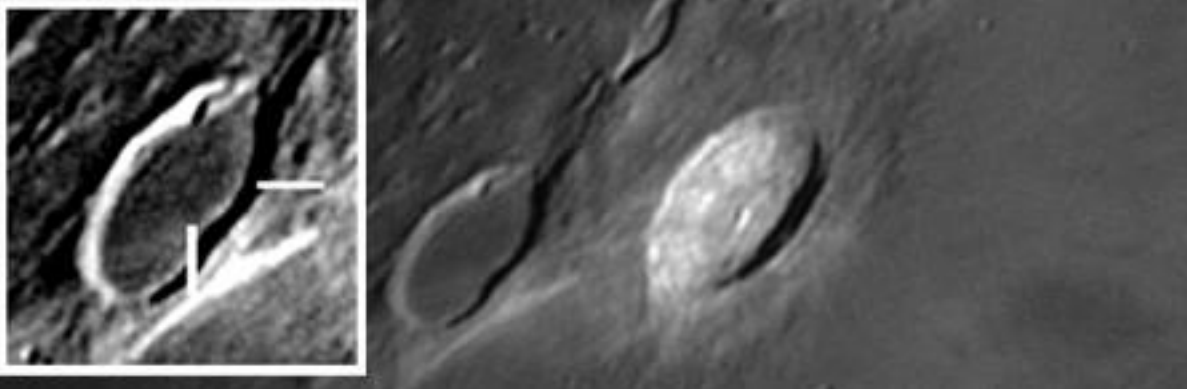
**Tycho:** On 2013 Oct 16 UT21:10-21:20 Marie Cook observed Tycho because this was under similar illumination (to within  $\pm 0.5^\circ$ ) to a LTP report concerning this crater by Patrick Moore:

*On 1980 Jul 24 at UT22:10-22:55 P. Moore (Selsey, UK, 15" reflector, x360 and x400) found an area just south east of the central peak (and upto the wall) to be quite dark in blue light, but normal brightness in red light or in white light. All other features were normal color-wise. At 22:55UT Tycho was normal again. Cameron 2006 catalog ID=103 and weight=4. ALPO/BAA weight=3.*

Marie comments that no dark area was seen in blue, red or white light, to the south east of the central peak, or up to the wall. Therefore this 1980 LTP shall remain at a weight of 3.

**Herodotus:** On 2013 Oct 17 UT Rik Hill imaged (See fig 5) the Aristarchus/Herodotus area under both similar illumination and libration (to within  $\pm 1^\circ$ ) to a LTP report concerning Herodotus crater:

*On 1995 October 6 at UT 21:30 R. Lena (Rome, Italy - a 11.4cm reflector) saw 4 or 5 flashes from Herodotus crater. Light intensities (mag?) ranged from 9 to 8 and they were brighter through a red filter. There is no 2006 Cameron catalog entry for this observation. The ALPO/BAA weight=3.*



**Figure 5.** The Aristarchus area as imaged by Rik Hill on 2013 Oct 17 UT 04:07 with north towards the top. The inset included on the left is a sharpened and contrast enhanced view of Herodotus with markers pointing to a slightly off-centre low lying hill – at least two other low lying hills can be seen to the north west.

Rik's image does not show any tiny bright craterlets that could exhibit the kinds of flashes observed under brief moments of good seeing – therefore the weight of this LTP report will remain at a 3. However it does show possible evidence for shallow relief hills on the floor of Herodotus, one of which is just north of the centre. Could this explain the central pseudo peak that has been seen in the past? Lena has proposed this idea before based upon some GLR observations, however the effect is probably too feeble to explain what is described in the following paper: "[The Pseudo-Peak of Herodotus](#)", published in The Moon: Occasional Papers of the Lunar Section of the British Astronomical Association Vol. 2, Dec 2012., p22-35, and so we must look for other explanations.

**The Moon:** On 2013 Oct 19 UT 21:55 Andre Munoz imaged the Moon (see Fig 6) under supposedly the same illumination as one of the earliest LTP described in the Cameron catalog.:

*Bright light seen during eclipse. Date given as 8<sup>th</sup> but the Full Moon was on 6th according to Goldatine's "New & Full Moon's"). ALPO/BAA catalog weight=1. Cameron catalog weight=3. Cameron Catalog ID: 4. Julian date 1096 Aug 06. Gregorian date 1096 Aug 12.*

Andre imaged the Moon under nominally the same illumination as one of the earliest LTP described in the Cameron catalog, though it should be said that as you can see from the Cameron description above, the date and time of whatever was observed back in 1096, to a naked eye observer was by no means certain. Andre's image reveals the terminator on the eastern limb which is not right for the Full Moon conditions needed for a lunar eclipse. The issue appears to be with my database software dealing with pre-Gregorian dates, and I will be looking into this.





*Figure 6. The northern hemisphere of the Moon with north towards the top left imaged by Andre Munoz on 2013 Oct 19 UT 21:55. This color image has had its color increased to 70% to bring out compositional color detail.*

**Suggested Features to observe in December:** 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>. 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, 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](mailto:atc@aber.ac.uk).

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## KEY TO IMAGES IN THIS ISSUE

1. Arago
2. Aristoteles
3. Bohnenberger
4. Boussingault
5. Byrgius A
6. Copernicus
7. Dorsa Euclides
8. Eratosthenes
9. Gassendi
10. Herodotus
11. Lacus Mortis
12. Mare Humboldtianum
13. Mare Nectaris
14. Posidonius
15. Ptolemaeus
16. Schickard
17. Seleucus
18. Werner

### FOCUS ON targets

X = Aristarchus (January)

Y = Mare Frigoris (March)

