THE LUNAR OBSERVER

RECENT BACK ISSUES: http://www.zone-vx.com/tlo_back.html

A PUBLICATION OF THE LUNAR SECTION OF THE A.L.P.O.
EDITED BY: Wayne Bailey wayne.bailey@alpo-astronomy.org
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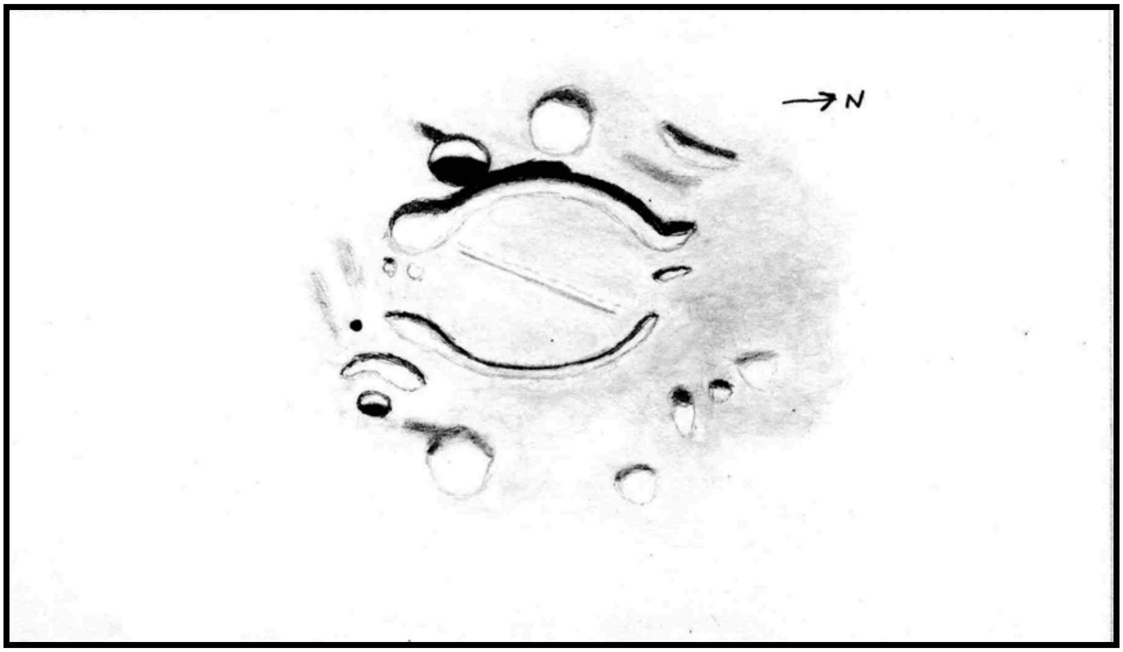
FEATURE OF THE MONTH – FEB. 2009

PALMIERI



Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
October 12, 2008 – 2:40 to 3:06 UT

I drew this crater and vicinity on the evening of Oct. 11/12, 2008 while watching the moon hide four stars. This crater is just west of Mare Humorum, but there is still mare material in this area, especially to the north. Palmieri is a broken crater with gaps in the north and south ends. Small peaks partly fill both gaps. Palmieri has a smooth floor except for a fine rille that nearly bisects it from northeast to southwest. This is a delicate feature that may be too conspicuous on the sketch. The floor has a grayish hue, similar to that of the nearby mare. Palmieri E is the relatively large, deep crater just to the southwest near where the western part of Palmieri ends in a large knob. A sizable patch of shadow extends westward from E. There is a large, low hill just off the west rim of Palmieri. A wide shadow near this hill is probably from a high point on Palmieri's rim. There is a small, bright, shadowless spot just north of the small peak in Palmieri's southern gap. Another crater, not labeled on the Lunar Quadrant map, lies southeast of Palmieri between two substantial hills. An assortment of peaks is north and east of Palmieri, some within a particularly dusky area near Palmieri's northern gap.

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 non-member 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 can be found on-line at: **http://www.alpo-astronomy.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.

LUNAR CALENDAR
FEB.-MARCH 2009 (UT)

Feb. 02	23:12	First Quarter
Feb. 07	20:09	Moon at Perigee (361,486 km - 224,617 miles)
Feb. 09	14:49	Full Moon (Penumbral Lunar Eclipse)
Feb. 11	15:00	Moon 5.7 Degrees SSW of Saturn
Feb. 16	21:38	Last Quarter
Feb. 19	17:01	Moon at Apogee (405,131 km - 251,737 miles)
Feb. 22	22:00	Moon 1.0 Degrees NNW of Mercury
Feb. 23	00:00	Moon 0.69 Degrees NNW of Jupiter
Feb. 23	06:00	Moon 1.5 Degrees NNW of Mars
Feb. 24	02:00	Moon 1.7 Degrees NNW of Neptune
Feb. 25	01:35	New Moon (Start of Lunation 1066)
Feb. 26	06:00	Moon 4.3 Degrees NNW of Uranus
Feb. 27	24:00	Moon 1.2 Degrees SSE of Venus
Mar. 04	07:45	First Quarter
Mar. 07	15:08	Moon at Perigee (367,019 km - 228,055 miles)
Mar. 10	22:00	Moon 5.5 Degrees SSW of Saturn
Mar. 11	02:37	Full Moon
Mar. 18	17:49	Last Quarter
Mar. 19	13:17	Moon at Apogee (404,301 km - 251,221 miles)
Mar. 22	21:00	Moon 1.4 Degrees NNW of Jupiter
Mar. 23	12:00	Moon 1.9 Degrees NNW of Neptune
Mar. 24	10:00	Moon 3.7 Degrees NNW of Mars
Mar. 25	16:00	Moon 4.4 Degrees NNW of Uranus
Mar. 26	06:00	Moon 5.7 Degrees NNW of Mercury
Mar. 26	16:07	New Moon (Start of Lunation 1067)
Mar. 26	20:00	Moon 3.8 Degrees SSE of Venus

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 always be included:

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

<u>CALL FOR OBSERVATIONS:</u>
<u>FOCUS ON: Tycho</u>

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 **March 2009** edition will be the crater **Tycho and its ray system**. Observations 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 fascinating feature to your observing list and send your favorites to:

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

<u>Deadline for inclusion in the Tycho article is February 20, 2009</u>

<u>FUTURE FOCUS ON ARTICLES:</u>

In order to provide more lead time for potential contributors the following target has been selected:

Triesnecker to Ariadaeus TLO Issue: May 2009 Deadline: April. 20, 2009

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A Simplified Stratigraphic Discussion of Ramsden and Environs

by Fred Corno

In the August 2008 issue of the TLO, fundamentals of stratigraphy as a relationship study have already been discussed: emplacement in time of different formations correlates with physical positioning of features, the oldest being the deepest, the youngest laying on top of everything else. Stratigraphy has been used in order to assess reciprocal timing of various formations on the Moon, referring to radiometric dating of manned missions samples for absolute age calculation.

Stratigraphy is a technique essentially based upon image analysis, and it may be applied both at small scale level, with the need for high resolution imaging, or at big picture level, with lower demands for image quality.

Skilled amateur astronomers can anyhow attain satisfying results even if based upon simple visual observations, provided the subject studied is simple and their observation skills proven.

Ramsden, positioned at 32.9°S 31.8°W in the westernmost reaches of Palus Epidemiarum, is a small crater, 25 km in diameter. The worn out walls and the flat floor don't elicit so much interest in it: much more appealing is the homonymous rille system developing around the crater and crossing the Palus floor.

The crater and *Rimae* Ramsden were easily focused at the eyepiece of my Takahashi FS128 at 347x on the night of the 8th of November 2008. The drawing I made reproduces the impression I had from the observation: nevertheless, reciprocal time relationships between the crater, the Palus plain and the *Rimae* system were not so clear to me. From my drawing I had to derive if the crater intersect the rilles or *viceversa:* in the former case, the crater would have formed last, in the latter case, crater formation should have occurred first, then followed by Palus lava-filling emplacement and eventually by rilles' formation. Against formation of the crater first, were the worn out appearance of the walls and the lack of a ray system and secondary impacts from Ramsden, but the shadow obscuring the crater walls and most of the inner part of it did not allow me to discriminate if the floor was lava filled or clear. Still, interruption of crater's wall to the south-west in conjunction with an incoming rille strongly supports the crater being already in place when rilles formed.

On his turn, G. North, in his excellent "Observing the Moon", leaves the question open to the reader: which formed first among the lava filling of the Palus, Ramsden and the rimae system? That was a challenge I was not to leave un-picked: therefore I turned to other information sources to support my hypothesis of an earlier crater and a later lava plain, eventually cut by rilles.

Pictures in Rukl's Atlas of the Moon and in the Atlas of the Clementine probe are not clear enough to solve the problem, but Lunar Orbiter 4 picture LO4-136H3 gives some hints:

a. The floor of the crater appears essentially flat, the same color and interspersed with small craters as the surrounding lava plain of the Palus;
b. As already noted from my drawing and observation, the crater does not show traces of ejecta or secondary impact that may overlay the plain;
c. On the east side, a branch of the Rimae slightly climbs over the exterior of the crater wall;
d. On the north side, the crater rim is almost interrupted by the approaching rille, and the junction on the rim is disturbed by a craterlet poking the rim.

From such a set of information, my original hypothesis was confirmed, since the following temporal series may be derived:

1. Formation of the Palus basin;
2. Formation of Ramsden;
3. Emplacement of the lava plain;
4. Cracking of the lava plain because of collapsing or graben formation, Rimae Ramsden formation and fracturing of crater walls.

Further confirmation of such an hypothesis came from Moon Geological Map I824 (see for reference http://www.lpi.usra.edu/resources/mapcatalog/), where crater walls are marked as pre-Imbric features (older than 3.85 billion years), the lava plain is Imbric as are the rilles (between 3.85 and 3 billion years ago), and the small crater to the south of Ramsden is mapped within the Eratosthenian system (3 to 1.2 billion years ago): the complete series of events is therefore:

1. Formation of the Palus basin;
2. Formation of Ramsden;
3. Emplacement of the lava plain;
4. Cracking of the lava plain because of collapsing or graben formation, Rimae Ramsden formation and fracturing of crater walls;
5. Formation of the small craterlet south from Ramsden.

Largely earlier than me, Harold Hill pictured on the 17th of January 1989 Ramsden and its environment: at page 155 of “A Portfolio of Lunar Drawings” intersection of rille with the eastern wall is clearly visible, as the intersection to the south arch of the crater wall can be spotted in the drawings by A. Johnson (1992 and 1994) reported in North’s book.

Main elements to determine basic stratigraphy of the considered district were then easily available in simple visual observation, well within the reach of amateur astronomers.

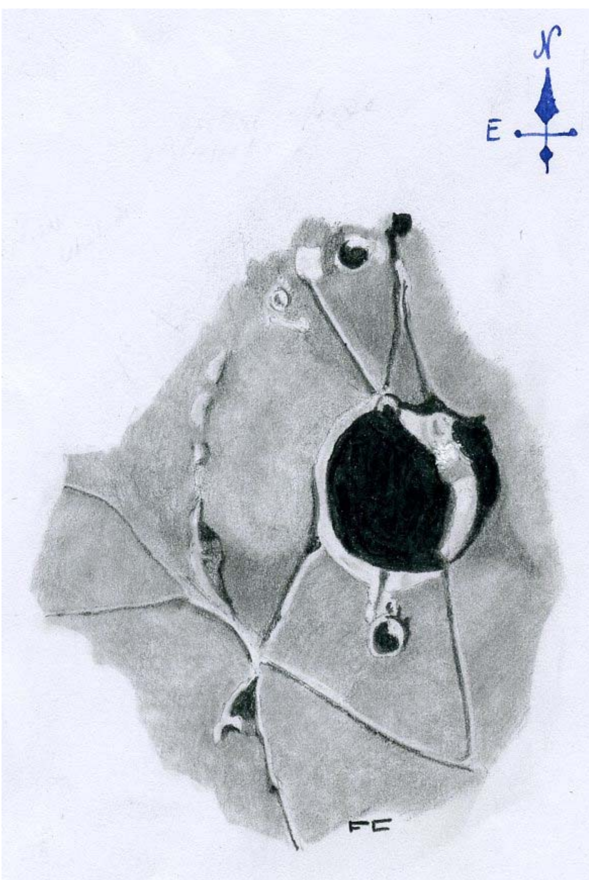

Figure 1: Author's observation on the night of 8th of November 2008. Rille heading north on the right side cuts in the southern wall of the crater, supporting its earlier formation when compared with the plain around it.

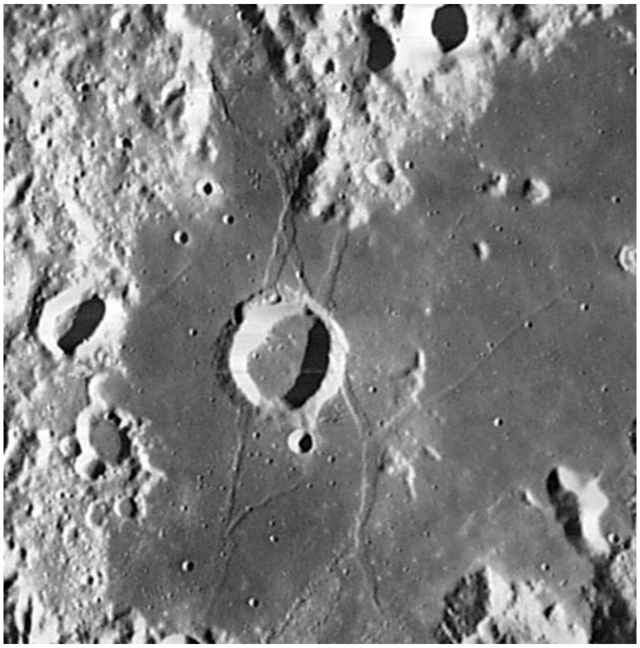

Figure 2: Crop from Lunar Orbiter 4 image LO4-136H3: for discussion of features see text.

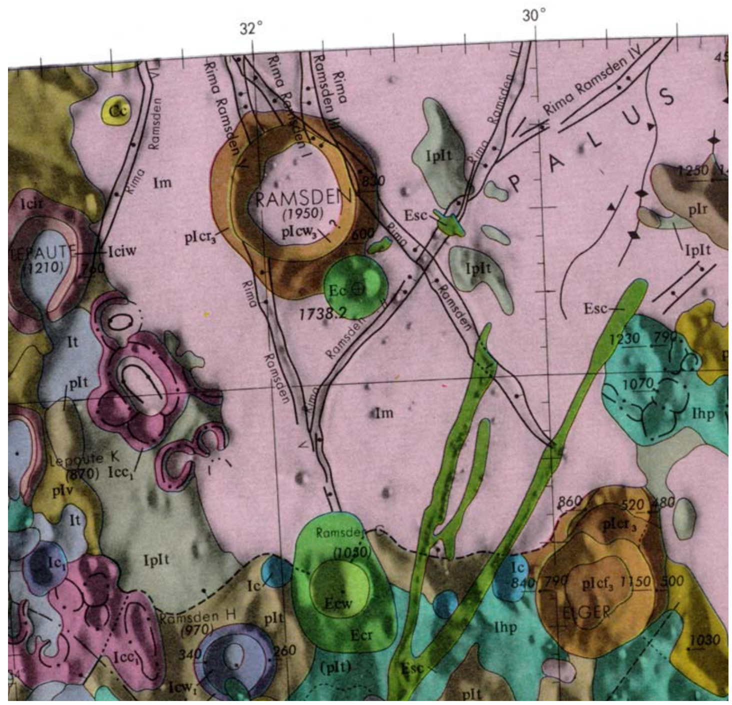

Figure 3: Crop from Moon Geologic Map I824. $PIcr_3$ and $PIcw_3$ mark features belonging to the Pre-Imbric system; IpIt terrains from Highlands, undifferentiated and intermediate between pre-Imbric and Imbric system; Im features of the Imbric period and Ec features of the Eratostehian system.

References

C.J. Byrne “Lunar Orbiter Photographic Atlas of the Near Side of the Moon”, Springer
T.A. Mutch “Geology of the Moon, a Stratigraphic View”, Princeton University Press
G. North “Observing the Moon” Cambridge University Press
H. Hill “A Portfolio of Lunar Drawings” Cambridge University Press

LUNAR TOPOGRAPHICAL STUDIES

Website: http://www.zone-vx.com/alpo-topo.html

OBSERVATIONS RECEIVED

JAY ALBERT – LAKE WORTH, FLORIDA, USA Digital image of Tycho

ALEKANDROS FILOTHODOROS – SAMOS, GREECE Digital images of Tycho (3)

ANTONIUS SCHALKEN – MELBOURNE, AUSTRALIA Digital images of Tycho (2)

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND Digital images of Tycho Ray System, 1st Qtr Moon (3), 10 day Moon, 15 day Moon, Full Moon

FRED CORNO – SETTIMO TORINESE, ITALY Drawing of Ramsden

ED CRANDELL – WINSTON-SALEM, NORTH CAROLINA, USA Digital images of Albategnius, Walter, Rupes Recta, Apennine Mts, Archimedes, Menelaus & Bessel Rays (2)

COLIN EBDON - COLCHESTER, ESSEX, UK Drawings of Archimedes & Spitzbergen, Cardanus & Krafft, Langrenus secondary craters

HOWARD ESKILDSEN - OCALA, FLORIDA, USA

Banded crater report forms for Agatharchides A, Anaxagoras, Ariadaeus, Aristillus, Bode, Conon, Davy, Dawes, Menelaus, Messier, Pytheas, Rosse, Silberschlag, Theaetetus

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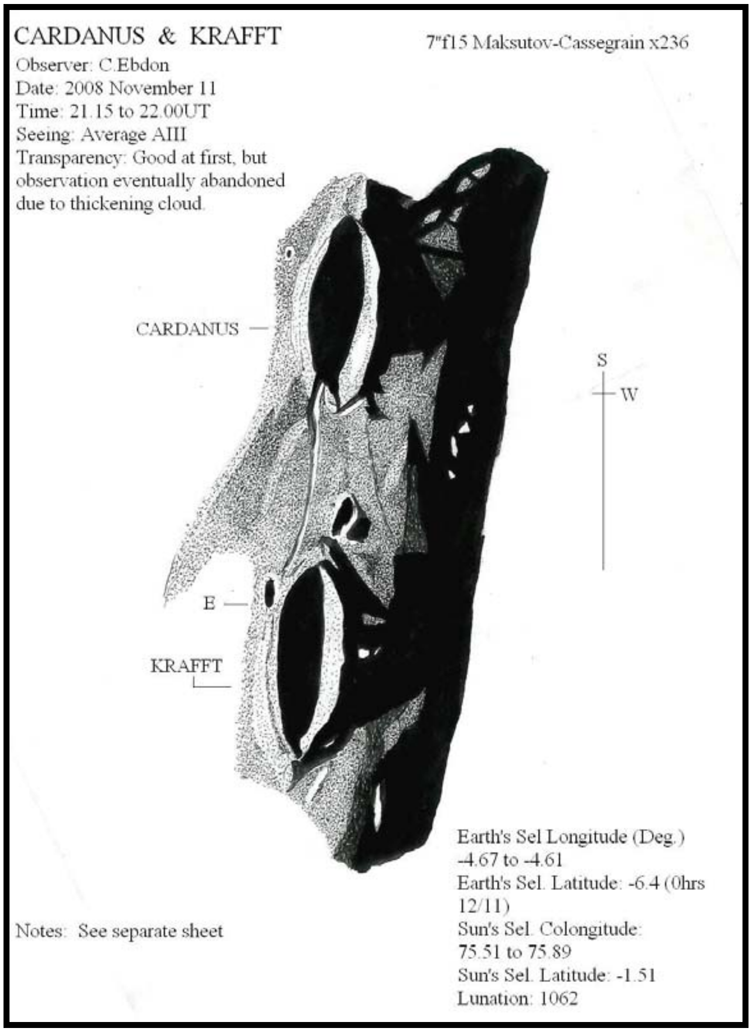
RECENT TOPOGRAPHICAL OBSERVATIONS



Notes of the Observation of Cardanus and Krafft, 2008 November 11 21.15 UT to 22.00UT. C.Ebdon.

Comparison is made with the fine drawings of this pair by the late Harold Hill (*Portfolio of Lunar Drawings* C.U.P.1990, p.80).

The present observation is incomplete due to the onset of cloud, but there are nevertheless notable differences with particular respect to the both the extent and position of Catena Krafft; the name, from Rukl's atlas, clearly indicates that it is considered to be a crater chain rather than a rille, albeit that those features are often found in combination.

This led the writer on to further consideration ofthe nature of this feature, the best available image of which is the Lunar Orbiter frame, which provides an overhead view ofthe two craters. This reveals the feature joining the two as an irregularly edged 'valley', tapering from the rim of Cardanus, and continuously narrowing towards Krafft, where it appears to pass straight through the S.S.E rim ofthat crater and continue across the entire floor. It appears to be postdated, however, by Krafft C, on the floor of Krafft, which clearly impacted later as the 'rille' does not pass through it.

Interestingly, in his drawing of 1988 March 31, continued by his observation of 1988 April 1, Hill shows the main rille as traversing the outer glacis of Krafft between position S to SSW (the side away from the adjoining small crater E) and the opposite side to other drawings, photos and the Orbiter frame.

He does, however, show a second, branching rille, running from a point about two-thirds the way from Cardanus, around the outer glacis of Krafft, towards E, and possibly beyond it.

On making the current observation, it appeared to the writer that the main 'rille' itself bent round towards E and terminated just before it, whereas no sign of a branching rille could be seen.

There is some suggestion in the Orbiter frame of a very fine and narrow rille or crater chain roughly in the position recorded by Hill for the branching rille, terminating at E, which would be a very difficult feature to pick out at most times. Beyond E, there is the suggestion of a wide, but very shallow 'trench-like' feature continuing around the outer glacis of Krafft for some way.

Although not specifically mentioned in the text, in his resumed drawing under higher lighting made on 1988, April 1, Hill seems to also show a secondary rill emerging from shadow on the NW outer slope near the tip of Krafft, as well as seeking confirmation for other small topographical features in the region, (craterlets and small hills).

Hill also picks out a shallow circular feature and short ridge adjoining the NW edge of Cardanus (confirmed by a shadow profile marking the change in height of the ground in the current observation). This roughly circular dip in the ground is clearly visible in the Lunar Orbiter frame -a tribute to Hill's extraordinary skill in picking out detail visually at the eyepiece.

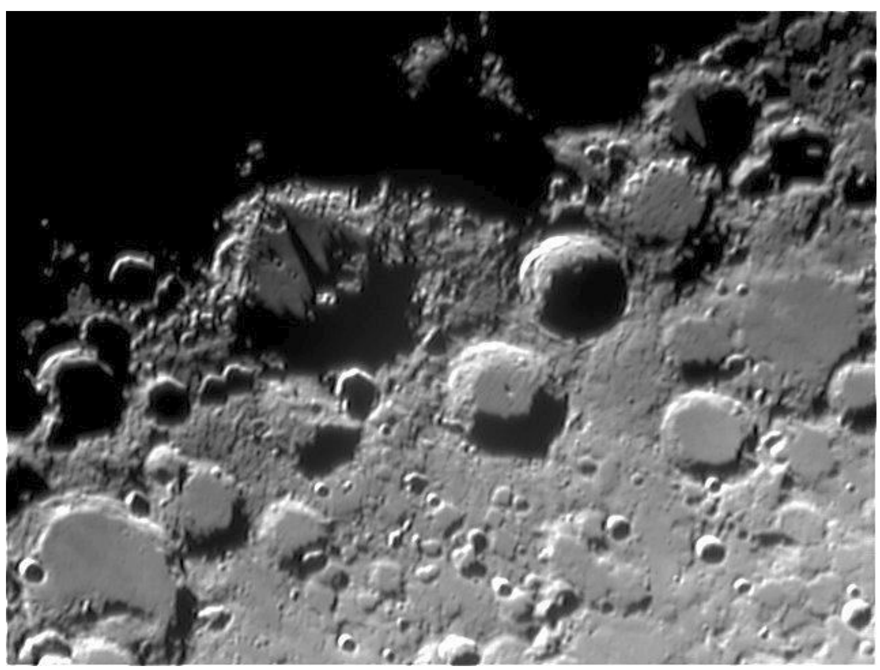
It would be an interesting exercise to make further observations of both the rille/crater chain and other topographical detail in this region, in order to make sense of them as viewed at the acute angle afforded from the earth, as compared to the overhead view of the Orbiter frame. The later generally reveals a complex and interesting region, with bands of smaller crater chains in parallel to the main feature. There remains something of a question mark over the true nature of the main rille/crater chain, however, described by one observer as looking more like the Alpine Valley than anything else (perhaps with shades of the Rheita valley at its widest point -CE). I leave others to speculate on its possible geological origins.

Colin Ebdon l6.l.09
Colchester (Essex), England

RECENT TOPOGRAPHICAL OBSERVATIONS

Tycho – Jay Albert – Lake Worth, Florida, USA. January 6, 2009 03:30 UT. Seeing 7/10, Transparency 4/6. Celestron NexStar 11" SCT. Afocal, Scopetronix 40mm Plossl, Olympus SP 570, ISO 64, 1/30 second. North up, East left.

Walter - Ed Crandall - Winston-Salem, North Carolina, USA
January 03, 2009 23:43 UT
colongitude 1.5º, seeing 6-7/10,
110mm f/6.5 APO
3x barlow– Toucam

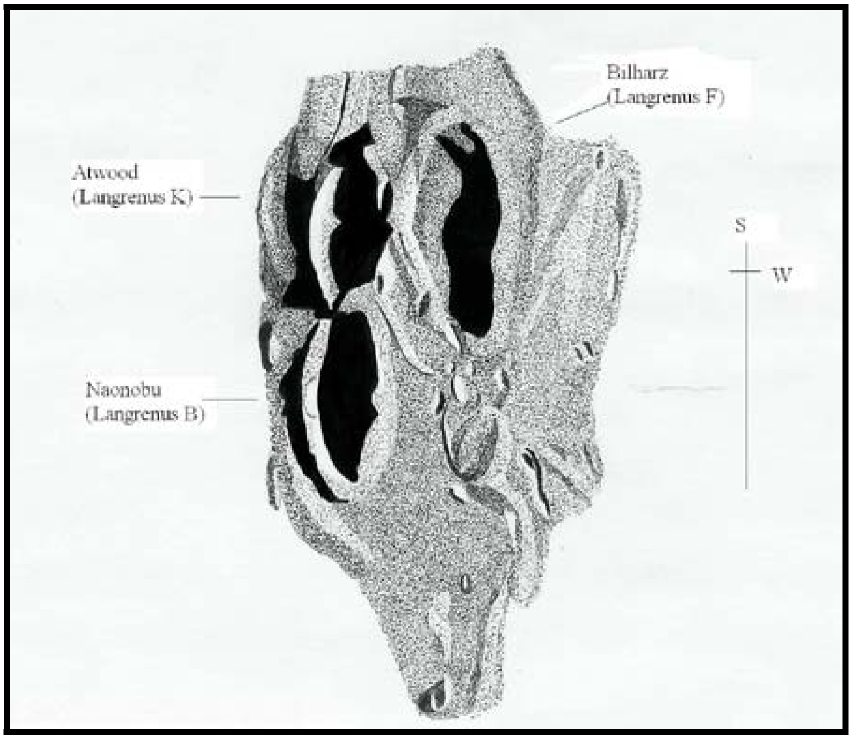


RECENT TOPOGRAPHICAL OBSERVATIONS

First Quarter Moon - mosaic – Maurice Collins, Palmerston North, New Zealand. January 04, 2009 08:17-08:32 UT. Seeing A II. C8 SCT, LPI.

Tycho – Alexandros Filothodoros - Samos, Greece. November 08, 2008 17:50 UT. Seeing 7/10, Transparency 4/6. Skywatcher 8" f/6 + 1.3 Mp colour webcam, 15 frames stacked.

ADDITIONAL TOPOGRAPHICAL OBSERVATIONS



Langrenus Secondaries – Colin Ebdon, Colchester (Essex), England. October 16, 2008 22:00-23:00 UT. Seeing AIII, Transparency good but some high cloud. 7", f/15, Maksutov-Cassegrain, x236. Colongitude 119.2º-119.7º.

Montes Apenninus - Ed Crandall, Winston-Salem, North Carolina, USA. January 04, 2009 23:42 UT, colongitude 13º, seeing 6-7/10, 110mm f/6.5 APO 3x barlow– Toucam

BRIGHT LUNAR RAYS PROJECT

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

Bright Lunar Rays Website: http://www.zone-vx.com/alpo-rays.html

RECENT RAY OBSERVATIONS

Menelaus - Bessel Digital image by Ed Crandall - Winston-Salem, North Carolina, USA. January 04, 2009 23:48 UT - colongitude 13.7 - seeing 5-6/10, transparency 4/6
110mm f/6.5 APO - 3x barlow – Toucam

Compare this image of Menelaus to the image by Howard Eskildsen (colongitude 30º, yellow filter) in the Banded Craters section below. Differences in Menelaus' interior are easily visible.

Full Moon Digital image by Maurice Collins – Palmerston North, New Zealand. January 11, 2009 09:50 UT. ETX-90 afocal Fuji A800

RECENT RAY OBSERVATIONS

Kepler – Digital image by Alexandros Filothodoros - Samos, Greece. December 10, 2008 20:51 UT. Seeing 5/10, Transparency 3/6. Skywatcher 8" f/6 + ToUcam.

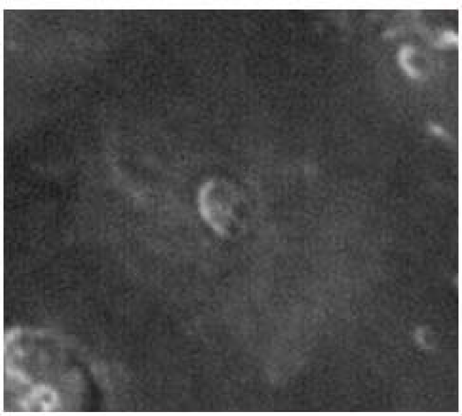
BANDED CRATERS PROGRAM

Coordinator – Wayne Bailey – wayne.bailey@alpo-astronomy.org
Banded Craters Program Website: http://www.zone-vx.com/alpo-bcp.html

A.L.P.O. Lunar Section: Selected Areas Program Banded Craters Observing Form

Crater Observed: Dawes
Observer: Howard Eskildsen Observing Station: Ocala, Florida
Mailing Address: P.O. Box 830415, Ocala, Florida, 34483
Telescope: Meade 6" Refractor 152 cm f/8
Imaging: Orion StarShoot II, 2X Barlow, Filters: W-15 Yellow
Seeing: 4/10 Transparency: 3/6
Date (UT): 2008/11/08 Time (UT): 01:23
Colongitude: 30°
Position of crater: Selen. Long. 26.4° East Selen. Lat. 17.2° North
Lunar Atlas Used as Reference: Virtual Moon Atlas Expert Version 2.1

Image (North up):



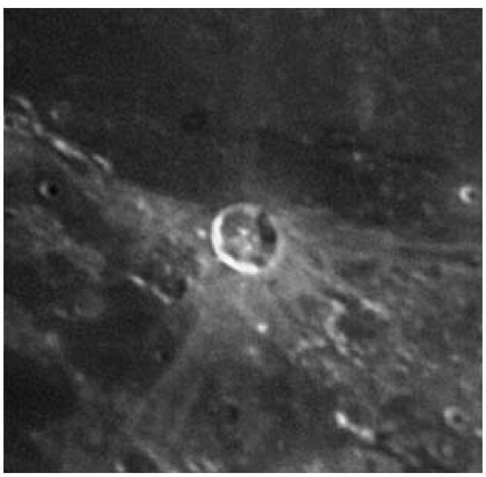
Comments:

Curious dark markings to the SE portion of the crater appear like eyes with the bright area between them widening towards the center appearing like a nose on a face. There is also a dark area inside the north rim of the crater as well. I wonder if the dark areas could be due to mare basalt in the crater or perhaps pyroclastics.

A.L.P.O. Lunar Section: Selected Areas Program Banded Craters Observing Form

Crater Observed: Menelaus
Observer: Howard Eskildsen Observing Station: Ocala, Florida
Mailing Address: P.O. Box 830415, Ocala, Florida, 34483
Telescope: Meade Refractor 15.2 cm f/8
Imaging: Orion StarShoot II, 2X Barlow, Filters: W-15 Yellow
Seeing: 4/10 Transparency: 3/6
Date (UT): 2008/11/08 Time (UT): 01:23
Colongitude: 30°
Position of crater: Selen. Long. 16.0° East; Selen. Lat. 16.3° North
Lunar Atlas Used as Reference: Virtual Moon Atlas Expert Version 2.1 2004-11-07

Image (north up):



Comments:

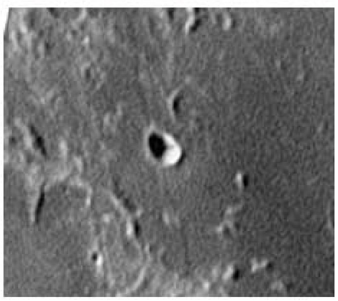
Complex bright and dark bands are most notable on the eastern rim on this photo.

Compare this image of Menelaus (colongitude 30°, yellow filter) to the image by Ed Crandall (colongitude 14°, white light) in the Rays section above. Differences in Menelaus' interior are easily visible.

A.L.P.O. Lunar Section: Selected Areas Program Banded Craters Observing Form

Crater Observed: Agatharchides A
Observer: Howard Eskildsen Observing Station: Ocala, Florida
Mailing Address: P.O. Box 830415, Ocala, Florida, 34483
Telescope: Meade Refractor 15.2 cm f/8
Imaging: Celestron NexImage, 2X Barlow Filters: None
Seeing: 9/10 Transparency: 0/6
Date (UT): 2008/12/20 Time (UT): 11:23
Colongitude: 185°
Position of crater: Selen. Long. 2.4° West Selen. Lat. 6.7° North
Lunar Atlas Used as Reference: Virtual Moon Atlas Expert Version 2.1 2004-11-07

Image (north up):



Comments:

Part of a dark band is visible in the eastern portion of the crater.

Howard wrote, concerning the observation above,

> Check out the seeing and clarity--yep, 0/6. Very steady skies, but fog blanked everything except the moon like a neutral density filter. The Orion StarShoot simply was not sensitive enough to use with a Barlow, so I dusted off the NexImage and was actually able to get a useable image. Then I got to thinking and have used it in two sessions with wonderful seeing and clarity since....

It doesn't always work out like this, but seeing and transparency really are two different, not necessarily correlated, characteristics. The moon is bright compared to other astronomical objects, so it can be usable brightness even through heavy haze. Poor transparency (read hazy skies) sometimes indicates a very stable atmosphere, which produces excellent seeing. So don't automatically assume those hazy nights are useless.

LUNAR TRANSIENT PHENOMENA

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

LTP NEWSLETTER – FEBRUARY 2009

Dr. Anthony Cook - Coordinator

Observations for December 2008 were received from the following observers: Jay Albert (FL, USA), Maurice Collins (New Zealand), myself (Aberystwyth, UK), and Marie Cook (Mundesley, UK). Weather conditions have definitely been improving for me here in west Wales, UK, though the cold temperatures have started to play havoc on some of the more power consuming parts of the robotic telescopes that I use at work, so much so that the other night the dome refused to rotate unless I switched a dome light off inside first!

At Aberystwyth University (Wales, UK) we have though acquired some additional narrow band interference filters. One is at 436nm, only a few nm off from a LTP emission line reported in the Cameron catalogs. Another one is at 490nm - close to another emission line that Winnie Cameron mentioned to me once on the telephone. Finally we have a 700nm filter, close to a bright Argon emission line. Although not precisely centered on these emission lines, the 10nm spectral FWHM width of each filter should encompass the lines concerned. These filters are being used for time lapse imaging of the Moon at the given wavelengths, trying to detect ionization of gases released from below the Moon's surface. There are several peer reviewed papers that suggest that outgassing maybe a cause of LTP. One problem though for these theories is how to produce some of the colors reported in past LTP reports. Ionization of the released gases is one possible process, though two questions that remain are what is the nature ionization process (solar irradiation, arcing between charged dust particles, energetic waves in space plasma) and whether the optical emissions will be sufficiently bright to be seen from Earth. So we now have the following covered: Hydrogen, Helium, Argon, Sodium, Radon, and two suspected LTP emission lines. The big issue now will be how long we should run the experiment for before drawing any conclusions about whether these gases are, "or are not", the cause of LTP reports.

Further news from members have been received about Dale Holt's sketch of the grey areas within the shadow of Posidonius J on 2008 Oct 19th. Prof. Bill Leatherbarrow forwarded a couple of observations, and notes that Wilkins and Moore mention a hill on the south east floor, and a ridge. His own observations reveal some clumps of raised ground on the floor. I have also heard from Phil Morgan – he too cannot find any of his observations that show the feature detected by Dale, though Phil forwarded me a sketch that he made in October 1969 which shows some terracing and landslips on the inner east wall of Posidonius J., though this is not quite in the right location for what Dale recorded. Do please keep on looking at this area, especially if this crops up in the on-line prediction web site listed at the bottom of this article.

The abstracts for this years Lunar and Planetary Science Conference, in Houston, TX, will be on-line soon. Probably I will not attend this year (the dollar-pound sterling exchange rate is not favourable for British citizens), but will instead look through what will be available on-line and summarize any work which will be of interest to the LTP team. More about this next month.

Observing predictions for repeat illumination conditons for LTPs, including the more numerous illumination only events can be found on the following web site: http://users.aber.ac.uk/atc/tlp/tlp.htm .For members who do not have access to the internet, please drop me a line and I will post predictions to you. 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 (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!

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

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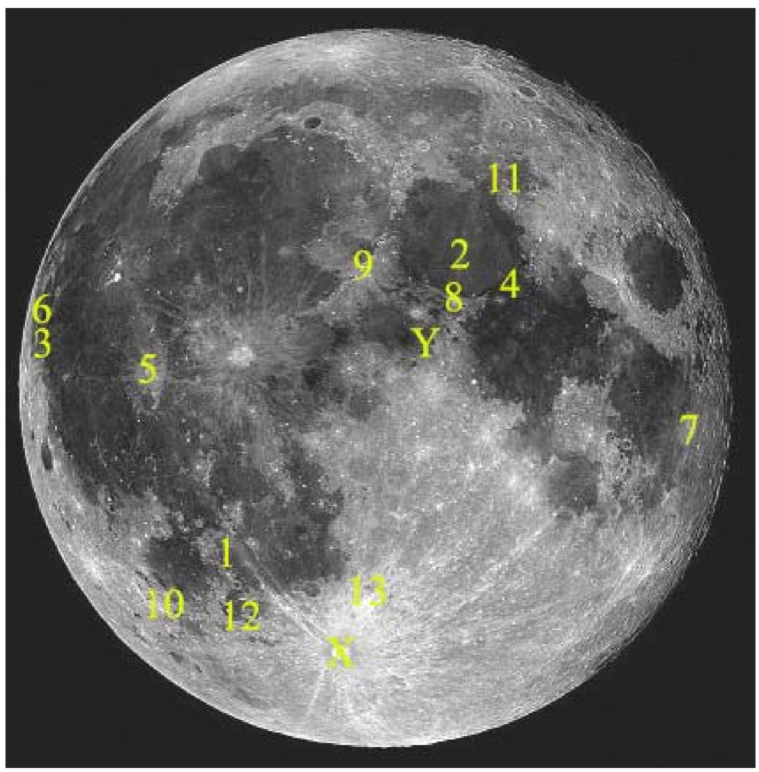
KEY TO IMAGES IN THIS ISSUE

1. **Agatharchides A**
2. **Bessel**
3. **Cardanus**
4. **Dawes**
5. **Kepler**
6. **Krafft**
7. **Langrenus**
8. **Menelaus**
9. **Montes Apenninus**
10. **Palmieri**
11. **Posidonius J**
12. **Ramsden**
13. **Walter**



X = Tycho (March FOCUS ON target)
Y = Triesnecker to Ariadaeus (May FOCUS ON target)