THE LUNAR OBSERVER

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

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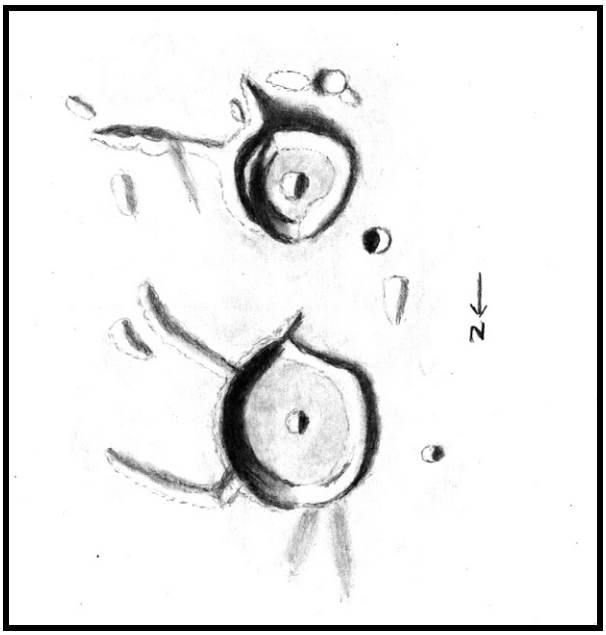
RECENT BACK ISSUES: http://moon.scopesandscapes.com/tlo_back.html

FEATURE OF THE MONTH – DECEMBER 2012

AGRIPPA & GODIN



Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
September 24, 2012 01:28-02:06 UT, 15 cm refl, 136 & 170x, seeing 5-6/10

I sketched these craters on the evening of Sept. 23/24, 2012 before the moon hid 43 Sgr. These conspicuous craters are good examples of the varied non-circular shapes that they can exhibit. Agrippa is the larger and more northerly of this pair. It shows evidence of interior terracing and has a modest central peak. Agrippa has ordinary curved east and north sides, but there are nearly straight west and south-west rims. There are resulting sharp points to the south and southwest, and a blunter point to the northwest. A conspicuous peak is west of Agrippa, and several ridges and strips of shadow extend from its north and east rims. The ridges east of Agrippa are part of the broken ring Tempel, and the pit Agrippa F may be lurking just outside the northeast rim. The smaller crater Godin is south of Agrippa, and has a distinct triangular shape. The north point of Godin is probably its sharpest, and points directly at the south point of Agrippa.

Other points are to the southeast and southwest, making for a nearly equilateral triangle. Godin is heavily terraced inside its east rim, and it has a substantial central peak. This peak appears larger than that in Agrippa. A long, knobby ridge extends eastward from Godin, and a shorter, pointed one protrudes from its southeast rim near one of the points. A few low hills are in this area. Godin A is the crisp, round crater north-west of Godin, and a low ridge is between it and Agrippa. Godin B is the shallower, less crisp crater to the south, and what appears to be a hill is adjacent to its west side. A shadowless bright patch is south of Godin, between Godin B and the pointed extension to the southeast.

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LUNAR CALENDAR

DECEMBER 2012-JANUARY 2013 (UT)

Dec. 06	04:00	Comet Gehrels-2 1.6 Degrees SSE of Moon
Dec. 06	15:32	Last Quarter
Dec. 10	10:00	Moon 4.0 Degrees SSW of Saturn
Dec. 11	14:00	Moon 1.7 Degrees S of Venus
Dec. 12	00:00	Moon 1.1 Degrees SSW of Mercury
Dec. 12	23:15	Moon at Perigee (357,073 km – 221,875 miles)
Dec. 13	03:48	Extreme South Declination
Dec. 13	08:41	New Moon (Start of Lunation 1113)
Dec. 14	11:00	Moon 0.28 Degrees NW of Pluto
Dec. 15	07:00	Moon 5.5 Degrees NNW of Mars
Dec. 18	02:00	Moon 5.8 Degrees NNW of Neptune
Dec. 20	05:19	First Quarter
Dec. 20	19:00	Moon 4.8 Degrees N of Uranus
Dec. 25	21:21	Moon at Apogee (406,099 km – 252,338 miles)
Dec. 26	00:00	Moon 0.42 Degrees S of Jupiter
Dec. 26	21:24	Extreme North Declination
Dec. 28	10:22	Full Moon
Jan. 05	03:58	Last Quarter
Jan. 06	24:00	Moon 3.7 Degrees SSW of Saturn
Jan. 09	15:24	Extreme South Declination
Jan. 10	10:27	Moon at Perigee (360,047 km – 223,723 miles)
Jan. 10	11:00	Moon 2.8 Degrees NNW of Venus
Jan. 11	00:00	Moon 0.32 Degrees NNW of Pluto
Jan. 11	12:00	Moon 5.8 Degrees N of Mercury
Jan. 11	19:44	New Moon (Start of Lunation 1114)
Jan. 13	07:00	Moon 6.2 Degrees NNW of Mars
Jan. 15	10:00	Comet Enke 1.2 Degrees SE of Moon
Jan. 17	02:00	Moon 4.5 Degrees NNW of Uranus
Jan. 18	23:45	First Quarter
Jan. 22	02:00	Moon 0.81 Degrees SW of Jupiter
Jan. 23	05:12	Extreme North Declination
Jan. 22	10:53	Moon at Apogee (405,311 km – 251,849 miles)
Jan. 22	18:00	Moon 1.2 Degrees NE of asteroid 4-Vesta
Jan. 27	04:39	Full Moon

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** 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 (**Bold items are required)**:

Name and location of observer
Name of feature
Date and time (UT) of observation
Size and type of telescope used
Magnification (for sketches)
Orientation of image: (North/South - East/West)
Seeing: 1 to 10 (1-Worst 10-Best)
Transparency: 1 to 6
Medium employed (for photos and electronic images)

CALL FOR OBSERVATIONS:
FOCUS ON: Alphonsus

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 2013** edition will be **the crater Alphonsus. In particular observations are desired at all phases, not just the most photogenic.** 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 Alphonsus to your observing list and send your favorites to:

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

Deadline for inclusion in the Alphonsus article is December 20, 2012

FUTURE FOCUS ON ARTICLES:

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

Subject	TLO Issue	Deadline
Wrinkle Ridges & Rilles	**March 2013**	**February 20, 2013**
Mare Insularum	**May 2013**	**April 20, 2013**

Wrinkle ridges & rilles are most easily seen near the terminator, but some are visible even under a high sun. So send images of any ridges or rilles that you see.

SUNSET OVER TORRICELLI AND SINUS ASPERITATIS

PETER GREGO

A sequence of nine observations (Figure 1) was made over a period of more than three hours as sunset fell over Torricelli. This observation augments observations of the same area made on 2008 September 19/20 and 2009 October 8.

1: After deciding to capture sunset over Torricelli, a CFG LTVT template was generated, adjusted to high contrast to show just the main features and transferred to a PDA (HP HX4700) – this is done in order that a positionally accurate drawing could be made. The template was entirely overdrawn with an observational electronic sketch in the program Mobile Atelier; none of the original template remains visible in the finished sketch.

Figure 1: ***Torricelli***- Peter Grego, St. Dennis, Cornwall, UK. September 6, 2012 Seeing AII, mainly good with good transparency. Time & Colongitude on images. 200 mm SCT, 250x.

The entire interior of Torricelli, with the exception of a brightly illuminated section of its inner eastern wall, was in shadow. The crater's distinct 'keyhole' shape was evident. The outer northern wall appeared bright, and so too did the western part of the southern outer wall; there was a dark gap where these met in the west. Much of the western floor of Torricelli R – the large flooded crater in which Torricelli itself lies – was visible, and the arcing mountains marking the northeastern, southeastern and southwestern rim of Torricelli R were prominent. Northwest of Torricelli, on the floor of Torricelli R, there appeared a low plateau. Two ridges ran due south of Torricelli, one of which formed a continuation of the crater's wall, while the other was narrower and ran into the long shadows cast by the peaks of Torricelli R's southwestern rim. Torricelli A's outer western and inner eastern wall were illuminated, and Torricelli B appeared as an almost complete dim circle, both A and B being surrounded by shadow. A bright point was visible north of B, while to the south of B ran a larger bright mountain peak. Further east, deep beyond the terminator, were visible a number of points catching the sunlight, near Torricelli M; the largest and brightest was probably high ground near Censorinus B, L and T. Numerous ridges extended north from Torricelli across Sinus Asperitatis, the broadest of which ran from the wall of Torricelli R, while a narrower, parallel ridge was visible to its west, running east of

Torricelli C. Torricelli C had a bright outer western wall and a brilliant inner eastern wall. A line of higher peaks north of C cast a set of shadows; these actually mark the eastern end of the two eastern branches of Rimae Hypatia, although the rimae themselves were not discerned. South of Torricelli R were numerous north-south ridges, which are actually part of the radial system of Theophilus. Theophilus lay considerably further south of the area depicted.

2: By this time there were a few subtle changes produced by the advancing terminator. A number of illuminated points north and east of the high ground near Censorinus L had disappeared, and the brightest had shrunk. The faintly illuminated plain southeast of Torricelli was now in shadow, while several peaks near Torricelli N remained visible.

3: Slight fading of bright points near Censorinus L. Fading of rim of Torricelli B and peak to its south. Disappearance of ridge in far north.

4: Only one fading patch near Censorinus L. Torricelli B and point to its north had disappeared, while the peak to its south had faded. Shadows cast by the mountains at the eastern end of Rimae Hypatia now cover the ridges to their west. Several more ridges in north had disappeared into shadow. Shadow of Torricelli C is now at the base of the narrow ridge to its east. Shadows cast by mountains on southwestern rim of Torricelli R now longer, the southernmost shadow now joined with terminator proper. The outer rim of Torricelli itself does not now appear as bright as before, and the inner eastern wall is slightly faded. There is a slight darkening mid-way along the northern outer wall and a darker patch on the southern outer wall in line with the narrow ridge to its south. A ridge is now visible running southwest from the southwestern mountain border of Torricelli R.

5: The floor of Torricelli R now darker. The broad ridge making up its western wall now casts a broad shadow. The plateau on Torricelli R's floor, north of Torricelli, has now been obscured by shadow. Unexpectedly, there is now a dark shadow running east from the shadow cast by Torricelli R's western wall the west tip of Toricelli, and a ridge or step in elevation is now visible running from the west tip of Torricelli to the shadow cast by the southwestern wall of Torricelli R. Interestingly, the northernmost mountain of the line at the eastern end of Rimae Hypatia now appears very bright – along with the inner eastern wall of Torricelli C, it is the brightest feature visible.

6: The inner eastern wall of Torricelli C and the northernmost mountain of the line at the eastern end of Rimae Hypatia remain the brightest features. The dimly illuminated peak near Censorinus L disappeared at 02:20 UT.

7: The inner eastern wall of Torricelli C and the northernmost mountain of the line at the eastern end of Rimae Hypatia remain the brightest features. The shadow cast by the southern mountain in the line at the eastern end of Rimae Hypatia now extends across the ridge to its east, and the mountain line appears to extend further west of Torricelli C and casts a wide shadow. The shadow cast by Torricelli C now covers the first ridge to its east. The final remnant of the floor of Torricelli R, northwest of the tip of Torricelli, has disappeared by 03:10 UT. At 03:15 UT the point of illumination on the northern wall of Torricelli disappears.

8: Torricelli now looking dull and fragmented; remaining visible are its inner eastern wall, sections of its southern and southwestern wall and a section of its northwestern wall. The shadows now encroach upon the base of the outherwestern wall of Torricelli C, and the shadow cast by Torricelli C now covers everything to its east. The plain at the base of the outer southwestern wall of Torricelli R is dark.

9: By 03:48 UT the inner eastern wall of Torricelli has disappeared, but the remaining fragments of the outer wall are still visible. The inner eastern wall of Torricelli C and the northernmost mountain of the line at the eastern end of Rimae Hypatia remain the brightest features.

LUNAR TOPOGRAPHICAL STUDIES

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

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

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

OBSERVATIONS RECEIVED

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 6, 7, 10, 14, 15, 16 & 23 day Moon.

ED CRANDALL – LEWISVILLE, NORTH CAROLINA, USA. Digital images of Albategnius, Abulfeda, Cassini, Cassini-Eudoxus, Catena Abulfeda, Menelaus-Bessel rays, Rimae Hyginus-Triesnecker, Rimae Triesnecker, Theophilus & W. Bond-Meton.

COLIN EBDON-COLCHESTER (ESSEX) ENGLAND. Drawings of Crozier, Dorsum Smirnov(2), Julius Caesar & Lacus Mortis.

HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Alphonsus(3), Brianchon-Sinus Iridum, Cardanus-Riccioli, Einstein-Cavalarius, Glusko, Hevelius-Seleucus, Janssen-Mare Australe, Janssen-Rheita, Lichtenberg-Aristarchus, Linne, Maurolycus-Gemma Frisius, Maurolycus-Janssen, northern moon, Plato-Archimedes, Poczobutt-Mons Rumker, Sharp-Diophantus, Struve-Russel-Eddington, waning crescent moon & Zagut-Janssen.

PETER GREGO – ST. DENNIS, CORNWALL, UK. Drawings of Torricelli(9).

HAYS, ROBERT - WORTH, ILLINOIS, USA. Drawings of Agrippa-Godin & Lictenberg.

RICHARD HILL – TUCSON, ARIZONA, USA Digital images of Bullialdus, Capella, Capuanus, Fracastorius, Posidonius, Theophilus & Torricelli.

PHILLIP MORGAN –LOWER HARTHALL-TENBURY WELLS, WORCESTERSHIRE, ENGLAND. Drawings of Cassini, Bompland & Sabine.

ROBERT O'CONNELL-KEYSTONE HEIGHTS, FLORIDA, USA. Digital image of southcentral moon.

JERRY ORR-ORACLE, ARIZONA, USA. Digital images of Clavius-Tycho & Copernicus area.

MICHAEL SWEETMAN – TUCSON, ARIZONA USA. Digital image of Torricelli-Catherina.

RECENT TOPOGRAPHICAL OBSERVATIONS

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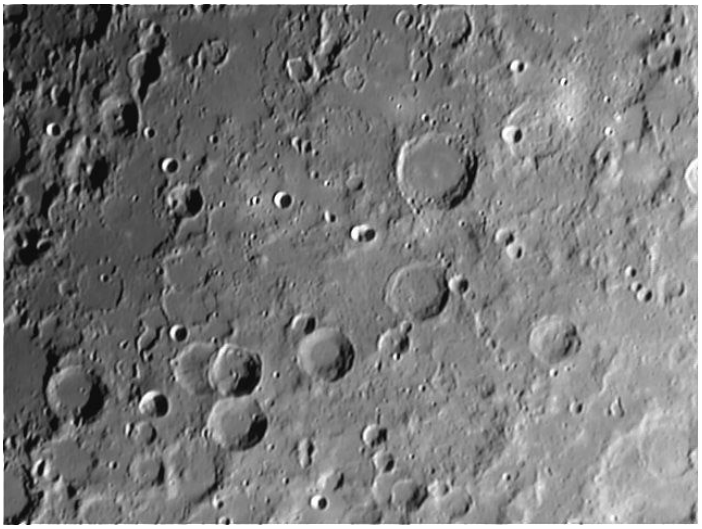
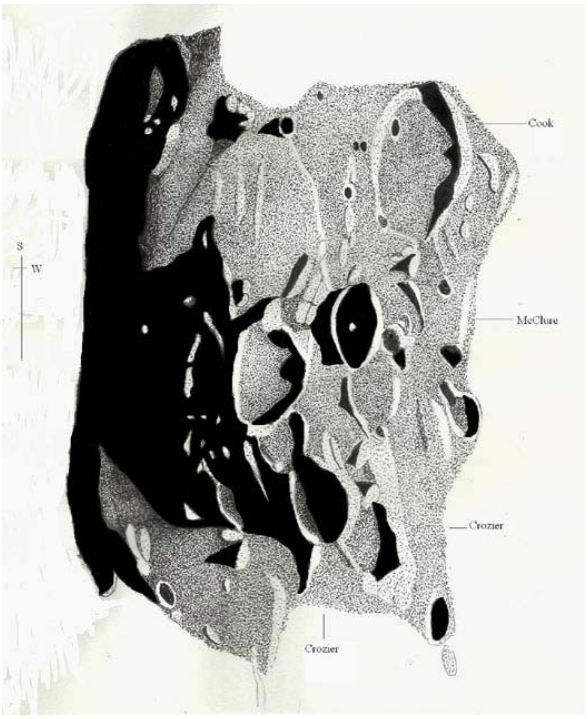
23 day MOON - Maurice Collins-Palmerston North, New Zealand. November 7, 2012 18:19-18:39 UT. ETX-90 SCT, LPI.

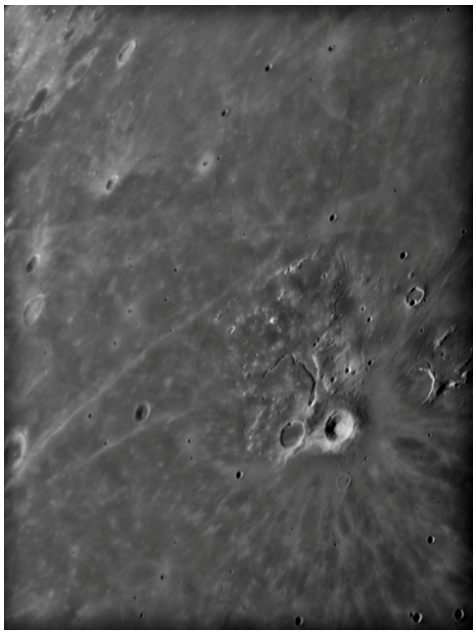


CATENA ABULFEDA – Ed Crandall – Lewisville, North Carolina, USA. October 23, 2012 00:01 UT. 110 mm f/6.5 APO, 3x barlow, ToUcam.

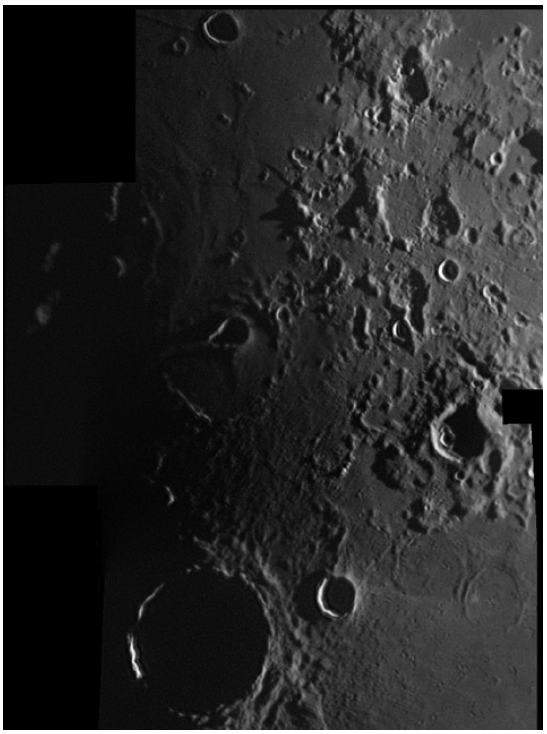


CROZIER- Colin Ebdon-Colchester (Essex) England. September 3, 2012 22:45-24:00 UT. Seeing A III, transparency good. Colongitude 125.9-126.5º. 7" f/5 Mak-Cas, 236x

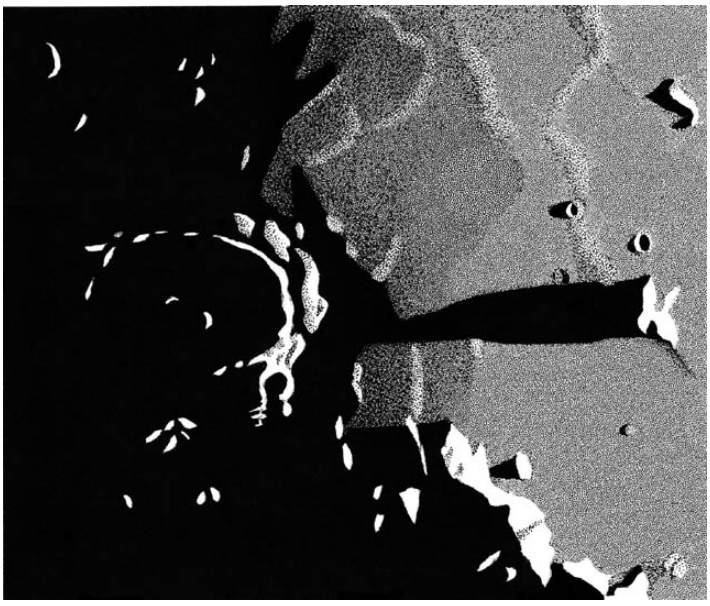
RECENT TOPOGRAPHICAL OBSERVATIONS



LICHTENBERG-ARISTARCHUS- Howard Eskildsen-Ocala, Florida, USA. November 8, 2012 UT 10:59 UT. Seeing 5/10, Transparency 5/6. 6" f/8 refractor, Explore Scientific lens, DMK 41AU02.AS, IR block & V block filters.

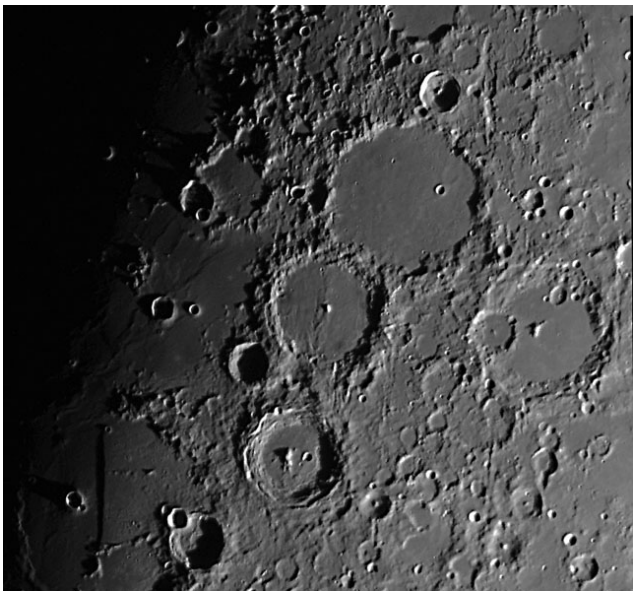


TORRICELLI – Richard Hill – Tucson, Arizona, USA November 19, 2012 00:53 UT. Seeing 8/10. TEC 8" f/20 MAK-CASS.. DMK21AU04. 656.3 nm filter.



CASSINI –Phillip Morgan –Lower Harthall-Tenbury Wells, Worcestershire, England. November 6, 2012 04:00-04:50 UT. 305 mm f/5 Newtonian, x400. Seeing 7/10 Transparency 5/6. Colongitude 176.5-177.0°.

RECENT TOPOGRAPHICAL OBSERVATIONS



SOUTH CENTRAL MOON – Robert O'Connell-Keystone Heights, Florida, USA. November 22, 2012 02:54 UT. 9.25" f/10 SCT, Seeing 4/10 transparency 6/6. Astronomik 742 IR pass filter, DMK41AU02-AS.

COPERNICUS AREA - Jerry Orr-Oracle, Arizona, USA. November 23, 2012 UT 01:30 UT. Seeing 7/10, Transparency 4/6. 90 mm f/10 refractor, Fujifilm finepix. Northeast up.

TORRICELLI-CATHERINA-Michael Sweetman, Tucson, Arizona, USA, October 21, 2012 03:06 UT, Seeing 3/10 transparency good. 6" f/12 Mak. DMK21. Orion IR cut off filter.

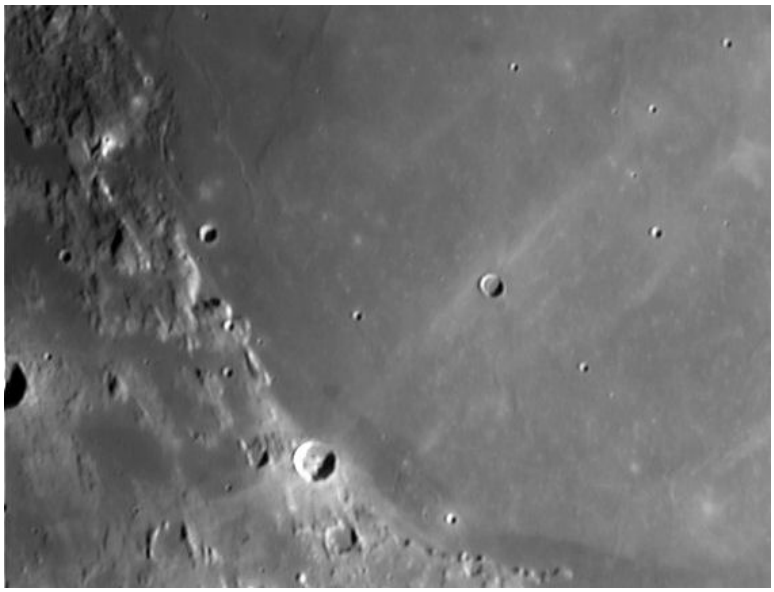
BRIGHT LUNAR RAYS PROJECT

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

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

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

RECENT RAY OBSERVATIONS



MENELAUS & BESSEL RAYS - Ed Crandall – Lewisville, North Carolina, USA. October 23, 2012 00:12 UT. 110 mm f/6.5 APO, 3x barlow, ToUcam.

EINSTEIN-CAVALARIUS REGION - Howard Eskildsen-Ocala, Florida, USA. November 8, 2012 UT 10:51 UT. Seeing 5/10, Transparency 5/6. 6" f/8 refractor, Explore Scientific lens, 2X Barlow, DMK 41AU02.AS, IR block & V block filters.

LUNAR TRANSIENT PHENOMENA

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

LTP NEWSLETTER – DECEMBER 2012

Dr. Anthony Cook - Coordinator

Firstly I wish our observers a Happy Holidays at this festive time of the year. Routine observations for October 2012 were received from the following observers: Jay Albert (Lake Worth, FL, USA) observed: Aristarchus, Mare Crisium, Mons Pico, Mons Blanc, Plato, the southern highlands, and the southwest limb. Artem Chitaylo (Novokuznetsk, Russia) imaged the lunar crescent. Maurice Collins (New Zealand) took whole disk image mosaics of the Moon. Marie Cook (Mundesley, UK) observed: Alphonsus, Aristarchus, Herodotus, Mons Pico, and Plato. I obtained time lapse images of the Moon in narrow wavebands, using the robotic telescope at Aberystwth University. Rik Hill (Tucson, AZ, USA) imaged: Atlas, Bullialdus, Capella, Endymion, Fracastorius, Mare Crisium, Messier, Palus Epidemiaium, Posidonius, and several features. Steve Laing (New Zealand) took a whole disk image of the Moon. Norman Izett (New Zealand) took image sequences of Earthshine and the lunar crescent. Bob O'Connell (Keystone Heights, FL, USA) observed Herodotus, Tycho and took images of several features. Thierry Speth (France) observed and imaged Gassendi. Michael Sweetman (Tucson, AZ, USA) imaged the Theophilus area.

LTP Reports: On 2012 Oct 14 at 23:36:32 UT, +/- 5 seconds, Artem Chitaylo of Novokuznetsk, Russia imaged a bright point on the Moon's eastern dark limb, just below the equator, during a sequence of images. This appeared on only one image. The spot was apparently not a hot pixel on the CCD, but was slightly red in color – though it should be said that the cusps of the Moon were slightly red too, and so the low altitude of the Moon may have contributed to this? However as we have seen before, with bright transient points on the Moon, cosmic rays, or strobe lights from distant aircraft, these can all produce similar effects to a small meteorite impact against the lunar surface. As there is no record of a 2nd observer making simultaneous observations, and it is in only one image from a sequence, this observation gets a weight of 1 for now.

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

On 2012 Oct 03 UT 00:10-00:30 Marie Cook observed Mons Pico under similar illumination to a LTP report from 1976 Aug 13:

> *Pico 1976 Aug 13/14 20:50-01:00, 03:15 Observed by Foley? or Findlay? (England, S=E) "Dark line to the E. (IAU?) of Pico obs. & persisted till 0100h. On 14th the whole area around Pico was gray & diffused. At 0315h detail reappeared & NW corner sparkled. Small brilliant spot appeared due N. of it & the albedo exceeded Aristarchus (=9+ ?)" NASA catalog weight=3 (average). NASA catalog ID #1443. The ALPO/BAA weight=2.*

Marie noted that Mons Pico was normal in appearance. There was some atmospheric spectral dispersion present, with blue to the north, and red to the south. The detail was sharp and the usual bright spot was visible. Nothing resembled the unusual descriptions from 1976, therefore the weight of this LTP report shall remain at 2.

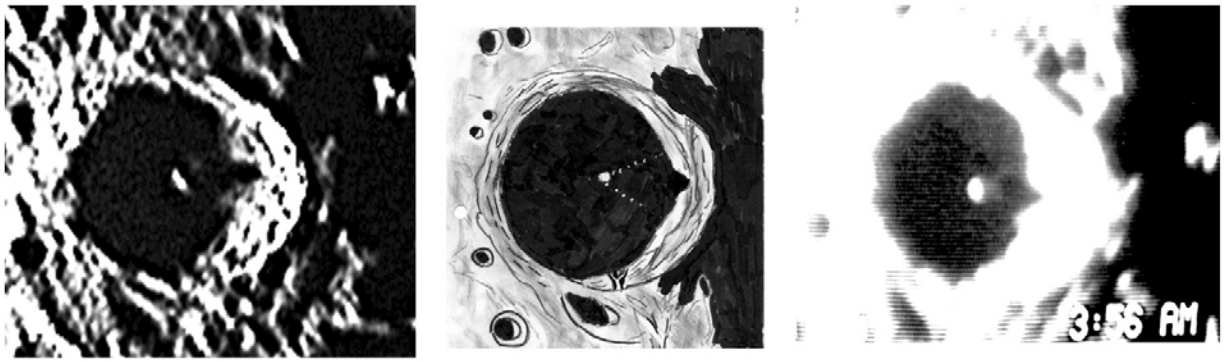


Figure 1 *Enhanced images, and a sketch of Tycho, with north towards the top.* ***(Left)*** *Bob O'Connell's image from 2012 Oct 08 UT 09:39 Selenographic Co-longitude = 186.0.* ***(Center)*** *Sketch by David Darling from 1992 Aug 21 UT 09:46 Selenographic Co-longitude = 187.0.* ***(Right)*** *Image by David Darling from 1992 Aug 21 UT 09:56 Selenographic Co-longitude = 187.1.*

On 2012 Oct 08 UT08:45-09:39 Bob O'Connell observed Tycho at local lunar sunset under similar illumination conditions to David Darling's LTP report from 1992:

Tycho 1992 Aug 21 UT 07:58-10:59 Observed by Darling (Wisconsin, USA, 16" & 11" reflectors, visual, photographic, CCD video observations made) "At 08:56UT a V-shaped glow started to appear in the shadow to the east of the central peak - there should be no glow here from sunlight as the shadow is increasing in size as the sun sets over Tycho!" ALPO LTP report. ALPO/BAA weight=3.

Figure 1 compares one of Bob's 2012 images with some observations provided by David Darling. In truth there is a lot more to David Darling's LTP observation than just the paragraph summary above, for example it was confirmed by 3 observers and the sketch and image from 1992 shown in Figure 1 are from the end of the predicted 2012 observing window for Bob's site in Florida. It does however suggest that a V-shaped formation of protruding sunlit ground is to be expected for this stage in illumination when the Sun's local altitude on the Moon lies between 4.5° and 3.9°. For these reasons I am lowering the weight from a 3 to a 2, but in future would very much like to see image or sketch evidence for the fragmented nature of the V shaped structure if anybody is able to capture this? I should add that back in 1992 a nebulous patch also formed to the NE of the central peak, and the V shaped formation was not visible in the shadow at the start of the observing, but towards the end? However as we have seen in the past, the sunlit eastern wall can illuminate floor detail quite well during sunset conditions, so maybe this explains the other phenomenon?

	07:45	07:55	08:05	08:14	08:20	08:29	08:39
Aristarchus	114.1	113.1	111.5	113.1	111.1	103.8	97.4
Bessarion	81.3	70.9	74.7	74.3	65.8	60.9	61.4
Copernicus	103.6	100.1	99.8	98.2	97.7	89.4	93.1
Kepler	84.5	80.2	82.4	79.8	78.1	71.5	66
Pytheas	84.6	82.2	91.9	78.5	82.2	65.9	70.4
Mare	47.5	47.9	43.4	46.3	43.7	41.3	39.4

Table 1. *The brightness's in image digital number (DN) values of 5 differentlunar features, and one reference mare area (between Copernicus and Keller)at 7 different UTs.*

Norman Izett has been busy taking some Earthshine images. This is important because there have been visual reports in the past that craters, Aristarchus in particular, can vary in brightness over short time scales in Earthshine. This is easily checked for using CCD cameras by taking images every 5 or 10 or 15

minutes and comparing them with other features. In figure 2, is an example from Norman showing the region around Aristarchus, Kepler and Copernicus. Table 1 contains image brightness measurements and figure 3 shows the corresponding graph of brightness versus time. Now I have left these as uncalibrated in case anyone would like to have a go at least squares adjusting them to an average of all the individual brightness values. This would calibrate out atmospheric transparency and background scattered light effects – although it should be said that this is more complicated if there is a scattered light gradient across the Moon from the terminator. Atmospheric seeing effects may play havoc on the photometry of very small features because the seeing blurs them by variable amounts giving rise to larger apparent brightness fluctuations than one would expect from larger uniform brightness features. This may explain to some extent the fluctuations in the brightness of Bessarion and Pytheas. Incidentally the overall fall in brightness of the measured features with time maybe due to a change in reflectivity of the Earth as it rotates, or is more likely due to a change in atmospheric transparency above the observing site.

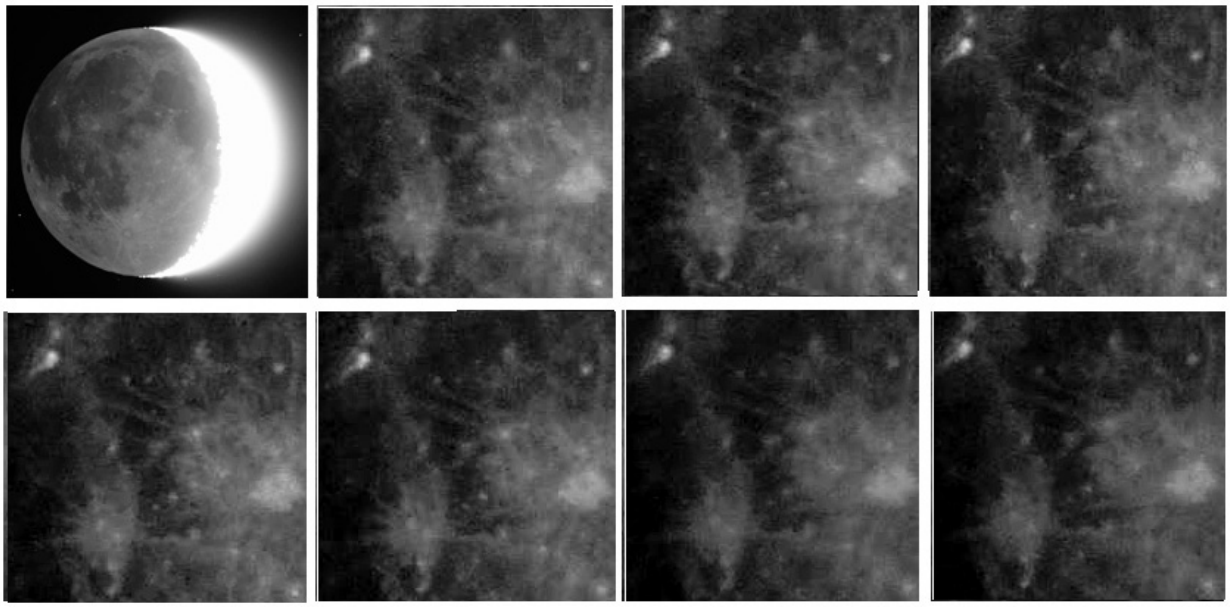


Figure 2. *Earthshine images by Norman Izett from 2012 Oct 19 with north at the top – 13 second exposures. (Top far left) a whole Moon image at 07:45UT. (Top left to Bottom far right) Aristarchus, Kepler, Copernicus area in Earthshine at 07:45, 07:55, 08:05, 08:14, 08:20, 08:29, and 08:39 UT.*

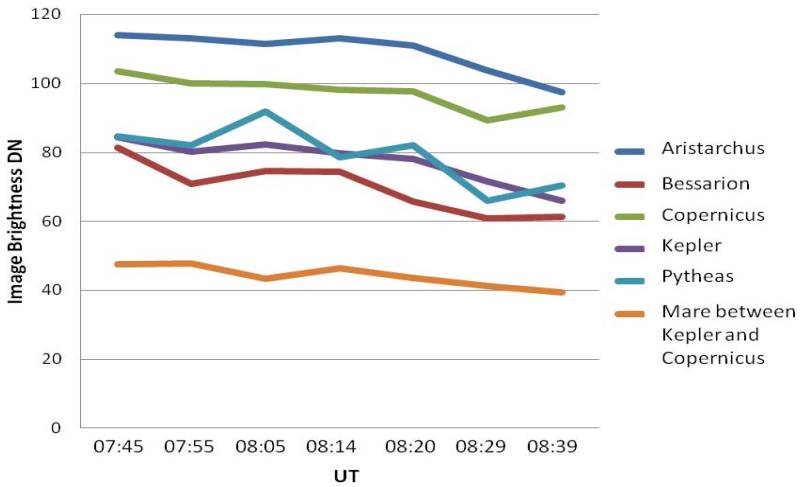


Figure 3. *Uncalibrated brightness plots of 5 craters and a mare area.*

On 2012 Oct 22 UT 01:10-01:35 Jay Albert checked out the appearance of the Aristarchus area in Earthshine because the lunar phase was very similar to that of a LTP from 1789:

On 1789 Sep 29 at UT04:25? Schroter (Lillienthal, Germany) noted a bright point 26" north of Aristarchus crater. Note that the year might have been 1788? The Cameron 1978 catalog ID=50 and the weight=3. The ALPO/BAA weight=3.

Jay commented that *"Aristarchus was visible as a roundish, slightly blue-gray smudge. I did not see a bright point slightly N or anywhere near the crater. I observed at 70x and 112x"*.As Jay did not see the bright point north of Aristarchus, the weight of the original LTP observation remains at 3, although as you can see in the report the year could be off by 1?

On 2012 Oct 24 UT 07:45-08:45 Steve Lang took an image of the whole lunar disk. This turned out to be of similar illumination to a sighting of a arc red on Tycho as seen visually by Jay Albert on 2010 Aug 19:

On 2010 Aug 19 at UT 00:50-01:02 J.Albert (Lakeworth, FL, USA, C11, Transparency 3, Seeing 7-8, 86F and very humid. Observer checking out repeat illumination condition appearance for Tycho concerning LTP #468 in the 1978 Cameron catalog. Did not see the effect from the original LTP report, but did see, immediately at looking at Tycho a very faint hint of redness in a pencil thin arc (< 1/4 circumference of the rim) confined to the top of the rim of the well-lit north east wall. Colored arc similar in thickness to Rupes Recta, but not as sharply defined. The outer (E) edge was perhaps sharper than the inner edge. The redness was more on the inside of the top of the rim. The outside of the rim was bright white. This effect was seen in three different eyepieces, at 311x, 224x and 400x. Checked for the effect on other craters nearby but could not see this effect anywhere else. The color had disappeared by 01:02UT. The fade took about 1-2 minutes. Observation of Tycho continued until 01:06UT, but all seemed normal. Quick checks were made again on Tycho periodically until 02:50UT but the color was not seen again. ALPO/BAA weight=3.

***Figure 4**. Extract from an image of the Moon by Steve Lang, showingTycho – image subsequently sharpened and color saturation enhancedto bring out natural color and atmospheric spectral dispersion. Northis towards the top in this image.*

Jay's observation is similar in a way to Eileen Horner's observation of color on the rim of Copernicus on 2012 Sep 24, namely that other crater rims were thoroughly checked for atmospheric spectral dispersion effects, but none were seen of the same color as the LTP. Also in Jay's case the altitude of the Moon was a lot higher than in Eileen's observation, and a rapid fade in color was noted. Steve's image has not had spectral dispersion effects removed, but clearly shows some present on Tycho – the orientation of which

is presumably because of the local vertical to the horizon? As is always the case with atmospheric spectral dispersion, color fringing is more noticeable on contrasty bright/dark edges of craters as well as more subtle color tinges shades on brightness gradients that lie along the local vertical to the observer's horizon. It has been proposed in the past, by Lawrence Fitton, that atmospheric spectral dispersion at other angles with respect to the horizon are possible, caused by pressure differences across the sky due to weather systems passing through – however again (and this applies to chromatic aberration too) color should be present on contrasty edges of many features, not just one specific area as seen by Jay. Steve's image does not show evidence for any natural surface color where Jay saw his red arc. An image mosaic by Maurice Collins, just after the repeat illumination window ended, shows no color here either. The weight of Jay's observation will stay the same for now,

On 2012 Oct 25 UT 18:00-21:10 Thierry Speth observed just outside the tail end of the repeat illumination for Sartory's 1966 Apr 20th LTP in Gassendi, but did not see or image anything unusual. There were quite a few LTP seen in Gassendi during the 1960's, especially from Armagh observatory, but relatively few in recent times matching the 1960's descriptions.

Gassendi 1966 Apr 30 UT 21:30-23:28 Observed by Sartory, Ringsdore (England, 8.5" reflector, S=E), Moore, Moseley (Armagh, Northern Ireland, 10" refractor, S=VG), Coralitos Observatory (Organ Pass, NM, USA, 24" reflector, Moon Blink) "English moon blink system detected red spots with vis. confirm. Ringsdore says no color but saw obscuration. (LRL 60-in photos showed nothing unusual by my casual inspection). Indep. confirm. (even E. wall was in dark). Corralitos did not confirm by MB." NASA catalog weight=5 (very high). NASA catalog ID #931.

Suggested Features to observe in December:.For repeat illumination (and 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 in the unlikely event you see a LTP, please give me a call on my cell phone: +44 (0)798 505 5681 and I will alert other observers. Note when telephoning from outside the UK you must not use the (0). When phoning from within the UK please do not use the +44! Twitter LTP alerts can be accessed on http://twitter.com/lunarnaut.

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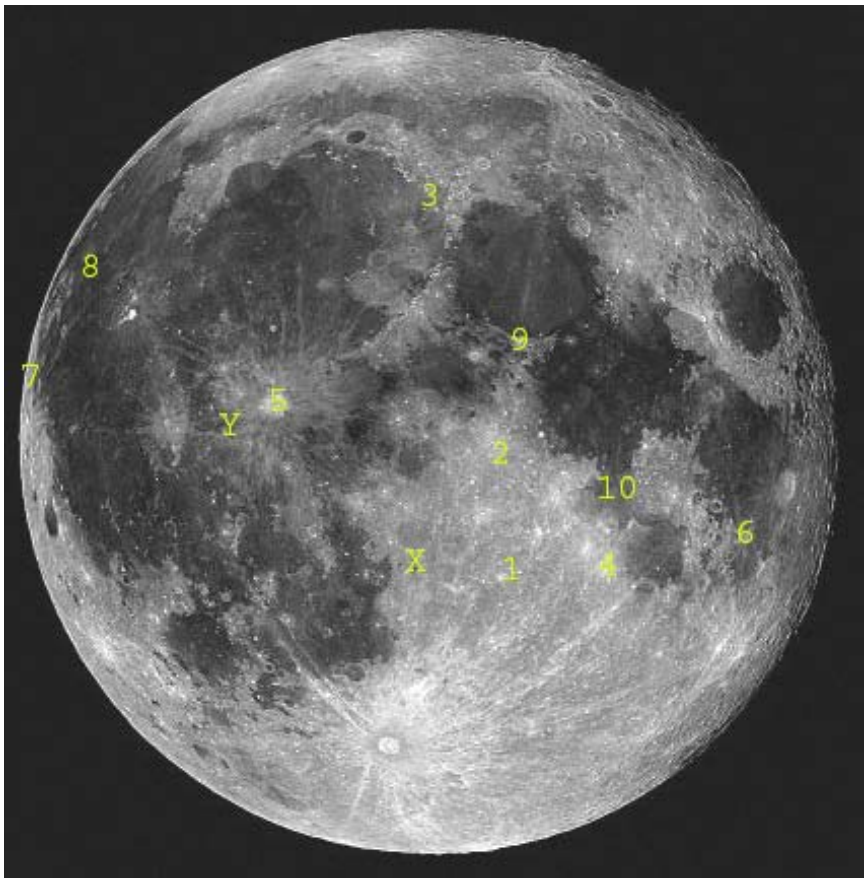
KEY TO IMAGES IN THIS ISSUE

1. **Abulfeda**
2. **Agrippa**
3. **Cassini**
4. **Catherina**
5. **Copernicua**
6. **Crozier**
7. **Einstein**
8. **Lichtenberg**
9. **Menelaus**
10. **Torricelli**



FOCUS ON targets

X = Alphonsus (January)
Wrinkle Ridges & Rilles (March)
Y = Mare Insularum (May)