THE LUNAR OBSERVER

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

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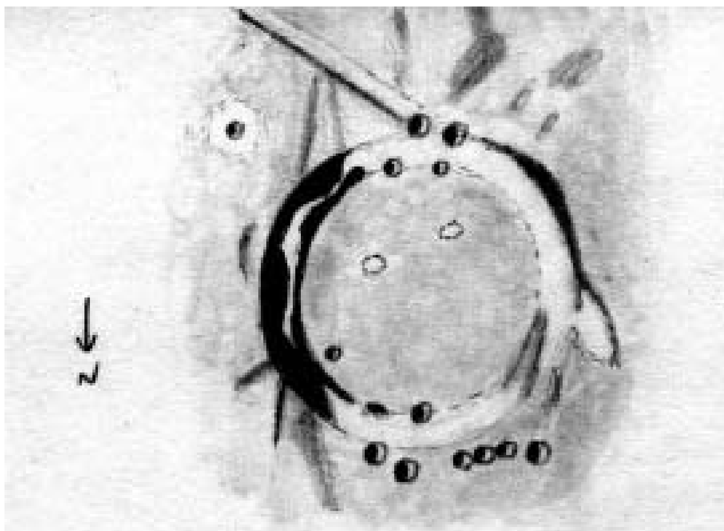
FEATURE OF THE MONTH - JUNE 2005



ABULFEDA

Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
January 18, 2005 - 15cm Newtonian - 170x - Seeing 6-8/10

I drew this crater on the evening of Jan. 17/18, 2005 while observing three occultations. This is a large, fairly crisp crater west of Mare Nectaris. It shows evidence of terracing, especially on the inside east wall. There is a generous sprinkling of small craters within or near this feature, especially to the north. Abulfeda R is the largest and westernmost of a chain just outside the north and northwest rims.

Abuldeda U is inside the north rim, while Abulfeda UB is the small pit inside the northeast rim near some irregular shadowing. Abulfeda Z is southeast of Abulfeda and has a modest halo. Abulfeda X and T are on the outside southern rim.

These craters are at the western end of a combination rille-crater chain that extends a considerable distance to the southeast. I saw two other pits inside the south rim. I drew nearby shadowing as I saw it. There appears to be a noticeable dropoff southwest of Abulfeda based on shadowing along the rim west of T. There also appears to be a low mound on the west rim of Abulfeda. There were two bright spots seen on the southern half of Abulfeda's floor, but no shadowing was noticed with them.

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 TOPOGRAPHICAL STUDIES

Acting Coordinator - William M. Dembowski, FRAS
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OBSERVATIONS RECEIVED

ACHILLE GIORDANO - NAPLES, ITALY
Digital image of Endymion

JAY ALBERT - LAKE WORTH, FLORIDA, USA
Sketch of Sirsalis

MICHAEL AMATO - WEST HAVEN, CONNECTICUT, USA
Ray maps of Messier (3), Menelaus (3), Proclus (3), Kepler (2), Aristarchus (2)

ED CRANDALL - WINSTON-SALEM, NORTH CAROLINA, USA
Digital image of Gassendi & environs

HOWARD ESKILDSEN - OCALA, FLORIDA, USA
Digital images of Mare Crisium, Mare Fecunditatis, Atlas & Endimion, Goclenius Rilles, Bilharz & Atwood & Naonobu

PETER GREGO - REDNAL, BIRMINGHAM, ENGLAND
Sketch of Mons la Hire

ROBERT H. HAYS, JR. - WORTH, ILLINOIS, USA
Sketches of Abulfeda, Wolf, Bohnenberger, Nicolai

PAOLO LAZZAROTTI - OSTELLATO, ITALY
Digital image of Rima Hadley, Davy,

YENAL OGMEN - LEFKONIKO, CYPRUS
RayMaps of Menelaus (2), Messier (2)

GERARDO SBARUFATTI - CASSELE LANDI (LODI), ITALY
Digital image of Petavius

ROBERT WLODARCZYK - CZESTOCHOWA, POLAND
Sketch of Copernican Ray System

Observations submitted should include the following:
- **Name and location of observer**
- **Name of feature**
- **Date and time (UT) of observation**
- **Size and type of telescope used**
- **Magnification (for sketches)**
- **Medium employed (for photos and electronic images)**

Using Digital Images To Make More Accurate Lunar Observational Drawings

By Peter Grego

Lunar Section Director, Society for Popular Astronomy
Editor, *Popular Astronomy*   Author, *Moon Observer's Guide (Philip's 2003)*

Ever since Galileo made the first drawings of the Moon's surface in 1610, the problem of obtaining good positional accuracy while making lunar observational drawings at the telescope eyepiece has troubled observers. Even the greatest visual observers, possessed of an eye for fine detail, have found the Moon's surface incredibly difficult to portray with a satisfactory degree of accuracy.

Why observe and draw the Moon?

Although these days digital images of the Moon are capable of instantly capturing the lunar surface in great detail, there remain many amateur astronomers around the globe who prefer to draw the Moon. It may be tempting to dismiss the efforts of the observer who sketches the Moon's features (and, for that matter, any other celestial object) as an arcane activity that belongs in the distant past, but it would be wrong to do so. Lunar observers realise fully that the Moon has been mapped in great detail and there are no really big lunar discoveries waiting to be made at the eyepiece. But that's not why most lunar observers study the Moon. Those who make lunar drawings are engaging in an activity which improves every single aspect of his or her observing skills. The Moon is packed with fine detail, and the ability to discern this constantly improves with hours spent at the eyepiece. Drawing the Moon, scrutinising its surface and attending to its details, is by far the best way (some would say the only way) of learning about the lunar surface, its topography and its various geological forms, and how it appears to change with illumination. Such an intricate knowledge of our satellite is exceedingly difficult to acquire by simply gathering CCD images and looking at them on a PC monitor. Armed with a good map of the Moon features may be identified, and before long the 'grey, glorious confusion' becomes a known place, with prominent landmarks pointing the way to lesser-known lunar delights.

It is not entirely true to say that real lunar discoveries are nowadays beyond the grasp of visual observers. Under very low illumination, cast shadows exaggerate the subtleties of topography, so that low ridges, low hills, shallow valleys and minor craters stand out near the terminator (the line of lunar sunrise or sunset). Many of these subtle features are not recorded on any maps, so there is a chance for discovery, albeit a minor discovery.

Traditional observational drawings

To ensure some degree of accuracy in their lunar drawings, many visual observers select a feature to observe in advance of the observing session, and prepare an outline blank showing the main features, based upon a map such as Rükl's *Atlas of the Moon*. Making a general outline blank prior to observing allows the observer to worry about subtle features and attend to detail at the eyepiece instead of expending excessive amounts of time and effort in attaining positional accuracy. However, this still requires an accurate outline map to begin with, and moreover it fails to address the problems of illumination and libration, the latter of which can distort lunar features considerably, especially those near the limb. Some lunar observers first select a suitable feature at the eyepiece, and then go indoors to prepare an outline blank showing the main topographic features, based upon a photograph that approximates to the libration, thus overcoming an obstacle to accuracy. Some lunar programs on PC give an accurate map of the Moon that takes libration into account, and this map can be zoomed in, printed off and used as a template for an observational drawing

Still, these techniques can be rather involved, and they require great concentration on the part of the observer. Unless carefully drawn reference points are used, the most minor but carelessly placed detail can throw out the overall accuracy of an observational drawing. It can be rather disheartening to find an observational drawing going awry after about half an hour; when one realises that a crater is at least its own diameter out of place, and the rille that you've drawn is going north-south instead of east-west, it is tempting to give up!

Since my first lunar observations in 1983, I have taken a variety of approaches, with varying degrees of success. One thing I found – and this is true for any lunar observer - the more you spend time drawing the Moon, the better you become at depicting its features, in terms of both accuracy and drawing technique.

Photographic technique

Johann Krieger (1865-1902) attempted to tackle the problem of positional accuracy by making his finished observational drawings directly over low contrast photographic enlargements, often combining the work of several nights into a single final image. Krieger used a 265 mm (10.5-inch) refractor at high magnifications to observe the Moon. Initially, he used the latest photographs taken with the Lick 90 cm (36-inch) refractor, supplied by Klein, but went on to extensively use Paris photographs sent to him by Loewy and Puiseux. 28 of his best drawings were published in 1898 at Trieste as the first volume of his atlas. In 1912 much of Krieger's work was gathered into two splendid volumes and published by the Vienna Academy of Sciences as Krieger's *Mondatlas*. Krieger was the first and last great exponent of this technique. In *The Astronomical Scrapbook* Joseph Ashbrook noted that "this valuable technique has been surprisingly little used by other workers."

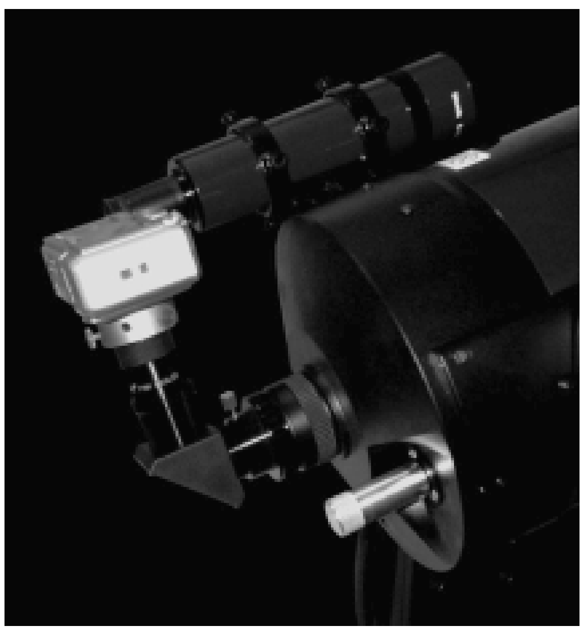


FIGURE 1

Author's SCT configured for afocal photography

Digital image meets observational drawing

There is a reasonably simple modern solution to the problem of visual observational accuracy in making a lunar drawing at the eyepiece, a logical extension of Krieger's technique. Take a digital image of the Moon, print it out and use it as an observing blank. The digital image can be centred on the feature that you intend to draw, or you can take a series of images of the terminator, from which you can then choose an area to draw at the eyepiece. The image may be secured with nothing grander than an ordinary digicam using the afocal method (this is when the camera is squared up to the eyepiece). The image needs to be good enough to show all the main detail of the area that you intend to draw, but it need not be such a perfect image that you'd submit for publication in a major journal.

This image is then adjusted on the computer indoors. Crop the image to size, and adjust its brightness and contrast so that it appears faint but distinct enough to be seen using a red light at the eyepiece. If your image shows any overt artifacts of processing, such as moiré patterns, it is best to remove these before printing it out. The print ought to be made in greyscale on smooth white paper, of drawing grade (120 gsm or thicker), and the area that you're going to draw needs to be at least 75 mm square. I use a laser printer, because damp conditions may make an inkjet print unsatisfactory to draw upon at the eyepiece. The template can be ready for use at the eyepiece within a few minutes of the image being taken. At the eyepiece, I prefer to clearly delineate all the main areas of shadow first, as I do when I make an unassisted drawing of the Moon, before concentrating on the detail. I usually work my way around a drawing from the top left, downwards, to prevent smudging, since I'm right-handed.

My first attempts were made using nothing more exotic than a 250,000 pixel Casio QV-11 compact digital camera capable of storing dozens of images. This required linking to the PC via cable, so the camera had to be unhooked from the telescope and brought indoors. I now use a Ricoh RDC-5000 digicam (1.3 megapixel) or a Trust 820 PowerCam (4 megapixel), both of which have a removable storage card that can be inserted into the PC. They both deliver reasonably good images of the Moon, the Ricoh having the advantage of an optical zoom, while the Trust requires the use of a high magnification eyepiece to deliver a close-up view. The immediate advantage of the technique is the ability to draw relatively large and complex areas of the lunar surface with surprising speed and accuracy. Confident, and armed with the knowledge that the positioning of the main features has been attended to, the observer is free to concentrate on areas of detail that might otherwise have been neglected due to time considerations. The technique will not make you a better observer, but it will make your observations more accurate, and accuracy is the foundation upon which all scientific observations rest. It is also a tremendously enjoyable pursuit, and something worth experimenting with, even if you haven't given the Moon much thought in the past.

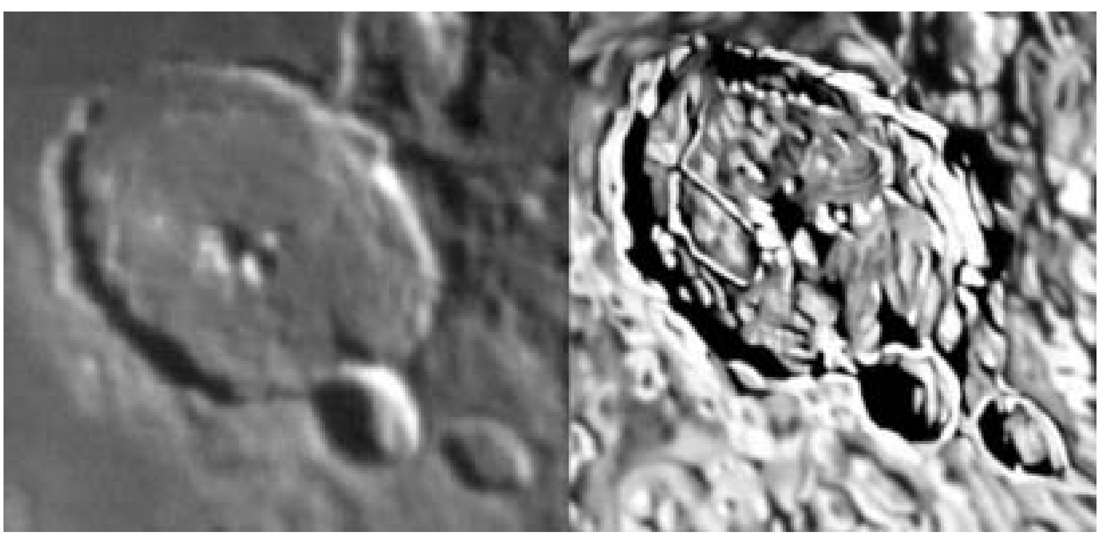


FIGURE 2 - GASSENDI
By Peter Grego using method described in text.
Digital image on left, finished sketch on right.

FIGURE 2 - JANSSEN
By Peter Grego using method described in text.
Digital image on left, finished sketch on right.

Once the observational drawing is made, that need not be the end of the process. Indoors, the drawing may be retouched, the areas of dark shadows blackened, details sharpened and areas of roughness smoothed over. Alternatively, the drawing may be copied manually and converted into a neat drawing, or scanned and a print of it used as a template for a neat drawing. I prefer to process the scanned observational drawing using computer software (I use Corel PhotoPaint and PaintShopPro) to enhance its appearance by using (mainly) the median filter and tone adjustment. The drawing may also be cut out and placed upon the original digital image, and once its edges are blended in with the background the effect can be rather pleasing.

ADDITIONAL DIGI-SKETCHES BY PETER GREGO

CLEOMEDES

POSIDONIUS

DISCOVERY OF AN UNLISTED DOME NEAR HORTENSIUS E - Located at 25.17º W and 6.07º N

By Raffaello Lena, Zac Pujic, Christian Wöhler, Maria Teresa Bregante - GLR group

The GLR Group has an ongoing project to discover lunar domes. Our activity has shown both the elusive nature of these volcanic structures and the usefulness of ground-based CCD imaging and digital image analysis in the elucidation of their character [1-2].

In a previous paper [3], some of us described a highland dome located near the crater T. Mayer B. Moreover, we reported some images of the very well known Milichius region, where two lunar cones were detected [3]. A study about these two lunar cones located near the crater Milichius will be published in a forthcoming issue of Selenology, the Journal of the American Lunar Society [4]. In another recent paper, some of us described a study about the well known Milichius π dome: the average slope angle of Milichius π is 2.72° and the summit of the dome was measured to be (211 ± 10) m higher than the surrounding plain [5]. These results strongly suggest that previous estimates of Milichius π height were incorrect [6]. Furthermore, some of us recently described another dome located near the crater Vendelinus, investigating its slope and height [7].

The dome field near crater Hortensius has been extensively studied. The ALPO Lunar Dome list reports several low domes in this region, as visible also in our revised lunar dome maps [8]. North of Hortensius there is a group of six well known domes, 6 to 8 km wide, termed "Schlumberger Domes" by Jim Phillips [9]. Based on comparisons with terrestrial volcanism these domes were probably formed when mare basalts erupted at a lower rate from a central vent [10].

South of Hortensius a group of four domes is situated; they are not easy to image. These four domes require a very low solar altitude to display maximum detail [11]. Most mare domes have low relief and are often not readily visible on images with moderate to high Sun-elevation angles. The dome field near crater Hortensius shows that domes of different classes occur together, suggesting, as reported in [12], different stages in the development of dome structures.

FIGURE 1 - Zac Pujic (See Text for details)

Recently this region was monitored by the GLR group. A shallow dome has been observed in this area, near the crater Hortensius E, and is described here. For each of the observations, the local solar altitude (Alt) was calculated using the Lunar Observer's Toolkit by H. D. Jamieson.

The dome was detected by Zac Pujic on April 03, 2005, at 19:25 UT (Fig. 1) using a 310 mm Newtonian telescope, a Wratten 25A filter, and a Philips ToUCam (solar altitude = 1.48°, colongitude = 203.65°). The image is oriented with north at the top and west (IAU) to the left. Table 1 lists the 6 observers and their instruments.

The dome is located at 25.17º W and 6.07º N (Xi = -0.423, Eta = +0.106). It is, to our knowledge, previously unreported by any lunar dome survey.

This dome requires a specific solar altitude to be observed clearly. Information about the vertical cross-section was obtained using the Ashbrook method [14]. Using this method, we estimated in the raw image the fraction x of the dome's east-west diameter that is covered by black shadow. The corresponding scale of the image was determined to 0.326 km per pixel, allowing diameters and shadow lengths to be expressed in kilometres. According to Ashbrook [14], the average slope of the dome flank is equal to the solar altitude when x = 0.25, assuming a hemispherical shape of the dome. The height H of the dome was then calculated by equation (1):

$$H = r (\tan s)$$

Our preliminary estimation indicates a diameter of (7.82 ± 0.33) km. Furthermore, a summit pit crater with an estimated size of about (3.10 ± 0.33) km x (1.60 ± 0.33) km is apparent.

Table 1: Contributing Observers

Observer	Telescope	Type	Date and time (UT)	Solar altitude (Alt)
Fattinnanzi, C.	Newton 250 mm f/6	webcam	April 18, 2005 (19:25)	1.69°
Lena, R.	Refractor 100 mm f/15	visual	April 18, 2005 (19:40)	1.82°
Pujic, Z.	Newton 310 mm f/5.75	webcam	April 3, 2005 (19:25)	1.48°
Salimbeni, P.	SC 200 mm f/10	digicam	April 18, 2005 (21:40)	2.83°
Zannelli, C.	Mak-Newton 180 mm f/6	webcam	April 18, 2005 (21:45)	2.87°
Wirths, M.	Newton 450 mm f/4.3	webcam	February 19, 2005 (02:21)	6.19°

Table 2: Measurements on the raw image taken by Z. Pujic.

Alt	Dome diameter		Shadow length		Height (m)	Slope
	pixels	Km	pixels	km		
1.48°	48 ± 1	7.82 ± 0.33	12 ± 1	1.95 ± 0.33	101 ± 10	1.48°

From Table 2 and [14] it follows that the average slope angle of the dome is 1.48°. The height of the dome was then estimated using equation (1). It turns out that the summit of the dome is (101 ± 10) m higher than the surrounding plain.

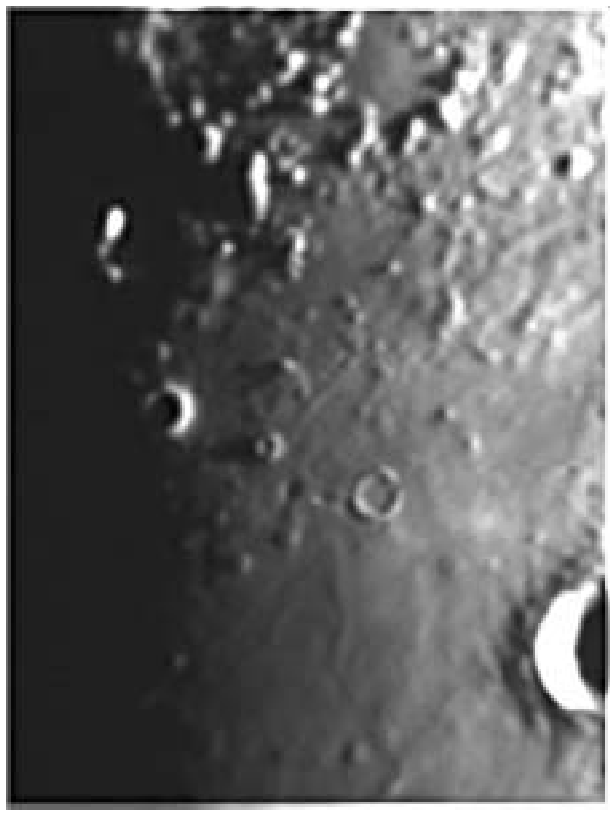


FIGURE 2 - Carmelo Zannelli - (See text for details)

Fig. 2 shows another image. It was taken by Carmelo Zannelli on April 03, 2005, at 21:45 UT.

Further morphometric data was obtained by generating a digital elevation map of the dome from the image shown in Fig. 1, relying on a combined photoclinometry and shape from shading analysis (cf. [2] and references therein). The result is shown in Fig. 3, viewed from south-eastern direction. The effective height of the dome was obtained by determining elevation differences between the summit of the dome and its surrounding, leading to a height of (105 ± 15) m. This value is in agreement with the dome height obtained by means of the Ashbrook method. The crater pit may be deeper than it appears in the 3D profile of Fig. 3 because it is not well resolved in Fig. 1.

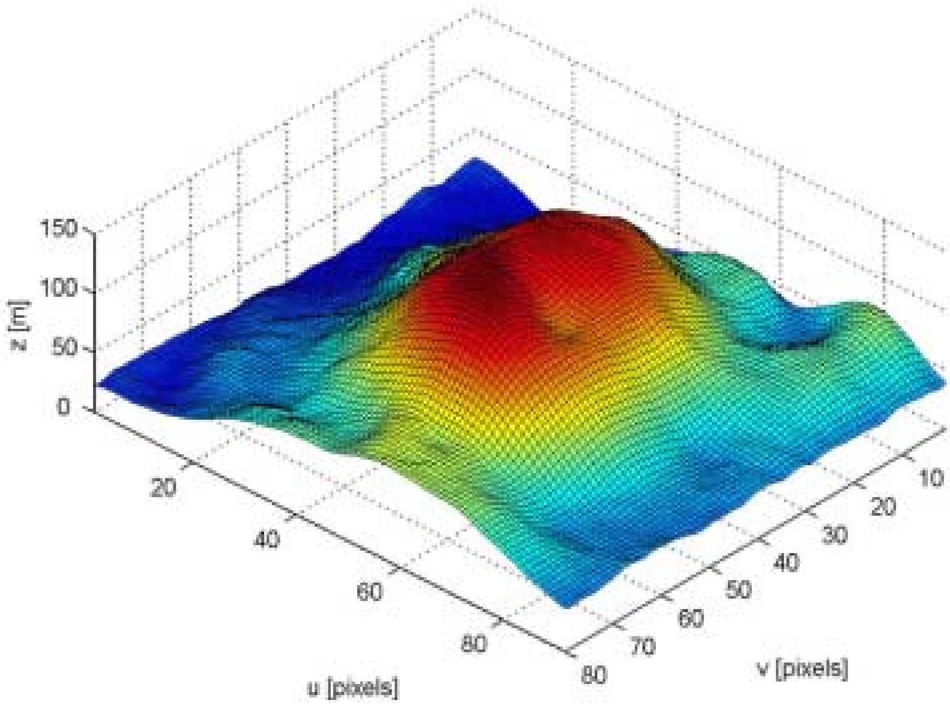


FIGURE 3 - (See text for details)

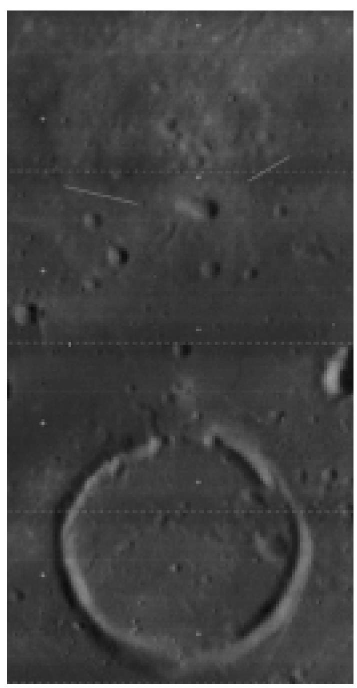


FIGURE 4 - (See text for details)

Fig. 4 displays Lunar Orbiter frame IV-126-H1, where this dome is recognisable with an elongated depression. This depression represents the original vent, the place at which lava poured out over the lunar surface, successively building up a shield-like volcano around it.

On the Earth, an elongation of this type would most likely represent an eruption along a rift zone, though other possible mechanisms also exist.

Clearly these preliminary data can be improved by new specific observations. Any observations that readers can make about the unlisted dome we are dealing with will be gratefully received for our GLR survey (lena@glrgroup.org). The activities of the GLR group are described at http://www.glrgroup.org.

References

[1] K. C. Pau, R. Lena, A Study about an unlisted dome near the Valentine dome, JALPO, 46 (4), pp. 25-27, 2004.

[2] R. Lena, K.C. Pau, J. Phillips, C. Fattinnanzi, C. Wöhler, Lunar domes: a generic classification of the dome near Valentine, located at 10.26° E and 31.89° N, JBAA, 2005, article in press.

[3] R. Viegas, R. Lena, J. Phillips, Highland dome near T. Mayer B and two cones near Milichius, TLO, February 2005, pp. 4-5.

[4] R. Viegas, R. Lena, M. T. Bregante, A study about two cones near Milichius, Selenology, 2005, article in press.

[5] R. Lena, R.Viegas, J. Phillips, M.T. Bregante, Milichius π: Observations, measurements and classification, TLO, March 2005, pp. 4-5.

[6] D. L. Brungart, Airforce Institute of Technology, Wright Patterson Air Force Base, Ohio, 15 July 1964.

[7] R. Lena, C. Wöhler, J. Phillips, M. T. Bregante, K. C. Pau, A dome near crater vendelinus, TLO, May 2005, pp. 8-11.

[8] R. Lena and GLR group, Lunar Domes and Lunar Domes Maps: an Overview (revised dome list by C. Kapral and R. Garfinkle - LAC dome maps by B. Shaw - Digital Version by P. Salimbeni and F. Lottero), TLO, April 2005, pp. 10-11.

[9] J. Phillips, The New Lunar Dome Survey: the Hortensius-Milichius-Tobias Mayer Region, JALPO, 33 (4-6), pp. 61-72, 1989.

[10] D. Wilhelms, The geologic history of the Moon, USGS Prof. Paper 1348, 1987.

[11] R. Lena, P. Salimbeni, E. Douglass, G. Santacana, M. Higashida, Domes in Hortensius Region, JALPO, 45 (1), pp. 26-28, 2003.

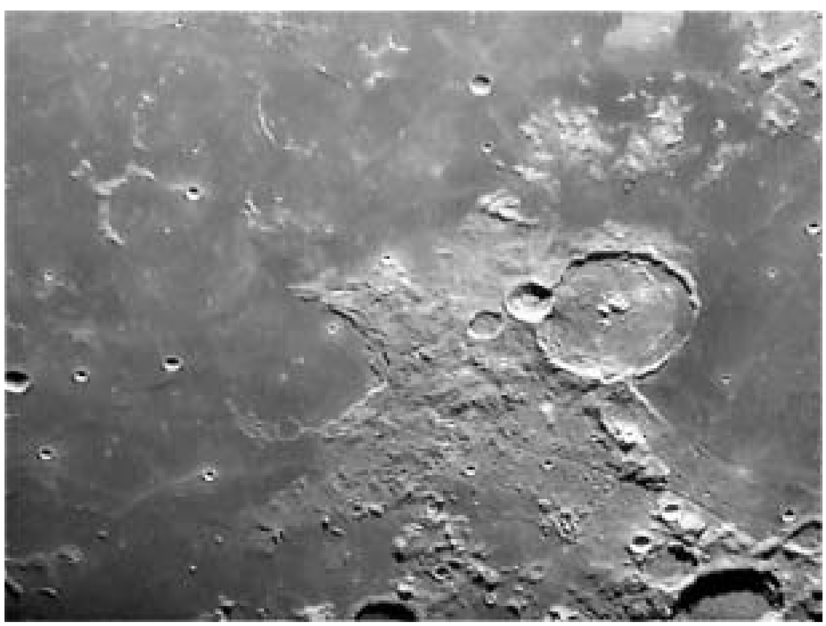
[12] J. W. Head, A. Gifford, Lunar Domes: Classification and Modes of Origin, Moon and Planets, vol. 22, pp. 235-258, 1980.

[13] J. Westfall, A Generic Classification of Lunar Domes, JALPO, 18 (1-2), pp. 15-20, 1964.

[14] J. Ashbrook, JALPO, 15 (1-2), 1961.

RECENT TOPOGRAPHICAL OBSERVATIONS

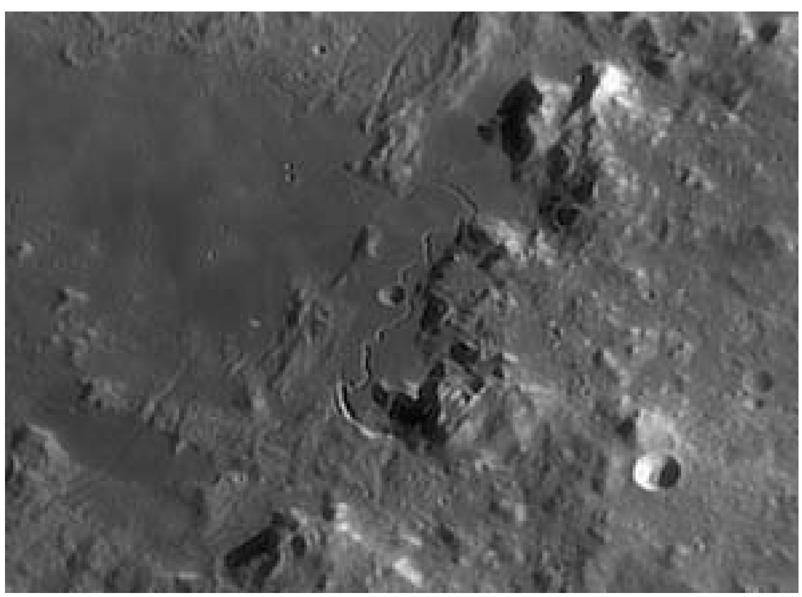
ATLAS, HERCULES, & ENDYMION
Digital image by Achille Giordano - Naples, Italy
April 14, 2005 - 19:38 UT
125mm ETX - 2x Barlow



GASSENDI
Digital image by Ed Crandall - Winston-Salem, North Carolina, USA
April 21, 2005 - 01:31 UT
110mm f/6.5 APO Refractor - 3x Barlow

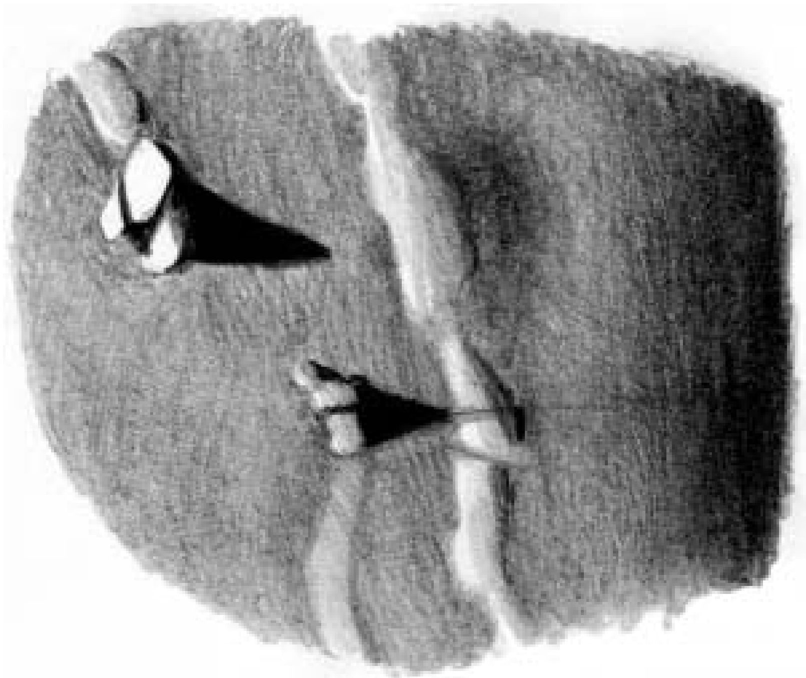
RECENT TOPOGRAPHICAL OBSERVATIONS

GOCLENIUS RILLES
Digital image by Howard Eskildsen - Ocala, Florida, USA
May 13, 2005 - 00:35
10 inch f/16 Refractor - 2x Barlow



RIMA HADLEY
Digital image by Paolo Lazzarotti - Ostellato, Italy
March 19, 2005 - 19:18 UT
250mm Planetary Newtonian

RECENT TOPOGRAPHICAL OBSERVATIONS



MONS LA HIRE
Sketch by Peter Grego - Rednal, Birmingham, England
April 19, 2005 - 00:50 to 01:10 UT
ETX125 - 140x - Seeing AIII

PETAVIUS
Digital image by Gerardo Sbarufatti - Cassele Landi, Italy
March 13, 2005 - 17:37 UT
Celestron 8 - Red Filter - Philips Vesta Pro

RECENT TOPOGRAPHICAL OBSERVATIONS

SIRSALIS
Sketch by Jay Albert - Lake Worth, Florida, USA
April 22, 2005 - 02:50 to 03:30 UT
Celestron NexStar 11GPS - 400x

OBSERVING NOTES:
The sketch is of the lunar crater Sirsalis, which is located south of the large crater Grimaldi near the west limb of the Moon. Sirsalis is the oval crater with its floor completely in shadow. According to Rukl, it's 42 kilometers in diameter. The large, more round crater adoining it to the west is Sirsalis A and the pair of small craters just to the south are Sirsalis F and J. The bright rill running SW to NE is the Rima Sirsalis, which is very easy to spot. The seeing was 8-9 out of 10 last night (4/21) and I was able to pump the Celestron NexStar 11 GPS up to 400x for this sketch. There was more detail than I could draw. This crater was one of a few craters I observed closely last night. They were on a list of possible lunar transient phenomena targets provided by the A.L.P.O.

A.L.P.O. LUNAR COORDINATORS

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BRIGHT LUNAR RAYS PROJECT

Coordinator - Willliam M. Dembowski, FRAS

Each month TLO features a book or magazine excerpt dealing with Bright Lunar Rays.
Some are from current sources, others from vintage astronomical literature.
This month's offering is from:

THE MOON
(The MacMillan Company)
By H.P. Wilkins & Patrick Moore

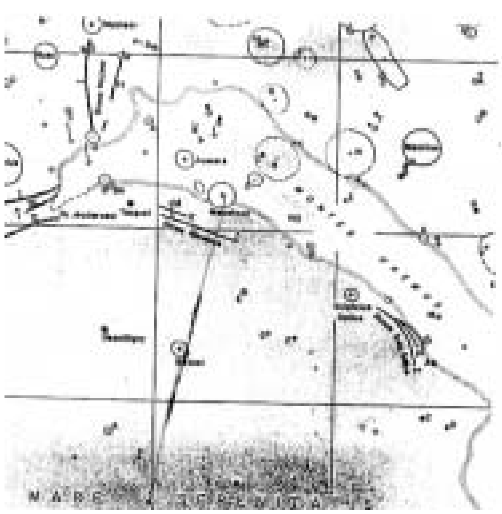
COPERNICUS (pp. 112-113):

Copernicus is the centre of a very complex ray system, noted in the Introduction; many of the rays lie on the sites of very low ridges. At Full Moon, Copernicus appears brighter than the rays, and may be seen with the naked eye as a bright spot.

There is a complex system of light rays connected with Copernicus and related to it as a common centre. They are very irregular in width, exhibit many breaks and are most numerous in the immediate neighbourhood of the crater. The rays extending west radiate from the centre; those extend northwards radiate from a point on the north wall, and also commence at a tangent to the west wall. One ray, between Pytheas and Timocharis, commences in the open country to the west of Copernicus and ends at an isolated mountain east of Timocharis. Two other prominent rays, roughly parallel with it, will be noticed. Pytheas list between them. The spaces between the rays are darker than the other surrounding country. North and north-east the streaks or rays form a very complex pattern; from their numbers they unit to cause a large, bright patch in the direction of Kepler. The rays to the south-east are overlaid by a ray from Kepler, and where they intersect the junction is marked by large, bright patches.

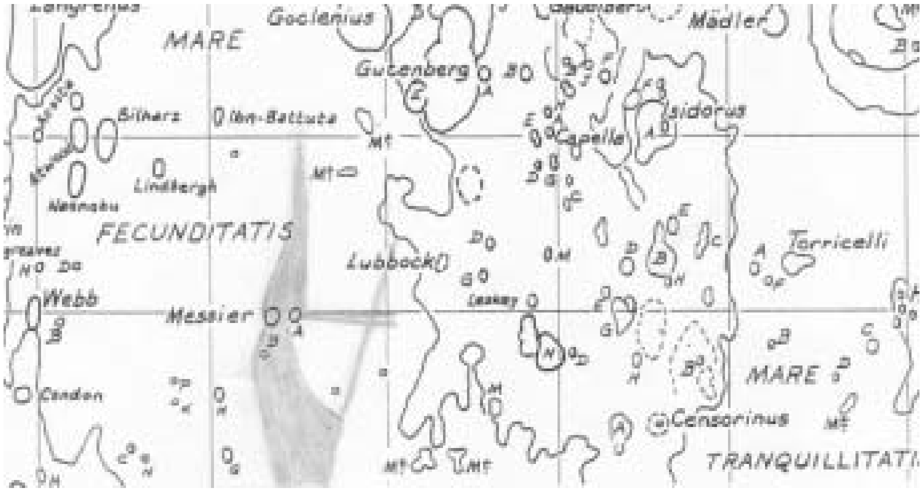
The southern rays are confined to a comparatively narrow arc; on either side the surface is very dark, much more so than the Oceanus Procellarum or even Grimaldi. These dark areas appear more intense in photographs than to telescopic observation.

RECENT RAY OBSERVATION

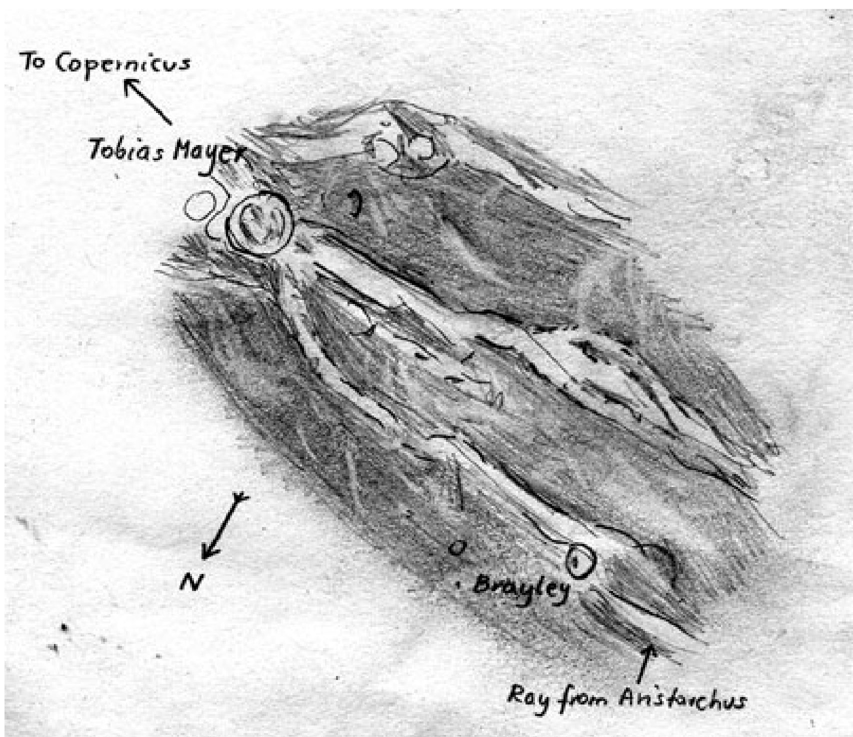


MENELAUS & BESSEL
Raymap by Michael Amato
West Haven Connecticut, USA
April 22, 2005
127mm Mak - 123x

RECENT RAY OBSERVATIONS



MESSIER A
Raymap by Yenal Ogmen - Lefkoniko, Cyprus
April 23, 2005 - 20:35 to 20:49 UT
Meade ETX125 - 73x



RAY SYSTEM OF COPERNICUS
FROM T.MAYER TO BRAYLEY
Sketch by Robert Wlodarczyk - Czestochowa, Poland
February 23, 2005 - 21:00 UT
12cm f/7.5 Newtonian - 75x - Seeing AII-III

LUNAR TRANSIENT PHENOMENA

Coordinator – Dr. Anthony Cook – acc@cs.nott.ac.uk
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LTP NEWSLETTER - JUNE 2005

Dr. Anthony Cook - Coordinator

Observations for April have been received from Clive Brook (U.K.), Antonino Brosio (Italy), David O. Darling (U.S.A.), William Dembowski (U.S.A.), Martin Mobberley (U.K.), Frank Sero (U.S.A.), and Don Spain (U.S.A.). Observers from two countries were represented by the observing network, they were United States and United Kingdom. For this month 7 days were covered giving us a 24% coverage of the lunation, these dates are 14, 15, 16, 17, 18, 19, 24. During the month of April a total of 23 lunar features were monitored. The following is the list of features monitored. Alphonsus, Albategnius, Arzachel, Aristillus, Autolycus, Alpine Valley, Archimedes, Aristoteles, Bulliadus, Copernicus, Cyrillus, Eratosthenes, Earthshine, Eudoxus, Fracastorius, Langrenus, Mare Crisium, Mare Nectaris, Petavius, Ptolemaeus, Theophilus, Torricelli B, and Tycho.

I would also like to thank David Darling very much for "holding the fort" whilst I was tied up with lecturing for the past 5 months. I hope that you have enjoyed reading his enthusiastic articles and it was certainly good to remind ourselves about the more interesting of the past LTP reports. However it is important to note that LTP of the types that he described are very rare indeed, so do not expect to go out and see these on any given night and indeed it might take many tens to hundreds of hours of observing before you see a LTP.

So what would it take to prove LTP to the scientific community? Well there have been some papers published in refereed journals, but even a recent paper by Dolfus, concerning variations of polarized light in Langrenus (Icarus, 2000, pp 430-443) has not really caught the attention of the planetary science community much. From our point of view as amateurs any observer who spots a suspect LTP needs to report it as fast as possible to me or David Darling, so that we may inform others to observe independently the area and report what they see. Ideally a sequence of CCD images should be taken to show time variability in brightness (sharpness) and/or color over regular time intervals. If this were to be captured by two or more observers at different geographical locations (as is used with impact flash observations) then we would have a very compelling set of observations that could be published. The sensitivity of CCD cameras certainly permits more reliable (if calibrated properly) color measurements than was ever achieved during the Corralitos observatory campaign, or during the electronic Trident Moon Blink project.

A more realistic observation strategy for detecting LTP is to do the opposite and try to disprove many past LTP reports as normal appearances of the surface. This is achieved by looking at identical illumination conditions to these past LTP events and if you see something pertaining to the past observation then the chances are this is the normal appearance and that the original LTP was not a LTP! Apart from helping to reduce the number of past LTP reports, getting amateur astronomers out observing the Moon improves their knowledge of the lunar surface, and through an accumulation of observing hours, eventually some of you may be in the right place at the right time to see a LTP. In addition any sketches made, or images taken, are passed onto topographic groups, so none of your observations are wasted.

An ESA press release about SMART-1 from April 15th shows that the spacecraft has started imaging the Moon, in particular the polar regions, looking for "Peaks of Eternal Light". These are mountains at the polar areas that stay illuminated for most of the time and which in future might provide suitable landing sites for polar exploration missions looking for suspected ice deposits in the cold permanently shadowed areas. No news yet on the release of the entire SMART-1 image dataset, but this will eventually occur. So we just have to keep on observing the Moon during the mission and when the images are eventually released we can compare our own observations with SMART-1 images.

Finally I have a brief request - was anybody observing the Moon on 14th April 2005 between 18:30 and 18:35 UT, in the vicinity of Archimedes crater, if so please contact me as we have a query from the Italian UAI group about an observation that they have received.

Further predictions, including the more numerous illumination only events can be found on the following web site: http://www.cs.nott.ac.uk/~acc/Lunar/TLP.pdf . 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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MOON MISSIONS

SMART-1

SMART-1 Homepage: **http://smart.esa.int/science-e/www/area/index.cfm?fareaid=10**

LRO

LRO Search for water **http://www.spaceref.com/news/viewpr.html?pid=16822**

LOLA Instrumentation for determining exact positions of lunar features
http://www.rednova.com/news/space/151599/a_hitchhikers_guide_to_the_moon/

CHANDRAYAAN-1

Chandrayaan-1 Homepage **http://www.isro.org/chandrayaan-1/index.htm**