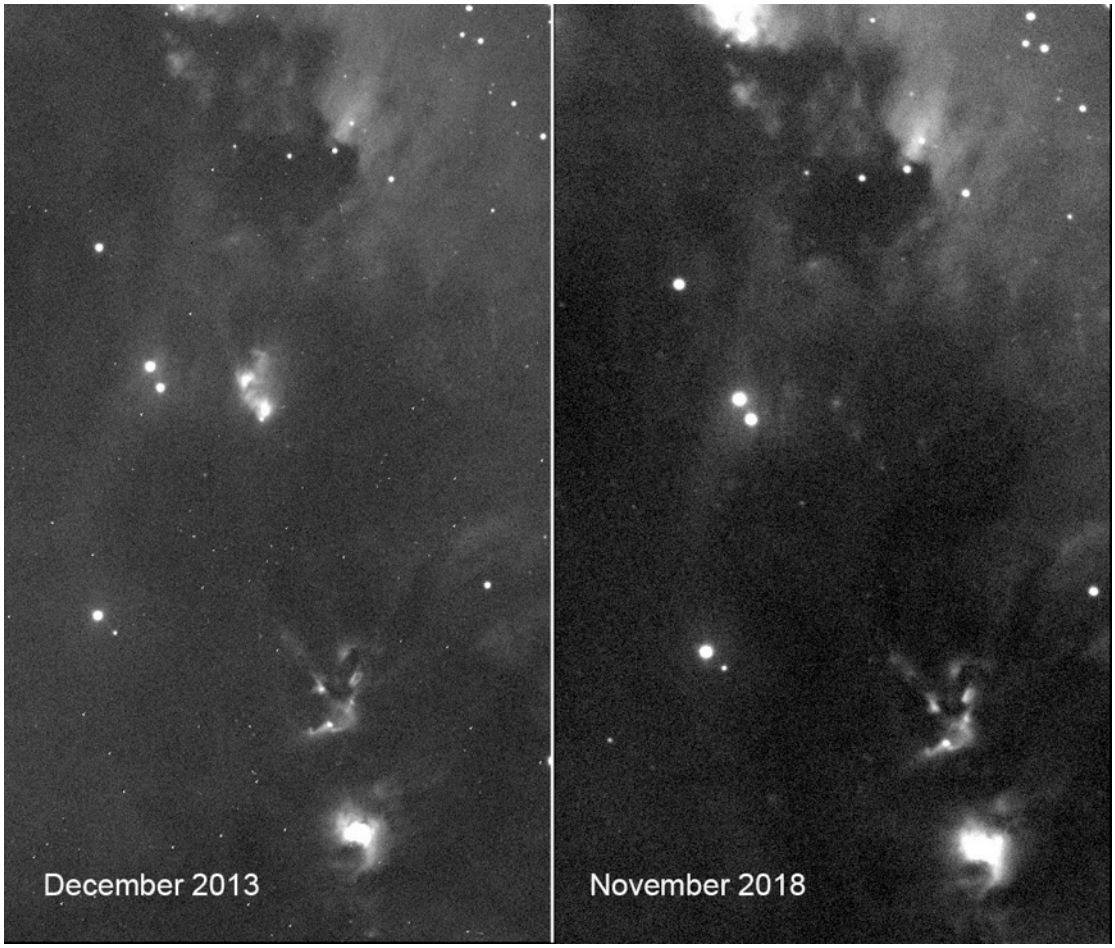
No. 550 Registered Charity 271313 Dec/Jan 2018/19

OASI News

The newsletter of the Orwell Astronomical Society



Dramatic fade of McNeil's nebula.

Remote telescope images by Mike Harlow

Contents

Society Notices

Society Contact details

Observatory (meeting nights only)
NB new number! 07960 083714

Email queries: info@oasi.org.uk

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

Twitter: @OASIpswich

The OASI Facebook pages are 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.

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, **07960 083714** during meeting hours. ***Kindly check/amend the number shown on your 2018 membership card.***

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

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, rtfd, 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."*?

Newsletter archive 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 2018

Chairman	Paul Whiting FRAS	Set overall agenda for OASI, Chair committee meetings, Press and publicity, Visits by outside groups, Observatory tours, 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.
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, OASI @ Newbourne
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club.
	Matt Leeks	Safety & security
	Andy Gibbs	
	Andy Wilshere	Librarian

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.

Next Committee Meeting

01 February 2019, 8.00pm, at Museum St Methodist Church rooms, Black Horse Lane

New members

Glyn Collins Nicola Hardy Philip Brett

Calling missing members!

At the Observatory Open Evening in October two people paid for membership. We have their names but no contact details so if you are wondering why you have not heard from us, please contact the membership secretary Martin Cook. membership@oasi.org.uk

2019 Annual General Meeting

Saturday 26 Jan 2018, starting at 7.30pm.

Venue: Methodist Church Hall Black Horse Lane

All members are invited to attend the AGM

See page 30 for the nomination form.

David Brown: 07.05.1942 – 05.10.2018

Royston Cheesman

It was with regret and sadness that I heard from Roy Adams of the passing of David who had been a life long friend since the early 1960's.

I first met David when I worked in the SMBP office in Landseer Road. David had just joined us after he had finished his apprenticeship on heavy goods vehicle maintenance with Eastern Counties Bus Co. Buses were to become one of his passions in life.

I was introduced to astronomy by David at that time and he became a life long active member of the Society. When I became chairman, together with other members who still play active parts in the Society, we arranged an open day at Orwell Park to raise money for restoring the observatoryand telescope. A film was made by Anglia Television showing the condition of the observatory. The Society and many members have copies of this broadcast.

The crematorium at Horsham St Faiths has a capacity of over two hundred, the chapel was full with many standing. A few years ago David and some friends were involved in purchasing a British Leyland Routemaster Bus which they restored. Many family and friends travelled in this bus to the service. There were many friends of David that had travelled from Doncaster, Harrogate, Surrey, South London and Ipswich.

David will long be remembered for his active role in the Society and as a Trustee for many years at Orwell Park.

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 or use this address to access this calendar from other calendar applications.

https://calendar.google.com/calendar/ical/1jhs9db71ncki4sojo7092vfvc%40group.calendar.google.com/public/basic.ics

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, 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 **NB OASI Xmas Dinner on Wednesday 12 Dec. so no meeting at OPS.**
Friday 30 Nov 20:00	Roy Gooding secretary@oasi.org.uk	OASI Committee Meeting
Saturday 8 Dec 14:30 37 Caledonian Road, Kings Cross, London, N1 9BU	http://britastro.org/node/14931	BAA Christmas Lecture SOLD OUT
Monday 10 Dec from19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes 20:00 astro bring & buy.
Wednesday 12 Dec. 20:00 Coach & Horses, Melton	Roy Gooding secretary@oasi.org.uk	OASI Christmas Dinner.
Thurs 13 Dec 20:15		Private visit to OPS observatory
2019		
Monday 14 January from19:00	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:45 Workshop: Astroimaging – Andy Gibbs
21 January		Lunar eclipse

Date, Time & Location	Contact	Event
Saturday 26 Jan 19:30 Museum St Methodist Church rooms	Roy Gooding secretary@oasi.org.uk	**OASI Annual General Meeting**
Monday 28 January from19:00	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap
Friday 2 February 20:00	Roy Gooding secretary@oasi.org.uk	Committee meeting
Monday 11 February from19:00	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Monday 25 February from19:00	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap
Saturday 2 March 09:45 to 18:00 Museum St Methodist Church room.	https://britastro.org/node/14933	BAA Back to Basics Workshop– hosted by OASI See page 18
Saturday 9 March, 09:30 Kettering Conference and Exhibition Centre, NN15 6PB	http://practicalastroshow.com/	The Practical Astronomy Show See page 18
Monday 11 March from19:00	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Monday 25 March from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap
Saturday 8 June Kirton Recreation Ground	Martin Richmond-Hardy newbourne@oasi.org.uk	**Public event. OASI Solar viewing at Kirton & Falkenham Village Fete**

Date, Time & Location	Contact	Event
Sunday 9 June Kirton Recreation Ground	Martin Richmond-Hardy newbourne@oasi.org.uk	**Public event. OASI Solar viewing at ESWR (East Suffolk Wireless Revival.**
29 June from12:00 Newbourne Village Hall	Pete Richards llectures@oasi.org.uk	OASI Summer BBQ

Planned Observatory visits

13 Nov, 11 Dec, 15 Jan, 12 Feb, 12 March, 9 April Booking essential. Contact Paul Whiting FRAS

Lecture Meetings

Contact: Peter Richards lectures@oasi.org.uk

We have an exciting and interesting set of lectures by guest speakers for the Autumn.

There is a new venue for lectures this year which is:

St Augustine's Church Hall
Bucklesham Road
Ipswich IP3 8TH.

The start time for all talks will be 8pm and, as usual, the talks will be held on Friday evenings.

OASI Guest Speaker Lectures for 2019

20th September	"Monsters in the Dark: Searching for the Most Massive Galaxies in the Universe." Dr Matthew Bothwell. University of Cambridge.
18th October	"Pulsars and our understanding of the cosmos" Dr Robert Ferdman. University of East Anglia.
15th November	"Neighbours - An Introduction to the Local Group". Dr Nick Hewitt. British Astronomical Association.

OASI @ Newbourne

Martin Richmond-Hardy newbourne@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 May 2019).

OASI @ Newbourne 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.

There are also **Stagazer's Guide (Sky Notes), Astronomy Workshops and the Book Swap.**

Stargazer's guide

On the first meeting each month Bill Barton FRAS 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.

OASI@Newbourne Meetings in 2018

10 Dec (S+B+ Bring & Buy)

OASI@Newbourne Meetings in 2019

14 Jan (W)	28 Jan (S+B)	11 Feb	25 Feb (S+B)
11 March	25 March (S+B)	8 April	22 April (S+B)
6 May[*]	27 May (S+B)	(both Bank Holidays)	

* NB 13 May is unavailable due to a Parish Council meeting.

10 June 24 June (S+B)

We open up for all meetings at 7pm. Star Guide (S) at 7:30pm and Workshops (W) at 7:45pm.
B = Book Swap night (see below).

Astronomy Workshops

Contact Mike Whybray **Location: Newbourne Village Hall IP12 4NP**

Doors open at 7:00pm. **Workshops start at 7:45pm**

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 – something not possible at the previous venue, Nacton village hall.

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

TBA Martin Cook on Tomline Refractor Training (at the Observatory)

Monday 14 January 2019: Andy Gibbs – Practical Astroimaging Workshop,

This would give members the chance to bring their own cameras and telescopes to see what can be done and to share tips and ideas.

There will be a first quarter Moon that evening, so it would be ideal for lunar imagers, without compromising deep sky imagers, where Orion will be well placed.

In the event of cloudy skies, I suggest members bring along their laptops so processing tips and ideas can be shared.

Astronomy Book Swap

Pete Richards

If you are anything like me you'll have a bookcase or two full of astronomy books and no room for any more but you know the next time you are at an astronomy event you'll be tempted again. OASI will be hosting an astronomy book swap event at Newbourne on a Monday evening help you to clear some space or maybe you can provide a home for someone else's unwanted books.

If you bring any books and they are not taken you will need to take them home again as OASI has no spare storage space for books.

You can take away any books you are interested in but if you have not provided any books yourself you might like to make a small cash donation to OASI.

Any cash donations will help towards running OASI @ Newbourne.

The books can be on any area of astronomy, or space exploration, or related subjects. They can be factual or works of fiction including space related science fiction. As well as books you could bring DVDs on similar subjects, or maybe you have an astronomical jigsaw puzzle you'd like to give away or exchange.

The book swap will be held at Newbourne Village Hall on Monday Star Guide/Workshop nights (a normal OASI @ newbourne night).

Other local astronomy society meetings

Athaneum Astro Soc

www.3a.org.uk/index.htm

We meet fortnightly on Thursdays, from 7.30pm, at our dark-sky site in the Walled Garden at Nowton Park, just outside Bury St Edmunds. If you're planning on joining us for the first time, please contact us in advance, just to make sure the meeting is going ahead. We recommend that you wear warm clothing (even summer nights can be chilly, especially when the skies are clear!) and bring a flask, or insulated mug, for a warm drink. We have tea and coffee-making facilities on-site. Events are listed here http://www.3a.org.uk/events.htm

6 December	The Oort Cloud What's topical in astronomy
10 January	Mysteries of Mars What's topical in astronomy
24 January	The Sun What's topical in astronomy
7 February	Basic Backyard Astronomy What's in the night sky
21 February	Indoor Astronomy What's topical in astronomy

DASH Astro

Darsham And Surrounding Hamlets

http://dash-astro.co.uk

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.

Note these are now on Sundays.

08 Dec	(Saturday) DASH Christmas Social – (Members and Guests only)

LYRA Lowestoft & Yarmouth Regional Astronomers

www.lyra-astro.co.uk

LYRA Programme and Local Events 2019 was not available at time of publication. Keep an eye on their website. All talks (unless other wise stated) will commence at 7.30pm in the Coach House Room at Parkhill Hotel, just outside Oulton Village on the B1375 (Oulton Broad to Gt. Yarmouth Road) NR32 5DQ

All Talks £2.50 For Non Members

Stour Astro

www.stourastro.org.uk

The Stour Astronomical Society was established in March 2003 by Dr Kevin Marshall and Geoff Burling. Its main aim is to fill a void in the county of Suffolk where there is a lot of interest in astronomy but very few places to go and meet other amateur astronomers. Also members can listen to talks given by expert speakers, receive advice on what equipment you perhaps would like to buy and what to observe in the night sky. It is anticipated that members will be drawn from nearby towns and villages in the Stour Valley area.

At the moment one either has to travel over to Cambridge or Orwell, both having first-class astronomical societies but nevertheless quite some distance away. So please come along on the first Tuesday of the month to meet fellow amateurs and to deepen your love of the wonders of the night sky. Please don't forget to tell any friends you have who might also be interested in astronomy!

Stour Astronomical Society meets on a monthly basis in the Cavendish Memorial Hall on the first Tuesday of every month at 7.30 p.m.

Tuesday 4 Dec	Planispheres by Peter Grimwood
2019	
Tuesday 8 Jan	Observing Evening
Tuesday 5 Feb	Observing Evening
Tuesday 5 March	The Kevin Marshall Memorial Lecture Big Bangs & Big Rips, a history of 20th century cosmology by Matt Bothwell, Cambridge University
Tuesday 2 April	Easter & astronomy by David Harper

Transit of Mercury, 11 November 2019

James Appleton

A transit of Mercury occurs on 11 November 2019. From the UK, the initial stages of the event will be visible (weather permitting!) but the Sun will set before the egress stages.

Event times are as follows (computed using the NASA JPL ephemeris DE-430) for the location of Orwell Park:

Contact	Explanation	Time (UT)
1st contact	Initial apparent geometric contact between the disks of Mercury and the Sun.	12:35:35
2nd contact	First instant at which disk of Mercury appears fully within the solar disk.	12:37:16
Greatest transit	Mercury passes closest to the centre of the Sun.	15:19:44

Martin Cook and James Appleton are coordinating arrangements to observe the event from Orwell Park. Further details will be publicised in the Newsletter once arrangements are in place.

Note that this will be the last opportunity to observe a transit of a planet before the transit of Mercury on 13 November 2032: don't miss it!

The Night Sky in December

Martin RH

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

ALL times are given in UTC (GMT).

Moon

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

New Moon	1st Quarter	Full Moon	Last Quarter
07 Dec 07:20	15 Dec 11:49	22 Dec 17:49	29 Dec 09:34

Sun, Moon and planets

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	07:41	15:47		Winter Solstice Dec 21, 22:22
	31	08:03	15:53		
Moon	1	00:16	13:40		
	31	01:52	12:52		
Mercury	1	06:47	15:26	2.8	Max. western elongation Dec 15
	31	06:56	14:33	-0.4	
Venus	1	03:56	14:13	-4.5	Perihelion Dec 26
	31	04:01	13:19	-4.4	
Mars	1	12:47	23:13	0	
	31	11:17	23:11	0.4	
Jupiter	1	07:21	15:31	-1.6	
	31	05:57	13:54	-1.6	
Saturn	1	09:57	17:37	0.5	
	31	08:12	15:55	0.5	
Uranus	1	14:06	03:59	5.7	
	31	12:07	01:58	5.8	
Neptune	1	12:53	23:34	7.9	
	31	10:55	21:38	7.9	

Paul's Astronomy Podcast for December

Paul Whiting FRAS Podcast, December 2018 www.oasi.org.uk/2018_12_pod.mp3

Visible ISS passes ≥15º max altitude

Martin RH

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

Times are BST. Predictions are approximate due to craft adjustments. Check the day before.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Dec	-3.9	17:50:52	10°	WSW	17:54:08	74°	S	17:54:26	67°	ESE
02 Dec	-3.5	16:58:41	10°	WSW	17:01:55	60°	SSE	17:04:13	17°	E
02 Dec	-1.9	18:35:04	10°	W	18:36:53	30°	W	18:36:53	30°	W
03 Dec	-3.9	17:42:47	10°	W	17:46:03	86°	S	17:46:40	56°	E
04 Dec	-4	16:50:31	10°	WSW	16:53:47	78°	S	16:56:27	15°	E
04 Dec	-2	18:26:58	10°	W	18:29:06	37°	W	18:29:06	37°	W
05 Dec	-3.9	17:34:40	10°	W	17:37:58	84°	S	17:38:55	43°	ESE
06 Dec	-3.8	16:42:22	10°	W	16:45:38	86°	S	16:48:46	11°	E
06 Dec	-2.8	18:18:50	10°	W	18:21:25	44°	WSW	18:21:25	44°	WSW
07 Dec	-3.7	17:26:30	10°	W	17:29:46	69°	SSW	17:31:20	28°	ESE
07 Dec	-0.6	19:03:13	10°	W	19:04:00	15°	WSW	19:04:00	15°	WSW
08 Dec	-4	16:34:10	10°	W	16:37:27	81°	S	16:40:43	10°	E
08 Dec	-2.5	18:10:43	10°	W	18:13:43	34°	SSW	18:13:59	33°	SSW
09 Dec	-3	17:18:18	10°	W	17:21:29	48°	SSW	17:24:07	14°	SE

The Final Iridium flares

There are later flares in December but too far ahead to predict.
See http://heavens-above.com/IridiumFlares.aspx

Iridium flares to cease by end of 2018 | BBC Sky at Night Magazine

Iridium flare captured by Iain Hastie.

Time	Brightness	Alt.	Azimuth	Satellite	Distance to flare centre	Brightness at flare centre	Sun alt.
Nov 28, 05:58:16	-0.4	21°	52° (NE)	Iridium 64	83 km (E)	-6.5	-14°
Nov 28, 16:31:49	-1.0	17°	214° (SW)	Iridium 54	46 km (E)	-5.7	-6°
Nov 30, 16:52:27	0.5	21°	286° (WNW)	Iridium 54	116 km (E)	-6.3	-9°
Dec 1, 05:26:24	-1.1	16°	45° (NE)	Iridium 14	103 km (W)	-6.2	-20°
Dec 2, 05:06:01	0.6	12°	40° (NE)	Iridium 64	240 km (W)	-5.9	-23°
Dec 6, 05:45:01	0.5	9°	142° (SE)	Iridium 14	53 km (E)	-5.3	-18°
Dec 9, 05:49:18	-1.4	14°	153° (SSE)	Iridium 64	51 km (W)	-6	-17°

OASI Clothing

It's getting colder and Christmas is coming...

FLEECES £39

L Navy

M Navy

SWEATSHIRTS £19

XL dark grey

L navy

L light grey

M light grey

M navy

Available on Newbourne Evenings

The Night Sky in January 2019

Martin RH

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

ALL times are given in UTC (GMT).

Moon

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

New Moon	1st Quarter	Full Moon	Last Quarter
06 Jan 01:28	14 Jan 06:46	21 Jan 05:16	27 Jan 21:10

Sun, Moon and planets

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	08:03	15:54		
	31	07:37	16:40		
Moon	1	03:05	13:16		Lunar eclipse 2019-Jan-12; Supermoon.
	31	04:21	12:53		
Mercury	1	07:00	14:34	-0.4	Aphelion 2019-Jan-12 Superior Conjunction 2019-Jan-30
	31	08:00	16:29	-1.3	
Venus	1	04:03	13:18	-4.4	Max. western elongation 2019-Jan-06
	31	04:51	12:59	-4.1	
Mars	1	11:14	23:11	0.5	
	31	09:46	23:10	0.9	
Jupiter	1	05:55	13:51	-1.6	
	31	04:26	12:13	-1.7	
Saturn	1	08:09	15:52	0.5	Superior Conjunction 2019-Jan-02
	31	06:23	14:11	0.6	
Uranus	1	12:03	01:54	5.8	
	31	10:06	23:53	5.8	
Neptune	1	10:51	21:35	7.9	
	31	08:55	19:41	8	

Pluto Superior Conjunction 2019-Jan-11

Paul's Astronomy Podcast for January

Paul Whiting FRAS Podcast, January 2019 www.oasi.org.uk/2019_01_pod.mp3

Occultations during December 2018 and January 2019

James Appleton

The table lists occultations during the month under favourable circumstances. The data relates to Orwell Park Observatory, but will be similar at nearby locations.

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.

Only one lunar occultation occurs during July under favourable circumstances, detailed below.

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(º)	Star Alt(º)	Mag	Star
17 Dec	21:21:50	D	0.73+	-50	38	7.4	Hip 7156
18 Dec	20:33:45	D	0.81+	-43	46	7.3	ZC 346
19 Dec	00:42:41	D	0.82+	-60	24	4.3	73 Cet, ξ2 Cet
19 Dec	18:23:18	D	0.89+	-23	37	6.0	ZC 462
21 Dec	19:24:50	D	0.99+	-32	36	4.9	104 Tau, m Tau
31 Dec	21:27:23	D	0.98+	-49	53	4.3	119 Tau, CE Tau
31 Dec	22:08:18	D	0.98+	-54	56	5.7	120 Tau, V960 Tau
2019							
10 Jan	17:47:40	D	0.18+	-15	20	5.8	74 Aqr
	18:56:33	R		-25	12		
12 Jan	21:06:18	D	0.36+	-44	14	6.9	ZC60
13 Jan	22:13:26	D	0.46+	-53	15	7.3	H6000
	22:14:43	D		-53	15		
14 Jan	19:18:07	D	0.55+	-28	43	6.8	ZC291
15 Jan	16:55:36	D	0.64+	-7	41	4.3	87 Cet, μ Cet
	17:16:50	R		-10	43		
16 Jan	17:19:54	D	0.75+	-10	41	6.7	ZC526
17 Jan	17:08:11	D	0.84+	-8	35	6.7	H21365
19 Jan	02:30:43	D	0.93+	-48	29	4.4	54 Ori, χ1 Ori
20 Jan	04:59:56	D	0.98+	-26	17	4.0	43 Gem, ζ Gem
	05:36:02	R		-20	11		
30 Jan	04:46:03	D	0.27-	-26	9	4.2	7 Oph, χ Oph
	05:59:46	R		-15	16		

There is a lunar eclipse on 21 January. During the eclipse, glare from the Moon will be much reduced and there will be a corresponding increase in the number of occultations of faint stars that can potentially be observed.

During the month, there are three grazing lunar occultations within feasible travelling distance of Ipswich. There are two on 01 January (05:34 and 06:15 UT) and one on 21 January, during the lunar eclipse (06:17 UT). Observing trips will be organised if weather conditions are favourable; contact Alan Smith or James Appleton if your are interested in participating.

Further details of occultations visible during the lunar eclipse and of the grazing occultations are on the OASI website: http://www.oasi.org.uk/Occs/Occ_summary_2019.php.

James Appleton

Meteor showers

Source: BAA Handbook 2018 p97-99

Shower	Maximum	Normal limits	ZHR at Max	Notes
Puppids–Velids	Dec 9 – 26	Nov 27 – Jan	15	Two of several radiants in Puppis, Vela and Carina from November to January.
Geminids	Dec 14d 08h	Dec 8–17	100+	Richest of the annual showers, with slow meteors and a good proportion of bright events. Favourable.
Ursids	Dec 22–23	Dec 17–25	10?	Under-observed shower which has produced outbursts in 1945, 1982, 1986 and 2014. Unfavourable.
Quarantids	Jan 4d 03h	Dec 28 – Jan 12	80+	High activity but with a rathre narrow peak. Good in 2014. Bright events leave persistent trains. Very favourable.

Astronomy on the radio

Bill Barton'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

David Murton's Radio Broadcast

On 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) and the internet. https://www.bbc.co.uk/radiosuffolk

BAA news

What telescope should I give a child?

By David Arditti

https://britastro.org/node/15810

McNeil's Nebula disappears

By Nick Hewitt

https://britastro.org/node/16309

Back to Basics 2019 – Hosted by OASIpswich

https://britastro.org/node/14933

Venue: Museum Street Methodist Church, 17 Black Horse Lane, Ipswich, IP1 2EF

Date: Saturday, 2019, March 2 - 09:45 to 18:00

The British Astronomical Association has designed a programme of talks and practical sessions to help you learn basic techniques and develop your interest to its full potential. Experienced people will be on hand to answer your questions.

The programme will cover:

- What Equipment you need to get started,
- Lunar Observing,
- Observing Planets,
- Comets
- Deep Sky Observing

The cost for the meeting is £TBC BAA Members & children under 16. £TBC for non-members.

SPACE IS LIMITED SO ALL ATTENDEES MUST BOOK EARLY

Programme times for the day are: -

10:30 Official welcome – BAA President – Mr Callum Potter
10:35 So what astronomy can I do? – Mrs Hazel Collett
10:45 What equipment & books do I need? – Dr Stewart Moore
11:30 Lunar observing & Workshop – Mr Nick James
12:15 Lunch
13:30 Ipswich Astronomical Society
14:45 Comets - Nick James TBC
15:30 Afternoon Tea
16:00 Deep Sky observing – Mr Callum Potter
16:45 Feedback, Q&A session & Raffle
17:00 Close.

The Practical Astronomy Show

Saturday 9 March 2019 - 09:30

The Practical Astronomy Show is a free one-day event at the Kettering Conference and Exhibition Centre, Thurston Drive, Kettering, Northamptonshire, NN15 6PB.

There will be free talks about the practical aspects of astronomy, with an emphasis on using and getting the best out of astronomy products.

The show caters for all levels of practical astrophotography and visual astronomy.

Organisations involved in astronomy education, outreach and tourism will be available to meet and greet the general public.

Please note the Practical Astronomy Show is not run by the BAA, but the BAA will be present as an exhibitor.

Astronomy Photographer of the Year

Two winning entries by BAA members at the Astronomy Photographer of the year currently front our December 2018 edition. Damian Peach (2 comets passing M45, category: remote telescopes) and Martin Lewis (The Grace of Venus, category: solar system) can be seen at the National Maritime Museum in Greenwich, London, until 5th May 2019. Make this year the one to visit and also take in the new and recently installed Annie Maunder Astrographic Telescope at the Royal Observatory Greenwich in the renovated Altazimuth Pavilion.

Variable Nebula Update

Mike Harlow, December 2018

Monitoring of Gyulbudaghyan's nebula continues using my home telescope but with an upgrade to improve resolution. And the story of McNeil's disappearing nebula!

Numbers in square brackets, [n], denote references given at the end of this article.

Gyulbudaghyan's Nebula. RA 20h 45m Dec. +67d 58m

The latest image of Gyulbudaghyan's nebula was taken with a slightly improved telescope set-up. To increase the resolution of the 12 inch telescope, I swapped out the Wynne corrector for a Barlow corrector at prime focus. This almost doubled the focal length, taking it to 2070mm at a focal ratio of F/6.8. Both correctors were bought from Astro Systeme Austria [1] some time ago although they no longer appear to make the Barlow corrector.

When I tested this new set-up for the first time, it suffered from condensation on the front lens of the corrector. However, a lens heater solved this problem and now, even after five hours out in freezing conditions and high humidity, the lens remains completely clear. Many thanks to Alan Melia and Laurence Newell, both of the UK radio astronomy association [2], for supplying and testing the heater pad that made this possible.

The image below shows the new prime focus assembly with the Barlow corrector, filter holder and CCD camera.

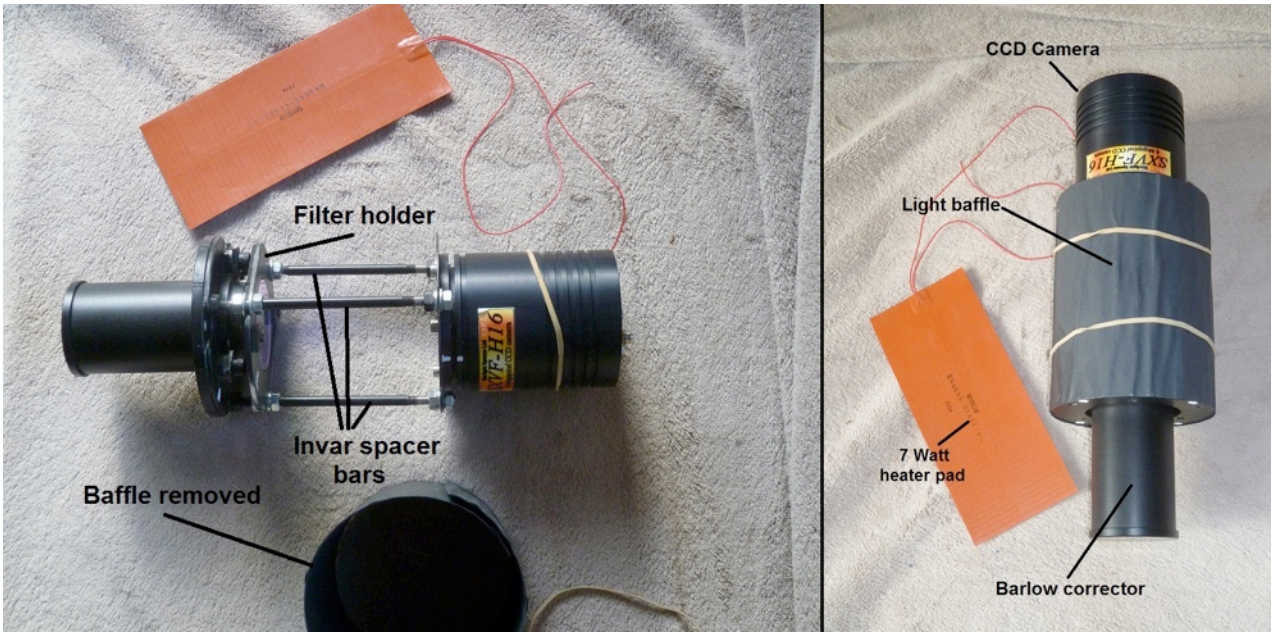


Figure 1: New prime focus assembly giving the 12 inch telescope a focal ratio of F/6.8

The first image with the upgraded telescope is shown in figure 2. The resolution is improved although, at the longer focal length, problems with polar alignment and tracking start to become more apparent. Still some tweaking to do!

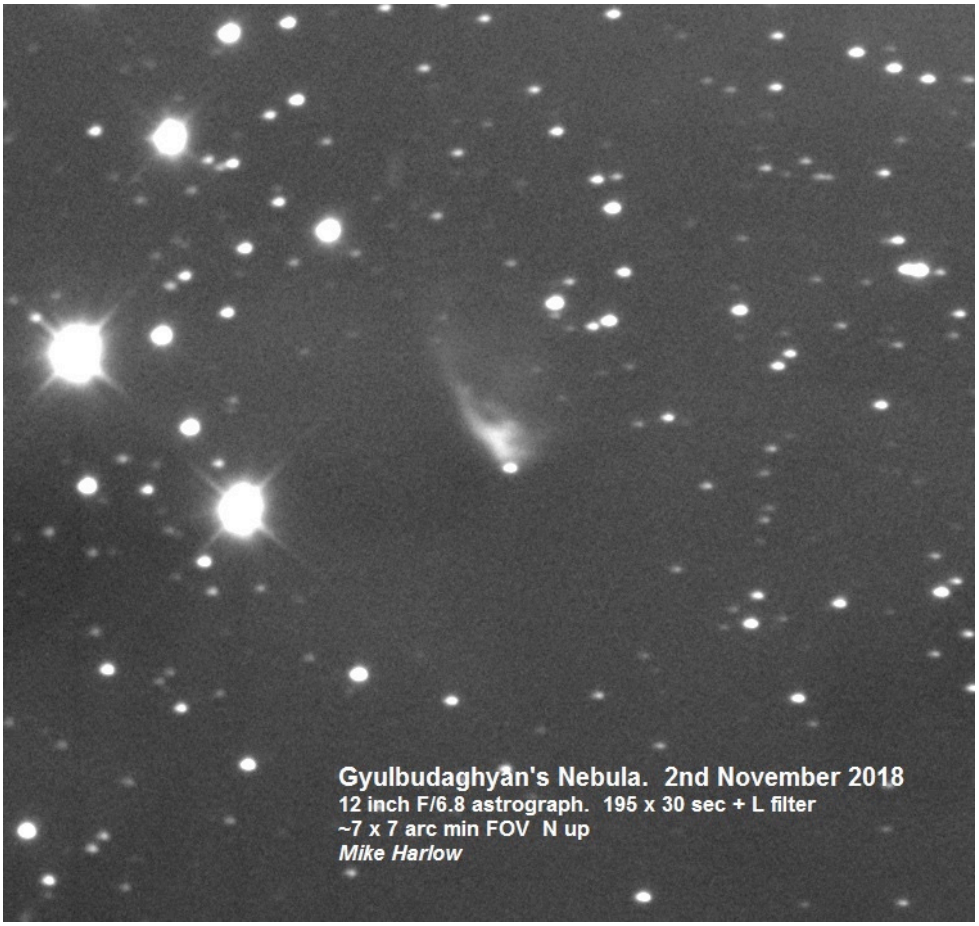


Figure 2: Gyulbudaghyan's Nebula on 2nd November 2018.
12 inch F/6.8 astrograph. 195 x 30 seconds with L filter

McNeil's Nebula. RA 05h 46m Dec +00d 05m

Sadly, I had neglected this variable nebula and looking back, I hadn't observed it since December 2013! From images up to that date it didn't appear to change much which is probably why I hadn't observed it. However, all that changed on 5th November when I imaged it with the 0.5M Gemini telescope of the Sierra Stars Observatory Network (SSON) [3]. The image showed that McNeil's nebula had vanished! I contacted Nick Hewitt of the BAA who confirmed the disappearance in an image taken with iTelescope, T24 on 6th November [4]. Nick subsequently issued a BAA alert to announce the disappearance and asking for any recent images of the region to check for its visibility.

Nick had an image of the region from October 2017 which showed McNeil's nebula and I found an image on the Las Cumbres observatory web site [5] taken in March 2018 which also showed the nebula (but already fading?). It appeared therefore, that the final fade from view happened between the end of March and beginning of November 2018. Then Nick received an image from Richard Berry taken on 12th October 2018 which showed that McNeil had virtually disappeared at that time. Unfortunately, the Sun is too close to Orion between April and September each year for any images to be taken so the details of the fade over the summer may never be known.

These four observations over the last year are shown in the composite image (Figure 3):

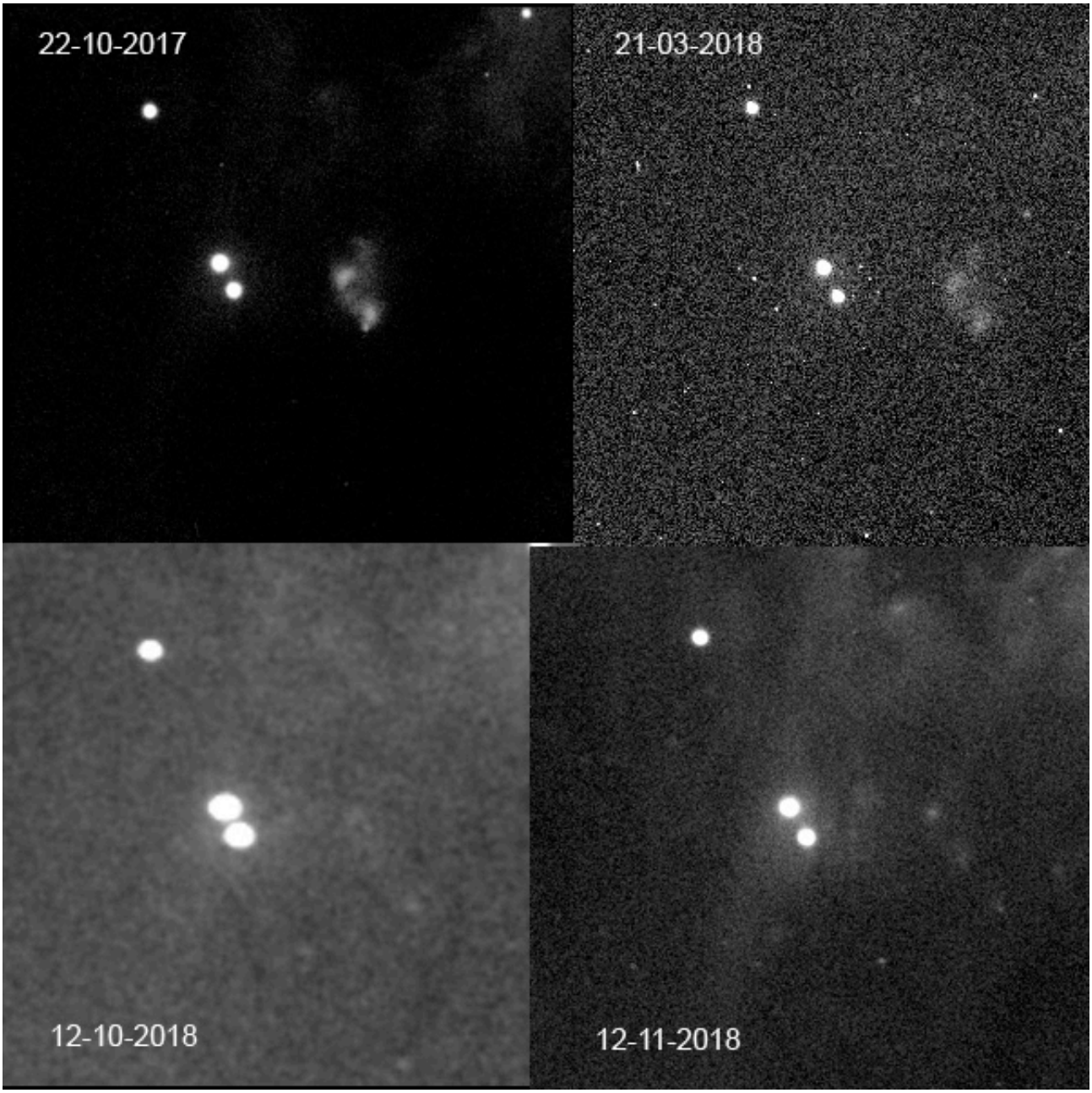


Figure 3: Four images of McNeil's nebula since October 2017.

A) Nick Hewitt, iTelescope T24, **B) Las Cumbres Observatory,**

C) Richard Berry **D) Mike Harlow, SSON 0.5M Gemini telescope**

The image below shows McNeil's 'normal' appearance as seen in 2013 and the annotated version at right labels the features discussed below.

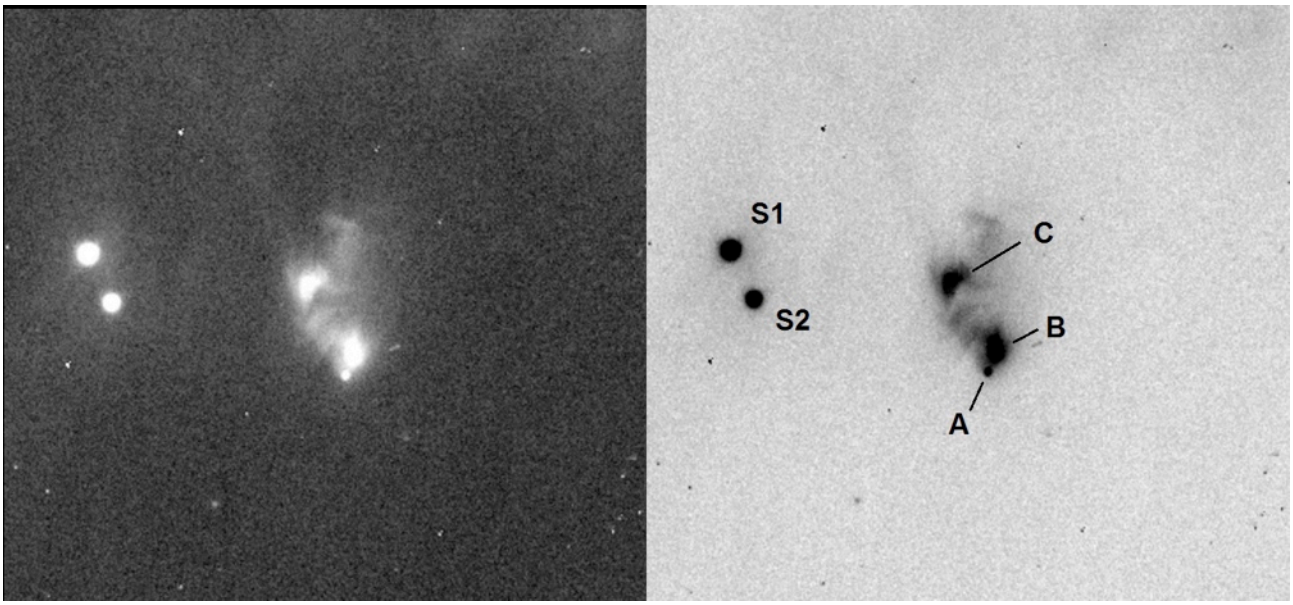


Figure 4: Appearance of McNeil's nebula 3rd January 2013 and the features discussed in the text below. Image 0.8M Mt Lemmon telescope (SSON)

A professional paper in the Astrophysical Journal [6] discusses the outburst of the nebula in 2004 which lead to McNeil's discovery. In the paper, the authors identify S1 and S2 as young T Tauri type stars but it is star A that illuminates the nebula and holds the key to its behaviour. The star can increase in brightness by ~100 times over a period of a few months as it did in late 2003 to early 2004 and make the nebulosity B and C visible in amateur sized telescopes. A very nice image of M78 and McNeil's nebula appeared in Sky at Night magazine showing the contrasting colours of B and C explained in the Astrophysical Journal paper [7]. It is clear from recent observations that star A can also fade in similar time scales back to its 'quiescent' state when it is simply too faint to illuminate the nebula which fades from view. The variable star A is now designated V1647 Orionis.

Historical images were examined when McNeil first discovered the nebula and it appears that, most of the time from the early 1950s to the early 2000s, the nebula was invisible. Just one image from 1966 shows the nebula [8] yet it was visible continuously from 2004 to 2018. So, its behaviour is far from regular and there is no way to predict how it will behave in the future.

In conclusion, for the first time the fade of McNeil's nebula has been observed. The star illuminating the nebula has faded so much, by about five magnitudes, that it is no longer bright enough to make McNeil's nebula visible in amateur sized telescopes [9].

From its past behaviour it isn't possible to predict when it will become visible again. It may be months, but more likely it will be many years before it returns. Only by continuing to observe this unexpectedly interesting patch of sky will we find out.

References

1. AstroSysteme Austria make a range of telescopes, drives and correctors. (http://www.astrosysteme.com/home/)
2. UK Radio Astronomy Association: http://www.ukraa.com/
3. Sierra Stars Observatory Network, SSON: http://sierrastars.com/
4. iTelescope remote telescopes: https://www.itelescope.net/
5. Las Cumbres Observatory: https://lco.global/
6. “McNeil's nebula in Orion: The outburst history”, C. Briceno et. al. The Astrophysical Journal 606: L123-L126 2004 May 10. http://iopscience.iop.org/article/10.1086/421395/fulltext/18263.text.html

7. Sky at Night magazine, December 2016, p 6. Image with ESO VISTA telescope taken on 5th October 2016.
8. Image by Evered Kreimer 20th October 1966. “The Messier Album” CUP 1979.
9. Very faint remnants of regions B and C are still visible in deep CCD images of the area. See 12-11-2018 image in figure 3.

Information from the Library

Andy Willshere

To Boldly Go with BepiColumbo

On the 20th October 2018 at 0145 hrs UTC (Coordinated Universal Time) , Ariane Flight VA245 was launched from the Guiana Space Centre (launch complex 3), taking with it BepiColumbo, a space mission to Mercury, with a total payload mass of 4241 kilograms, which included the payload adapter. This is a joint mission involving the European Space Agency and the Japanese Aerospace Exploration agency. The Mission was named after Giuseppe Columbo (1920-1984) who was a polymath at the University of Padua in Italy. He came up with the idea of interplanetary gravity assist manoeuvres which were used in the Mariner 10 mission with great effect, and are now in common usage. He also discovered that the axial rotation period of Mercury is equal to 2/3 of its revolution time around the sun.

Separation occurred 26 minutes and 47 seconds after launch putting the probe into a Mercury transfer orbit. It left Earth at 3.475 km/sec and will be expected to be seized by Mercury and proceed into orbiting on the 5th December 2025. This will be the culmination of seven years travel which will include flybys of both Earth in 2020 and Venus in 2020 and 2021. In total there will be nine gravity assists, the last six being past mercury between 2021 and 2025. The Earth flyby is to perform a gravity assist manoeuvre for the probe, and guide it towards Venus. This method can either increase or decrease speed and if necessary change direction. The flybys at Venus reduce the perihelion distance to almost that of Mercury and the six Mercury flybys reduce the relative velocity to 1.76 km/s. The craft will be situated in a similar orbit to Mercury after the fourth flyby and remain co-linked. When finally approaching Mercury, there will be separation of the transfer module which will be seized by Mercury's gravity so that it will continue in polar orbit around the planet. Thrusters will be manipulated until the required polar orbit has been established, and an operating distance of between 590km at perihelion and 11640km at aphelion, above Mercury's surface has been achieved. At this point the MPO will be separated and again using thrusters be stabilized to its own orbit between 480 to 1500 km. Manipulation and tuning will occur for a further three months and if all well, the experiments can begin.

The main objectives of the mission are:

1. Investigate the origin and evolution of Mercury, especially as its parent star is close by.
2. Investigate the geological formation both internally and externally, and its exosphere.
3. Study its magnetosphere in all aspects and the source of its magnetic field.
4. Measure several limitations of the parameterized post-Newtonian formalism. This is a method of calculating Einstein's gravity equations in expressions of the lowest-order divergence from Newton's law of universal gravitation

Artist's impression of BepiColombo fairing release.

Credit: ESA/ATG medialab

BepiColumbo is made up of three segments that during the launch and flight to mercury will stay fixed to each other. These segments are known as the MTM or Mercury Transfer Model, the MPO or Mercury Planetary Orbiter and the MMO(Mio), which is the Mercury Magnetospheric Orbiter. The latter when released into Mercury orbit will be controlled by Usuda Deep Space Center which is situated in Nagano, Japan. The dimensions of the MPO are 2.4*2.2*1.7m and the MMO(Mio) is 1.8*1.1m. The 5th December 2025 will be the point at which the Mio and MPO satellites will disconnect and will independently monitor Mercury for a year, with a possibility of a further year. During this time the scientific instruments will be gathering information.

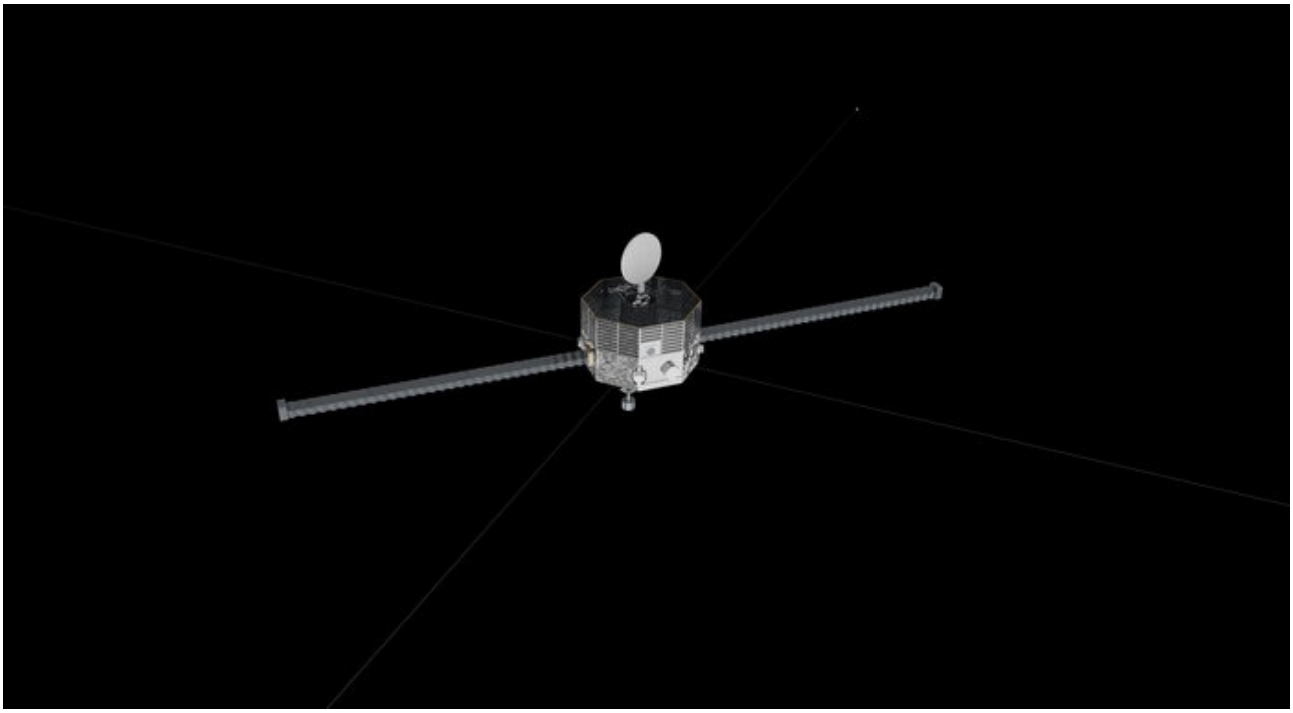
The Mercury Transfer Module (MTM) can be found at the base of the three segmented pile. It is designed to carry the two other modules to Mercury and then continue to back them up during the project. Its main propulsion is solar electric, which is a combination of solar cells and ion drive. This system allows for a high precise impetus, and has four QinetiQ T6 ion thrusters.

The Mercury Planetary Orbiter(MPO) has a mass of 1,150kg. It is capable of generating 1000 watts using its solar array. It carries with it 11 instruments:

BELA	Laser altimeter
ISA	Italian spring accelerometer
MPO-MAG	Magnetic field Investigation
MERTIS	Mercury radiometer/thermal imaging spectrometer
MGNS	Mercury Gamma-ray and neutron spectrometer
MIXS	Mercury Imaging X-ray Spectrometer
MORE	Mercury Orbiter Radio science Experiment
PHEBUS	Probing of Hermean Exosphere by Ultraviolet Spectroscopy
SERENA	Search for Exosphere Refilling and Emitted Neutral Abundances
SIMBIO_SYS	Spectrometers and Imagers for MPO BepiColombo Integrated Observatory
SIXS	Solar Intensity X-ray and particle Spectrometer

The Mercury Magnetosphere Orbiter (MIO) is shaped like a prism with eight sides. It has a total mass of 330 Kg which includes its scientific payload. This is a group of five science instruments. It is a spin stabilized module at 15 r.p.m. as well as a spin axis vertical to the equator of Mercury. The five science instruments are:

Mercury Magnetometer (MMO-MAG)	Provide scientific detail of Mercury's magnetosphere.
Mercury Plasma Particle Experiment (MPPE)	7 sensors study energetic particles and plasma in the magnetosphere. Also solar wind investigation.
Mercury Plasma Wave Instrument (PWI)	Analysis of electric fields as well as plasma and radio waves.
Mercury Sodium Atmosphere Spectral Imager (MSASI)	Sodium analysis in the exosphere.
Mercury Dust Monitor (MDM)	Analysis of interplanetary dust around Mercury.



Picture credit: https://www.esa.int/spaceinimages/Images/2017/04/Mercury_Magnetospheric_Orbiter_top_view

The Ariane 5 Rocket is a two stage dispensable system that has a height of 50.5 m and a diameter of 5.4m. It has two solid rocket boosters with two alternatives, one that can carry a payload over 10 metric tons to a geostationary transfer orbit (GTO) and one that can carry a payload of over 20 metric tons to low Earth orbit.

Flight schedule for BepiColumbo which will take 7.2 years.

20/10/2018	Earth launch
06/o4/2020	Earth flyby
12/10/2020	First Venus flyby
11/08/2021	Second Venus flyby
02/10/2021	First Mercury flyby
23/06/2022	Second Mercury flyby
20/06/2023	Third Mercury flyby
05/09/2024	Fourth Mercury flyby
02/12/2024	Fifth Mercury flyby
09/01/2025	Sixth Mercury flyby
05/12/2025	Mercury Orbit
14/03/2026	MPO in final science orbit
01/05/2026	Mission completed
01/05/2027	Completed if extended

Data obtained from: https://en.wikipedia.org/wiki/BepiColombo

In the planning phase of the project a Mercury Surface Element (MSE) was proposed. This entailed a 44kg disc shaped landing vehicle which would operate for approximately one week on the surface of the planet assessing data. Carrying a spectrometer, magnetometer and a seismometer as well as facility to dig into the surface, this would have been a really exciting project. However due to financial constraints this part of the project was cancelled in 2003.

References:

1. https://danspace77.com/2018/10/18/ariane-5-to-launch-bepicolombo-to-mercury/
2. https://simple.wikipedia.org/wiki/NASA
3. https://en.wikipedia.org/wiki/BepiColombo
4. http://sci.esa.int/bepicolombo/
5. www.esa.int/Our_Activities/Space_Science/BepiColombo/Mercury_Planetary_Orbiter

Observation of Mira

Joe Startin

We observed Mira through the 10 inch refractor on Wednesday evening 14 November.

Later that evening I estimated its magnitude at 4.5, using binoculars and the 18 degree field chart from the Variable Star Section (VSS) of the British Astronomical Association.

To check it out yourself you can get all you need to know from the Observations section of the OASI website, at http://www.oasi.org.uk/Obsvns/20180212_Mira/20180212_Mira.php This includes the 60 degree, 18 degree and 5 degree field charts.

Nominal maximum is on 26 November, so you need presence of mind and some luck with the weather if you want to see it peak.

Lunar Occultations during 2019

Introduction

During 2019, there are almost 600 lunar occultations potentially observable from East Anglia, although many involve faint stars. The tracks of eight grazing occultations cross the region during the year. No lunar occultations of planets are visible from the region during the year.

This article 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 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 4.5.10.0).

Occultations of Bright Stars

Table 1 lists occultations during the year, of stars brighter than magnitude 6.0, where circumstances are favourable. The events should be readily visible in small telescopes or binoculars. The first two columns of the table list the date and time (UT) of the occultation. Column three specifies the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. The table lists circumstances of D and/or R as dictated by the visibility of each phenomenon (determined by altitude, lunar phase, etc). Column four details the lunar phase (positive for waxing and negative 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.

Date	UT	D/R	Lunar Phase	Sun Alt (°)	Star Alt (°)	Mag	Star
10 Jan	17:47:40	D	0.18+	-15	20	5.8	74 Aqr
	18:56:33	R		-25	12		
15 Jan	16:55:36	D	0.64+	-7	41	4.3	87 Cet, μ Cet
	17:16:50	R		-10	43		
19 Jan	02:30:43	D	0.93+	-48	29	4.4	54 Ori, χ^1 Ori
20 Jan	04:59:56	D	0.98+	-26	17	4.0	43 Gem, ζ Gem
	05:36:02	R		-20	11		
30 Jan	04:46:03	D	0.27-	-26	9	4.2	7 Oph, χ Oph
	05:59:46	R		-15	16		
13 Feb	23:16:35	D	0.60+	-50	27	5.6	63 Tau
20 Mar	04:07:06	D	0.99+	-18	18	5.8	ZC 1625
16 Apr	02:37:14	D	0.85+	-19	13	5.3	53 Leo, l Leo
19 Apr	03:14:48	D	1.00+	-14	17	5.7	80 Vir
09 May	21:30:06	D	0.26+	-14	23	5.2	63 Gem
	22:14:27	R		-17	17		
26 Jun	01:44:49	D	0.43-	-11	10	4.8	20 Cet
	02:32:12	R		-7	17		
15 Jul	00:31:38	D	0.96+	-16	10	5.7	ZC 2595

Date	UT	D/R	Lunar Phase	Sun Alt (°)	Star Alt (°)	Mag	Star
16 Jul	00:17:32	D	0.99+	-16	14	5.9	ZC 2754
11 Aug	22:57:33	D	0.88+	-21	11	5.8	ZC 2706
	23:11:03	R		-22	10		
24 Aug	02:45:21	D	0.45-	-17	37	3.8	61 Tau, δ^1 Tau
	03:55:14	R		-9	47		
24 Aug	03:29:07	D	0.44-	-12	43	4.8	64 Tau, δ^2 Tau
11 Sep	00:08:48	D	0.91+	-33	11	4.8	22 Cap, η Cap
19 Oct	00:25:08	D	0.75-	-47	41	3.0	123 Tau, ζ Tau
	01:15:02	R		-44	48		
22 Oct	00:36:14	D	0.44-	-47	17	5.3	33 Cnc, η Cnc
	01:32:36	R		-43	26		
01 Nov	17:33:36	D	0.24+	-11	10	5.5	24 Sgr
15 Nov	21:53:06	D	0.88-	-51	30	3.3	7 Gem, η Gem
	22:15:10	R		-53	33		
16 Nov	01:33:33	D	0.87-	-50	58	2.9	13 Gem, μ Gem
	02:50:56	R		-40	60		
05 Dec	18:07:33	D	0.63+	-21	31	4.6	33 Psc, BC Psc
	19:19:07	R		-32	32		
05 Dec	21:37:22	D	0.64+	-52	25	5.8	ZC 18
10 Dec	23:19:26	D	0.98+	-60	55	5.9	ZC 610
12 Dec	02:17:37	D	1.00+	-49	46	5.3	106 Tau, l Tau
13 Dec	06:45:07	D	0.99-	-10	17	3.3	7 Gem, η Gem
	07:14:15	R		-6	13		

Table 1. Occultations of stars brighter than magnitude 6.0.

Occultations during Lunar Eclipse, 21 Jan 2019

There is a lunar eclipse on 21 January. Weather permitting, the entire event will be visible from the UK. Table 2 lists contact times (from the *BAA Handbook*):

Contact	P1	U1	U2	U3	U4	P4
Time (UT)	02:36:30	03:33:54	04:41:17	05:43:16	06:50:39	07:48:00

Table 2. Contact times for lunar eclipse.

With the glare from the Moon reduced during the eclipse, many more occultations than usual will be visible. In fact, predictions show 17 total occultations plus two grazes, the track of one of which passes within 1 km of Orwell Park Observatory! (See below for details.)

Nights with many Occultation Events

During the year, the Moon traverses some rich star fields. When this happens, many occultations can occur during a short period. Table 3 lists dates throughout the year when the Moon occults 10 or more stars. (Figures for early morning events are included with those of the previous evening, if any.) The occultations on 21 January occur during a total lunar eclipse, when stars fainter than usual can be seen. The large numbers of occultations during early May are

associated with the passage of the Moon through the rich star fields of Taurus, Gemini and Cancer.

Date, no of occs	Date, no of occs	Date, no of occs	Date, no of occs
11 Jan, 14	21 Jan, 17	10 Mar, 10	11 Mar, 16
14 Mar, 13	08 Apr, 25	10 Apr, 16	11 Apr, 21
13 Apr, 16	07 May, 10	08 May, 36	09 May, 36
10 May, 11	07 Jun, 10	04 Oct, 14	30 Nov, 10
01 Dec, 11	30 Dec, 12	31 Dec, 13	-

Grazing Occultations

The tracks of eight grazing occultations cross East Anglia during the year. Table 4 summarises the circumstances. Columns one and two give the date and time of the graze and column three specifies the lunar limb involved. Column four indicates the distance between Orwell Park Observatory and the closest point on the track, on land. Column five details the lunar phase (positive for waxing, negative for waning); column six the altitude of the Sun (a negative solar altitude means that it is below the horizon); and columns seven and eight the altitude and azimuth of the star. Columns nine and ten specify the star and its magnitude.

Date	Time (UT)	Limb	Dist OPO (km)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star Azi (°)	Mag	Star
01 Jan	05:34	S	39	0.21-	-22	17	140	7.8	H73200
01 Jan	06:15	S	41	0.21-	-15	20	149	7.7	H73291
21 Jan	06:17	S	1	1.00-	-14	13	284	9.7	T1385-0909-1
26 Mar	03:29	S	21	0.70-	-21	17	166	5.6	ZC2401
19 Oct	04:27	N	4	0.74-	-19	59	197	8.4	T1310-1231-1
21 Oct	00:05	N	21	0.55-	-48	22	82	8.3	H36573
17 Nov	05:29	S	32	0.78-	-16	53	225	6.8	ZC1128
20 Dec	04:29	S	26	0.38-	-31	30	138	8.0	ZC1840

Table 4. Grazing lunar occultations.

Note:

- There are two grazes on the morning of 01 January, separated by approximately 40 minutes. The tracks run approximately parallel and 5 km apart over East Anglia, providing an opportunity to observe both during a single observing trip!
- The graze on the night of 21 January occurs during the final stages of a total lunar eclipse. The graze track passes only 1 km from Orwell Park Observatory.
- There are two grazes within two days in mid-October (19th and 21st).

Figure 1 illustrates the tracks of the above grazing occultations through East Anglia. Weather permitting, the usual band of OASI occultation observers will organise observing trips. Please get in touch if you are interested in participating. Further information, including plots of the tracks in Google Earth, is on the OASI web site: http://www.oasi.org.uk/Occs/Occs.php.

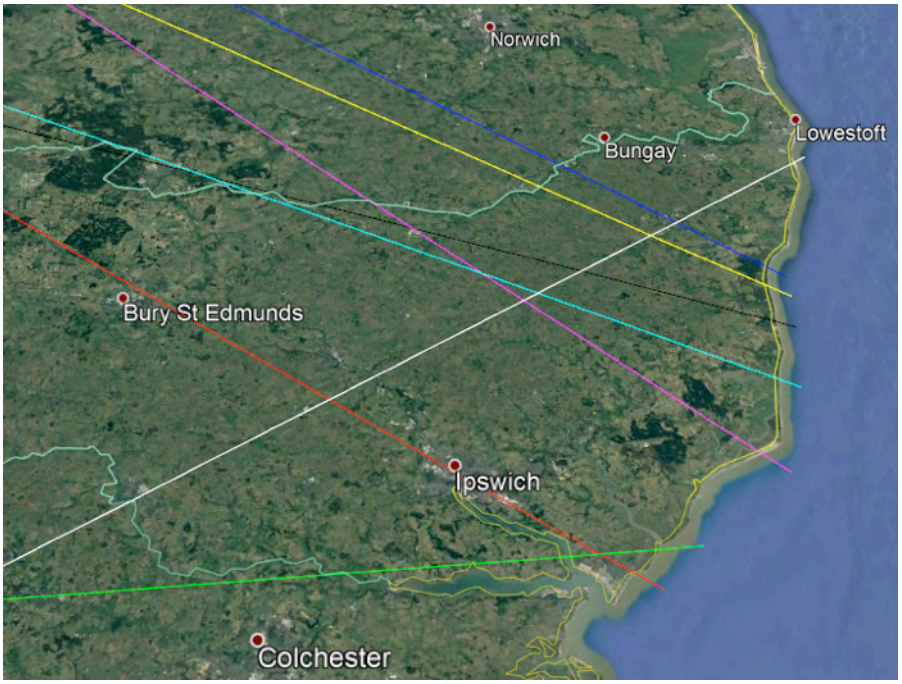
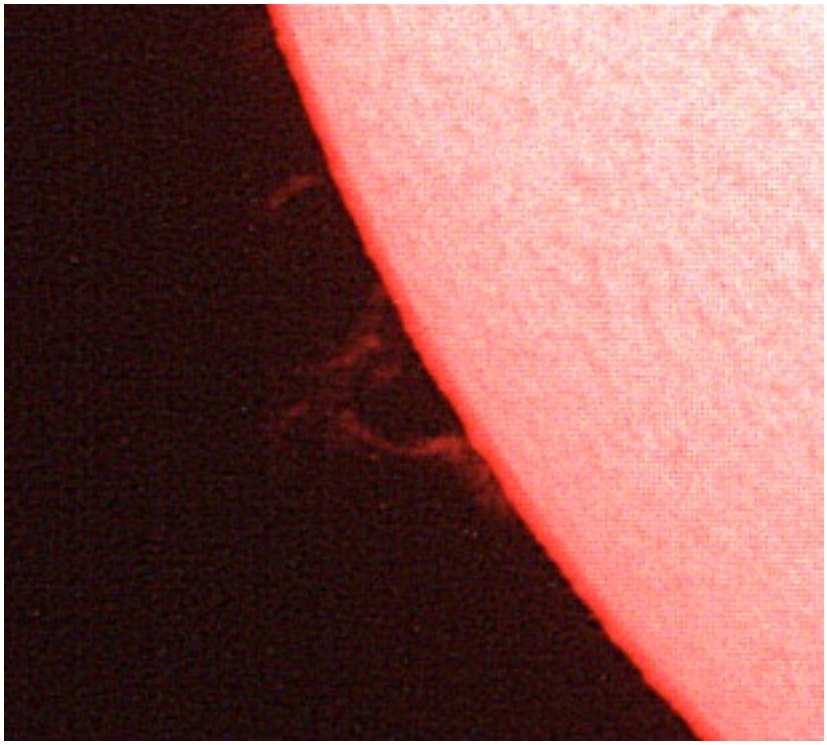


Figure 1. Graze tracks, colour coding as follows:

Jan 01, 05:34: yellow
Jan 01, 06:15: blue
Jan 21: red
Mar 26: purple
Oct 19: green
Oct 21: white
Nov 17: black
Dec 20: cyan

Solar prominence

Martin Cook



The Sun on 11 November at 1145 showing a large prominence

Lunt LS50THa B600PT H-alpha Solar Telescope.

QHY5P-II Colour camera.

Was more flares to be seen but the neighbour's tree at the bottom of the garden came into play before I could image them.

Basil Brown – Archaeologist & Astronomer

Pete Richards

On the weekend I attended a talk at Ipswich Museum about Basil Brown the archaeologist who was the first to excavate the Anglosaxon ship burial at Sutton Hoo. I was aware from OASI astro-historians that he was also an accomplished amateur astronomer but I learnt quite a lot more at that event.

Basil Brown was a farm worker who left school at 12 but taught himself astronomy and archaeology and was accomplished in both subjects. To advance his knowledge in his areas of interest he taught himself 4 languages so that he could correspond with experts in other countries. His own equipment was apparently a 2 inch telescope but he was able to do research which allowed him to write an important astronomy book which was well known in the interwar period.

The Ipswich Museum employee who gave the talk - Caleb Howgego - has produced a podcast which you can access in the following link if you are interested:

Ipswich History Podcast - Episode 1 - Basil Brown : Caleb Howgego : Free Download, Borrow, and Streaming : Internet Archive

If you'd like a copy of Basil Brown's astronomy book "Astronomical Atlases, Charts and Maps: An Historical and General Guide" you can get a copy from Amazon (if you fork out at least £149): https://www.amazon.co.uk/Astronomical-Atlases-Charts-Maps-Historical/dp/0712901310

There is also a Basil Brown biography: https://www.amazon.co.uk/BASIL-BROWN-ASTRONOMER-ARCHAEOLOGIST-ENIGMA/dp/B001F7Q7O0

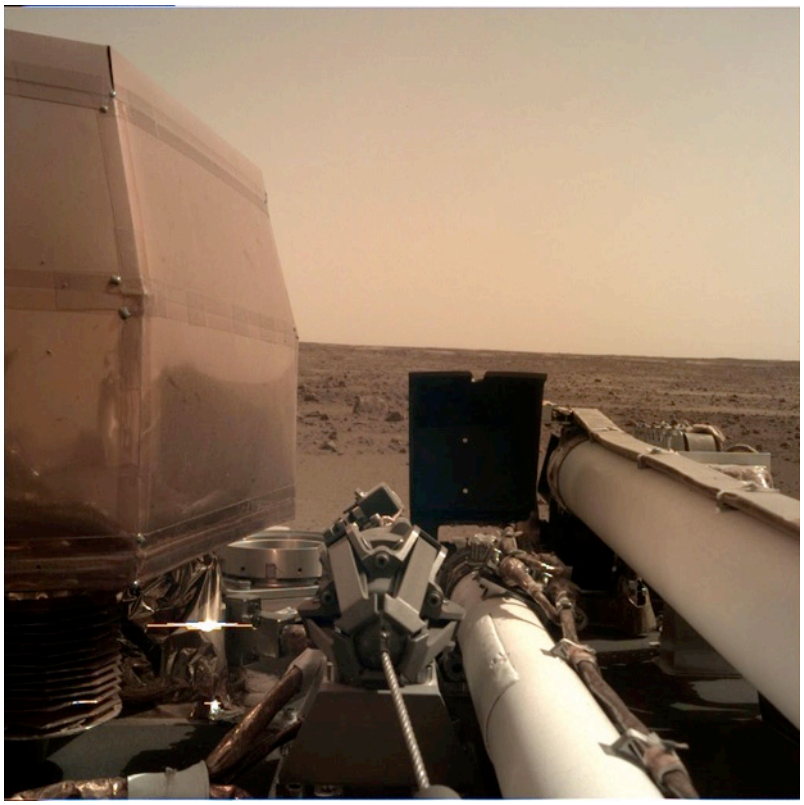
Bill Barton notes that Basil Brown's 'Astronomical Atlases, Charts & Maps' is also available on abebooks from £55:00.

https://www.abebooks.co.uk/servlet/SearchResults?an=Basil%20brown&cm_sp=SearchFwi-_-SRP-_-Results&kn=Astronomy%20&n=100121503&sortby=17

InSight Is Catching Rays on Mars

The Instrument Deployment Camera (IDC), located on the robotic arm of NASA's InSight lander, took this picture of the Martian surface on Nov. 26, 2018, the same day the spacecraft touched down on the Red Planet. The camera's transparent dust cover is still on in this image, to prevent particulates kicked up during landing from settling on the camera's lens. This image was relayed from InSight to Earth via NASA's Odyssey spacecraft, currently orbiting Mars.

Image Credit: NASA/JPL-Caltech. Raw Image and Caption



2019 Annual General Meeting

Saturday 26 Jan 2018, starting at 7.30pm.

Venue: Methodist Church Hall Black Horse Lane

All members are invited to attend the AGM

Nominations for Chairman, Secretary & Treasurer.

Orwell Astronomical Society – Nomination form

Nomination for 2019 committee

Name of Nominee .....

Post .....

E.g. Chairman/Treasurer/Secretary/Committee.

Proposer .....

Seconded by .....

Any members who are nominated must have given their consent.

All forms must be returned to the secretary (Roy Gooding secretary@oasi.co.uk) before the AGM.

Members who are elected to the 2019 committee. will be expected to attend as many committee meetings as possible.

Committee meetings are usually held about every six to eight weeks.

Every committee member is given an area of responsibility to help with the running of the society.