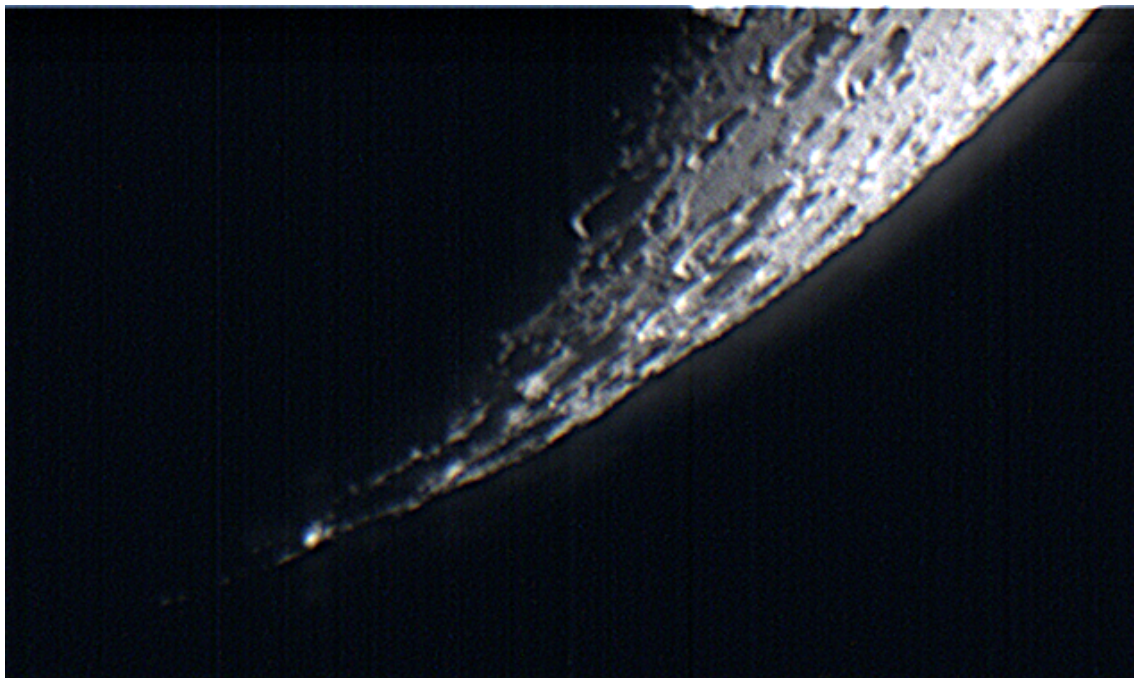




OASI News

The newsletter of the Orwell Astronomical Society



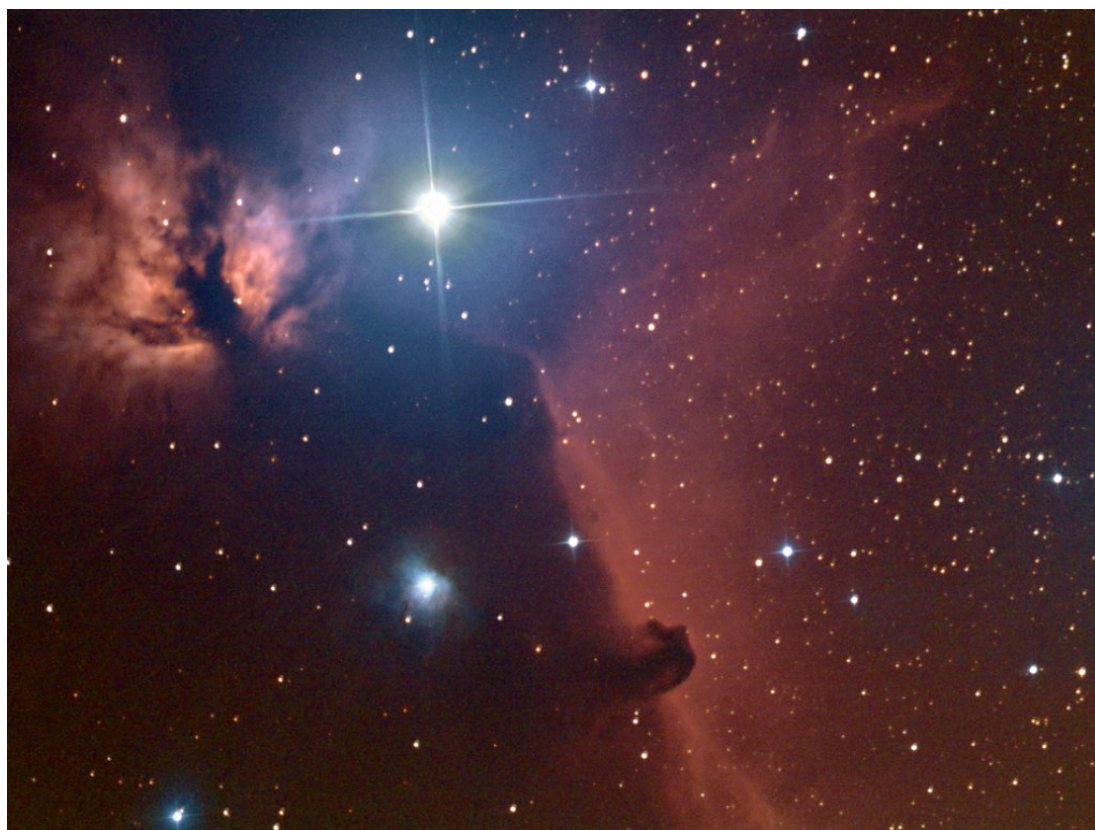
Moon on 18 December

Photo: Martin Cook

Trustees: Mr Roy Adams Mr David Brown Mr David Payne
Honorary President: Dr Allan Chapman D.Phil MA FRAS

Nebulae: Flame, Horsehead, NGC2024, IC234, IC405

David Murton



NGC 2024 the Flame Nebula in Orion with IC 234 (Barnard 33) the Horeshead Nebula.
7x 480 seconds at iso 400 plus 1x480 seconds at iso 1600 using an Ha filter.
Canon 60Da camera and Skywatcher 200PDS on NEQ6 mount.



IC 405 the Flaming Star nebula in Auriga. Magnitude 10.
As before but 15x480 seconds plus 2x480 seconds at iso 1600 in Ha

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Happy New Year and “clear skies”

Society Contact details

Observatory (meeting nights only)

07967 519249

Email queries: info@oasi.org.uk

Facebook: <https://www.facebook.com/groups/445056098989371/>

Twitter: @OASlpswich

The OASI Facebook pages are now proving very popular. Several non-members are active contributors.

Please send material for the OASI web site and newsletter e.g. observations, notices of events, general interest articles, to

news@oasi.org.uk

Other contact details will be issued to members on a separate printed list or emailed directly to those who only receive the e-version of the News.

Access into the School Grounds and Observatory Tower

Please use the third gate into the school grounds by the gym.

Areas out of Bounds

Access to the Observatory is **only via the black door** at the foot of the Observatory tower, which leads to the staircase and thence to the spiral staircase up to the Observatory. If the black door is locked, please phone the observatory mobile, 07967 519249 during meeting hours.

Please do NOT explore other routes. When in doubt, ask or call the Observatory mobile.

Remember this is a school and straying into the main part of the school where the pupils reside would cause the society big problems and could see us losing the use of the observatory. Any member found to be anywhere other than the approved access route or the observatory area will face serious sanctions up to and including expulsion from OASI.

Please note that access time for all observatory member nights is after 20:15

The key to the toilets in the school gym is located in the seating area in the Belvedere room.

Articles for OASI News

News, pictures and articles for this newsletter are always welcome. Please send them to

news@oasi.org.uk

The CLOSING date is the 15th day of the month

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtf, doc, docx, odt, Pages, pdf

Spreadsheets: xls, xlsx, OpenOffice/LibreOffice, Numbers

Images: tiff, png, jpg

Please send tables as separate files in one of the above formats.

If you don't feel up to writing a major article, perhaps you might write a short note for OASI News along the lines of *"This month I have mostly been observing/constructing/mending/reading/etc."*

Articles win points! See page 15.

The full colour version is available from the OASI web site.

[Newsletter archive www.oasi.org.uk/NL/NL_form.shtml](http://www.oasi.org.uk/NL/NL_form.shtml)

Authors, please note that your articles will now be publicly available worldwide!

Reproducing articles from OASI News

If you plan to reproduce an article exactly as per OASI News then please contact the [Editor](#) – otherwise, as a matter of courtesy, please seek permission from and credit the original source/author. You may not reproduce articles for profit or other commercial purpose.

Committee 2016

Chairman	David Murton	Set overall agenda for OASI, Chair committee meetings, Press and publicity, Public appreciation of astronomy, Outreach activities.
Secretary	Roy Gooding	Outreach meetings (jointly with Chairman), observatory decoration.
Treasurer	Paul Whiting FRAS	Finance, Supervision of applications for grants, Visits by outside groups, Observatory tours, Public appreciation of astronomy (jointly with Chairman).
Committee	James Appleton	Committee meeting minutes, Web site
	Martin Cook	Membership, Tomline refractor maintenance & user testing
	Peter Richards	Lecture meetings, Email distribution lists
	Martin Richmond-Hardy	Newsletter
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club.
	Avtar Nagra	Newbourne Observing Group
	Matt Leeks	Safety & security
Co-opted	Andy Wilshire	Librarian

Society Notices

The Annual General Meeting

AGM, **Saturday 21 January 2017**, Museum St Methodist Church Hall, starting 7.30pm (note: start is earlier than usual).

The usual AGM items followed by a discussion on the outreach activities of the Society.

MEMBERSHIP RENEWAL: (50th Anniversary Year)

A blue membership renewal form and a questionnaire will be sent to you shortly.

Please complete the forms and return to me at the address shown.

Thank you

Martin Cook
Membership Secretary

Contacts

A printed list of Committee and other activity contacts is available from the Secretary or the Observatory. Email links are available in the A4 pdf version of this newsletter.

For general enquiries please email info@oasi.org.uk and your enquiry will be forwarded for action.

Signing in and out

Please ensure you sign in and out when visiting the Observatory and/or Newbourne.
This is for fire safety precautions and also provides an historic record.

OASI and BAA Events

For the latest event details, please see www.oasi.org.uk/Events/Events.php

There's a Google Calendar on the OASI web site with the latest dates (and corrections!). If you want to easily add OASI Events to your own computer/ phone/tablet calendar application click this button on the website Events page.



Download the OASI 2016 year planner from the web site. An A3 printer is advised.

For other astronomy news and astro pictures try our

Twitter feed <https://twitter.com/OASIpSwich>

Facebook page <https://www.facebook.com/pages/Orwell-Astronomical/158256464287623>

Subscribe to the OASI Yahoo group by emailing oasi-subscribe@yahoogroups.com

Date and Time	Location	Contact	Event
Weekly, every Wednesday, 20:15–22:00	Orwell Park Observatory	Martin Cook, Roy Gooding	General observation (weather permitting) using a variety of telescopes. Entry via the third gate left. NOT the main gate
Monday 06 January From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Tuesday 10 January 20:00	Orwell Park Observatory	Paul Whiting treasurer@oasi.org.uk	Observatory visit. Booking essential.
Monday 16 January From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 21 January 14:00	Burlington House Piccadilly London W1J 0DU	https:// britastro.org/	BAA Ordinary Meeting
Saturday 21 January 19:30	Methodist Church Hall Black Horse Lane, Ipswich	Roy Gooding secretary@oasi.org.uk	The AGM
Monday 30 January From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Tuesday 7 February 20:00	Orwell Park Observatory	Paul Whiting treasurer@oasi.org.uk	Observatory visit. Booking essential.
Monday 13 February From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Monday 27 February From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 4 March	Newbury	https:// britastro.org/	BAA Deep Sky Section Annual Meeting

Date and Time	Location	Contact	Event
Saturday 11 March	Swinton, Mexborough S64 8PZ	https:// britastro.org/	BAA Back to Basics Workshop
Monday 13 March From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Tuesday 14 March 20:00	Orwell Park Observatory	Paul Whiting treasurer@oasi.org.uk	Observatory visit. Booking essential.
Monday 27 March From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Wednesday 29 March 17:30	Burlington House Piccadilly London W1J 0DU	https:// britastro.org/	Special General Meeting and Ordinary Meeting
Friday 7 April	Sparsholt College, Winchester	https:// britastro.org/	BAA Winchester Weekend
Monday 10 April From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Tuesday 11 April 20:00	Orwell Park Observatory	Paul Whiting treasurer@oasi.org.uk	Observatory visit. Booking essential.
Monday 24 April From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 29 April 10:00	The Birley Centre, 49 Carlisle Rd, Eastbourne BN21 4JR	https:// britastro.org/	One Day Spring Meeting - "Planets in our solar system and beyond"
Wednesday 31 May 17:30	Burlington House Piccadilly London W1J 0DU	https:// britastro.org/	Special General Meeting and Ordinary Meeting
Saturday 3 June 10:00	Cambridge	https:// britastro.org/	Webb Deep-Sky Society Annual Meeting, Cambridge A short AGM for Society members followed by a full day of talks by leading amateur and professional astronomers and astrophysicists
Saturday 17 June (all day)	Burlington House Piccadilly London W1J 0DU	https:// britastro.org/	Comet Section meeting
Saturday 29 July	UCS, Ipswich	David Murton chairman@oasi.org.uk	OASI 50th Anniversary
21 August	USA	www.greatamericaneclipse.com	Total solar eclipse

Later 2017 NOG dates, up to the end September, are on the website.

Newbourne Observing Group

Avtar Nagra nog@oasi.org.uk

We normally meet at Newbourne Village Hall, Mill Lane, IP12 4NP on the 2nd and 4th Mondays (with a few exceptions, like December and January).

The Newbourne Observing Group (The NOGs) is a good place to start for beginners. If you are thinking of buying a scope or binoculars, come and try before you buy and talk to owners about the strengths and weaknesses of particular models. If you've already splashed the cash, bring your new scope along to use or for advice on setting-up and adjustment. All welcome, with or without telescopes. We would like visitors to join OASI to enjoy the full benefits of membership.

The car park at Newbourne Village Hall has recently been much enlarged. OASI donated £100 towards this much-needed improvement.

Newbourne Observation Group Stargazer's guide

On the first meeting each month Bill Barton will give a short presentation of what can be viewed in the following 4 weeks. For armchair stargazers (on those cloudy nights) there is a small branch of the OASI Library held at Newbourne and a copy of the full catalogue.

NOG Meetings in 2017

6 Jan	30 Jan	13 Feb	27 Feb
13 March	27 March	10 April	24 April
15 May	29 May	12 June	26 June
10 July	24 July	14 Aug	28 Aug
11 Sept	25 Sept		

We open up for all meetings at 7pm. Star Guide (S) and Workshops (W) start at 8pm.

Please check the web site diary for any changes during the year.

Astronomy Workshops

Contact Mike Whybray

Location: Newbourne Village Hall IP12 4NP

Doors open at 7:00pm.

Workshops start at 8:00pm

If you are a new OASI member, or haven't been to one of these informal workshops before, they are a mixture of events of different characters including beginners talks, interactive workshops, films, etc., suitable for all. They are also a chance to chat with other members over a cup of tea and a biscuit, in a venue rather warmer than the observatory dome on a winter's night!

Given a clear night, we can make use of the field for a workshop or continue afterwards with some observing.

Do you have a subject you could workshop? You could do a short one, or share the effort with a partner. Drop Mike Whybray a line! workshops@oasi.org.uk

Lecture Meetings

Contact: Peter Richards lectures@oasi.org.uk

These take place in [Museum Street Methodist Halls](#), Upstairs room, Black Horse Lane, Ipswich

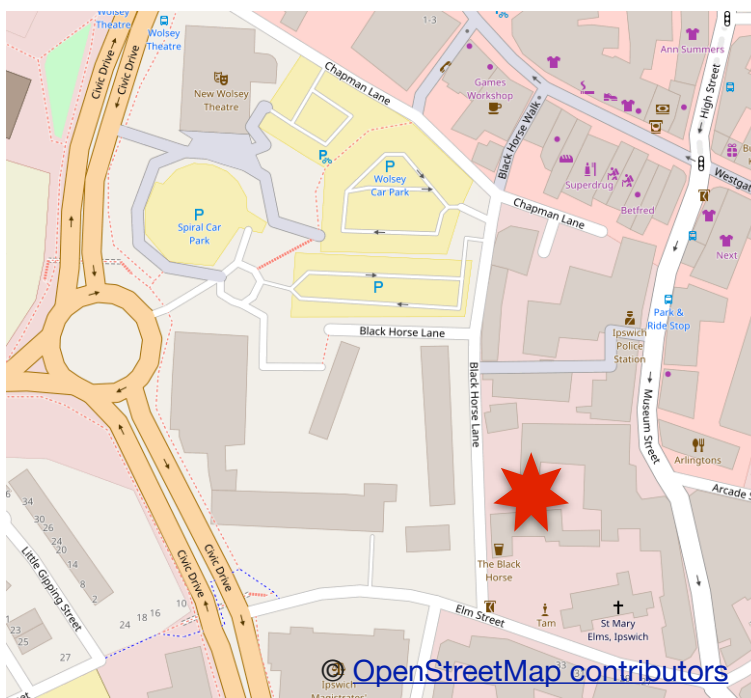
There is some parking at the venue but if there is no space at the venue you can drive to the end of Black Horse Lane and turn left to find a pay and display car park which charges (at the time of writing) £2 for parking between 6pm and 6am.

NB The spiral car park by the New Wolsey theatre is CLOSED.

Please note that we have to be out of the building by 10pm

17 November

Steve Hubbard and Malcolm Brown will be "Talk with ET? We think not."



DASH Astro Events – 2017

See <http://dash.moonfruit.co.uk> for the latest details.

All DASH Astro observing sessions will take place at WESTLETON COMMON. ASOG observing sessions and locations may be arranged at the time of observation.

Unless stated all group meetings will take place at WESTLETON VILLAGE HALL from 7:30 pm



Date	Event
14.01	Meeting – Bob Greef – Globular Clusters
27/28.01	Star Gazing Live – RSPB Minsmere (Sunset 16:32 Moonset 17:21 0.3% Moon)
11.02	Meeting – Bill Barton & Dave Murton –Astrophotography

The Night Sky in January

Martin RH

All event times given are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E

Times are in UTC(GMT).

Moon

Source: <http://heavens-above.com/moon.aspx>

New Moon	1 st Quarter	Full Moon	Last Quarter
29 Dec 2016 06:53	05 Jan 2017 19:47	12 Jan 11:34	19 Jan 22:14
28 Jan 00:07			

Sun, Moon and planets

Source: <http://heavens-above.com/PlanetSummary.aspx>

Object	Date	Rise	Set	Mag.	Notes
Sun	1	08:03	15:54		
	31	07:36	16:41		
Moon	1	09:43	19:36		Perigee 368,816 km 10 Jan 06:01
	31	09:12	20:59		Apogee 404,914 km 22 Jan 00:14
Mercury	1	07:15	15:26	3.0	Inferior conjunction 2016-Dec-28
	31	06:45	14:31	0.0	Maximum western elongation 2017-Jan-19
Venus	1	10:24	20:01	-4.3	Maximum eastern elongation 2017-Jan-12
	31	08:57	21:01	-4.4	
Mars	1	10:42	21:11	0.9	
	31	09:18	21:23	1.1	
Jupiter	1	01:07	11:53	-1.8	
	31	23:16	09:59	-2.0	
Saturn	1	06:36	14:28	1.4	
	31	04:53	12:42	1.4	
Uranus	1	11:48	01:06	5.8	
	31	09:50	23:07	5.9	
Neptune	1	10:41	21:08	7.9	
	31	08:45	19:15	8.0	

Occultations during January 2017

James Appleton

The table lists occultations during the month under favourable circumstances. The events should be readily visible in small telescopes or binoculars. The first two columns list the date and time (UT) of the occultation. Column three gives the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. The table lists circumstances of disappearances and reappearances as dictated by the visibility of each phenomenon (determined by altitude, lunar phase, etc). Column four details the lunar phase ('+' for waxing and '-' for waning). Columns five and six give the altitude of the Sun and the star, both in degrees. (A negative solar altitude means that the Sun is below the horizon.) Columns seven and eight provide the star's magnitude and catalogue number.

The data relates to Orwell Park Observatory, but will be similar at nearby locations.

Please note that **times are shown in UTC**.

Date	Time (UT)	D/ R	Lunar Phase	Sun Alt(°)	Star Alt(°)	Mag	Star
01 Jan 2017	17:05:55	D	0.11+	-10	17	6.9	ZC 3149
01 Jan 2017	17:13:30	D	0.11+	-11	16	6.6	ZC 3152
04 Jan 2017	18:39:35	D	0.38+	-24	32	6.4	4 Cet
04 Jan 2017	18:55:58	D	0.38+	-26	31	6.2	5 Cet, AP Psc
04 Jan 2017	19:20:12	D	0.38+	-30	29	7.1	ZC 15
05 Jan 2017	21:36:31	D	0.50+	-50	23	7.2	Hip 5060
	21:50:32	R		-51	21		
06 Jan 2017	22:13:44	D	0.62+	-54	29	7.4	DE Psc
09 Jan 2017	22:54:53	D	0.91+	-57	52	5.5	ZC 741

See page 15 for James's Annual Summary

*Don't forget the OASI AGM
on Saturday 21 January*

Visible ISS passes $\geq 15^\circ$ max altitude

Martin RH

Source: <http://heavens-above.com/PassSummary.aspx?satid=25544>

Mostly early morning passes this month.

Times are UTC. Predictions are approximate (data taken on 16 Dec) due to craft adjustments. Check the day before.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
02 Jan	-1.8	06:34:57	10°	SW	06:37:58	35°	SSE	06:41:00	10°	E
03 Jan	-1.2	05:44:12	17°	S	05:45:51	25°	SSE	05:48:35	10°	E
03 Jan	-3	07:18:45	10°	WSW	07:22:00	71°	SSE	07:25:16	10°	E
04 Jan	-0.4	04:54:30	16°	SE	04:54:30	16°	SE	04:55:57	10°	E
04 Jan	-2.7	06:27:11	14°	WSW	06:29:46	55°	SSE	06:32:59	10°	E
05 Jan	-2.3	05:37:17	39°	S	05:37:33	40°	SSE	05:40:39	10°	E
05 Jan	-3.3	07:10:37	10°	W	07:13:52	84°	S	07:17:10	10°	E
06 Jan	-0.3	04:47:16	16°	E	04:47:16	16°	E	04:48:14	10°	E
06 Jan	-3.3	06:19:56	26°	WSW	06:21:35	75°	S	06:24:51	10°	E
07 Jan	-2.6	05:29:49	51°	ESE	05:29:49	51°	ESE	05:32:32	10°	E
07 Jan	-3.3	07:02:28	10°	W	07:05:44	85°	S	07:09:00	10°	E
08 Jan	-3.4	06:12:16	38°	W	06:13:23	86°	S	06:16:41	10°	E
09 Jan	-2.1	05:22:01	42°	E	05:22:01	42°	E	05:24:20	10°	E
09 Jan	-3.2	06:54:40	13°	W	06:57:31	73°	S	07:00:46	10°	ESE
10 Jan	-3.4	06:04:23	49°	W	06:05:10	83°	S	06:08:27	10°	E
11 Jan	-1.7	05:14:04	34°	E	05:14:04	34°	E	05:16:04	10°	E
11 Jan	-2.9	06:46:43	15°	W	06:49:11	52°	SSW	06:52:23	10°	ESE
12 Jan	-3.3	05:56:24	57°	WSW	05:56:51	68°	SSW	06:00:06	10°	ESE
13 Jan	-1.2	05:06:05	28°	ESE	05:06:05	28°	ESE	05:07:45	10°	E
13 Jan	-2.2	06:38:43	17°	W	06:40:45	33°	SSW	06:43:44	10°	SE
14 Jan	-2.9	05:48:25	47°	SSW	05:48:27	47°	SSW	05:51:36	10°	SE
15 Jan	-0.8	04:58:08	20°	ESE	04:58:08	20°	ESE	04:59:19	10°	ESE
15 Jan	-1.5	06:30:47	16°	WSW	06:32:10	20°	SW	06:34:39	10°	SSE
16 Jan	-1.9	05:40:31	27°	S	05:40:31	27°	S	05:42:48	10°	SSE
29 Jan	-0.8	18:59:06	10°	SSW	18:59:54	15°	S	18:59:54	15°	S
31 Jan	-2.1	18:49:39	10°	SW	18:52:04	32°	S	18:52:04	32°	S

Iridium flares

Too many to list but see <http://heavens-above.com/IridiumFlares.aspx>

Meteor Showers

Source: BAA Handbook 2016 p97-99

Shower	Limits	Maximum	ZHR at Max	Notes
Puppids-Velids	Nov 27 – Jan	Dec 8	15	Two of several radiants in Puppis, Vela and Carina from November to January
		Dec25		
Quarantids	Jan 1 – 6	Jan 3 ^d 15 _h	80+	Blue and yellow meteors. Diffuse radiant except at peak. High rates in 2014. Very favourable

Comets due in 2017

Bill Barton

Here are the comets listed in the BAA Handbook with single figure peak magnitudes:-

- 45P/Honda-Mrkos-Pajdusakova, **peak magnitude 6 in January** and visible from the UK from January to May
- 2P/Encke, peak magnitude 5 in March and visible from the UK from January to February.
- 41P/Tuttle-Giacobini-Kresak, peak magnitude 3 in April and visible from the UK from January to July.
- Johnson (2015V2), peak magnitude 7 in June and visible from the UK from January to July.
- 96P/Machholtz will peak at magnitude 2 in October, but will not be visible from the UK.

Paul's Astronomy Podcast for January

Paul Whiting FRAS Podcast, December 2017 www.oasi.org.uk/2017_01_pod.mp3

With this month's podcast we have now completed 5 years and started on year 6 with the 61st such monthly podcast.

David's Radio Broadcast

On the 1st Tuesday of the month, 1.40pm on the Lesley Dolphin show on BBC Radio Suffolk – now digital (channel 10c) and FM 103.9 (Ipswich), 104.6 (west Suffolk), 95.5 (Lowestoft), 95.9 (Aldeburgh).

Bill's Radio Broadcast

ICRFM (Ipswich Community Radio) 105.7 MHz at about 08:25 in the morning of the first Wednesday of each month. I aim to cover what there is to see in the sky and then a little bit on something topical.

ICRFM is also available to listen to over the Internet and there is a listen again option on their website. <http://www.icrfm.com>

Lunar Occultations During 2017

James Appleton

Introduction

During 2017, there are over 660 lunar occultations potentially observable from East Anglia, although many involve faint stars. The tracks of three grazing occultations cross the region during the year within a few kilometres of Orwell Park Observatory. No lunar occultations of planets are visible from the region during the year.

This article summarises circumstances of the best occultations during the year. It provides details for the location of Orwell Park Observatory; differences will in general be negligible for locations throughout East Anglia.

Predictions below are calculated as follows:

- Details of total occultations are calculated from software of my own creation, based on algorithms in "Astronomy on the Personal Computer" by O. Montenbruck and T. Pfleger, Springer-Verlag, 1994.
- Circumstances of grazes are calculated from the package Occult, created by Australian amateur David Herald (version 4.1.5.4).

Occultations of bright stars

Table 1 lists occultations during the year, of stars to magnitude 5.5, where the circumstances are favourable. The events should be readily visible in small telescopes or binoculars. The first two columns of table 1 list the date and time (UT) of the occultation. Column three gives the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. The table lists circumstances of disappearances and reappearances as dictated by the visibility of each phenomenon (determined by altitude, lunar phase, etc). Column four details the lunar phase ('+' for waxing and '-' for waning). Columns five and six give the altitude of the Sun and the star, both in degrees. (A negative solar altitude means that the Sun is below the horizon.) Columns seven and eight provide the star's magnitude and catalogue number.

Table 1. Occultations of stars of magnitude 5.5 or brighter.

Date	UT	D / R	Lunar Phase	Sun Alt (°)	Star Alt (°)	Mag	Star
09 Jan	22:54:53	D	0.91+	-57	52	5.5	ZC 741
02 Feb	19:04:04	D	0.34+	-21	35	4.4	106 Psc, ν Psc
	20:11:51	R		-32	27		
04 Feb	18:05:12	D	0.56+	-12	51	4.1	5 Tau, f Tau
	19:10:05	R		-22	50		
05 Feb	17:49:29	D	0.68+	-9	50	3.4	78 Tau, θ^2 Tau
	19:02:23	R		-20	54		
05 Feb	17:52:15	D	0.68+	-10	50	3.8	77 Tau, θ^1 Tau
	19:00:01	R		-20	54		
05 Feb	19:12:53	D	0.68+	-22	54	4.8	ZC 677
	19:57:25	R		-29	54		
07 Feb	03:02:51	D	0.81+	-40	10	5.5	130 Tau
04 Feb	18:05:12	D	0.56+	-12	51	4.1	5 Tau, f Tau
	19:10:05	R		-22	50		
05 Feb	17:49:29	D	0.68+	-9	50	3.4	78 Tau, θ^2 Tau
	19:02:23	R		-20	54		

Date	UT	D / R	Lunar Phase	Sun Alt (°)	Star Alt (°)	Mag	Star
05 Feb	17:52:15	D	0.68+	-10	50	3.8	77 Tau, θ^1 Tau
	19:00:01	R		-20	54		
05 Feb	19:12:53	D	0.68+	-22	54	4.8	ZC 677
	19:57:25	R		-29	54		
07 Feb	03:02:51	D	0.81+	-40	10	5.5	130 Tau
08 Feb	23:02:42	D	0.95+	-50	55	5.0	74 Gem, f Gem
04 Mar	20:48:47	D	0.42+	-29	36	3.7	54 Tau, Γ Tau, Hyadum I
	21:48:19	R		-36	27		
04 Mar	23:41:40	D	0.44+	-44	11	4.5	71 Tau, V777 Tau
05 Mar	23:27:49	D	0.55+	-43	22	5.0	111 Tau, V1119 Tau
06 Mar	00:18:13	R		-44	15		
19 Mar	01:47:52	R	0.64-	-34	10	4.9	24 Sco
13 Apr	23:39:18	D	0.93-	-29	16	3.9	38 Lib, Γ Lib
14 Apr	00:55:38	R		-27	22		
28 Apr	19:06:17	R	0.08+	0	22	0.9	87 Tau, α Tau, Aldebaran
06 Aug	21:18:25	D	0.99+	-13	15	5.1	10 Cap, π Cap
13 Aug	23:56:07	R	0.62-	-24	16	4.3	73 Cet, ξ^2 Cet
15 Aug	02:47:47	D	0.49-	-15	36	4.1	5 Tau, f Tau
	03:51:58	R		-7	44		
16 Aug	01:39:55	D	0.38-	-21	21	4.5	71 Tau, V777 Tau
	02:36:50	R		-16	30		
16 Aug	02:44:53	D	0.38-	-15	31	3.4	78 Tau, θ^2 Tau
	03:48:46	R		-8	40		
16 Aug	02:48:00	D	0.38-	-15	31	3.8	77 Tau, θ^1 Tau
	03:46:47	R		-8	40		
17 Aug	02:20:11	D	0.27-	-18	20	5.4	115 Tau
	03:07:08	R		-13	27		
29 Sep	19:03:33	D	0.66+	-14	18	4.9	56 Sgr, f Sgr
	19:57:06	R		-22	17		
03 Oct	22:13:34	D	0.96+	-39	30	4.9	92 Aqr, χ Aqr
05 Nov	19:47:58	R	0.96-	-32	17	3.7	54 Tau, Γ Tau, Hyadum I
06 Nov	02:39:47	D	0.95-	-39	52	0.9	87 Tau, α Tau, Aldebaran
	03:26:39	R		-33	48		
09 Nov	03:48:41	D	0.69-	-30	56	4.9	81 Gem, g Gem
	05:02:57	R		-19	56		
23 Dec	18:48:58	D	0.24+	-27	16	5.3	42 Aqr
28 Dec	19:24:21	D	0.75+	-31	46	4.3	73 Cet, ξ^2 Cet
29 Dec	23:02:57	D	0.85+	-59	43	4.1	5 Tau, f Tau
30 Dec	17:06:59	D	0.92+	-11	26	3.7	54 Tau, θ Tau, Hyadum I
	18:03:08	R		-19	34		
30 Dec	21:22:04	D	0.92+	-49	54	5.0	75 Tau
30 Dec	22:46:02	D	0.93+	-58	52	4.8	ZC 677
31 Dec	01:13:29	D	0.93+	-58	37	0.9	87 Tau, α Tau, Aldebaran
	02:00:31	R		-53	30		
31 Dec	21:27:24	D	0.98+	-49	53	4.3	119 Tau, CE Tau

Occultation Seasons

The Moon's orbit is defined by a range of periodicities, both short and long term. The short term periodicities cause the Moon's path through the sky to follow a pattern whereby it almost repeats every month. The longer term periodicities gradually shift the orbit so that no particular pattern of approximate repetition can last more than a few years. This results in so called "occultation seasons", lasting for months or years, during which particular stars are repeatedly occulted, or repeatedly not occulted. In 2017, the phenomenon is evident through repeated occultations of Aldebaran and stars in the Hyades.

Nights with many occultation events

During the year, the Moon traverses some rich star fields. When this happens, a large number of occultations can occur during a single evening. Table 2 lists all evenings throughout the year when the Moon occults 10 or more stars. The large number of occultations on 30 April is associated with star fields in Gemini.

Date	No. occs	Date	No. occs	Date	No. occs	Date	No. occs
03 Jan	18	31 Jan	12	01 Feb	13	02 Feb	11
05 Feb	22	01 Mar	13	02 Mar	17	31 Mar	12
01 Apr	28	02 Apr	19	03 Apr	10	29 Apr	25
30 Apr	66 (!)	29 May	15	16 Aug	10	22 Nov	11
23 Nov	12	25 Nov	11	23 Dec	13		---

Table 2. Evenings with 10 or more occultations.

Grazing Occultations

Three grazing lunar occultations are predicted for the year. Table 3 summarises the circumstances as follows. Columns one and two give the date and time of each graze and column three specifies the lunar phase ('+' for waxing and '-' for waning). Column 4 specifies the lunar limb involved; columns five and six give the altitude of the Sun and the star, both in degrees. (A negative solar altitude means that the Sun is below the horizon.) Column seven indicates the minimum distance from Orwell Park Observatory to the graze track and Columns 8 and 9 specify the star and its magnitude.

Weather permitting, the usual band of OASI occultation observers will organise observing trips to the grazes. Please get in touch if you are interested in participating. Further information on the grazes, including plots of the tracks in Google Earth, is on the OASI web site: <http://www.oasi.org.uk/Occs/Occs.php>.

Date	Time (UT)	Lunar Phase	Limb	Sun Alt (°)	Star Alt (°)	Track Dist from OPO (km)	Mag	Star
05 Feb	19:23	0.80 +	S	-24	53	24	5.5	81 Tau
25 Oct	18:07	0.13 +	S	-14	13	32	6.4	V4190 Sgr
09 Dec	06:27	0.86 -	S	-12	45	17	6.8	ZC1522

Table 3. Grazing lunar occultations.

Figure 1 shows the graze track

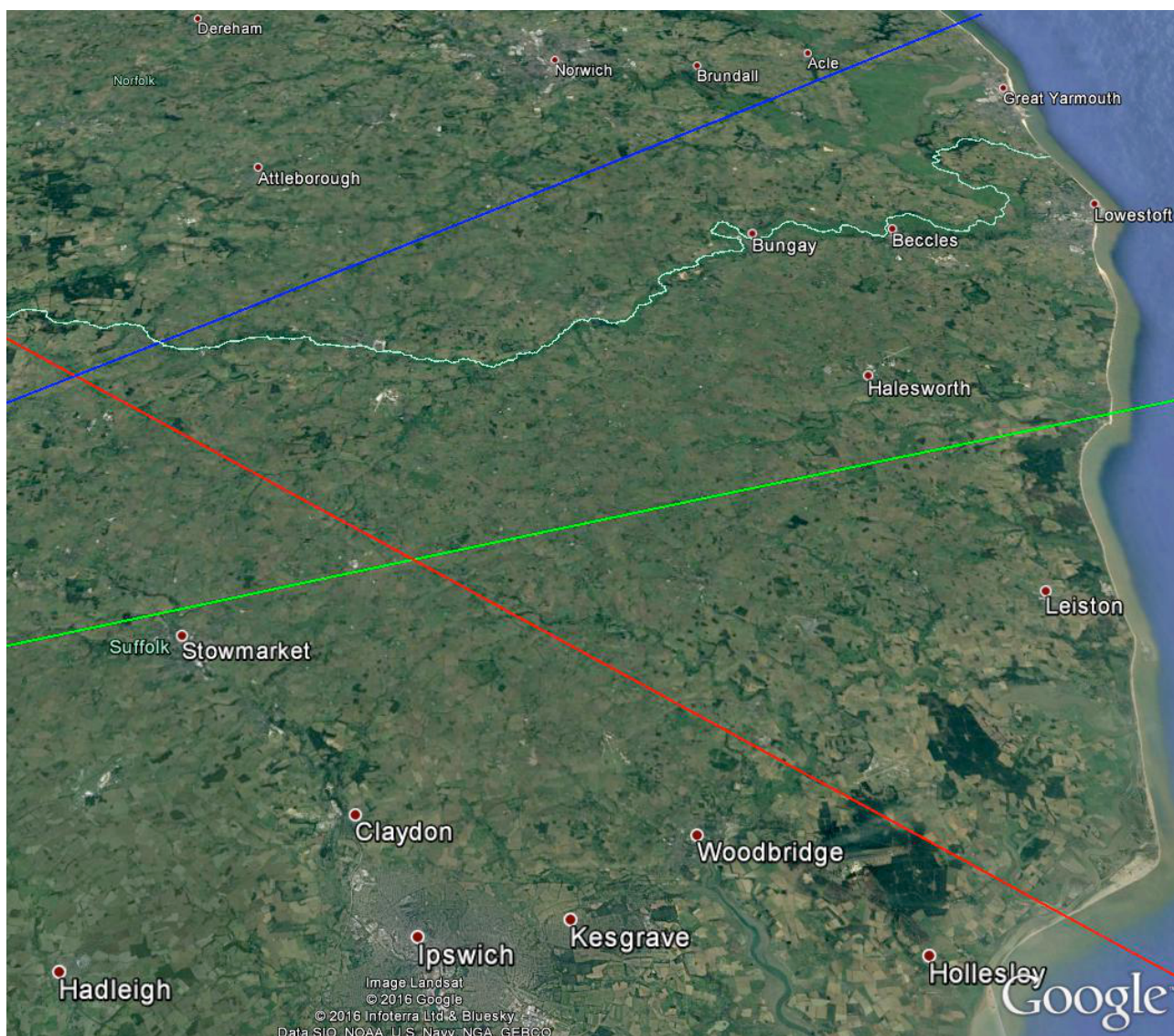


Figure 1. Graze tracks. (81 Tau green; V4190 Sgr blue; ZC1522 red.)

James Appleton

*Don't forget the OASI AGM
on Saturday 21 January*

BAA News

Amateur involvement in support of the proposed TWINKLE and ARIEL space missions

We would like to invite interested observers to a workshop at the Royal Astronomical Society on the afternoon of Monday, 9th January 2017 to explore amateur involvement in support of the proposed TWINKLE and ARIEL space missions. The workshop will be held in the Council Room of the Royal Astronomical Society, Burlington House, Piccadilly, London, W1J 0BQ.

The aim of the workshop is to take the first steps in setting up a worldwide group of amateur observers able to provide ground-based support for measuring photometric variability of space mission target stars, including exoplanet transits.

TWINKLE is an independent mission to characterise the atmospheres of around 100 hot, bright exoplanets observed from Earth-orbit. The mission is led by University College London and Blue Skies Space Ltd. It will be built by Surrey Satellite Technology Ltd involving a consortium of over 15 institutions across the UK, and scheduled for launch in 2019. ARIEL is a more ambitious exoplanet mission in which observations are planned from the L2 position in space, due for launch about 2026.

EXOPLANET WORKSHOP Agenda - Monday 9th January

- 1:30 Coffee / tea on arrival
- 2:00 - 2:15 Welcome, introduction to the Twinkle mission (Jonathan Tennyson, Twinkle Senior Advisor)
- 2:15 - 2:25 Twinkle's target list (Giovanna Tinetti, Twinkle Science Lead)
- 2:25 - 2:40 Twinkle's instrumentation and ground-based/amateur observations required in support of the mission (Giorgio Savini, Twinkle Payload Lead)
- 2:40 - 2:50 Groundbased support via the BAA Observing Sections (Richard Miles, Roger Pickard, BAA)
- 2:50 - 2:55 Europlanet workshops and ground-based campaign in support of Rosetta (Anita Heward)
- 2:55 - 3:05 Connected Telescope Project (Marco Rocchetto, Konica Minolta)
- 3:05 - 4:45 Discussion on next steps
 - Mechanisms for communicating and sharing data
 - Further groups to involve
 - Roles and responsibilities
 - Planning for Europlanet workshop
- 4:45 - 5:00 Summary

As a follow-up to this initial UK-focused workshop, the plan is to submit a proposal to the Europlanet organisation for funding a 2-day international workshop (most probably to be held in London) to progress amateur observational support of TWINKLE, ARIEL, Gaia and other exoplanet missions.

Despite the rather short notice, we hope that a good number of interested observers will be able to participate in this first workshop. If you are planning to attend then do please let us know in advance by e-mailing the undersigned (R. Miles). Many thanks.

Richard Miles, BAA Asteroids and Remote Planets Section Director

rmiles [at] baa [dot] u-net [dot] com

December BAA meeting video

The video of the December BAA meeting is now available for viewing on the BAA web site:

<https://britastro.org/video/7185>

You'll be able to catch up on the three excellent talks that were present:

- The 2016 Christmas lecture, 'Atmospheres on other worlds: the next step for exoplanet science' presented by Dr Joanna Barstow (UCL)
- 'HIGGS IN SPACE: Particle Physics Amongst the Stars' by Dr Tom Whyntie (Queen Mary University of London)
- Sky Notes for December and January by Nick James (BAA)

I hope you enjoying watching the talks. Please note that you needed to be logged into the BAA website before viewing. The Sky Notes talk is also freely available to all on YouTube here:

<https://www.youtube.com/watch?v=qLLyzGd8xHg>

Do note the AGM talks given on 2016 October 26 are also still available at:

<https://www.britastro.org/video/7184>

OASI Member of the Year Competition

- Open to any non committee member (at time points earned)
- Runs from 1st September to 31st August each year
- It is the members responsibility to check that they have been credited the points for a particular event

Activity	Points	Activity	Points
Helping at an OASI outreach event	10	Writing a newsletter article (per page)	3
Giving a workshop/monthly sky notes	20/10	Introducing a new member	5
Astro photo published	2		

Members' points to date

Adam Honeybell	20
Alan Smith	16
Andy Gibbs	33
Bill Barton	71
Chris Lock	10
Ian Hastie	10
Joe Startin	29
Joe Walsh	10
Mandy Gibbs	10
Mike Nicholls	30
Mike O'Mahoney	36
Nicky Richards	20
Nigel Evans	6
Ray Larson	10
Rob Herring	28
Steve ??	10
Tina Hammond	10

Come and help at one of our outreach events and earn 10 points. You don't need to be an expert!

Write a short article for the magazine, e.g.

Bought some new astronomy kit? Tell us about it – successes and pitfalls.

New: You now get 2 points for an astrophoto.

We are all learners.

Martin RH

Hi,

Its time for our New Year rendering of another of our quite old books, taken from our library:

Welcome one and all to:

The Life and Times of Nicolaus Copernicus

Andy Willshire

Copernicus was born of February 19th 1473, in Torun a Polish town in the province of Royal Prussia. His work helped to bring in a new brand of astronomy to modern science. His Heliocentric theory put down the basis for modern science in physics and philosophy and also changed man's view of the heavens.

He was the youngest of four children. There is little known about his younger life, except to say that his father left the capital Krakow to move to a smaller town called Torun, where he married Barbara Watzenrode, the daughter of a rich Torun patrician.

1491 found Nicolaus at the Jagiellonian University, where his father had paid his tuition fees in full. His elder brother Andrej also attended, but read Arts.

Nicolaus was well grounded in the maths of astronomy as well as philosophy taught at the university. Here he acquired a large library on astronomy, which was taken by the Swedes as booty in the 1650's and is now in Uppsala University Library.

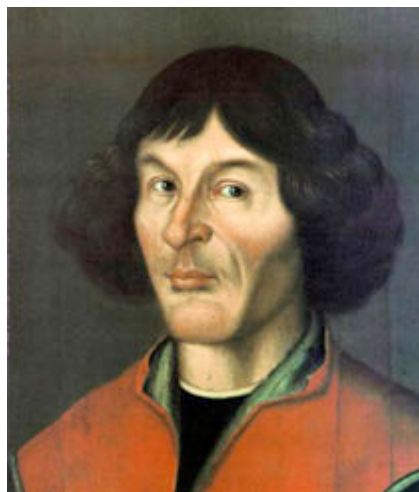
From the beginning of the 15th century the University had one chair for maths and one for astronomy. This was founded by Marcin Krol, a friend of the German astronomer Johann Muller.

Nicolaus could speak Latin, German, Polish, Greek and Italian. Most of his surviving works are in Latin which at the time was the language that most academic works were written in. This included the work presented to the Polish Court and to the Catholic Church. Today, a few documents survived having been written in German.

During his four years at Krakov, he developed a critical eye for looking at prior observations and began to initiate a logical analysis of both Aristotle's and Ptolemy's works. In 1500 he spent time in Rome observing the lunar eclipse of the 5-6 November. He had also studied medicine and astrology, but did not show any interest in the latter.

Before 1514, Nicolaus wrote his sketch outline in the *Commentariolus*, about his heliocentric theory. It was a concise conceptual account of the world's heliocentric apparatus. Tycho Brahe in his own treatise included a little of the *Commentariolus*. In 1532 he had basically finished the heliocentric theory, but failed to publish. He wasn't sure how authority would take it.

It would be Georg Joachim Rheticus, mathematician and pupil to Copernicus who eventually persuaded him to publish, which was done in 1543, just before his death on the 24th May of that year, aged 70. He died of apoplexy (a bleeding of internal organs) and paralysis. He was buried in Frombork Cathedral.



References:

1. Nicolaus Copernicus 1473-1773., Polish Scientific Publishers 1972. This book is in the OASI library.
2. Nicolas Copernicus – Wikipedia https://en.wikipedia.org/wiki/Nicolaus_Copernicus
3. www.sciencekids.co.nz/sciencefacts/scientists/nicolauscopernicus.html

Next month: The Heliocentric treatise.

2017 Star Parties at Haw Wood



Haw Wood is a Milky Way class Dark Sky Discovery Site.

Naked eye visibility 5.73, averted 5.99 best SQM reading 21.75



SPRING

Wednesday 22nd to Thursday 30th March

AUTUMN

Friday 13th Friday 20th October

Pitches £12 per night including hook up



Haw Wood Farm

Book with Daniel or Georgina.

01986 784 248 Mobile 07 990 594 294

Haw Wood Farm Caravan Park, Hinton, Saxmundham. IP17 3QT

daniel@hawwoodfarm.co.uk

We are trying some new arrangements in 2017 to better fit in with the use of Haw Wood.

Dan and Georgina are considering block booking the site for the star parties so you can book by phone rather than on line. Initially they will keep it available just for astronomers and even segregate visual from imagers, as their needs are different. Visual will be in the bottom fields and imagers further up the site.

Depending on how it goes they may keep this out of season block booking just for astronomers bearing in mind, that, in October, they will have the half term the following weekend, during which outreach will be provided.

The 2016 autumn star party on the Saturday was a great success and had a good atmosphere with the talks and soup & rolls later. A lot of the families attending had come for the 'star party' event but didn't understand the light etiquette needed by astronomers. If they do open it up to non-astronomers with an interest to attend they will keep them away from the main body of astronomers and given the lighting etiquette to comply with. Whatever NO CAMP FIRES will be allowed during star party periods.

For the autumn 2017 star party in October, there is a 34% phase moon rising at 2340 GMT on Fri 13th and a 25% moon rising just before 1am GMT on the Sat/Sun night so only half a night's dark sky observing available on the Friday night. However for most amateurs this is sufficient and for the few die hard all-nighters it gets good from the Sunday night onwards with 5 full nights available up until the morning of Fri 20th. The reason for this is that half term starts on Sat 21st October and we just want to avoid that weekend. There is a clash with the IAS (International Astronomy Show at Birmingham) which is on 13th and 14th Oct but doubt that would bother too many people. Those of you that really want to go to the IAS can still attend Haw Wood from the Sunday onwards or the Saturday if only attending the IAS on the Friday.

Calibrating the Meade MA12 Illuminated Astrometric Eyepiece

Bill Barton

This eyepiece is designed to measure angles and distances between objects when viewed in the same telescopic field of view. Of course, when I say 'distance between objects' I am not referring to a linear measure (kilometres or miles), but the angle between two objects. For very small angles where degrees would be too big to be useful we use 'minutes of arc' and 'seconds of arc'. Just like the more familiar time measurement there are sixty seconds in each minute and sixty minutes in each, in this case, degree. Minutes are denoted ' and seconds ".

As can be surmised from its name it has a focal length of 12mm. So if you divide this into the focal length of the telescope you would like to use it on you will get the resulting magnification. In my case this focal length was 1000mm so the magnification was around 83x. The barrel size is 1.25" (31.7mm).

The 'astrometric' part of its name refers to what you can see when you use it. Instead of the normal circular 'window' you are faced with a complex set of graduations. However these can be broken down into two families, there are the angle measuring scales which form an outer circle and inner semi-circle, and then there is the 'linear' scale which forms a bar across the middle. A full circle with two doubled diameters at right angles is also included if you wish to use this eyepiece for guiding purposes.

The scale markings are focussed to the individuals eyesight by turning the rubber eye-cup. The telescope is then focussed in the normal way. To orient the bar or angle measuring sectors the whole eyepiece is rotated within the telescopes eyepiece holder.

To make the scales visible when using this device at night a dimmable red LED illuminator has been included. It is powered by two LR44 batteries. These may also be known as A76, MS76 or AG13.

The linear scale is the one requiring care in use as it has to be calibrated for each telescope/ Barlow lens combination you are going to use it on.

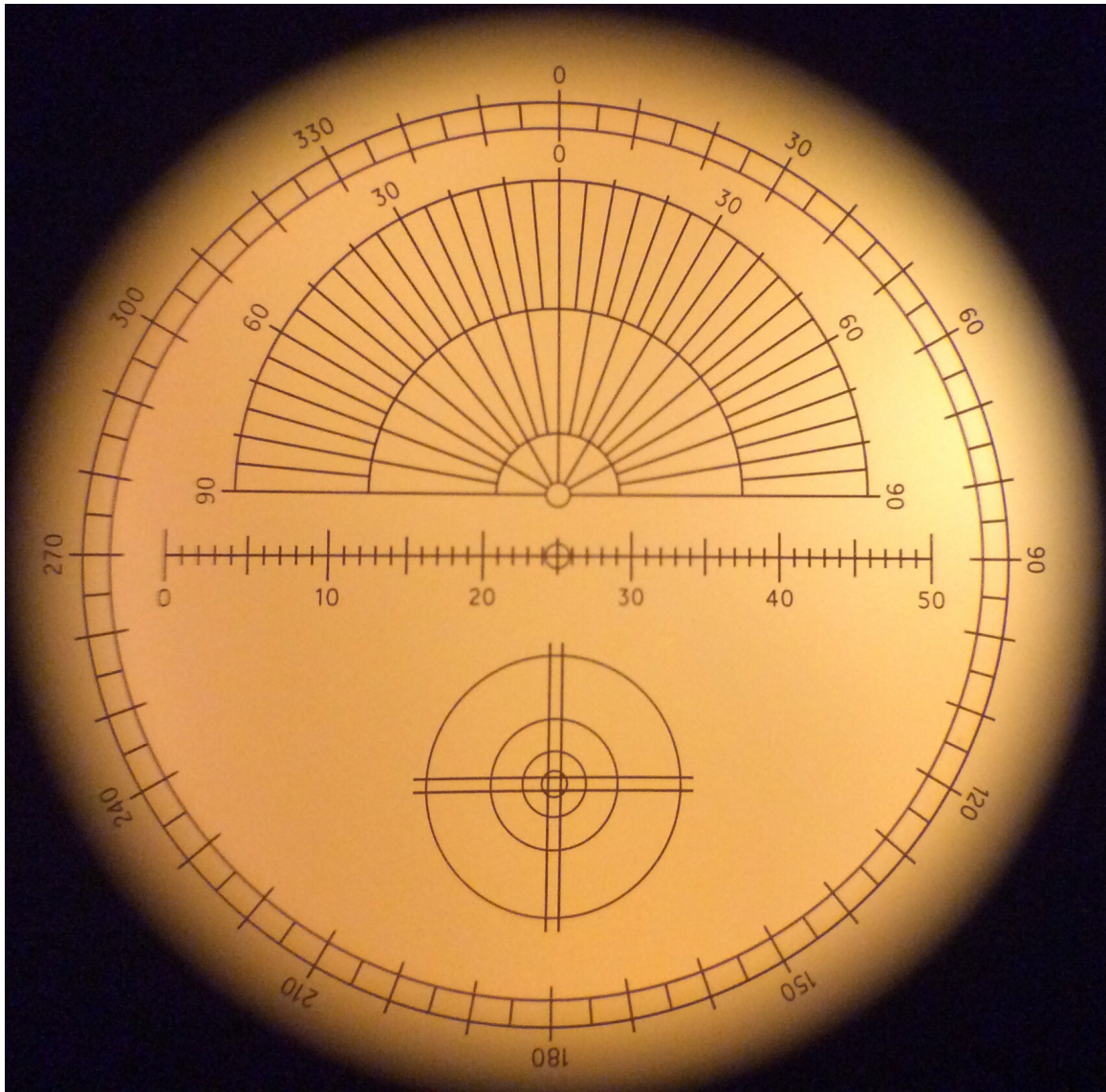
I calibrated mine in the following way.

I secured a metric foot-ruler to a door handle in my flat with two elastic bands. The farthest back I could get (without falling off the balcony!) gave me a nine-metre viewing distance. My telescope only just focussed at this small distance, but I was able to take the measurements I required. The fifty division linear scale covered a mere 47mm on the ruler. I divided the 47mm by two in order to form a right-angle triangle with sides of 23.5 and 9000. The small angle of such a triangle comes out at 0.1496050, doubling this angle to cover the complete fifty division scale is 0.299210, or approximately 20' or 1200". Each division is, therefore $1200/50 = 24''$. Of course this figure only holds one a 1m focal length telescope without a Barlow lens. A times two Barlow will reduce the 24" figure to 12".

It is also possible to calibrate using the night sky when you would time the drift of a star along the linear measure and use this time as the basis for your calculations.

- Examples of measurements that can be taken with such an eyepiece are:-
- Diameters of the planets and their satellites radial distances.
- Double star position angle and separation.
- Sizes of craters on our Moon.





*Did I mention the OASI AGM
on Saturday 21 January?*