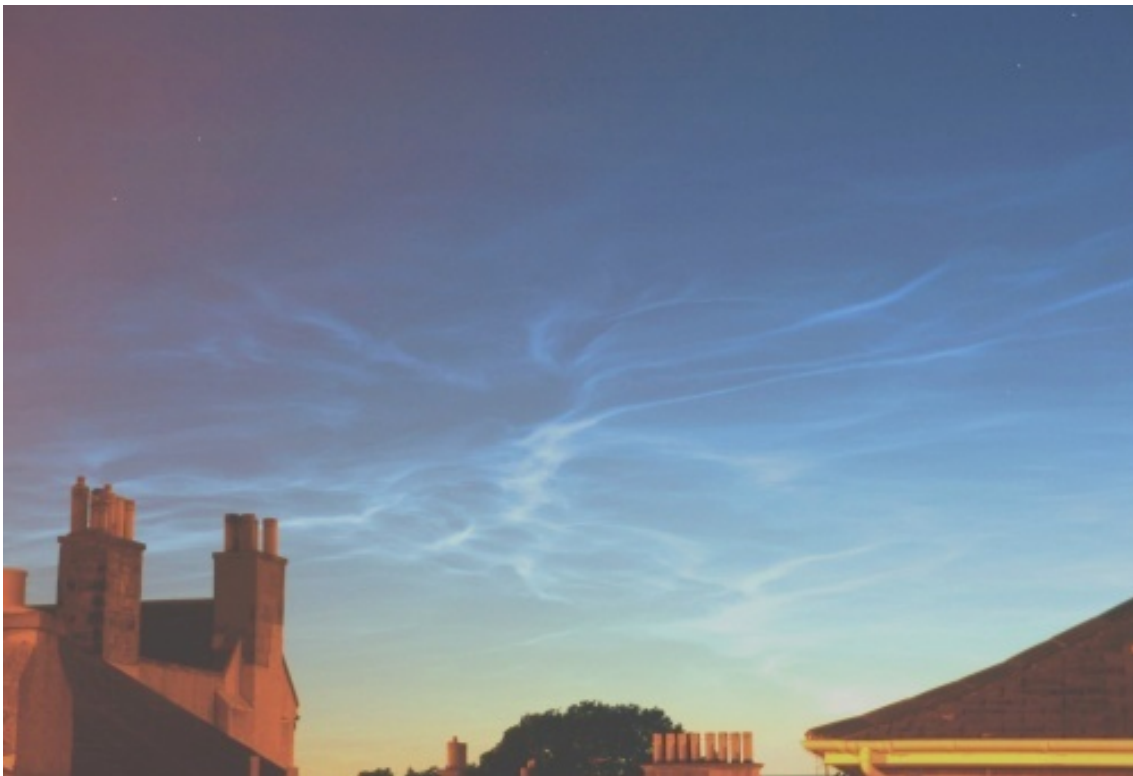


# The Astronomical Society of Edinburgh Journal

No 54 – November 2007

Web version at  
<http://www.astronomyedinburgh.org/publications/journals/54>

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*A beautifully clear summer's evening. The noctilucent cloud display was first seen from Craiglockhart Hill, almost due North, before midnight and it just got better. Awe-struck by the beauty of the display and its brightness, the expression 'frozen lightning' came to mind! Over a period of 3 hours I watched the display from the hill and later from Morningside village, where even the glare of the sodium street lights failed to spoil the view, even contributing a certain 'unreality' to the scene. 'Backyard astronomy / back-street photography' at its most rewarding. (Photograph and caption by Frank Howie.)*



## ASTRONOMICAL SOCIETY OF EDINBURGH QUESTIONNAIRE ANALYSIS



Question	Response							Conclusion	
	Advanced	Beginners	Status Quo	Don't know					
1 Monthly Meeting Level	0	1	14	4				Status Quo	
2 Meetings attended	All 0	Almost All 4	Most 8	Half 1	Quarter 0	Less 1	None 3	Status Quo	
3 New Lecture Topics & Requests	No Answer 9	Suggested Topics: Intro to Digital Photography, Remote Observing, How to collimate a Newtonian scope, How to Polar Align, How to clean a mirror, How to Observe Variables Visits to Royal Observatory & Maxwell Museum, Visits to Other Societies, Heliosphere, Meteorites (Rob Elliot, Monica Grundy), Research at Royal Observatory.						Council to discuss and investigate further	
4 News, Obs, etc	More 6	Fewer 0	Status Quo 8						Status Quo
News	6	0	8						Status Quo
Obs'n Reports	6	0	8						Status Quo
Notices & Business	3	0	11						Status Quo
5 Facilities in City Dome	Excellent 0	Good 6	Acceptable 5	Poor 4	Unacceptable 0	Don't Know 1		Status Quo	
6 Improvements at the observatory	Don't Know 1	Toilets 3, Library 3, List of Astronomical websites 1, Loan of Instruments 1, Water Supply 1, Tidy up Lecture Theatre 1, Another Venue for meetings 1, Heating 2, Hospitality 1, Access (Damaged doors) 1, Improve "talking space" after meetings						Council to discuss and investigate	
7 Meeting Nights	Mon 2	Tues 2	Wed 3	Thur 3	Fri 10	Sat PM 1	Sun PM 1	Sun Eve 0	Status Quo
Would Attend More if	2	2	3	3	10	1	1	0	
Would Attend Less if	4	4	2	2	1	7	6	7	
Would Not Attend if	3	4	2	1	1	8	8	9	
8 Preferred Meeting times	7:00/7:30 3	8:00 PM 11	Don't Know 3						Status Quo
9 Tea/Coffee post meeting	Yes Usually 6	Occasionally 3	Never 5	Don't Know 2					Council to discuss
10 Facilities in Playfair Building	Excellent 0	Good 2	Acceptable 6	Poor 4	Unacceptable 1	Don't Know 4		Status Quo	
11 Cooke Telescope Can Use	Yes 11	No 4						Council to discuss and investigate	
Would like to Learn	10	1							
12 Telescope Dome Facilities	Excellent 0	Good 2	Acceptable 9	Poor 1	Unacceptable 1	Don't Know 3		Status Quo	
13 Open Evenings Attended & Requests	All 0	Almost All 0	One or Two 6	No 6	Don't Know 4	Enjoyed 4	Council to discuss and investigate		
	Move to after Monthly Meeting, Space Probes info, News in Magazines, Observing/Astrophoto Groups Progress								
14 Astronomical Knowledge	Professional 0	Advanced 3	Amateur 8	Beginner 3	Theoretician 4	Observationist 0			
15 Evening Classes attended	Att. Elsewhere 1	ASE 1	No Classes 8	Like to Att. 3	No Interest 8	Don't Know 1			
16 Other Membership	This section gave very little information, therefore no conclusions can be drawn							Conclusion	
17 Money Spent	Only a few replies received. It is therefore concluded the Council must continue to decide on Finances							Conclusion	
18 Website Development	Discussion Form 10, How To Articles 13, Downloadable Journal & Council Meeting Minutes 2. Other suggestions were, News Items, Observational Reports, Other Astronomical website information, Star Party/Viewing at Dark Sky Site, Short Break Holidays, Welcome to Newcomers.							Council to discuss and investigate	
19 Dark Sky Site	Yes 12	No 3	Don't Know 3	Two Members indicated they would like to use the site but did not have transport to get there.				Available September	

## ASE questionnaire

First of all may I thank all who took the time to fill in and return the Members Questionnaire. You have given us important information that will help to improve how we run the Society and where you see the priority improvements that must be made. Eighteen completed forms were returned and the data contained brings out some interesting facts along with a lot of worthwhile suggestions. As you will see in the analysis, the Council will have to discuss the responses you have made to several of the questions. Namely:

- suggestions for new lecture topics
- suggested improvements to the Observatory
- the setup of Cooke Telescope training
- suggested Open Evening topics
- website development

As you know the fabric of the building is the responsibility of the Edinburgh City Council, and is therefore outside of the Society's direct control. However, the Society are pressing Edinburgh City Council as much as possible to get these much needed repairs done. Most of the remainder of the suggestions are fairly straightforward, and where appropriate we will attempt to implement – Finance permitting. Once again let me thank everyone who took part in the Survey.

*Danny Gallacher*

## SAG magazine and online forum

One of the stated aims of the Scottish Astronomers Group is to be a forum for those actively involved in astronomical observations across Scotland. With the development of the Internet over the past few years the SAG Mag has had a diminishing role in the passing on of information. There is now an online forum for posting information about astronomy and observing. The SAG Mag will continue to be where your results, pictures and reports are printed so please continue to send material to our editor, Iain McEachran. The SAG Mag is our "archive"!

The online forum is now live and details of how to register are on the SAG website, <http://www.scottishastronomers.info>

*Bill Ward*

*President of the Scottish Astronomers Group*

## Book review: Aurora

*Neil Bone, 2007, Aurora – Observing and recording nature's spectacular light show, Springer Practical Astronomy Series, ISBN 978-0-387-36052-2, softback, 182 pp., £ 20.50.*

This is Neil's third Aurora book, thoroughly revised and updated to include the big displays we had back in 2003, which were photographed by Russell Cockman and others. The book takes us through some of the ancient and medieval accounts of the aurora as terrifying appearances, then into the age of science and the investigations into the solar-wind and terrestrial magnetic field interactions, with remote sensing and satellites. The physics of the aurora are briefly and clearly summarised. There are instructions for observing and photographing the aurora, and an account of some of the big displays of recent years. Briefly mentioned are some other upper-atmosphere phenomena worth observing, nacreous clouds, meteors, and most importantly – noctilucent clouds, with a little on aurorae on other planets, and finally a glossary of technical terms.

This book, by someone who has been observing the aurora for decades, since boyhood in Campbeltown, is highly recommended to all, from serious amateur aurora observers to those with a passing interest because it is a great read.

Neil Bone used to be Vice-President of ASE before redundancy forced him to move to Sussex, where he has continued to observe aurora and noctilucent cloud. He is currently Director of the BAA Meteor Section.

*Dave Gavine*

## Observing group returns

The Society has re-launched an observing group with meetings at 20:00 at the Calton Hill Observatory on the Monday following the monthly ordinary meeting. Previously we had parallel Messier and imaging groups. Ken Thomas will be heading the group, and the emphasis will be on simple observations, so this should be a good opportunity for those who are not seasoned observers yet.

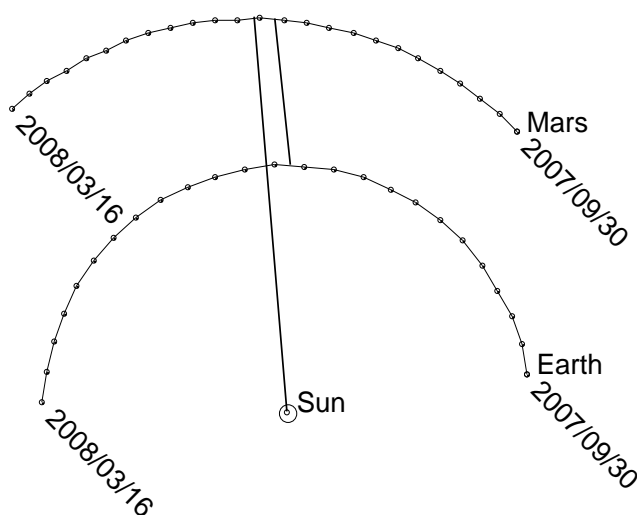
*Horst Meyerdierks*

## Observing Mars in 2007/08

On the occasion of the historically close Mars opposition in 2003 the Astronomical Society of Edinburgh published two observing guides for the public. These were written mainly by myself and Ken Thomas, and the shorter one was published in this Journal [1]. The longer of the two guides was re-issued for the 2005 opposition. This article is an update for the forthcoming opposition.

### The opposition

Mars passes through opposition at Christmas 2007. During the months leading up to opposition the distance between Earth and Mars reduces drastically, and increases afterward. This makes the weeks around opposition the best time to observe the Red Planet.

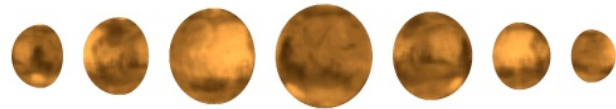


**Fig. 1:** Movement of Earth and Mars in their orbits around the Sun. The dots are one week apart, the tracks start on 30 September and end on 16 March. Opposition is at the centre of the tracks, when Sun, Earth and Mars line up. Earth and Mars are closest about six days before opposition. (This figure has been produced with Xephem [2].)

Since the planetary orbits are not circles but ellipses, Mars is closest not exactly at opposition. Also, not every Mars opposition is equally good regarding how close it gets to Earth. In August 2003 it was particularly close at 56 million km. By comparison, during the opposition in 1997 Mars kept the rather longer distance of 99 million km. In 2007 the closest approach

is on the morning of 19 December 2007 at 88 million km. The opposition itself is on the evening of 24 December 2007.

The closer Mars and Earth approach each other, the larger Mars appears in our telescopes and the more detail we can see on its surface. Northern observers are unfortunate in that close encounters happen at rather southerly declination. The 2007/08 opposition gives us optimal height above the horizon, but the largest apparent diameter of Mars this time is only 16".



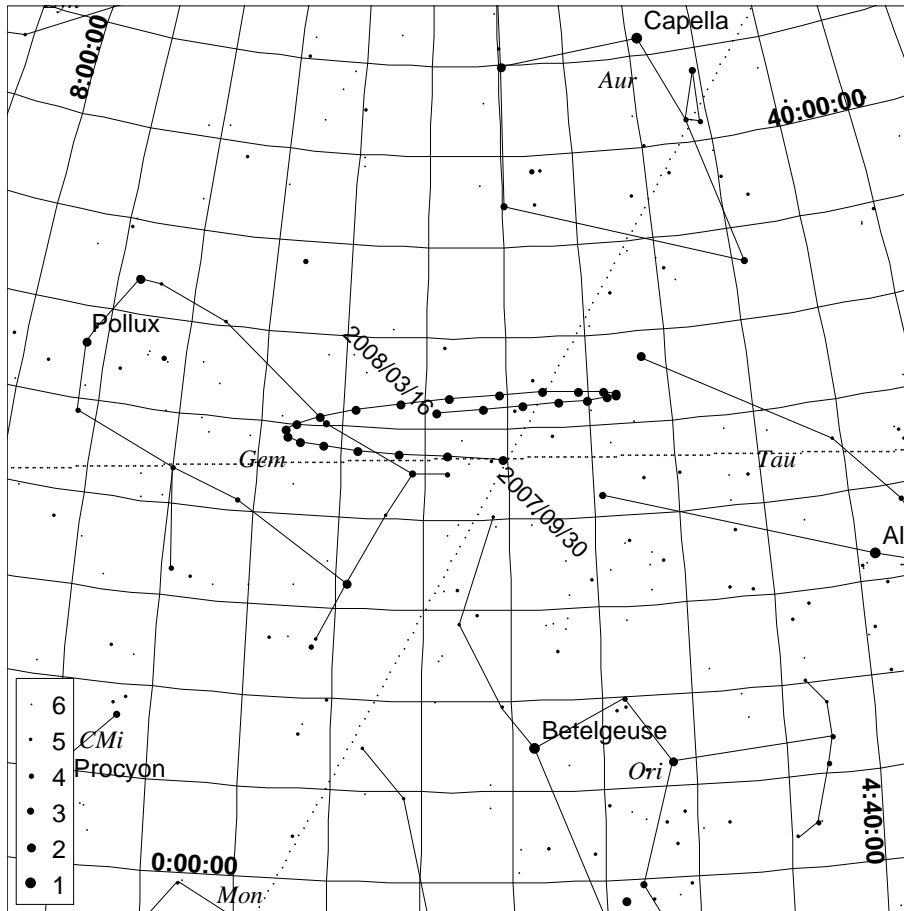
**Fig. 2:** Size comparison at intervals of four weeks. The dates left to right are 30 September, 28 October, 25 November, 23 December, 20 January, 17 February and 16 March. Note how Mars appears systematically bigger before opposition than after. The individual views of Mars have been produced with Xephem [1].

Another consequence of the reduced distance and fuller phase near opposition is an increase in brightness of the planet. Mars is roughly as bright or brighter than the brightest stars. It brightens from  $-0.1$  mag in late September to  $-1.6$  mag at opposition. It then fades to  $+0.5$  mag by mid March. Prior to opposition Mars is closer, appears larger and brighter than after opposition.

### Ephemerides

Tab. 1 includes the rise, set and transit times at weekly intervals. During opposition the planet changes from the morning sky to the evening sky. After opposition it rises earlier and at a given time in the evening is at a higher elevation above the horizon.

Mars rises in the East, goes through its highest point in the South and sets in the West. It is a bright, red, object and appears star-like to the naked eye. Don't confuse it with Aldebaran, which is a bright red star in the constellation Taurus. (The author's first recorded observation of "Mars" turned out to be one of Antares, another bright red star whose name translates to "Antimars".) To find Mars by constellations, look between



**Fig. 3:** Movement of Mars from late September to mid March in the constellations of Gemini and Taurus. The dots are one week apart, the track starts on 30 September and ends on 16 March. The grid lines are at intervals of 5°, the coordinates for J2000. (This figure has been produced with Xephem [2].)

Gemini and Taurus. Aldebaran and the open star clusters of the Hyades and Pleiades are some distance west (right) of Mars, Castor and Pollux are the two main stars of Gemini and are some distance east (left) of Mars. Fig. 3 is a star chart of the area with Mars' path.

The movement is not straightforward. Mars starts out on the right and moves to the left. In mid November it turns back (becomes retrograde) and only in early February returns to forward (direct, right to left) motion. Opposition occurs near the centre of the retrograde motion. This opposition loop is the result of the two planets running on their circular race track around the Sun. The Earth has the inside lane and the higher speed. Usually it sees Mars apparently moving in the same direction as Earth itself moves, right to left against the star background. But during the overtaking manoeuvre around opposition, Earth sees Mars moving backward against the distant landscape that are the constellations of the fixed stars.

#### Images with simple cameras

A simple camera can be used to record the position of the planet within the constellations of Taurus and

Gemini. You will need a tripod and must be able to expose for a number of seconds up to a minute. Use the ordinary lens for a reasonably wide field. Stars begin to become trails at about 30 seconds exposure time. Use an aperture on stop smaller than maximum as a good compromise between speed and image quality.

#### Drawings at the telescope

In telescopes the planet is visible as a small disc, hopefully with a few dark or bright surface features. Small telescopes are suitable, although the BAA Mars Section [4] recommends at least a 150 mm refractor or 200 mm reflector to make drawings of surface features. Use high magnification with those apertures, 200x to 300x.

Keep observing. As you get used to the view you begin to see more. It may take a while until you start to see surface detail. Observe repeatedly during the night. Mars rotates once in 24 hours and 40 minutes, surface detail will move perceptibly over an hour or so. Keep observing every night. From one night to the next we see almost the same side of Mars, but over a

Date	Sun		Mars				m	D "	i °	PA °	CM °
	rise	set	set	rise	transit	h °					
2007-09-30	06:13	17:52	14:25	20:55	05:41	57	-0.1	10	+4	-26	286
2007-10-07	06:27	17:34	14:12	20:39	05:26	58	-0.2	10	+5	-25	220
2007-10-14	06:41	17:16	13:57	20:22	05:10	58	-0.3	11	+6	-23	153
2007-10-21	06:55	16:58	13:40	20:03	04:53	58	-0.4	11	+6	-22	87
2007-10-28	07:10	16:42	13:22	19:42	04:33	58	-0.5	12	+7	-21	22
2007-11-04	07:25	16:27	13:02	19:18	04:11	58	-0.7	12	+7	-20	317
2007-11-11	07:40	16:13	12:40	18:51	03:47	58	-0.8	13	+7	-20	252
2007-11-18	07:54	16:01	12:16	18:20	03:20	59	-1.0	14	+7	-20	188
2007-11-25	08:08	15:51	11:49	17:46	02:50	59	-1.2	15	+7	-20	125
2007-12-02	08:20	15:43	11:21	17:08	02:17	59	-1.3	15	+6	-21	62
2007-12-09	08:31	15:39	10:50	16:26	01:41	60	-1.4	16	+5	-22	0
2007-12-16	08:38	15:38	10:16	15:43	01:02	60	-1.6	16	+3	-23	299
2007-12-23	08:43	15:40	09:40	15:00	00:23	61	-1.6	16	+2	-25	237
2007-12-30	08:44	15:46	09:03	14:18	23:38	61	-1.5	16	0	-26	176
2008-01-06	08:42	15:55	08:25	13:39	23:00	61	-1.4	15	-1	-27	114
2008-01-13	08:37	16:06	07:49	13:03	22:24	61	-1.2	14	-2	-28	52
2008-01-20	08:28	16:20	07:14	12:31	21:50	61	-1.0	13	-2	-29	350
2008-01-27	08:18	16:34	06:43	12:02	21:20	61	-0.7	13	-3	-29	286
2008-02-03	08:05	16:49	06:14	11:36	20:53	61	-0.5	12	-2	-29	223
2008-02-10	07:50	17:04	05:48	11:12	20:28	61	-0.3	11	-2	-29	158
2008-02-17	07:35	17:20	05:24	10:51	20:06	60	-0.1	10	-1	-29	93
2008-02-24	07:18	17:35	05:02	10:31	19:45	60	0.0	10	-1	-28	28
2008-03-02	07:01	17:50	04:42	10:14	19:27	60	0.2	9	0	-27	323
2008-03-09	06:43	18:05	04:23	09:58	19:09	60	0.4	8	+2	-26	257
2008-03-16	06:25	18:19	04:05	09:44	18:53	60	0.5	8	+3	-24	191

**Tab. 1:** Full data for the 2007/08 opposition. All times are UT, add one hour to convert to BST. All data are for Edinburgh. *h* is the altitude above the horizon at transit time. *m*: brightness, *D*: apparent diameter, *i*: inclination of the axis toward the observer, *PA*: position angle of the axis (rotation from celestial north), *CM*: Martian longitude of the centre of the disc. The rotation of Mars is such that *CM* increases by  $14.6205^\circ$  per hour. The tabled values are for 0 hours UT on the morning of the date listed. (The data have been calculated with Sputnik 2.1.3 [3].)

few weeks and with several hours visibility per night all sides will come into view.

Neither pole is tilted towards Earth during this opposition, the polar ice caps will therefore not be easily visible, if at all. But do look out for dark areas on the surface in general. These will show the rotation of the planet.

If you have them, use coloured filters. These can greatly improve the amount of detail you can see. The most commonly used filters are orange/red to enhance the dark surface markings. Green filters help to accentuate the dark band close to the polar cap. Blue/violet filters can sometimes be useful, depending on the state of the Martian atmosphere.

In order that you can make drawings at the telescope, prepare sheets with circles of a standard size, the BAA use 50 mm diameter [5]. Make a note of the time of the drawings, which way celestial North and East are, and the telescope and magnification used. Perhaps also a short comment on the weather or image quality.

Afterward compare your drawings with the maps available on the BAA Mars Section web site [6]. To make the comparison you should know the orientation of the planet. Tab. 1 includes the inclination and position angle of Mars' rotation axis, as well as the central Martian longitude for certain times. Remember that telescopes rotate the image by  $180^\circ$  and that a zenith prism changes this to an upright mirrored image.

## Webcam images of the telescopic view

Traditional photography through the telescope can be done, but is difficult. The image of the planet on the film is small and the exposure times are awkward. You need a long focal length, about 10000 mm. To do this use eyepiece projection with a high magnification eyepiece. Even then Mars is only 1 mm on film. A fine grain film may resolve 0.02 mm, so this is not as bad as it sounds. But you will again need extreme magnification when making prints or projecting slides.

If you have a webcam and laptop, it can be quite simple to make a good recording of what you see. Bright planets deliver sufficient light for webcams to work well even with their short frame exposure times of 1/50 second or so. Take little movies of less than a minute, repeat every 20 or 30 minutes to detect rotation. The recording software is not a critical issue, but you should obtain software that enables you to combine a number of movie frames into a single higher quality image. This has to take account of the movement of the image from frame to frame. You should also obtain software to perform an unsharp mask on the combined image. This reduces the limb darkening and increases the contrast of surface features.

Again, you need a long focal length, 3000 to 4000 mm. A 300 mm f/10 Schmidt-Cassegrain tele-

scope can possibly be used in prime focus, but for most telescopes you need to use a 2x Barlow lens, a 2x photo adapter, or eyepiece projection.

## References

1. Astronomical Society of Edinburgh, 2003, Mars Opposition – August 2003, *ASE Journal*, **46**, 8
2. Elwood Charles Downey, 2000, *Xephem 3.4*, <http://www.ClearSkyInstitute.com/xephem>
3. Horst Meyerdierks, 2004, *Sputnik 2.1.1*, <http://www.chiandh.me.uk/soft>
4. R.J. McKim, 2002, *Mars Section programme*, British Astronomical Association, <http://www.britastro.org/mars/progrm.htm>
5. BAA Mars Section, 1992, *Report form*, British Astronomical Association, <http://www.britastro.org/mars/repform1.htm>
6. BAA Mars Section, *Maps of Mars*, British Astronomical Association, <http://www.britastro.org/mars/maps.htm>

*Horst Meyerdierks*

## Recent observations

### Noctilucent cloud

There have been many nights with noctilucent clouds this season, but Scottish observers have not seen many due to the above average occurrence this year of more mundane tropospheric clouds. Nonetheless a few nights have been good enough, and Frank Howie took the 8 s, f/5, 200 ISO exposure shown on the front cover on the night 2007-07-08/09.

### Perseids and other meteors

Dave Gavine at Joppa, on Aug 12/13 got 25 Perseids and 2 others between 22:30 and 00:10 UT, in a 4/8 cloud sky with limiting magnitude 4.5; then it clouded over completely. The best was a  $-4$  mag in Lynx at 23:56. On Aug 13/14 it was clear 22:30-23:30, limiting magnitude 5.0. 15 Perseids and 1 sporadic.

Neil Grubb on the night 2007-08-22/23 caught a Kappa Cygnid in a 30 s exposure of the Milky Way in Cygnus.

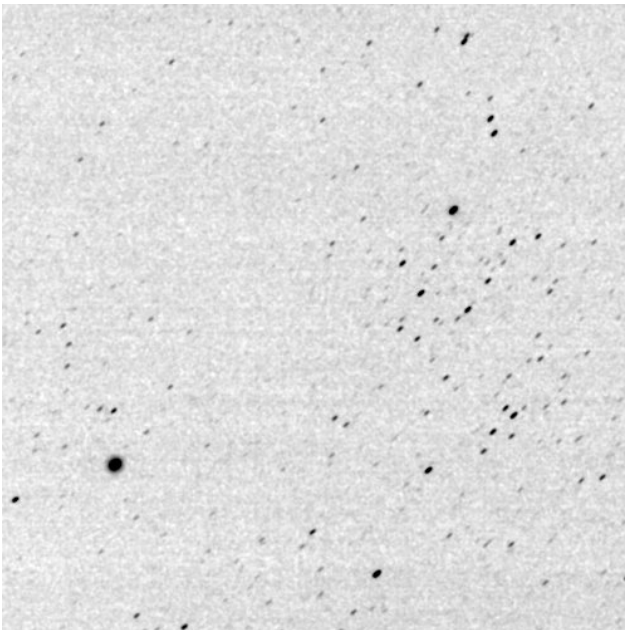
Mike Dale under the dark skies of Arran one September night observed by chance several Alpha Aurigids.

### Old Moon

Just a few days before Ramadan, Horst Meyerdierks has finally captured the old Moon on the morning of 2007-09-10. Only 1.6 % of the lunar disc were illuminated at that time. The exposure was 1/15 s at f/12.6 with 800 mm focal length. New Moon followed at 2007-09-11T12:44 UT (after 12:00 UT), and so Ramadan began in most countries at sunset on 2007-09-12, so that 2007-09-13 was Ramadan 1, 1428 AH (<http://moonsighting.com>). The Islamic calendar has years of 12 actual lunar phase cycles, about 354 days ([http://en.wikipedia.org/wiki/Islamic\\_calendar](http://en.wikipedia.org/wiki/Islamic_calendar)).



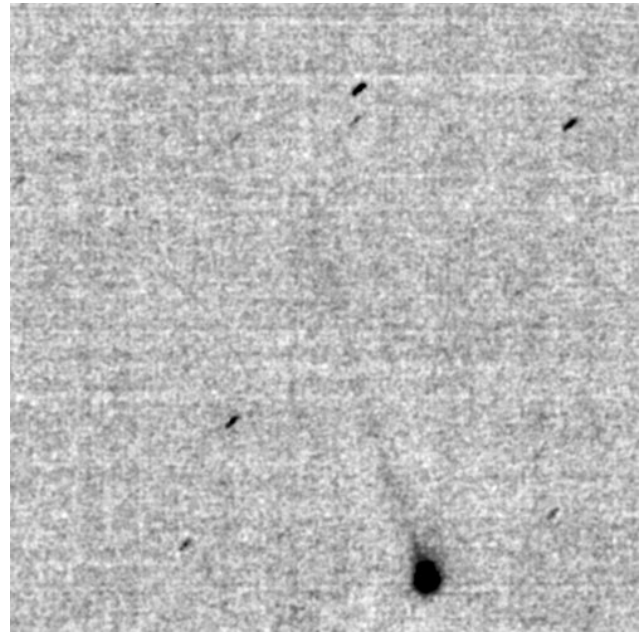
*Old Moon on 2007-09-10.*



*17P/Holmes on 2007-10-27.8 near the  $\alpha$  Persei Group. The comet near the bottom left appears brighter than it is, due to the high contrast and its extended size. It is brighter than  $\delta$  Per (centre bottom) but fainter than  $\alpha$  Per (halfway from centre to top right).  $f = 50$  mm,  $f/2.8$ , Canon EOS 400D, 20 s without tracking. The field is approx.  $8^\circ$ .*

## Comets

C/2007 F1 LONEOS was visible after sunset in mid October, moving from Coma into Bootes. Horst Meyerdierks measured these magnitudes, coma diameters and tail lengths from digital SLR images at  $f = 400$  mm: 2007-10-14.8 UT, 7.0, 0.3', 0.8'; 2007-10-16.8, 6.7, 2', 4' ( $f = 135$  mm); 2007-10-17.8, 6.3, 1.5', 3.5'; 2007-10-19.8, 5.9, 1.5', 5'; 2007-10-22.8, 5.8, 1.5', 25'; 2007-10-23.8, 6.3, 1', 2'.



*C/2007 F1 LONEOS on 2007-10-22.8.  
 $f = 400$  mm,  $f/6.3$ , Canon EOS 400D,  
6 tracked exposures of 1 min each.  
The field is approx.  $50'$ .*

17P/Holmes surprised professionals and amateurs alike with an outburst in brightness toward the end of October. The comet was near opposition at high declination in Perseus. It was brighter than  $\delta$  Per, 500,000 times brighter than the predicted 17 mag. Although reports for 2007-10-24 had described it as a star-like object, Horst found it very bright and extended in 9x63 binoculars. He measured these magnitudes from digital SLR images at  $f = 50$  mm: 2007-10-27.0 UT, 2.6; 2007-10-27.8, 2.5.

## A new dark site for ASE

As of September we have a new dark site. Danny Galacher has been negotiating on behalf of the Society with the West Calder Aeromodellers [1] about using their airfield. I went along for a bit of site testing last year, and as a result had to come up with a site name for my observing logs. I settled for **Pearie Law**, which is the nearest named feature on the Landranger maps [2]. I have used the site twice in September this year – with Neil Grubb and Frank Howie, resp. – for some deep-sky imaging with a tracking go-to mount.



*The author at Pearie Law with camera on tracking mount, Ursa Major in the background. Picture by Frank Howie.*

The site has a good horizon in all directions – Pearie Law is only 20 m higher and 600 m away. It is dark; you can see the Milky Way without effort. I may be wrong, but I think I counted 8 stars in the square of Pegasus, which translates to a limiting magnitude of 5.5 or 5.7 mag [3]. The only direct light is from a few street lights in the hamlet of Woolfords 1 km south. Cobbinshaw Reservoir is 1 or 2 km east, and the Edinburgh to Carlisle railway line is 1 km to the East and South. The nearest train stations are not on that line, but at West Calder and Addiewell on the Edinburgh to Shotts line. But it is a 5 km hike from there.

The site is a 40 km drive from Edinburgh. The easiest approach is westbound on the A71 through West Calder. Just west of West Calder bear left onto the A704. After about 2 km there is a crossing staggered by about 50 m, turn left here. (If you miss the A704,

after 2 km on the A71 there is a similar staggered crossing, turn left to get to the staggered crossing of the A704.) Drive another 3.5 km; this is mostly a single-file road. The site is on the left just about 100 m after you cross into South Lanarkshire. For the nerds and SatNav'ers, the site is at NT 003 579,  $\lambda = -3^{\circ}35'28''$ ,  $\phi = +55^{\circ}48'17''$ .

On the whole the infrastructure is better than at Earlyburn: there is a large car park with solid ground, and we can also use the tarmac runways to set up telescopes. Watch out for the low fence between the car park and the runway, which keeps out the sheep! Also, due to the peaty ground in the area, naked flames and smoking are not allowed on the site.

There is no electricity. Run your telescope off the car battery or bring a power pack. If you obtain a key from Danny, there is a hut/container with gas-fired facilities to warm yourself up and to make a cuppa. Bring your own consumables, including water. Also take away everything you bring – including litter. Don't store anything in the hut or on site, and leave the site in good order (sheep fence up, hut locked, site gate locked, etc.).

You don't need a key if you just want to drive in and set up so use the sky, but you will need to know the padlock code for the gate. Danny has drawn up some instructions on the use of the site, and he can provide you with a key for the hut. Please contact him, the Council, or myself before going to the site for the first time. It would be good to keep us informed so that the Society has some idea of who uses the site and how much use is made of it.

And if you get some nice results from using the site, tell the Society about it at the monthly meeting!

### References

1. West Calder Aeromodellers, <http://www.modelclub.org/>
2. Ordnance Survey, *Landranger Series*, **65**, NT 007 583
3. Tom Trussock, 2004, Small wonders: Pegasus, [http://www.cloudynights.com/item.php?item\\_id=439](http://www.cloudynights.com/item.php?item_id=439)

*Horst Meyerdirks*

## Forthcoming events

2007-11-02	Ordinary meeting
20:00	Andrew Elliot, BAA <b>Real time video astronomy</b>
2007-11-05	Observing group
20:00	
2007-12-07	Ordinary meeting
20:00	Lyn Smith, BAA Solar Section Director <b>Observing the Sun in white light and hydrogen alpha</b>
2007-12-10	Observing group
20:00	
2008-01-11	Ordinary meeting
20:00	John Braithwaite <b>Adventures of a telescope maker</b>
2008-01-14	Observing group
20:00	
2008-02-01	Ordinary meeting
20:00	<i>TBD</i> , British Geological Survey <b>The Earth's magnetic field</b>
2008-02-04	Observing group
20:00	
2008-03-07	Ordinary meeting
20:00	Prof Andrew Collier Cameron, St. Andrews University <b>The search for extra solar planets</b>
2008-03-10	Observing group
20:00	
2008-03-21	<b>Annual General Meeting</b>
20:00	

Ordinary meetings are open to the public. We are always happy to see new faces. Ordinary meetings, observing group meetings and the Annual General Meeting take place at the City Observatory, Calton Hill, Edinburgh. Changes to our meeting arrangements may be put on the website <http://www.astronomyedinburgh.org> and on the answering machine at the observatory (0131-556.4365).

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## About the ASE Journal

This Journal is published by

The Astronomical Society of Edinburgh  
City Observatory  
Calton Hill, Edinburgh  
<http://www.astronomyedinburgh.org>

The Astronomical Society of Edinburgh is registered Scottish charity SC022968.

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This Journal appears approximately four times a year, usually in March, June, September and December. Contributions should be sent to the editor by the beginning of the month preceding publication. Contributions are welcome from members of the Society, or regarding astronomy in Edinburgh or Scotland.