

# THE LUNAR OBSERVER

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

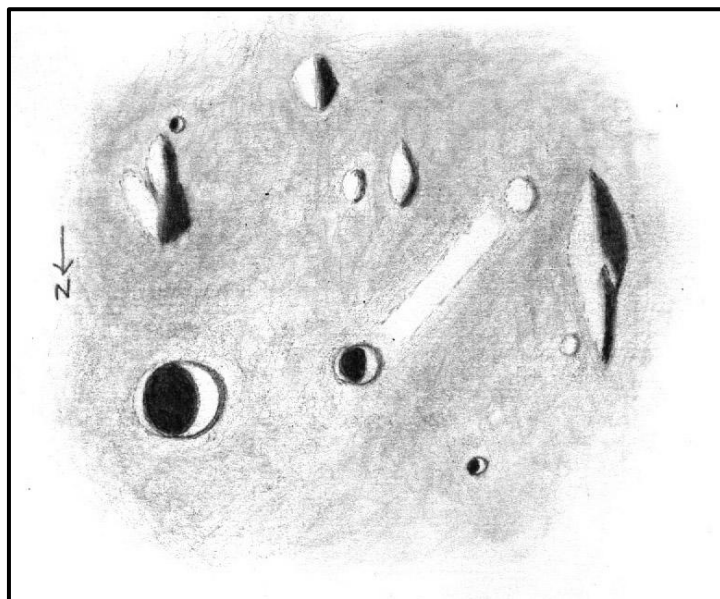
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RECENT BACK ISSUES: [http://moon.scopesandscapes.com/flo\\_back.html](http://moon.scopesandscapes.com/flo_back.html)

## FEATURE OF THE MONTH – MAY 2015

### TURNER



**Sketch and text by Robert H. Hays, Jr. - Worth, Illinois, USA  
December 31, 2014 02:08-02:34 UT, 15 cm refl, 170x, seeing 8/10**

I sketched this crater and vicinity on the evening of Dec. 30/31, 2014 after the moon hid ZC 355; 31 Arietis was hidden later near moonset. Turner is a modest crater well southeast of Copernicus, where Oceanus Procellarum, Mare Nubium and Sinus Aestuum merge. Turner itself is a neat, crisp crater with a noticeable raised rim. Turner F to the west is a smaller version of Turner. A low partial ring is between these craters. This feature has a fairly obvious, nearly straight northwest rim with low extensions toward the east and south. Any nominal east rim would probably have been obliterated by Turner. The small pit Turner A is northwest of Turner F; a shadowless bright patch is between these craters. The large mountain Fra Mauro eta is west of Turner F. Two round domelike hills are near the ends of this elongated peak. A ray-like streak is between Turner F and the hill near the south end of Fra Mauro eta. Turner H is the tiny pit south of Turner, and lies nearly in the shadow of the V-shaped peak Turner nu. Three substantial hills are southwest of Turner and south of Turner F. One of them is Fra Mauro delta. It's hard to tell which one, judging from the Lunar Quadrant map, but it may be the farthest south of this trio. That one is the largest of the group and has the darkest shadowing.

# **LUNAR CALENDAR**

## **MAY-JUNE 2015 (UT)**

2015		UT	
May	01	09:50	Moon Ascending Node
	04	03:42	Full Moon
	05	16:18	Moon-Saturn: 2.1° S
	07	13:39	Moon South Dec.: 18.3° S
	11	10:36	Last Quarter
	14	20:37	Moon Descending Node
	15	00:23	Moon Perigee: 366000 km
	18	04:13	New Moon
	20	09:41	Moon North Dec.: 18.4° N
	25	17:19	First Quarter
	26	22:12	Moon Apogee: 404200 km
	28	14:40	Moon Ascending Node
Jun	01	20:02	Moon-Saturn: 2° S
	02	16:19	Full Moon
	03	21:10	Moon South Dec.: 18.4° S
	09	15:42	Last Quarter
	10	04:39	Moon Perigee: 369700 km
	10	23:29	Moon Descending Node
	16	14:05	New Moon
	16	19:47	Moon North Dec.: 18.5° N
	20	11:28	Moon-Venus: 6.3° N
	23	17:01	Moon Apogee: 404100 km
	24	11:03	First Quarter
	24	17:23	Moon Ascending Node
	29	01:27	Moon-Saturn: 2.1° S

## **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 nonmember 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.alpo-astronomy.org>. 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.

## **2015 ALPO CONVENTION**

The 2015 ALPO Convention will be held in Las Cruces, NM Monday –Saturday, July 6-11, 2015, in conjunction with the Astronomical League's ALCON2015. Details are available in the Spring 2015 issue of the Journal of the ALPO (vol. 57 #2). Registration, schedule and accommodation information is available on the ALCON2015 website ([alcon2015.astroleague.org](http://alcon2015.astroleague.org)). Las Cruces is the home of Walter Haas, the ALPO's founder, who recently passed away. There will be a special tribute to Walter at the Star-B-Que on Friday evening.

There will be a separate session for ALPO papers. You are encouraged to submit a paper for presentation. The Spring JALPO includes instructions for submission.

### **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 be included:

**Name and location of observer**

**Name of feature**

**Date and time (UT) of observation**

**Size and type of telescope used**

**Magnification (for sketches)**

**Filter (if used)**

Medium employed (for photos and electronic images)

Orientation of image: (North/South - East/West)

Seeing: 1 to 10 (1-Worst 10-Best)

Transparency: 1 to 6

Full resolution images are preferred-it is not necessary to compress, or reduce the size of images. *Additional commentary accompanying images is always welcome.* **Items in bold are required. Submissions lacking this basic information will be discarded.**

Digitally submitted images should be sent to both

Wayne Bailey – [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)

and Jerry Hubbell – [jerry.hubbell@alpo-astronomy.org](mailto:jerry.hubbell@alpo-astronomy.org)

### **CALL FOR OBSERVATIONS:**

#### **FOCUS ON: Mare Tranquillitatis**

*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 2015** edition will be **Mare Tranquillitatis, including its surface and margins**. 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 to your observing list and send your favorites to (both):

**Wayne Bailey** - [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)

**Jerry Hubbell** – [jerry.hubbell@alpo-astronomy.org](mailto:jerry.hubbell@alpo-astronomy.org)

**Deadline for inclusion in the Mare Tranquillitatis article is June 20, 2015**

### **FUTURE FOCUS ON ARTICLES:**

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

**Subject**

**TLO Issue**

**Deadline**

# Focus On: Rimae Sirsalis

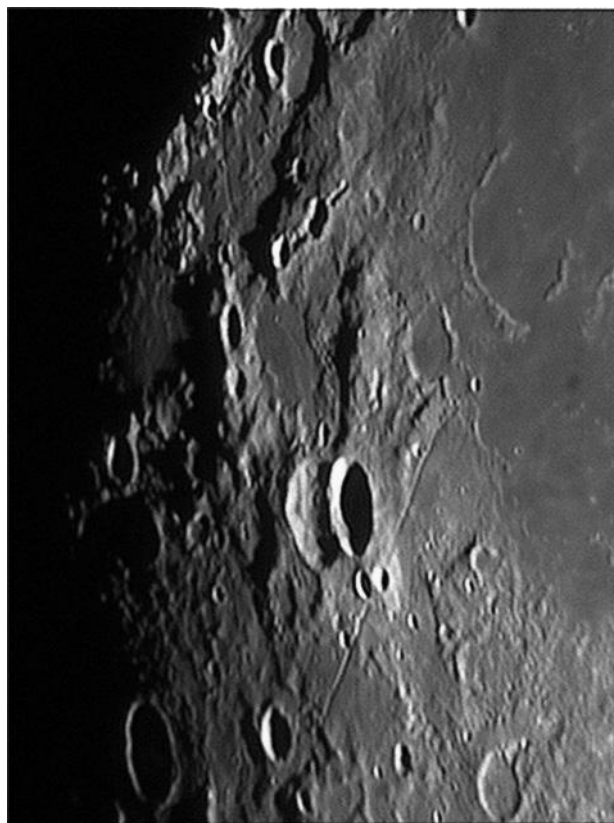
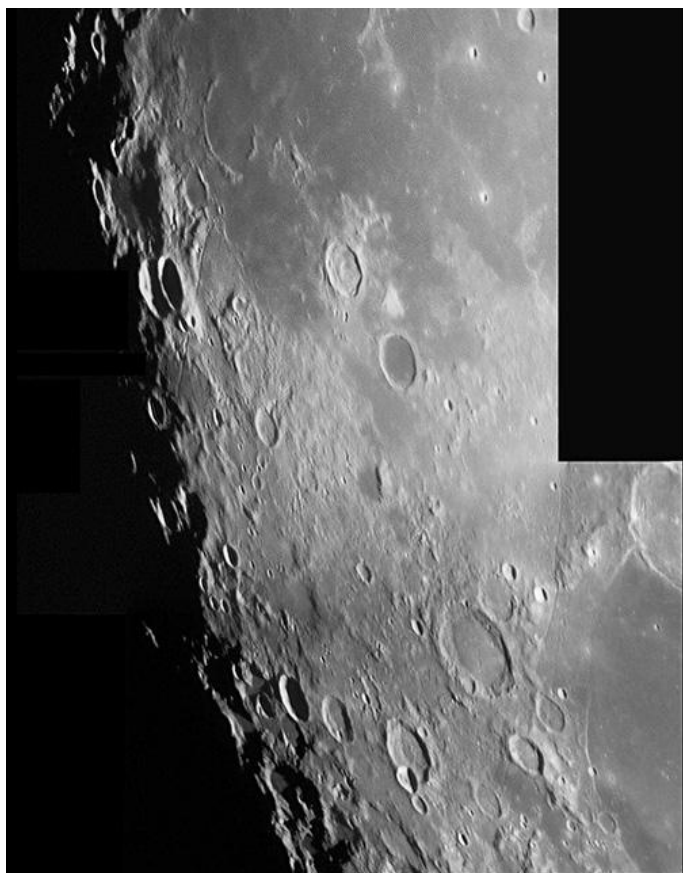
**Jerry Hubbell**

**Acting Assistant Coordinator Lunar Topographical Studies**

Rimae Sirsalis is a very interesting formation, along with craters Sirsalis and Sirsalis A, which look like twins in that they overlap and are very much the same size (41 km and 42 km in diameter, respectively) (Figures 1 & 2).

Rimae Sirsalis is a lunar rille. It is located at 15.7°S 61.7°W and is 426 km long. It cuts across highlands almost exclusively. The rille starts at the edge of Oceanus Procellarum, near the modest crater Sirsalis from which it gets its name, and proceeds directly away from the mare,

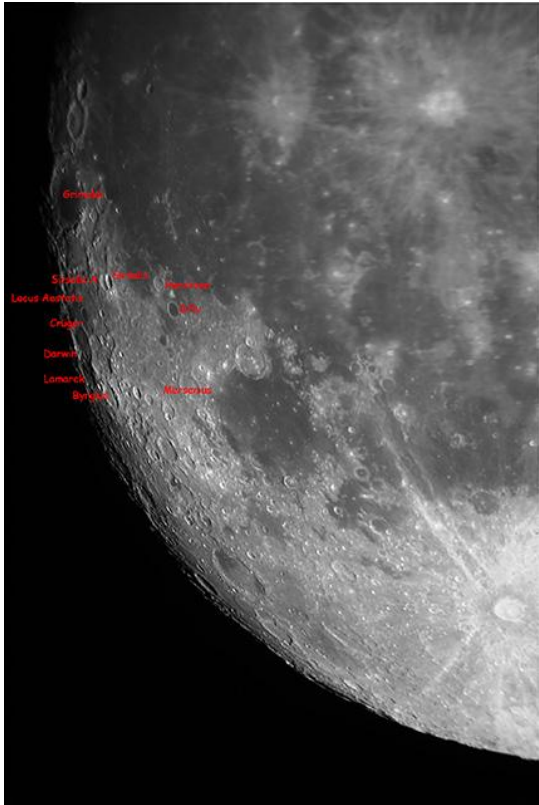
**Figure 1. Rimae Sirsalis, Jerry Hubbell, Locust Grove, VA.**  
01/07/2012 0017 UTC, 0.13-m refractor, 4x Televue Powermate,  
DMK21AU04 video camera, multiple stack/1000 frames, North:UP,  
East:RIGHT, Colongitude: 67.8 degrees, Transparency 8/10, Seeing  
4/5.



eventually ending up among the cracks in the floor of the crater Darwin. Along the way, it passes through craters, ranges of hills, and other small rilles.

**Figure 2. Rimae Sirsalis, Richard "Rik" Hill, Loudon Observatory, Tucson, AZ, 04/02/2015 0342 UTC,**  
TEC 8" f/20 Mak-Cas, SKYRIS 445M CCD Video  
Camera, 600/3,000 frames, Seeing 9/10, North:UP  
East:RIGHT

The following is a very good description and observation provided by Alberto Martos, Nieves del Río, José del Castillo, Eduardo Adarve, and Jorge Arranz. They are members of the Lunar Group of Madrid Amateur Astronomy Association (AAM).



Rimae Sirsalis is a system of rilles located close to the WSW limb of the lunar near side (Figure 3.).

What makes Rimae Sirsalis a target of interest that deserves attention by TLO is its geological environment. While most Moon

***Figure 3. WSW Limb of the Moon, Alberto Martos, et.al.***

clefts run along magmatic terrains, Rimae Sirsalis finds its way across the highlands. Besides stretching along these unusual surroundings, this system of rilles exhibits another odd characteristic: it is the origin of a strong magnetic field, uncovered during the epic Apollo times.

This magnetic field could be a remnant of a stronger magnetic field of global extent, believed to have embraced the Moon early after its birth, and that vanished as soon as the small nucleus of the Moon cooled down. In this case, the magnetic field located along Rimae Sirsalis might constitute “fossil” evidence of the old and more intense one.

Lunar geologists have explained the nature of the rille system as a geologic dike. That’s to say, it is a plume of lava that rose from the very hot lunar mantle toward the surface during the early geologic life of the Moon, without breaking through the crust. The molten rocks ejected in the form of lava along with the plume and solidified later underneath the crust, forming a laminar deposit of ground rocks (the dike) that presently conserve their ancient magnetization in some degree.

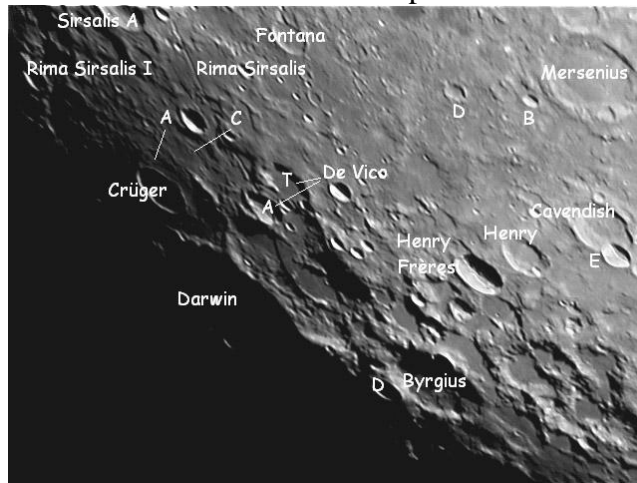
Another event, this time of exogenous origin, scorched the area of Rimae Sirsalis: the hard bombardment of extremely hot impact melts ejected from the excavation of the Mare Orientale basin. Those hot fragments landed here and there all over the area, forming viscous ponds of melts that flowed down hill along the rilles toward Oceanus Procellarum. So, the rille fed lava to the Ocean and did not drain it, as was previously thought. The drag of such heavy and hot materials along the rilles may have pushed the walls apart and polished them up to the high degree of parallelism and evenness that resembles the “wet paint” appearance that amazes us today when we observe the long cleft through our telescopes.

Contrary to the flow we have just described, Rima Sirsalis (the long rille) is said to start at the border of Oceanus Procellarum (Figure 4), very close to the small crater Sirsalis K (7 km). Initially, it runs for about 40 km WSW, until it reaches the “shores” of the Oceanus. From this point on, the cleft bends slightly toward SW and maintains this course for 290 km. Two small craters cut across the



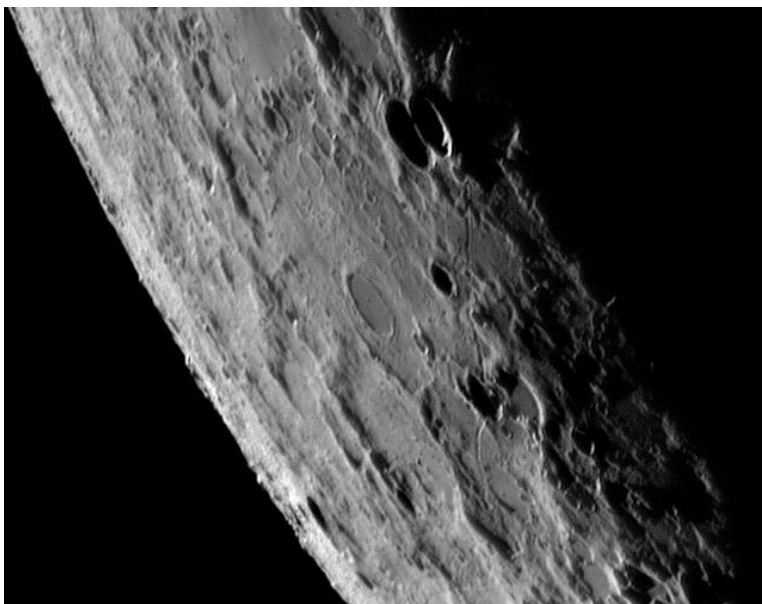
rille, Sirsalis F (13 km) and J (12 km), due South of Sirsalis (42 km), the crater that gives the rille its name. One wonders at how the cleft path can be seen through the whitish mound of soil piled up, on top of which sits crater J.

**Figure 4. Rimae Sirsalis at the border of Oceanus Procellarum.**  
Alberto Martos, et.al.



Past these two small craters, Rimae Sirsalis joins the short Rimae Sirsalis I (Figure 3), which branches toward the very old crater Sirsalis A (49 km) and subjacent to the younger crater Sirsalis. Then, the rille continues its way across a plain toward the rather rugged realm of crater Crüger (46 km). It looks as if it swirls a bit around the small crater Crüger C (12 km) before it plunges from a tall ravine into a depression leading to the very deep and very worn-out crater De Vico A (49 km). This old crater is cut in two pieces by the rille as it splashes downhill into the crater from the northern rim and comes out of the glaciis at the southern rim. Thereafter, the rille makes an ample bend SE, intersecting the ill-defined Rimae Darwin and approaches crater Byrgius (87 km), to come to an end near the small crater Byrgius P (19 km).

Some of the most interesting features of the region around Rimae Sirsalis can be seen by enlarging the images and taking a close look. This region is best viewed and imaged 3 days before full Moon, or a few days before new Moon in the early morning hours. (Figure 5) Additional insights can be obtained by loading an image of the region into the Lunar Terminator Visualization Tool (LTVT) and measuring the heights and sizes of the various objects in and around the region.



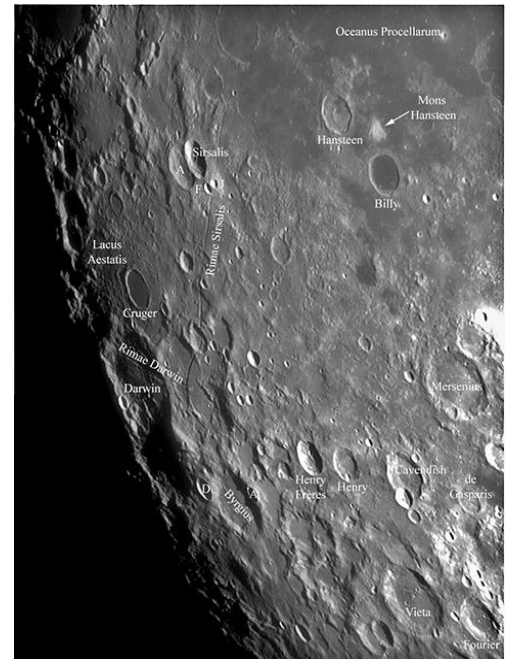
**Figure 5. Rimae Sirsalis,** Howard Eskildsen, Ocala, FL, 09/03/2013 1039 UTC, 6" f/8 refractor, 2x Barlow, IR, Vblock filters, DMK41AU02.AS CCD Video camera, Seeing 7/10, Transparency 6/6, North:UP, East:RIGHT

# ADDITIONAL RIMAE SIRSALIS OBSERVATIONS



**SIRSALIS** - Jay Albert, Lake Worth, Florida USA.  
April 22, 2005 03:30 UT. Seeing 8-9/10 Transparency 5/6. Nexstar 11GPS, 400x, no filter.

**SIRSALIS** - Howard Eskildsen, Ocala, Florida, USA. December 30, 2009 01:32 UT. Seeing 8/10, Transparency 4/6. Meade 6" f/8 refractor, 2x barlow, no filter, DMK 41AU02.AS.

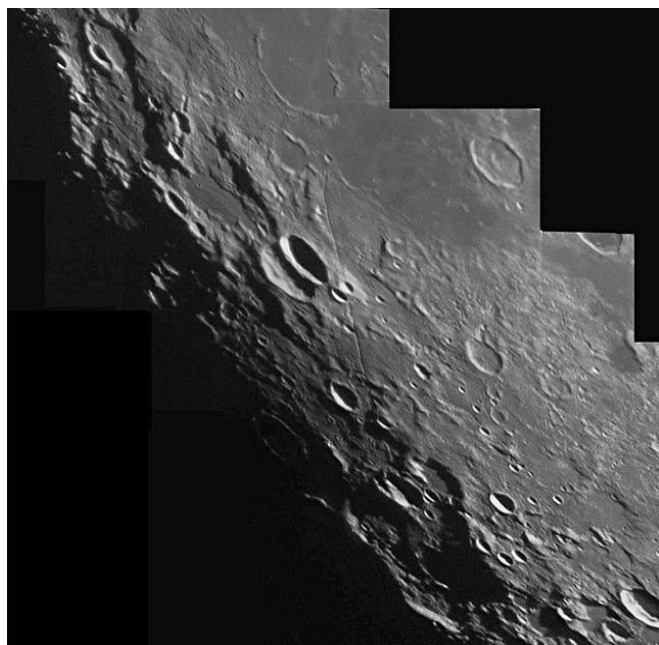
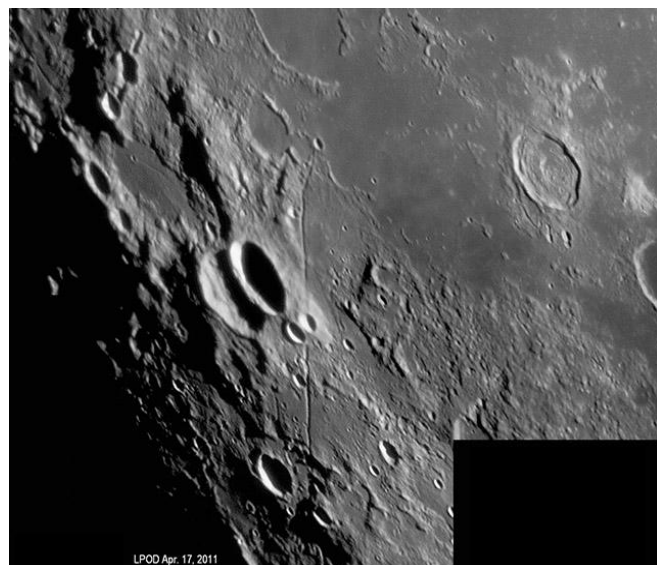


**SIRSALIS BASIN** - Howard Eskildsen, Ocala, Florida, USA.  
October 3, 2010 10:23 UT. Seeing 7/10, Transparency 4/6. 6" f/8 refractor-Explore Scientific lens, 2x barlow, W-8 yellow filter, DMK 41AU02.AS.



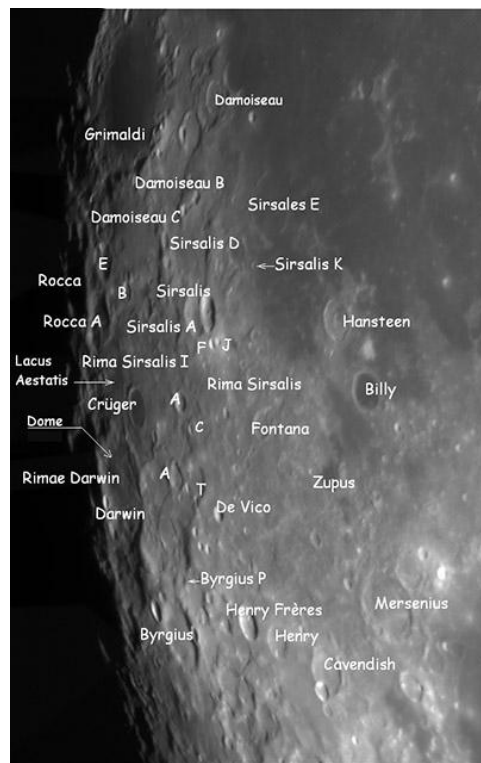
# ADDITIONAL RIMAE SIRSALIS OBSERVATIONS

**RIMAE SIRSALIS** – Richard Hill – Tucson, Arizona, USA February 16, 2011 04:59 UT. Seeing 8/10. C-14 SCT, 2x barlow (f/22), DMK 21AU04. UV/IR block filter.



**RIMAE SIRSALIS** – Richard Hill – Tucson, Arizona, USA May 4, 2012 05:19 UT. Seeing 7/10. TEC 8” Mak-Cass, DMK 21AU04. W-23 filter.

**RIMAE SIRSALIS.** - Alberto Martos, Nieves Del Río, José Del Castillo, Eduardo Adarve & Jorge Arranz – Madrid, Spain. April 2, 2015 23:00 UT. 20cm Newtonian reflector.



# LUNAR TOPOGRAPHICAL STUDIES

Coordinator – Wayne Bailey - [wayne.bailey@alpo-astronomy.org](mailto:wayne.bailey@alpo-astronomy.org)

Assistant Coordinator – William Dembowski - [dembowski@zone-vx.com](mailto:dembowski@zone-vx.com)

Assistant Coordinator – Jerry Hubbell – [jerry.hubbell@alpo-astronomy.org](mailto:jerry.hubbell@alpo-astronomy.org)

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

## OBSERVATIONS RECEIVED

JAY ALBERT – LAKE WORTH, FLORIDA, USA. Drawing of Sirsalis.

RAFAEL BENAVIDES – PORSADAS (CORDOBA), SPAIN. Digital images of Longomontanus & Moretus.

MAURICE COLLINS - PALMERSTON NORTH, NEW ZEALAND. Digital images of 5, 6, & 11 day Moon, Alexander, 5 day Earthshine, Gassendi, Posidonius, Sinus Iridum, & Theophilus(4).

HOWARD ESKILDSEN - OCALA, FLORIDA, USA. Digital images of Capuanus, Clavius, Copernicus-Eratosthenes, Kies, Rima Sirsalis & Sirsalis(3).

RICHARD HILL – TUCSON, ARIZONA, USA. Digital images of Cruger, Heraclitus & Rimae Sirsalis(3).

JERRY HUBBELL – LOCUST GROVE, VIRGINIA, USA. Digital image of Sirsalis.

ALBERTO MARTOS, NIEVES DEL RÍO, JOSÉ DEL CASTILLO, EDUARDO ADARVE & JORGE ARRANZ – MADRID, SPAIN. Digital images of Sirsalis(3).

FRANK MELILLO – HOLTSVILLE, NEW YORK, USA. Digital image of Ina.

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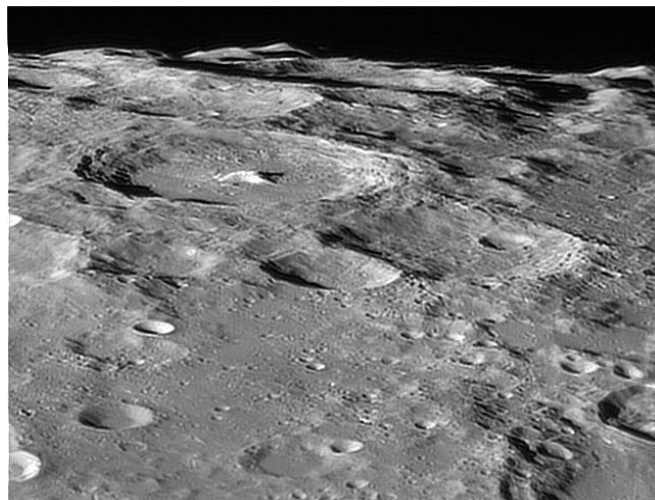
## RECENT TOPOGRAPHICAL OBSERVATIONS



**LONGOMONTANUS** - Rafael Benavides, Posadas (Córdoba), Spain March 1, 2015 21:32 UT. C-11, 2x barlow. Seeing 7/10, transparency 5/6. DMK21AU618. Baader IR pass filter.

## RECENT TOPOGRAPHICAL OBSERVATIONS

**MORETUS** - Rafael Benavides, Posadas (Córdoba), Spain March 1, 2015 21:35 UT. C-11, 2x barlow. Seeing 7/10, transparency 5/6. DMK21AU618. Baader IR pass filter.



**ALEXANDER** - Maurice Collins, Palmerston North, New Zealand. April 25, 2015 06:17 UT. FLT-110, f/21.

**EARTHSHINE** - Maurice Collins, Palmerston North, New Zealand. April 24, 2015 07:27 UT. FLT-110, f/21.





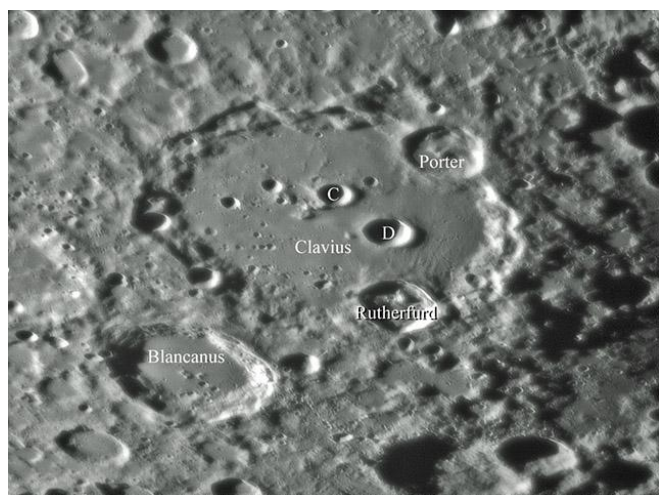
# RECENT TOPOGRAPHICAL OBSERVATIONS



**POSIDONIUS** - Maurice Collins, Palmerston North, New Zealand. April 24, 2015 07:41 UT. FLT-110, f/21.

## **CAPUANUS & PALUS EPIDEMIARUM**

Howard Eskildsen, Ocala, Florida, USA. April 11, 2015 11:24 UT. Seeing 9/10, Transparency 3/6. Mewlon 250, 1.4x barlow, W-25 red filter, DMK 41AU02.AS.



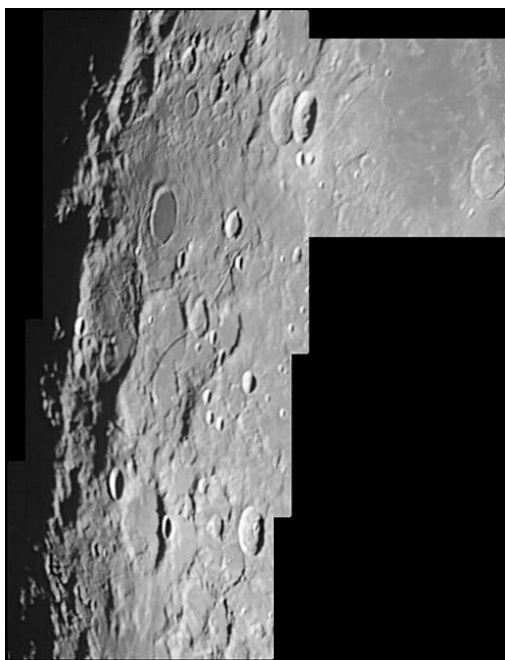
**CLAVIUS** - Howard Eskildsen, Ocala, Florida, USA. April 11, 2015 11:26 UT. Seeing 9/10, Transparency 3/6. Mewlon 250, 1.4x barlow, W-25 red filter, DMK 41AU02.AS.

# RECENT TOPOGRAPHICAL OBSERVATIONS

**KIES-MARE NUBIUM** - Howard Eskildsen, Ocala, Florida, USA. April 11, 2015 11:22 UT. Seeing 9/10, Transparency 3/6. Mewlon 250, 1.4x barlow, W-25 red filter, DMK 41AU02.AS.



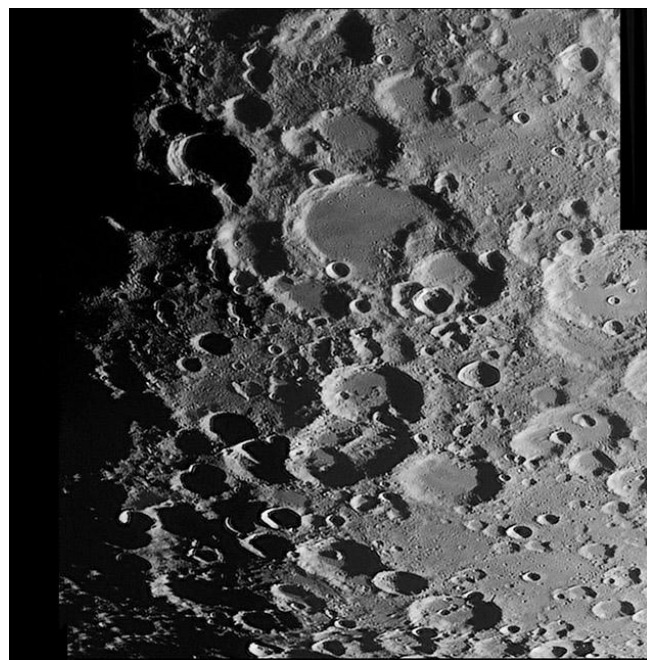
**CRUGER** – Richard Hill – Tucson, Arizona, USA September 25,, 2007 04:01 UT. Seeing 7/10. C-14, 1.6x barlow, SPC900NC. UV/IR blocking filter.



**HERACLITUS & STOFLE** – Richard Hill – Tucson, Arizona, USA March 38, 2015 03:00 UT. Seeing 9/10. TEC 8" f/20 Mak-Cass, SKYRIS 445M, 656.3 nm filter.

I had a very good night of 9/10 seeing on the 27/28th. This region caught my eye towards the end of the observing session mostly due to Heraclitus, the trilobite shaped crater. What was particularly eye-catching was the shadow on the floor of Heraclitus D. It formed a strong, stark crescent shadow, nearly a full circle. The mountain chain on the floor of the main crater was as always, striking. The large crater to the north is the great 129km Stofler, overlain to the lower right by Faraday which, in turn, is overlain by two very interesting irregularly shaped craters of 30-33km diameter.

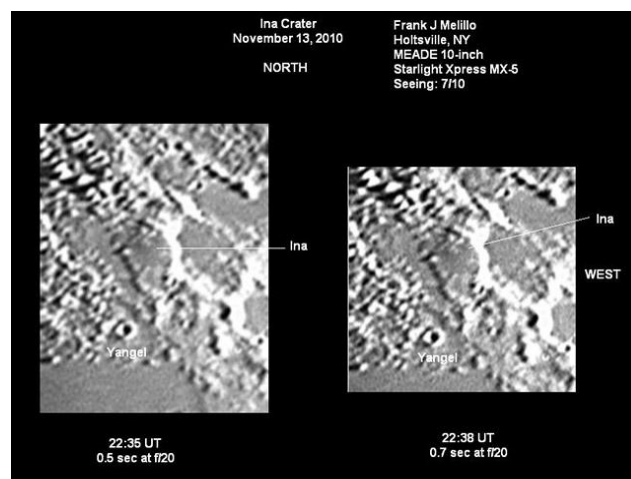
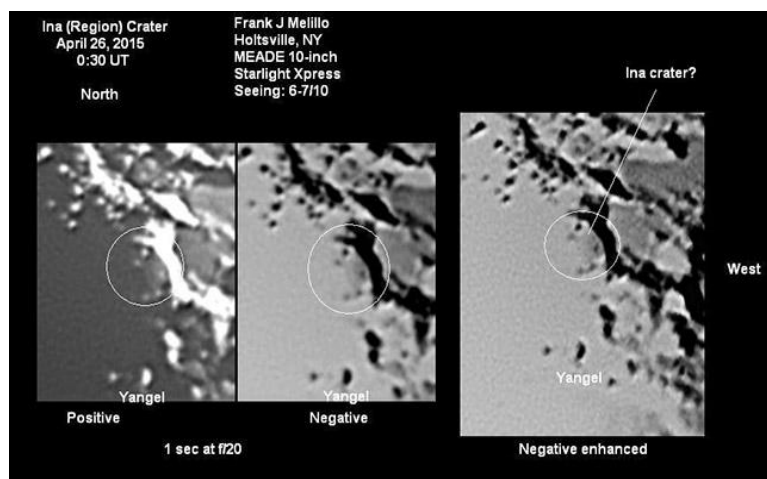
To the right of these is one of our old friends, Maurolycus with several well defined young craters on its floor. Then to the right of Heraclitus is Cuvier, appropriate to have France's first true paleontologist next to a trilobite shaped crater! Directly below Heraclitus with a well defined central peak casting a long shadow, is the 63km Lilus



At the top of the image is an unusual sideways teardrop shaped depression called Nonius. This is so interesting it may well be the subject of a future study. Just down and to the left, to the left of Stofler as well, is the shadow filled Miller, looking very deep in this lighting. Note that the whole area of this two image montage is peppered with 1-3 km secondary craterlets. A very busy selenoscape!



# RECENT TOPOGRAPHICAL OBSERVATIONS



**INA** - Frank Melillo, Holtsville, NY, USA. Meade 10", Starlight Express MX-5. Left panel: April 26, 2015 00:30 UT. Seeing 6-7/10. Right panel: November 13, 2010 00:45 UT. Seeing 7/10.

Last night, I was looking for a Lunar X on the terminator. Somehow I wasn't too sure where it was. But I came across a possible sighting of Ina crater (left panel). It was just about sunrise where Ina crater (region) was located. Even though the condition was good, I think it was a bit too early to capture it clearly. The next night, it probably would be faintly visible. I had captured Ina Crater in 2010 (right panel & TLO October 2010). You can see the difference when Ina was more illuminated.

# **LUNAR TRANSIENT PHENOMENA**

**Coordinator – Dr. Anthony Cook – [atc@aber.ac.uk](mailto:atc@aber.ac.uk)**

**Assistant Coordinator – David O. Darling - [DOD121252@aol.com](mailto:DOD121252@aol.com)**

## **LTP NEWSLETTER – MAY 2015**

**Dr. Anthony Cook – Coordinator**

Observations from the following observers were received in March: Jay Albert (Lake Worth, FL, USA - ALPO) observed: Aristarchus, Herodotus, Mare Humorum, Plato, Ross D, Torricelli B, and Tycho. Kevin Berwick (Ireland, ALPO) observed Mons Pico. Thomas Bianchi (Italy, UAI) imaged: Copernicus and Petavius. Maurice Collins (New Zealand, ALPO) imaged: Aristarchus, Gassendi, Tycho, Langrenus, Mare Crisium, Mare Humboldtianum, Mare Orientale, Mare Smythii, Marius, Rupes Altai, Schickard, Sinus Iridum, Sinus Roris, and also made some whole Moon image mosaics. Alexandra Cook (Newtown, UK) imaged the solar eclipse. Anthony Cook (Newtown, UK – BAA) imaged several features, videoed Earthshine, and imaged the solar eclipse. Marie Cook (Mundesley, UK – BAA) observed Alphonsus, Aristarchus, Cavendish, Gassendi, Plato, Proclus, Schickard, and Torricelli B. Brian Halls (Lancing, UK, BAA) imaged Alphonsus, Gassendi, and Picard. Rik Hill (Tucson, AZ, USA) imaged Heraclitus, and Triesnecker. Alun Jones (Aberystwyth University, UK) imaged the solar eclipse. Brendan Shaw (UK, BAA) imaged Aristarchus, Langrenus, Mons Piton, Oenopides, Schickard, and Torricelli B. Franco Taccogna (Italy, UAI) imaged Archimedes, Copernicus, and Proclus. Ivor Walton (Cranbrook, UK, CADSAS) imaged Torricelli. Paul Zeller (Indianapolis, IN, USA, ALPO) observed several features.



**Figure 1.** Walter Haas (Left) visiting veteran British planetary observer, Alan Heath (Right) at Alan Heath's observatory, on 2004 Jun 13<sup>th</sup>, near Nottingham.

**News:** It is with great sadness that I learnt of the passing of Walter Haas (1917-2015), whom most of us will remember as the founder of ALPO. I met Walter at a meeting in Nottinghamshire in 2004, but upon checking some archive audio tapes, it seems that I had met him, and his wife Peggy, many years earlier, during lunch amongst astronomers, when I visited New Mexico State University in Las Cruces in 1987. Walter was a key person who encouraged me to take on the running of the LTP section at ALPO, and was, despite his age, still able to submit routine observations right up until 2003. He kick started modern interest in attempting to observe changes on the Moon with the famous paper: “Does Anything Ever Happen on the Moon”, which was published in the Journal of the Royal Astronomical Society of Canada in 1942 (<http://adsabs.harvard.edu/full/1942JRASC..36..237H>). He had even made 47 observations of LTP himself, and you can attempt to observe what the normal appearances of these features should have been like when you see his name crop up in the repeat illumination predictions (see web link at the foot of this newsletter). Walter also encouraged amateurs to work together simultaneously to look for evidence of impact flashes/flares at the Moon, many decades before the modern video impact flash era – a true pioneer in every sense. In the last few years he donated his entire personal collection of the ALPO journals to the BAA, a fascinating resource as you can often see some scrawled corrections/comments about some of the articles.



**Figure 2.** Pictures courtesy of NHK and Kevin Kilburn. **(Top)** Tony Cook with film crew and Reina Shimizu, on freezing cold day, on location at Aberystwyth Castle. **(Bottom)** Kevin Kilburn with Yoshinori Tsutsui (producer) and the film crew at Manchester Astronomical Society Observatory.

Also I learnt from Alexandre Amorim, that another key LTP expert, Ronaldo Rogerio de Freitas Mourao, passed away in 2014. Mourao organized Brazilian amateur astronomers during the Apollo watch era 1968-1972.

The Japanese TV company, NHK, produced a 52 minute documentary about LTP for their Cosmic Front Science series. It was shown on the NHK Space Cable network, on 2015 April 9<sup>th</sup> in Japan (see [http://www.nhk.or.jp/space/info/cfn\\_moon.html](http://www.nhk.or.jp/space/info/cfn_moon.html) for some animations – albeit overly exaggerated for a TV audience). I was involved in about three days of filming here in Aberystwyth, and Kevin Kilburn, of the Manchester Astronomical Society was also involved with showing them a telegram received from NASA during the Apollo 11 mission, concerning LTP reports of glows seen in Aristarchus crater. Several ALPO, BAA, and UAI members contributed images to this program, and these were acknowledged at the end of the video recording. If I hear about it being re-broadcast on NHK World, which can be received by satellite or cable internationally, then I will let you know.

The changes to the LTP program that I mentioned last month, will start to be implemented from June onwards – as you can understand it takes time to make changes. But as a taster, please check this web site in the next few days ([http://users.aber.ac.uk/atc/tlp/spot\\_the\\_difference.htm](http://users.aber.ac.uk/atc/tlp/spot_the_difference.htm) ).

**LTP Reports:** Two reports for March, were covered last month, but I will repeat them again here in case they jog a memory:

Aristarchus: 2015 Mar 03 UT23:38 Brendan Shaw (UK – BAA) whilst looking at the Moon on his computer screen, in between imaging the crater, noticed a flash on the NW rim of Aristarchus when his camera had an IR pass band filter in place . The seeing was not very good at the time – so it was either a bright small craterlet just coming into view, during a brief moment of good seeing, or it was more likely a cosmic ray air shower decay particle impinging on the camera chip. Either way, it is worth checking under the same illumination conditions in future, and so I shall assign this report weight of 1.

Moon: 2015 March 08 UT 01:25-01:30 Alex Abbinante (Ames, Iowa) saw, with the naked eye, a dark line move across the Moon very slowly. After some email correspondence with him, I think we came (or were coming to) a similar conclusion, that because the Moon was very low down, and there is a large atmospheric path length between him and the Moon, that it probably was an aircraft contrail. I have both seen, and videoed, these on a number of occasions. They can be quite spectacular, but are clearly not really lunar related. This has received a weight of 0. Paul Zeller was observing a lot later at 06:15-07:25UT, but reported nothing unusual.

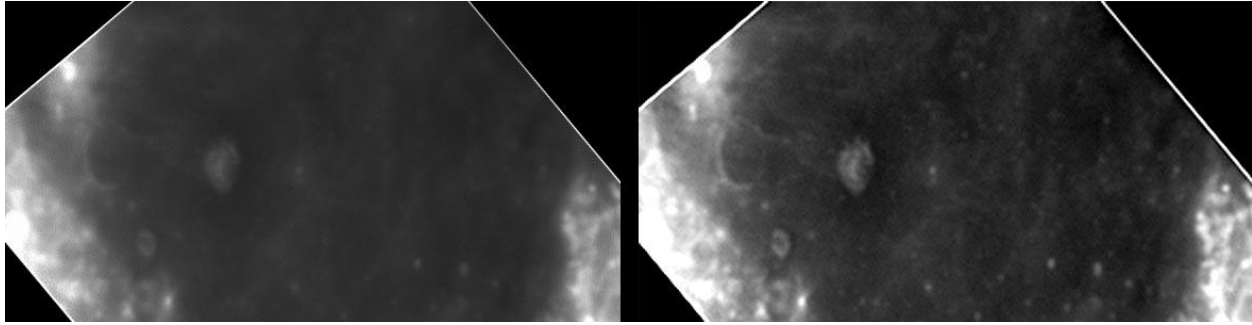
**Routine Reports:** Below is a selection of reports received for March that can help to re-assess past LTP observations. As you can see some of these old LTP reports we can solve, but remain a puzzle. Of those that remain a puzzle, we may drop some of these from the list of scheduled observations if it looks unlikely that repeat illumination observation will help explain them. Some are low weight anyway, and so do not matter.

**East of Picard:** On 2014 Mar 2 Brian Halls (BAA) observed and imaged (see Fig 3) this area under the same illumination and topocentric libration to a Patrick Moore and Richard Baum's LTP seen in 1948:

*E. of Picard 1948 Aug 16/17 UTC 22:30-02:26 Observed by Moore & Baum (Chester, UK) described in NASA catalog as: "2 areas E. of Picard appeared featureless. Cloud-like patches, 12(?) inch reflector. NASA catalog weight=4. NASA catalog ID No. #509. ALPO/BAA weight=3.*

Brian was using a 6" f/8 Achromat under seeing III conditions and made both visual and a CCD observation. Brian commented that the only featureless patch east of Picard was the bright patch on the mare floor of Crisium, that which surrounds the small crater Curtis. He checked this area several times during that observing night. Brian's images show no sign of two cloud-like patches east of Picard, just Curtis, and even that is not very cloud-like - when the image is sharpened. Therefore this Moore and Baum observation remains a puzzle, because what they should have seen is shown in Fig 1, but they reported something quite different. Therefore I shall keep the weight at 3 for now, and will consider raising it to a 4 if more details of the original observations could be found confirming the original description given in the Cameron catalog.





**Figure 3.** Image by Brian Halls of the Mare Crisium interior, orientated with north towards the top taken on 2015 Mar 02 UT19:40. **(Left)** Image taken showing a hazy smudge just left of centre. **(Right)** The hazy smudge is clearly resolved into Curtis crater in this high pass filtered (sharpened) version of the same area.

**Herodotus:** On 2015 Mar 03 UT 02:20-03:35 Jay Albert observed the Aristarchus area under similar illumination to [Peter Grego's observation of a peak](#) on the southern floor of this crater, exhibiting a shadow:

*Herodotus 1985 May 31 UT 20:20-21:00 Observed by Grego (Birmingham, UK, 175mm refractor) "Sketch shows a pseudo-peak with shadow in the southern half of the crater's floor - there should be no peak on the floor of Herodotus. There is a light spot here but there should be no shadow." ALPO/BAA weight=2.*

Jay was using a Celestron C11 SCT and the Moon was high - it was mostly clear, but hazy with no breeze, transparency was 3<sup>rd</sup> magnitude and seeing went from 7/10 to 6/10. Jay noticed the light spot on the floor, south east of the crater centre, and commented that the “*black shadow*” touching the E edge of the light spot appeared to be the shadow of the E wall. There was a faint hint of grey shadow (marginally darker than the surrounding crater floor) on the western edge of the light spot. The light spot appeared to be a slight, rounded elevation or bulge in the crater floor. Jay had seen this light spot with barely perceptible grey shadow before, and believes this appearance may be normal for this solar angle. I concur and remember a GLR study by Raffaello Lena which also found a similar effect here. We have been doing repeat illumination studies of this southern pseudo peak effect for some time now, and with similar results – it is predictable. I will therefore reduce the weight from 2 to 0, and declare this to be a LTP no longer, just the normal appearance of a white spot on the SE corner of this crater.

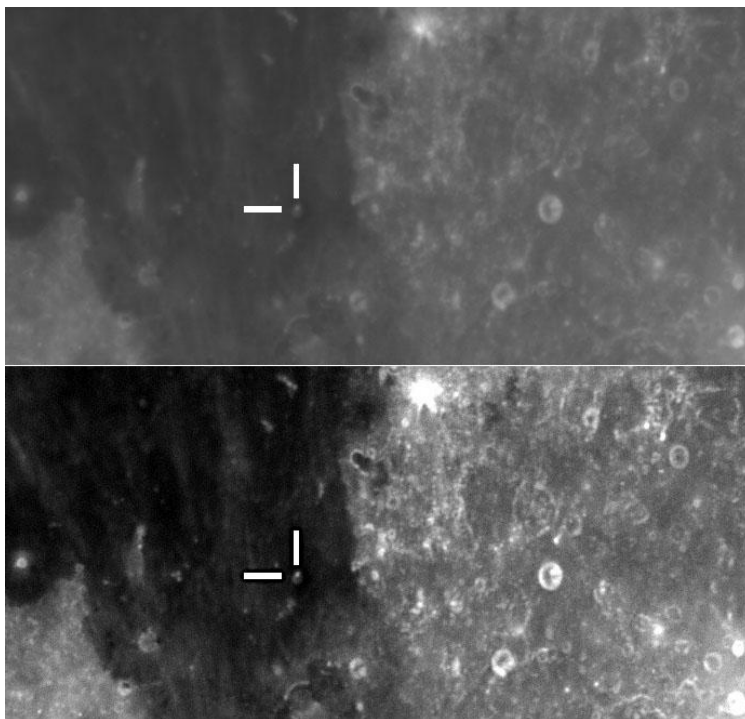
**Torricelli B:** On 2015 Mar 03 UT 22:20-22:25 and 22:32 Marie Cook observed, and Brendan Shaw imaged (see Fig 4) this crater under the same illumination conditions to the following 1985 LTP:

*On 1985 Jul 01 at 02:00-03:00 UT K. Marshall (Medellin, Columbia) observed that Torricelli B was very bright - verified using a C.E.D. No color was seen though. The Cameron 2006 catalog ID=279 and the weight=4. The ALPO/BAA weight=2.*

Brendan's image clearly shows Torricelli B as not especially bright, even after I sharpened and contrast stretched it. The appearance is backed up by Marie Cook's observation, made with a 90mm Questar, x80-130 under Antoniadi III seeing and moderate to poor transparency, where she commented that the crater “*looked dull*”, though local cloud was gathering above her site at this point. We have had plenty of repeat illumination/libration observations of this crater, and the fact that the 2015 Mar 03 observation is repeat illumination only, makes me think it odd that Kevin Marshall, who measured it with a C.E.D. instrument in 1985, reported it bright. Therefore I will raise the weight of this LTP report to a 3.

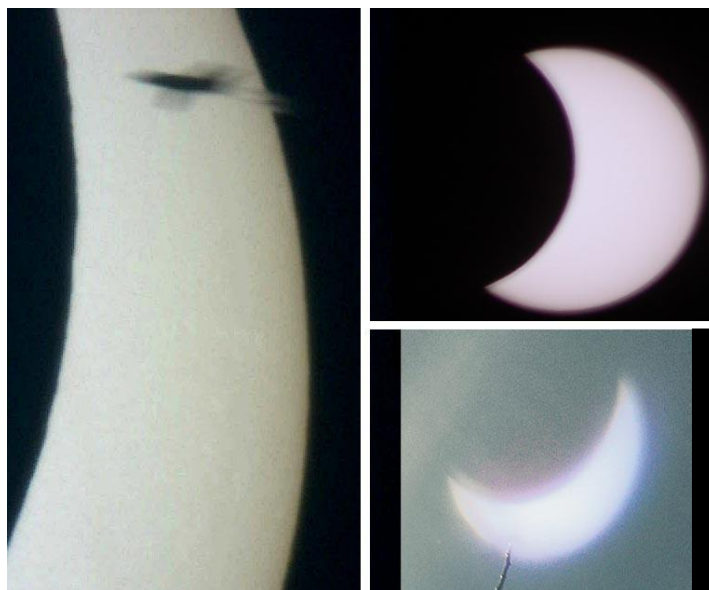
**Solar Eclipse:** On 2014 Mar 20 many observers in the UK tried to capture the partial Solar Eclipse – but were thwarted by thick cloud, but for once the Welsh sky was mostly clear. There are a small number of LTP that have been reported during solar eclipses – most concern the Astronomer Royal, Edmund Halley e.g. on 1715 May 03 there was an account of “lightening on the face of the Moon” observed by de Louville (France) and Edmund Halley (UK). We suspect strongly now that these may have been misinterpretations of solar flares and





**Figure 4** The area around Torricelli B (marked by indicator bars) as imaged by Brendan Shaw on 2015 Mar 03 UT 23:32, with north towards the top. **(Top)** Image submitted by Brendan Shaw. **(Bottom)** same image but high pass filtered and contrast stretched.

Bailey's Beads. As you can see from Fig 5, the only unusual thing visible during this eclipse was a very fast moving military jet that I just caught, along the line of sight, passing across the disk of the Sun!

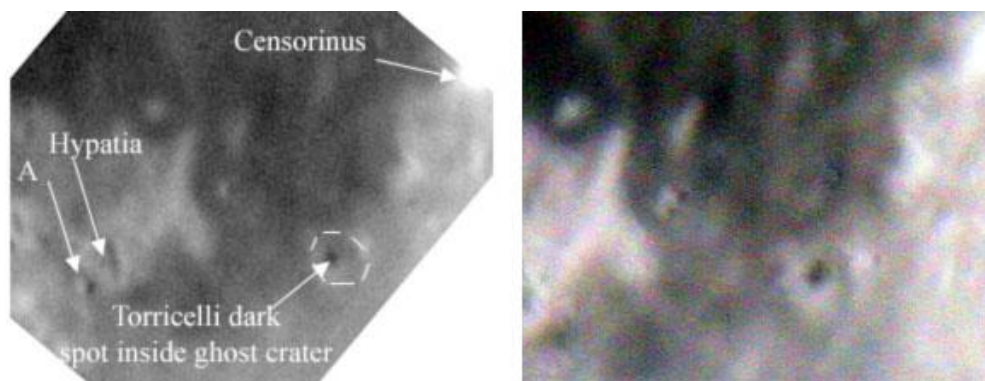


**Figure 5.** Partial Solar Eclipse as imaged from the U.K. – note that no UTs are given, and north maybe in different directions between images. **(Left)** By Tony Cook (Newtown) taken through an 8" reflector with double layered solar aluminized solar filter over the front of the telescope. **(Top Right)** By Alun Jones (Aberystwyth University). **(Bottom Right)** A hand held digital camera view by Sasha Cook (Newtown).

**Torricelli:** On 2015 Mar 27 UT 20:49 Ivor Walton (CADSAS) imaged this region under the same illumination and topocentric libration conditions (to within  $\pm 1^\circ$ ) to a LTP seen on 2003 Nov 1 by Marie Cook, and videoed by myself.:

*Torricelli area 2003 Nov 01 UT 17:45-19:59 Observed by M. Cook (Mundesley, UK, 90mm Questar Cat. x80, Seeing III, Transparency Very Poor) and A. Cook (Long Eaton, UK, 20cm Newtonian + CCD camera + 3x Barlow). "At 17:45 UT M. Cook noticed an extremely dark, dense, circular area with a ghost type crater surrounding it. It lay in the Mare Tranquilitatis - not easy to identify the region. A. Cook observed with a CCD camera (seeing V) and commented that: as the feature concerned was probably Torricelli and that as the sun was 29 deg above the horizon at this crater, it seemed strange that most of the floor appeared dark (perhaps in shadow?), although this could be due to small scale steep topography making the area look dark from lots of local shadow. Other nearby craters did not appear to have such dark shadows." Note it is possible that this may have been the shadow of the west rim of Torricelli casting a shadow? BAA Lunar Section observation. ALPO/BAA weight=1.*

Now this 2003 report, has been considered to be probably normal surface appearance, but looked odd at the time, hence why it has retained a weight of 1 up until now – just in case. However now we have Ivor's image, at the same illumination, and libration, and it looks very similar – see Fig 6. Therefore I am really very happy to remove this from the LTP catalog, by assigning a weight of 0. You can see though why it caused some interest back in 2003, because Torricelli is a flattish crater, and one would not expect a shadow like appearance here when the Sun is  $29^\circ$  above the local horizon. It was even more impressively odd in appearance when seen visually.



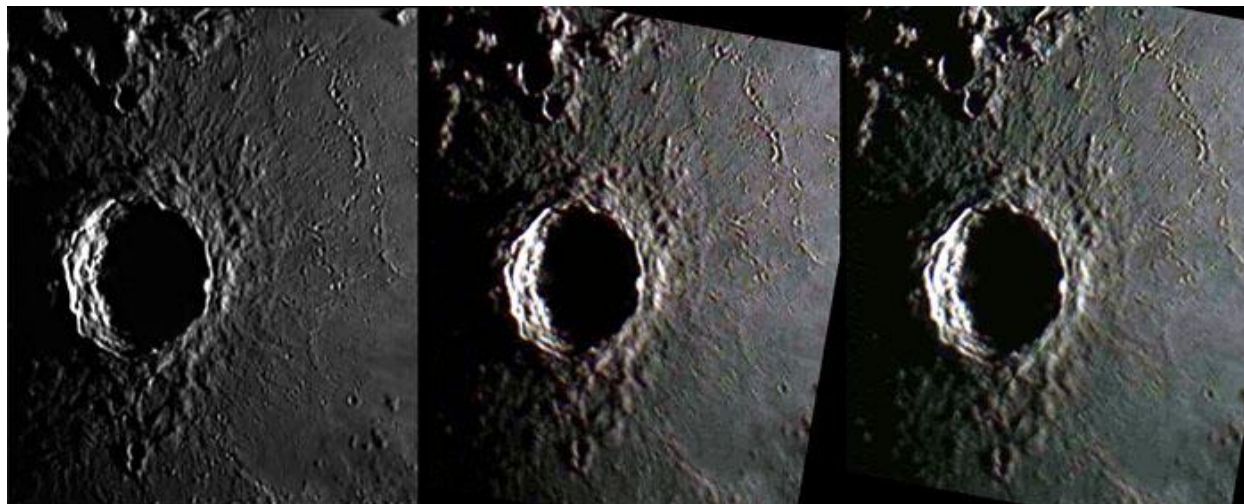
**Figure 6.** Torricelli with north towards the top. **(Left)** A frame from the video taken myself on 2003 Nov 01. **(Right)** A color image taken by Ivor Walton on 2015 Mar 27.

**Copernicus:** On 2015 Mar 29 UT 17:28-17:49 both Franco Taccogna (UAI) and Thomas Bianchi (UAI) imaged (Fig 7) Copernicus under the same illumination conditions, to within  $\pm 0.5^\circ$ , to the following LTP report from 1932:

*Copernicus 1932 Mar 16 UT 18:45-19:30 Observed by Barker (Cheshunt, England, 12.5" reflector, x310) "Term. from Cop. to lat. 20S was misty & hard to define. The terminator beyond this latitude zone was its usual sharp definition. Mistiness cleared at 1930. Cleaned his eyepiece & prism but it persisted. The night was clear without any trace of cloud in the sky" NASA catalog weight=3. NASA catalog ID #402. ALPO/BAA weight=2.*

The images taken by Thomas and Franco quite clearly show that for the illumination conditions seen in Barker's 1932 observation, there clearly should not have been any mistiness in the vicinity of Copernicus, or south of it. The only thing I can think of is that it might have been something like an aircraft contrail passing across the Moon and causing localized seeing blur, however this would not account for the 45 min duration of the event seen by Barker in 1932. On the other hand if the event was lunar in origin, then this is an enormous area to explain by current explanations for LTP, namely  $\sim 900$  km in length. So we have an unexplained

observation here, but I will not increase the weight to a 3 as it is difficult to explain by current lunar processes we know about.

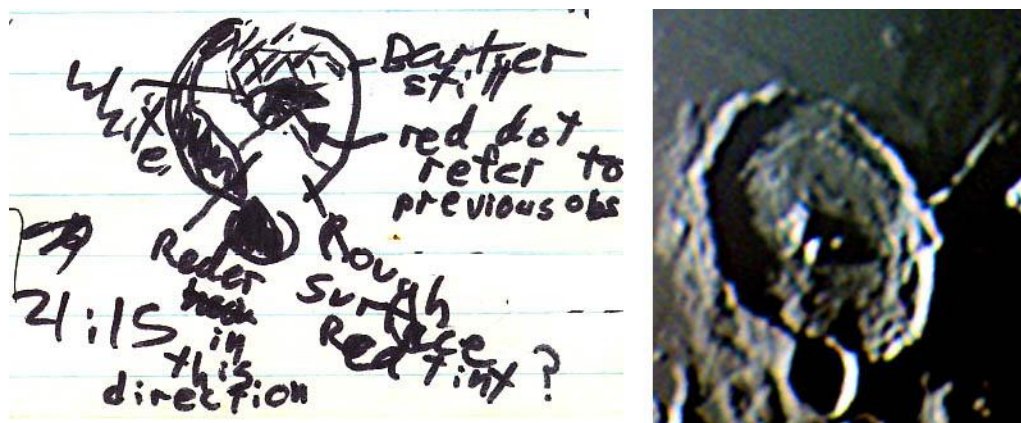


**Figure 7.** Copernicus with north towards the top as imaged on 2015 Mar 29.. **(Left)** Monochrome image by Thomas Bianchi (UAI) taken at UT 17:34. **(Centre)** Color image by Franco Taccogna (UAI) taken at 17:39. **(Right)** Color image by Franco Taccogna (UAI) taken at 17:47.

**Gassendi:** On 2015 Mar 31 UT 09:23 Maurice Collins (ALPO) imaged (Fig 8) Gassendi under the same illumination conditions to a couple of LTP seen in 1966 and 1977 respectively:

*Gassendi 1966 May 30 UT 20:32-20:59 Observed by Sartory (England, 8.5" reflector + filters) "SW wall blink - Orange patch & obscuration -- detected by Eng. moon blink system. Color seen visually." NASA catalog weight=4. NASA catalog ID #941. ALPO/BAA weight=3.*

*Gassendi 1977 Sep 23 UTC 21:15 Observed by Cook (Frimley, England, 6" reflector x144, Seeing IV (Antoniadi)) "Prominent red dot seen at central peak, also a hint of red on floor in N. quadrant of crater. More likely to be spurious color than LTP the observer feels". ALPO/BAA weight=1.*



**Figure 8.** Gassendi, orientated with south towards the top. **(Left)** Sketch by myself, made in 1977 Sep 23 UT 21:05. **(Right)** Image taken by Maurice Collins on 2015 Mar 31 UT 09:23.

Maurice's image appears very similar to my rough sketch, but does not show the colors I saw in 1977, but observing conditions were pretty poor then and my observation had a weight of 1. It does not show any of the Sartory reported colors either. It would seem appropriate to leave the weights as they are, but it may be worth trying again with repeat illumination imagery, and especially visual observations with similar instruments.



**Pico B:** On 2015 Mar 31 UT 23:30-23:53 Kevin Berwick (ALPO, using a TV101 4 inch APO, Nagler zoom at 3 mm, 180X) observed the Mons area under similar illumination to the following LTP report from 1934:

*In 1934 Feb 25 at UT 18:30 Rawstron (USA?, 4" refractor, x250, S=6/12) observed in Pico B: "A large patch of haze appeared & drifted off across the mare in same direction as haze from Pico (white patch). It was obs. on 20 other occasions. Drawing". The Cameron 1978 catalog ID=410 and weight=3. The ALPO/BAA weight=2.*

Kevin commented that he looked at this region throughout the observing period and saw nothing unusual and certainly no haze effect. Alas the summary of the Rawstron observation, from the Cameron Catalog, does not give any information about the speed of the drifting haze, nor exactly what the observer meant by “*It was obs. On 20 other occasions*”? – on the same day?? – over what UT range??? The reference for the original 1934 observation comes from Popular Astronomy (1934) Vol 34, p 291 – which unfortunately I do not have a copy of – does anybody have this? Therefore I will leave this LTP at a weight of 2 for now.

**Suggested Features to observe in May:** For repeat illumination (and a few repeat libration) LTP predictions for the coming month, these can be found on the following web site: <http://users.aber.ac.uk/atc/tlp/tlp.htm>. By re-observing and submitting your observations, we will get a clear understanding of what the feature ought to have looked like at the time. Only this way can we really fully analyze past LTP reports.

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, firstly read the LTP checklist on <http://users.aber.ac.uk/atc/alpo/ltp.htm>, and if this does not explain what you are seeing, 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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## KEY TO IMAGES IN THIS ISSUE

1. Alexander
2. Aristarchus
3. Capuanus
4. Clavius
5. Copernicus
6. Cruger
7. Gassendi
8. Heraclitus
9. Herodotus
10. Ina
11. Kies
12. Longomontanus
13. Mons Pico
14. Moretus
15. Picard
16. Posidonius
17. Torricelli
18. Turner

### FOCUS ON targets

X = Rimae Sirsalis

Y = Mare

Tranquillitatis

