THE BRITISH ASTRONOMICAL ASSOCIATION

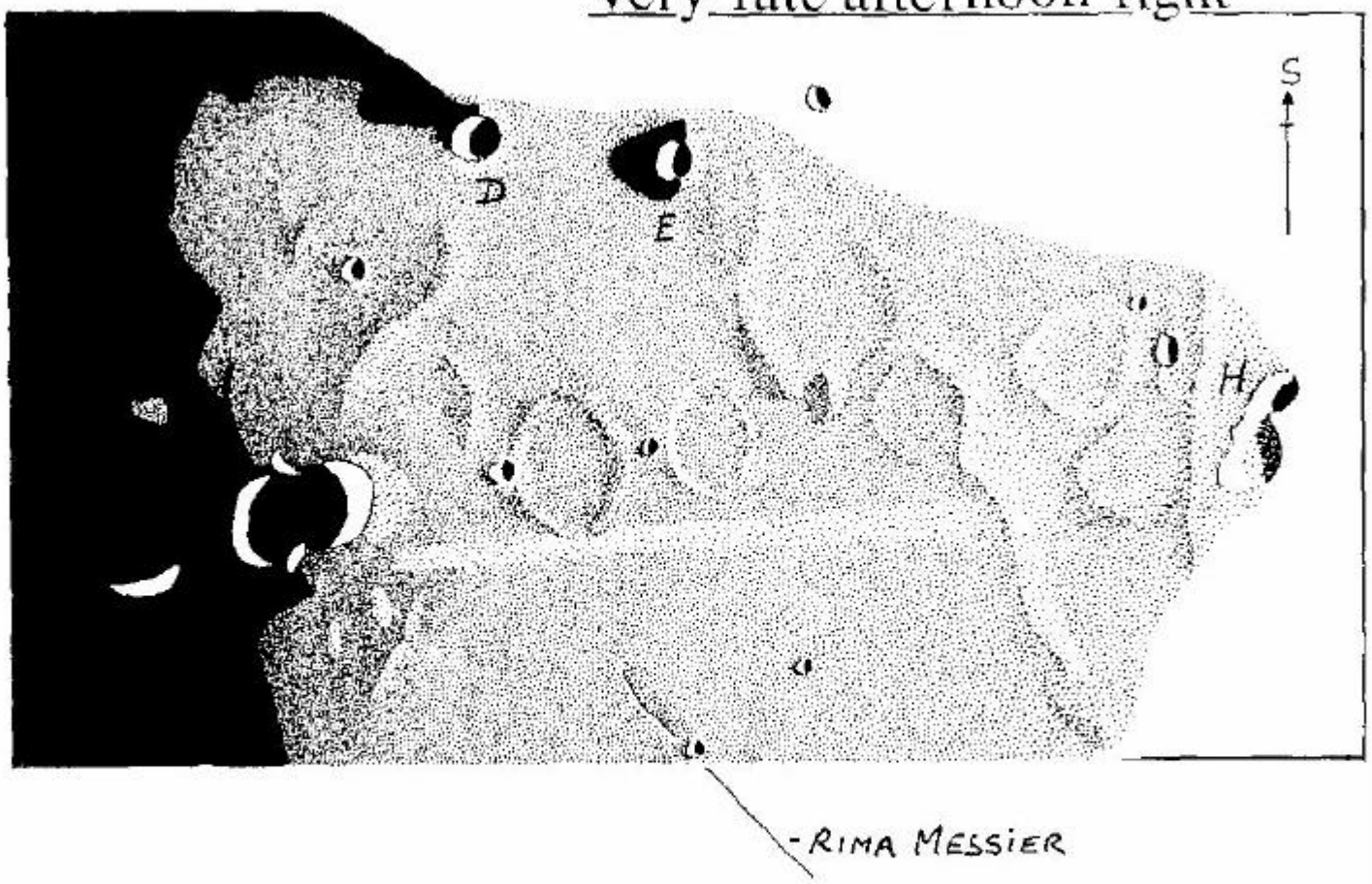
LUNAR SECTION CIRCULAR

Director Alan Wells
Assistant Director/Editor John Pedler

Volume 43 No.11 | Data on pages 7-8 are for Dec. 2006 | Lunations 1038/1039 | Nov. 2006

The Messier Craters

Very late afternoon light



OBSERVATION BY PHIL MORGAN. 2006 SEPTEMBER 11 d

305mm f5 NEWTONIAN X400 04·55 to 05·30 U.T.

SEEING 8/10 TRANSP. 4/5 SUN'S COL 132°·26 to 132°·55

The Goodacre Ghost Rings — Phil Morgan

This follows the recent observations by myself of the Messier Craters (see LSC May 2006) and the associated ghost rings discovered by Walter Goodacre. My latest observation, shown above was made under very late afternoon lighting on the 11th Sept., and shows all five ghost rings mentioned by him. In fact, only four could be clearly detected, but had the observation continued for another couple of hours then maybe the other one could have been seen.

As can be seen, only a segment of Messier's north rampart was left catching the last of the lunar evening light, whilst interestingly, only the northern ray could be seen. No trace of the southern one could be detected.

In the 9th Lunar Memoir Goodacre wrote "...the course of the rays covers the site of five obscure crater-rings, which have been reduced by erosion or other action almost to a state of obliteration. One crater shows the remains of a central peak...These obscure crater-rings are only visible under certain conditions of phases, when they are not very difficult to see."

Because these rings are lying (mostly) within the rays, Goodacre believed that the rays marked the site of two converging fault lines and the craters had formed a chain that had migrated along and inside them over a great period of time. This would,of course. Explain the odd shape of Messier. It was not an impact crater, but was of internal origin and had simply had its north-south axis limited to two deep seated faults in the lunar crust.

CLOUDWATCH — Andrew Bytnar

Tabulated data for September 2006

Observer and location	Excellent *days*	Cloudy *days*	Overcast *days*	Hazy *days*	No watch *days*
P.Burt (Chatham)	8 (27%)	4 (13%)	17 (57%)	0 (0%)	1 (3%)
A.Bytnar (Mansfield)	7 (23%)	6 (20%)	14 (47%)	3 (10%)	-----
M.Cook (Cromer)	8 (27%)	11 (37%)	9½ (32%)	1½ (5%)	-----
K.Hall (Warrington)	9½ (32%)	12 (40%)	8½ (28%)	0 (0%)	-----
A.Heath (Nottingham)	6 (20%)	10 (33%)	14 (47%)	0 (0%)	-----
J.Wrigley (Reading)	5 (17%)	8 (27%)	16½ (55%)	0½ (2%)	-----

Predictions for 52°27'41.4"N 1°44'44.0"W (Birmingham) – December 2006

Day	Time-UT H	M	S	D	P	Object Reference	O V	Max Mag	Sp	% Snlt	Elg Alt	Sn	Mn Alt	Mn Az	CA	PA	Watts Angle	a Min/°	b	Star's RA	apparent Dec
3/18	35	55		DT	PPM	92534	97	6.1	G5	98+	164		35	97	63N	64	78	-.2	1.4	32852.3	224952
4/03	02	44		DV	PPM	92803	96	5.4	B5	99+	167		37	262	31N	38	50	-.7	.3	34514.4	241850
ABOVE OCCULTATION CLOSE TO SMOOTH-MOON TERMINATOR																					
4/02	52	43		DU	FK5	136	99	3.8	B5P	99+	167		38	260	71N	78	91	-.5	-.7	34518.7	240817
4/03	35	03		DX	PPM	92841	96	4.0	B5	99+	167		32	269	18N	27	39	-.8	.7	34615.8	242332
ABOVE OCCULTATION CLOSE TO SMOOTH-MOON TERMINATOR																					
4/03	38	54		D	PPM	92859	99	4.2	B5	99+	167		31	269	56S	132	144	.0	-2.3	34645.7	235822
4/03	37	48		DK	PPM	92863	95	7.0	A0	99+	167		32	269	54N	62	75	-.5	-.5	34653.5	241646
4/03	43	21		D	M	45	99	1.6		99+	167		31	270	86N	94	107	-.3	-1.2	34714.2	240828
ABOVE PREDICTION IS FOR CENTRE OF GALACTIC NEBULAR OBJECT - DURATION ~141.9 MIN																					
4/04	40	33		R	M	45	98	1.6		99+	167		22	281	-59S	248	260	-.2	-.7	34714.2	240828
ABOVE PREDICTION IS FOR CENTRE OF GALACTIC NEBULAR OBJECT - DURATION ~141.9 MIN																					
4/03	57	44		DU	PPM	92888	96	6.3	A0	99+	167		29	273	89S	99	111	-.2	-1.3	34747.2	240826
4/04	01	28		DK	FK5	139	99	3.0	B5P	99+	167		28	274	86S	103	115	-.2	-1.4	34755.3	240746
4/04	55	14		RK	FK5	139	95	3.0	B5P	99+	167		20	284	-52S	240	252	-.2	-.6	34755.3	240746
4/04	04	00		DU	PPM	92899	95	6.8	B9	99+	167		28	274	55N	64	76	-.4	-.6	34755.6	241845
4/04	30	14		DX	PPM	92921	95	6.6	A0	99+	168		24	279	49N	59	71	-.3	-.6	34856.3	242211
ABOVE OCCULTATION CLOSE TO SMOOTH-MOON TERMINATOR																					
4/04	49	18		DU	FK5	142	99	3.8	B8	99+	168		21	282	58S	131	144	.3	-2.2	34935.9	240439
ABOVE STAR IS A VARIABLE STAR																					
4/04	44	19		DK	PPM	92936	98	4.8	B8	99+	168		22	281	81S	109	121	.0	-1.5	34937.4	240939
ABOVE STAR IS A VARIABLE STAR -- MINIMUM MAGNITUDE = 5.5.																					
4/04	51	25		DX	PPM	92941	95	6.6	B9	99+	168		21	283	48N	58	70	-.3	-.6	34948.0	242418
ABOVE OCCULTATION CLOSE TO SMOOTH-MOON TERMINATOR																					
5/20	29	41		RV	PPM	94540	96	6.5	K0	99-	168		37	92	84N	249	252	-.3	1.4	53623.3	274008
6/03	53	24		RY	PPM	94967	98	5.6	K0	98-	165		50	250	61N	280	281	-.6	-1.0	55125.9	275818
6/19	43	40		RO	PPM	96242	95	6.9	G0	96-	156		22	73	85S	257	254	.1	1.4	63653.9	271625
7/01	45	57		R	PPM	96583	96	6.6	A2	95-	154		65	176	80S	255	251	-.9	.4	64937.8	271101
9/01	51	48		RV	FK5	1228	79	4.7	A0	82-	129		53	136	53N	319	305	-.8	-.7	84342.4	212637
10/04	26	14		RK	PPM	126628	68	5.9	K0	73-	117		54	179	59N	319	302	-.7	-1.0	93726.4	162424
10/04	45	03		RM	PPM	126629	65	7.7	F8	73-	117		54	186	82S	280	263	-.9	-.3	93731.3	161140
10/07	38	16		R	PPM	126706	76	7.9	K0	72-	115	-4	38	242	49N	330	312	-.2	-1.8	94209.6	154324
11/02	29	13		RC	PPM	127326	75	8.0	K0	64-	106		38	127	39S	240	220	-.9	2.1	102049.2	111903
11/03	47	38		R	PPM	127341	65	8.0	G5	64-	106		46	150	86N	294	275	-.8	-.1	102232.3	111627
11/07	11	09		R	PPM	127399	66	7.6	K0	63-	105	-8	42	220	84S	285	265	-.8	-.9	102649.2	102803
12/04	24	22		R	PPM	157519	86	7.5	F0	54-	95		40	151	36S	239	218	-1.3	1.6	110702.3	52333
14/05	09	15		R	PPM	195580	75	8.4	K2	35-	73		26	147	78N	305	284	-.7	.0	123218.5	-54937
15/05	16	41		RB	PPM	227004	77	6.9	G0	26-	61		18	141	86S	287	266	-.7	.5	131517.1	-112423
15/05	18	34		R	PPM	227006	75	7.8	K0	26-	61		19	141	87N	294	274	-.6	.4	131522.3	-112305
15/05	27	11		R	PPM	227034	95	8.4	G5	26-	61		19	143	32N	349	328	-.1	-1.0	131617.6	-111638
15/06	47	30		R	PPM	227055	75	8.5	F2	26-	61	-12	24	163	76S	277	256	-.9	.3	131712.6	-114825
15/06	29	42		R	PPM	227068	97	6.7	A2	26-	61		24	159	28N	353	333	-.1	-1.2	131743.4	-113111
24/19	17	37		D	PPM	239518	56	7.0	K0	20+	53		9	230	48N	30	49	-.2	.2	215522.6	-151338
25/16	26	00		D	PPM	240640	37	7.2	K0	29+	65	-4	27	178	73S	86	106	-.9	.1	224323.0	-100403
25/17	59	39		DA	PPM	206739	37	7.3	A5	29+	66		25	203	80S	79	99	-.8	-.3	224542.6	-93633
26/18	35	29		D	PPM	207747	35	8.0	F8	41+	79		33	201	53S	103	125	-1.6	-1.0	233707.3	-25522
27/17	14	09		D	PPM	143450	25	8.0	K0	52+	92	-10	40	163	24N	1	23	.0	2.3	2418.8	34801
27/18	05	16		DC	PPM	143489	15	8.4	F2	52+	92		42	179	67N	44	66	-.8	1.0	2618.4	35752
27/18	07	24		D	PPM	143502	17	6.9	B8	52+	92		41	179	85S	71	93	-1.1	.4	2638.3	35154
27/21	13	25		D	PPM	143562	17	6.6	F5	53+	93		30	234	32N	9	31	-.3	1.6	3030.5	45359
27/21	44	12		D	PPM	143588	15	8.0	F0	53+	93		26	242	88N	65	87	-.7	-.6	3211.6	45308
28/18	17	46		DA	PPM	117189	15	8.2	F5	63+	105		47	166	50N	28	49	-.6	1.6	11736.1	103807
28/21	39	24		D	PPM	117284	17	6.9	K0	64+	106		38	232	77N	56	77	-.8	.0	12316.2	112417
29/16	32	14		DK	PPM	117971	37	7.5	K0	74+	118	-5	38	116	49S	113	132	-1.3	.8	20827.5	155025
30/19	40	27		DM	PPM	92254	46	7.4	F0	83+	132		57	153	82S	86	101	-1.2	.5	31031.8	214635
30/20	01	45		DX	PPM	92267	45	7.8	K0	84+	132		59	162	81N	70	85	-1.1	.8	31105.2	215519
30/20	43	39		D	PPM	92277	55	7.8	B9	84+	132		60	181	39N	27	42	-.7	2.0	31144.9	221200

Predictions courtesy of the International Occultation Timing Association – European Section – (IOTA/ES) "OCCMOON" program.
A letter in the "D" column indicates a possible double star.
See LSC **35**, 5 (May 1999) for comments on recording observations using the predictions.

The only grazing occultation predicted for this month occurs in the early morning of Tuesday November 7th, starting from 07:29 UT. The track crosses from the Isle of Lewis to the north west Highlands, where it ends due to the solar elevation reaching –2º. The moon is just past full, at an elevation of 22º, on the opposite side of the sky from the rising sun. It is a southern limit graze occurring against the rough dark limb of the "Cassini region". The star is triple with a total magnitude of 5.4, so the graze could be quite interesting. Unfortunately I am not aware of any section members in that area!

Total occultation predictions for November are in last month's Circular.

BAA/ALPO TRANSIENT LUNAR PHENOMENA — Tony Cook

Observations were received for 2/3 September, mostly related to the attempts to observe the SMART-1 impact flash or subsequent debris, which could have potentially happened on 2 orbits before, 1 orbit before, on the planned orbit, or 1 orbit after. I made some observations two orbits before using the University of Nottingham robotic telescope in remote control mode, but fortunately saw nothing and anyway the orbit had been raised at this point. David Darling (WI, USA) went for one orbit before but saw nothing apart from an aircraft flying in front of the Moon, across the line of sight. Larry Wadle (TX, USA) went for the planned orbit but with the Moon only 7 deg above the horizon, he saw nothing. Finally Kath Teychenne (Australia) went for a later orbit, but by this time the probe had crashed on it's planned orbit. Thanks to all observers who participated – nobody really knew for sure what to expect and it was good to have observers standing by, just in case. We also received routine observations (nothing to do with SMART-1), from Michael Amato (CT, USA) who observed on 7-10th and 13th Sep., concentrating on Proclus, Menelaus and Aristarchus. Routine reports were also received from Marie Cook, who is now back in operation again. Finally I would like to welcome BAA lunar section member Rod Hobbs to the team.

Please support Brian Cudnik of ALPO in looking out for Leonid impact flashes on the Moon during 2006 Nov 16-18, and especially close to 05:34UT on Nov 17th. There may be a surge in activity and although nowhere near as strong as in previous years, the Leonids are high velocity and are more likely to create visible flashes than other showers.

Not much luck lunar-observation-wise with the robotic telescopes here in Nottingham. Usually when the Moon has been around it has been too low, or the weather has worsened, or I have been busy with academic tasks which have to be completed before the next day! However I have been able to get the 11" Celestron scope working on some deep sky objects in order to try out the different filters – see: http://www.cs.nott.ac.uk/~acc/Robotic_telescopes.html . This has not been without problems, trying to get the scopes aligned on bright stars for the initial set up has taken ages as this has had to be done remotely over an internet link. Also now for the cooled ATK-16 CCD camera on the Celestron scope I have been experiencing humidity and frost problems which have degraded image quality on a number of occasions. Hopefully a recently installed dehumidifier will help to reduce this problem in future! The 10" Meade scope has been a bit more temperamental in the set up procedure and as yet I have not got this working properly in goto mode. Hopefully with nights lengthening in the UK I can go upto the roof one night and manually sort out the set/up alignment. I hope to use this scope in particular for occultations, impact flash detection and searching for TLP with some narrow band or Polaroid filters.

The following repeat illumination and libration events for UK observers occur for November...

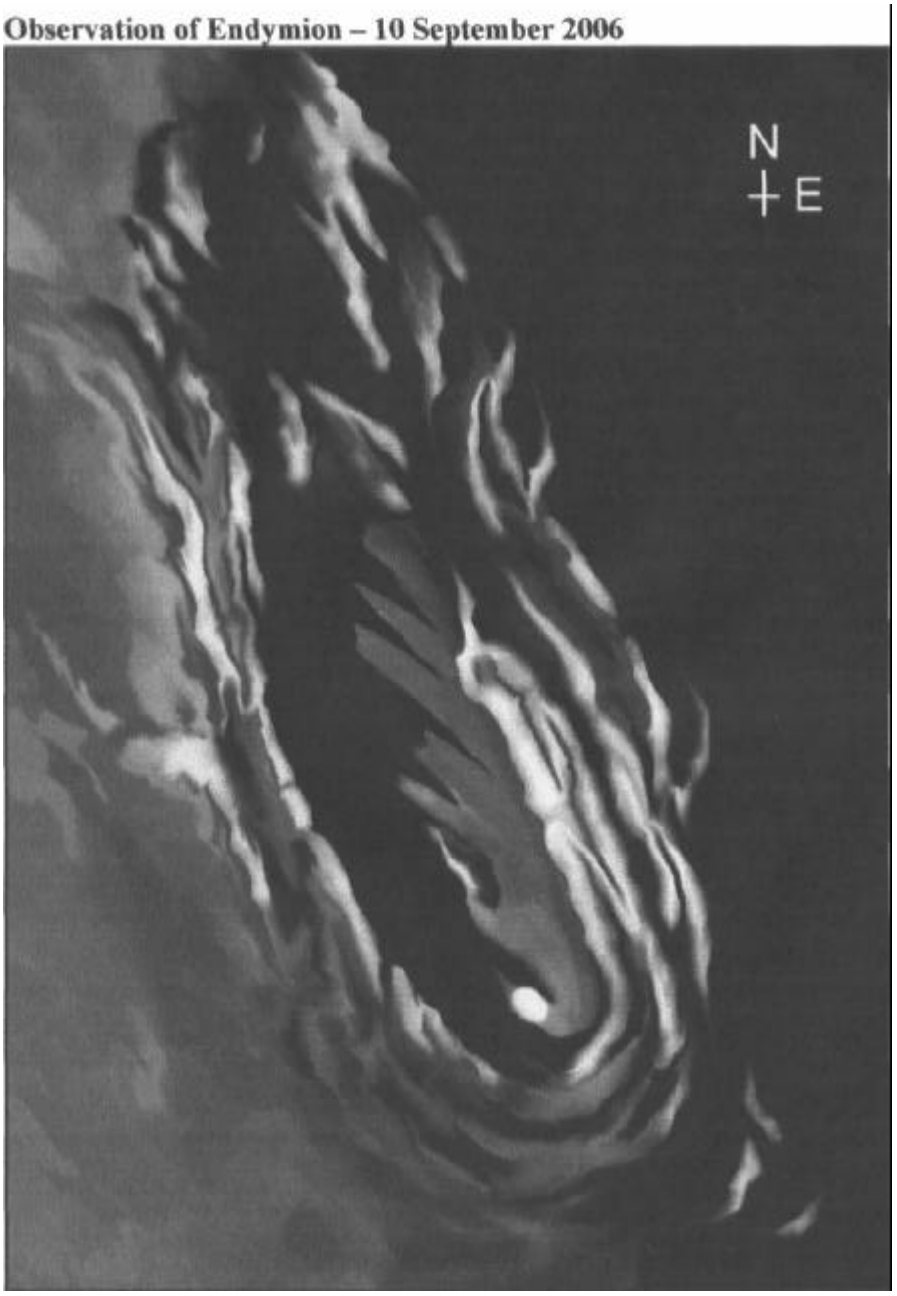
Event: Proclus (Bartlett, 1970 Oct 12) can be seen on/from (UT): 2006 Nov 02 (16:31-18:39) - *[How dark is the floor and can you see the central pseudo-peak?]*
Event: Archimedes (Haas, 1940 Aug 18) can be seen on/from (UT): 2006 Nov 05 (16:46-17:54) - *[How bright is the NE wall?]*
Event: Near Censorinus (Hopmann, 1964 Apr 26) can be seen on/from (UT): 2006 Nov 05 (16:46-17:25) - *[Image or sketch this area]*
Event: Proclus and Censorinus (Darling, 2002 Mar 29) can be seen on/from (UT): 2006 Nov 06 (03:32-05:50) - *[Monitor the brightness of these two craters, using other bright ray craters as a reference]*
Event: Aristarchus (Bartlett, 1976 Aug 11) can be seen on/from (UT): 2006 Nov 06 (17:16-18:09) - *[Can you see any colour and how sharp is the W wall?]*
Event: Plato (Bartlett, 1970 Nov 08) can be seen on/from (UT): 2006 Nov 29 (15:54-20:06) - *[What craterlets can you see on the floor and elsewhere?]*

Further predictions, including the more numerous illumination only events can be found on the following web site: http://www.lpl.arizona.edu/~rhill/alpo/lunarstuff/ltp.html. For members who do not have access to the internet, please drop me a line and I will post predictions to you. If you would like to join the TLP 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 TLP, 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!

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

Lured by sleeping Endymion's beauty…

125 km in diameter, Endymion is a large and very prominent dark floored crater located to the north of Lacus Temporis, about 200 km northeast of the crater Atlas. Positioned at longitude 56.5°E, Endymion always appears rather close to the Moon's northeastern limb. Endymion has large, somewhat disintegrated internally terraced walls that surround a smooth dark plain, across which, under a high illumination, can be discerned linear streaks of light ray material from Thales, 190 km to the northwest.

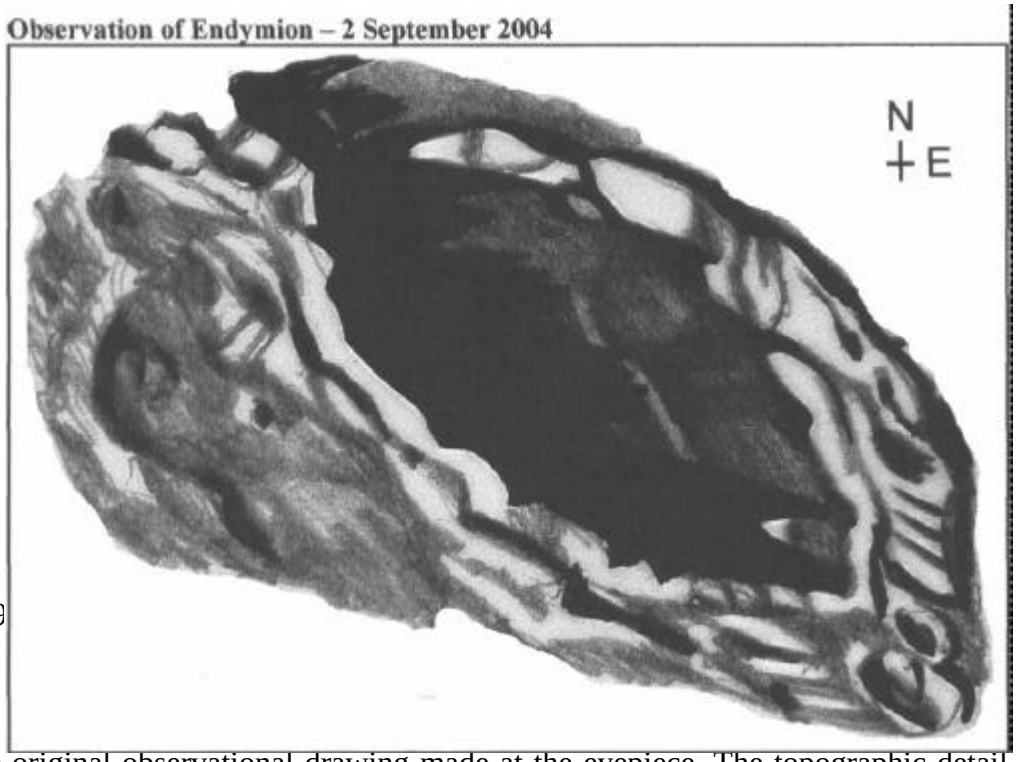


Observation of Endymion
By Peter Grego (Rednal, UK)
10 September 2006
03:45 – 04:15 UT
200mm SCT x200
Seeing: AIII
Sun's colongitude: 119.6° - 119.8°
Libration in longitude: - 02° 59'
Libration in latitude: + 03° 53'

Notes: The original observational drawing was made on a PDA, based upon the template of an enlarged image which was taken before the observing session commenced with a DSLR at prime focus of 200mm SCT. The PDA drawing was later enhanced in Corel PhotoPaint to produce the drawing above.

Endymion appeared on the evening terminator of a 17 day old waning gibbous Moon. Libration was not very favourable, but this was a good opportunity to continue studies of the crater's interior shadows and floor topography at a reasonably low illumination. A ridge was observed in the central southern part of Endymion's floor, bordering the advancing shadow cast by the crater's western rim. A particularly bright area lay near the southern edge of the floor, nestled in the shadow – the sunlit face of an elevated part of Endymion's floor.

Observation of Endymion – 2 September 2004



By Peter Gregо (Rednal, UK)
1/2 September 2004
23:50 – 00:25 UT
200mm SCT x200
Seeing: AII
Sun's colongitude: 120.3° - 120.9
Libration in longitude: + 06° 13'
Libration in latitude: + 01° 54'

Notes: The drawing above is the original observational drawing made at the eyepiece. The topographic detail observed on this occasion closely matches that seen in my latest observation, although the shadows cast by the western rim appeared remarkably different in outline.

Intriguingly, no definite ridge on Endymion's floor is mentioned in *The Moon* by Wilkins and Moore (2nd Edn, 1956), their description being as follows:

Endymion (Mythical). A great crater, 78 miles in diameter, with lofty, peak-surmounted walls, rising 15,000 feet on the west and still higher on the north. The floor is dark, which makes the formation easy to detect under any illumination. In general the floor is remarkably smooth, but there is some delicate detail. This consists of white spots, a light streak, and a few craterlets and hills, or cones. Debes and Andel depicted a central hill, and some observers, including Lenham, three craterlets in a line on the northern portion. Wilkins, however, does not confirm this. On 5 October 1952, with power 300, on the 30-inch reflector belonging to Dr. W. H. Steavenson, the formation being close to the evening terminator and about a third of the floor already in shadow, Wilkins distinctly saw a faint whitish streak near the centre, but placed somewhat diagonally. At its eastern end was a minute white spot. On the southern portion are a distinct craterlet, three mounds, also probably craterlets, and a landslip from the south-eastern wall. North of the whitish streak, **which may be a low ridge**, [my emphasis] although it cast no shadow, are three delicate craterlets, while on the west, along the foot of the inner slope, is a delicate cleft, running to a craterpit almost in the centre of this portion of the slope. This cleft had been seen previously in his own 15-41-inch, but with this instrument its true nature was undecided. There is also a craterlet at the northern end of the floor. D. W. G. Arthur found a valley on the outer north-east wall, ending on the north in two confluent irregular depressions. Endymion has overlapped an older and large ring, a portion of which can be seen on the west and north-west. Beyond this mountain ridge is the Mare Humboldtianum.

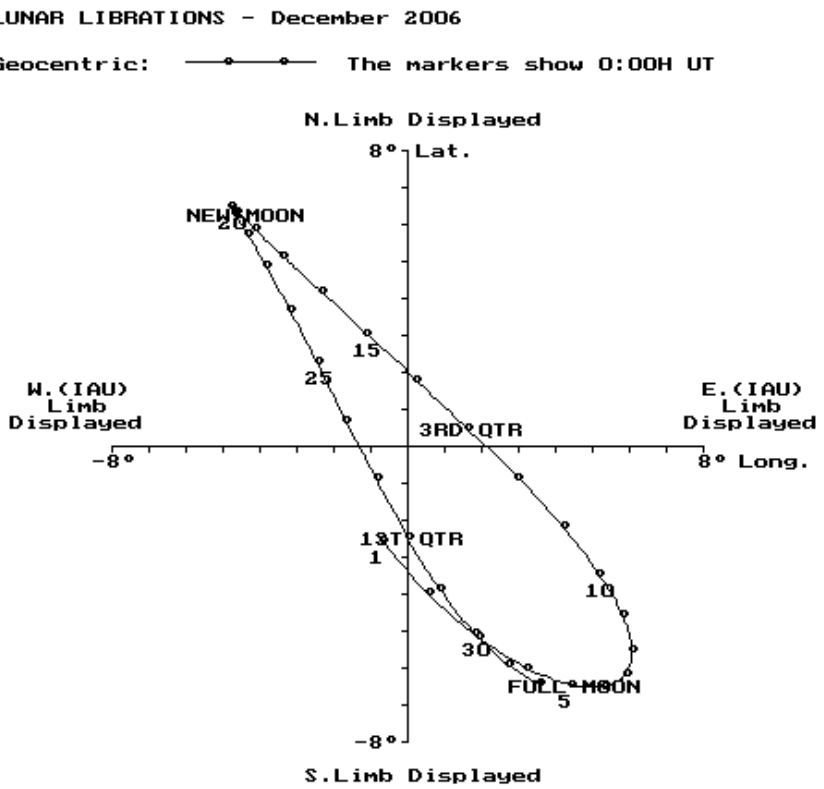
Observing Endymion in November

Endymion is located near the waning gibbous Moon's evening terminator on 7/8 November 2006. Libration greatly favours the southeastern limb. The Moon will be at a high declination, so let's hope for good seeing conditions.

Observations of Endymion are most welcome. A full article, featuring members' observations, will appear in the first issue of *The New Moon* published in 2007.

LIBRATION Dec 2006

Date	Libration amountø	PAø	Feature presented
1.0	2.5	144	Pingre*
2.0	3.5	179	Short
3.0	4.9	197	Neumayer
4.0	6.3	208	Pontecoulant
5.0	7.5	216	Brisbane
6.0	8.2	222	Oken
7.0	8.5	227	Hamilton*
8.0	8.3	232	Gum*
9.0	7.7	237	Abel*
10.0	6.6	243	W. Humboldt*
11.0	5.3	251	Schorr*
12.0	3.8	264	Hirayama*
13.0	2.6	291	Hubble*
14.0	2.5	336	Hayn*
15.0	3.5	7	Philolaus
16.0	5.0	21	Desargues
17.0	6.3	27	Cleostratus
18.0	7.3	31	Xenophanes
19.0	8.1	33	Xenophanes
20.0	8.4	34	Volta*
21.0	8.3	36	Volta*
22.0	7.7	37	Repsold*
23.0	6.8	39	Galvani*
24.0	5.6	43	Gerard*
25.0	4.2	49	Lavoisier*
26.0	2.8	64	Bartels*
27.0	1.8	103	Rocca*
28.0	2.2	156	Bailly*
29.0	3.4	181	Malapert
30.0	4.7	193	Boussingault
31.0	5.9	201	Helmholtz



Program by Bob Roberts.
Observer at: Lat. 51.0øN, Long. 1.0øW
* indicates that the feature is not illuminated.

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2006 DEC.	Age d	Phase	Earth's Selenographic Longø	Latø	Sun's Selenographic Colongø	Latø	R.A. h m	Dec. ø	Rises h m	Sets h m	Transit h m	Alt ø
1.0	10.1	0.795	-0.7	-2.5	36.8	-1.48	00 51	7.5	13 42	03 00	20 54	51
2.0	11.1	0.880	0.6	-4.0	48.9	-1.49	01 44	14.0	13 57	04 30	21 48	57
3.0	12.1	0.945	1.9	-5.1	61.1	-1.50	02 40	19.7	14 18	06 03	22 45	62
4.0	13.1	0.985	3.3	-6.0	73.2	-1.51	03 39	24.2	14 49	07 34	23 45	65
5.0	14.1	0.998	4.4	-6.5	85.3	-1.52	04 41	27.2	15 33	08 57	.. ..	..
6.0	15.1	0.986	5.4	-6.5	97.5	-1.53	05 44	28.4	16 34	10 03	00 45	66
7.0	16.1	0.950	5.9	-6.2	109.6	-1.54	06 46	27.8	17 49	10 50	01 47	65
8.0	17.1	0.894	6.1	-5.5	121.7	-1.54	07 45	25.6	19 09	11 21	02 44	63
9.0	18.1	0.823	5.8	-4.6	133.9	-1.55	08 39	22.1	20 29	11 42	03 36	59
10.0	19.1	0.741	5.2	-3.5	146.0	-1.55	09 29	17.7	21 45	11 57	04 22	54
11.0	20.1	0.652	4.2	-2.2	158.1	-1.55	10 16	12.6	22 57	12 09	05 05	49
12.0	21.1	0.558	3.0	-0.9	170.3	-1.55	10 59	7.2	.. ..	12 18	05 46	43
13.0	22.1	0.464	1.6	0.5	182.5	-1.55	11 41	1.6	00 08	12 27	06 25	38
14.0	23.1	0.372	0.2	1.8	194.6	-1.55	12 23	-4.0	01 18	12 37	07 04	32
15.0	24.1	0.283	-1.2	3.1	206.8	-1.55	13 05	-9.5	02 28	12 47	07 43	26
16.0	25.1	0.202	-2.4	4.2	219.0	-1.54	13 49	-14.7	03 42	12 59	08 26	21
17.0	26.1	0.131	-3.4	5.2	231.2	-1.54	14 36	-19.5	04 58	13 16	09 11	16
18.0	27.1	0.072	-4.2	5.9	243.3	-1.54	15 27	-23.5	06 16	13 39	10 01	13
19.0	28.1	0.029	-4.7	6.4	255.5	-1.53	16 21	-26.4	07 33	14 13	10 55	10
20.0	29.1	0.006	-4.8	6.5	267.7	-1.52	17 19	-28.1	08 41	15 04	11 52	9
21.0	0.4	0.004	-4.7	6.3	279.9	-1.52	18 18	-28.2	09 34	16 12	12 50	10
22.0	1.4	0.025	-4.4	5.8	292.1	-1.51	19 19	-26.7	10 13	17 33	13 48	12
23.0	2.4	0.069	-3.9	4.9	304.3	-1.50	20 17	-23.5	10 39	19 01	14 44	17
24.0	3.4	0.136	-3.2	3.7	316.5	-1.49	21 14	-19.0	10 58	20 29	15 36	22
25.0	4.4	0.221	-2.5	2.3	328.6	-1.48	22 07	-13.5	11 12	21 56	16 25	28
26.0	5.4	0.321	-1.7	0.7	340.8	-1.47	22 58	-7.2	11 24	23 21	17 13	35
27.0	6.4	0.431	-0.9	-0.9	353.0	-1.46	23 48	-0.5	11 36	00 45	18 00	42
28.0	7.4	0.545	-0.0	-2.4	5.1	-1.46	00 38	6.1	11 48	00 46	18 49	49
29.0	8.4	0.656	0.9	-3.9	17.3	-1.45	01 29	12.5	12 02	02 12	19 40	55
30.0	9.4	0.759	1.8	-5.0	29.4	-1.44	02 22	18.3	12 20	03 41	20 34	60
31.0	10.4	0.848	2.7	-5.9	41.6	-1.44	03 19	23.0	12 46	05 11	21 31	64

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1.0	11.4	0.919	3.6	-6.4	53.7	-1.43	04 19	26.4	13 23	06 36	22 31	66
2.0	12.4	0.968	4.3	-6.6	65.8	-1.42	05 21	28.2	14 16	07 48	23 32	66
3.0	13.4	0.994	4.9	-6.3	77.9	-1.42	06 22	28.2	15 26	08 42	.. ..	..
4.0	14.4	0.997	5.1	-5.7	90.1	-1.41	07 22	26.5	16 45	09 19	00 29	64
5.0	15.4	0.977	5.1	-4.8	102.2	-1.40	08 18	23.4	18 06	09 44	01 24	61
6.0	16.4	0.937	4.7	-3.7	114.3	-1.38	09 10	19.2	19 24	10 01	02 13	56
7.0	17.4	0.881	4.0	-2.4	126.5	-1.37	09 59	14.3	20 39	10 14	02 58	51
8.0	18.4	0.811	3.0	-1.1	138.6	-1.36	10 43	8.9	21 51	10 25	03 40	46
9.0	19.4	0.731	1.8	0.3	150.7	-1.35	11 26	3.3	23 02	10 34	04 20	40
10.0	20.4	0.643	0.4	1.7	162.9	-1.33	12 08	-2.3	.. ..	10 43	04 59	34
11.0	21.4	0.551	-1.0	3.0	175.0	-1.32	12 50	-7.9	00 12	10 53	05 38	28
12.0	22.4	0.457	-2.3	4.1	187.2	-1.30	13 33	-13.2	01 23	11 04	06 19	23

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Items for the December 2006 circular should reach the Editor by the 10th November 2006