



# THE LUNAR OBSERVER

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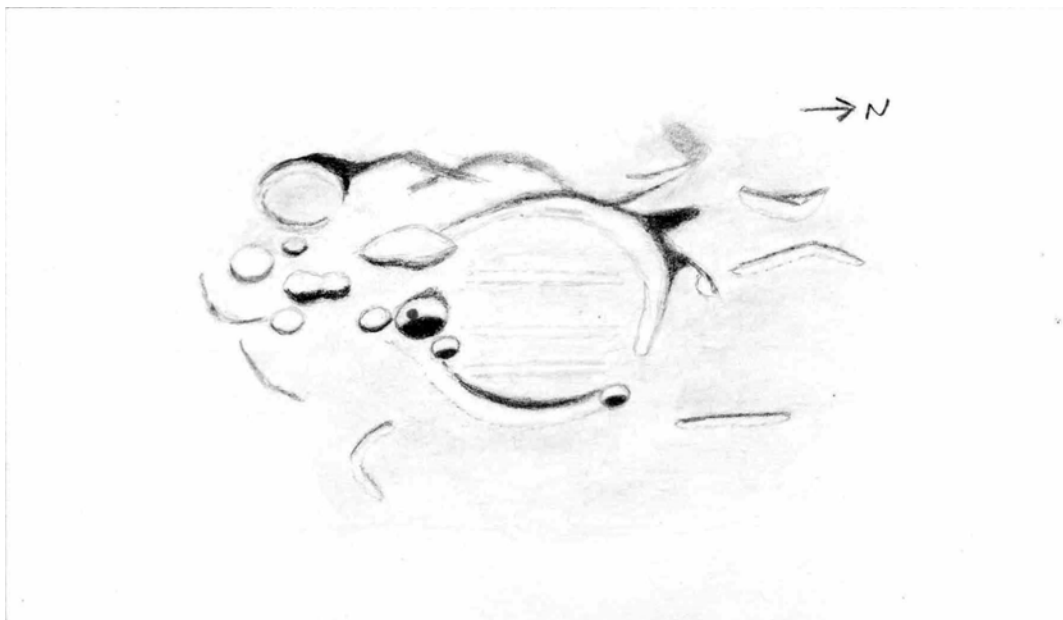
A PUBLICATION OF THE LUNAR SECTION OF THE A.L.P.O.

EDITED BY: Wayne Bailey [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)

17 Autumn Lane, Sewell, NJ 08080

## FEATURE OF THE MONTH – JAN. 2009

### CAPUANUS



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

**October 11, 2008 – 2:05 to 2:51 UT**

**15cm Newtonian - 170x - Seeing: 6-7/10**

I sketched this crater and vicinity on the evening of Oct. 10/11, 2008 before the moon hid 37 Aqr. This crater lies in Palus Epidemiarum, southwest of Mare Nubium. It has a smooth, dusky interior and substantial gaps in its northeast and south rims. There are three narrow, relatively bright streaks on the floor; the middle one is less obvious than the other two. These streaks are parallel to each other, are aligned north-south, and none of them cast any shadowing. There is a modest, but deep crater near the northeast gap in Capuanus' rim, and another north-south streak is nearby. This latter feature is parallel to the streaks within Capuanus, but unlike them, it has some shadowing. Several other ridges and strips of shadow are farther west. The Lunar Quadrant map shows Capuanus B on the main crater's west rim, but I saw only a hodgepodge of shadowing there. Capuanus A is the deep crater on the east side of the south-rim gap, and Capuanus C is the smaller, shallower crater south of A. A crater not labeled on the LQ map is just east of Capuanus A; this crater is definitely deeper than C, and is much like the one near the northern gap in Capuanus' rim. Capuanus D is the largest crater drawn to the south of Capuanus. Its interior is darker than the surrounding terrain,

and there is a gap in its north rim. There is a varied assortment of craters south of Capuanus. None of them are labeled on the LQ map. A relatively deep overlapping pair lies among some shallow saucers east of Capuanus D. A shallow, elongated depression is north of Capuanus D, and on the west side of Capuanus' south rim gap, just across it from A. This feature might be another coalesced pair. The south half of an old ring is evident southeast of Capuanus.

## **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

## JAN.-FEB. 2009 (UT)

Jan. 02	13:00	Moon 4.1 Degrees NNW of Uranus
Jan. 04	11:55	First Quarter
Jan. 10	10:53	Moon at Perigee (357,500 km - 222,140 miles)
Jan. 11	03:27	Full Moon
Jan. 15	07:00	Moon 5.7 Degrees SSW of Saturn
Jan. 18	02:46	Last Quarter
Jan. 23	00:12	Moon at Apogee (406,115 km -252,348 miles)
Jan. 25	02:00	Moon 0.71 Degrees S of Mars
Jan. 25	10:00	Moon 4.8 Degrees SSE of Mercury
Jan. 26	04:00	Moon 0.24 Degrees WSW of Jupiter
Jan. 26	07:55	New Moon (Start of Lunation 1065)
Jan. 27	17:00	Moon 1.6 Degrees NNW of Neptune
Jan. 29	21:00	Moon 4.2 Degrees NNW of Uranus
Jan. 30	09:00	Moon 2.5 Degrees NNW of Venus
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

### 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:

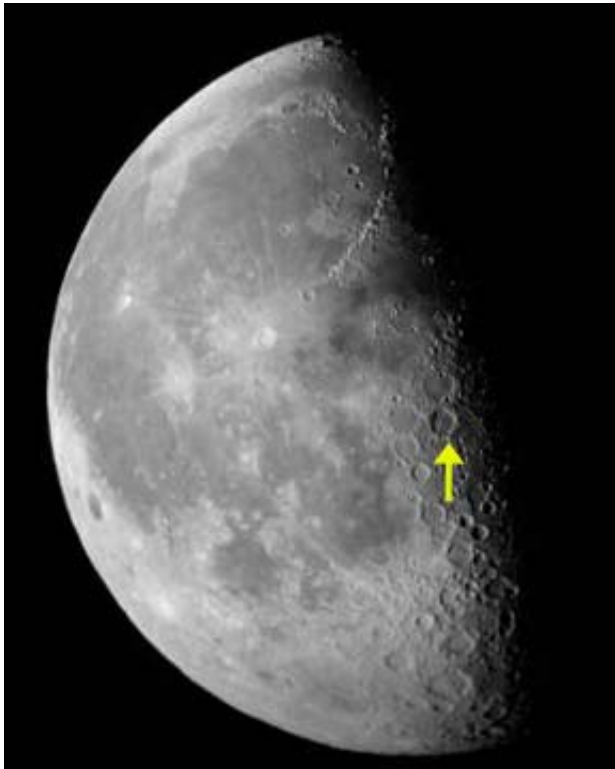
- Name and location of observer
- Name of feature
- Date and time (UT) of observation
- Size and type of telescope used
- Orientation of image: (North/South - East/West)
- Seeing: 1 to 10 (1-Worst 10-Best)
- Transparency: 1 to 6
- Magnification (for sketches)
- Medium employed (for photos and electronic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

# FOCUS ON: Albategnius

By Wayne Bailey

## Acting Coordinator: Lunar Topographical Studies

Albategnius is located to the east of Ptolemaeus and Alphonsus in the central highlands (figures 1 & 5). Near full phase, when features can be difficult to identify, the pattern of dark markings in Alphonsus and the circular outline of Ptolemaeus serve as a convenient guide to its location. It is named after the Muslim astronomer Al-Battani (852-929), whose name was Latinized as Albategnius. His achievements included much improved determinations of the rate of precession, the obliquity of the ecliptic and the length of the year. A sketch by Galileo in his Sidereus Nuncius (published 1610) is believed to show Albategnius at the terminator.



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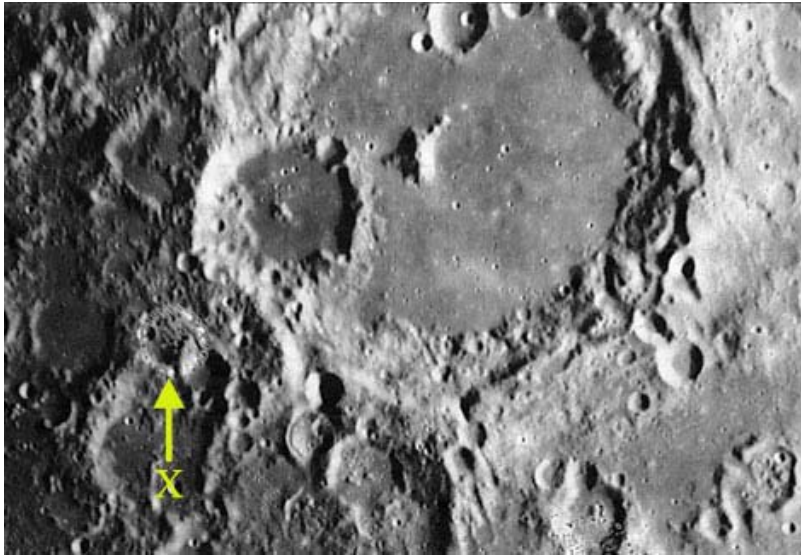
**Figure 1. Albategnius near the last quarter terminator.** Aleksander Bovic, Slovenija, 120 mm refractor, Canon IXUS 430.

It is a "walled plain" with a high, terraced rim surrounding a flat floor (figure 2). The outer wall is somewhat hexagonal, and heavily eroded by craters and slumps. The rim reaches 4000 m in the northeast, and is broken in the southwest by the crater Klein. The central peak is 1600-1700 m high and about 20 km long in the north-south direction, but only about half as wide. A small crater is visible on the peak in the Lunar Orbiter image (figure 3) and a narrow ridge or series of peaks extends northeast from the central peak. The floor is mostly smooth. Abategnius B, C, and N are visible at the north wall. Otherwise, the floor is marked only by tiny craters and inconspicuous, shallow saucers (figure 4). The latter are best viewed under a very low sun.

1700 m high and about 20 km long in the north-south direction, but only about half as wide. A small crater is visible on the peak in the Lunar Orbiter image (figure 3) and a narrow ridge or series of peaks extends northeast from the central peak. The floor is mostly smooth. Abategnius B, C, and N are visible at the north wall. Otherwise, the floor is marked only by tiny craters and inconspicuous, shallow saucers (figure 4). The latter are best viewed under a very low sun.

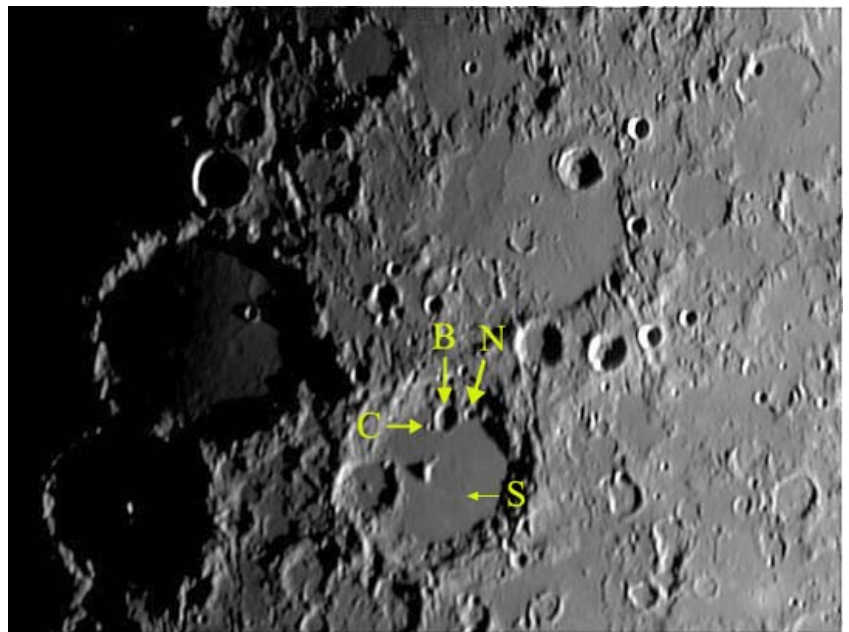
**Figure 2.** Maurice Collins, Palmerston North, New Zealand. December 5, 2008 08:47 UT. Celestron 8 inch SCT, LPI.





**Figure 3. Extract from Lunar Orbiter Photo L04-101H2.** A small pit is visible on the summit of the central peak. Also note the circular marking southwest of Klein (X)

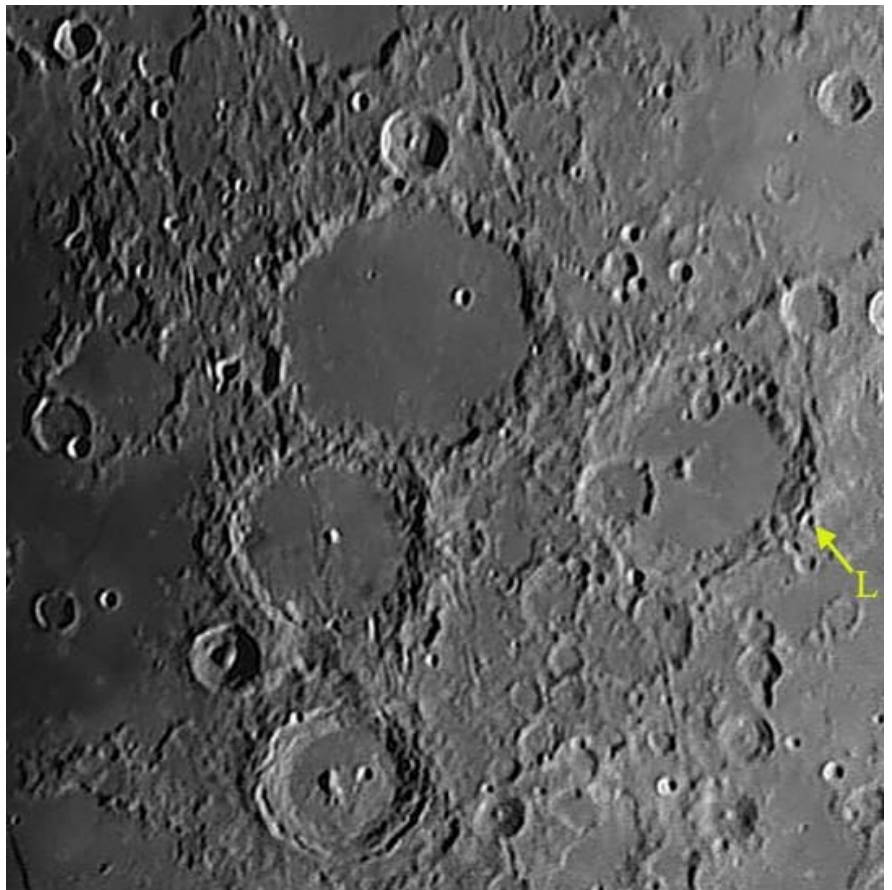
**Figure 4. Albategnius, showing shallow saucers.** Ed Crandall, Winston-Salem, NC, USA. November 5, 2008 22:47 UT, 110 mm f/6.5 APO, 3x barlow, Toucam, Seeing 3-4/10, Transparency 4/6, Colongitude 3.5 degrees. Several shallow saucers are visible between the arrowhead (S) and the central peak.



The floor of Albategnius is light hued, very similar to the highlands surrounding it, rather than the dark hue of mare basalts (figure 5). Together with the shallow saucers, which appear to be buried craters, this suggests that the floor is covered with either pulverized Imbrium ejecta or local (not maria type basalt) lava. The surrounding area is grooved by Imbrium ejecta and coated with pulverized Imbrium material. The crater Vogel, southeast of Albategnius, is an Imbrium secondary crater associated with a large groove. Airy is almost buried by pulverized Imbrium debris (figure 5). The lack of fresh craters on Albategnius' floor, compared to the surroundings, indicates that it is too young to be Imbrium ejecta. The abrupt, localized transition from the grooved and battered surroundings to the smooth interior points towards a local lava source within the crater, since whatever filled the crater didn't affect the surroundings. The light hue indicates that the source of the lava was not the same as the source of the maria lavas.

One feature that puzzles me appears on figure 3. It is the circular feature X that is seen southwest of Klein. It appears to be a light hued ring, marked by small bright features. The entire circular feature looks lighter than the surroundings. The puzzling part is that it seems unaffected by the underlying topography. I haven't found any trace of it on the other images, so it may just be an effect of the lighting.

**Figure 5. Albategnius and surroundings under high sun illumination.** William Dembowski, Elton, PA, USA. October 30, 2006 22:41 UT. Celestron 8 inch SCT, NextImage camera, Seeing 4/10, Colongitude 18.9 deg.



The small crater Albategnius L (figure 5) located on the southeast wall is on the ALPO banded crater list. There are several banded craters in the region, among the closest are Airy A, Ammonius (Ptolemaeus A), Argelander, Argelander A, Hipparchus K, and possibly Hipparchus C & L. The bands are not especially conspicuous in most of these, unfortunately.

## **References:**

- Byrne, Charles J. Lunar Orbiter Photographic Atlas of the Near Side of the Moon. Springer-Verlag, London, 2005.  
Rukl, Antonin, ed Gary Seronik. Atlas of the Moon. Sky Publishing Corp., Cambridge, MA, 2004.  
Wood, Charles A. The Modern Moon. Sky Publishing Corp., Cambridge, MA, 2003.

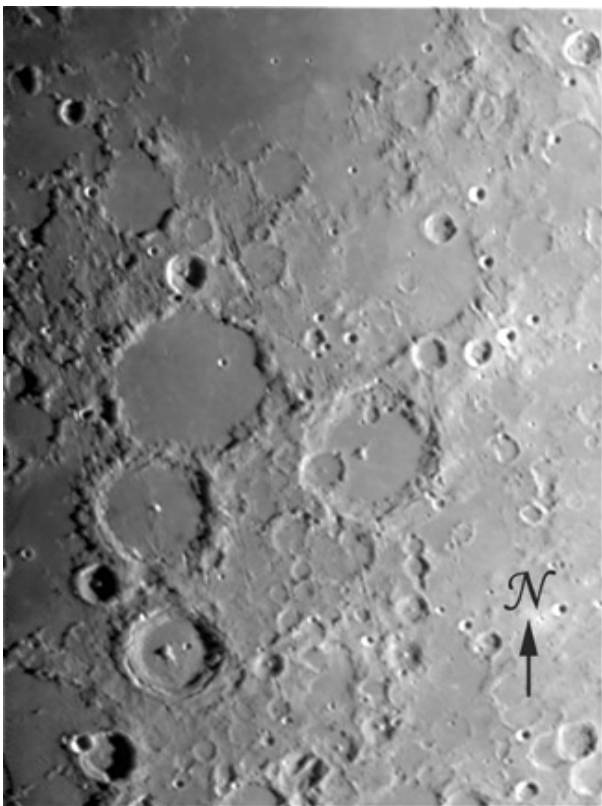
# Albategnius

Antonius J. Schalken

Luar Observatory

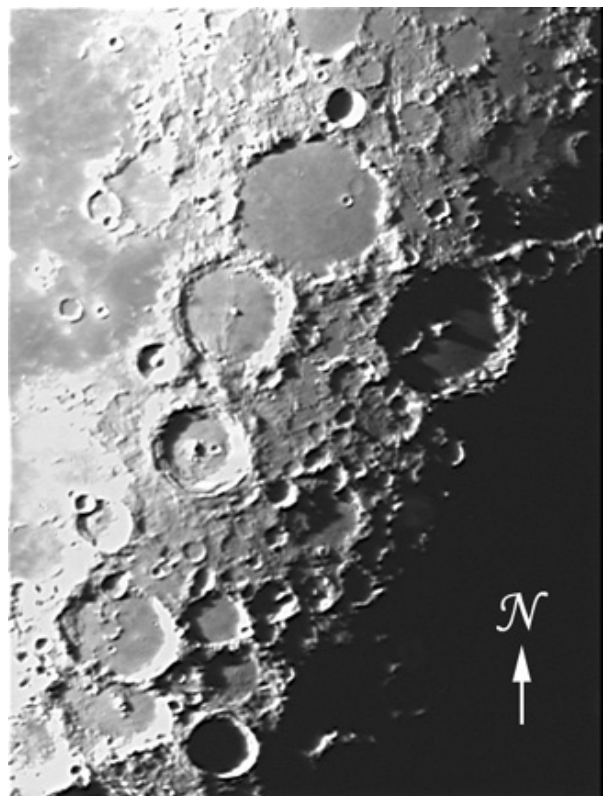
Melbourne, Victoria, Australia

Located near the centre of the lunar disc at  $4^{\circ}$  East and  $11^{\circ}$  South, Albategnius is a large (diameter about 136 km), roughly hexagonal (Fig.1), crater bordered to the west by the mighty triad of Ptolemaeus, Alphonsus and Arzachel and, to the North, by the walled plain Hipparchus and further north Sinus Medii - R ukl maps 44 and 55. A linear depression, from the crater Halley (to the north-east of Albategnius), runs in a north-south direction and skirts the eastern wall of Albategnius. To the south we find an exquisite chain of craters: Vogel, Argelander and Airy. This region also includes many fractures and fault lines.



**Figure 1: Albategnius and to the west: Ptolemaeus, Alphonsus and Arzachel.** – Antonius Schalken, Melbourne, Victoria, Australia, October 11, 2005 09:04 UT, 6 inch, f/10 Maksutov, Phillips ToUcam Pro II, colongitude  $10.9^{\circ}$ , lunation 7.9 days (from New Moon).

**Figure 2: Albategnius at the terminator** – Schalken, March 2, 2005 20:18 UT, colongitude  $174.7^{\circ}$  lunation 21.9 days.



The central peak is slightly offset to the west and appears to be quite insignificant in figure 1. Seen, however, at a low angle of illumination (Fig. 2) one can readily see that this peak is of considerable height (the height given in USGS map is 1640 m – Howard and Masursky, 1968). In the picture below (Fig.2), the shadow of the central peak extends to the base of, and part way up, the eastern wall.

In figure 3, below, we see the crater Albategnius in greater detail.



**Figure 3: Albategnius detail** – Schalken, August 20, 2006 19:02 UT, 6 inch f/20 Maksutov, colongitude 162.9° lunation 20.8 days.

The wall of Albategnius has undergone significant collapse. Going in a clock-wise direction we find the crater Klein on the western wall. Klein is approximately 44 km in diameter, contains a small peak and has a small impact crater on its northeastern rim. To the north of Klein the wall of Albategnius has collapsed and there appears to be a linear gully (V or U shaped in cross-section) cutting into the wall from the rim and extending to the floor of the crater. Further along we come across a grouping of craters of diverse size. The largest crater of this group - Albategnius B - contains another crater within it.

Further along, the southeastern wall has slumped in many places and the wall also shows signs of further cratering. This is one instance where observations carried out when the Sun is reasonably high above the lunar horizon can be very rewarding. Both figures 1 and 3 were obtained when the terminator was approximately 13° to 14° to either side of Albategnius.

### **References:**

A Rühl (1993) Atlas de la Lune, Librairie Gründ, Paris

K A Howards and H Musarsky (1968) Geologic Map of the Ptolemaeus Quadrangle of the Moon, USGS 1968



## Additional Observations of Albategnius



**Albategnius at the terminator-waxing quarter moon.**  
Aleksander Bozic, Slovenija. 120 mm refractor, Canon IXUS 430.

**Albategnius.** Wayne Bailey, Sewell, NJ, USA. October 19, 2008 05:14 UT. 11 inch SCT f/20, Lumenera Skynyx 2-1M, Schuler IR72 filter. Seeing 4/10, Transparency 4/6, Colongitude 123.1



## **CALL FOR OBSERVATIONS:**

### **FOCUS ON: Tycho**

*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](mailto:wayne.bailey@alpo-astronomy.org)

**Deadline for inclusion in the Tycho article is February 20, 2009**

## **FUTURE FOCUS ON ARTICLES:**

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**

# **LUNAR TOPOGRAPHICAL STUDIES**

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

## **OBSERVATIONS RECEIVED**

ALEKSANDER BOZIC - SLOVENIJA Digital images of Albategnius (6)

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND Digital images of Albategnius, Clavius , Longomontanus, Clavius-Moretus, Copernicus, Plato-Mare Frigoris, Southern Terminator, Humboldt, Tycho-Longomontanus-Wilhelm, 7-day Moon, 9-day Moon, 15-day Moon, waning crescent Moon in daylight

ED CRANDELL – WINSTON-SALEM, NORTH CAROLINA, USA Digital images of Palus Epidemiarum, Dopplemayer, Gassendi, Prinz, Gassendi & Letronne, Clavius

COLIN EBDON - COLCHESTER, ESSEX, UK Drawing of Darwin

HOWARD ESKILDSEN - OCALA, FLORIDA, USA

Banded crater report forms for Agatharchides A, Burg, Damoiseau E, Kepler, Maury, Messier & Messier A, Milichius, Proclus, Pytheas, Rosse

CHARLES GALDIES – MALTA Drawing of Orontius-Huggins-Nasireddin

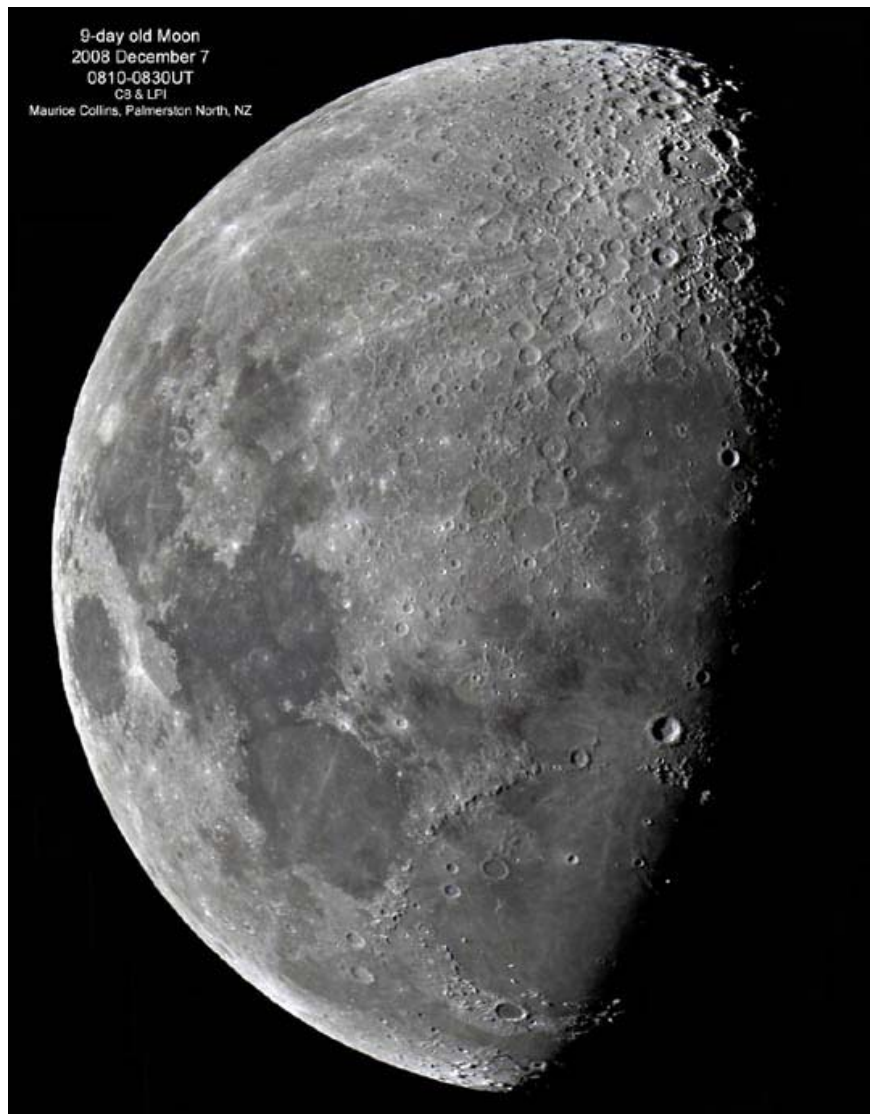
ROBERT H. HAYS, JR. - WORTH, ILLINOIS, USA Drawings of Capuanus, Palmieri

RIK HILL - TUCSON, ARIZONA, USA Digital images of Alponus, Cichus, Gassendi, Hainzel, Longomontanus-Bullialdus

WAYNE BAILEY – SEWELL, NJ, USA Digital images of Albategnius (4)

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## RECENT TOPOGRAPHICAL OBSERVATIONS



**9-Day Moon** – Maurice Collins – Palmerston North, New Zealand  
December 7, 2008, 08:10-08:30 UT, C8 & LPI, Seeing A III

## RECENT TOPOGRAPHICAL OBSERVATIONS



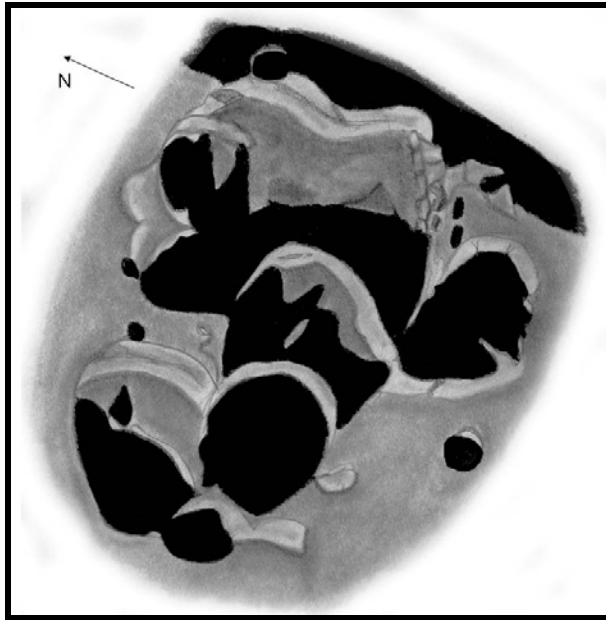
### Gassendi

Ed Crandall - Winston-Salem,  
North Carolina, USA  
November 10, 2008 01:14 UT  
colongitude 53 - seeing 7-8/10,  
trans 4/6 - 110mm f/6.5 APO  
3x barlow + 2 inch extension -  
Toucam

Hainzel - Richard Hill  
Tucson, Arizona, USA  
November 9, 2008 04:37  
UT Seeing 6/10  
C14 + 2x barlow  
UV/IR blocking filter  
SPC900NC camera



## RECENT TOPOGRAPHICAL OBSERVATIONS



**Orontius, Huggins and Nasireddin.** Charles Galdies. Malta. December 5, 2008, 18:15-18:30 UT. 250mm, f4.5, 17mm plossl, 2x barlow, Moon filter. Seeing 8/10.

### **Orontius Trio**

**By Charles Galdies**

On November 5th I scanned the heavily cratered southern highlands of the moon and was struck by the interesting arrangement of the triplet group of craters: Orontius, Huggins and Nasireddin. The eastern part of the largest and oldest crater Orontius is overlaid by the smaller crater Huggins, which is overlain in turn on its eastern rim by the still smaller Nasireddin. On the western side lies the terminator. This trio forms an interesting crater chain which was very interesting to sketch. The rim of Orontius is battered, but the southwestern rim shows some erosion processes which I tried to depict in my sketch. In the north of the crater, 'Orontius F' forms a distorted, crater-like oval which was immersed by the shadow cast by Huggins. Huggins' rim is well-defined. The western half of the interior lit floor shows to be relatively smooth, while during the time of sketching the central peak next to the outer rampart of the intruding Nasireddin was evident. At the time of sketching its floor was in total darkness but the inner wall shows a sharp rim. Saussure crater is situated on the south flank of Orontius, with its evident "double" wall and a well defined rim.

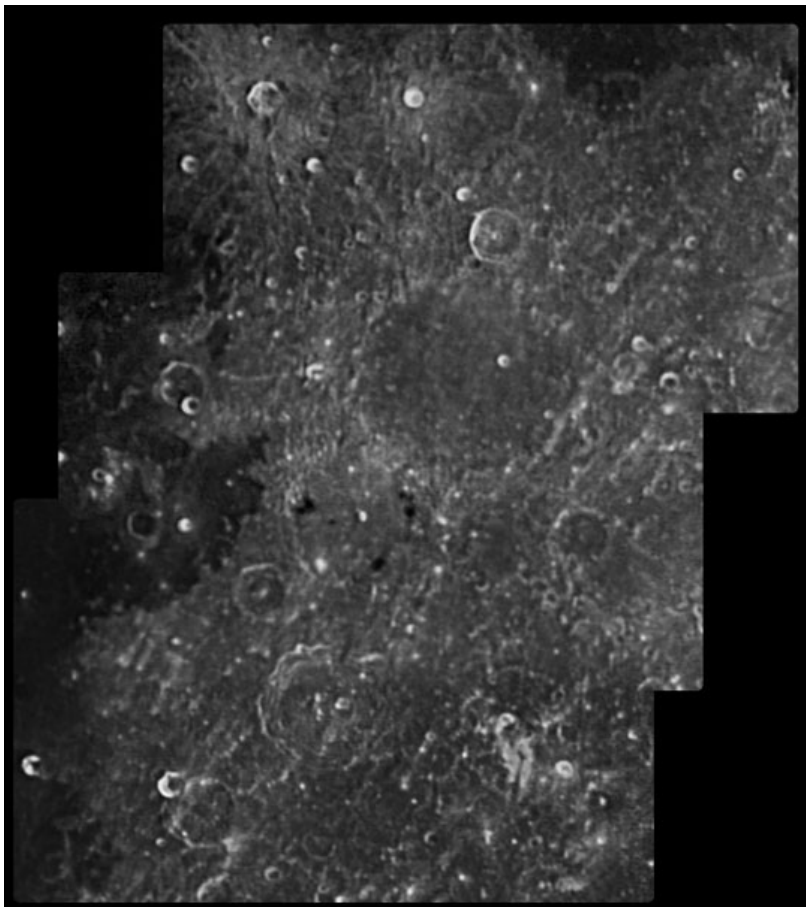
# RECENT TOPOGRAPHICAL OBSERVATIONS



**Darwin** Colin Ebdon, Colchester (Essex), England. October 12, 2008 21:30-22:30 UT seeing A III – A II, trans very good but heavy dew and some low cloud, 7" f/15 Maksutov-Cassegrain, x236, Colongitude 70.3-70.8 degrees

# ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

**Clavius-Moretus** Maurice Collins, Palmerston North, New Zealand. December 7, 2008 08:40-08:55 UT. C8 SCT, LPI, 3x Barlow.



**Thebit to Oppolzer** Richard Hill Tucson, Arizona, USA September 13, 2008 06:24 UT. Seeing 5/10, C14 + 2x barlow, UV/IR blocking filter, SPC900NC camera

## **BRIGHT LUNAR RAYS PROJECT**

Coordinator – Wayne Bailey – [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)  
Bright Lunar Rays Website: <http://www.zone-vx.com/alpo-rays.html>

### **RECENT RAY OBSERVATIONS**



**Palus Epidemiarum** Digital image by Ed Crandall - Winston-Salem, North Carolina, USA.

November 10, 2008 UT - colongitude 53 - seeing 6-7/10, transparency 4/6  
110mm f/6.5 APO - 3x barlow – Toucam



## BANDED CRATERS PROGRAM

Coordinator – Wayne Bailey – [wayne.bailey@alpo-astronomy.org](mailto: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: 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: Orion StarShoot II, 2X Barlow Filters: W-15 Yellow

Seeing: 6/10 Transparency: 5/6

Date (UT): 2008/10/22 Time (UT): 10:01

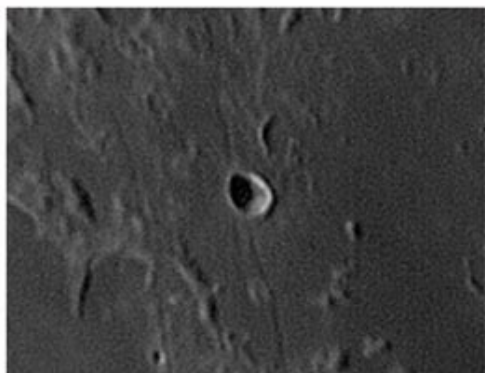
Colongitude: 187°

Position of crater: Selen. Long. Selen. Lat.  
2.4° West 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.

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

Crater Observed: Damoiseau E

Observer: Howard Eskildsen

Observing Station: Ocala, Florida

Mailing Address: P.O. Box 830415, Ocala, Florida, 34483

Telescope: Meade Refractor 152 cm f/8

Imaging: Orion StarShoot II, 2X Barlow, Filters: W-15 Yellow

Seeing: 6/10 Transparency: 5/6

Date (UT): 2008/10/22 Time (UT): 09:59

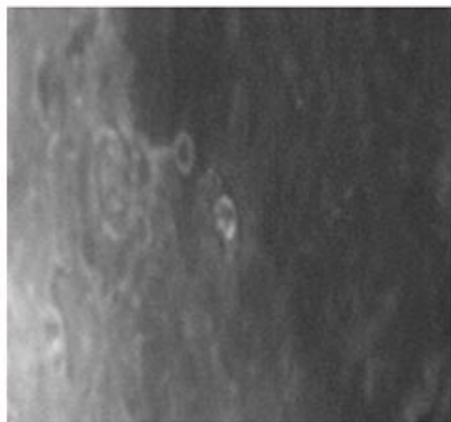
Colongitude: 186°

Position of crater:	Selen. Long.	Selen. Lat.
	58.3° West	5.2° South

Lunar Atlas Used as Reference: VMA Expert Version 2.1

Image (North up):

Comments:



Complex dark markings are visible in the crater interior.

# LUNAR TRANSIENT PHENOMENA

Coordinator – Dr. Anthony Cook – [atc@aber.ac.uk](mailto:atc@aber.ac.uk)

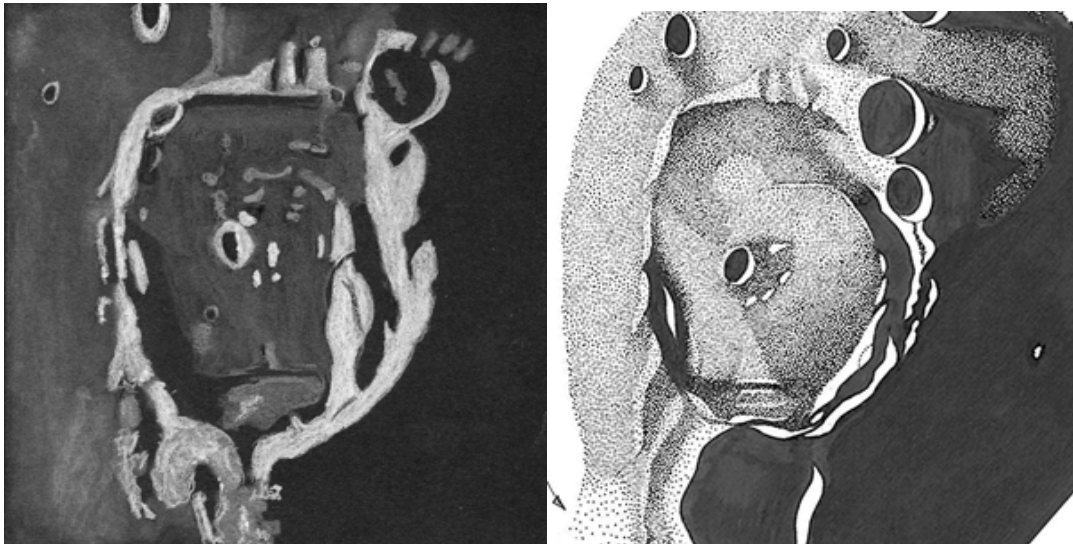
Assistant Coordinator – David O. Darling - [DOD121252@aol.com](mailto:DOD121252@aol.com)

## LTP NEWSLETTER – JANUARY 2009

Dr. Anthony Cook - Coordinator

Firstly, I wish you all the best for 2009 and plenty of clear sky. Observations for November 2008 were received from the following observers:, Jay Albert (FL, USA), Wayne Bailey (NJ, USA), Maurice Collins (New Zealand), myself (Aberystwyth, UK), Marie Cook (Mundesley, UK) and Ben Kingsley (Maidenhead, UK). Ben submitted some excellent high resolution images of Janssen and Piccolomini. Wayne sent me some high resolution color waveband images of Aristarchus, and Jay Albert, Marie Cook and Maurice Collins continue to send valuable repeat illumination observations that sometimes help to disprove past LTP events. Weather in the UK has been improving and I have been able to restart more serious time lapse video imaging of the Moon in a 10nm FWHM wide band centred on a strong Radon near IR emission line. Talking of which, was anybody imaging the area covering Menelaus, Manilius and Pytheas during ~16:00-23:00 on 2008 Dec 09? Only I am curious to check out some long duration variability in one of these craters. This trend may turn out to be a photometric effect on the lunar surface because the Sun has moved through ~3.5 ° over this time period?

Secondly, I am very grateful to Nigel Longshaw, who submitted a sketch of the Posidonius area that he made on: 1995 Dec 11 at UT 23:00-23:48. This appears to overlap Dale Holt's sketch in terms of selenographic co-longitude, and yet does not show the grey areas within the shadow of Posidonius J. Nigel



Posidonius J in the top right corner of both sketches. **Left sketch** by Dale Holt, on 2008 Oct 19 UT 05:30-06:30, Col. 147.3 ° -147.8 ° - note the grey patch on the floor of Posidonius J. **Right sketch** made by Nigel Longshaw, on 1995 Dec 11 UT 23:00-23:48, Col. 147.4 ° -147.9 °.

mentions that he also has a drawing by Harold Hill, made with his 10 inch F/10 Newtonian with selenographic colongitude values of 145.8° -146.6° on 1992 October 16th and again this does show the grey area either. Furthermore Nigel points out that the grey patch does not show up either on plate 34 of the Kwasan Atlas, which was taken at a selenographic colongitude of 146.8 ° - however the image scale is small. So in view of the discrepancy in appearances, I would very much encourage observers to try to watch, sketch or image Posidonius J over selenographic colongitudes of say 147 ° -148 ° in order that we may better understand what Dale saw on 2008 Oct 19<sup>th</sup>. Suggested observing dates/UTs will appear in the on-line prediction web site given at the bottom of this article, assuming that the Moon is gettable and at a reasonable altitude from your geographical location.

LTP repeat predictions, 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!

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## KEY TO IMAGES IN THIS ISSUE

- 1. **Agatharchides A**
- 2. **Damoiseau E**
- 3. **Albategnius**
- 4. **Capuanus**
- 5. **Orontius**
- 6. **Darwin**
- 7. **Gassendi**
- 8. **Palus Epidemiarum**
- 9. **Clavius**
- 10. **Hainzel**
- 11. **Alphonsus**

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

