



THE LUNAR OBSERVER

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

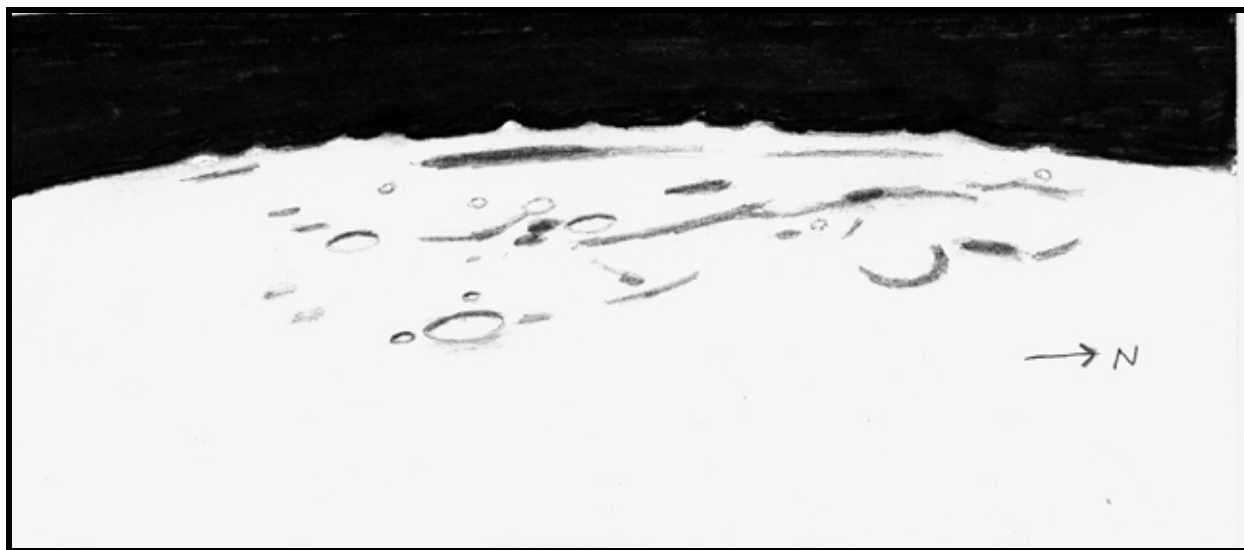
EDITED BY: Wayne Bailey wayne.bailey@alpo-astronomy.org

17 Autumn Lane, Sewell, NJ 08080

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

FEATURE OF THE MONTH – FEBRUARY 2010

MARE ORIENTALE



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

July 17, 2009 09:30-10:10 UT

15 cm refl, 116x, seeing 8

I tried sketching the area around this mare on the morning of July 17, 2009 after watching three occultations. Mare Orientale is usually at or beyond the limb, but libration was favorable for it this morning. Mare Orientale itself is the largest dark feature just inside the limb near a conspicuous peak. It has a sharp southern edge, but it tapers off gradually to the north. A long, dusky strip is detached from Mare Orientale to the north. More dusky strips are farther from the limb, oriented mostly north-south. The longest one has several kinks and a dark bulge. A dark spot lies between this feature and Orientale, and several more

detached spots lie farther north. A few isolated dark markings are to the south of the long strip, and another detached spot is close to the limb, south of Mare Orientale. The largest crater in the sketch, and the one farthest from the limb, is Eichstadt. This crater has two small companions, Eichstadt E to the south and Eichstadt G to the west (Other small craters shown nearby on the Lunar Quadrant map were not seen as such, probably due to the terminator's distance at this time). Two other fairly large craters are southwest and northwest of Eichstadt; both have bright interiors. There are at least five shadowless bright spots in this area, the largest one being near the crater northwest of Eichstadt and some dark markings. There are some substantial peaks along the limb in this area. I tried placing them as well as possible, but they may be exaggerated in the sketch.

LUNAR CALENDAR

FEBRUARY-MARCH 2010 (UT)

Feb. 02	21:00	Moon 7.5 Degrees SSW of Saturn
Feb. 05	23:50	Last Quarter
Feb. 08	14:30	Extreme South Declination
Feb. 12	03:00	Moon 2.3 Degrees NW of Mercury
Feb. 13	02:07	Moon at Apogee (406,541 km - 252,613 miles)
Feb. 14	02:52	New Moon (Start of Lunation 1078)
Feb. 14	03:00	Moon 3.5 Degrees NW of Neptune
Feb. 14	21:00	Moon 5.0 Degrees NNW of Venus
Feb. 15	01:00	Moon 4.6 Degrees NNW of Jupiter
Feb. 16	15:00	Moon 5.4 Degrees NNW of Uranus
Feb. 22	00:42	First Quarter
Feb. 23	06:00	Extreme North Declination
Feb. 26	02:00	Moon 5.1 Degrees SSW of Mars
Feb. 27	21:41	Moon at Perigee (357,831 km - 222,346 miles)
Feb. 28	16:37	Full Moon
Mar. 02	04:00	Moon 7.4 Degrees SSW of Saturn
Mar. 07	15:43	Last Quarter
Mar. 07	21:24	Extreme South Declination
Mar. 12	10:08	Moon at Apogee (406,009 km - 252,282 miles)
Mar. 13	13:00	Moon 3.5 Degrees NNW of Neptune
Mar. 14	22:00	Moon 5.1 Degrees NNW of Jupiter
Mar. 15	21:02	New Moon (Start of Lunation 1079)
Mar. 15	23:00	Moon 5.4 Degrees NNW of Uranus
Mar. 15	24:00	Moon 6.0 Degrees NNW of Mercury
Mar. 17	05:00	Moon 6.1 Degrees NNW of Venus
Mar. 22	12:18	Extreme North Declination
Mar. 23	10:59	First Quarter
Mar. 25	11:00	Moon 4.3 Degrees SSW of Mars
Mar. 28	04:57	Moon at Perigee (361,876 km - 224,859 miles)
Mar. 29	12:00	Moon 7.4 Degrees SSW of Saturn
Mar. 30	02:25	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 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.

Note: The published images now contain links to the original, full resolution images. Clicking on an image while connected to the internet, will download the original image, which in some cases is significantly higher resolution than the published version.

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)

CALL FOR OBSERVATIONS: **FOCUS ON: Snellius-Furnerius**

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 2010** edition will be the Snellius-Furnerius area. 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 complex region to your observing list and send your favorites to:

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

Deadline for inclusion in the Snellius-Furnerius article is February 20, 2010

FUTURE FOCUS ON ARTICLES:

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

Ray Craters (at all Phases)	TLO Issue: May 2010	Deadline: Apr. 20, 2010
Dark-Haloed Craters	TLO Issue: July 2010	Deadline: June 20, 2010

A list of some ray craters is available at: <http://moon.scopesandscapes.com/alpo-rays-table.pdf>.
A list of some dark haloed craters is in Appendix A of the Selected Areas Program Handbook, available at: <http://moon.scopesandscapes.com/sap-hdbk-5.pdf>.

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 3, 12 day moon, Full Moon, Piccolomini, Schiller-Zuchius, Taurus Mountains and Tycho.

ED CRANDALL – LEWISVILLE, NORTH CAROLINA, USA. Digital images of Mare Imbrium-Mons Gruithuisen-Montes Harbinger, Mons La Hire, Sinus Iridum-J Herschel.

COLIN EBDON – COLCHESTER, ENGLAND. Drawings of Furnerius, Lacus Mortis (2).

HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Anaxagoras, Aristarchus, Aristillus, Bailly, Birt, Bode, Burg, Casatus, Dawes, Grimaldi, Kepler, Lichtenberg, Maury, Menelaus, Messier, Milichius, Moretus, Piazzzi(2), Proclus, Pythagoras, Pytheas, Rosse, Rumker, Schickard, Seleucus, Sirsalis.

CHARLES GALDIES – NAXXAR, MALTA. Drawings of Davy, Ramsden.

ROBERT HAYS – WORTH, ILLINOIS, USA Drawings of Epimenides, Flamsteed T, Mare Orientale.

PAOLO LAZZAROTTI – MASSA, ITALY. Digital images of Aristarchus, Mare Humboltianum, Mare Marginis, Mare Orientale, Montes Haemus, Santbach.

MIKE WHITE – LEVIN, NEW ZEALAND. Digital images of 5 day Moon (2), Furnerius-Vallis Rheita-Janssen, Mare Nubium-Rupes Recta, Mare Serenitatis-Caucasus Mountains-Mare Imbrium.

RECENT TOPOGRAPHICAL OBSERVATIONS

TAURUS MOUNTAINS - Maurice Collins
- Palmerston North, New Zealand. South up.
December 22, 2009 08:35 UT.



RECENT TOPOGRAPHICAL OBSERVATIONS

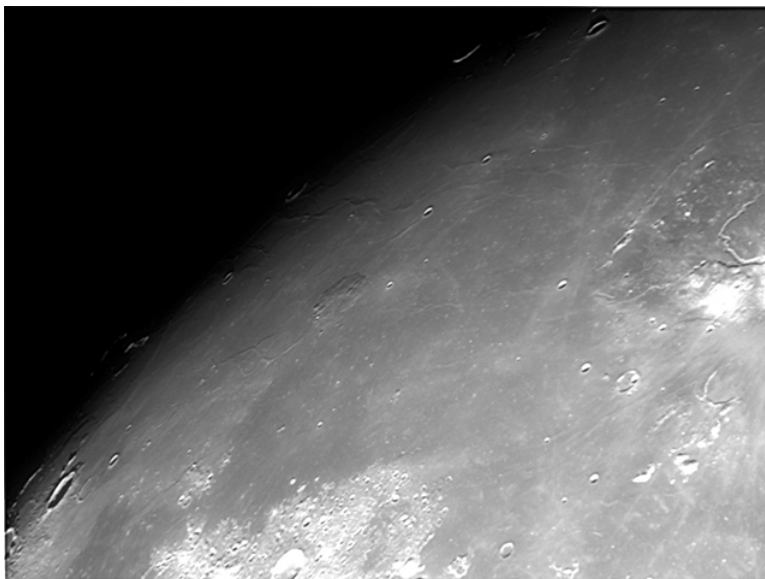
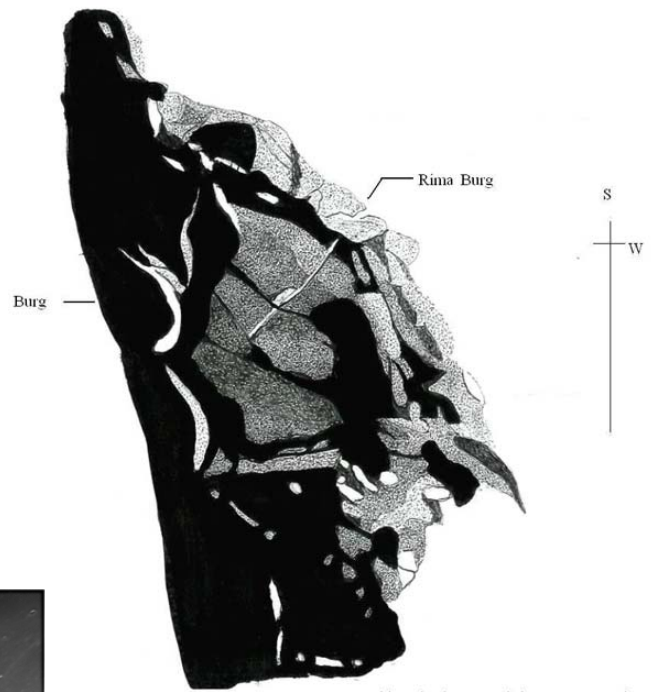


MONS LA HIRE – Ed Crandall – Lewisville, NC, USA. December 28, 2009 00:56 UT. Colongitude 47°, Seeing AIII. 110 mm f/6.5 APO, 3x barlow, Toucam.

Mons La Hire was white hot bright and I have endeavored to show it like it came over the PC screen and appeared in the diagonal flip mirror device. The image also is a ray study many of which are most likely coming from Copernicus. The focus however are the more confined rays-ray/ like structures appearing from Euler (Copernicus rays?); as well as the single ray, flowing in the opposite direction compared to the other rays previous mentioned, appearing directly from Euler E* about two degrees north of Mons Vinogradov.

LACUS MORTIS – Colin Ebdon – Colchester, England. October 9/10, 2009 23:30-00:15 UT. Seeing AIII improving, Transparency Excellent. Colongitude 152.2°-152.4°. 7" f/15 Maksutov, 236x.

Note: Although Rima Burg is known to enter the Western rim of Lacus Mortis, the writer was surprised to see it apparently dissect the shadow of the rim as depicted. There was a prominent small hill (not in Rukl) at the junction of the Rima and the Southernmost of the slender shadows shown-the latter probably following a fault line.



MONS RUMKER – Howard Eskildsen - Ocala, Florida, USA. December 30, 2009 12:44 UT. Seeing 8/10, Transparency 4/6. Meade, 6" f/8 Refractor, 2x barlow, DMK 41AU02AS, no filters.

RECENT TOPOGRAPHICAL OBSERVATIONS

DAVY – Charles Galdies – Naxxar, Malta.

January 23, 2010 19:07-19:42 UT. Cloudy. 200 mm f/10 SCT, 17 mm Televue Plossl, 2x barlow, moon filter.

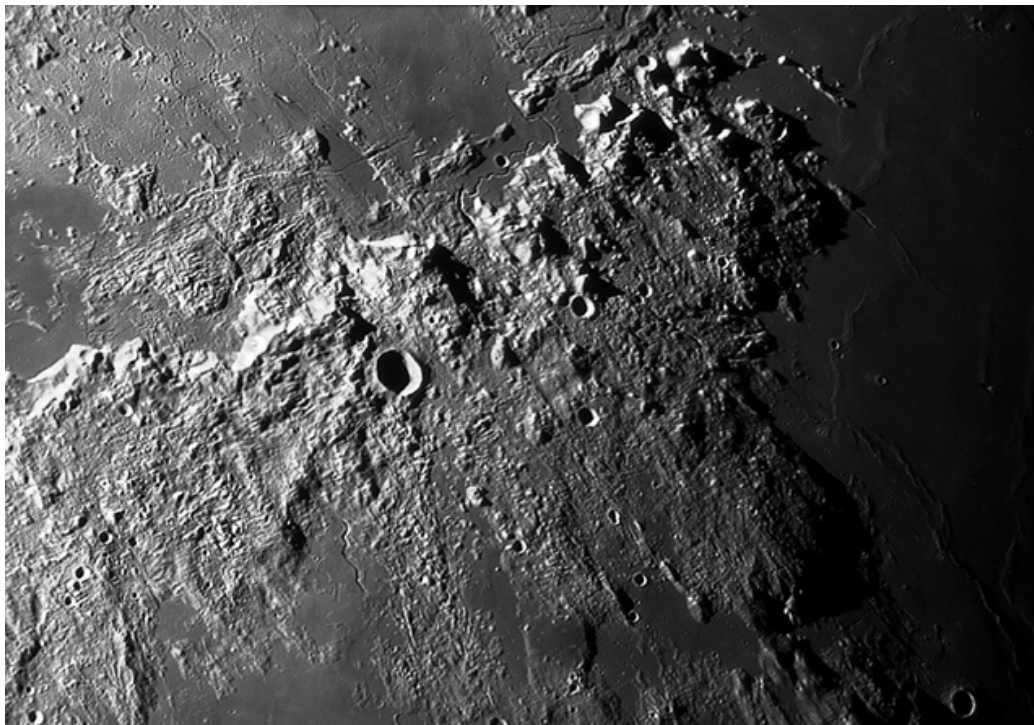
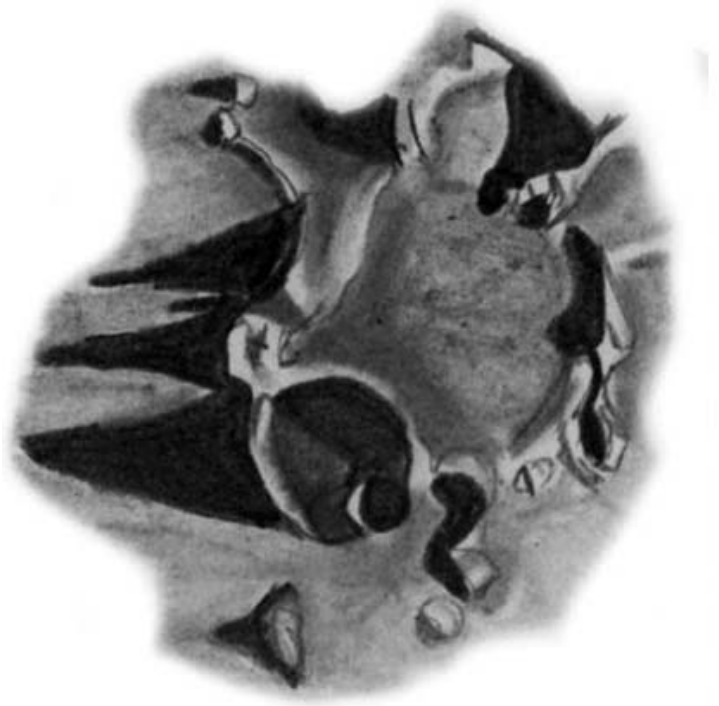
Davy was very prominent tonight. The small lunar crater is located on the eastern edge of the Mare Nubium.

This crater covers the remains of the bigger satellite crater 'Davy Y' to the east, which contains a crater chain designated as Catena Davy. This catena was not visible tonight possible due to the higher sun angle at the time. I had another opportunity some months ago to identify and sketch this catena. The floor of Davy Y appeared to be rather smooth with no visible features.

The outer rim of Davy was conspicuous and reflective. The interior was in semi-darkness, so interior features were not visible. The perimeter is somewhat polygonal in shape, and the southeast rim is overlaid by the Davy A crater. Davy A is rather deep and its interior was also in darkness. No central peaks were visible in its interior.

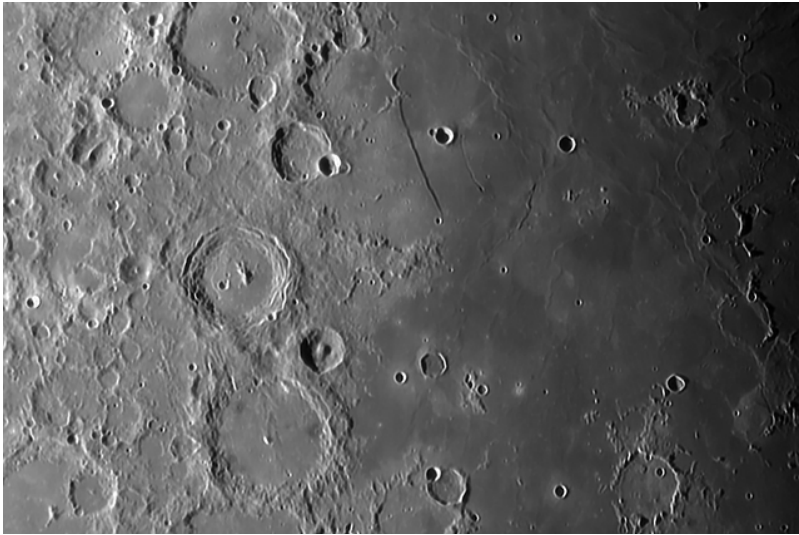
An interesting feature is the tapering shadows cast by the western wall of Davy, craterlet B and part of the walls of Davy Y.

Sketching Davy within the overall context of its surrounding neighbourhood was quite hard and took more than the usual sketching time. ([Znith Astronomy Observatory Malta](http://www.znith.org))



MONTES
APENNINUS –
MONTES HAEMUS –
Paolo Lazzarotti – Massa,
Italy. August 12, 2009
02:01 UT. Seeing 6/10,
Transparency 4/6.
Gladius CF-315
Lazzarotti Opt. Scope,
LVI-1392 PRO
experimental camera,
Edmund R filter, 0.18
arcsec/pixel.
(<http://www.lazzarotti-hires.com/2010/01/appen-nini-col-monte-haemus.html>)

RECENT TOPOGRAPHICAL OBSERVATIONS



MARE NUBIUM-RUPES RECTA –

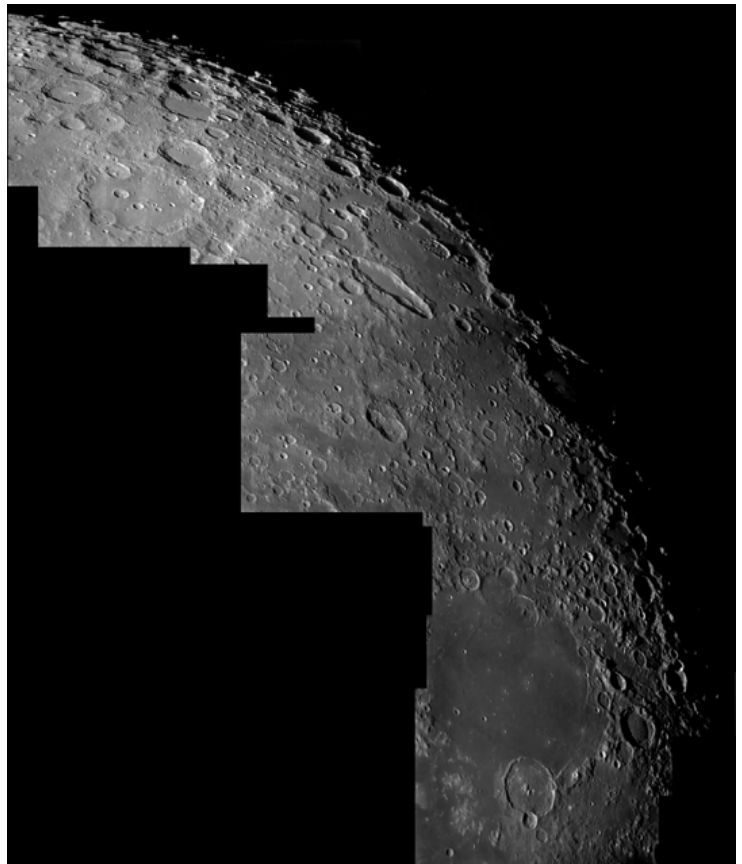
Mike White – Levin, New Zealand. South up. November 26, 2009 10:14 UT. Seeing A IV. Orion XT101 Dobsonian, Televue 2x barlow, DMK41AF02 camera.

The Mare Nubium/Rupes Recta region shows (aside from the obvious Straight Wall feature) many wrinkle ridges and remnants of flooded craters in Mare Nubium, along with Rima Birt. Also of interest are the dark patches around several volcanic vents in the crater Alphonsus.

ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

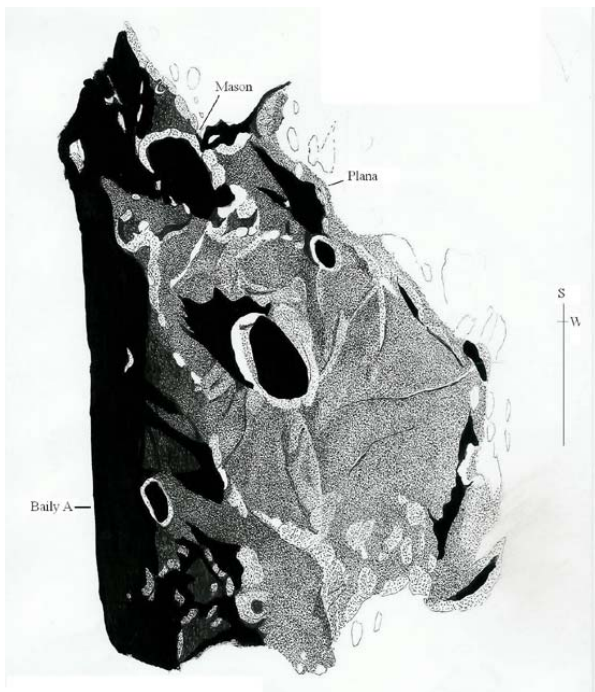
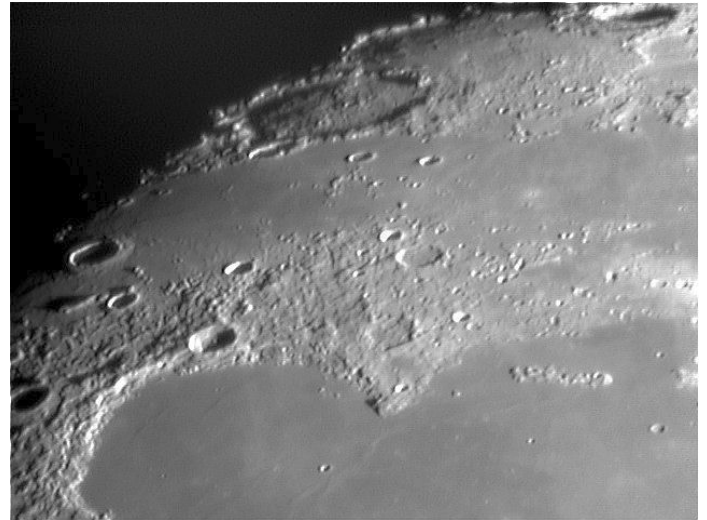
SCHILLER-ZUCHIUS BASIN - Maurice Collins - Palmerston North, New Zealand, South up. January 27, 2010 09:40-10:07 UT. C8, 2x barlow, LPI.

I caught sunrise over Schickard where the center of the crater is catching the sun with the surrounding rim area still in darkness. The Schiller-Zucchi basin is one of my favorites as when I first saw it and couldn't find it on my maps I thought I had found something new! (Not that time however). But still an interesting feature, as is oblong Schiller - a crater formed from an oblique impact.

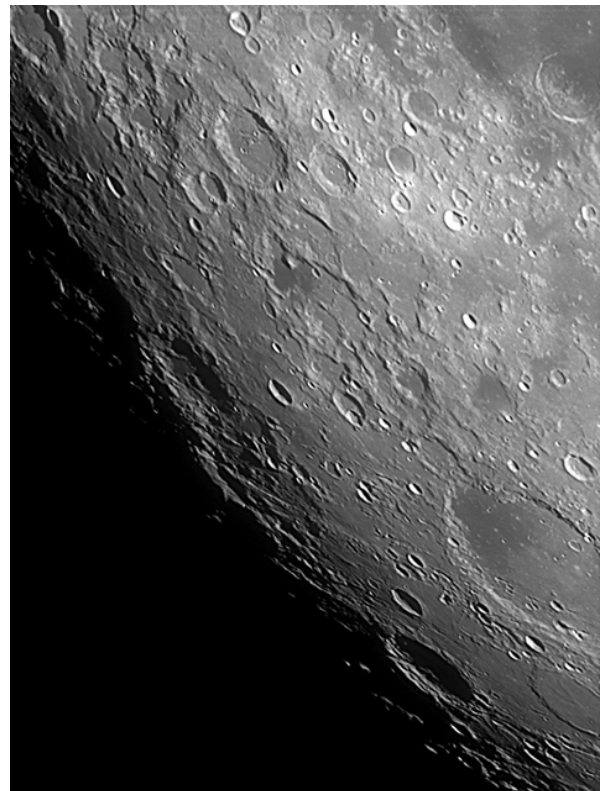


ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

SINUS IRIDUM – J. HERSCHEL – Ed Crandall – Lewisville, NC, USA. December 28, 2009 00:56 UT. Colongitude 47°, Seeing AIII. 110 mm f/6.5 APO, 3x barlow, Toucam.

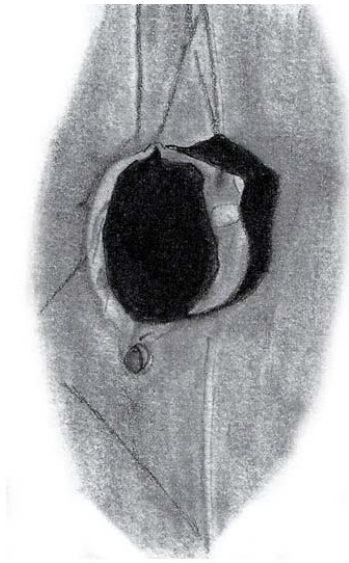


LACUS MORTIS – Colin Ebdon – Colchester, England. November 7, 2009 00:30-01:30 UT. Seeing AIII, Transparency Good. Colongitude 145.2°-145.8°. 7" f/15 Maksutov, 236x.



PIAZZI – Howard Eskildsen - Ocala, Florida, USA. December 30, 2009 01:59 UT. Seeing 8/10, Transparency 4/6. Meade, 6" f/8 Refractor, 2x barlow, DMK 41AU02AS, no filters.

ADDITIONAL TOPOGRAPHICAL OBSERVATIONS



RAMSDEN – Charles Galdies – Naxxar, Malta. November 27, 2009 18:53 UT. Seeing 7/10. 200 mm f/10 SCT, 17 mm Televue Plossl, 2x barlow, moon filter.

This evening I have focussed my scope on Ramsden - a lunar impact crater located on the western stretch of the Palus Epidemiarum.

The floor of this 25km crater has been flooded with lava, which this evening was in total darkness. The rim looked oval in outline, with depressions along parts of the walls. Ramsden is 2km deep and lacks terraces, central peaks, and any ray system.

In my sketch I tried to bring out the delicate rille system that form part of the Rimae Ramsden system. These rilles span an area 130 kilometers across, sprawling over the western Palus Epidemiarum. A branch reaches northwest to the Mare Nubium, passing between the craters Campanus and Mercator.

All in all, Ramsden and its surrounding rille system was a worthwhile sketching experience. ([Znith Astronomy Observatory Malta](http://www.znith.org))



MARE MARGINIS – Paolo Lazzarotti – Massa, Italy. June 10, 2008 18:38 UT. Seeing 6/10, Transparency 3/6. Gladius CF-315 Lazzarotti Opt. Scope, LVI-1392 PRO experimental camera, Edmund R filter, 0.18 arcsec/pixel. (<http://www.lazzarotti-hires.com/2010/01/librazione-estrema.html?lan=english>)



MARE SERENITATIS-MARE IMBRIUM – Mike White – Levin, New Zealand. South up. November 26, 2009 10:18 UT. Seeing A IV. Orion XT101 Dobsonian, Televue 2x barlow, DMK41AF02 camera.

There are several features of interest here, including the crater rays which emanate from Aristillus and extend out into Mare Serenitatus, but seem to have been somewhat obliterated by ejecta from Autolycus, indicating that the Autolycus impact may have occurred after Aristillus. Also of interest is the banded crater Archimedes, which is visible at top-right of the image. Much of the banding appears radial to Autolycus, so if it is caused by ejecta spray from that impact, that would again indicate that the

Autolycus impact occurred after Aristillus. At this illumination, a wrinkle ridge is also apparent from the north/north-eastern edge of Archimedes. On close inspection of the image, the wrinkle ridge appears to meander roughly north-east towards Aristillus B but appears to pass between Aristillus B and Aristillus, and continue on towards an unnamed flooded crater (barely visible) whose elongated central peak can be seen south-west of Mons Piton.

BRIGHT LUNAR RAYS PROJECT

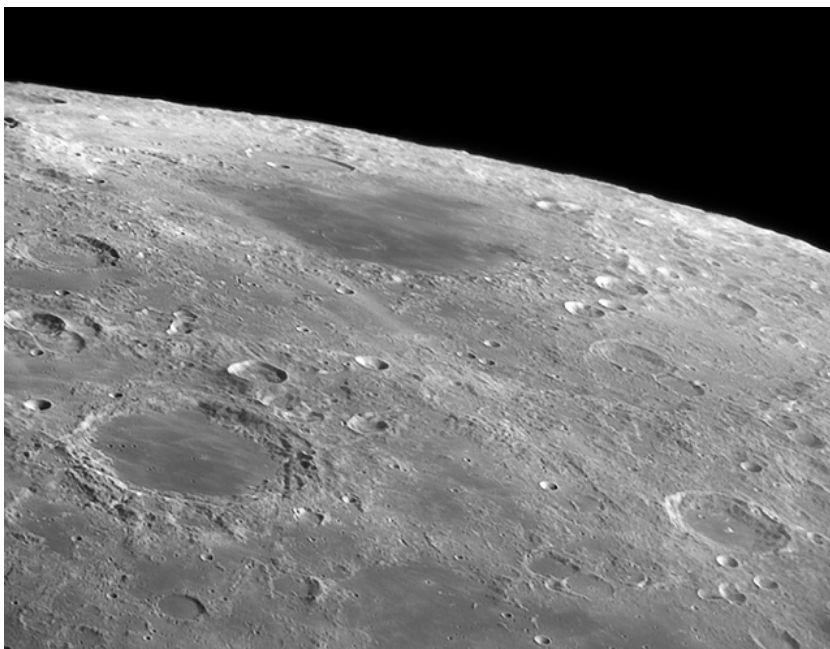
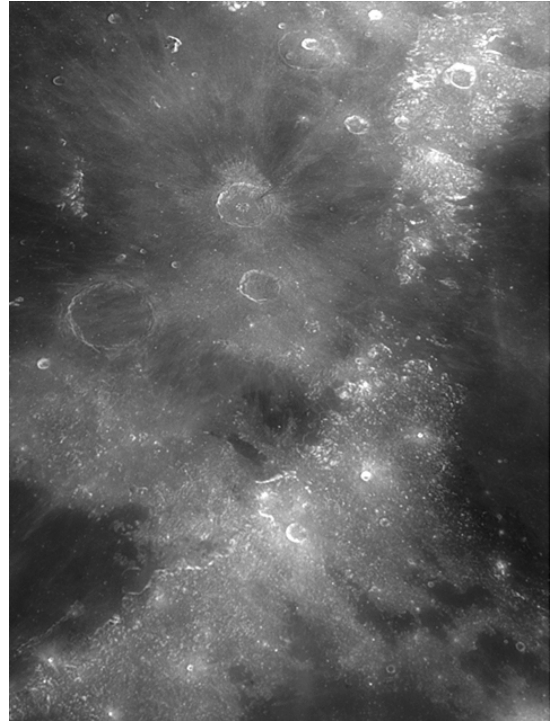
Coordinator – Wayne Bailey – wayne.bailey@alpo-astronomy.org

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

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

RECENT RAY OBSERVATIONS

ARISTILLUS RAYS – Howard Eskildsen - Ocala, Florida, USA. December 30, 2009 02:37 UT. Seeing 8/10, Transparency 4/6. Meade, 6" f/8 Refractor, 2x barlow, DMK 41AU02AS, no filter.



MARE HUMBOLDTIANUM – Paolo Lazzarotti – Massa, Italy. June 10, 2008 19:08 UT. Seeing 5/10, Transparency 3/6. Gladius CF-315 Lazzarotti Opt. Scope, LVI-1392 PRO experimental camera, Edmund R filter, 0.18 arcsec/pixel. (<http://www.lazzarotti-hires.com/2010/01/librazione-estrema.html?lan=english>)

BANDED CRATERS PROGRAM

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

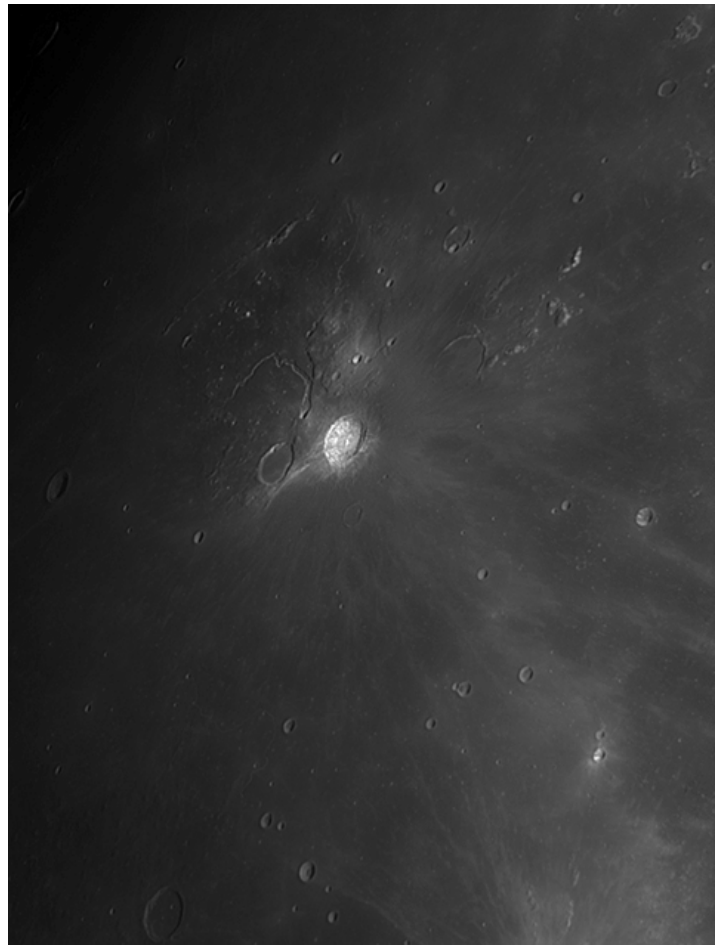
Assistant Coordinator – William Dembowski - dembowski@zone-vx.com

Banded Craters Program Website: <http://moon.scopesandscapes.com/alpo-bcp.html>



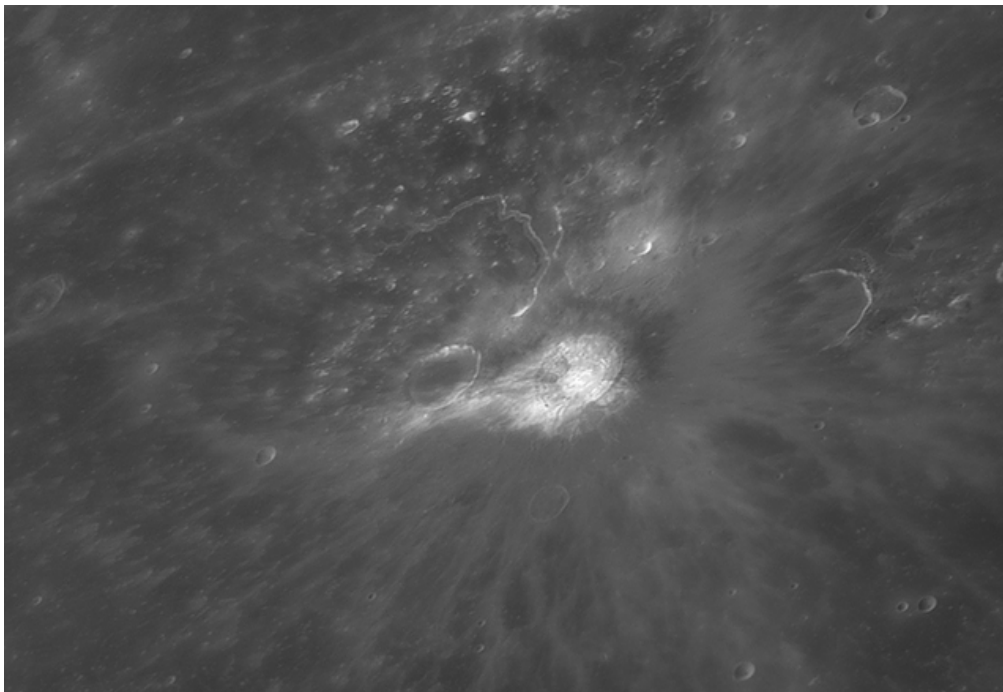
ARISTARCHUS - Maurice Collins -
Palmerston North, New Zealand, South up.
January 27, 2010 09:22 UT. C8, 2x barlow,
LPI.

ARISTARCHUS – Howard Eskildsen - Ocala,
Florida, USA. December 30, 2009 02:06 UT.
Seeing 8/10, Transparency 4/6. Meade, 6" f/8
Refractor, 2x barlow, DMK 41AU02AS, no filter.



BANDED CRATERS PROGRAM

MENELAUS – Howard Eskildsen - Ocala, Florida, USA. December 30, 2009 02:30 UT. Seeing 8/10, Transparency 4/6. Meade, 6" f/8 Refractor, 2x barlow, DMK 41AU02AS, no filter.



ARISTARCHUS – Paolo Lazzarotti – Massa, Italy. August 12, 2009 02:31 UT. Seeing 6/10, Transparency 4/6. Gladius CF-315 Lazzarotti Opt. Scope, LVI-1392 PRO experimental camera, Edmund R filter, 0.18 arcsec/pixel. (<http://www.lazzarotti-hires.com/2010/01/aristarchus-plateau.html>)

LUNAR TRANSIENT PHENOMENA

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

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

LTP NEWSLETTER – FEBRUARY 2010

Dr. Anthony Cook - Coordinator

Observations for Dec 2009 were received from the following observers: Jay Albert (Lakeworth, FL, USA), Maurice Collins (Palmerston North, New Zealand), myself (Aberystwyth University, robotic telescope and at Newtown, UK), Marie Cook (Mundesley, UK), and Simon Kidd (UK). Clive Brook (Plymouth, UK) reports that due to ill health he feels that he probably cannot contribute to any more observing. I would like to thank Clive for his many observations over the years. He has been one of our most stalwart observers and has contributed at least a hundred and fifty routine reports (I still have to scan in many more of his reports in our archives) and has also discovered several suspected LTP over the years of which you can see many examples described on the LTP predictions web site. David Darling reports that he is putting his LTP web site back together again – this is welcome news as it was a major resource being linked into by numerous web pages, including Wikipedia, in the past few years. Finally, the LTP alert Twitter site, featured on the bottom of this article, now has 14 followers, and I have made it publicly available, so you no longer need permission to view the tweets. However if you decide to “follow” it then you will have the benefit of being alerted to a LTP by mobile phone text message, should you wish to authorize this option.



Fig 1. Aristarchus by Simon Kidd (BAA) – note the spot (imaging artifact) on inner east rim.

LTP reports: Only one report was received for December, from Simon Kidd (UK), concerning a spot on the east inside rim of Aristarchus (see Fig 1), just inside the shadow, imaged at 17:35UT on 2009 Dec 28. It is not normal to see highland protruding into the shadow in this way, nor at this colongitude. However Simon analyzed his Registax video frames carefully and found this to be an artifact of the processing. I am including the image so as to illustrate the high quality of Simon's work, but also to show that how vigilant we must be in interpreting images that have been through software packages. It is very important therefore to have a time sequence of images to check! Anyway many thanks to Peter Grego (BAA

Assistant Lunar Section Director) for drawing my attention to this report, and also to Simon for investigating and concluding that this was not a real LTP.

Concerning the 2009 Nov 25th Eratosthenes LTP: because analysis is still in progress, I have decided to avoid any further discussion for now, and instead publish a paper on Eratosthenes with the observers concerned.

Lunar and Planetary Science Conference: Two page abstracts for this year's 41st Lunar and Planetary Science Conference, to be held at The Woodlands, Texas (2010 Mar 1-5) are now available on line to read on <http://www.lpi.usra.edu/meetings/lpsc2010/> . These abstracts are very educational to read to see what the latest news is in the planetary sciences, and this year they cast some light on some recent results from the LCROSS impact, LRO results and other missions, and the latest theories on lunar dust, and volatiles in the lunar regolith. I will summarize here some of the findings from the LCROSS impact:

N.Okamura *et al.* (University of Tokyo), using the Subaru telescope IR camera and spectrograph, found that they could not detect the ejecta plume from Earth. They were however able to place a limit on any possible ejecta thrown up such that it would not be seen. They consider possible reasons for the lack detection of ejecta from Earth-based telescopes to be: 1) ejecta was more clumpy than expected, 2) crater was smaller than expected, 3) there was some kind of cut-off velocity effect, or 4) the ejecta plume was emitted in a direction that was not expected. The authors conclude that the last two explanations are the most likely. A.D. Storrs and A. Colaprete report on Hubble Space Telescope observations of the impact. The spectrograph revealed no spectral emission, from impact gases in the immediate lunar atmosphere, although there was hint of a slight increase in scattered sunlight at all wavelengths – however results are preliminary. G.R. Gladstone and the LAMP team at Southwest Research Institute, using the Lyman Alpha Mapping Project (LAMP) onboard LRO, managed to detect molecular Hydrogen, Mercury, Calcium and Magnesium in the LCROSS ejecta plume. M.Millen *et al.* of NASA's Goddard Space Flight Center), using the McMath-Pierce Solar Telescope at Kitt Peak, were able to detect Sodium emission for about 6 minutes after the impact of LCROSS. The amount of the Sodium was estimated at about 2.4g, somewhat less than the predicted 2kg. The authors speculate that this discrepancy may have been because most of the ejected Sodium did not make it into sunlight. Although they did see some evidence for water, this did not change before, during or after the impact, nor did dust levels, or polarization of reflected sunlight. P.O. Hayne *et al.* (University of California) discuss the LCROSS impact as seen from the DIVINER radiometer onboard the LRO. This observed the impact site before the impact and 20 seconds after the impact. The thermal signature of the impact was clearly recorded, and it was also seen some two hours later in the next orbit fly past of LRO, in three of its nine channels, and was just detectable in one channel on the subsequent orbit i.e. 4 hours after impact. Some dust was also seen entering into sunlight.

Next month I will discuss LPSC abstracts on levitating lunar dust particles, and also the latest news on the presence of water and other volatiles in the lunar soil and deeper beneath the regolith, and how these maybe relevant to LTP reports.

For repeat illumination LTP predictions for the coming month, these 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! Twitter LTP alerts can be accessed on <http://twitter.com/lunarnaut>.

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

KEY TO IMAGES IN THIS ISSUE

1. **Aristarchus**
2. **Aristillus**
3. **Davy**
4. **J. Herschel**
5. **Lacus Mortis**
6. **Mare Humboldtianum**
7. **Mare Imbrium**
8. **Mare Marginis**
9. **Mare Nubium-Rupes Recta**
10. **Mare Orientale**
11. **Mare Serenitatis**
12. **Menelaus**
13. **Mons La Hire**
14. **Mons Rumker**
15. **Montes Apenninus & Haemus**
16. **Piazzini**
17. **Ramsden**
18. **Shiller-Zuchius Basin**
19. **Sinus Iridum**
20. **Taurus Mountains**

FOCUS ON targets

- X = Snellius & Furnerius (March)**
Ray Craters (May)
Dark-Haloed Craters (July)

