THE LUNAR OBSERVER

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

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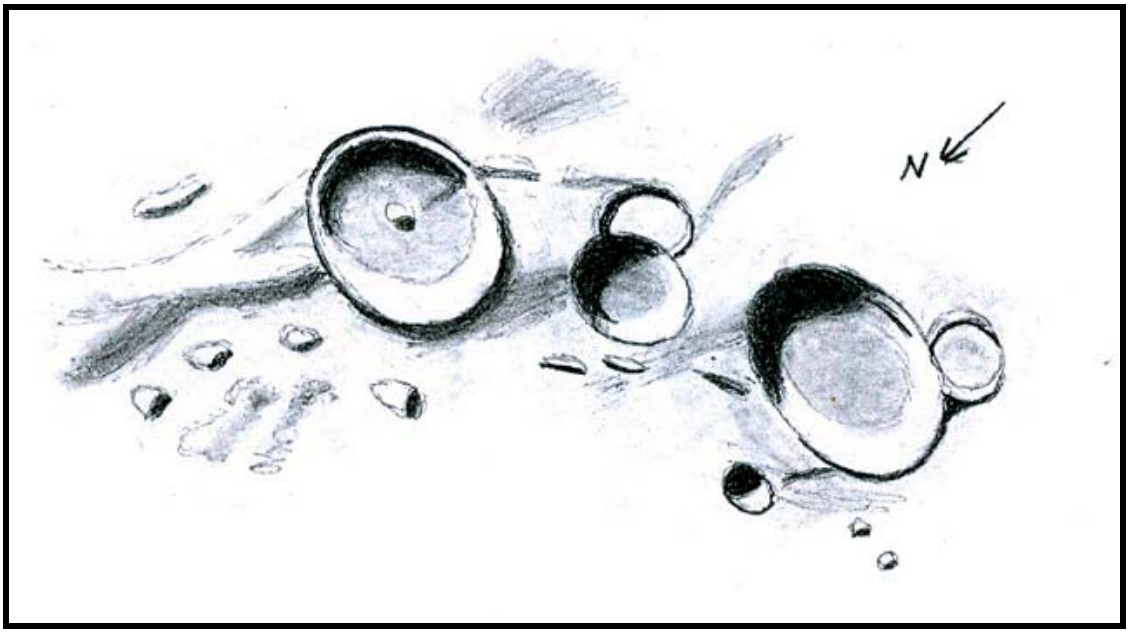
RECENT BACK ISSUES: http://moon.scopesandscapes.com/tlo_back.html

FEATURE OF THE MONTH – JUNE 2011

LOCKYER



Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA
February 10, 2011 01:56-02:28 UT, 15 cm refl, 170x, seeing 7/10

I sketched this crater and vicinity on the evening of Feb. 9/10, 2011 while watching the moon hide 6th-magnitude ZC 317 and four fainter stars. Lockyer abuts the west side of the large ruined ring Janssen, well south of Mare Nectaris. It is at the northeast end of the crater group sketched, and the only one with a central peak. There is a narrow, bright strip separating interior shadow from the shadow just inside the east rim, and a narrow dusky strip reaches from its south rim toward the central peak. Lockyer has substantial shadowing outside its west rim, and assorted lumpy terrain to its north and northwest. Some long, low ridges are part of Janssen's rim. Lockyer F is the conspicuous crater southwest of Lockyer, and Vlacq D is the large crater southwest of Lockyer F. These craters have ordinary interior shadowing and relatively little

exterior shadowing compared to Lockyer. Lockyer F and Vlacq D both have shallow rims on their south sides that obviously predate the named craters. The small, deep, crisp crater north of Vlacq D is Pitiscus H. There is relatively dusky terrain near this crater as well as near Lockyer F and south of Lockyer. Several short ridges and strips of shadow are aligned northeast-southwest near Lockyer and Lockyer F.

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LUNAR CALENDAR

JUNE-JULY 2011 (UT)

June 01	21:02	New Moon (Start of Lunation 1094)
June 02	09:54	Extreme North Declination
June 09	02:09	First Quarter
June 10	17:00	Moon 7.6 Degrees SSW of Saturn
June 12	01:43	Moon at Perigee (367,187km – 228,159 miles)
June 15	08:48	Extreme South Declination
June 15	20:12	Full Moon (Total Eclipse of the Moon)
June 16	20:00	Moon 3.4 Degrees SSE of Pluto
June 20	23:00	Moon 5.4 Degrees NNW of Neptune
June 23	11:48	Last Quarter
June 23	19:00	Moon 5.9 Degrees NNW of Uranus
June 24	04:14	Moon at Apogee (404,274 km – 251,204 miles)
June 26	04:00	Moon 5.2 Degrees NNW of Jupiter
June 28	20:00	Moon 1.9 Degrees NNE of Mars
June 29	17:48	Extreme North Declination
June 30	06:00	Moon 1.0 Degrees W of Venus
July 01	04:53	New Moon (Start of Lunation 1095)
July 02	23:00	Moon 4.9 SSW of Mercury
July 07	14:05	Moon at Perigee (369,565 km – 229,637 miles)
July 07	23:00	Moon 7.5 Degrees SSW of Saturn
July 08	06:29	First Quarter
July 12	16:54	Extreme South Declination
July 14	01:00	Moon 3.3 Degrees S of Pluto
July 15	06:38	Full Moon
July 18	05:00	Moon 5.4 Degrees NNW of Neptune
July 21	01:00	Moon 5.8 Degrees NNW of Uranus
July 21	22:48	Moon at Apogee (404,356 km – 251,255 miles)
July 23	05:03	Last Quarter
July 23	22:00	Moon 4.9 Degrees NNW of Jupiter
July 27	03:06	Extreme North Declination
July 27	19:00	Moon 1.0 Degrees ESE of Mars
July 30	08:00	Moon 4.2 Degrees SSW of Venus
July 30	18:39	New Moon (Start of Lunation 1096)

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 is on-line at: **http://www.alpoastronomy.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.

Note: The published images now contain links to the original, full resolution images. Clicking on an image while connected to the internet, will download the original image, which in some cases has significantly higher resolution than the published version.

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)

CALL FOR OBSERVATIONS: FOCUS ON: Plato

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 2011** edition will be Plato. Observations at all phases and 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 crater to your observing list and send your favorites to:

Wayne Bailey - wayne.bailey@alpo-astronomy.org

Deadline for inclusion in the Plato article is June 20, 2011

FUTURE FOCUS ON ARTICLES:

In order to provide more lead time for potential contributors the following targets have been selected:

Posidonius TLO Issue: September 2011 Deadline: August 20, 2011

ALPO 2011 CONFERENCE

The annual ALPO Conference is being held in Las Cruces, New Mexico this year. I encourage you to attend, if possible, and to consider presenting a paper. Information, including deadlines, from the conference web-site follows, with links to more information.

ALPO 2011 CONFERENCE

The 2011 Annual Conference of the Association of Lunar and Planetary Observers will be held at New Mexico State University, Guthrie Hall Room 201, in Las Cruces, New Mexico, Friday, July 22, 2011 and Saturday, July 23, 2011. For the latest information visit: www.morning-twilight.com/alpo

REGISTRATION:

	Before July 1:	After July 1:
Individual:	$65.00	$80.00
Individual plus family member:	$75.00	$95.00

Banquet: $30 per person (Held at NMSU Golf Course Clubhouse)

LODGING:

Conference Hotel: Sleep Inn University — 2121 S. Triviz, Las Cruces, NM 88001 (575) 522-1700

Reservations: (877) 424-6423

Single queen bed: $70+tax single or double occupancy (Call after April 1, 2011- Mention the Association of Lunar and Planetary Observers Conference)

NMSU Dorm Rooms		Bedding Included*	Bedding not included**
Residence Halls	Single Occupancy	$25.00	$19.00
	Double Occupancy	$21.50	$16.00
Apartments	Chamisa Village	N/A	$39.00
	Vista Del Monte or Cervantes Village	N/A	$28.50

DORM RATES PER PERSON PER NIGHT
*Bedding includes 2 flat sheets, 1 pillowcase, 1 pillow, and 1 blanket. Towels are not provided.
**Apartments include kitchens. Guests must bring their own cooking equipment and dining utensils.
If you would like to stay in the dorms, you can download the NMSU Housing Request Form here (PDF).

SPECIAL TOURS: July 21 and July 22

Very Large Array — Apache Point Observatories
National Solar Observatory — White Sands Missile Range
(All venues may not be available, dates to be determined. See website for current details)

REGISTRATION/QUESTIONS: alpoconference@morning-twilight.com

Registrar: ALPO 2011 Conference Robert Williams, 308 N. Mesquite St. #3, Las Cruces, NM 88001

CONTRIBUTED PAPERS:

Deadline for four or five sentence abstract/proposal for papers/workshops/posters is June 15, 2011.
For submission details see JALPO 53, #2, Spring 2011, pg. 4

Contact:
Dr. Richard Schmude
Professor of Chemistry, Gordon College
Barnesville, GA 30204
(770) 358-0728 schmude@gdn.edu

TARUNTIUS: MESSAGES FROM DOWN UNDER

Fred Corno

What caught my eye on the evening I observed Taruntius was the most evident bi-colored floor of the crater sitting in the northern portion of Mare Fecunditatis: at a 56 km width, a more accurate inspection reveals an inner double ring, a prominent and complex central peak and a large bulge of ejecta just surrounding the rim. Compared with other craters of similar size, the bowl of Taruntius is particularly shallow. Even if almost perfectly circular, the crater appears oval to the telescope observer due to the longitude sight-shortening. The rim is interrupted to the North-West by a small crater, Cameron or Taruntius C, clearly younger than the major: the observed darkening of the floor apparently originates from the small Taruntius C, but extends on almost half of the crater, at the North East (Figure 1).

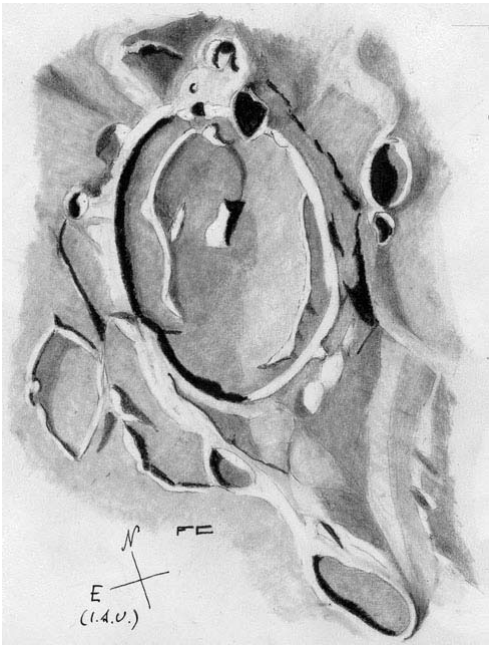

Figure 1: *Visual observation report of crater Taruntius by the Author, 5" apo-refractor at 208x on the 7th of April 2011 at 18.55 UT.*

Details observed visually can easily be explained through an analysis of geological map (Figure 2) and Clementine imagines (Figure 3). According to Moon Geological Map I722 the crater is made of a separate unit emplaced along the early Copernican Period: this sets Taruntius among the youngest features in the area. Age has been assigned considering freshness of the form, albedo and stratigraphy. Not much more can be derived from the geological map only. When Clementine data are considered, the distribution of iron and titanium in the area demonstrates the generally low titanium content of the Fecunditatis lava floods. On the other side, the rocks of the mare are rich in iron as it may be expected from a typical basaltic composition. The ejecta of Taruntius are nevertheless very low in iron, almost as low as the highland district making the reliefs engulfing the Mare. In impact cratering, the materials are expelled in a reverse stratigraphic order: materials from the deepest strata are found the closest to the crater rim, while materials initially sitting on the surface are thrown the farthest. Therefore, the impact making Taruntius was such to penetrate through the Mare filling and expel the pristine crustal material underneath, as it may be expected by the estimated less than 500 m thickness of the basaltic blanket in the area. Taruntius belongs to a peculiar class of craters, whose depth is smaller than typical for the given diameter: a depth of 4 km is expected, while the actually observed is approximately 1.1 km. An uplift of the floor therefore occurred, due to rising of mantle lava underneath the thinned crust. Fractures and concentric internal ridges observed on the crater floor support such a thesis.

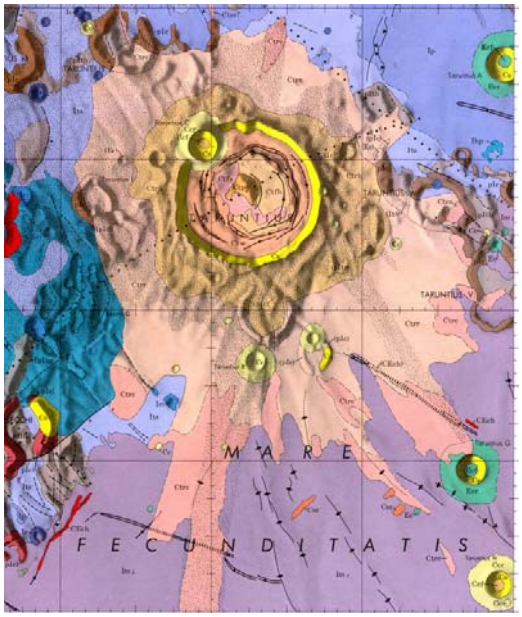

Figure 2: *Taruntius as it is displayed in Moon Geological Map I722: the crater and ray material are distinguished from surrounding mare, but not further discussed. Note that ray system of Taruntius C (Cameron) is not evident.*

The small crater Taruntius C is surrounded by a ray system of its own, fairly evident as the floor darkening of the main crater in visual observation: when Clementine FeO images are considered, high iron content is evident for such ray material. Formation of Taruntius C therefore, destroyed Taruntius' wall reaching the mare basalt beneath it and spraying iron rich rocks around.

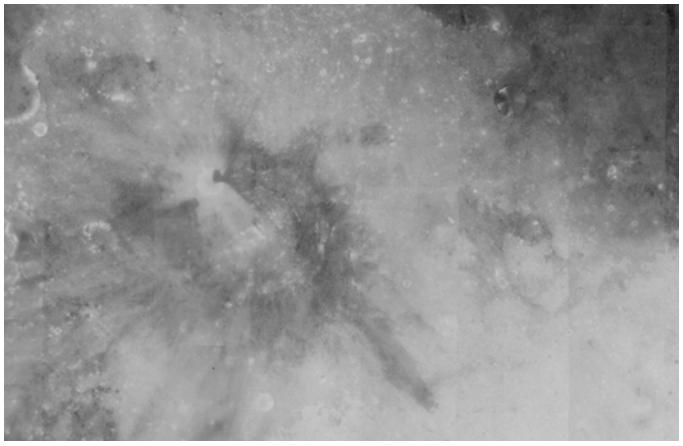

Figure 3: *The same region as in, but extended to cover also highland district to the east, in FeO maps from Clementine (the higher the iron content, the brighter the hue; Gillis et al. 2004): ejecta both for the main crater Taruntius and satellite Taruntius C are fairly evident, as is their different composition.*

A complex relationship between major crater Taruntius and its minor counterpart Taruntius C has been investigated, confirming and supporting with geological evidence details revealed by a simple visual observation: in doing that, iron content mapping by the Clementine mission was the most effective tool.

FURTHER READING AND REFERENCE

Wilhelms, D. E. "The Geologic History of the Moon", USGS Professional Paper I348
Shirao, Motomaro & Charles A. Wood. 2011. The Kaguya Lunar Atlas. Springer, New York

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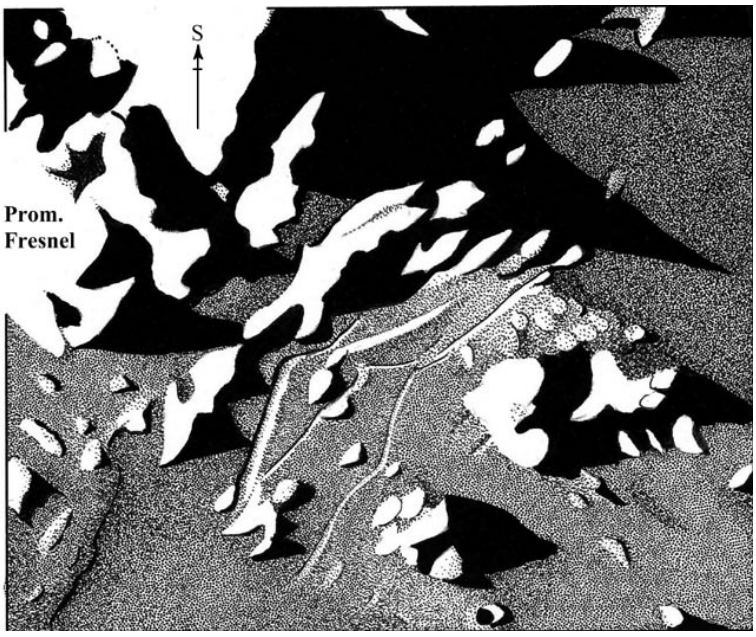
Lensing the Fresnel

Phil Morgan.

This interesting system of three roughly parallel rilles know collectively as the Rimae Fresnel are situated just to the west of the Prom. Fresnel at the northern terminus of the Apennine range, and seems to have been largely overlooked by most amateur lunar observers in the past. The most intriguing of the trio is the Rima Fresnel I, which is located closest to the Prom. Fresnel. This rille is the easiest to observe being the widest and deepest. But at its mid-point it opens up into a large rectangular lava flooded lagoon, with the north-western bank of the rille left standing on its own and looking like a mini Straight Wall, with the scarp face appearing very bright in the early morning light at this colongitude. Further to the north-west the Rimae II and III are fainter and appear to link up to the south, as they approach the Palus Putredinis. The Rima Hadley also appears to join the pair at this point, though finding a definite link is somewhat difficult due to the lava flooding. Both Goodacre and Wilkins show the wider Rima Fresnel I continuing strongly northwards along the western shore of the Mare Imbrium towards the Montes Caucasus, but I have always found this lava buried section of the rille difficult to find, except under the most glancing of illumination. On Wednesday the 4th of May, I was fortunate enough to have this observation appear on Chuck Woods 'Lunar Photo of the Day'. Under the discussion forum John Moore posted some detailed images that confirm that the Rima II and III do indeed link up with the Hadley Rille to the south in the Palus Putredinis. On the following day's LPOD Chuck Wood showed a very fine image of the region taken by George Tarsoudis. This showed the faint continuation of the Rima Fresnel I northwards down towards the Caucasus, but it also appeared to show a possible, but very faint extension between the Rima I and the Rima Bradley to the north, and cutting across the Palus Putredinis. This link seems a possibility because both these rilles look the same width and age, and have a good alignment. Finding any such definite connection between them is difficult though, because of the later down faulting and lava flooding of the region. It would seem then that there are opportunities here for both the lunar imager and visual observer to try and capture the region under a very low Sun angle, when any small surface irregularities are brought to prominence, and to try and confirm any such faint continuation between these two rilles. Also to confirm that northern extension of the Rima Fresnel I shown so clearly by both Goodacre and Wilkins.



RIMAE FRESNEL - *Phillip Morgan –Lower Harthall-Tenbury Wells, Worcestershire, England. April 10, 2011. 20:30-21:30 UT, Colongitude 359.8°-360.3°. Seeing 9/10, Transparency 4/5. 305mm, f/5, Newtonian, 400x.*

LUNAR TOPOGRAPHICAL STUDIES

Coordinator – Wayne Bailey - wayne.bailey@alpo-astronomy.org

Assistant Coordinator – William Dembowski - dembowski@zone-vx.com

Website: http://moon.scopesandscapes.com/

OBSERVATIONS RECEIVED

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 5, 6, 7, 10, 11, 15, & 18 day moon, Alpine Valley, Full Moon, Lunar X, Mare Nectaris, Posidonius.

FRED CORNO - SETTIMO TORINESE, ITALY. Drawing of Taruntius.

HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Anaxagoras, Aristillus, Dawes, Diophantus, Hortensius, Milichius, northeast moon, Pytheas, & Thales rays. Banded crater form for Anaxagoras.

ROBERT HAYS – WORTH, ILLINOIS, USA Drawings of Ideler & Lockyer.

PHILLIP MORGAN –LOWER HARTHALL-TENBURY WELLS, WORCESTERSHIRE, ENGLAND. Drawing of Rimae Fresnel.

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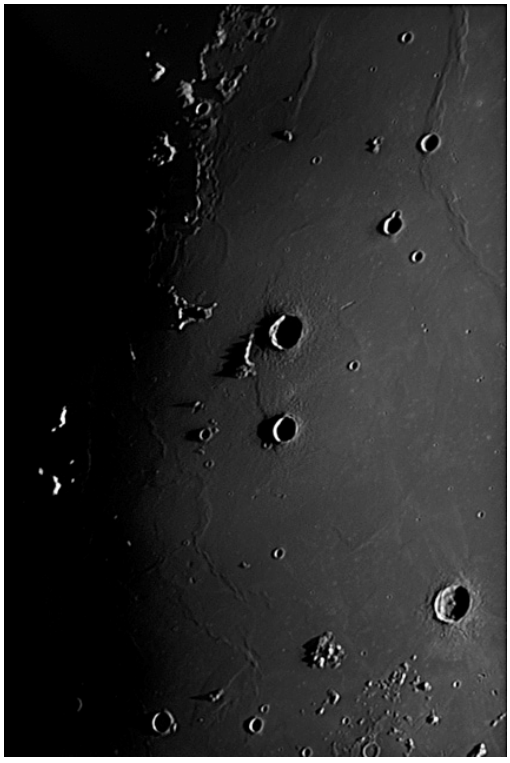
RECENT TOPOGRAPHICAL OBSERVATIONS

18 day MOON - Maurice Collins-Palmerston North, New Zealand. May 21, 2011 11:00-11:53 UT. C8, LPI.

RECENT TOPOGRAPHICAL OBSERVATIONS



DIOPHANTUS - Howard Eskildsen-Ocala, Florida, USA. April 14, 2011 01:03 UT. Seeing 9/10, Transparency 5/6. 6" f/8 refractor, Explore Scientific lens 3X Barlow, DMK 41AU02.AS, IR block & V block filters.

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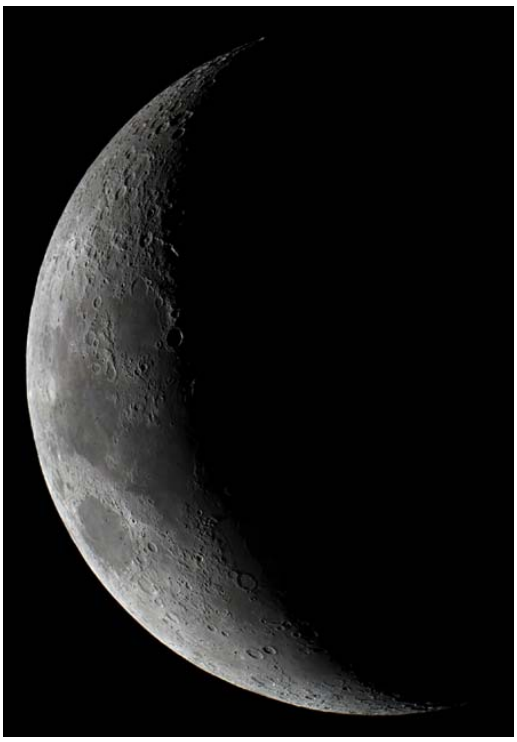
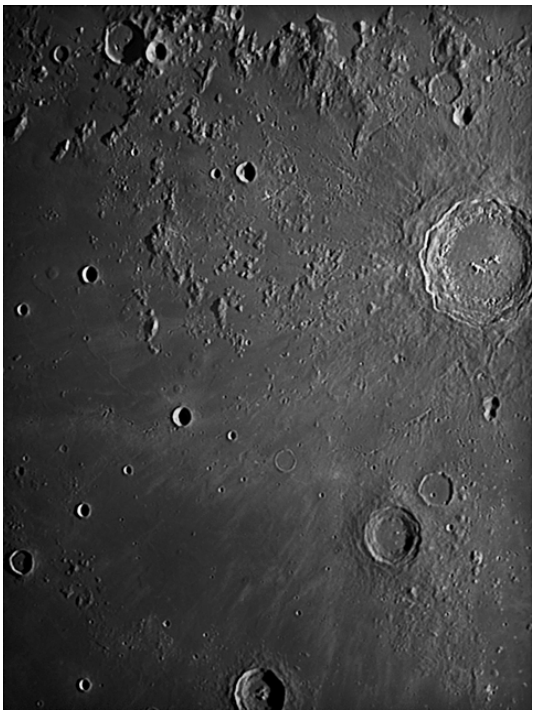
ADDITIONAL TOPOGRAPHICAL OBSERVATIONS

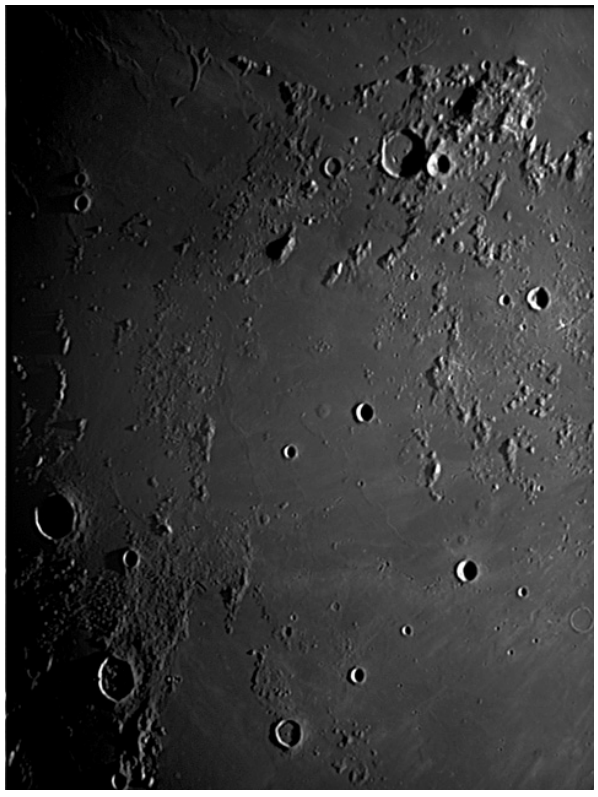
5 day MOON - Maurice Collins-Palmerston North, New Zealand. May 8, 2011 06:13-06:38 UT. C8, LPI.



LUNAR X - Maurice Collins-Palmerston North, New Zealand. May 10, 2011 06:38 UT. C8, 2x barlow, LPI.



HORTENSIUS - Howard Eskildsen-Ocala, Florida, USA. April 14, 2011 00:59 UT. Seeing 9/10, Transparency 5/6. 6" f/8 refractor, Explore Scientific lens 3X Barlow, DMK 41AU02.AS, IR block & V block filters.



MILICHIUS - Howard Eskildsen-Ocala, Florida, USA. April 14, 2011 01:01 UT. Seeing 9/10, Transparency 5/6. . 6" f/8 refractor, Explore Scientific lens 3X Barlow, DMK 41AU02.AS, IR block & V block filters.

BRIGHT LUNAR RAYS PROJECT

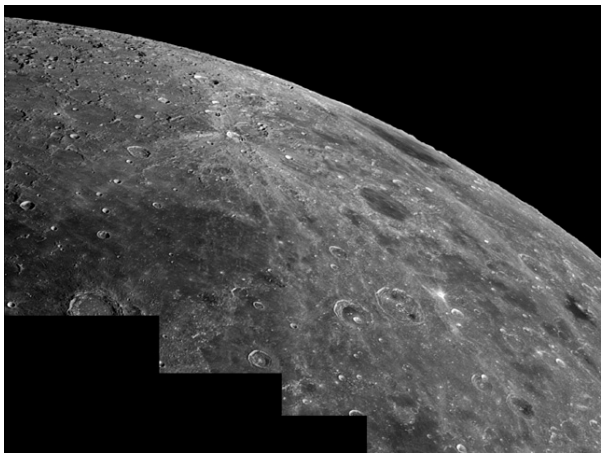
Coordinator – Wayne Bailey – wayne.bailey@alpo-astronomy.org

Assistant Coordinator – William Dembowski – dembowski@zone-vx.com

Bright Lunar Rays Website: http://moon.scopesandscapes.com/alpo-rays.html

RECENT RAY OBSERVATIONS

THALES RAYS - - Howard Eskildsen-Ocala, Florida, USA., April 14, 2011 00:51-00:55 UT. Seeing 9/10, Transparency 5/6. 6" f/8 Explore Scientific lens refractor, 3x Barlow, DMK 41AU02.AS, IR-UV block filter.



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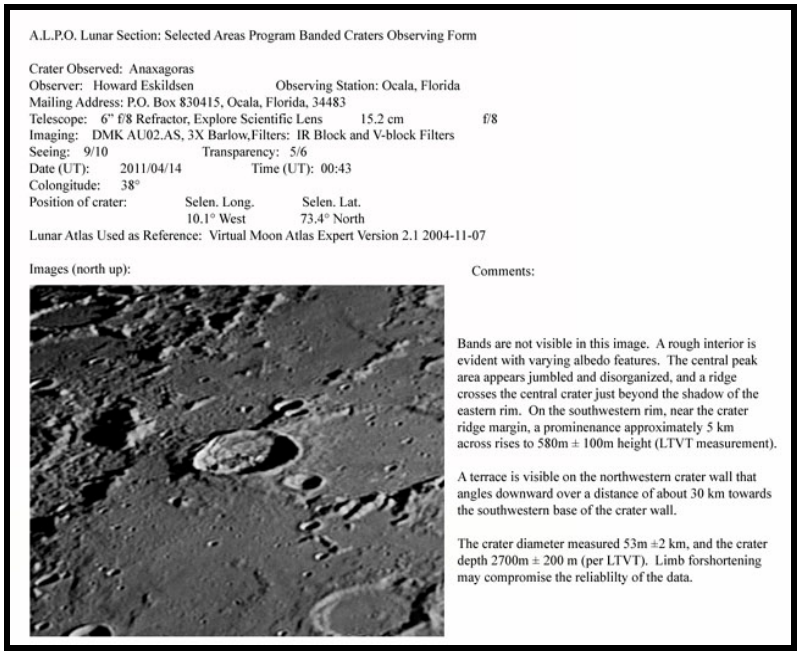
BANDED CRATERS PROGRAM

Coordinator – Wayne Bailey – wayne.bailey@alpo-astronomy.org

Assistant Coordinator – William Dembowski - dembowski@zone-vx.com

Banded Craters Program Website: http://moon.scopesandscapes.com/alpo-bcp.html



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

Crater Observed: Anaxagoras
Observer: Howard Eskildsen Observing Station: Ocala, Florida
Mailing Address: P.O. Box 830415, Ocala, Florida, 34483
Telescope: 6" f/8 Refractor, Explore Scientific Lens 15.2 cm f/8
Imaging: DMK AU02.AS, 3X Barlow,Filters: IR Block and V-block Filters
Seeing: 9/10 Transparency: 5/6
Date (UT): 2011/04/14 Time (UT): 00:43
Colongitude: 38°
Position of crater: Selen. Long. Selen. Lat.
10.1° West 73.4° North
Lunar Atlas Used as Reference: Virtual Moon Atlas Expert Version 2.1 2004-11-07

Images (north up):

Comments:

Bands are not visible in this image. A rough interior is evident with varying albedo features. The central peak area appears jumbled and disorganized, and a ridge crosses the central crater just beyond the shadow of the eastern rim. On the southwestern rim, near the crater ridge margin, a prominenance approximately 5 km across rises to 580m ± 100m height (LTVT measurement).

A terrace is visible on the northwestern crater wall that angles downward over a distance of about 30 km towards the southwestern base of the crater wall.

The crater diameter measured 53m ±2 km, and the crater depth 2700m ± 200 m (per LTVT). Limb forshortening may compromise the reliablilty of the data.

LUNAR TRANSIENT PHENOMENA

Coordinator – Dr. Anthony Cook – atc@aber.ac.uk
Assistant Coordinator – David O. Darling - DOD121252@aol.com

LTP NEWSLETTER – JUNE 2011

Dr. Anthony Cook - Coordinator

Observations for Apr 2011 were received from the following observers: Jay Albert (Lakeworth, FL, USA) observed: Aristarchus, Burg, Earthshine, Jansen, Klein, Langrenus, Proclus, and Theophilus. Palle Bohnholdt (Denmark) took whole Moon images. Maurice Collins (New Zealand) observed:.Mare Smythii, Montes Alpes, Palus Putredinus, Petavius, Plato, and took whole Moon images. Myself (Newtown, UK): captured color webcam images of various parts of the Moon. Marie Cook (Mundesley, UK) observed: Aristarchus, Copernicus, Fracastorius, Moltke, Piccolomini, Theophilus, Torricelli, and Torricelli Bev Ewen-Smith (COAA, Portugal) observed Aristarchus. Martin Federspiel (Freiburg, Germany) observed Aristarchus. Rolf Hemple (Germany) observed Aristarchus and took a whole Moon image. Colin Henshaw (Tabuk, Saudi Arabia) captured whole disk images of the Moon and Earthshine. Piotr Malǹski (Poland) observed Aristarchus. Norman Izett (New Zealand) took a whole Moon image. Frank Melillo (Holtsville, NY, USA) observed Aristarchus. Leonard Mercer (Malta) observed Aristarchus. Bob O'Connell (Keystone Heights, FL, USA) observed: Aristarchus. Brendan Shaw (UK) observed: Alpetragius, Alphonsus, Atlas, Birt, Bullialdus, Censorinus, Copernicus, Eimmart, Hercules, Manilius, Mare Crisium, Maskelyne, Mons_Piton, Picard, Plato, Proclus, Rimma Hyginus, Ross D, Theophilus, and Tycho. Marcin Siudzinski (Poland) took whole Moon images.

News: As you can see from this month we have a wealth of observations of Aristarchus. Unfortunately I received a set-back in that my hard-drive crashed in mid May, and a rather antiquated backup approach did not help much in recovering files beyond March 4th. I may therefore be getting in contact with some of you if I find any post March observations were not recovered successfully to ask if you could please send the observations again. To help prevent this situation occurring again, I will be doing monthly full backups and daily incremental backups from now on! Also to speed up data entry, Andrew Rawlins, our computer expert at IMAPS, has written a portal so that you can submit your observations electronically, instead of going via email. This has the added advantage that the observations you submit, go straight into an automatically organized directory structure for the archives, and which can also be read in directly into a LTP and routine observation database. Please let me know if you would like to try out this observation submission portal, and I will send you a username and password.

LTP Reports: Two candidate LTPs were reported in April. If anybody else was observing at these times, then I would really appreciate that you get in contact to provide additional evidence for or against these being LTP so that we can correct the provisionally assigned weights below.

Aristarchus in Earthshine: On 2011 Apr 07 UT 19:45-20:10 Aristarchus was seen to be "very bright" in Earthshine. Giorgio Sancristoforo (Milan, Italy, 203mm SCT, atmospheric seeing good) noticed Aristarchus to be exceptionally bright (Sketch supplied – see figure 1) at around 20:00 and was the first to report this. Although he did not record the start and end times, he commented that the effect lasted 20-30 minutes and then was significantly reduced in brightness. Although direct comparison in terms of brightness could not be made with a star, he thought Aristarchus to be brighter than +0.7 in magnitude. Furthermore Aristarchus was visible when daylight was still present, when looking through the telescope, although it could not be seen with the naked eye due to too much extraneous light. Aristarchus was probably white in color, but the observer was partly color blind and so was uncertain. Not much detail was seen elsewhere in Earthshine, even when the sky darkened, and he was not able to see Kepler or Copernicus, just the limb. No

details were seen in Aristarchus itself, for example no ray to the SW was visible. It later transpired that Lajos Bartha (Budapest, Hungary, 70 mm refractor, x83, seeing conditions good) had observed Earthshine even earlier from UT 19:45-20:10 and noticed a very bright area close to the edge of the Moon that he later confirmed was Aristarchus. When he started observing the sky twilight was still a deep blue, but the dark side of the Moon was seen both with the naked eye and through the telescope. Earthshine was medium in brightness and grey in color. Copernicus and Kepler were weak in brightness but certainly visible. There was some scattered light from the sunlit side of the Moon noticed, but not enough to obscure Copernicus and

Figure 1. *A computer generated illustration by Giorgio Sancristoforo showing the appearance of Aristarchus in Earthshine on 2011 Apr 07 at approximately UT20:00. North is at the top in this image.*

Kepler from visibility. As a test he moved the telescope around and the very bright spot moved with the Moon and so was not a glare problem. The following day he checked Earthshine again but found that the bright spot was significantly less conspicuous.

Now observing in Earthshine has several dangers that may have tricked observers in the past. For a start we are operating at the limits of sensitivity of our eyes – with most features barely visible in the image noise. Secondly there is a severe glare problem from the daylight side of the Moon which imposes a brightness (& contrast) gradient across the field of view. Thirdly it is a well established fact that reflected light from the Earth can vary over intervals as short as tens of minutes due to variable cloud cover on Earth, especially clouds coming around the limb, and this can change image contrast noticeably during an observing period. Local atmospheric transparency can affect visibility. Lastly the color of the Earth may

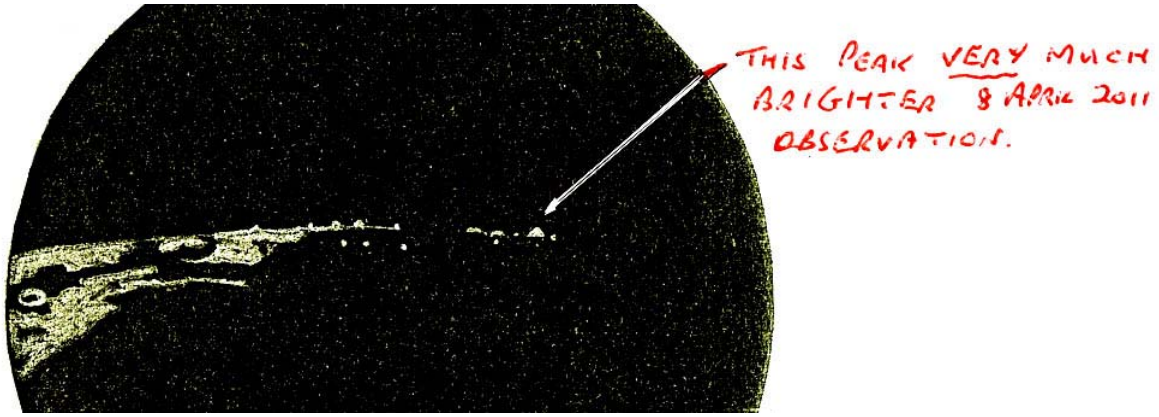


Figure 2. *An annotated 1977 Mar 24 drawing by Arthur Kemp. The position of the brilliant peak seen on 2011 Apr 08 is depicted by the arrow. North is at the bottom in this image.*

change and for slightly blue features, such as Aristarchus, this can make them appear brighter still, especially. to people with eyesight sensitive to blue light. So although this LTP has been confirmed independently by two observers (one of whom has been an experienced observer for several decades) and so should get a weight of 4, I am going to be cautious lower its weight to a 3, as both observers were astonished at the brightness, at least until I have found out if anybody else was observing that night.

South Pole: On 2011 Apr 08 UT 19:30-20:00 Arthur Kemp (Mold, Flintshire, UK) observed that the Leibnitz peaks at the southern pole stood out sharply. However the 2nd peak from the right, as illustrated in figure 2 was "*shining like a spot light. So bright that I couldn't make out its shape*". The image was clear and steady with excellent transparency and seeing in the 70mm f/13 refractor (25mm and 10mm eyepieces). Inspections during the above time period revealed no changes in brightness. Arthur's previous observations of this area had never shown such an unusual brightness, and he likened the brightness to "*a maximum brightness of Venus shining amongst 2nd magnitude stars*" - I guess he means relative brightness to the other peaks? I would have assigned a weight of 3 as Arthur is an experienced observer, however the fact that the feature remained largely unchanged in brightness (uncharacteristic of LTP) suggests to me it is probably a sunlit peak – we shall have to await a similar libration and colongitude to prove this.

Routine Reports: These have been dominated by two repeat illumination Greenacre and Barr occurrences during April. An email was issued through the BAA (http://britastro.org/blog/?p=727) and ALPO, and as a consequence we obtained an extremely good set of observations by many international observers. For reason of space what will be presented here is just a preliminary illustration of the kinds of observations obtained. We have tested for chromatic aberration and atmospheric spectral dispersion effects on previous sessions. This time, with the high quality of color imagery we shall also try to see if natural surface color could offer an explanation.

> *On 1963 Nov 28 at UT 00:30-01:45 Greenacre, Barr, Hall and Dungan (Flagstaff, AZ, USA, 24" refractor and 69" reflector), Tombaugh (New Mexico, USA, 16" reflector x524) and Olivarez (New Jersey, USA, 17" reflector) observed a reddish-orange and sparkle on the rim and central peak, west (IAU?) side and blue on the floor of Aristarchus later. However Cyrus did not see anything from 02:25-02:30UT. The Cameron 1978 catalog ID=785 and weight=5. The ALPO/BAA weight=4.*

Bob O'Connell (Keystone Heights, FL, USA) observed from 04:00-04:50 UT. Frank Melillo (Holtsville, NY, USA) observed at 04:18 and 04:30 UT. Jay Albert (Lakeworth, FL, USA) was unfortunately clouded out. The key point of this re-observation was that not only was the illumination similar (see April 2011 TLO LTP article), but the topocentric libration was too, to within ± 1° of the Nov 1963 event (in case it was a photometric phase angle effect?). In Bob's image there is no obvious color showing up in Aristarchus, where Greenacre saw color. So natural surface color cannot be an obvious explanation as to what was seen in 1963

– at least at this resolution. I have however simulated spectral dispersion, using a technique that I described originally six years ago in the Sep 2005 TLO (also see last month), and although we can get an artificial orange red color on the south-west rim of Aristarchus (also see April 2011 TLO article), it is not quite in the right place, nor the correct size and shape - according to Bob O'Connell who has investigated the historical documents concerning this observation, kept in the archives at Lowell observatory. Another study of this

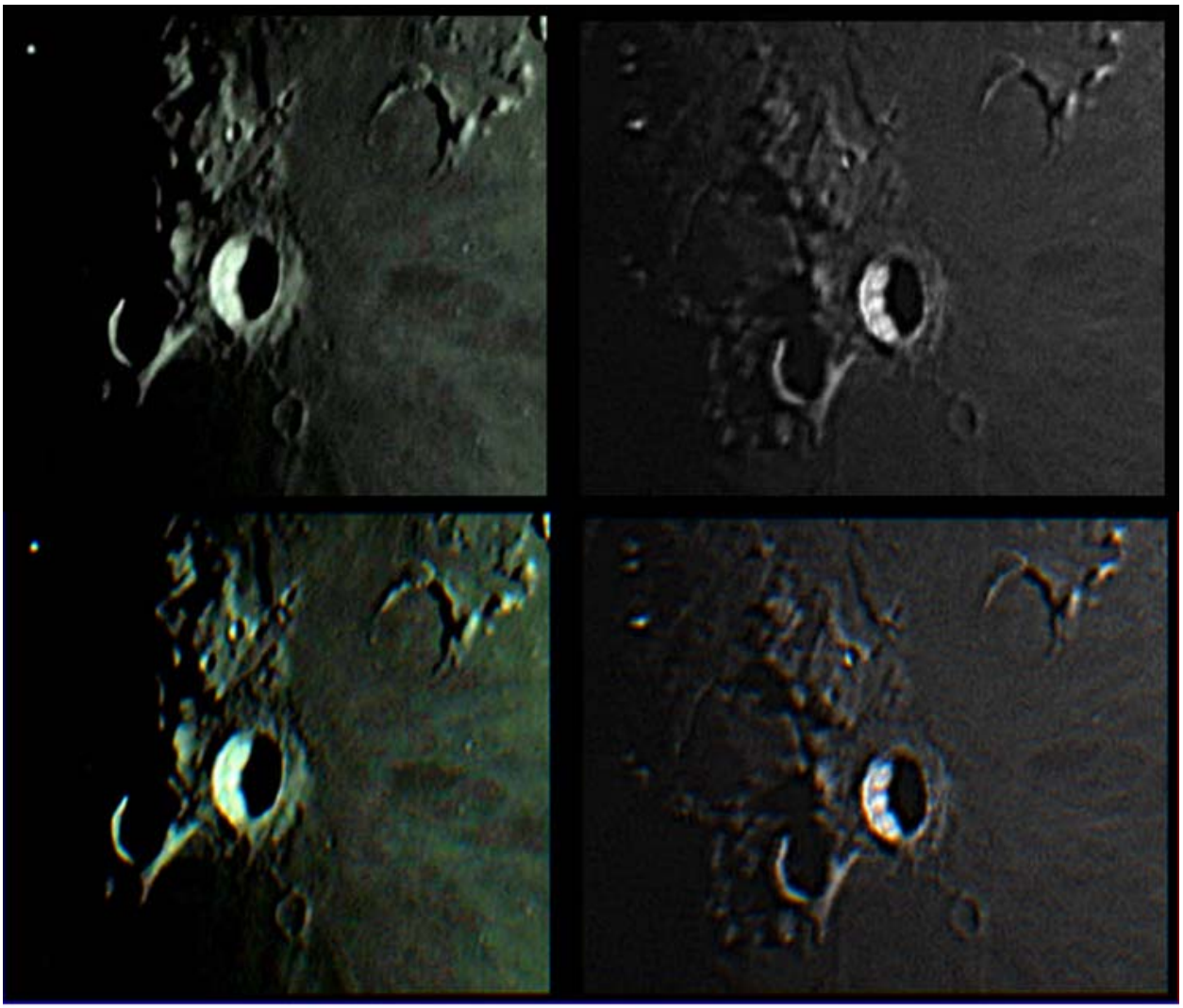


Figure 3. *How the crater Aristarchus would have appeared to observers during the 1963 Nov 28 LTP. Everything appears normal in 2011. North is towards the top.* ***(Top Left)*** *Bob O'Connell's color image from 2011 Apr 15 UT 04:10.* ***(Top Right)*** *Frank Melillo's monochrome image from 2011 Apr 15 UT 04:30. Simulated spectral dispersion versions of the above two images (****Bottom left****) & (****Bottom right****).*

repeat illumination and libration event has been published in a rather long article by the GLR organization – see http://digidownload.libero.it/glrgroup/selenologytoday24.pdf using higher resolution images by Jim Phillips which show simulated spectral dispersion in the same area, but again not of the right size or shape (although not mentioned in the article). The Lowell observers were highly skilled planetary cartographersand well acquainted with the process of spectral dispersion and so would have seen strong spurious color effects visible on other features too as you can see in the bottom left and bottom right parts of Figure 3, and hence would unlikely to have been fooled.

Aristarchus 1963 Oct 30 UTC 01:50-02:15 Observed by Greenacre and Barr (Flagstaff, AZ, USA) described in the NASA catalog as: "Ruby-red spots, brilliant, sparkle, movement. Pink on rim later violet 3h later. (this & their Nov. obs, started the modern interest & observing the Moon. Jamieson didn't see anything until 0115, Greenacre & Barr event 01:58- 02:05, (indep. confirm.)

Greenacre did not see it in 12-inR finder. Cobra Head spot 2x8km, Aris, 19x2km, Scarfe rep. 30% enhancement at 5400A in spect. at Aris., Cop." The NASA catalog gives 01:15-02:20 for second period of activity but it is unclear if this refers to Scarfe, Jamieson or Greenacre & Barr. Also a UTC of 22:00? is given in the catalog and I am not sure to what this refers, possibly the Scarfe observation as he was in Cambridge, UK (36" refelctor?). Greenacre & Barr were using a 24" refactor and Jamieson, Budine, Farrell (Binghampton, NY, USA) were using a 4" refractor. The NASA catalog ID No. is #778. The NASA catalog weight is 5.

Many observers in Europe attempted to make this repeat illumination observation. Below (Figure 4) is just a small selection of those received. Piotr Maliǹski (Poland) apart from imaging at several times during the evening, even attempted some multi-wave band imaging. The images do pick out an interesting dichotomy in the ejecta blanket around Aristarchus. To the south it has an orange cast and in the north a purplish tinge. You can also see evidence in the bottom right image for a sinuous rille (or at least a graben) on the inner western floor of Herodotus – this is often covered by shadow, or illumination is not shallow enough to reveal it at other times. A couple of small pink-orange mounds are visible, in Bev Ewen-Smith's image, to the NW of Aristarchus at about 9 O'Clock (just south east of the Cobra's Head) and at 10:30 just on the southern edge of a highland plateau . In terms of natural color though, none of these images show any evidence that the two red spots seen near the Cobra's head back in Oct 1963 could have been due to natural surface color. A preliminary study of the possibility of spectral dispersion has been undertaken for the highest resolution images, and found to be implausible as an explanation of the two red spots as well. A full report of the observations received, and their analysis, will be written up and sent into the BAA/ALPO journals in the next few months.

Suggested Features to observe in June: A total lunar eclipse can be seen on Jun 15 for European observers (not so well placed for higher latitudes in Europe). Totality starts at UT 19:22 and ends at 21:03. For repeat illumination (only) LTP predictions for the coming month, these can be found on the following web site: http://users.aber.ac.uk/atc/tlp/tlp.htm . 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! Twitter LTP alerts can be accessed on http://twitter.com/lunarnaut.

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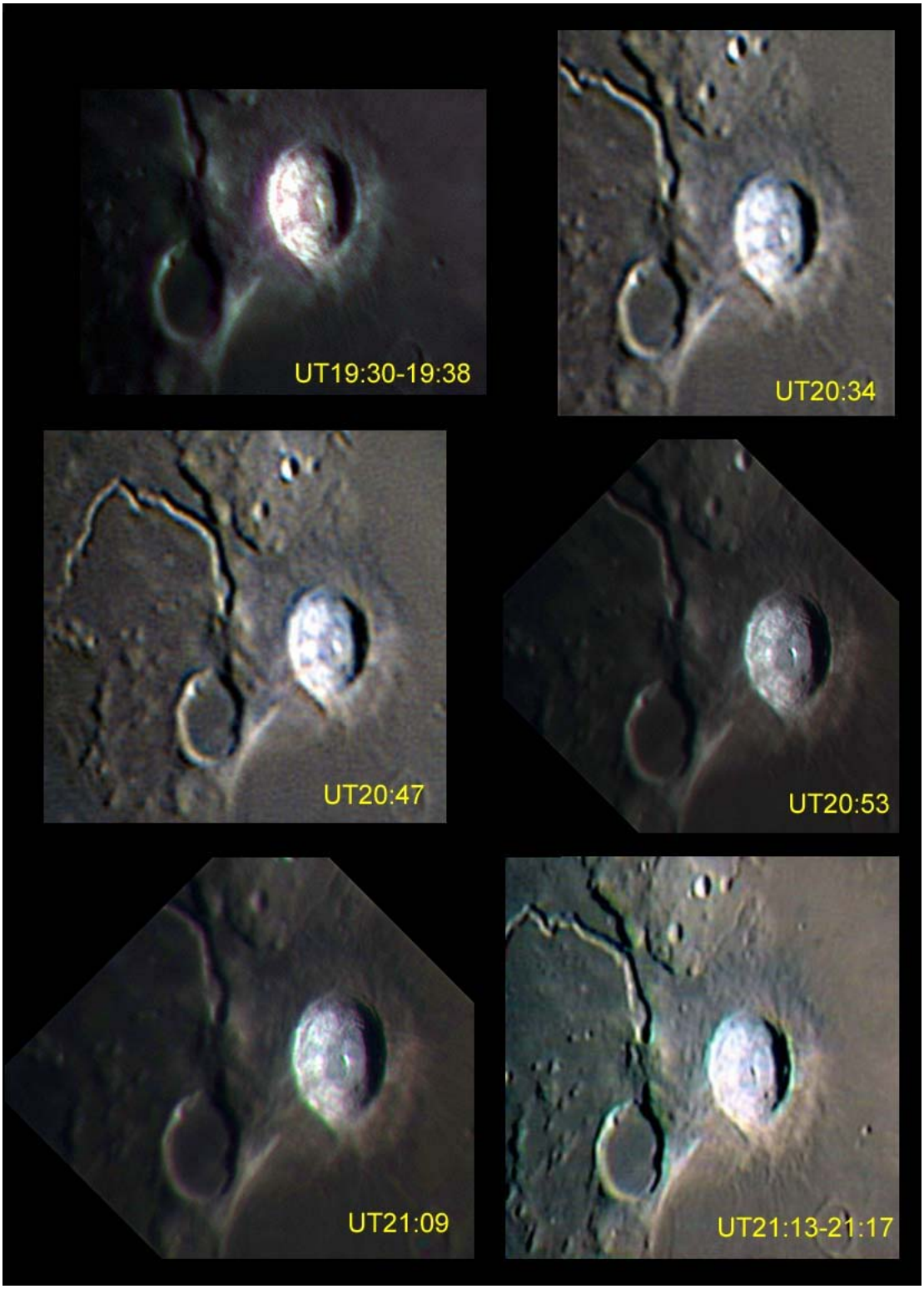

Figure 4. *Aristarchus at the same illumination (within ± 0.5°) as was present back in 1963 Oct 30.* ***UT19:30-19:38*** *Leonard Mercer (Malta).* ***UT20:34*** *Martin Federspiel (Germany).* ***UT20:47*** *Martin Federspiel.* ***UT20:47*** *Piotr Maliǹski (Poland).* ***UT21:09*** *Piotr Maliǹski (Poland).* ***UT21:13-21:17*** *Bev Ewen-Smith (COAA, Portugal).*

KEY TO IMAGES IN THIS ISSUE

1. **Anaxagoras**
2. **Diophantus**
3. **Hortensius**
4. **Lockyer**
5. **Lunar X**
6. **Milichius**
7. **Rimae Fresnel**
8. **Taruntious**
9. **Thales**

FOCUS ON targets

X = Plato (July)
Y = Posidonius (September)