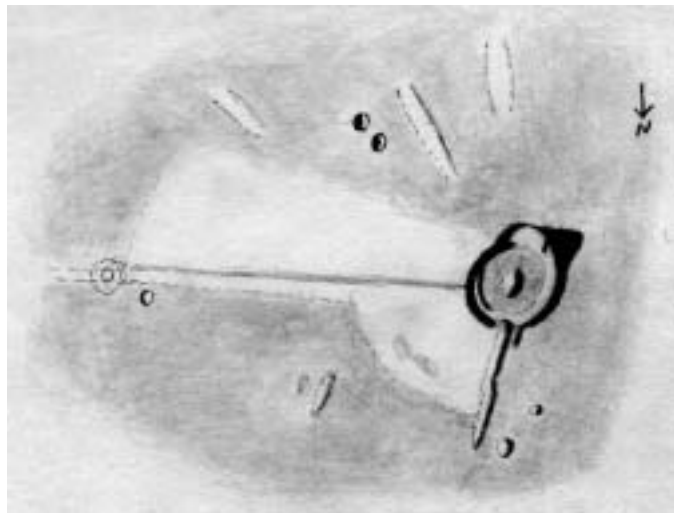


THE LUNAR OBSERVER

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
Elton Moonshine Observatory - <http://www.zone-vx.com>
219 Old Bedford Pike (Elton) - Windber, PA 15963

FEATURE OF THE MONTH - MAY 2006



MADLER

Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
December 8, 2005 - 01:15 to 01:45 UT
15cm Newtonian - 170x - Seeing 7-8/10

I observed this crater and vicinity on the evening of Dec. 7/8, 2005 while timing a couple of occultations. This crater is just east of Theophilus and is probably overlooked due to its prominent neighbor. It has a somewhat odd, lobed shape with possible interior rims. I have to wonder if Madler is the product of two impacts. Madler has a large central peak and much shadowing to the southwest. There may be a gap or two at the north end. Two pits are conspicuous to the southeast; the LQ map labeled the one to the northwest as Madler D. Three ray segments are near these pits and south of Madler. The middle one (just west of the pits) had some slight shading on its west side. A long ridge extends north from Madler, and a longer one extends to the east. The longer one looked much like a ray, but there was shadowing along its south edge. A bright, round, shadowless patch is near the end of this ridge, and a shallow pit is just to its northwest. There is a bright, fan-shaped area between the two ridges near Madler. Farther out, the terrain is dark right up to the north edge of the east-west ridge, but is lighter to the south, out to the aforementioned bright spot. It then gradually darkens southward toward the pair of pits. I have tried to show this on the sketch, but this effect was not easy to draw.

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.justfun.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 - MAY 2006 (UT)

02 11:00 Moon 3.6 Degrees N of Mars
03 07:00 Moon 1.7 Degrees N of Vesta
04 11:00 3.7 Degrees NNE of Saturn
05 05:13 First Quarter
07 02:00 Moon at Apogee (404,571 km - 251,389 miles)
12 13:00 Moon 4.6 Degrees SSW of Jupiter
13 06:52 Full Moon
19 18:00 Moon 3.3 Degrees SSE of Neptune
20 09:20 Last Quarter
21 11:00 Moon 0.85 Degrees SE of Uranus
22 16:00 Moon at Perigee (368,609 km - 229,043 miles)
24 05:00 Moon 3.8 Degrees NNW of Venus
27 05:00 New Moon (Start of Lunation 1032)
28 02:00 Moon 3.2 Degrees N of Mercury
31 05:00 Moon 3.1 Degrees NNE of Mars
31 12:00 Moon 0.83 Degrees NNE of Vesta
31 23:00 Moon 3.4 Degrees NNE of Saturn

A.L.P.O. LUNAR COORDINATORS

Dr. Anthony Cook – Coordinator, Transient Lunar Phenomena
acc@cs.nott.ac.uk

Brian Cudnik – Coordinator, Lunar Meteoritic Impact Search
cudnik@sbcglobal.net

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

William M. Dembowski – Coordinator, Lunar Topographical Studies
Dembowski@zone-vx.com

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

COPERNICAN VOLCANOES

Mardi Clark - Whitepeak Observatory, Tacoma, Washington, USA

While examining an image taken Wednesday evening (March 8, 2006 PST) of the Copernicus area (beautifully situated right on the terminator) I noticed some positive elevation features in the dark albedo area situated east of Copernicus and south of Stadius. I was unaware of any mention of domes/volcanoes in this area so decided to see what exactly these features were. Here's the image of the area in question:

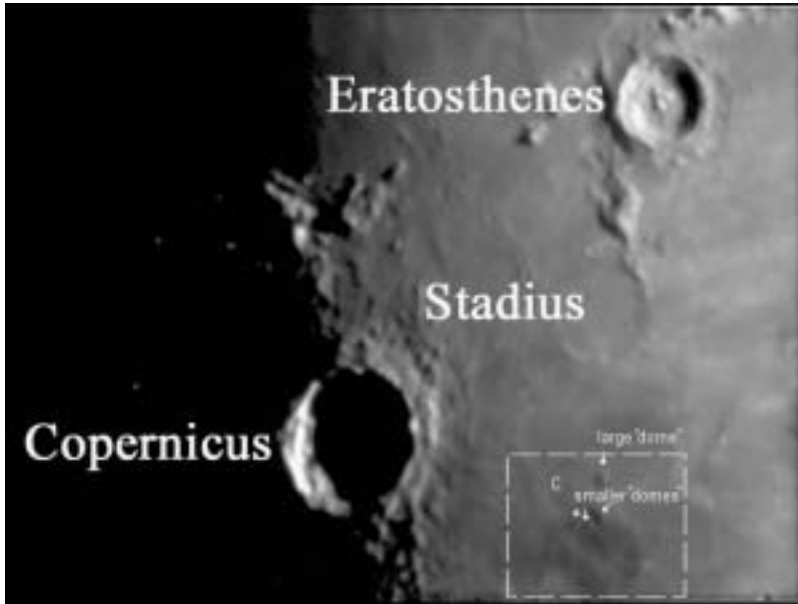
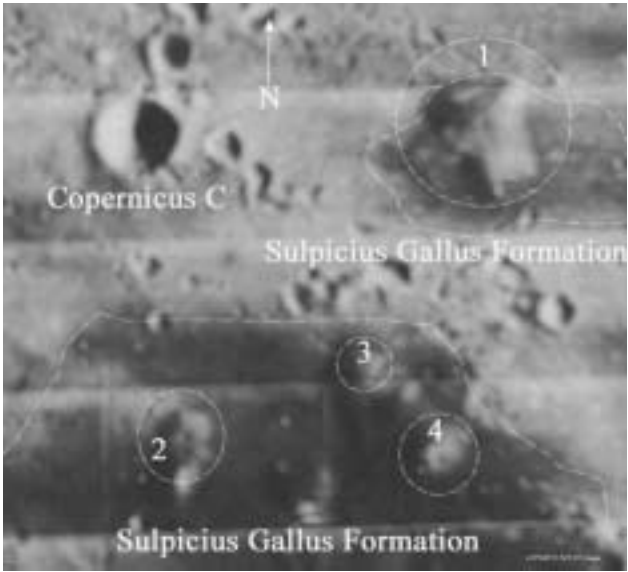


FIGURE 1
Whitepeak Observatory Image
Dashed lines indicate general area covered by enlargements.
(See text for details)

Here (dashed box) you can see the dark patch delineating the volcanic province, which the geologists call the Sulpicius Gallus formation, quite clearly. Copernicus C is located in this image just to the right of the 'C' (unresolved dot) and is the reference point for the following images. The domes/volcanoes in question are also marked with small arrows.

Now, the resolution of this image is quite poor, nonetheless these features are quite obvious! Are these features “really” overlooked examples of lunar volcanoes? Let's take a closer look

FIGURE 2
NASA Image
(See text for details)



The above image contains the 'smoking gun'. This is an enlargement of the printed page out of the Bower & Hughes Lunar Orbiter atlas. The relevant features (crater pits) are unfortunately too small to show clearly on the digitized version that the Lunar and Planetary Institute hosts so I had to resort to taking a photo enlargement of the page of the actual atlas. This image is still less clear than it is under a magnifying glass.

At any rate, one can see three of the domes possess summit crater pits and the second & fourth have what looks to me to be an enlarged flank blow-outs typical of a cinder cone type feature. The second also has a summit crater. The first looks very similar to the Gruithuisen domes, gamma & delta.

FIGURE 3 - USGS Map (See text for details)

Above is the USGS Geological quad for this area delineating (in blue) the extent of the volcanic provinces in the immediate area and the corresponding location of the features in question.

Factors which lead to classification of these features as lunar volcanoes: (1) These features appear in a well-known volcanic province, evidenced by extensive surrounding areas of dark pyroclastics (ash etc). (2) All possess summit pits and/or conspicuous negative features (flank craters) congruent with volcanic cones. (3) These craters appear isolated in size & frequency in this area, reducing the possibility to virtually zero that they are merely coincident impact features.

The summit pit of #1 is only about 800meters in diameter ... quite a challenge for an observer with a larger scope to see under the best of seeing conditions.

I found the age of the volcanic areas, at least partially, predates Copernicus. I examined high sun ray images of the area and there are indeed rays that cross these provinces. Also I looked at the new geological quad of this area that Paul Spudis et al are working on and evidently, other than predating Copernicus, the exact age of these volcanic provinces has even them ambivalent as they list these on

their new map as of indeterminate age (bracketed by question marks! Link to the new geo-quad: <http://www.lpi.usra.edu/meetings/lpsc2006/pdf/2135.pdf>

There is, it seems to me, still a possibility that there may have been limited activity within this volcanic province near Copernicus C after Copernicus was emplaced.

Take a look at the examination of rays in the below graphic. Note that although the dark volcanic province south of Copernicus C is crossed by rays, it shows as much less impacted by them than the dark maria above it and also less than the extension of this same volcanic province to the southward has been impacted by ray material. Why is this?

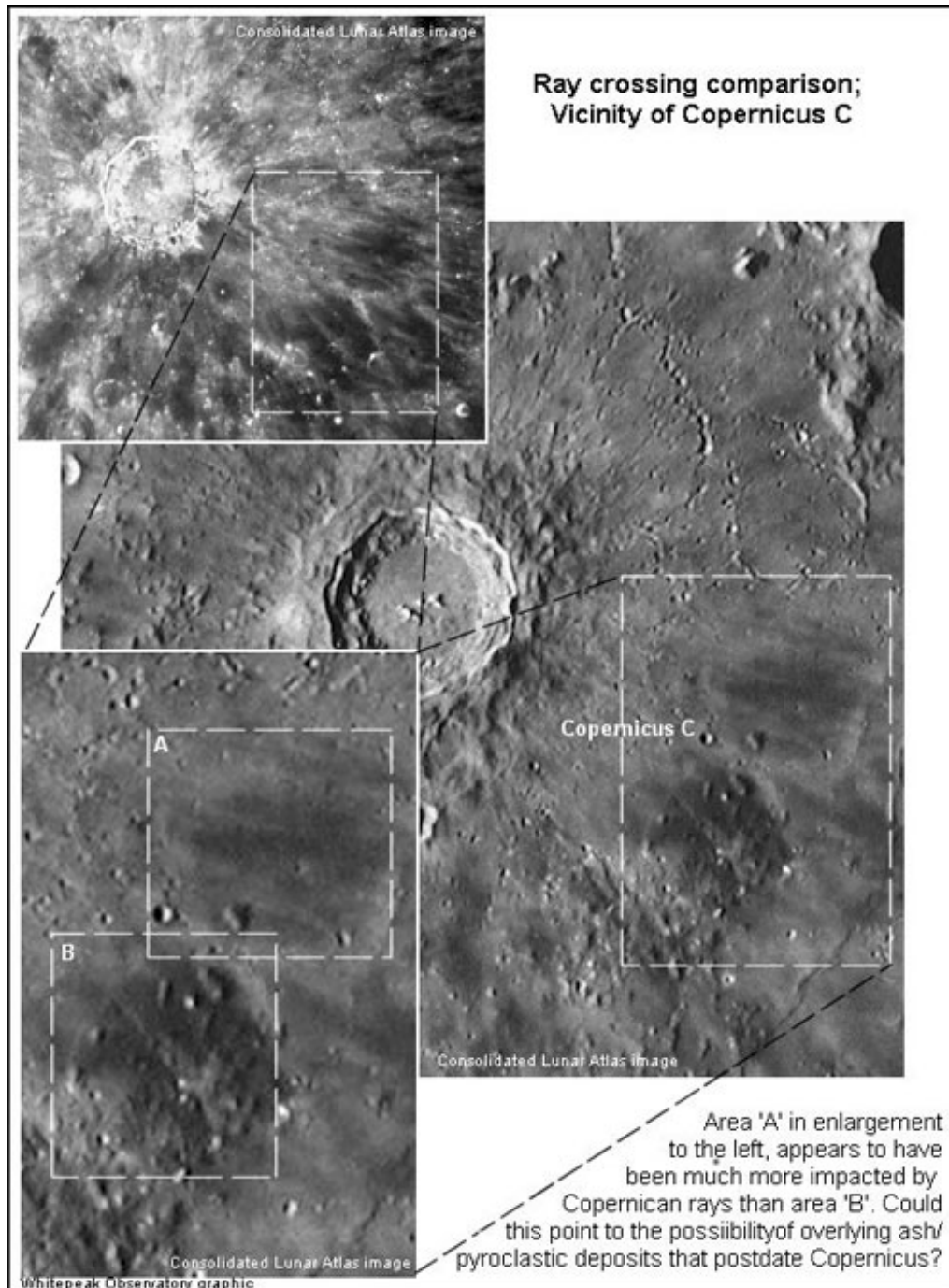


FIGURE 4 - Whitepeak Observatory Graphic (NASA images)

One explanation would be later Copernican era pyroclastic eruptions overlay some of the earlier Copernican impact rays. Also this entire volcanic province extends southward and slightly west of the upper dark area (outlined irregular area on graphic)--and the lower portion seems pretty heavily impacted by rays/ejecta compared to the same area to the north, despite their being purportedly the same, pre-Copernican, age.

One thing is for sure though--there are quite a number of lunar volcanoes and volcanic vents in this province. I counted >20 in this enlargement of LO image IV-121-H1:

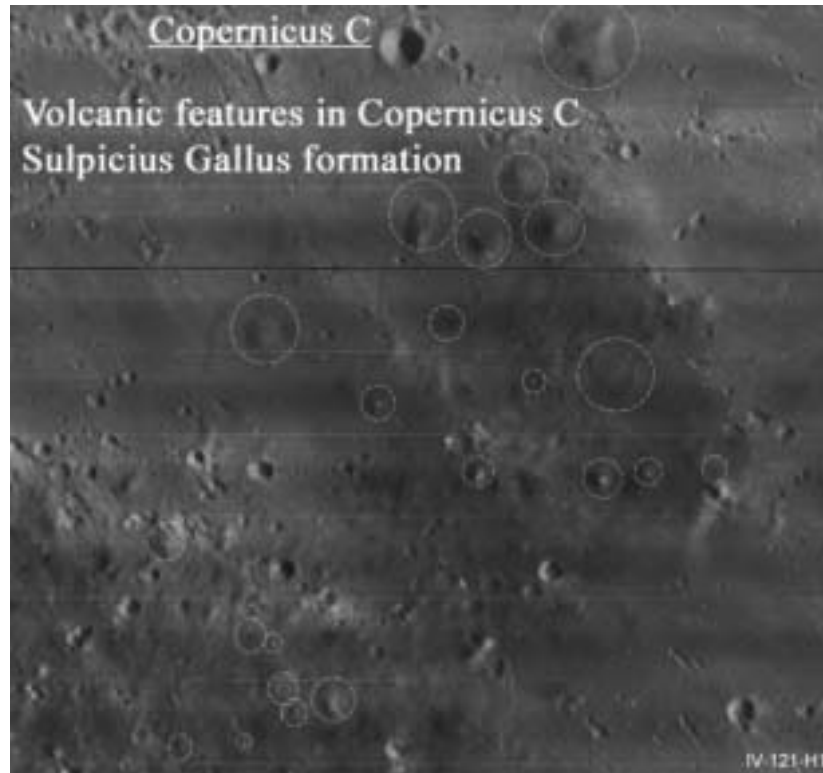


FIGURE 5 - NASA Image (See text for details)

At any rate this is a fascinating area -- or, as Paul Spudis et al put it in their paper on this area with typical professional understatement, "...curious stratigraphic relationships with highland and mare units make this an interesting region to study..."

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
- Seeing: 1 to 10 (1-Worst 10-Best)
- Transparency: 1 to 6
- Magnification (for sketches)
- Medium employed (for photos and electronic images)

FOCUS ON: Pitatus

William M. Dembowski, FRAS
Coordinator, Lunar Topographical Studies

Pitatus is a 100 km (60 miles) diameter crater that sits on the southern shore of Mare Nubium, just southwest of one of the Moon's biggest tourist attractions, the Straight Wall (Rupes Recta). (See Figure 1)



FIGURE 1

Digital image by Wayne Baily
Sewell, New Jersey, USA
December 9, 2005 - 02:43 UT
11 inch f/10 SCT
Schuler IR72 Filter
Philips Toucam

The floor of Pitatus is completely lava covered and surrounded by a heavily damaged rim which rewards the patient observer with a number of interesting features. One of the more nicely formed rim-craters is Pitatus C, an 11 km crater with a flat floor that marks the northeastern wall of Pitatus. The most prominent valley breaches the wall with the adjoining crater Hesiodus to the west. Both are nicely shown on Figure 2.

FIGURE 2

Digital image by
Paolo Lazzarotti - Massa, Italy
February 18, 2005 - 20:17 UT
252mm Newtonian
Lumenera LU075M Camera





FIGURE 3
Digital image by Zac Pujic
Brisbane, Australia
March 3, 2005
32cm Newtonian at f/28
Philips Toucam Pro

Many details on the floor of Pitatus are small and/or subtle, and usually require a sizeable telescope and steady seeing. Among the more easily seen are the off-center peak, a cluster of hills to the northeast, and a series of rilles that encircle the floor (Figure 3). Several of the rilles extend well into the interior of the crater but, as is usually the case with rilles, their visibility is largely dependant upon the lighting conditions at the time.

FIGURE 4
Digital image by
Anthony Ayiomamitis
Athens, Greece
November 11, 2005
AP160 f/7.5 Refractor
Philips Toucam Pro



Under a high sun there are several broad comet-like streaks south of the “central” peak, and one to the North (Figure 4). When seen in isolation one might tend to attribute their origin to the extensive ray system of Tycho to the Southwest. But, with a broader view (Figure 5), it is obvious that these bright Pitatus features do not “point back” to Tycho. We should be careful not to underestimate the value of low-powered views and images of the lunar surface.

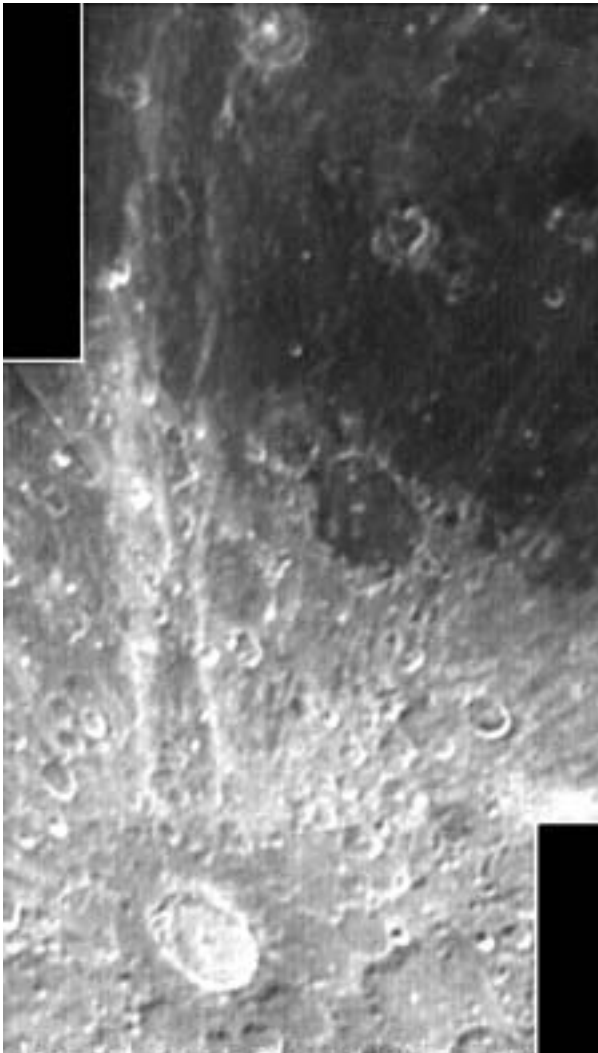


FIGURE 5

**Digital image by Howard Eskildsen
Ocala, Florida, USA
March 18, 2006 - 10:57 UT
6 inch f/8 Newtonian
V-Block Filter - NexImage Camera**

CALL FOR OBSERVATIONS - FOCUS ON: MARE SERENITATIS

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 July 2006 edition will be Mare Serenitatis. Observations of all kinds (electronic or film based images, sketches, 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 send your favorites to one of the addresses shown in the banner on Page One.

Deadline for inclusion in the Mare Serenitatis article is June 20, 2006

ADDITIONAL PITATUS OBSERVATIONS



**Digital image by Rafael Benavides Palencia
Posadas, Cordoba, Spain
January 8, 2006 - 20:26 UT
15cm f/8 Refractor - 3x Barlow - Philips Toucam Pro**



**Digital image by Michael Boschat - Halifax, Nova Scotia, Canada
April 18, 2005
105mm f/10 Refractor - Centrios 3MP Camera**

ADDITIONAL PITATUS OBSERVATIONS



**Digital image by Achille Giordano - Naples, Italy
March 8, 2006 - 21:40 UT**

ETX125 5 inch Mak-Cass - 2x Barlow - Philips Toucam Pro



**Digital image by Antonio Marino - Ercolano, Italy
August 27, 2005 - 03:59 UT**

150mm Intes Micro - 2x Barlow - Philips Vesta

ADDITIONAL PITATUS OBSERVATIONS



**Digital image by George Tarsoudis - Alexandroupolis, Greece
March 9, 2006 - 17:38 UT
8 inch SCT - 2.5x Barlow - IR/UV Cut Filter - Philips Toucam Pro**



**Digital image by Davide Zompatori - Anzio (Rome) Italy
August 27, 2005 - 02:20 UT
Celestron 11 inch SCT - Logitech QuickCam Pro**

ADDITIONAL PITATUS OBSERVATIONS



**Digital image by Claude Libert - Gent, Belgium
May 17, 2005
12 inch SCT - Webcam**



**Digital image by K.C. Pau - Hong Kong, China
March 16, 2003
212mm Cass-Newt - Philips Toucam Pro**

LUNAR TOPOGRAPHICAL STUDIES

Acting Coordinator - William M. Dembowski, FRAS

dembowski@zone-vx.com

OBSERVATIONS RECEIVED

WAYNE BAILEY - SEWELL, NEW JERSEY, USA

Digital images of Posidonius, Daguerre, Dionysius, Aristarchus, Aristoteles (2), Pitatus (5), Atlas, Ptolemaeus Chain (4), Piccolomini, Theophilus, Deslandres (4), Maginus & Tycho, Rupes Recta, Eratosthenes

ED CRANDALL - WINSTON-SALEM, NORTH CAROLINA, USA

Digital images of Gassendi, Gruithuisen, Longomontanus

ACHILLE GIARDANO - NAPLES, ITALY

Digital images of Pitatus (2), Arago,

HOWARD ESKILDSEN - OCALA, FLORIDA, USA

Digital images of Tycho Rays to Pitatus, Occultation of Pleiades by the Moon (3), Messier Twins, Thales,

CLAUDE LIBERT - GHENT, BELGIUM

Digital image of Pitatus

RAFAEL BENAVIDES PALENCIA - POSADAS, CORDOBA, SPAIN

Digital images of Guericke to Opelt, Ptolemaeus Chain, Clavius, Cassini, Pitatus (2), Theophilus Chain, Arago, Rupes Altai

DONALD SPAIN - LOUSVILLE, KENTUCKY, USA

Digital image of Pitatus

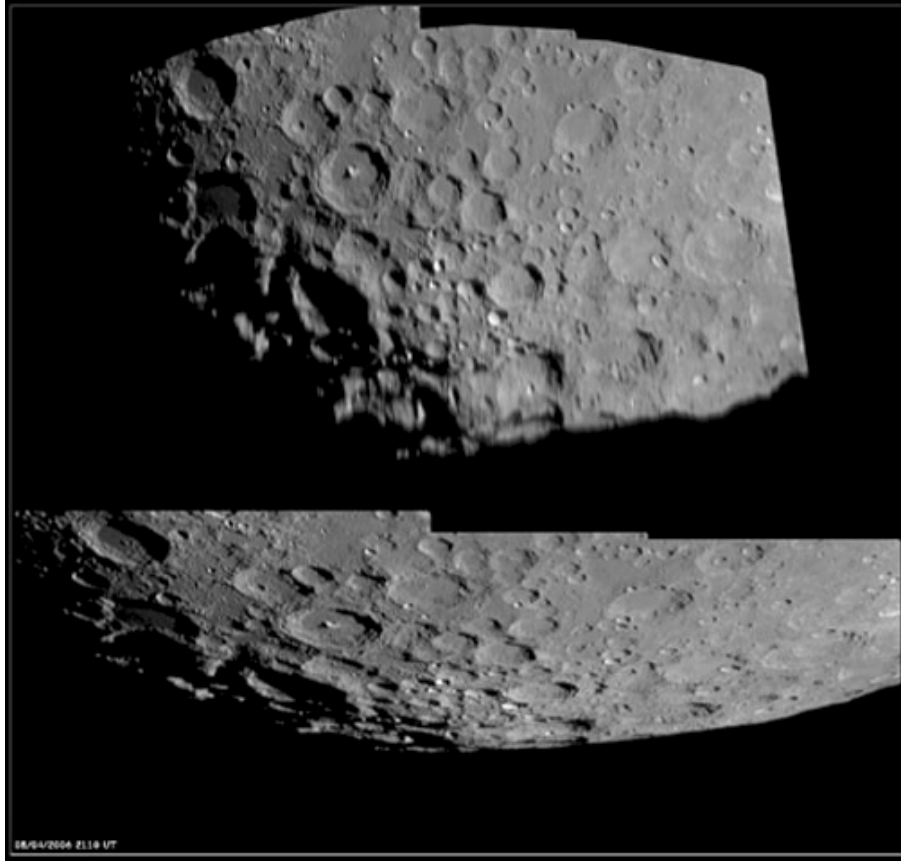
GEORGE TARSOUDIS - ALEXANDROUPOLIS, GREECE

Digital image of Pitatus

ALEXANDER VANDENBOHEDE - GHENT, BELGIUM

Digital images of Clavius, Tycho & Maginus, Atlas & Hercules, Plato & Alpine Valley, Sinus Iridum, Normal and rectified views of Southern Polar Region, Northern Limb Region, Normal and rectified views of Mare Marginus, Copernicus, Mare Nubium, Mare Crisium, Petavius to Langrenus, Northeast limb of 4-day Moon, Earthshine on 4-day Moon (composite)

RECENT TOPOGRAPHICAL OBSERVATIONS



RECTIFIED & NORMAL VIEW OF SOUTH POLAR REGION

Digital images by Alexander Vandenbohede - Ghent, Belgium
April 8, 2006 - 20cm f/15 Refractor



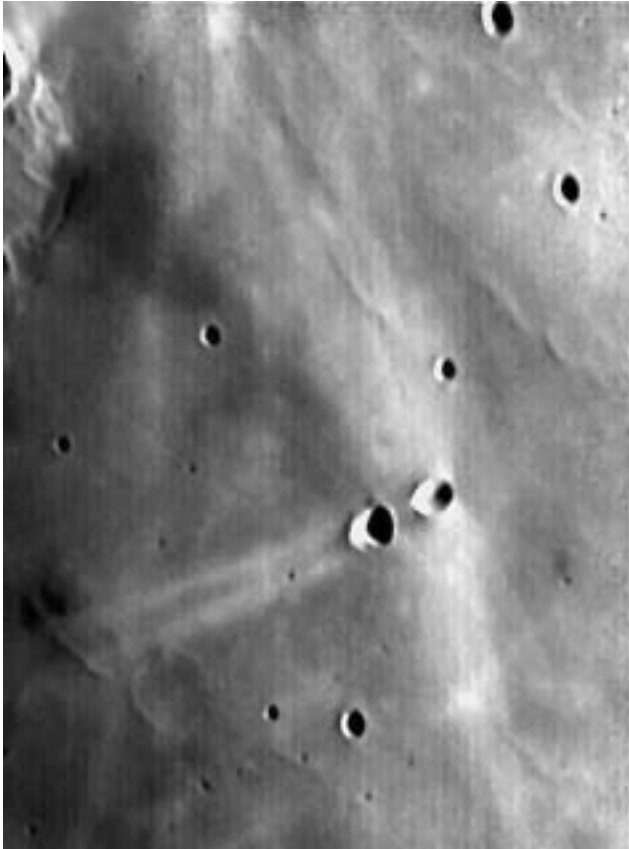
MONS GAMMA & DELTA GRUITHUISEN

Digital image by
Ed Crandall
Winston-Salem
North Carolina, USA
April 10, 2006
110mm f/6.5 Refractor
3x Barlow - 2" Extension
Philips Toucam

BRIGHT LUNAR RAYS PROJECT

Coordinator - William M. Dembowski, FRAS

RECENT RAY OBSERVATIONS



MESSIER & MESSIER A

**Digital image by
Howard Eskildsen
Ocala, Florida, USA
January 5, 2006 - 00:34 UT
6 inch Refractor - 5x TeleXtender**

DESLANDRES

**Digital image by Wayne Bailey
Sewell, New Jersey, USA
April 10, 2006 - 02:29 UT
11 inch f/10 SCT
UV/IR Block Filter
Philips Toucam**



LUNAR TRANSIENT PHENOMENA

Coordinator – Dr. Anthony Cook – acc@cs.nott.ac.uk

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

LTP NEWSLETTER - JANUARY 2006

Dr. Anthony Cook - Coordinator

Observations for March were received from: Jay Albert (USA), Rafael Benavides (GLR, Italy), Clive Brook (UK), Marie Cook (UK), Raffaello Lena (GLR, Italy), Gerald North (UK), and Piergiovanni Salimbeni (GLR, Italy). March was a quiet month with no LTP reports being received, but instead a lot of useful routine observations, some of which can help to disprove past LTP. My thanks also go to David Darling who has been receiving observations too via his web site and submits these to me in batches at appropriate intervals.

Last month I mentioned that I had some exciting news about ESA's SMART-1 probe. On September 3rd at 02:00 UT the spacecraft, at the end of its useful life, with depleted fuel, will be targeted to crash impact into the Moon at approximately 44W and 34S on the night side. The terminator is about 9 deg away. Due to uncertainties in predicting the orbit so far in advance and some uncertainties in the topography in this region as the spacecraft descends, it could crash either 5 hours earlier or 5 hours later in approximately this location. As the spacecraft is just 290kg and traveling at 2km/sec at the time of the impact, the expected impact flash (duration 1/50th sec) will be probably be too faint to see against the glare from the Moon with amateur sized telescopes. The impact energy will be the same as a 1kg meteorite striking the surface at 40km/s. However there is a chance that dust will be kicked up (200m/s vertically) could possibly make it into sunlight. As dust in sunlight is one of the explanations of LTP, I would very much like to urge observers the monitor the region of the impact site on the night side of the terminator for any faint apparent glows. Low light CCTV will be ideal, but visual observations with descriptions made into a tape recorder will be useful too. Unfortunately from the UK and most northern hemisphere sites the Moon will be below the horizon for most of us, therefore low latitude and southern hemisphere observers are encouraged to observe. Glare from scattered light will no doubt be a problem, but it might be worth having a go at. I have in the past video recorded Earthshine with a lunar phase of 70%, but it depends upon one's local sky conditions. If you do plan to have a go (if the Moon will be visible from your site) can you please contact either Brian Cudnik of ALPO, or myself to let us know so that we can coordinate observations and make suggestions to maximize chances of success and usefulness of the observation.

There will also be observing opportunities on Jul 10th and 11th and again on Aug 6th and 7th for coordinated observing of the proposed impact site and elsewhere by SMART-1 and ground based observers. The over-flight of the SMART-1 ground site will take place on Jul 10 at ~17h and on Aug 6 at ~17h. Other observing opportunities, corresponding to the same illumination as the night of the impact will be mentioned in the repeat illumination predictions for LTP that are given on-line on the web site below. I will provide further details as and when I know them.

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!

Dr Anthony Cook, School of Computer Science & IT, Nottingham University, Jubilee Campus, Wollaton Road, Nottingham, NG6 1BB, UNITED KINGDOM. Email: acc@cs.nott.ac.uk

THE MOON IN THE NEWS

(ESA) SMART-1 maps Humorum edge where highlands and mare mix
http://www.esa.int/SPECIALS/SMART-1/SEMHWFOFGL_0.html

(ASA Astrobiology) Melting the moon
<http://www.astrobio.net/news/modules.php?op=modload&name=News&file=article&sid=1927&mode=thread&order=0&thold=0>

(Oregon State Univ.) New Lunar Rock Ages Indicate Cataclysmic Meteorite Bombardment of Moon, Earth
<http://oregonstate.edu/dept/ncs/newsarch/2006/Apr06/moonrocks.html>

(ESA) Reiner Gamma swirl: magnetic effect of a cometary impact?
http://www.esa.int/esaSC/SEM05FNFGLE_index_0.html#subhead1

(BBC) Europe's lunar vision blossoms
<http://news.bbc.co.uk/1/hi/sci/tech/4895610.stm>

(Space.com) U.S. not alone in future lunar exploration
http://www.space.com/business/technology/060426_international_moon.html

(MSNBC) Commerce said key to moon exploration
<http://msnbc.msn.com/id/12536410/>

(BBC) 1962: First US rocket lands on moon
http://news.bbc.co.uk/onthisday/hi/dates/stories/april/26/newsid_2950000/2950011.stm

(Space.com) NASA adds moon crashing probes to LRO mission
http://www.space.com/missionlaunches/060410_lro_moon_crash.html

(American Scientist) Mining the moon
<http://www.americanscientist.org/template/BookReviewTypeDetail/assetid/50749;jsessionid=baacOHf3v0zoIE>

(Physorg.com) Rumbblings on the moon could be problematic for lunar base
<http://www.physorg.com/news63645811.html>