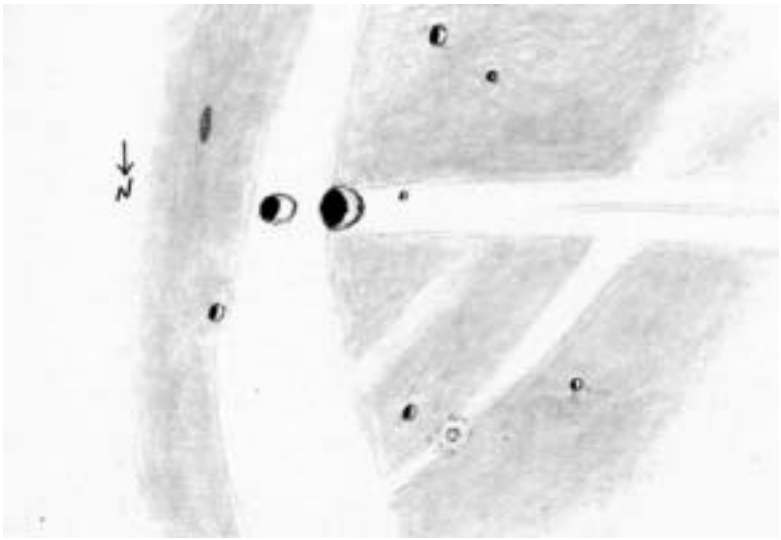
THE LUNAR OBSERVER

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 - October 2006



MESSIER & MESSIER A

Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
May 3, 2006 - 02:20 to 02:30 UT
15cm Newtonian - 170x - Seeing 7-8/10

I observed this well-known crater and vicinity on the evening of May 2/3, 2006 while observing four occultations. Messier itself is the eastern crater of the large pair. It has a distinct east-west orientation despite its proximity to the eastern limb in Mare Fecunditatis. Messier A is the larger crater to the west of Messier. It has a D-shape, and is considerably deeper than Messier. A long, narrow ray extends westward from this pair. It splits in two lengthwise giving it a cometlike appearance. The craters Messier D and E lie south of this ray, and a tiny pit is within it just west of Messier A. The small crater northeast of Messier is Messier B. The craters Secchi K and X are farther to the northwest. A wide north-south ray encompasses Messier, and grazes the east rim of Messier A and the west rim of Messier B. This feature tapers somewhat to the south. Another ray extends from the wide ray to the cometlike feature on a diagonal. These rays have isolated a patch of Mare Fecunditatis with Secchi K at its northern end. A short, weak ray is within this patch, parallel to the diagonal feature. The LQ map shows a rille in this area, but I was not able to see it.

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 - October 2006 (UT)

03 . . . . . 09:00 . . . . . Moon 3.0 Degrees SSE of Neptune

05 . . . . . 00:00 . . . . . Moon 0.45 Degrees SSE of Uranus

06 . . . . . 14:00 . . . . . Moon at Perigee (222,084 miles)

07 . . . . . 03:13 . . . . . Full Moon

14 . . . . . 02:00 . . . . . Last Quarter

16 . . . . . 16:00 . . . . . Moon 1.9 Degrees NNE of Saturn

19 . . . . . 10:00 . . . . . Moon at Apogee (252,323 miles)

19 . . . . . 18:00 . . . . . Moon 0.33 Degrees SSE of Juno

22 . . . . . 01:00 . . . . . Moon 3.9 Degrees SSW of Venus

22 . . . . . 05:00 . . . . . Moon 3.3 Degrees SSW of Mars

22 . . . . . 05:13 . . . . . New Moon (Start of Lunation 1037)

24 . . . . . 05:00 . . . . . Moon 5.2 Degrees SSW of Jupiter

24 . . . . . 07:00 . . . . . Moon 1.3 Degrees SSW of Mercury

29 . . . . . 21:25 . . . . . First Quarter

30 . . . . . 17:00 . . . . . New Moon 2.9 Degrees SSE of Neptune

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)

As stated in the September issue of TLO, the Selected Areas Program (SAP) previously coordinated by Dr. Julius Benton, Jr. has been transferred to the Lunar Topographical Studies Section. The SAP provides for the formal monitoring of seven specific areas of the Moon for albedo changes during a lunation and from one lunation to the next. In addition, it includes programs for the cataloging and study of Dark Haloed Craters and Bright & Banded Craters.

Following is a description of the Bright and Banded Craters Program as prepared by Dr. Benton:

BRIGHT AND BANDED CRATERS

Dr. Julius Benton, Jr.

The *Bright and Banded Craters Program,* abbreviated *BBCP,* is concerned with systematic observations of lunar craters that appear extremely brilliant when the Sun is overhead (i.e., near Full Moon), as well as craters that exhibit dark or light radial bands within their walls. A particular crater may be both bright and banded, or it may just be bright with no bands; also, a crater may not be particularly brilliant, but it may exhibit dark or bright bands. So, there may be several categories of features covered by the BBCP. Earlier efforts to observe, categorize, and catalog these features generated useful data, but program participants were too few in number to provide adequate coverage. Considerable work, therefore, remains to be done.

Some of the objectives of the BBCP may be listed as follows:

1. Limiting systematic scans of the lunar surface to a small region at a time (e.g., 15° of selenographic longitude x 15° of selenographic latitude), detect and catalog craters that are especially brilliant (have high albedos) at or near local noon at the site. Record the albedo for each crater, using indices in the same manner as for other SAP features, as applicable. Like other SAP features, it is worthwhile to examine these bright craters under all illumination conditions throughout a lunation and from one lunation to the next to establish normal albedo profiles.

2. Determine whether or not there is a relationship between crater brightness at local noon and the visibility of dark or light bands, central peaks, or both.

3. Limiting systematic scans of the lunar surface to a small region at a time (e.g., 15° of selenographic longitude x 15° of selenographic latitude), detect and catalog craters that exhibit dark or bright bands, or both, under various lighting conditions throughout a given lunation and from one lunation to another.

4. For craters exhibiting banding, determine the relative positions, orientation, and intensities (albedos) of the bands throughout a lunation and from one lunation to another.

5. Investigate what correlations may or may not exist between crater size, the presence of central peaks, and the occurrence of light and/or dark bands.

6. Monitor the visibility and morphology of bright and/or banded craters during umbral and penumbral lunar eclipses.

7. Use extensive drawings, photographs, CCD images, and video tape to help support and achieve the above goals.

Observational data should always be recorded on the *BBCP Observing Form*.
Consider the following tips when completing the forms:

1. Use only one form for each bright and/or banded crater observed.

2. A number of lunar maps and atlases of differing vintage exist. Positional data for bright and/or banded craters may be expressed using *xi* and *eta* coordinates, as well as *Selenographic Longitude* and *Selenographic Latitude.* Either or both coordinates are useful. Enter descriptive data about the "Environs" in which the feature is located [e.g., "crater is located approximately 4 km E (IAU) of Gassendi"] should always be included. Always enter the *colongitude, C,* for the date and time of the observation.

One of the easiest ways to determine the position of a newly confirmed bright and/or banded crater, or to check the positional accuracy of an existing feature, is to make a copy of the region containing the crater from a lunar atlas depicting coordinates. Using the copy, sketch in the position of the crater, paying attention to its correct relative dimensions, and measure the coordinates of the feature later. Some observers draw features directly on copies of lunar maps, attaching them to the observing forms.

3. Using lunar features of known dimensions, estimate the diameter of crater, as well as the length and width of bands, in kilometers whenever possible (careful use of kilometer scales on lunar maps will add precision to this process).

4. Estimates of albedo (intensity) should be made by reference to *Elger's Albedo Scale,* and albedo data should be linked to specific indices on the crater (set up in the same manner as for other SAP features). Utilization of the *Albedo and Supporting Data* form is essential for recording intensity data, and it should be attached to the *BBCP Observing Form.* Data that is duplicated on the two forms need not be entered twice.

5. Drawings of craters should be made on the *BBCP Observing Form.* Make certain that the direction of North (N) is clearly indicated on the drawing (attention should be given to the proper field orientation of the eyepiece). Also, supplement drawings with good photographic, CCD, or video images of bright and/or banded craters in an effort to capture their overall characteristics during different solar illumination conditions. It would be useful to record the appearance of craters in different color filters, as well as with variable-density polarizers.

6. In the "Descriptive Notes" section of the *BBCP Observing Form,* include information that may not be immediately apparent on the rest of the form or drawing. Notes should be made about the morphology of the feature (e.g., visibility of dark or light bands, central peaks, or both; relative positions, orientation, and albedos of bright and/or dark bands; correlations that may or may not exist between crater size, the presence of central peaks, and the occurrence of light and/or dark bands).

7. Submit observational data, along with photographs, CCD images, or video tapes, to the A.L.P.O. Lunar Section at the end of a given lunation.

Links to Observing Forms for the Bright & Banded Craters Program (PDF)

BBCP Observing Form: http://www.zone-vx.com/alpo-bbcp-observing.pdf

BBCP Albedo & Supporting Data Form: http://www.zone-vx.com/alpo-bbcp-albedo.pdf

MAJOR LUNAR STANDSTILL

Anthony Ayiomamitis - Athens, Greece

EDITOR'S NOTE: This photo sequence is very likely to be the first of its kind ever produced; multiple internet searches have failed to yield any similar images. The presence of electrical lines in the center photo is the result of untimely new construction by the local electric utility.

The period 2005-2007 is particularly interesting, for it represents the end of the current Saros cycle and allows for some very creative, interesting and educational photography in relation to the moon and its highly variable position in the sky and, more specifically, its position above and below the ecliptic during the SAME synodic month.

Presented here is a digital mosaic based on the rising sun and moon during the past two weeks (September 3 to 15, 2006). To be more precise, late last week was particularly special since it represented one of the major lunar standstills for the current Saros cycle and which I exploited by capturing the rising third-quarter moon as a time series using exposures spaced five minutes apart. This technique was put into action once again later with the rising sun (and the ecliptic) so as to capture the maximum deviation possible in the declination between the sun and moon and which is possible and occurs only at the end of each Saros cycle. Of course, the third part of the puzzle is the greatest declination of the moon below the ecliptic DURING the same synodic month and which was successfully captured two weeks earlier (the afternoon sun was somewhat challenging in capturing the nearly first-quarter moon).

Although the moon generally hugs the ecliptic and follows the sun across the sky, the tilt in the earth's axis of rotation (23.45 degrees) coupled with a similar tilt in the moon's axis of rotation (5.1 degrees) relative to the same ecliptic lead to a possible maximum net tilt of 28.55 degrees for the moon and which dramatically impacts its rising and setting declinations in relation to the sun (and the ecliptic).

In order to capture the maximum possible declination of the moon above and below the ecliptic (the rising sun is included as a reference for the ecliptic) and which ranges over 70 degrees in azimuth (!), a wideangle lens had to be employed to make the imaging of this phenomenon even feasible.

Links of possible interest include:
(1) http://www.umass.edu/sunwheel/pages/moonteaching.html

(EXCELLENT reading material on the major lunar standstill)
(2) http://www.astro.umass.edu/~young/moontable.html

(Major Lunar Standstills during 2005-2007)
(3) http://www.perseus.gr/Astro-Lunar-Scenes-Major-Standstill-2006.htm

LUNAR DRAWING WITH A PDA
Peter Grego - Rednal, Birmingham, England

Feature: Atlas near the evening terminator
Date: 11 September 2006
Time: 03:00-03:45 UT
Seeing: AII - good
Instrument: 200mm SCT (LX90), f/6.3 reducer, 7mm UWA ocular (Nagler)
Magnification: x180
PDA (SPV M-2000) using Mobile Atelier drawing software
Observer: Peter Grego
Location: Rednal, England

ADDITIONAL NOTES BY PETER GREGO:
I have also produced a sequence in GIF format showing the actual stages of the Atlas drawing. The drawings were made on the PDA at the eyepiece of my 200mm SCT and saved at intervals throughout the session. The last image is the final version, touched up indoors on my PC using a graphics tablet. It gives an idea about my observing technique, and I think it might be of use for other lunar observers to see. The GIF is low res, though, to make it easier to view on the web.

CLICK ON LINK TO SEE GIF SEQUENCE: http://www.zone-vx.com/tlo-oct06

EDITOR'S NOTE:
Peter will be explaining various drawing techniques for astronomy using PDAs and Tablet PCs in a new book to be published next year.

LUNAR TOPOGRAPHICAL STUDIES

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

OBSERVATIONS RECEIVED

MICHAEL AMATO - WEST HAVEN, CONNECTICUT, USA
Ray maps of Menelaus, Proclus

COLIN EBDON - COLCHESTER, ESSEX, ENGLAND
Sketch of Diophantus & Deslisle

HOWARD ESKILDSEN - OCALA, FLORIDA, USA
Digital images of Ruithuisen & Rumker Hills, Gardner & Cauchy, Rimae Bond, Altai Scarp, Mare Nectaris

ALEXANDROS FILOTHODOROS - SAMOS, GREECE
Digital images of Southwestern Limb (3)

GUILHERME GRASSMANN - AMERICANA, BRASIL
Digital images of Thales, Atlas, Clavius, Copernicus, Moretus, Proclus
Positive and negative pairs of ray system images of Copernicus (2), Kepler, Aristachus, Plato, North polar region

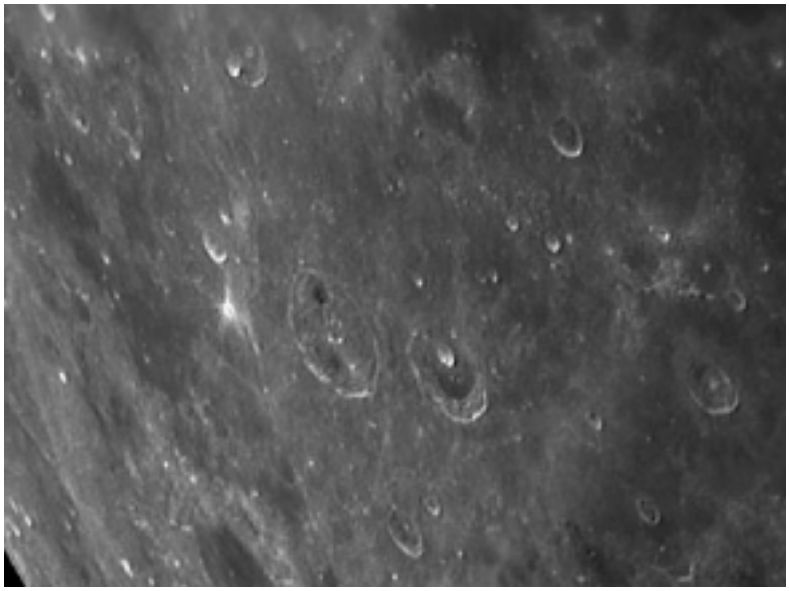
PETER GREGO - REDNAL, BIRMINGHAM, ENGLAND
PDA Sketches of Atlas, Endymion

PAOLO LAZZAROTTI - MASSA, ITALY
Digital mosaic of North Polar Region

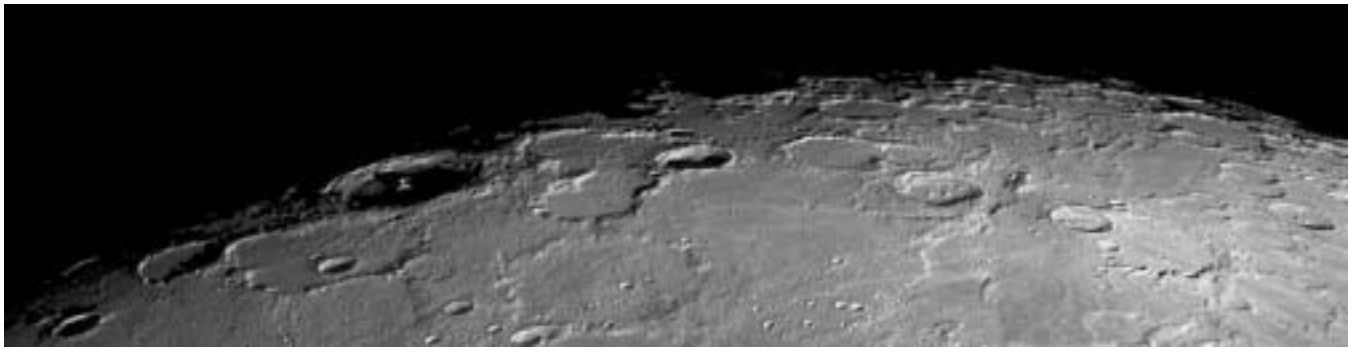
PRAET MARNIX - BELGIUM
Digital images of Clavius (2)

ZAC PUJIC - BRISBANE, AUSTRALIA
Digital image of Moretus

RECENT TOPOGRAPHICAL OBSERVATIONS

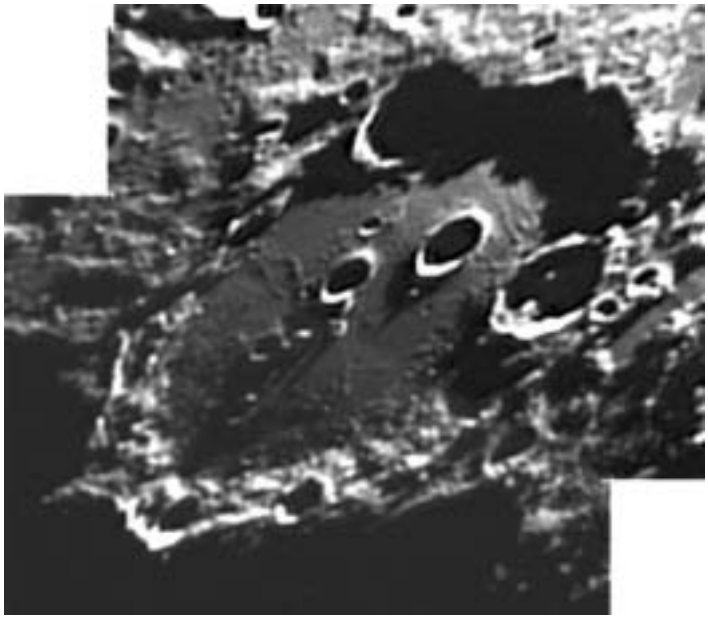


ATLAS
Digital image by Guilherme Grassmann - Americana, Brasil
September 3, 2006 - 02:57:39 UT - Seeing 8/10 - Transparency 5/6
10 inch f/10 SCT - Toucam Pro - No filter

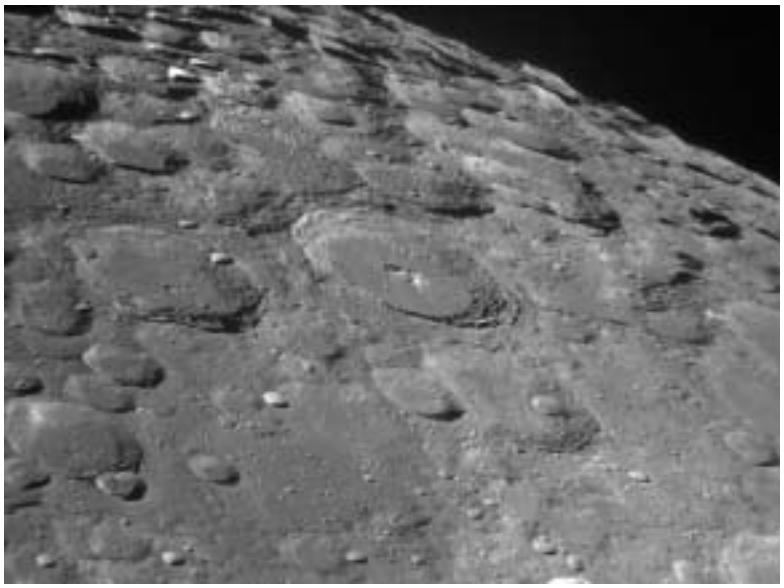


NORTH POLAR REGION
Digital mosaic (5 images) by Paolo R. Lazzarotti - Massa, Italy
September 5, 2006 - 21:45/21:53/21:58/22:02/22:06 UT
Seeing 3/10 - Transparency 2/5
Gladio 315 Lazzarotti Opt. scope - Lumenera Infinity 2-1M Camera
Edmund Optcs R filter - 42 msec. exposure
0.22 arcsec/pixel image scale (binning 2x2) 300/4700 frames

RECENT TOPOGRAPHICAL OBSERVATIONS

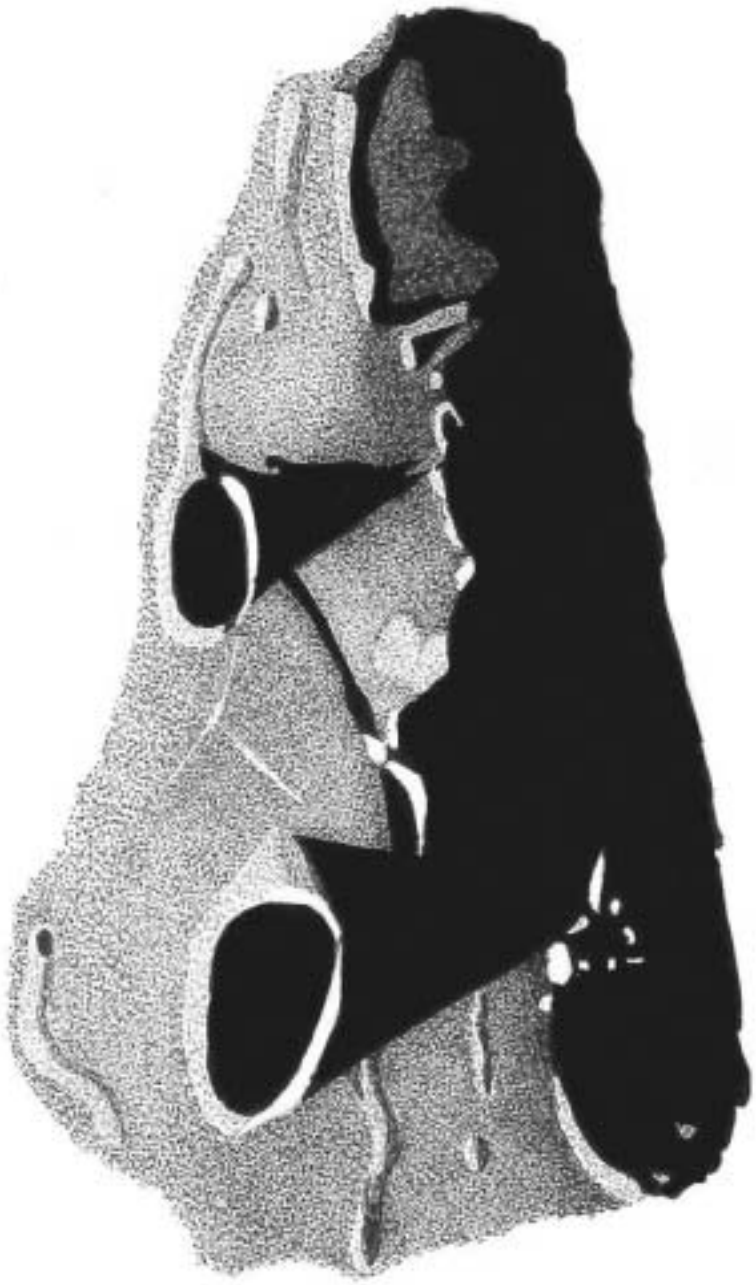


CLAVIUS
Digital image by Praet Marnix - Belgium
June 5, 2006 - (Day 8 of lunation)
10 inch LXD Schmidt-Newtonian - 5x Powermate - atk-2c Camera



MORETUS
Digital image by Zac Pujic - Brisbane, Australia
August 12, 2006 - 31cm Newtonian - f/21
SkyNyx 2.1M Camera - Wratten 25A Filter
Frames stacked using MAP processing with Registax

RECENT TOPOGRAPHICAL OBSERVATIONS

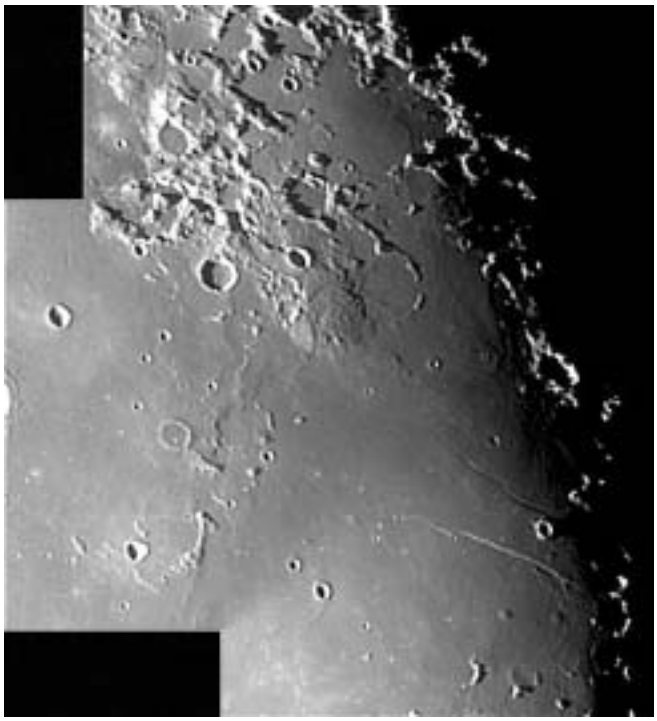


DIOPHANTUS & DESLISLE

Drawing by Colin Ebdon - Colchester, Essex, England
February 8, 2006 - 22:30 to 23:30 UT - Seeing AII then AIII
7 inch Maksutov-Cassegrain - 225x & 300x

ADDITIONAL NOTE BY COLIN EBDON:
The white "T" shaped lines between Diophantus and Deslisle denote what appeared to be part of a fine lunar ray, possibly crossed by part of Rima Diophantus at the limits of resolution.

RECENT TOPOGRAPHICAL OBSERVATIONS



GARDNER TO CAUCHY

Digital mosaic (3 images) by Howard Eskildsen - Ocala, Florida, USA
August 13, 2006 - 08:27 UT - Seeing 8/10 - Transparency 5
6 inch f/8 Meade Refractor - 2x Barlow - NexImage Camera

ADDITIONAL NOTES BY HOWARD ESKILDSEN:

The Gardner mega-dome has interesting features that almost appear to be creased by rilles or faults. The usual domes are visible in the Cauchy region, but what really catch my attention are the Cauchy Fault and Cauchy Rille. While the uplift (or subsidence) of the fault is plainly visible, the rille seems to blur the boundary between rille and fault. I suspect that faulting is critical to formation of this type of rille (as opposed to sinuous rilles). Also, wrinkle ridges or dorsa really appear as if they might be overthrust faults as well.

f

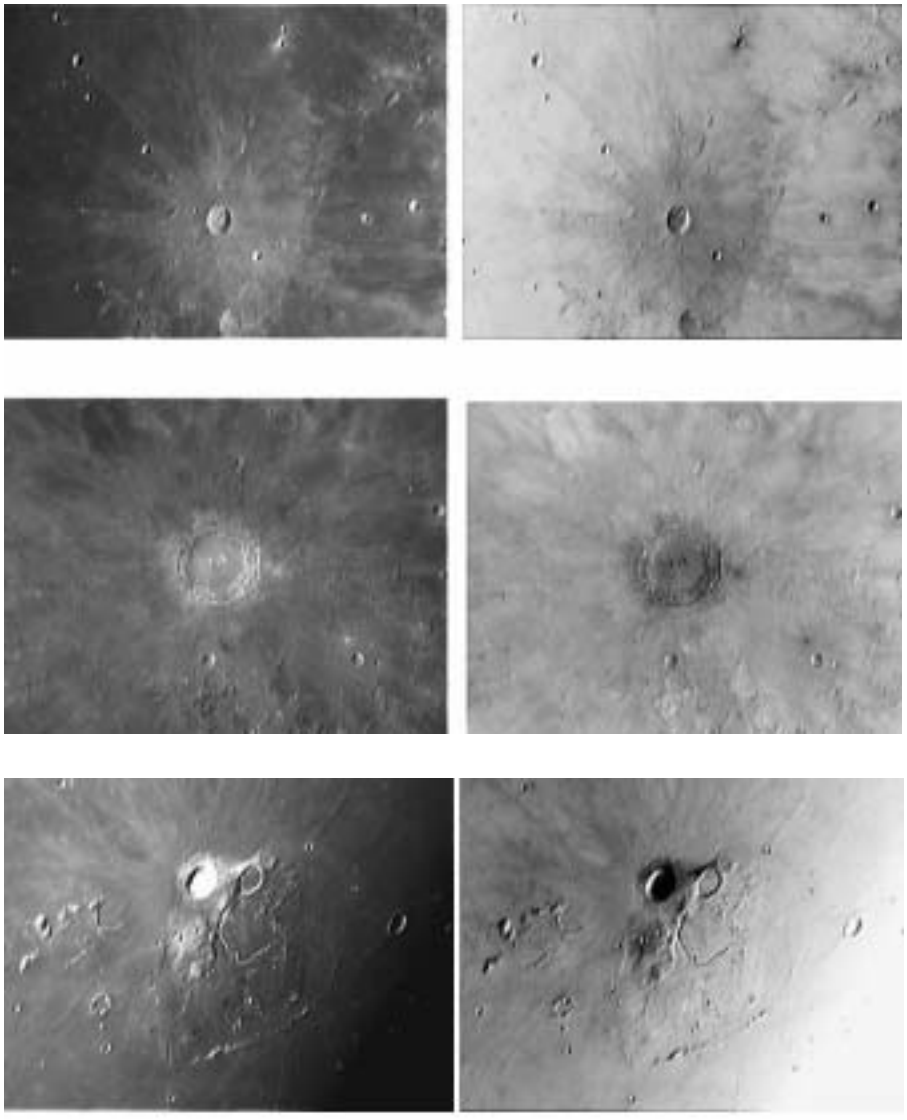
BRIGHT LUNAR RAYS PROJECT

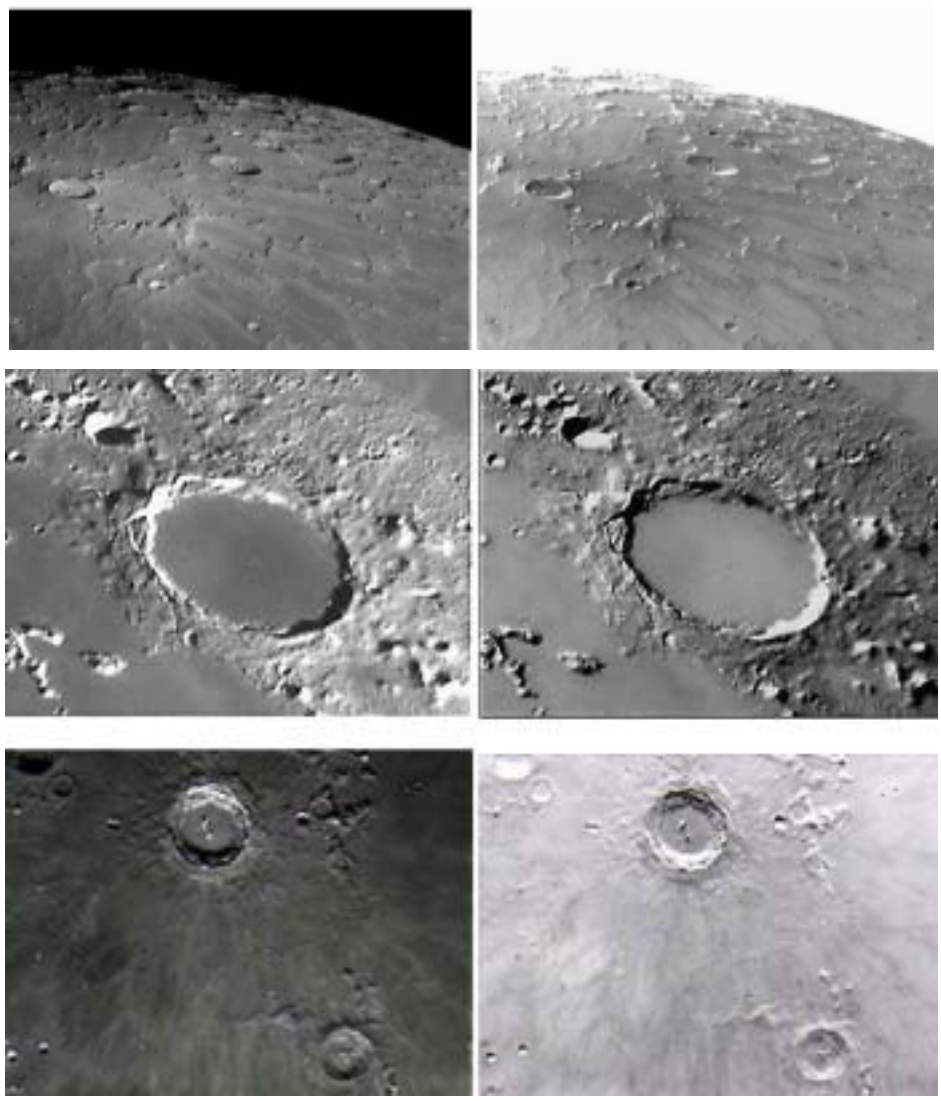
Coordinator - Willliam M. Dembowski, FRAS

Report for the Bright Lunar Rays Project

Guilherme Grassmann - Americana, Brasil

I am quite sure that this idea is not new and all digital imagers sometimes use the negative option of any image processing program, like Microsoft Photo Editor that I use to see my image results. Using negative images, a lot of information can be seen and increase our perception of lunar rays, and will be very helpfully for dome investigation, banded craters, etc. Remember that the shroud of Turin negative images shows a lot of information not showing on the positive image. Below are some examples of how the details are increased. I hope our fellow observers can enjoy my small contribution to the program.





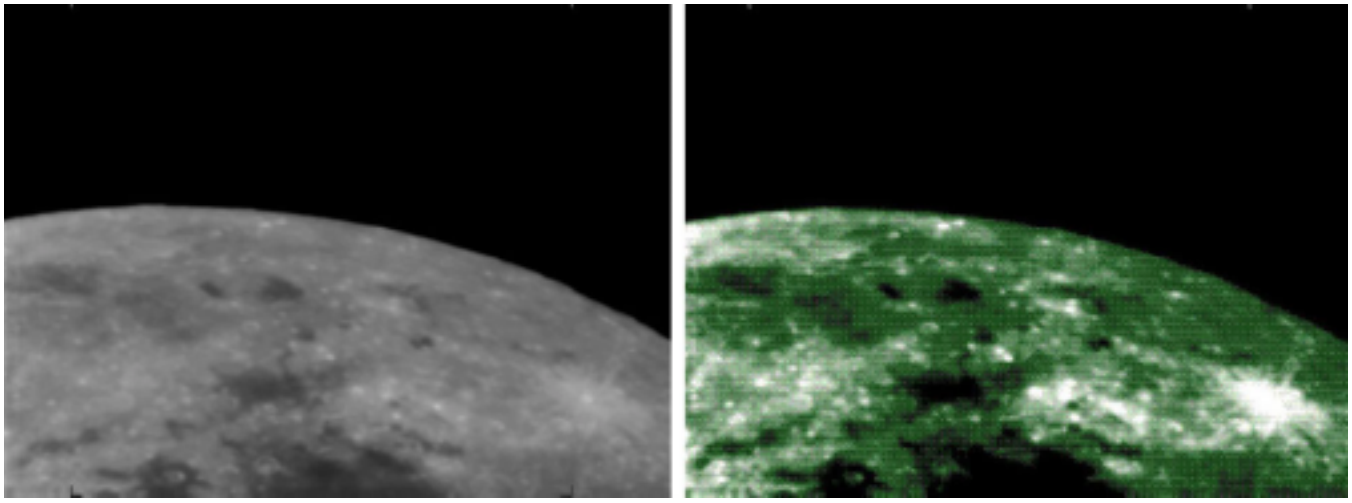
RECENT RAY OBSERVATIONS

BESSEL & MENELAUS

Ray Map by Michael Amato
West Haven, Connecticut, USA
September 11, 2006 - 03:30
127mm Mak-Cass

ADDITIONAL NOTE BY MICHAEL AMATO:
I observed this lunar ray at local lunar sunset. All I could see was a small part of the ray around the crater Bessel. It was very faint.

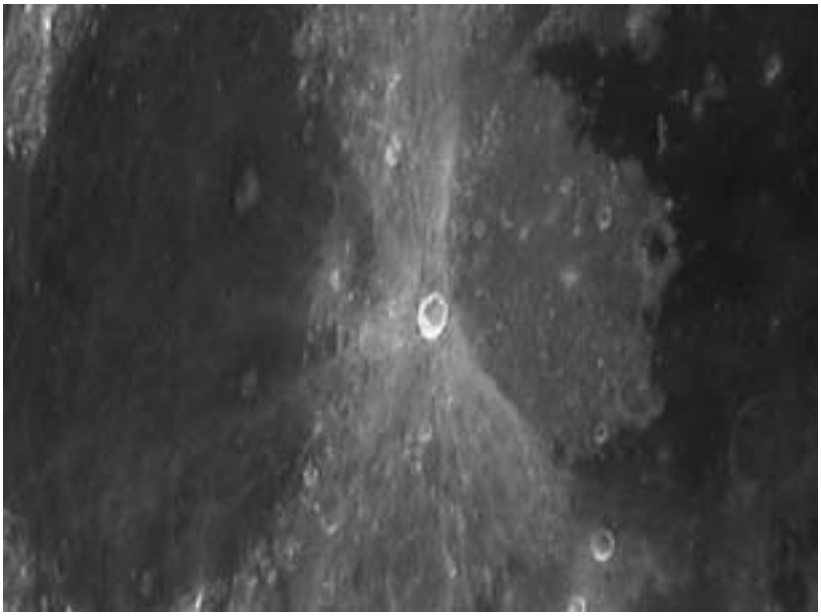
RECENT RAY OBSERVATIONS



Normal **Saturated**

RAYS OF NORTH POLAR REGION

Digital images by Alexandros Filothodoros - Samos, Greece
May 13, 2006 - 22:58:15 UT
90mm Maksutov-Cassegrain - NexImage Camera - Ir cut filter



PROCLUS

Digital image by Guilherme Grassmann - Americana, Brasil
September 3, 2006 - 20:55:58 UT - Seeing 8/10 - Transparency 5/6
10 inch f/10 SCT - ToucamPro - No filter

LUNAR TRANSIENT PHENOMENA

LTP NEWSLETTER - OCTOBER 2006

Dr. Anthony Cook - Coordinator

Only two observations were received for August – Michael Amato (West Haven, CT, USA) monitored Proclus, Menelaus and Aristarchus. I did though receive a couple of images of Clavius from Praet Marnix of Belgium taken on 2006 Jun 5th and 06th – you can see these by going to the following web site: http://users.skynet.be/mpraet/Clavius-dag.jpg . These show some nice detail emerging from shadow – we are lucky having such talented observers working for us. A lot more observations were received for September, related to the SMART-1 impact and I will list these next month.

SMART-1 has now impacted the lunar surface to within a second or two of the predicted impact time, but it was a very close run thing with reports of a safe mode for the spacecraft shortly before a minor orbit correction to avoid a crater rim on the orbit before the desired impact. In correspondence with ALPO's Brian Cudnik, at the time of writing (11th Sep 2006), there would appear to be just one amateur report of a candidate flash on video by Peter Lipscomb (http://cosmonut.org/Smart-1.gif), but this is still being checked out for the possibility of other explanations such as a cosmic ray event, though I hope it turns out to be real! If not then any optical flash must have been fainter than magnitude 10 for it to have been invisible to amateur sized telescopes. Other than that I know only of the positive detection by the Canada France Telescope in Hawaii that was imaging in the thermal infrared at 2.1 microns and saw both a flash, and more importantly for us a cloud of material. The cloud of material moved to the SW of the flash (assuming the images are oriented with north at the top) and lasted about 150 sec, covering about 80km. For more information see Christian Veillet's excellent web site on: http://www.cfht.hawaii.edu/News/Smart1/ . This is quite an area effected for a small washing machine sized spacecraft collision (the impact crater was at most probably about 10 m in diameter), though how much of this will leave a permanent change to the surface over the affected region remains to be seen. Please monitor the impact site and compare with old images and photos.

Actually the cloud is slightly puzzling because if it was traveling ballistically, one might expect it to have fallen down out of the lunar sky after a few seconds. So perhaps there are other effects taking place that we can only speculate on e.g. electrostatically charged particles, kinetic collision flow of debris across the surface, landslides of regolith on mountain slopes, ionization of gas emitted during the impact. The motion off to one side is also interesting – perhaps related to the shallow impact angle or could it be related to topographic slope (actually it is not very steep at the impact site), or could it be related to solar wind direction (from particles and not light). The point is that any impact that can produce a flash bright enough to be seen from Earth, may produce short term effects that create LTP cloud like features – though whether this is as true in the optical as in the thermal infrared is still open to question. It is probably worth examining any impact flash video from the past near the terminator in order to see if similar effects are present.

Further 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: +44 798 505 5681 and I will alert other observers or give David Darling (US observers) a call on: (608) 837 6054.

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 report on the SMART-1 impact including links to images of the impact:
http://smart.esa.int/science-e/www/object/index.cfm?fobjectid=39961

View of the SMART-1 impact by the Canada-France-Hawaii Telescope:
http://www.cfht.hawaii.edu/News/Smart1/

View of the SMART-1 impact by amateur Peter Lipscomb:
http://cosmonut.org/Smart-1.gif

ESA: SMART-1 Swan song:
http://www.esa.int/SPECIALS/SMART-1/SEMC378ZMRE_0.html

Lunar meteorite found in Antarctica:
http://www.spaceref.com/news/viewpr.html?pid=20807

Scientific panel endorses lunar exploration:
http://www.usatoday.com/tech/science/space/2006-09-19-moon-return-endorsed_x.htm

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 & Selected Areas Program Dembowski@zone-vx.com

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