THE LUNAR OBSERVER

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

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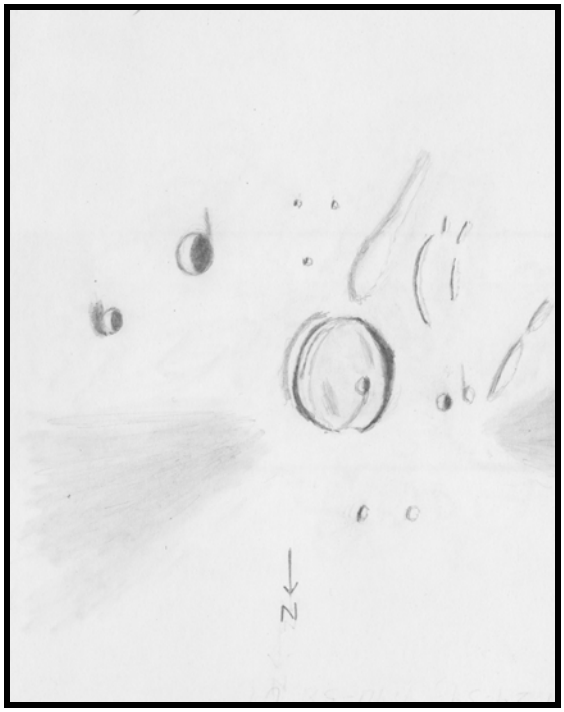
RECENT BACK ISSUES: http://moon.scopesandscapes.com/tlo_back.html

FEATURE OF THE MONTH – DECEMBER 2010

KEPLER



Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
October 1, 2010 09:24-09:34, 9:40-9:58 UT
15 cm refl, 170x, seeing 7/10

I drew this crater on the morning of Oct. 1, 2010 while watching eight stars reappear from occultation. This observation is of Kepler and nearby features, rather than its ray system. Kepler itself is a relatively shallow crater with a dimple in its north end. There are high areas on its southwest and northeast rims. Some terracing is evident inside the southheast edge, and shadowing is just outside the southeast rim of Kepler. A small pit is on the floor west of center, and a narrow strip of shadow connects it with the dimple. The interior

also has two vague dusky strips. Kepler A is the relatively large crater southeast of Kepler, and Kepler B is the smaller crater to its northeast. There is a substantial shadow adjacent to Kepler B on the east. The smail pit just west of Kepler is Kepler F. Kepler kappa is the long ridge west of F, and two smaller elevaations are nearby, The small but crisp peak to the north is Kepler omega, and a very low peak is to its west. There are some very narrow, hairline strips of shadow southwest of Kepler; they are probably too obvious on the sketch. One of them appears curved as though it's a remnant of an old ring. These delicate features contrast with a low, wide ridge near the south end of Kepler. Three tiny peaks are also in this area. Most of this view has a light tint from Kepler's ray system, but is otherwise even textured. Two dusky wedges reach close to Kepler from the west and northeast. These are gaps in an otherwise smooth ray system near Kepler.

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LUNAR CALENDAR

DECEMBER 2010-JANUARY 2011 (UT)

Dec. 01	13:00	Moon 7.4 Degrees SSW of Saturn
Dec. 02	18:00	Moon 6.2 Degrees SSW of Venus
Dec. 05	17:36	New Moon (Start of Lunation 1088)
Dec. 06	02:12	Extreme South Declination
Dec. 06	23:00	Moon 0.78 Degrees NE of Mars
Dec. 07	07:00	Moon 2.0 Degrees NNW of Mercury
Dec. 11	10:00	Moon 4.7 Degrees NNW of Neptune
Dec. 13	08:36	Moon at Apogee (404407 km - 251,287 miles)
Dec. 13	13:58	First Quarter
Dec. 13	21:00	Moon 6.6 Degrees NNW of Jupiter
Dec. 14	00:00	Moon 6.0 Degrees NNW of Uranus
Dec. 20	12:36	Extreme North Declination
Dec. 21	08:14	Full Moon (Total eclipse of Moon)
Dec. 25	12:25	Moon at Perigee (368,462 km - 228,952 miles)
Dec. 27	15:00	Moon 1.6 Degrees S of asteroid 3 Juno
Dec. 27	23:18	Last Quarter
Dec. 28	22:00	Moon 7.5 Degrees SSW of Saturn
Dec. 31	15:00	Moon 6.9 Degrees S of Venus
Jan. 02	10:06	Extreme South Declination
Jan. 04	09:04	New Moon (Start of Lunation 1089)
Jan. 10	05:39	Moon at Apogee (404,977km - 251,641 miles)
Jan. 12	11:33	First Quarter
Jan. 16	22:54	Extreme North Declination
Jan. 19	21:23	Full Moon
Jan. 22	00:11	Moon at Perigee (362,792 km - 225,428 miles)
Jan. 26	12:58	Last Quarter
Jan. 29	16:30	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 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: Marius-Reiner Gamma

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 2011** edition will be the Marius-Reiner Gamma Area. This area includes domes, craters, rilles, hills, mare, and a major swirl feature. 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 area to your observing list and send your favorites to:

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

Deadline for inclusion in the Marius-Reiner Gamma article is December 20, 2010

FUTURE FOCUS ON ARTICLES:

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

Central Peaks with craters	**TLO Issue: Mar. 2011**	**Deadline: Feb. 20, 2011**
Alphonsus	**TLO Issue: May 2011**	**Deadline: Apr. 20, 2011**

Note: Rik Hill has pointed out three craters (Plinius, Walther, Regiomontanus) that have central peaks with craters superimposed on them. These are probably chance impacts, but I don't know of any list of such features. How many other examples can you find? And does anyone know of an existing list?

DECEMBER LUNAR ECLIPSE

The total lunar eclipse on December 21st (UT) is very favorable for North American observers. It occurs when the moon is near its most northern declination. The entire eclipse will be visible from anywhere in North and Central America, although the moon will be highest in the sky on the west coast, and the final stages (mostly penumbral) continue into astronomical twilight in the eastern region.

The table gives a list of contact times. Darkening will not be noticable until the moon is well into the penumbra, probably about half way to the umbra. There are numerous possibilities for observations during the eclipse. Tony Cook mentions transient phenomena and impact flash possibilities in his TLP report below. John Westfall is interested in naked-eye timings of the umbral contacts (see www.alpo-astronomy.org, go to the eclipse section and then to the recent post labeled "Timing an eclipse of the Moon with the Unaided Eye"). Roger Sinnott is interested in timings of individual crater's entry and exit from the umbra (see skyandtelescope.com/cratertimings). I (**wayne.bailey@alpo-astronomy.org**) would like to see observations within the umbra, particularly series of images of individual features (including, but not limited to, the Selected Areas Program subjects; Alphonsus, Aristarchus, Atlas, Copernicus, Plato, Theophilus and Tycho) as the eclipse proceeds. Images of features just prior to entry into, and just after exit from, the umbra would also be interesting.

Time of Contacts (December 21, 2010 UT)

Start of Penumbral Eclipse	05:29
Start of Partial Eclipse (1st Contact)	06:33
Start of Total Eclipse (2nd Contact)	07:42
Mid-Eclipse	08:18
End of Total Eclipse (3rd Contact)	08:55
End of Partial Eclipse (4th Contact)	10:03
End of Penumbral Eclipse	11:07

Penumbral Duration: 5h 38m
Umbral Duration: 3h 29m
Duration of Totality: 1h 13m

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"SHARK'S TEETH" CRATER

Phil Morgan

The observation shown in figure 1 portrays the trio Murchison, Pallas and Bode under very late afternoon lighting, as seen on the 30th of October 2010 at 04:30 UT. At the onset the small central peak of Pallas was seen as just a bright star-like point of light, so I decided to try to determine the actual timing of extinction, and as near as I could ascertain this occurred at precisely 05:04 UT.

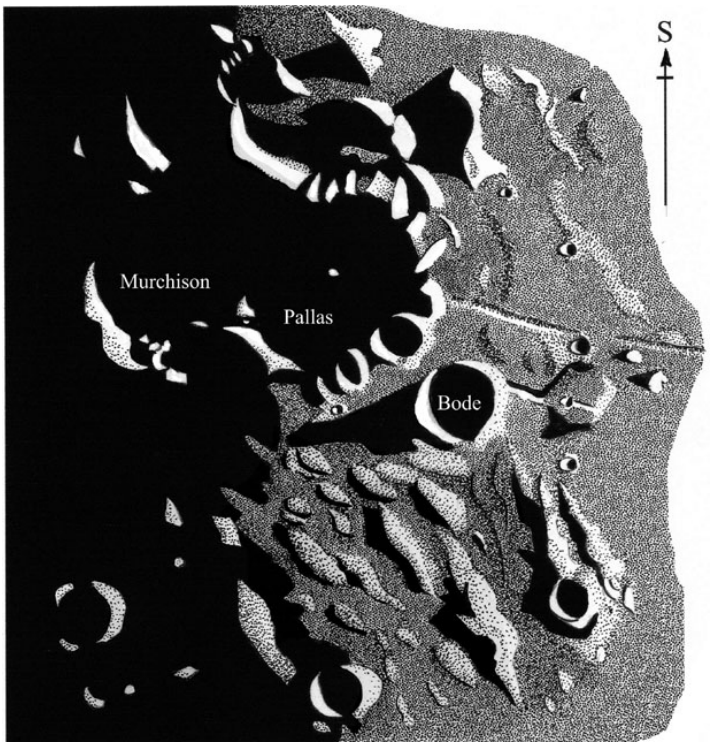


Figure 1: Murchison, Pallas & Bode. *Phillip Morgan –Lower Harthall-Tenbury Wells, Worcestershire, England. October 30, 2010 04:30-05:15 UT. Seeing 8/10, transparency 5/5, colongitude 180.3º-180.7º. 305mm, f/5, newtonian, 400x.*

Jim Mosher did a simulation for last light on the central peak of Pallas (figure 2) utilising his LTVT programme with the LOLA DEM, and obtained a time of 05:15 UT. At twice the resolution shown here the central peak is last visible in the "normal" simulation at 05:08 UT, and in a "last light" simulation at 05:16 UT. Unfortunately the LOLA DEM misses a strip of data at the critical point, so the predicted timing could be slightly earlier or later.

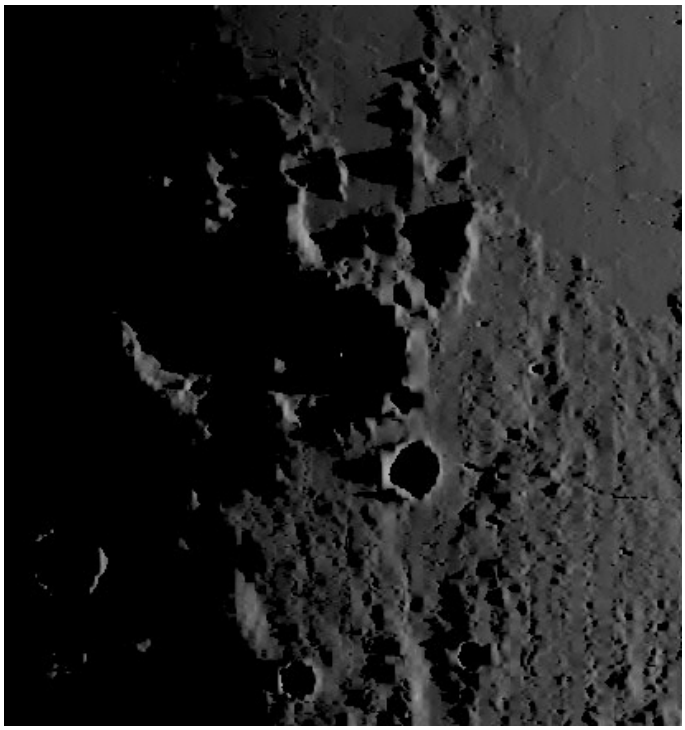


Figure 2: *LTVT simulation of lighting (see discussion in text).*

Murchison, (Pre Nectarian) is overlapped by the younger crater Pallas (Nectarian). But despite its younger age Pallas appears to have almost faired worse as far as degradation is concerned. The remaining south, north and west outer ramparts have been sliced into individual segments. Observing the region many year's ago under similar lighting conditions I thought that these segments resembled a set of sharp teeth, and so just for my own interest nicknamed Pallas the " Shark's Teeth" crater!

Situated just to the north of Pallas is the 19 kilometre wide Bode. Running from the outer west rampart is a rille that cuts a flat-topped mound, with another much longer one to the south, both easily seen on this occasion.

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 2, 3, 5, 6, 9, 10, 11, 12 & 16 day moon, Alphonsus, Atlas-Hercules, Clavius Eratosthenes, Fra Mauro, Langrenus, Mare Nectaris, Moretus-Clavius, Petavius-Humboldt & Plato.

ED CRANDALL – LEWISVILLE, NORTH CAROLINA, USA. Digital images of Copernicus, Fra Mauro & Tycho.

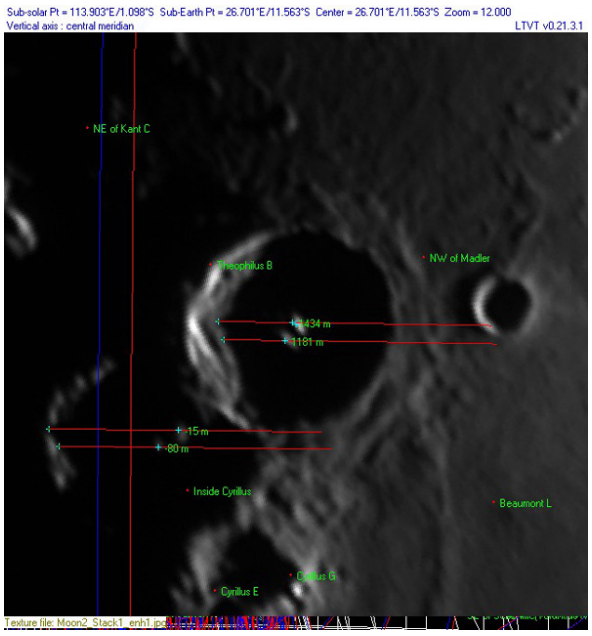
HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Alpetragius, Aristarchus(2), Carpenter, Copernicus, Euler, Flamsteed(3), Fra Mauro, Grimaldi, Gruithuisen, Hortensius, Kepler(2), Laplace, Longomontanus-Clavius, Mare Humorum(3), Marius(2), Mons LaHire, NW Limb, Pitatus(2), Prinz(2), Oceanus Procellarum, Palus Epidemiarum(2), Pythagorus(2), Riccioli, Riphaeus, Schickard(2), Schiller(2), Sirsalis, Vieta region.

JERRY HUBBELL - – LOCUST GROVE, VIRGINIA, USA. Digital images of Theophilus-Cyrillus region, Cauchy-Maskelyne-Jansen & Posidonius-Atlas-Hercules. Elevation measurements of Theophilus-Cyrillus & Piccolomini.

FRANK MELLILO – HOLTSVILLE, NEW YORK, USA. Digital images of Ina(2).

PHILLIP MORGAN –LOWER HARTHALL-TENBURY WELLS, WORCESTERSHIRE, ENGLAND. Drawing of Murchison-Pallas-Bode.

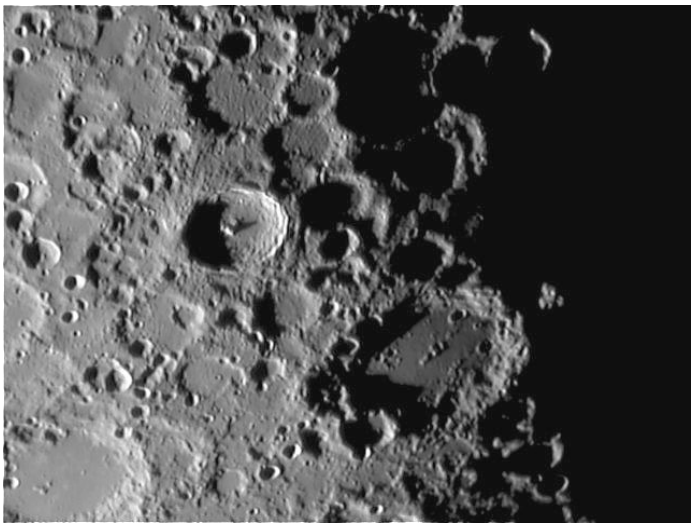
RECENT ELEVATION OBSERVATIONS



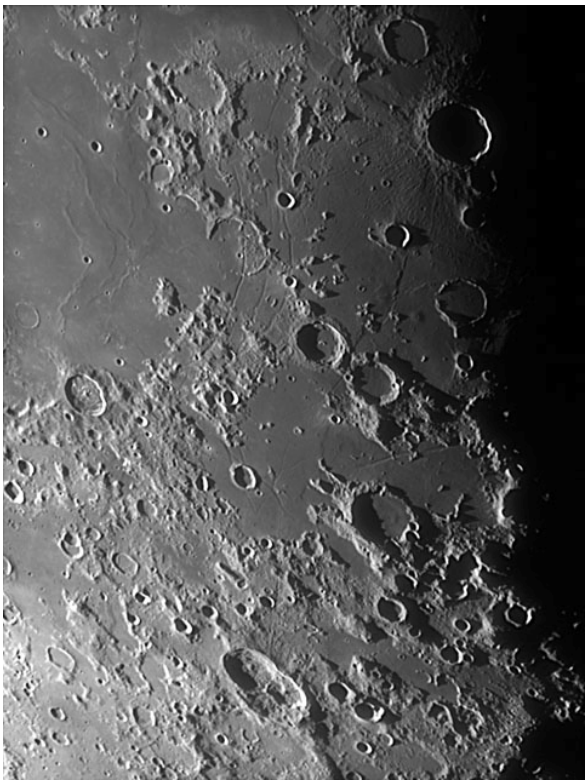
THEOPHILUS-CYRILLUS – Jerry Hubbell, Locust Grove, Virginia, USA. November 11, 2010 23:07 UT. Colongitude 336º, Seeing 6/10, Transparency 5/6. 0.2 m AT8RC Ritchey-Chretian. ATIK 314e TEC CCD.

RECENT TOPOGRAPHICAL OBSERVATIONS

LANGRENUS-Maurice Collins - Palmerston North, New Zealand. November 11, 2010 08:23 UT. Seeing AII. C8, 2x barlow, LPI.



TYCHO – Ed Crandall – Lewisville, North Carolina, USA. September 1, 2010 09:45 UT. Seeing AIII. Colongitude 183.2º. 110 mm f/6.5 APO, 3x barlow, ToUcam.

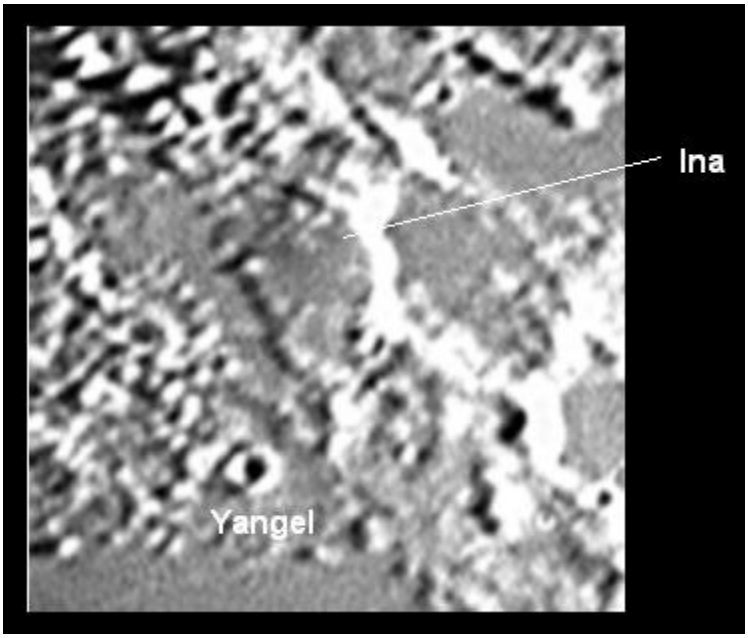


PALUS EPIDIMIARUM-Howard Eskildsen-Ocala, Florida, USA. October 2, 2010 09:54 UT. Seeing 6/10, Transparency 4/6. 6" f/8 Explore Scientific refractor, 2x barlow, DMK 41AU02 AS, no filter.

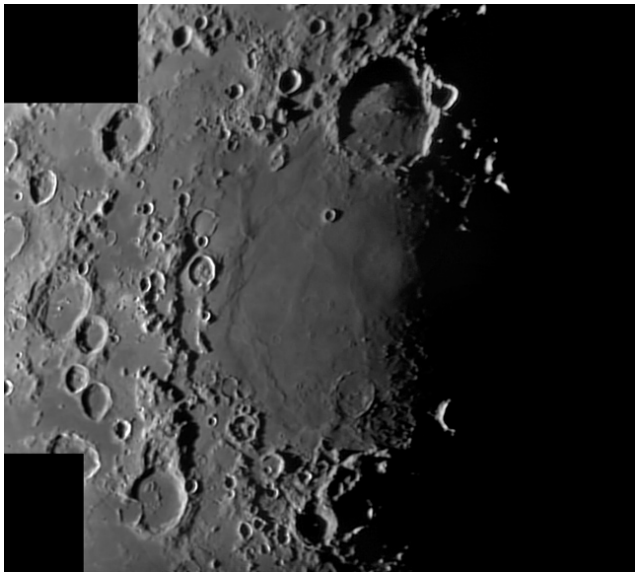
RECENT TOPOGRAPHICAL OBSERVATIONS

THEOPHILUS-CYRILLUS – Jerry Hubbell, Locust Grove, Virginia, USA. November 11, 2010 23:07 UT. Colongitude 336º, Seeing6/10, Transparency 5/6. 0.2 m AT8RC Ritchey-Chretian. ATIK 314e TEC CCD.
[This is] Theophilus showing the crater ejecta blanket surrounding the rim, plus other features. The bifurcated central peak is very well resolved as well as the terracing in the crater walls to the South-West.

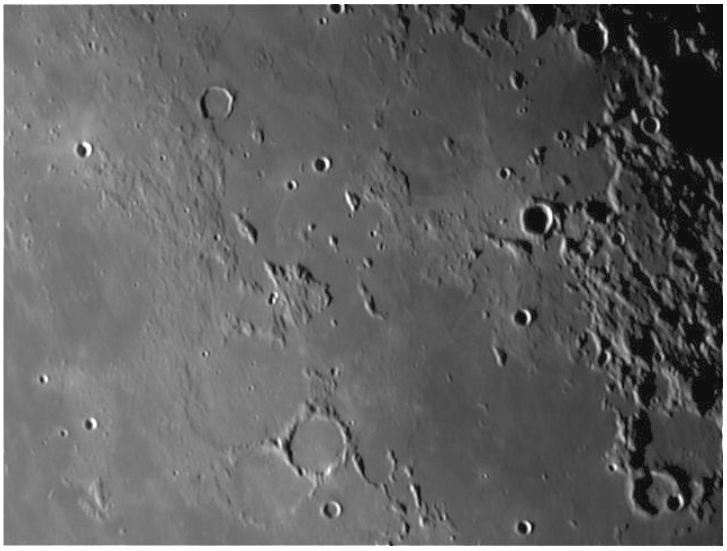
INA - Frank Melillo, Holtsville, NY, USA. November 13, 2010 22:38 UT. Seeing 7/10. Meade 10" SCT, f/20, Starlight Express MX-5.
I have attached my best shots of Ina so far and I think I can make out a D-shaped crater if you look carefully. The seeing was much better this time and the moon was much higher in the sky than last September 16th.



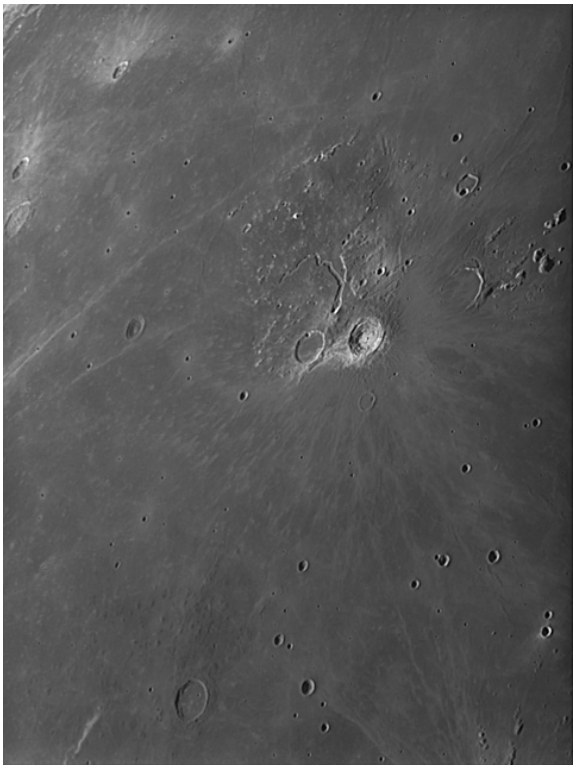
ADDITIONAL TOPOGRAPHICAL OBSERVATIONS



MARE NECTARIS-Maurice Collins - Palmerston North, New Zealand. November 11, 2010 08:10-08:20 UT. Seeing A-II. C8, 2x barlow, LPI.

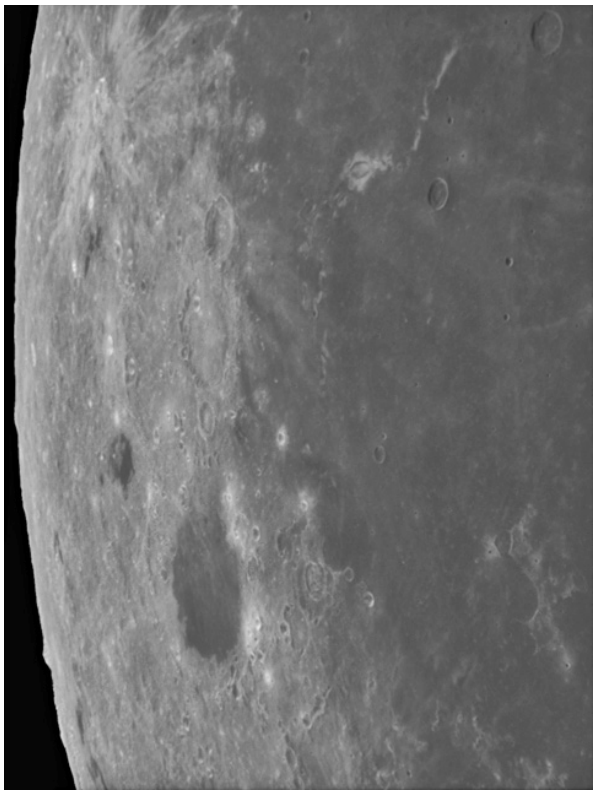


FRA MAURO – Ed Crandall – Lewisville, North Carolina, USA. September 1, 2010 09:49 UT. Seeing AIII. Colongitude 183.2º. 110 mm f/6.5 APO, 3x barlow, ToUcam.

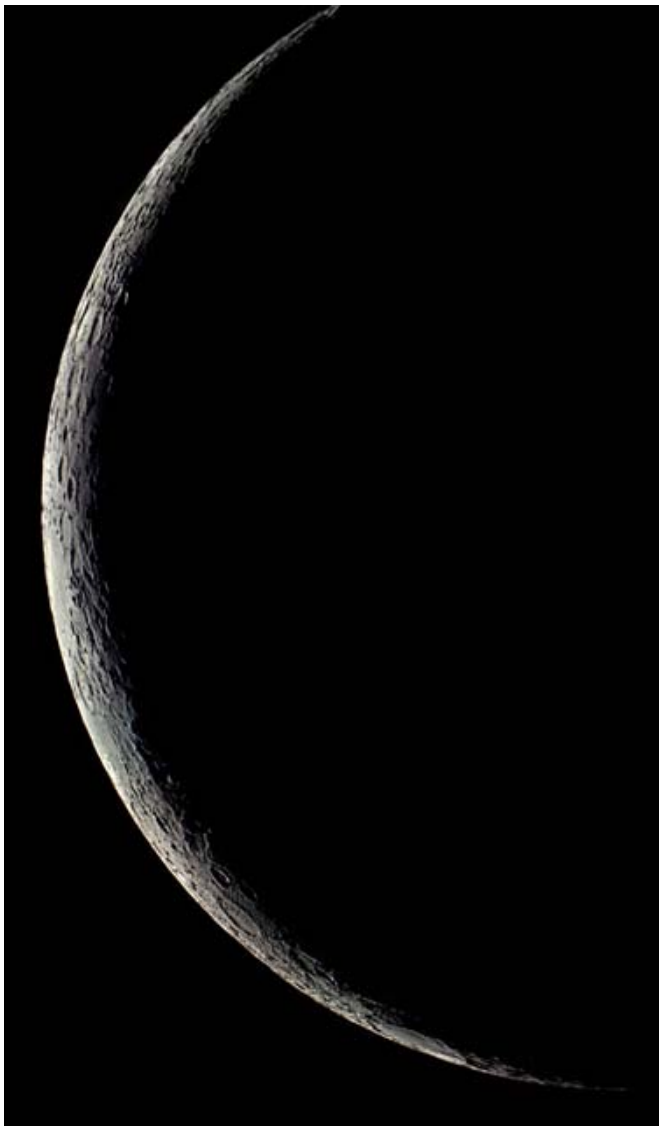


ARISTARCHUS - Howard Eskildsen-Ocala, Florida, USA. October 2, 2010 10:09 UT. Seeing 6/10, Transparency 4/6. 6" f/8 Explore Scientific refractor, 2x barlow, DMK 41AU02 .AS, no filter.

ADDITIONAL TOPOGRAPHICAL OBSERVATIONS



RICCIOLI-GRIMALDI - Howard Eskildsen-Ocala, Florida, USA. October 31, 2010 08:51 UT. Seeing 7/10, Transparency 5/6. 6" f/8 Explore Scientific refractor, 2x barlow, DMK 41AU02 .AS, no filter.



2-DAY MOON-Maurice Collins - Palmerston North, New Zealand. November 8, 2010 07:09-07:31 UT. C8, 2x barlow, LPI.

BRIGHT LUNAR RAYS PROJECT

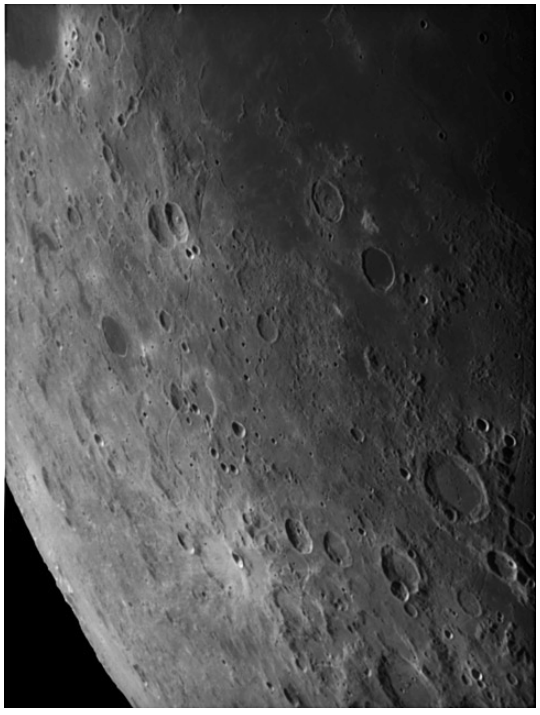
Coordinator – Wayne Bailey – wayne.bailey@alpo-astronomy.org

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

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

RECENT RAY OBSERVATIONS

KEPLER-Howard Eskildsen-Ocala, Florida, USA. 6" f/8 refractor, 2x barlow, DMK 41AU02 AS.
Left: October 3, 2010 10:04 UT. Seeing 7/10, Transparency 4/6. W-8 Yellow filter.
Right: October 31, 2010 08:44 UT. Seeing 7/10, Transparency 5/6. no filter.



BYRGIUS A-SIRSALIS - Howard Eskildsen-Ocala, Florida, USA. October 3, 2010 10:23 UT. Seeing 7/10, Transparency 4/6. 6" f/8 Explore Scientific refractor, 2x barlow, DMK 41AU02 .AS, W-8 Yellow filter.

LUNAR TRANSIENT PHENOMENA

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

LTP NEWSLETTER – DECEMBER, 2010

Dr. Anthony Cook - Coordinator

Observations for Oct 2010 were received from the following observers: Jay Albert (Lakeworth, FL, USA) observed Eimmart, Philolaus, Riccoli, Tycho, and several other features. Maurice Collins (New Zealand) observed Copernicus, Sinus Iridum, Tycho and took whole Moon images. Marie Cook (Mundesley, UK) observed Mare Imbrium, Picard, and several other features. Myself (Aberystwyth University Robotic Telescopes) observed Earthshine and took time lapse video of the Moon in various spectral wavebands. Steve Lang (New Zealand) took a whole Moon image. Brendan Shaw (UK) observed Atlas, Mare Crisium, Moltke, and Plato.

News: ALPO member Bob O'Connell has been in contact with me regarding some research that he has been undertaking into the background behind Greenacre and Barr's historical report of red glows and other phenomena near to the Cobra's Head area of Aristarchus and the crater itself, as seen in 1963 Oct 30th and Nov 28th. Whilst shedding light on new evidence for these being LTP he has also come across a few errors/discrepancies in the original published accounts. I will not say anymore in case this lessens the impact of the paper that he is working on. I would however like to encourage all observers to keep a look out for Greenacre repeat illumination events cropping up in the predictions below. I am sure that Bob would appreciate any sketches or detailed imagery (especially in color) of Aristarchus and its surrounds that match these. Bob also put me in contact with Gene Cross who was one of the observers involved with some significant confirmed sightings of LTP activity in the crater Ross D and its surrounds in the 1960's, and with Gene's help I hope to be able to verify the dates, UTs and weights of these reports.

Routine Reports: Although no past LTPs have been disproven this month. Two efforts to observe deserve a mention:

On 2010 Oct 02 between 09:28 and 09:40UT, Jay Albert checked the appearance of the Riccioli crater. This matched the same illumination to within +/-0.5° with a Walter Haas observation from 1937 Sep 29 where deep purple had been seen on the rim. No color was seen when Jay observed this time. Here is the original Haas report based upon the Cameron LTP catalog: *Riccioli 1937 Sep 29 UT 09:10 Observed by Haas (Alliance, OH USA, 12?" reflector) "Vivid deep purple (Deep purple color on the previous day), but on July 2, 1937 at col. 195deg it was gray tinged with brownish purple. Pbs. conditions similar on all." NASA catalog weight=4 (high). NASA catalog ID #426. ALPO/BAA weight=3.*

On 2010 Oct 22 at UT11:32-11:36 Steve Lang (New Zealand) produced a whole Moon mosaic. This was close to the illumination conditions to the following LTP report: *Aristarchus observed by Mellor on 1978-5-22: Aristarchus was not normal, but all the following features were: Mare Crisium, Proclus, Sinus Iridium, Grimaldi, and Tycho. Observed by Mellor and Fitton, UK. Observer notes that Aristarchus is brighter than Tycho when normal. Estimated variation was 25%. However the Moon was low and the Moon was yellow. Despite this the*

observer decided that the effect was real. Cameron 2006 extension catalog ID=32 and weight=2. ALPO/BAA weight=1. In Steve Lang's image Aristarchus does indeed appear brighter than Tycho to the eye, and had a digital brightness value of 211 at its brightest point, where as Tycho's brightest point was 192. The only difference I can suggest was that the sub-observer point (topocentric libration) back in 1978 was Lon=2.5W, Lat=5.0N where as in 2010 it was Lon=2.7W Lat= 6.9S. I doubt however if the viewing angle difference is large enough to yield a photometric effect sufficient to make Aristarchus fainter than Tycho. More likely the observing conditions back in 1978 with the Moon at low altitude, may have had something to do with this?

LTP Reports: No LTP reports were received for October 2010.

Observing Schedule: For repeat illumination (only) LTP predictions for the coming month, these can be found on the following web site: http://users.aber.ac.uk/atc/tlp/tlp.htm . December offers two special events:

(1) The opportunities to look for impact flashes in Earthshine around Dec 11-14th during the Geminids – low light cameras suited to occultation work will offer an advantage here. Although impact flashes have been seen visually in the past. Accurate times of any flashes detected will be important. All reports should be sent to Brian Cudnik.

(2) There is a total lunar eclipse on Dec 21st. This will be of particular interest as it will allow us to check out some lunar eclipse reports from the past that occurred at the same libration. There will also be a European wide effort to look for impact flashes in Earthshine during this eclipse.

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. **Byrgius A**
3. **Fra Mauro**
4. **Ina**
5. **Kepler**
6. **Langrenus**
7. **Mare Nectaris**
8. **Pallas**
9. **Palus Epidemiarum**
10. **Riccioli**
11. **Theophilus**
12. **Tycho**

FOCUS ON targets

X = Marius-Reiner gamma (January)
Y = Alphonsus (May)