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: William M. Dembowski, F.R.A.S. - dembowski@zone-vx.com
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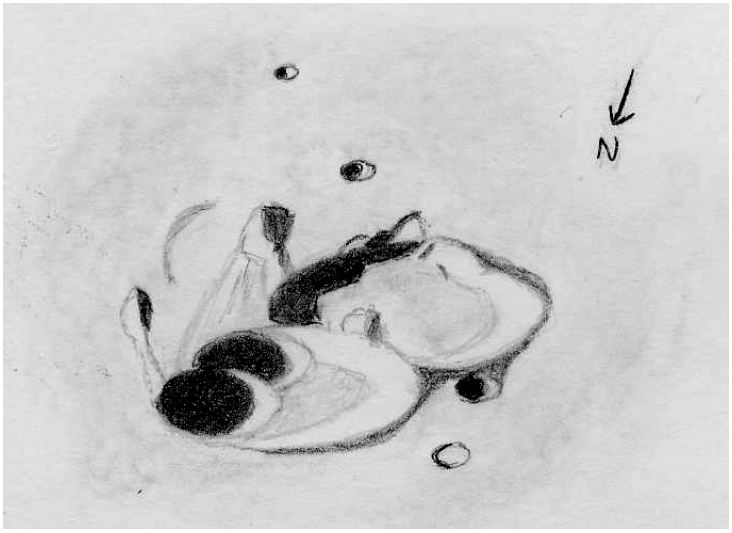
219 Old Bedford Pike (Elton) - Windber, PA 15963

FEATURE OF THE MONTH - AUG. 2007



NEARCH B & C

Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
February 23, 2007 - 01:20 to 01:54 UT
15cm Newtonian - 170x - Seeing 6-7/10

I observed these overlapping craters on the evening of Feb. 22/23, 2007 before the moon occulted epsilon Arietis arid a few other stars. These craters are toward the lunar southeast limb south of Hommel, but this area had a favorable libration that evening. Nearch B is the more northeasterly of the two, and has two sizable craters at its east end. The Lunar Quadrant map identifies them as Nearch BA and BC. The latter is near the junction of Nearch B and C. The LQ map shows C overlapping B, but I saw B overlapping into C. There is a modest peak within C near the rim of B. Nearch E is located on the north rim of C, and a shallow, unlabeled crater is north of E. There are some hills and ridges that connect to the east rims of Nearch B and C, and a possible ghost ring is nearby. Nearch F is just south of C, and Nearch G is farther to the south. The area near and south of F and G is very smooth. There is a bright area on the south rim of C that is partly outlined by shadow and a lobe on C's rim.

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. Several copies of recent journals can be found on-line at: **http://www.justfurfun.org/djalpo/** Look for the issues marked FREE, they are not password protected. Additional information about the A.L.P.O. can be found at our website: **http://www.lpl.arizona.edu/alpo/** 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.lpl.arizona.edu/~rhill/alpo/member.html** which now also provides links so that you can enroll and pay your membership dues online.

LUNAR CALENDAR - AUGUST 2007 (UT)

Aug. 02	00:00	Moon 1.8 Degrees NNW of Uranus
Aug. 03	23:53	Moon at Perigee (368891 km - 229218 miles)
Aug. 05	21:21	Last Quarter
Aug. 07	02:00	Moon 6.3 Degrees NNW of Mars
Aug. 12	17:00	Moon 0.29 ENE of Mercury
Aug. 12	23:02	New Moon (Start of Lunation 1047)
Aug. 13	14:00	Moon 0.43 Degrees S of Saturn
Aug. 13	15:00	Moon 8.3 Degrees SSE of Venus
Aug. 19	03:29	Moon at Apogee (404620 km - 251419 miles)
Aug. 20	23:54	First Quarter
Aug. 22	01:00	Moon 5.7 Degrees S of Jupiter
Aug. 27	10:00	Moon 1.3 Degrees SSE of Neptune
Aug. 28	10:36	Full Moon (Total eclipse of the Moon)
Aug. 29	07:00	Moon 1.7 Degrees NW of Uranus
Aug. 31	00:14	Moon at Perigee (364173 km - 226287 miles)

CALL FOR OBSERVATIONS
FOCUS ON: Proclus & Palus Somni

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 **September 2007** edition will be the crater **Proclus and adjoining Palus Somni**. 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 crater to your observing list and email your favorites to **Dembowski@zone-vx.com** or send to the postal address shown in the banner on Page One of this newsletter.

Deadline for inclusion in the Proclus & Palus Somni article is August 20, 2007

Be sure to check the July issue of TLO (Pages 4 & 5)
for information on Proclus LTP observations.
http://www.zone-vx.com/TLO200707.pdf

FIRST QUARTER MOON AND REGULUS

By Anthony Ayiomamitis

It is often assumed that stars are only visible during the evening and well after the sun has already set. This is really a myth since many stars and a good number of planets are also visible during the day. Since the eye focuses at a distance of 400 feet when focusing for "infinity", such observations become a challenge. However, when the moon is in the immediate vicinity of our object of interest so that our eye can focus properly for infinity (with the observer looking at the moon), such observations become much easier.

Moon and Regulus (lower right)
Digital image by Anthony Ayiomamitis - Athens, Greece
May 23, 2007
AP160/f7.5 EDF refractor - AP1200GTO GEM Mount
Canon EOS 300d digital camera

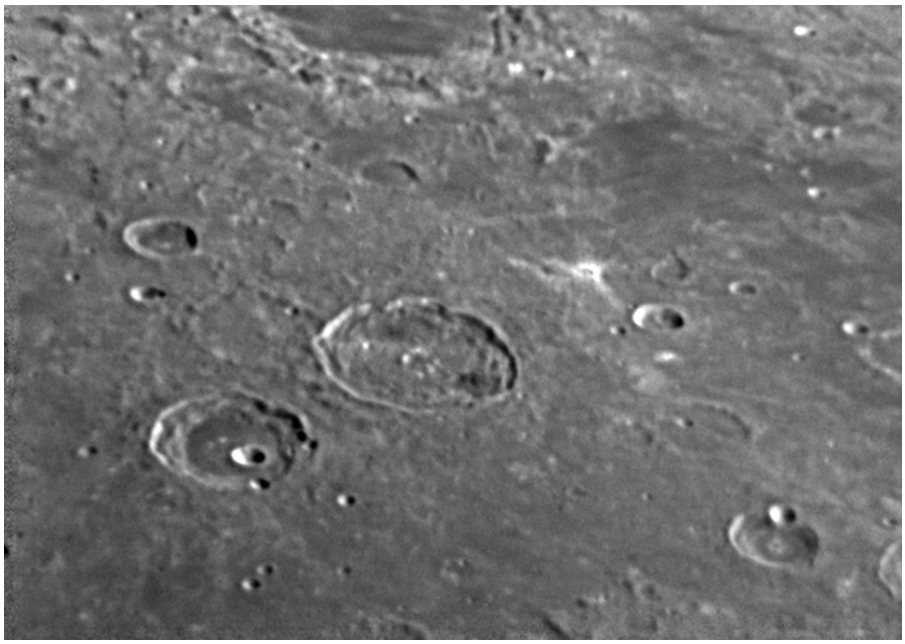
Above is an image taken on May 23, 2007 involving the First Quarter Moon and Regulus. The latter is one of the brightest stars in the sky (magnitude 1.40) and the primary star of the constellation of Leo. Lying at a distance of 77.5 light-years away, it is also one of the closest stars to Sol. It is really a triple-star system comprised of Regulus A (mag. 1.40) and two other fainter members (mag. 8.0 and 13.0).

Links of possible interest include:

(1) http://www.perseus.gr/Astro-Lunar-Occult-2007-05-23.htm
(2) http://www.astro.uiuc.edu/~kaler/sow/regulus.html

A Brief Study of Atlas & Hercules

By Wayne Bailey



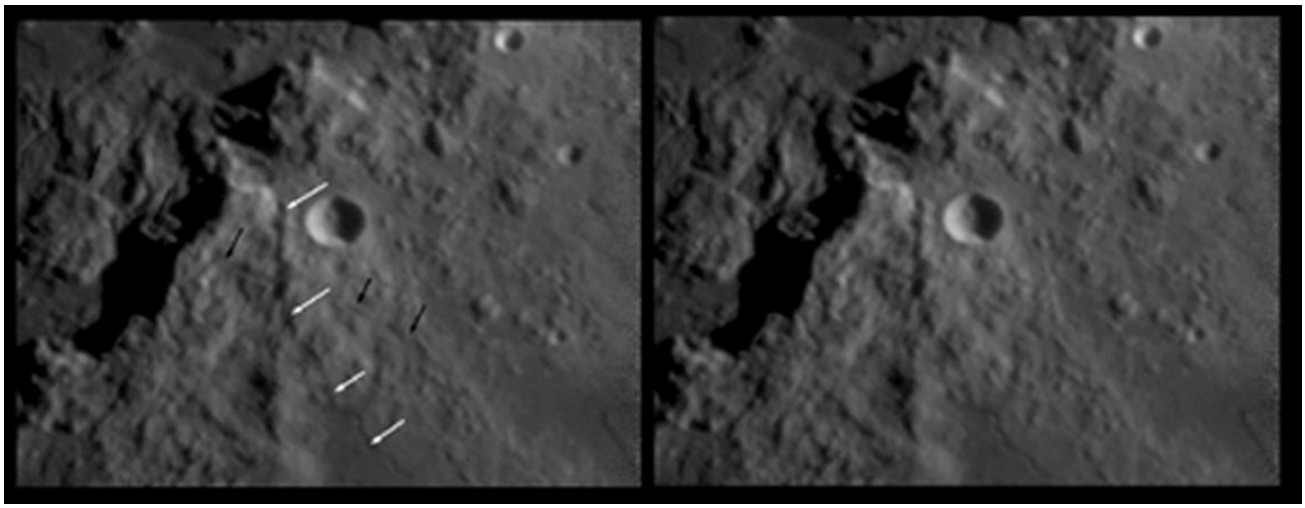
ATLAS & HERCULES
Digital image by Wayne Bailey - Sewell, New Jersey, USA
May 25, 2007 - 03:12 UT
Colonitude: 9.5 - Latitude +1.5 - Seeing: 5/10 - Trans: 3/6
Celestron C11 f/10 SCT - 2x Barlow
Lumenera Skynyx 2-1M Camera - Schuler IR72 Filter

Above is an image of Atlas & Hercules taken on May 25, 2007. Several rilles are faintly visible on the east floor of Atlas, one runs directly into the dark western dark spot of the pair near the south rim. There's also what looks like a small ray crater on the floor just inside the northwest rim. Of the three rays extending from this, the two directed toward the nearby wall seem to terminate at the wall, while the one directed across the crater continues much further, possibly past the southeast wall. Higher sun images may show the rays more clearly, but if they really are blocked by the wall, that would give a limit on the angle of ejection of the ray material. A quick look at an image from 5/30 shows the western most ray continuing a short distance across the wall but the northwest ray still appears to terminate abruptly at the wall.

Considering that Atlas & Hercules are similar sizes and close together, the floors of the two craters are noticeably different. Atlas appears rough with rilles and dark spots. Hercules appears smooth. Both are shallow, so must be partially filled. The results of the filling are noticeably different though.

Possible Rilles Near Crater Conon

By Howard Eskildsen



POSSIBLE RILLES NEAR CONON
Digital image by Howard Eskildsen - Ocala, Florida, USA
January 27, 2007 - 02:42 UT - Seeing: 7/10 - Trans: 5/6
Meade 6 inch f/8 Refractor - 5x Barlow - Celestron NexImage - IR Block Filter

I took this photo in January and have seen these features several times since. I wonder if they might be surface features caused by faults under the Montes Apenninus. The black arrows point to interrupted linear features that are radial to Imbrium, that could conceivably be related to a deep underlying fault. The white arrows point to a rille starting to the west of Conon and arcing southward towards the lava flows around Rima Conon (marked by the bottom white arrow).

If these surface irregularities are caused by deep underlying faults, perhaps the one marked with white arrows could be the source for the lava flow at the base of Montes Apenninus that produced Rima Conon. Also, the areas marked by black arrows to the right of the intersection of the two (possible) faults appears shifted slightly to the north, compared to the other side. This could imply motion along the north-south fault and reveal their relative ages. Of course, this could also be the result of chance alignments and an overactive imagination.

A.L.P.O. LUNAR COORDINATORS

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David O. Darling – Asst. Coordinator, Transient Lunar Phenomena DOD121252@aol.com

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Marvin W. Huddleston – Coordinator, Lunar Dome Survey kc5lei@comcast.net

LUNAR TOPOGRAPHICAL STUDIES

Coordinator - William M. Dembowski, FRAS
dembowski@zone-vx.com

OBSERVATIONS RECEIVED

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND
Various lunar observations from May 25 to June 27

Digital images of 9-day Moon , Northeast Quadrant, Southern Highlands (2), 12-day Moon, Copernicus region, Mare Humorum, Mare Ibrium,

HOWARD ESKILDSEN - OCALA, FLORIDA, USA
Digital images of Ina and surroundings, Mare Orientale, Capuanus, Grimaldi, Mare Humorum, Rilles near Conon, Eienstein (2)

Banded crater report forms with digital images of Ariadaeus (2), Aristarchus (2), Conon (2), Kepler, Proclus (2), Pytheas (2),Theaetetus, Aristillus, Birt, Bode, Messier

PETER GREGO - REDNAL, BIRMINGHAM, ENGLAND
Drawings of Proclus (3)

ROBERT H. HAYS, JR. - WORTH, ILLINOIS, USA
Drawings of Cook, Arago & Manners

Timings of 58 stars occulted by the Moon

RIK HILL - TUCSON, ARIZONA, USA
Digital image of Copernicus

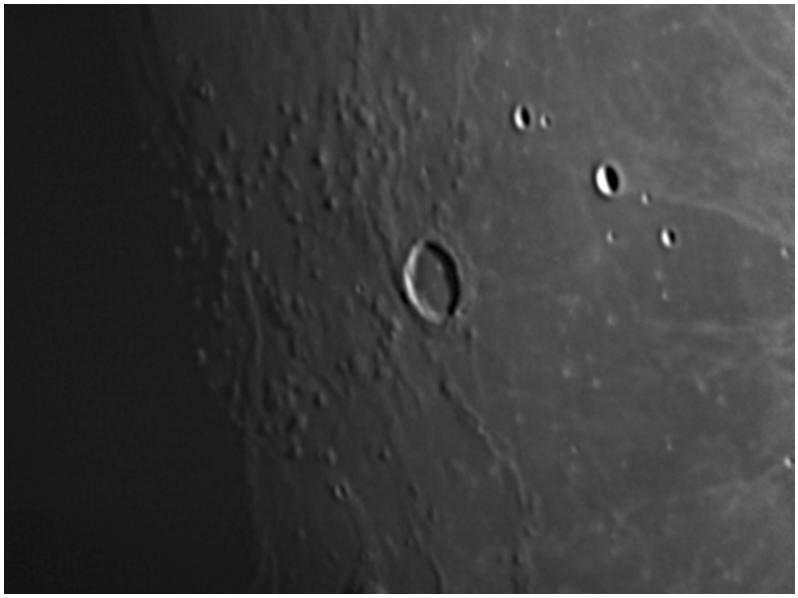
PAULO LAZZAROTTI - MASSA, ITALY
Digital images of Lacus Mortis & Atlas & Hercules, Hipparcus, Rima Ariadaeus, Caucasus Mountains,

RAFAEL BENAVIDES PALENCIA - POSADAS, CORDOBA, SPAIN

KLAUS PETERSEN - GLINDE, GERMANY
Digital image of Aristoteles to Hercules

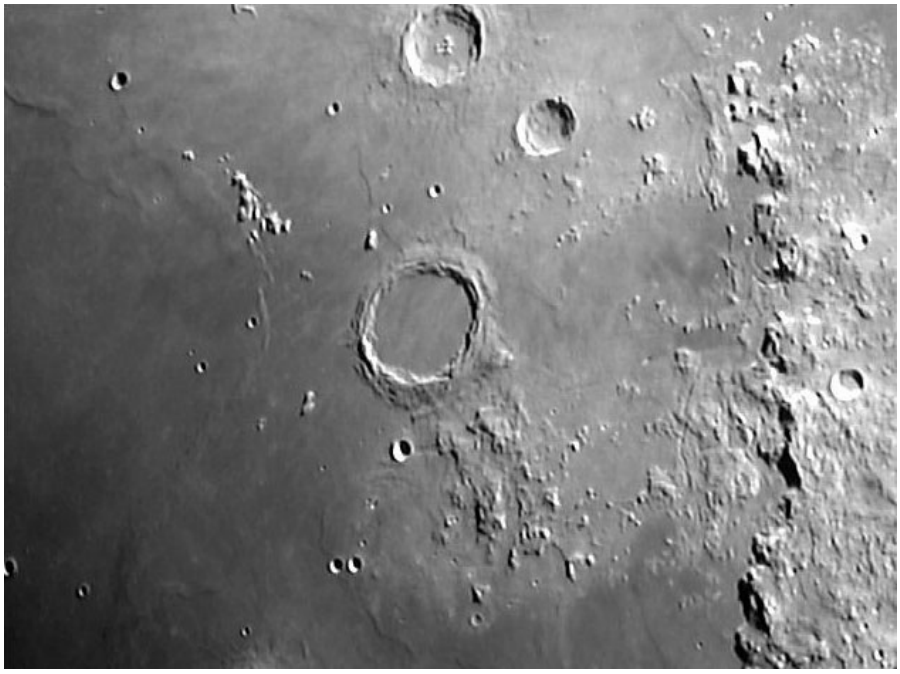
RECENT TOPOGRAPHICAL OBSERVATIONS

16-DAY MOON
Digital image by Maurice Collins - Palmerston North, New Zealand
June 2, 2007 - 08:28 UT - Seeing: 3/5 - Meade ETX90



MARIUS DOMES AND HILLS
Digital image by Wayne Bailey - Sewell, New Jersey, USA
May 29, 2007 - 02:01 UT - Colong: 57.7 - Seeing: 5/10 - Trans: 2/6
Celestron 11 inch SCT - 2x Barlow - Lumenera Skynyx 2-1M - Schuler IR72 Filter

RECENT TOPOGRAPHICAL OBSERVATIONS

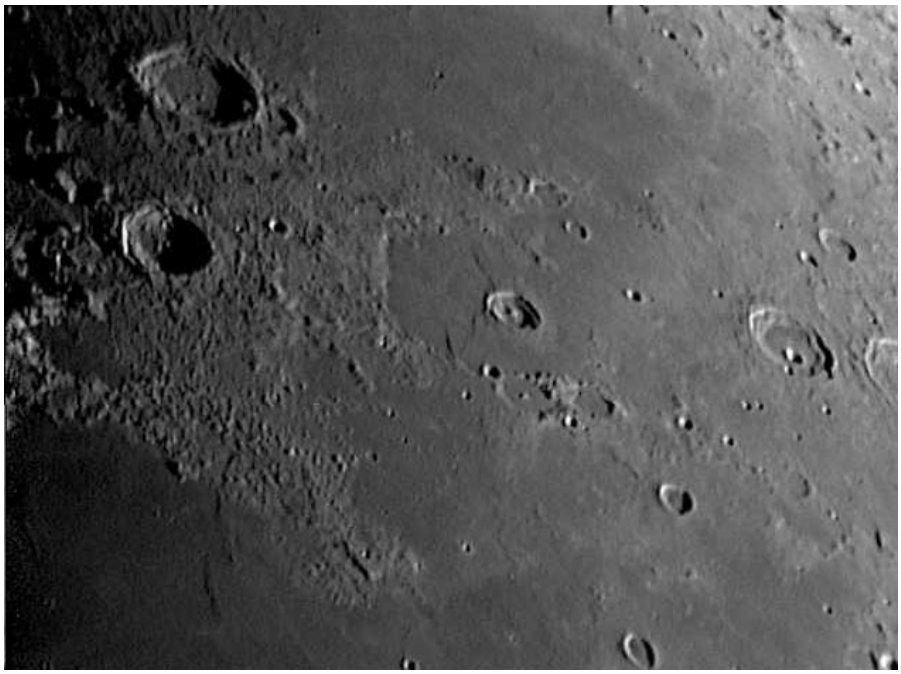


ARCHIMEDES
Digital image by Ed Crandall - Winston-Salem, North Carolina, USA
May 26, 2007 - 00:50 UT - Colong: 26
110mm f/6.5 APO Refractor - Seeing: 5/10 - Trans: 3-4/6

MARE HUMORUM
Digital image by Howard Eskildsen - Ocala, Florida, USA
June 9, 2007 - 10:44 UT - Seeing: 7/10 - Trans: 4/6
Meade 6 inch f/8 Refractor - Orion StarShoot II

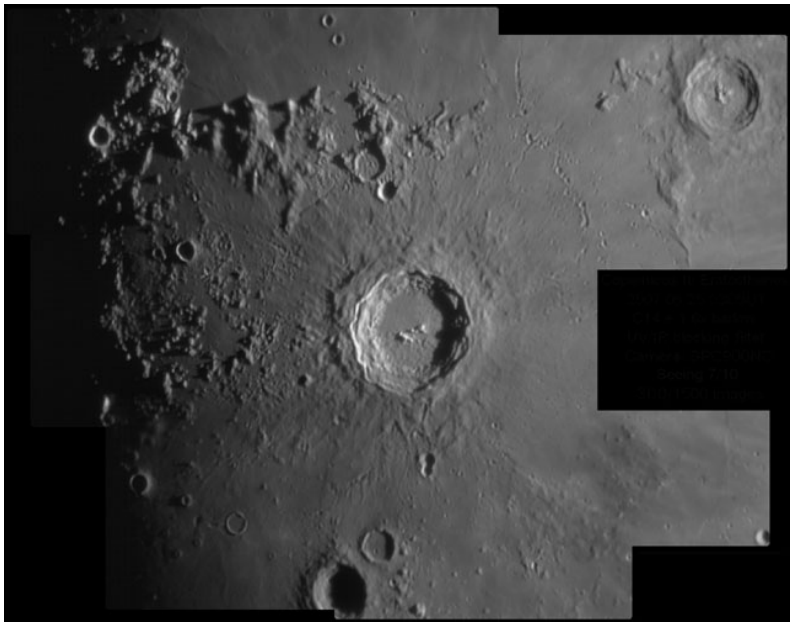
RECENT TOPOGRAPHICAL OBSERVATIONS

RIMA ARIADAEUS
Digital image by Paolo Lazzarotti - Massa, Italy
April 24, 2007 - 19:34 UT - Seeing: 6/10 - Trans 2-3/5
Gladius CF-315 Lazzarotti Opt.Scope - Lumenera Infinity 2-1M Camera
Edmund Optics R Filter - 0.12 arcsec/pixel Image Scale - 50 msec. Exposure

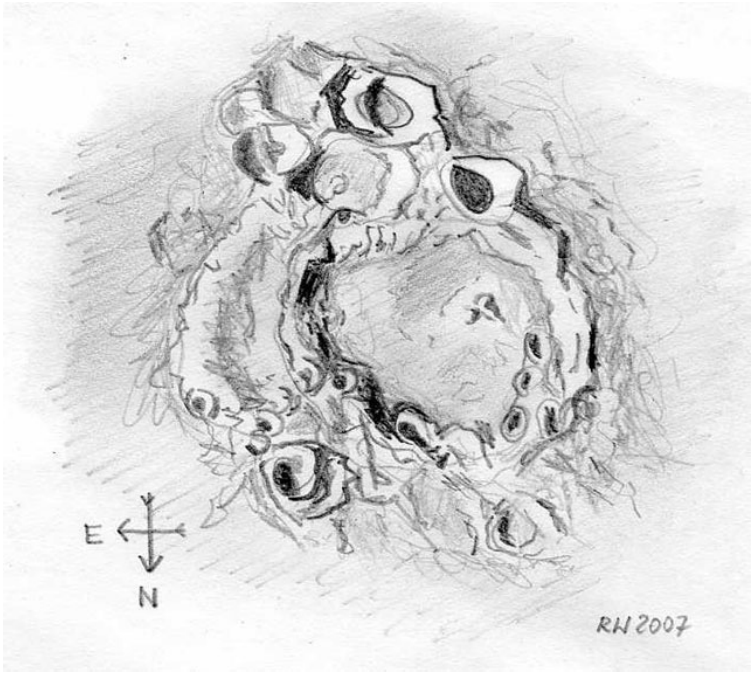


ARISTOTELES TO HERCULES
Digital image by Klaus Petersen - Glinde, Germany
March 25, 2007 - 18:17 UT - Seeing 6/10
Meade LX200 8 inch f/10 SCT - Philips Toucam - IR Block Filter

RECENT TOPOGRAPHICAL OBSERVATIONS



COPERNICUS TO ERATOSTHENES
Digital image by Rik Hill - Tucson, Arizona, USA
June 25, 2007 - 03:05 UT - Seeing: 7/10
Celestron C14 SCT - 1.6x Barlow - UV/IR Block Filter - SPC900NC Camera

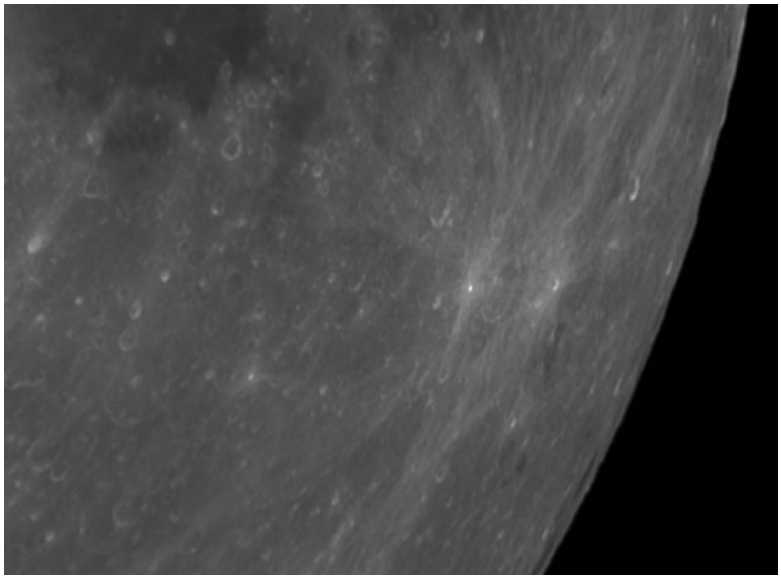


LONGOMONTANUS
Drawing by Robert Wlodarczyk - Czestochowa, Poland
April 27, 2007 - 18:00 to 18:15 UT - Seeing: 5/6 - Trans: 5/6
18cm f/6.6 Newtonian Reflector - 130x

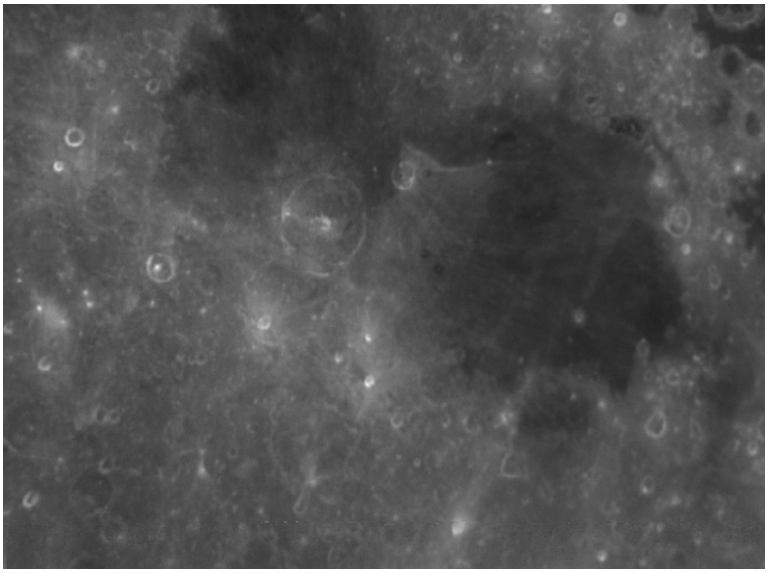
BRIGHT LUNAR RAYS PROJECT

Coordinator - Willliam M. Dembowski, FRAS

RECENT RAY OBSERVATIONS

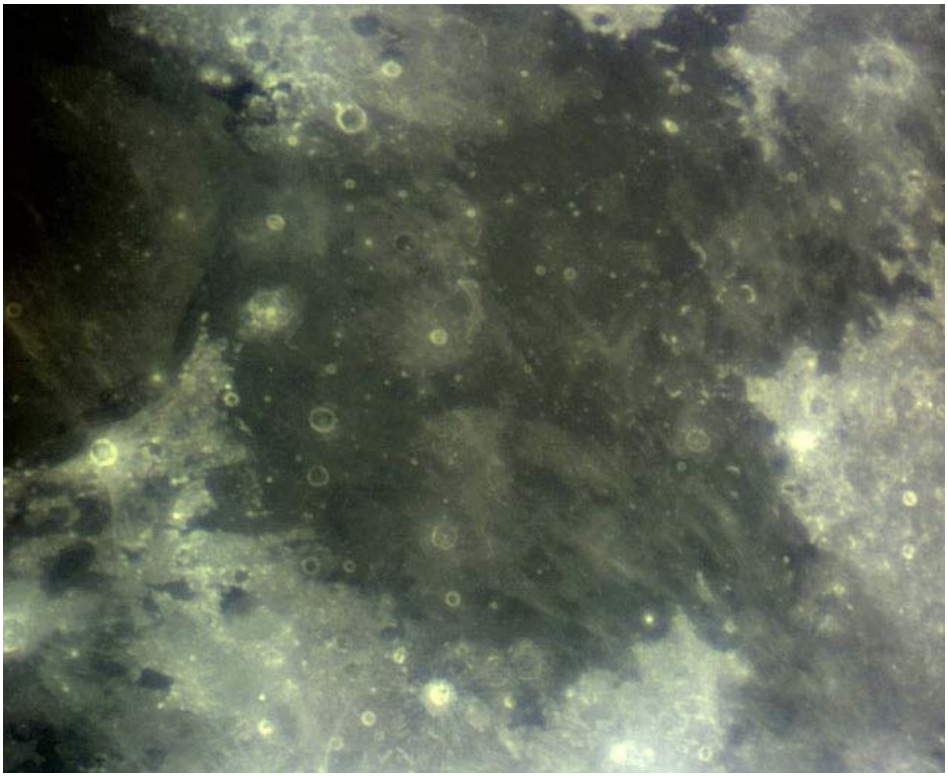


STEVINUS & FURNERIUS
Digital image by Wayne Bailey - Sewell, New Jersey, USA
May 30, 2007 - 04:02 UT- Colong: 70.9 - Seeing: 2/10 - Trans: 2/6
Celestron 11 inch SCT - Lumenera Skynyx 2-1M - Schuler IR72 Filter



MARE NECTARIS
Digital image by Wayne Bailey - Sewell, New Jersey, USA
March 31, 2007 - 05:06 UT- Colong: 59.3 - Seeing: 5/10 - Trans: 4/6
Celestron 11 inch SCT - Lumenera Skynyx 2-1M - Schuler IR72 Filter

RECENT RAY OBSERVATIONS



MARE TRANQUILLITATIS
Digital image by Howard Eskildsen - Ocala, Florida, USA
April 30, 2007 - 00:35 UT - Seeing: 6/10 - Trans: 4/6
Meade 6 inch f/8 Refractor - 2x Barlow - Orion StarShoot II

BANDED CRATERS PROGRAM

Coordinator - Willliam M. Dembowski, FRAS
Banded Craters Program Website: http://www.zone-vx.com/alpo-bcp.html

On June 30 2007, BCP team member Howard Eskildsen imaged the crater Anazagoras which does not appear on the master list of banded craters.

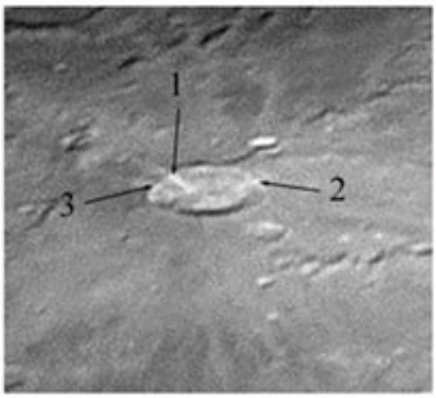
Master List of Banded Craters: http://www.zone-vx.com/alpo-bcp-longlist.pdf

Following are his original observation and that of team member Wayne Bailey who researched his personal archives and found a supporting image taken on May 29 2007.

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

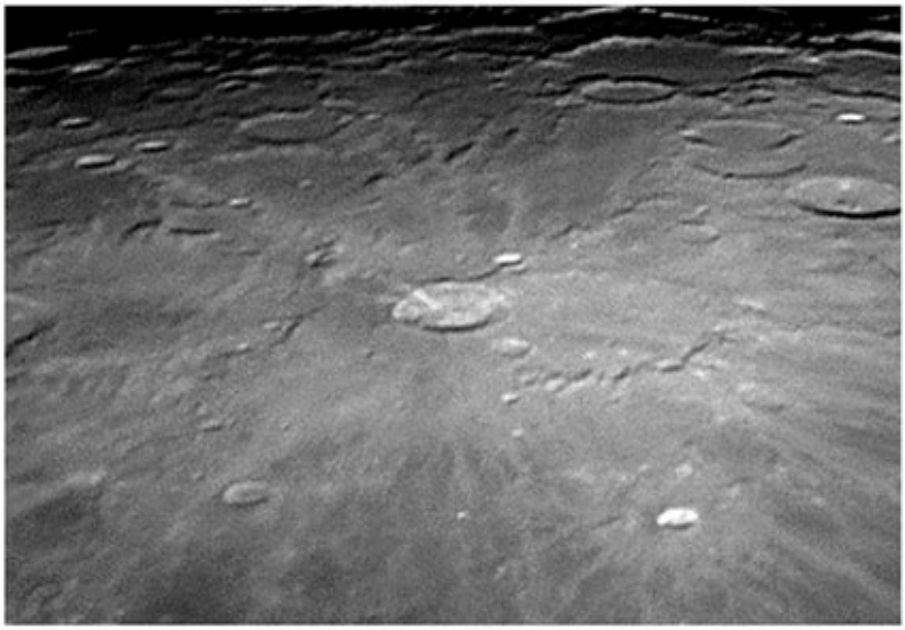
Crater Observed: Anaxagoras
Observer: Howard Eskildsen Observing Station: Ocala, Florida
Mailing Address: P.O. Box 830415, Ocala, Florida, 34483
Telescope: Meade Refractor 15.2 cm f/8
Imaging: Orion Starshoot II, 2X Barlow (left image), Filters: None
Seeing: 5/10 Transparency: 4/6
Date (UT): 2007/06/30 Time (UT): 02:33
Colongitude: 87.8°
Position of crater: Selen. Long. Selen. Lat.
10.1° West 73.4° North
Lunar Atlas Used as Reference: Virtual Moon Atlas Expert Version 2.1 2004-11-07
Rukl, Antonin, Atlas of the Moon

Images (north up):



Comments:

1. Bright-albedo band extends to the northwest in the general direction of a ray visible in the larger image.
2. A short, bright band extends to the crater rim.
3. This bright feature crosses the rim and extends a short distance to the surrounding surface.



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

Crater Observed: Anaxagoras
Observer: Wayne Bailey Observing Station: Sewell, NJ
Mailing Address: 17 Autumn Lane, Sewell, NJ 08080
Telescope: Celestron SCT 28 cm f/10
Imaging: Skynyx 2-1M Filters: Schuler IR72
Seeing: 3/10 Transparency: 2/6
Date (UT): 2007/05/29 Time (UT): 04:16
Colongitude: 58.9 Latitude: +1.6
Position of crater: Selen. Long. Selen. Lat.
10.1° West 73.4° North
Lunar Atlas Used as Reference: Rukl, Atlas of the Moon, Revised Updated Ed.

Image (North up): (East right):

Comments:

This image shows two of the three bright albedo features found by Eskildsen on his June 30, 2007 image of Anaxagoras. Both of the NW-SE features (#'s 1&3 on Eskildsen) are visible. The NE-SW feature is not obvious, but would approximately coincide with the edge of the interior shadow. In addition the crater floor NE of Eskildsen's feature #1 and NW of the dark albedo band which crosses the crater center appears mottled, as if crossed by several parallel bands.

NOTE FROM PROGRAM COORDINATOR:

In order to maximize the data submitted to the Banded Crater Program (BCP) observations should be submitted on the forms provided on the BCP Website. A digitized version for use with Adobe Photoshop and Photoshop Elements is now available. Unfortunately, files in this format cannot be uploaded to the BCP website but they can be obtained via email from the Program Coordinator.

Program Coordinator Email: Dembowski@zone-vx.com

LUNAR TRANSIENT PHENOMENA

Coordinator – Dr. Anthony Cook – acc@cs.nott.ac.uk
Assistant Coordinator – David O. Darling - DOD121252@aol.com

LTP NEWSLETTER - AUGUST 2007

Dr. Anthony Cook - Coordinator

Observations were received from the following observers for June: Clive Brook (Plymouth, UK), Maurice Collins (New Zealand), Marie Cook (Mundesley, UK), and Bob O'Connell (Florida, USA). On August 28th there will be a total eclipse of the Moon. Alas this will not be visible to European observers, but parts of it will be visible from the Americas and Asia. The times are as follows: 08:51 (UT) partial eclipse starts. 09:52 UT total eclipse starts. 10:37 UT maximum eclipse. 11:22 total eclipse ends. 12:23 partial eclipse ends. For LTP work, please use low light sensitive CCTV camera to look for flashes from impacts in the umbra – this is not ideal because the umbra is bright in the near-IR, but at least the visible light level is drastically reduced, thus improving chances of seeing impact flashes. It would also be worth watching the interiors of craters such as Tycho, Aristarchus, etc for flashes, short term brightness variation, or color, once these are in the umbra.

My thanks to Bill Dembowski for pointing out to me a Scientific American magazine web site article on LTP. I followed the link and got through to a research group web site at Columbia University, New York, in the US. Here a team called AEOLUS ("Atmosphere seen from Earth, Orbit and the Lunar Surface)" has been set up to study the effects of the lunar atmosphere. Two robotic cameras have been built at Cerro Tololo observatory in Chile. One camera has a very low image scale, 10 km/pixel and takes an image 5 times per second – so this is ideal for wide area monitoring. The other, a 6" reflector, has an image scale of 1.2 km/pixel and takes an image every 10 sec. An automatic change detection algorithm is used to look for LTP without human intervention. More specialized equipment may be used in future to obtain spectra of any detected LTP. Prof. Arlin Crotts, from Columbia University, has submitted one paper to Icarus and four to the Astrophysics Journal, on the subject of LTP and has put these on-line on their web site: http://www.astro.columbia.edu/~arlin/LTP/ . I am not sure if these have been accepted for publication yet, but as the conclusions have been widely reported in the press I thought that I would take a stab at summarizing the papers, starting this month with the Icarus paper: "Lunar Outgassing, Transient Phenomena and The Return to The Moon I: Existing Data".

The paper attempts to do a statistical filter to find reliable LTP reports and then checks to see if these correlate with other factors such as geographical location. He utilizes observational reports from the Middlehurst (1968) and Cameron (1978) catalogs – this does not include reports from the last 29 years, but as those have not been published in official catalogs and the earlier catalogs cover a few hundred year time base, then this is OK. Furthermore he rejects the numerous Bartlett observations, less these incur an observational bias in the statistics.

Discussions are given about "band wagon" effects e.g. if one crater becomes notorious for LTP reports then one could imagine most observers wanting to study this in great detail to the neglect of other features. A prime case for this is Aristarchus. To get around this problem, he splits the LTP catalog information into half in years prior to and after 1930. This was around an era of a natural break in LTP reports in both catalogs. Prior to the 1930's LTP were not as famous as they are today and so it was not

fashionable to go looking for LTP in Aristarchus. This was despite Wood's claim in 1911 to have found sulphur near Aristarchus and a brief increase of interest in this region. After the 1930's and especially post 1957 there was an incredible rise in observers looking for LTP on the Moon, especially in suspected hotspots like Aristarchus. So to avoid the band wagon effect he created two datasets of the Moon, one for reliable pre-1930's observations and one for reliable post-1930's observations. 1930 lies at the median of the Middlehust catalog (equal No. of observations before and after). The observations were used to create images with 300x300 km pixels, one image for each dataset. He then combined the two image datasets by taking the lower number for LTPs for a given pixel – this should remove any band wagon effect. The corrected frequency of occurrence shows 66 reports for Aristarchus, 16 for Plato, Grimaldi and Messier at 2 each, and then just 1 LTP report for the following features: Alphonsus, Bessel, Cassini, Copernicus, Gassendi, Kepler, Lichtenberg, Littrow, mare Humorum, Mare Nubium, Mons Pico, Pallas, Picard, Ptolemaeus, Riccioli, South Pole, Theaetetus and Tycho. The location of these LTP correlate well with Mare edges, and in the case of Aristarchus with a prime Radon (222) hotspot. A comparison is also made with the sites of Moon quakes and again a good correlation is found, except not for geologically young craters such as Aristarchus.

As to possible causes he implies that electrostatic dust levitation is not the cause because his selected sample does not show a significant increase near the terminator, where one would expect to see this effect. Instead he promotes the idea of outgassing. He suggests that one reason for Aristarchus being the prime candidate for LTP, was that it was the antipodal location of the impact of the South Pole Aitken Basin (SPA) and points out that others had suggested that the SPA was created in a glancing blow impact, so the antipodal point need not be exactly opposite the basin center. Aristarchus would therefore have a lot of deeply seated cracks from which gas from the interior could seep readily. He rightly points out though that if the SPA were due to a glancing blow impact, that we do not know the direction of the impact, so cannot say where the antipodal point would be; so in fact this theory is highly speculative. Another possible source of outgassing, related to the mare edges might be from the grinding action of the mare plate with rocks, and calculations suggest that this could release ~10-30 tonnes of gas per year over the whole Moon. Gas from rock grinding at other fault locations could also occur.

I will cover the other papers in other months, especially if they make it into published journals rather than internet copies. Although some of the theories seem to be a bit speculative, it does show that planetary scientists (in this case an astrophysicist) take LTP research seriously and it is welcome to see such papers after a glut in the last few years.

Predictions, including the more numerous illumination only events can be found on the following web site: http://www.lpl.arizona.edu/~rhill/alpo/lunarstuff/ltp.html. 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!

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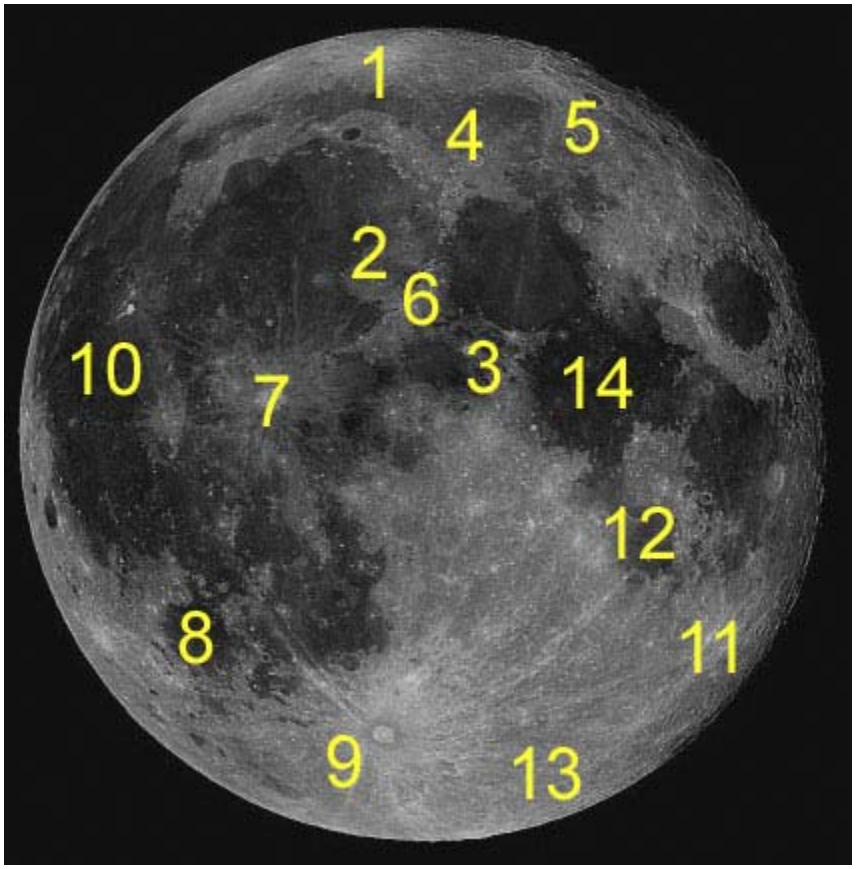
KEY TO IMAGES IN THIS ISSUE

1. Anaxagoras
2. Archimedes
3. Ariadaeus (Rima)
4. Aristoteles
5. Atlas & Hercules
6. Conon
7. Copernicus
8. Humorum (Mare)
9. Longomontanus
10. Marius
11. Nearch
12. Nectaris (Mare)
13. Stevinus & Furnerius
14. Tranquillitatis (Mare)



SIX ONLINE LUNAR ATLASES

Digital Lunar Orbiter Photographic Atlas of the Moon
http://www.lpi.usra.edu/resources/lunar_orbiter/

Consolidated Lunar Atlas
http://www.lpi.usra.edu/resources/mapcatalog/LAC/

Apollo Image Atlas
http://www.lpi.usra.edu/resources/apollo/

Neison Map of the Moon (1876)
http://www.lpod.org/cwm/Maps-AtlasStuff/Neison/1876-Neison-indexmap.htm

Clementine Lunar Image Browser
http://www.cmf.nrl.navy.mil/clementine/clib/

Virtual Moon Atlas (Not online but available for free download)
http://astrosurf.com/avl/