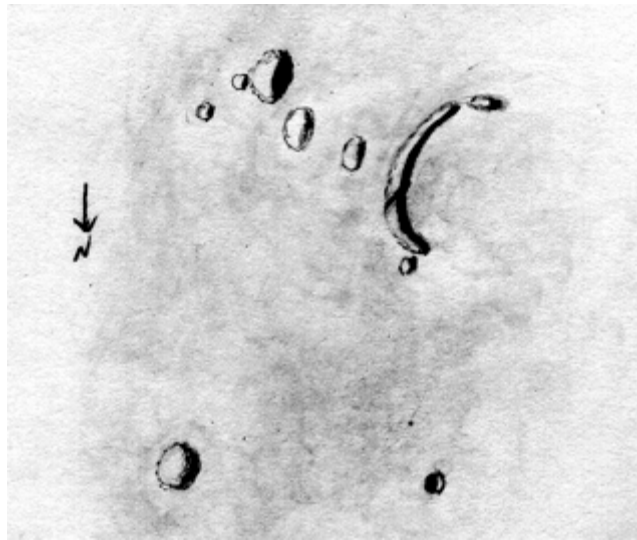


# THE LUNAR OBSERVER

A PUBLICATION OF THE LUNAR SECTION OF  
THE ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS  
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## FEATURE OF THE MONTH - SEPT. 2004



### MASKELYNE E & CAUCHY TAU

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

February 26, 2004 - 01:36 to 01:54 UT

15cm Newtonian - 170x - Seeing 7/10

I drew this area shortly after sketching the Cauchy region (TLO August 2004). Maskelyne E is a partial ring between Cauchy and Maskelyne. The eastern portion is a low, curved ridge with a detached peak at the south end; the west side is completely missing. Another detached peak lies off the north end. A loose group of hills was seen east of Maskelyne E. Only the largest one had anything close to dark shadow; the others were quite low. The two closest to Maskelyne E may be domes.

Cauchy M lies north of Maskelyne E, and the dome Cauchy tau is east of Cauchy M. This dome had a very smooth, roundish appearance with moderate gray shading (no black shadow). The part of Mare Tranquillitatis between Cauchy tau and Maskelyne E appears to be very smooth.

# **LUNAR TOPOGRAPHICAL STUDIES**

Acting Assistant Coordinator – William M. Dembowski, FRAS

[Dembowski@zone-vx.com](mailto:Dembowski@zone-vx.com)

## **OBSERVATIONS RECEIVED**

MICHAEL AMATO - WEST HAVEN, CONNECTICUT, USA

Ray maps of Menelaus (2), Messier (2), Proclus (2), Kepler (2), Aristarchus (2)

ED CRANDALL - WINSTON-SALEM, NORTH CAROLINA, USA

CCD image of Archimedes

DANIEL DEL VALLE - AGUADILLA, PUERTO RICO

Sketches of Arago domes, dome near Manilius, Aristillus, Kies & dome

CCD image of Maurolycus, Agrippa, Airy, Aliacensis, Hipparchus, Manilius, Apennine Mountains, Stofler

HOWARD ESKILDSEN - OCALA, FLORIDA, USA

CCD image of Mare Imbrium, Rumker, Pythagoras, Sirsalis Rille, Wargentini, Bulialdus ejecta, Pitatus & Hesiodus (2)

RIK HILL - TUCSON, ARIZONA, USA

CCD images of Alpine Valley, Plato, Mons Piton, Archimedes

K. C. PAU - HONG KONG, CHINA

CCD images of Hainzel, J.Herschel, Gassendi, Lilius, Ramsden, Bode, Davy, Mons Piton, Rima Bradley, Arzachel, Alphonsus, Archimedes

RODRIGO VIEGAS - MONTEVIDEO, URUGUAY

Sketches of Prinz and dome, Reiner and Reiner gamma, Gruithuisen (2)

ROBERT WLODARCZYK - CZESTOCHOWA, POLAND

Sketches of Hommel & Pitiscus, 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)

## RECENT TOPOGRAPHICAL OBSERVATIONS



### ARCHIMEDES

**Digital image by Ed Crandall - Winston, Salem, NC, USA**

**August 7, 2004 - Seeing 3-5/10**

**10 inch Newtonian at f/14 - Toucam Pro**



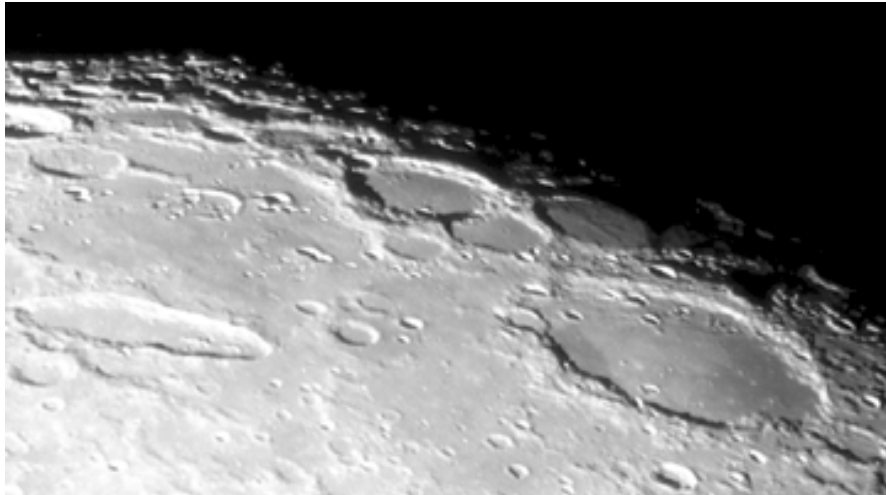
### KIES & DOME

**Sketch by Daniel del Valle - Agadilla, Puerto Rico, USA**

**July 27, 2004 - 02:02 to 03:00 UT**

**120mm Refractor - 333x - Orion V-Block Filter**

## RECENT TOPOGRAPHICAL OBSERVATIONS

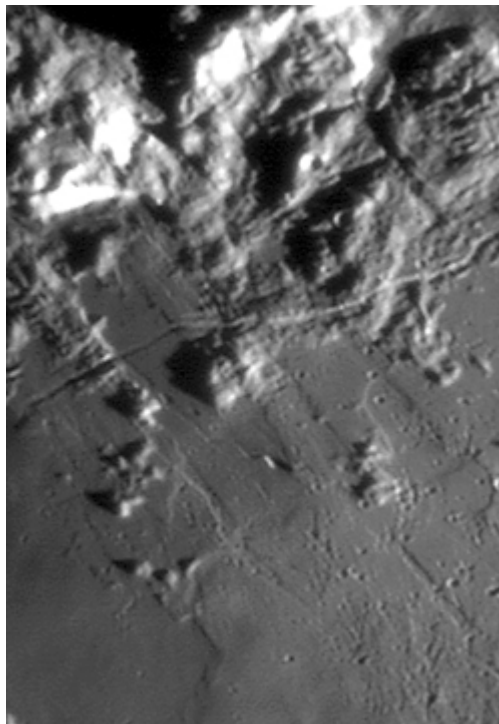


### WARGENTIN

**Digital image by Howard Eskildsen - Ocala, Florida, USA**

**June 1, 2004 - 00:56 UT**

**10 inch Refractor - 2x Barlow - Nikon Coolpix 4300**



### RIMA BRADLEY

**Digital image by K.C. Pau - Hong Kong, China**

**August 7, 2004 - 21:02 UT**

**250mm Newtonian - 5x Barlow - 48 Frames Stacked**

# THE DOME TO THE NORTH OF "VALENTINE"

$\xi +0.151$  and  $\eta +0.528$

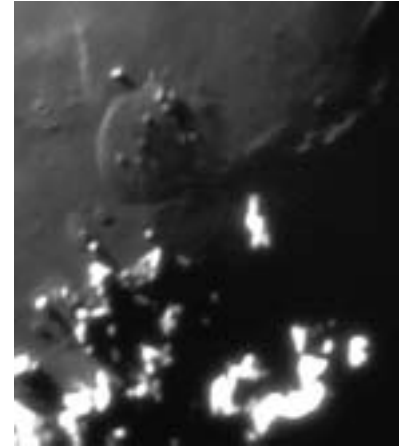
By Raffaello Lena and KC Pau (GLR group)



**Figure 1**



**Figure 2**



**Figure 3**

In a previous paper which appeared in Selenology [1], the Journal of the American Lunar Society, some of us have described a very well known dome designated as the "Valentine dome" by Alike Herring. In [1] we reported further measurements and include our CCD imaging where the rille crossing the "Valentine dome" was detected. Recently, we detected near "Valentine" the presence of another smaller dome; it lies to the north of Valentine at coordinates  $+0.151+0.528$  (longitude  $10.26^\circ$  E latitude  $31.89^\circ$  N). This structure does not appear in the A.L.P.O. Lunar Dome Survey database and seems to require specific lighting conditions to be visible. It appears flat suggesting a subsurface intrusions of magma (Figures 1-3). Using the Westfall Classification Scheme [2], we categorize the unlisted dome as DW/2b/5g/8p.

This elusive dome was added to the unpublished Revised Lunar Dome Catalogue by Robert A. Garfinkle, F.R.A.S and to the unpublished revised list by Charlie Kapral (personal communications).

**A full report about this intriguing dome and its morphology  
will be published in a next issue of the JALPO.**

**Figure 1** - KC PAU On October 16 2003 at 19:02 UT, 250mm f/6 Newtonian telescope

**Figure 2** - Raffaello Lena on November, 30, 2003 at 17:35 UT, 100mm refractor at f/15 (200x)

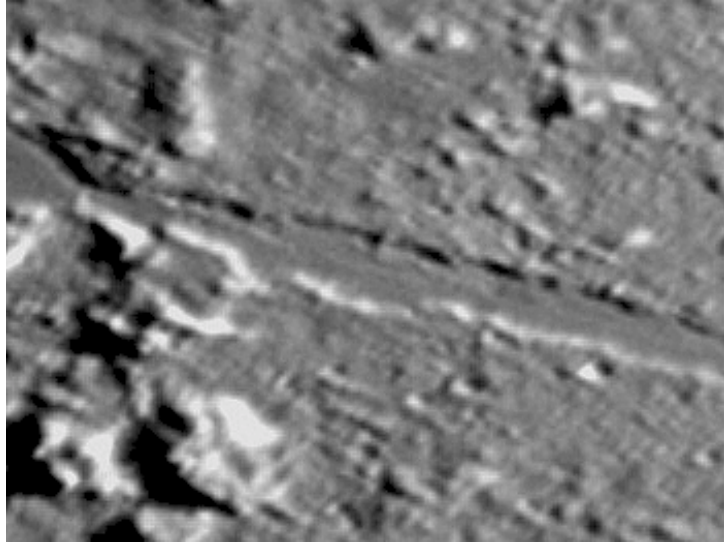
**Figure 3** - J. Phillips on March, 26, 2004 , TMB 8" F/9 apo.

## References

[1] Lena R., Pau. KC, Fattinnanzi C., Selenology, 2003, Vol 22,4.

[2] Westfall, John; J.A.L.P.O. 1964, Vol 18, no 1-2.

## THE ALPINE VALLEY



**Image and text by Rik Hill - Tucson, Arizona, USA  
January 31, 2004 - 03:21 UT  
From video with C14 with 3x Barlow**

A history of the observations of the Alpine Valley is not only interesting but leads one to wonder if it were observed before the end of the 19th century. Riccoli may have shown it in one of his maps but that is not unambiguously clear. The earliest specific written reference to the Valley that I have is by Nasmyth and Carpenter (1874). In their description they make no mention of any rilles. Earlier observations are alluded to in other writings on this Valley but I have not yet been able to track them down.

Elger (1895) shows hints of the Valley in his map of 1885. When investigating the history of observations of the Alpine Valley, there is sometimes ambiguity in descriptions where the longitudinal rille is confused with a transverse rille that nearly bisects the Valley. Of this latter rille Elger says: "A winding cleft crosses the valley about midway, which, strange to say, is not shown in the maps, though it may be seen in a 4-inch achromatic." But he makes no mention of the rille running the length of the Valley. The perpendicular rille is easier to see for I have done it in a Celestron 5 in mediocre seeing.

Goodacre (1933) mentions the discovery in 1891 by Pickering as follows: "Prof. W.H.Pickering has discovered a delicate cleft running along the center of the valley, and intersecting several crater pits, objects beyond the reach of small telescopes." This has led to the informal naming of the rille as Pickering's Rille. Most detailed maps after 1910 have shown the rille at least in part. Fauth's map of (1964) at a scale of 1mm=960m shows portions of it clearly and here too it was interpreted as separate short rilles.

The rille is described briefly by Wilkins and Moore (1955) with only the most brief mention of the rille. This prompted me to contact Patrick Moore about his observations of this feature back in 1993. In a note I received from Patrick Moore he writes: "Shown here is a slender white line that runs almost the entire length of the Alpine Valley's flat floor. This is the delicate rille discovered by W.H.Pickering in 1891 with a 13-inch refractor in Peru. On the Air Force Lunar Chart (sheets LAC 12 and 25), Pickering's Rille

is resolved into a complex of lesser ones."

It is interesting that the sinuosity was interpreted as separate shorter rilles! Ewen Whitaker informed me that of the photographs taken with the 61-inch Mt. Bigelow telescope here in Tucson (owned and operated by the Lunar and Planetary Lab. of the Univ. of Arizona): "Several...show indications of the rille, but only 2 or 3 show it unambiguously."

An image that shows the Pickering Rille through a 43" telescope can be seen in S&T, July 1967, p. 22-23. On my copy of the LUNAR ATLAS by G. Kuiper, I was unable to find the rille unambiguously on any of the prints. I would point out here that this discovery by Pickering was made when he was in Peru to observe the Mars opposition. During this time he also did his study of the Galilean moons that I cited yesterday. (LOWELL OBSERVATORY ANNALS, Vol.II, Pt.I). An interesting synopsis of these observations of Jupiter's Moons can be found in the Astronomical Scrapbook column of Sky & Telescope, Dec. 1963, p.335. Further, there were other recent observations of the Galilean Moons done in Europe and published in ICARUS 25, p.397-404, but this report completely ignores and does not try to correlate any of the older work done in the U.S. at Lowell and Yerkes. Too bad there.

### **References:**

Elgers, T.G. (1895). THE MOON: A Full Description and Map of its Principal Physical Features. Geo.Phillip & Son, London. p.64-5.

Fauth, P. (1964). MONDATLAS. Olbers Soc., Bremen, Germany.

Goodacre, W. (1931). THE MOON. Pardy & Son, London. p.236.

Nasmyth, J., Carpenter, J. (1874). THE MOON: Considered As A Planet, A World, and a Satellite. London. p.136-7.

Wilkins, H.P., Moore, P. (1955). THE MOON. Macmillan, N.Y. p.223.

## **INTERNATIONAL BRIGHT LUNAR RAYS PROJECT**

### **EXCERPT OF THE MONTH (Part 3):**

#### **LUNAR CRATER RAYS: COMPOSITIONS AND MODES OF ORIGIN**

B.R. Hawke 1, D.T. Blewett 1, P.G.Lucey 1, C.A. Peterson 1, J.F. Bell III 2, B.A. Campbell 3, and M.S. Robinson 4,

1 Planetary Geosciences/HIGP, Univ.of Hawaii, Honolulu, HI 96822,

2 CRSR, Cornell Univ., Ithaca, NY 14853,

3 CEPS, National Air & Space Museum, Washington, DC 20560,

4 Dept. of Geological Sciences, Northwestern Univ., Evanston, IL 60208.

Olbers A Ray.

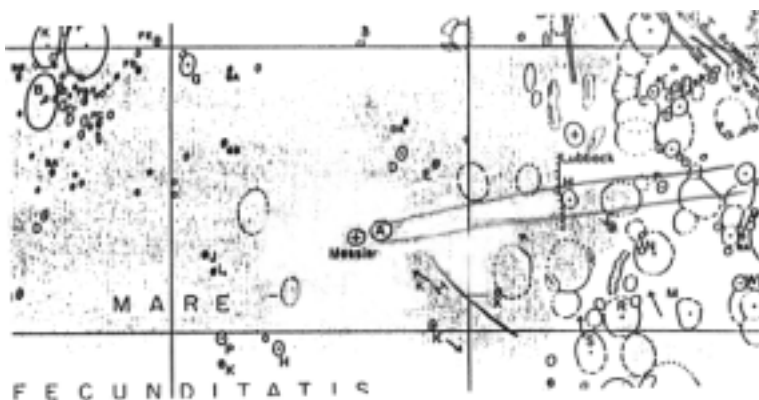
This Copernican-aged impact crater (diameter = 43 km) is located in the highlands on the Moon's western limb (8.1° N, 77.6° W) and exhibits an extensive ray system. Eight near-IR reflectance spectra were obtained for a prominent ray that extends northeast of Olbers A across Oceanus Procellarum. Three of these spectra are for small (3-6 km in diameter) areas near the intersection of two major ray

elements approximately 385 km northeast of Olbers A. Three spectra were collected for a portion of the ray immediately northeast of Seleucus crater. This ray segment is approximately 550 km from the rim of the parent crater. Two spectra were obtained for diffuse ray elements in the same general area. Spectra were also obtained for Olbers A crater as well as both mature mare and fresh craters near the ray. All spectra were analyzed and spectral mixing model studies were conducted using the techniques described by Blewett et al. [5]. Three component mixing studies were performed using mature mare, fresh mare, and either fresh or mature highland material as endmembers. The spectra obtained for areas near the ray intersection are dominated by mare material. However, highland debris is quite abundant (contributing 30-50% of the flux to the spectra). Perhaps these high values are due to the fact that two rays cross in the area for which the spectra were collected. Surprisingly, even larger amounts (35-55%) of highland material were found to be present in portions of the ray north-east of Seleucus. Lesser amounts (26-38%) of highland debris were determined to be present in the more diffuse segments of the ray. Maturity and FeO maps produced from Clementine UV-VIS images suggest that the ray is less mature than the adjacent terrain and that it contains a significant amount of highlands debris.

References:

- [1] Shoemaker E. (1962) in Physics and Astronomy of the Moon, 283
- [2] Pieters C. et al. (1985) J. Geophys. Res., 90, 12393
- [3] Oberbeck V. (1971) Moon, 2, 263
- [4] Schultz P. and Gault D. (1985) J. Geophys. Res., 90, 3701
- [5] Blewett D. et al. (1995) J. Geophys. Res. 100, 16959
- [6] Campbell B. et al. (1992) Proc. Lunar Planet. Sci., 22, 259
- [7] Zisk S. et al. (1974) Moon, 10, 17
- [8] Thompson T. (1987) Earth, Moon, Planets, 37, 59
- [9] Hawke B. et al. (1996) Lunar Planet Sci. XXVII, 507
- [10] Lucey P. et al. (1995) Science, 269, 1150
- [11] Lucey P. et al. (2000) J. Geophys. Res., submitted
- [12] Hawke B. et al. (1999) Workshop on New Views of the Moon II, 22

## RECENT RAY OBSERVATIONS



### MESSIER A RAY SYSTEM

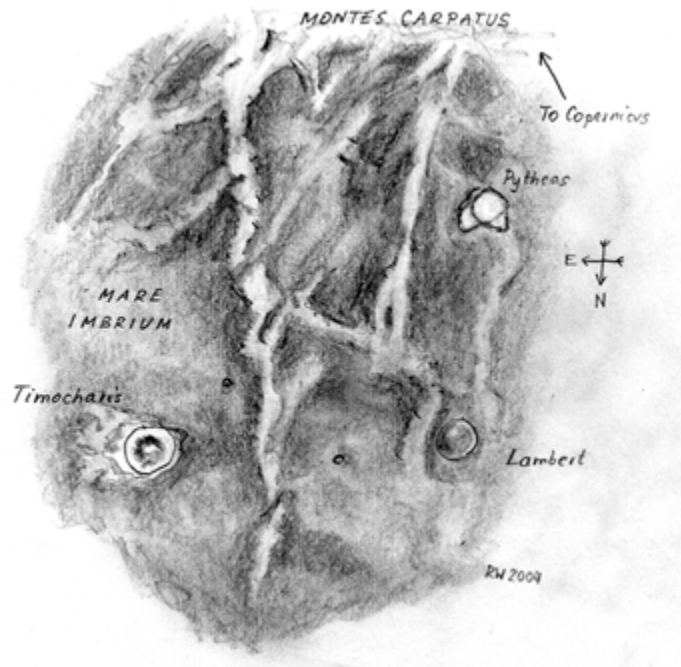
**Ray map by Michael Amato - West Haven, Connecticut, USA**

**August 21, 2004 - 04:30 UT**

**127mm Maksutov-Cassegrain - 123x**



## RECENT RAY OBSERVATIONS

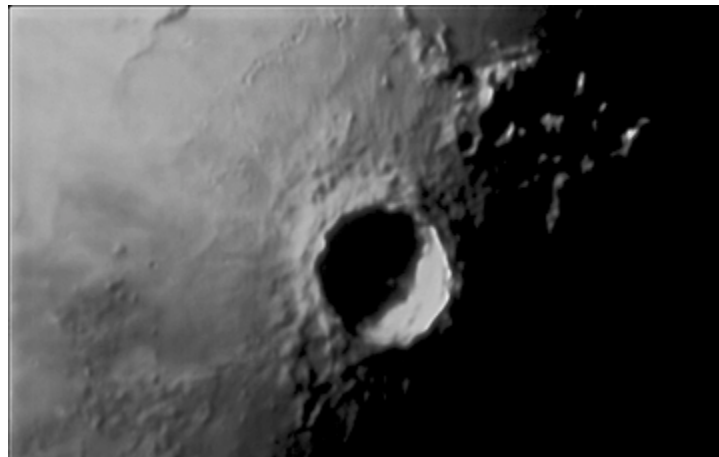


### COPERNICAN RAY SYSTEM BETWEEN TIMOCHARIS, PYTHEAS, LAMBERT

Sketch by Robert Wlodarczyk - Czestochowa, Poland

August 4, 2004 - 23:00 UT

18cm Newtonian - 96x 150x - Seeing: Ant. II-III



### TYCHO

Digital image by Guido Santacana - San Juan, Puerto Rico

June 27, 2004 - 01:15 UT

120mm f/8 Refractor - 2x Barlow - Lunar filter

# TRANSIENT LUNAR PHENOMENA

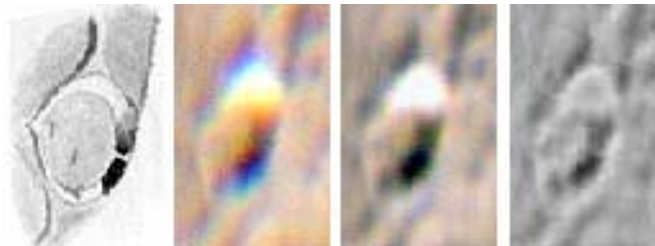
Coordinator – Dr. Anthony Cook – [acc@cs.nott.ac.uk](mailto:acc@cs.nott.ac.uk)

Assistant Coordinator – David O. Darling – [DOD121252@AOL.COM](mailto:DOD121252@AOL.COM)

## ALPO/BAA LUNAR TRANSIENT PHENOMENA - SEPTEMBER 2004

Observations for July have been received from: Jay Albert (Boca Raton, FL), Michael Amato (West Haven, CT, USA), Clive Brook (Plymouth, UK), and Jim Fisher (Austin, TX, USA). In addition many thanks for observations for June and earlier that were received from Marie Cook (Mundesley, UK), Jacques van Delft (Wepener, South Africa), John Hauk (Stafford, VA, USA), Richard Hill (Tucson, AZ, USA), Sander Klieverik (Denekamp, the Netherlands). I would like to remind members to please include the date and UT that observations are made at (make sure that the date is a UT date, and not local) and also other information such as telescope, seeing, transparency, magnification (if visual), CCD camera, filters etc.

Several members kindly made follow up observations for Jay Albert's Proclus anomaly and I received also a detailed CCD image that Jay took. The latter showed that some spurious color was present – so I did some image processing and separated out the red, green and blue color components and registered these back together again after compensating for spectral dispersion offset. This removed the spurious color and improved overall image contrast – something that Jay would have been unable to do when making his sketch. The re-constituted image does in fact show that there was a faint shadow to the south of the dark shadow, so everything appears to have been normal on the night of June 24<sup>th</sup>, it was just that atmospheric conditions reduced visibility of the southern shadow.



**Figure 1:** Proclus observations by Jay Albert, 2004 Jun 24 UT 02:30 with north at the top. (Far left) Jay's sketch. (Left) Color image taken with an Olympus C5050 digital camera – showing spurious color. (Right) color image with spurious color removed by manual registration of the RGB channels – note you can just about see the southern shadow here. (Far right) – high pass filtered version: confirming presence of southern shadow.

**Observations Sought:** Staying on the subject of spurious color, I would like to encourage all members to go out and observe the Moon during September with the specific intention of capturing CCD images/sketches showing examples of spurious color. Spurious color is caused by: 1) refraction in our atmosphere – blue light is bent (refracted) more than red light and the effect worsens the lower the Moon is in the sky. 2) telescope refractive optics that are not fully achromatic/aligned properly. 3) in the 1970's Lawrence Fitton (UK) suggested that atmospheric pressure differences between weather systems moving across the observing site might cause spurious color too. 4) although not strictly spurious color, on many color CCD cameras RGB filters “tile” the CCD surface, so one pixel has a red filter, another a green filter, and the third adjacent pixel a blue filter (often “L” shaped tiling patterns are used) – you normally do not notice the effect of this in everyday images, but it can create apparent colors on edge-like features.

So I would very much like to receive images/sketches that you take during September showing spurious color and please also note down which way the Moon is orientated in the sky as seen with the naked eye using clock directions i.e. 12 O'Clock the S-N line of the Moon is vertical, 3 O'Clock the south pole of the Moon is on the left and the north pole is on the right etc. Please also note down the atmospheric transparency and experiment with rotating the CCD camera and/or eyepiece/Barlow e.g. rotated to the left 90 deg - just to see if these have some effect – again please note down the arrangement for each image. We will do this for just one month and I will then comment on the results in the October newsletter. If you are new to the LTP team then think of this as an exercise to gain experience in determining what is spurious and what is real color on the Moon – as ever you should ALWAYS check for the presence of spurious color on other lunar features of similar size, contrast and illumination. If you see colors on these too then it is almost certainly spurious.

General repeat illumination and/or libration lunar targets for Sep 2004 can be found on the following web site: <http://www.lpl.arizona.edu/~rhill/alpo/lunarstuff/ltp.html>.

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](mailto:acc@cs.nott.ac.uk)

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