No. 541 Registered Charity 271313 March 2018

OASI News

The newsletter of the Orwell Astronomical Society

Moon set over Havøysund

Photo: Paul Whiting FRAS

Contents

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. ***Please note this is a new number. Kindly 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

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, 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 Observing Group
	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

Society Notices

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.

2018 AGM Notes

Methodist Church Hall Black Horse Lane, 19:30 Saturday 20th January 2018

The full minutes will be available to members from the Secretary in due course.

Election of Officers for 2018

Chairman: Paul Whiting [for one year only]

Treasurer: Paul Whiting

Secretary: Roy Gooding

All votes carried *nem con*.

Election of Committee for 2018

Committee: en bloc, carried *nem con*

The meeting closed 20:45

Next Committee Meeting

Friday 20 April 20:00 at Museum St Methodist Church rooms, Black Horse Lane.

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
Thursday, 1 March meet 19:45 in car park, 3rd gate.	Orwell Park Observatory	chairman@oasi.org.uk	OASI@Orwell Park Special Evening for members to visit the observatory.
Monday, 12 March 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI@Newbourne: Skynotes+Workshop (p7)
Tuesday, 13 March 20:00	Orwell Park Observatory		Observatory Tour Public access event. Observatory tour. Booking essential.
Sunday 25 March			**British Summertime begins**
Monday, 26 March 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne
Monday, 9 April 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne: observing+Skynotes
Friday 19 April	Museum St Methodist Church, Blackhorse Lane, Ipswich	Roy Gooding	Committee meeting
Monday, 23 April 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne
Monday, 14 May 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne
Monday, 28 May 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne
Saturday 02 June from 12:00	Kirton Recreation Ground	Martin RH via OASI @ Newbourne	**Public event: OASI @ Kirton Village Fete.**
Sunday 10 June from 10:00	Kirton Recreation Ground	chairman@oasi.org.uk	**Public event: OASI @ East Suffolk Wireless Revival**

Outreach meetings

Framlingham Country Show April 8th and 9th

Arrangements still in progress.

Sutton Hoo Solar Event June 16th or 17th

Venue: Sutton Hoo Visitors Centre on the grass outside the cafe

Option 1	Saturday 16th	Option 2	Sunday 17th
Setup time:	10:30	Setup time:	10:30
Event time:	11:00 to 16:00	Event time:	11:00 to 16:00

There will be solar observing plus Bill Barton is hoping to present a lecture on Basil Brown's activities as an astronomer. More details nearer the date

Other meetings in planning

Christchurch Park solar observing – date to be arranged, ideally in June or July.

Holywells Park Family Day - usually the first Wednesday in August.

Bentley Families Day – solar observing in September.

Norwich Science Festival, likely to be during autumn half term.

OASI @ Newbourne – NOG renamed!

Martin Richmond-Hardy newbourne@oasi.org.uk

We are now **OASI @ Newbourne** (no. it's not an email address!)

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).

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.

Meeting on 12 February

Yet another clear night! With three telescopes (Andy Gibbs's new 12" Dob, Iain Hastie's refractor, my Skywatcher 200 Dob and some bins) we observed:

M1, M31, M35, M36, M37, M38, M42, M45, M78, M81, M82, beehive, μ Cetei, NGC457 (Owl cluster), Mira and the Garnet Star. A very enjoyable evening's observing!

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.

OASI@Newbourne Meetings in 2018

12 March (S)	26 March	9 April (S)	23 April
14 May	28 May	11 June	25 June
9 July	23 July	13 Aug	27 Aug
10 Sept	24 Sept		

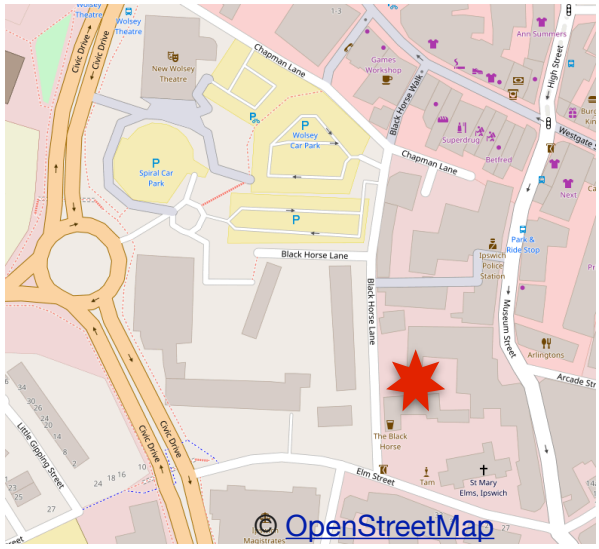
We open up for all meetings at 7pm. Star Guide (S) at 7:30pm and Workshops (W) at 7:45pm.

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 – 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

Hertzsprung Russell Diagram Workshop – An Introduction to the Development and Implications

12th March 7:45pm start (Note earlier than usual start time)

Presented by Alex Sinclair

Since its creation by early 20th century astronomers the HR-diagram has been an important astronomical tool and an essential aid to understanding how stars evolve over time. Stellar evolution cannot be appreciated from observation of individual stars as significant changes usually occur over millions or billions of years. But the HR-diagram is concerned with recording the properties of many stars of various types and at various stages in their evolutionary journey. Stars with similar properties and at similar phases of development occupy definite regions on the diagram. The comprehensive illustration provided by this diagram also makes plain how those stars which do evince noticeable change, pulsating variable stars, are passing through transitional periods between much longer stages of evolution.

Lecture Meetings

Contact: Peter Richards lectures@oasi.org.uk

These currently 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. Free after 8pm.

We are exploring a new venue for lecture meetings.

Special OASI @ Orwell Park evening

This is to be held on Thursday 1 March primarily for members who have not yet visited the OPS observatory.

Meet in the car park (3rd gate towards Broke Hall) at 8:00 and you will be escorted to the Dome,

Other local astronomy society meetings

DASH Astro Events – 2018

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. **Note these are now on Sundays.**

04 Feb	Meeting – Matthew Bothwell: From Big Bang to Big Rips ! A History of Modern Cosmology.
18 Feb	Dash Observing Session (Sunset 17:11 Moonset 20:09 7% Moon)
04 March	Meeting – Paul Whiting: Cassini – Huygens.
18 March	Dash Observing Session (Sunset 18:02 Moonset 19:09 2% Moon)
01 April	Meeting – Annaliese Avery: Women in Astronomy.
15 April	Dash Observing Session (Sunset 19:51 Moonset 19:04 0.6% Moon)
29 April	Meeting – Nick James: Comets.

LYRA Lowestoft & Yarmouth Regional Astronomers

www.lyra-astro.co.uk

LYRA Programme and Local Events 2018 – 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

13 March	TBC
27 March	LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7.30pm
10 April	Talk by Nick James, BAA Comet Section Director “Observing & Studying Comets”
24 April	LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7.30pm
8 Ma	Talk by **Paul Whiting, FRAS** “Practical Radio Astronomy”
22 May	LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7.30pm

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

1 March	Presentation on Mars
	What's topical in astronomy
	What's in the night sky
15 March	Overview/final checks for Star Parties
	The Moon
	What's in the night sky
23 & 24 March	**Star Parties in Nowton Park**
29 March	Presentation on astrophotography
	What's topical in astronomy
12 April	Presentation on Venus
	What's in the night sky
26 April	How to do objects in the night sky
	What's topical in astronomy
10 May	Presentation on Mercury
	What's in the night sky
24 May	Equatorial mounts - the what, the why and how to set them up!
	What's in the night sky
	What's topical in astronomy
7 June	Hertzsprung-Russell diagram and the study of stellar evolution
	What's topical in astronomy
21 June	Sundials and astronomy
	What's topical in astronomy

The Night Sky in March

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) until start of BST on 25 March

Moon

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

New Moon	1st Quarter	Full Moon	Last Quarter
		02 March 00:51	09 March 11:20
17 March 13:12	24 March 15:35	31 March 13:37	

Sun, Moon and planets

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	06:41	17:35		Spring equinox Mar 20, 16:15
	31	06:33	19:27		
Moon	1	16:58	06:37		
	31	19:26	06:57		
Mercury	1	07:09	18:26	-1.3	Maximum eastern elongation 2018-Mar-15 Perihelion 2018-Mar-10 Inferior conjunction 2018-Apr-01
	31	06:22	19:40	4.8	
Venus	1	07:16	18:34	-3.8	
	31	07:15	21:12	-3.8	
Mars	1	02:47	10:26	0.8	
	31	03:09	10:37	0.3	
Jupiter	1	00:17	09:07	-2	
	31	23:11	08:08	-2.2	
Saturn	1	03:57	11:42	0.6	
	31	03:05	10:51	0.5	
Uranus	1	08:06	21:42	5.9	
	31	07:10	20:53	5.9	
Neptune	1	06:58	17:40	8	Superior conjunction 2018-Mar-04
	31	06:01	16:49	8	

Paul's Astronomy Podcast for March

Paul Whiting FRAS Podcast, March 2018 www.oasi.org.uk/2018_03_pod.mp3

Occultations during March 2018

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.

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
22 Mar	20:18:55	D	0.30+	-20	32	5.0	75 Tau
	21:15:27	R		-27	23		
23 Mar	22:41:50	D	0.41+	-34	21	4.3	119 Tau, CE Tau
	23:35:08	R		-36	13		
23 Mar	23:17:28	D	0.42+	-36	16	5.7	120 Tau, V960 Tau
24 Mar	00:03:12	R		-37	9		
24 Mar	23:43:44	D	0.53+	-36	21	7.1	22 Gem
26 Mar	00:41:43	D	0.65+	-35	21	6.8	ZC 1151

On 25 March at 20:45 there is a southern limit graze of the magnitude 6.4 star ZC1130. Details are on the OASI website: http://www.oasi.org.uk/Occs/Occ_summary_2018.php. An observing trip will be organised if weather conditions are favourable: details will be provided via the OASI email list.

Visible ISS passes ≥15º max altitude

Martin RH

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

Times are UTC. Predictions are approximate (20 Feb) due to craft adjustments. Check the day before. Mostly for the night shift until the end month!

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Mar	-2.1	05:58:38	10°	SW	06:01:32	30°	SSE	06:04:28	10°	E
01 Mar	-2.1	05:58:08	10°	SSW	06:01:03	30°	SSE	06:03:58	10°	E
02 Mar	-1.6	05:06:53	10°	SSW	05:09:24	20°	SE	05:11:55	10°	E
03 Mar	-3	05:50:02	10°	SW	05:53:13	47°	SSE	05:56:23	10°	E
04 Mar	-2.5	04:59:19	20°	SSW	05:00:58	34°	SSE	05:03:58	10°	E
05 Mar	-1.9	04:09:06	23°	SE	04:09:06	23°	SE	04:11:27	10°	E
05 Mar	-3.6	05:41:45	11°	WSW	05:44:53	69°	SSE	05:48:10	10°	E
06 Mar	-3.4	04:51:27	34°	SW	04:52:34	53°	SSE	04:55:47	10°	E

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
07 Mar	-2.3	04:01:06	32°	ESE	04:01:06	32°	ESE	04:03:21	10°	E
07 Mar	-3.8	05:33:45	13°	W	05:36:35	83°	S	05:39:52	10°	E
08 Mar	-3.8	04:43:21	45°	WSW	04:44:12	73°	SSE	04:47:29	10°	E
09 Mar	-2.4	03:52:55	35°	E	03:52:55	35°	E	03:55:04	10°	E
09 Mar	-3.8	05:25:34	15°	W	05:28:15	86°	S	05:31:32	10°	E
10 Mar	-3.9	04:35:06	52°	W	04:35:49	85°	S	04:39:06	10°	E
11 Mar	-2.3	03:44:39	35°	E	03:44:39	35°	E	03:46:41	10°	E
11 Mar	-3.8	05:17:17	16°	W	05:19:51	75°	S	05:23:07	10°	ESE
12 Mar	-3.9	04:26:49	57°	W	04:27:24	84°	S	04:30:41	10°	E
13 Mar	-2.1	03:36:22	31°	E	03:36:22	31°	E	03:38:14	10°	E
13 Mar	-3.6	05:09:01	17°	W	05:11:20	55°	SSW	05:14:33	10°	ESE
14 Mar	-3.9	04:18:36	64°	WSW	04:18:55	71°	SSW	04:22:11	10°	ESE
15 Mar	-1.7	03:28:13	25°	E	03:28:13	25°	E	03:29:44	10°	E
15 Mar	-3.1	05:00:52	19°	W	05:02:43	36°	SSW	05:05:46	10°	SE
16 Mar	-3.5	04:10:34	48°	S	04:10:34	48°	S	04:13:30	10°	SE
17 Mar	-1.2	03:20:21	16°	ESE	03:20:21	16°	ESE	03:21:07	10°	ESE
17 Mar	-2.4	04:53:01	19°	WSW	04:53:57	22°	SSW	04:56:33	10°	SSE
18 Mar	-2.1	04:02:57	23°	SSE	04:02:57	23°	SSE	04:04:34	10°	SE
25 Mar	-2	20:23:18	10°	S	20:25:20	15°	SE	20:25:35	15°	SE
26 Mar	-3.1	21:05:39	10°	SW	21:08:25	36°	S	21:08:25	36°	S
27 Mar	-2.6	20:13:26	10°	SSW	20:16:13	26°	SSE	20:18:21	14°	E
27 Mar	-2.4	21:49:06	10°	WSW	21:51:01	32°	WSW	21:51:01	32°	WSW
28 Mar	-3.8	20:56:32	10°	WSW	20:59:46	57°	SSE	21:00:47	37°	ESE
29 Mar	-3.3	20:04:03	10°	SW	20:07:10	42°	SSE	20:10:17	10°	E
29 Mar	-3.6	21:40:12	10°	W	21:43:04	65°	WSW	21:43:04	65°	WSW
30 Mar	-3.9	20:47:32	10°	WSW	20:50:48	76°	S	20:52:36	24°	E
30 Mar	-1.5	22:23:57	10°	W	22:25:14	22°	W	22:25:14	22°	W
31 Mar	-4	21:31:16	10°	W	21:34:33	85°	S	21:34:42	80°	SE

Iridium flares

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

Meteor showers

None this month.

David'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).

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

Blue Moons

In case you hadn't noticed, we have not one but two blue moons coming up. A blue moon is a second full moon within the same month, and this will happen on 31st January and 31st March. So how about a little observing challenge?

Take a photo of the Blue Moon. Use what you like – phone, tablet, camera, telescope, whatever. This is not a competition. We just want to see people getting involved. Take your pictures, select the best (or worst!) and send it toto me at chairman@oasi.org.uk

We will then prepare a display of your efforts Vision On style (for those old enough to remember!).

Paul Whiting (your new Chairman)

That Super Blue Blood Moon

Paul Whiting, FRAS

The Super Blue Blood Moon was how Sky & Telescope magazine described the January 2018 umbral lunar eclipse. Whether they were the first to use this phrase but it has certainly caught on across America and latterly even the BBC were using it.

So the term Super moon has become the phrase introduced and much beloved by the popular press to excite the public over the coincidence of a full Moon occurring around the same time that the Moon is at its closest point to the Earth, or at perigee. The distance of the Moon at perigee varies from one month to the next as the lunar orbit is not circular. For example 1st January 2018 the perigee distance was 221,559 miles whereas 30th January 2018 the distance was 223,068 miles. Therefore during a Super moon the lunar surface will appear to be up to 12% bigger than normal (the press never define what "normal" means – possibly they mean the point in the lunar orbit furthest from the Earth, or apogee). So this particular moon was not a spectacular super moon, but what made it special was the fact that it was a Blue Moon too.

A Blue moon is the term given to a second full moon in the same month. Out of interest I have not found any reference to a specific term for a second New moon in a month. Given the 29.5 day lunar period and our own 28 to 31 day months, the chances of such an event are quite low (approx. once every 2.5 – 3years) – hence the expression "once in a blue moon". However very rarely if you get a full moon on the 2nd January, you will get a second on 31st January, There will be no full moon in February and you will again get full moons on 2nd and 31st March. In other words two blue moon in succession. Note that the last two super moons do not match exactly with their blue moon equivalent – but what's a day?

So what about the third term – the Blood moon? This is another term coined by the press to excite their readers over a forthcoming lunar eclipse. When the moon enters in to the total shadow of the Earth (that is when it enters the umbral phase of the eclipse) the moon should go dark. However thanks to sunlight "leaking" through the Earth's atmosphere, the Moon can become illuminated somewhat. Thanks to two separate effects this illumination can be quite a deep ruddy brown or even "blood red". These two effects are firstly the scattering of the blue sun light, which is the same effect that gives us a blue sky, so the spectrum of light transmitted from the Sun is skewed somewhat towards the red after it leaves the Earth's atmosphere. Second and more importantly, the amount of pollution in the Earth's atmosphere – especially volcanic ash – will have the greatest effect on the reddening of the Moon's eclipsed surface.

The Danjon Scale is used to define the level of redness. This eclipse turned out to be an L2 on this scale, namely: "Deep red or rust-coloured eclipse. Very dark central shadow, while outer edge of umbra is relatively bright". https://en.wikipedia.org/wiki/Danjon_scale

So here we were at Honningsvåg, North Norway, where we should see the Moon rise in eclipse. The twilight was far too strong to enable any background aurora to be seen, but worse than that it was cloudy and it shouldn't be; the forecast was for the sky to be clear all afternoon and evening. Worse still was that from where the boat was parked the Moon was behind a mountain! We were patiently for the Moon to rise above the mountain and hopefully still be in eclipse. Luckily the boat started its journey to the next port of call so effectively removing the mountain from our line of sight. That just left the clouds. At least they were broken and eventually the Moon did re-appear, just in the last minutes of totality.

The circumstances of the Moon were very strange – we were waiting to witness the moon rise in eclipse at Honningsvåg around 2pm having seen it set only about 4 hours earlier whilst travelling past Havøysund.

The temperature was around -5 but felt more like -20 with the wind chill effect. So another successful eclipse … and then there were the northern lights. Nothing was seen on night one, a small display on night two (just enough so that the Hurtigruten don't have to pay out on second cruises through there not being any aurora seen). Things got a bit better on night three, with some very motile and colourful displays, but there was also a lot of cloud and snow. On the last night we saw a very strange phenomenon. A dim streamer of aurora branched across the sky, with occasional brightening and dimming at places along its length. The strange thing was that it stayed pretty much in place for several hours. Was it aurora? It passed the green photograph test and stars were visible through it, which pretty much rules out cloud or smoke. The Moon was very dominant so could it have been a moonbow of some kind? Again unlikely as it was at an oblique angle to the Moon and didn't not vary with the Moon over time.

Figure 1: The Super Moon over Tromsø Bridge

Figure 2: Moon set over Havøysund

Figure 3: 3rd Contact (end of umbral eclipse)

Figure 4: Partial phase

Figure 5: Aurora over the Barents Sea

The Library update. The Five-hundred-metre Aperture Spherical radio Telescope(FAST).

Andy Willshere

In 1960 the astronomer Frank Drake (Drake equation), performed the first modern SETI experiment using a 26 metre diameter telescope at Green Bank, West Virginia. He started by looking at the stars Tau Ceti and Epsilon Eridani examining close to the 1.420 gigahertz frequency. This radio spectrum frequency is known as the "water hole" because of its closeness to the hydrogen and hydroxyl radical spectral lines. He scanned a 400 kilohertz zone around the marker frequency, and used a single channel receiver with a 100 hertz bandwidth. This was named project Ozma. Nothing was found. This was the basic start of the search for extraterrestrial intelligence. Started in November of 1984 the SETI institute was formed, going into operation on February 1, 1985. In 1999 The Arecibo Observatory in Puerto Rico using its 305 metre radio telescope began to collect information for the SETI@home programme.

Up to present day, this telescope has been the largest to furnish the SETI model. However in 2011 a new construction was begun in Guizhou province, China, which upon completion has become the world's largest filled aperture radio telescope.

Beijing has suggested that this will help the human race to search for alien life. This telescope is a five hundred metre aperture spherical dish, and goes under the acronym: FAST. (Five-hundred-metre Aperture Spherical radio Telescope). At present however only a circle of 300 m diameter is used. It is situated in an area of Guizhou that is mountainous, in a giant sinkhole where the limestone has dissolved away. Building it in this remote area will protect it from radio wave interference, such as wi-fi and cell phones. The cost of the build was 1.2 billion yuan (£138 m) and dwarfs the Arecibo telescope. The dish of 4,450 triangular panels forming a geodesic dome will be used by FAST to search for intelligent life and to detect distant pulsars. These panels give the dish a collecting area of 196 * 103 square metres which virtually doubles that of the Arecibo dish. It also has 2225 winches positioned beneath making it a mobile surface. The larger the dish, the greater the collecting power and the better the detection ability. Smaller telescopes can be moved to investigate different parts of the universe, but FAST is much too large for this to happen. Instead FAST's mirrored panels and its receiver are manufactured to allow the use of winches to twist the flexible steel cable braces to initiate a parabola shaped bowl which allows the telescope to be pointed wherever. Thus the active surface of the panels can be inclined by computer to change the focus to different areas in the sky. It has the ability to observe at wavelengths of 10 cm to 4.3 m. The fixed primary reflector focuses radio waves onto the receiving antenna situated 140 m above it. It has an operating frequency range of 70 MHz to 3.0 GHz with the range being monitored by nine receivers. FAST has already made its first discovery to locate a pair of pulsars (PSR J 1859-01 and PSR J1931-01) which have been verified by the Parkes telescope in Australia on September 10, 2017. These are 16,000 and 4,100 light years away from Earth. By October 2017 it had received confirmation by other international organisations of a further six pulsars.

FAST lists the following as its main objectives:

- Large scale neutral hydrogen survey.
- Observe pulsars.
- VLBI network.
- Detect interstellar molecules.
- SETI.
- Pulsar timing arrays.

National Astronomical Observatories/ CAS

Picture reference: http://www.bbc.co.uk/news/science-environment-37453933

The basic design of the Arecibo radio telescope and FAST is basically similar, with both having an effective aperture smaller than the physical size of the primary. However the main difference is that the Arecibo dish is a fixed spherical shape with two additional reflectors suspended above it to correct for spherical aberration. The FAST dish is also deeper in design.

This radio telescope is one segment of a very expensive, military run space programme, essentially telling the world that the country has progressed in this field to compete with the world. This telescope is only one of several it will build over the next decade.

References:

https://en.wikipedia.org/wiki/Five_hundred_meter_Aperture...

http://www.skyandtelescope.com/astronomy-blogs/astronomy-space-david-dickinson/fast-worlds-largest-radio-telescope-open/

https://gbtimes.com/chinas-huge-new-fast-radio-telescope-discovers...

European Astrofest 2018

Kensington Town Hall and Conference Centre 9-10-February 2018

It was time to make my annual pilgrimage to London for this years Astrofest.

As I have done so for the last couple of years, I travelled up to London on Friday morning to attend the Friday afternoon and all day Saturday conference sessions.

Highlights included, OASI Honorary President Dr Allan Chapman's talk on The Victorian Amateur Astronomer, Astronomer Royal, Prof. Martin Rees on Searching for Extraterrestrial Intelligence and

Michelle Bannister on some new information about Interstellar Planetesimal, Oumuamua.

On Saturday morning the talk on the Solar Wind, was due to be given by Chris Owen, until his wife decided to give birth three weeks early, so he had to cancel! Fortunately, another Solar Physicist, Prof. Lucie Green, who was Co-Chairing the conference, stepped in.

I enjoyed walking around the exhibition area during the lunch and tea breaks. There was a Soyuz simulator to try out, for those brave enough to attempt a docking with the ISS! Many traders were offering show discounts, so there were some good deals available. I had to use all my available willpower to resist taking advantage of one of these deals!

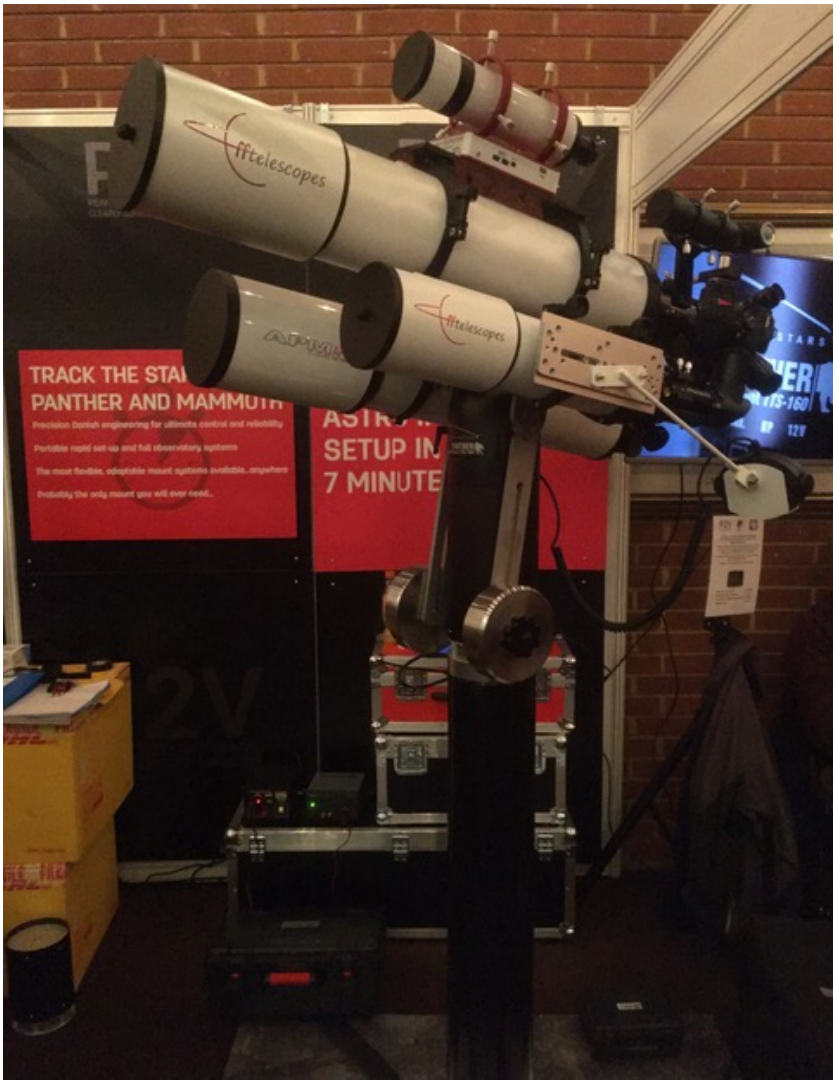
I met Mike O'Mahony at the exhibition on Friday and our new Chairman and Treasurer, Paul Whiting F.R.A.S. on Saturday.

The Lectures I attended were: -

- New Horizons: Getting to Pluto: Alice Bowman, John Hopkins University.
- The Victorian Amateur Astronomer: Allan Chapman, Oxford University.
- Jupiter Through the Eyes of Juno: Jack Connerney, Space Research Corporation.
- Searching for Extraterrestrial Intelligence: Martin Rees, Cambridge University.
- White Mars: Beth Healy, Concordia Station Doctor.
- Catching Gravitational Waves and Light from Colliding Stars: Ofer Lava, University College London.
- The Solar Wind: Lucie Green, UCL, Mallard Space Science Laboratory.
- How to Leave the Planet: Dallas Campbell, broadcaster and author.
- Juno Probes Jupiter's Interior and Exosphere: Jack Connerney, Space Research Corporation.
- First Arrival from Afar: The Interstellar Planetesimal 'Oumuamua: Michelle Bannister, Queens University Belfast.
- Fire in the Sky: Siberian Airbursts and Dangerous Asteroids: Mark Boslough, University of New Mexico.
- New Horizons: Into the Kuiper Belt: Alice Bowman, John Hopkins University.

Conference Chairs: Prof. Lucie Green and Dr. Stuart Clark.

add pictures



Need more telescopes?

Einstein was right again!

Revisiting Mira

Joe Startin

In the second half of 2012 I made some binocular observations of the long-period variable star Mira (*omicron Ceti, o Ceti, o Cet*). I wrote an article about my experiences for the OASI Newsletter of February 2013, which you can easily find on the OASI website.

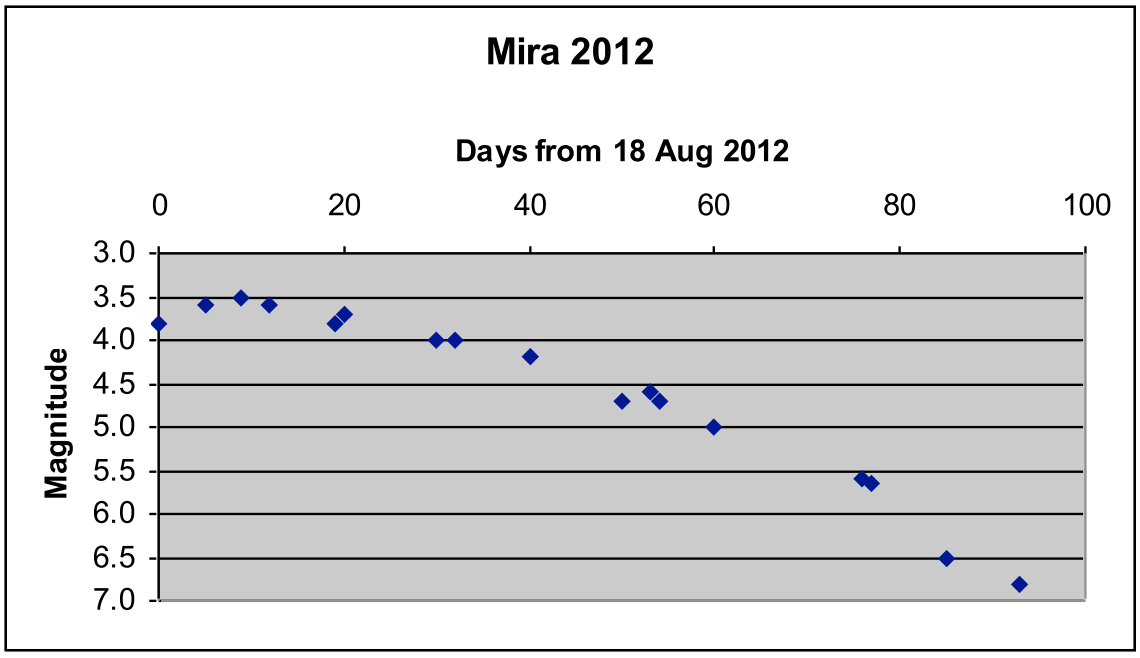
Mira is the first periodic variable star to be recorded. David Fabricius noticed it in 1596. He saw it increase in brightness and then fade away, and assumed it was a nova, never to be seen again. Then he spotted it 15 years later. Johannes Holwarda studied it systematically in 1638, attributing a period of 11 months. Johannes Hevelius, described as the last astronomer to do significant work without the help of a telescope, called it “Mira” in a publication of 1662.

It remains the most famous long period variable star, with a cycle of about 332 days. Around 100 days of this are brighter than magnitude 5. At its peak, the magnitude averages 3.5, with historical limits of 4.9 and 2.0. The minimum ranges from magnitudes 10.1 to 8.6. Brightness increases at twice the rate of its fall. It is located quite close to the ecliptic, in an unremarkable area of the sky below Aries.

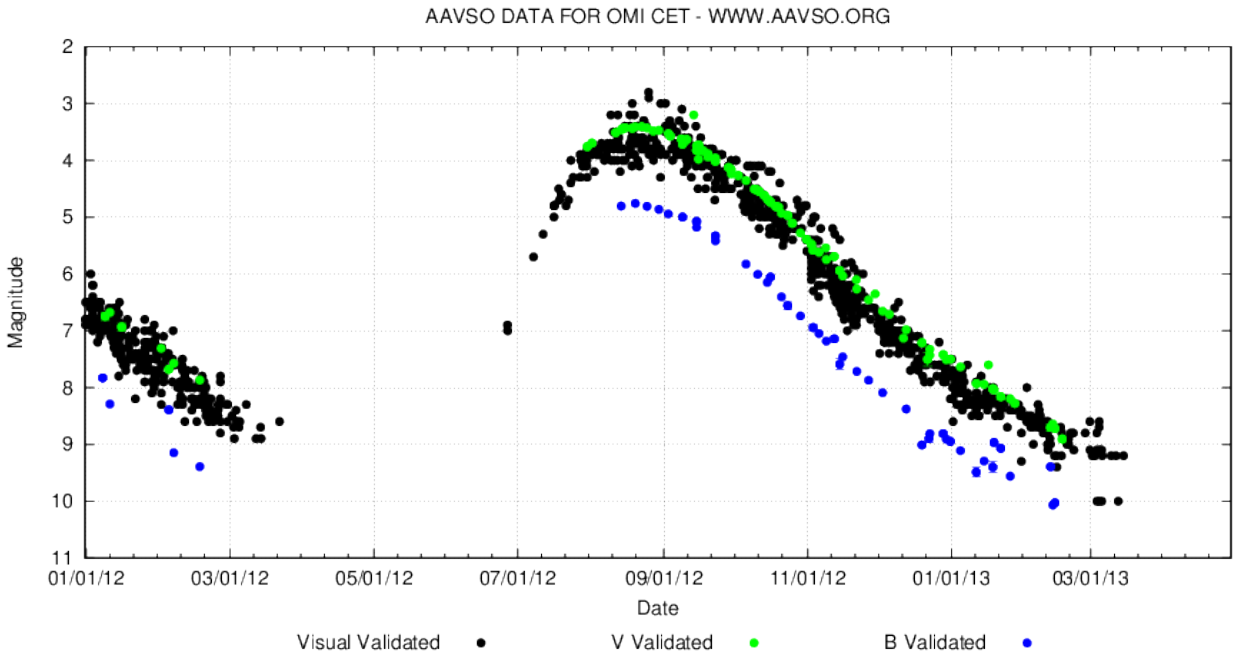
My 2013 article speculated that the next attractive possibilities for observation would be in 2018 or 2019. This seems to have proved correct. At the end of January 2018 I saw a report saying Mira had peaked around 29 Dec 2017. Although a month had passed since its maximum, I was able to find Mira easily using binoculars. As I shall explain below, this does not really mean that a good opportunity to observe Mira has been missed. However, the following two cycles, nominally peaking on 26 Nov 2018 and 24 Oct 2019, will be very attractive.

In 2012 the peak brightness occurred around the end of August. Viewing was not very convenient. Mira was rising uncomfortably late, although this situation slowly eased as time passed. I just caught the peak, and tracked the fall in brightness using binoculars. Mike Nicholls helped by pointing me at the charts from the Variable Star Section of the British Astronomical Association, and giving me tips on how to use them. The Mira (*o Cet*) charts can be found at http://www.britastro.org/vss/xchartcat/omi-cet_.html . I found two of these charts useful, but for binoculars I never seriously needed the 5˚ field chart. My attempts using a telescope were ignominious. See the article for details.

My final observation was in mid-November, when I reached the limit of my capability. Here are my results:



How do these observations shape up? Here is an output from the light curve generator of the AASVO (American Association of Variable Star Observers), which can be found at https://www.aavso.org/lcg . The axis uses American date format, and the intervals are marked every 10 days. My results should be compared with the black dots, which are described as 'Visual Validated'. Here 'Validated' simply means that a human being has weeded out the more doubtful looking submissions. I seem to do OK, but given the way the dots are spread out this would not be very difficult.



[As an aside, the V and B results are for colour indexing. These observations used special filters with 'visible' and 'blue' passbands, and calibrated detectors. Many sources will tell you that the value of the B-V colour index of Mira is +1.53. This is literally the difference between its B and the V magnitudes, and a glance at the blue and green dots show they are consistent with this value. It also shows that Mira is red, but not as red as Betelgeuse with a B-V of +1.85, or Herschel's Garnet Star (*μ Cephei*) with a B-V of +2.35.]

When I tried to pick up Mira again at the end of January it was reasonably dark around 1830 BST. I using the star-hopping technique I had learnt in 2012:

- Identify the three-star asterism for Aries, and use its line to point to the right, going about 7 degrees of arc. This distance is slightly more than the length of the asterism.
- Find the star *η Piscis*, at magnitude 3.8.
- Now turn right through nearly 90˚ degrees, and head off for that same distance again.
- Find *o Piscis* (magnitude 4.25).
- Continue that line the same distance to *α Piscis*, at magnitude 4.1.
- Continue that line the same distance again to find Mira – if it is visible.

Mira was then slightly past the meridian and had an altitude of 35˚. Its magnitude was between 3.5 and 3.

You might be able to find Mira at the time you read this. The evidence from the AAVSO is that the current peak is flatter than for most cycles. It will have faded some more, but the real problem will be the later sunset. We saw it very low at the OASI meeting at Newbourne on 12/2/18, at about magnitude 3.6.

In hindsight I might have started looking for Mira at the beginning of December 2017. It should have been brightening towards magnitude 6 on the upward side of its light curve, and it would have been on the meridian around 2100 BST. However, it would be close to a full moon and the conditions for observing would have been horrible. So I do not think this was an opportunity missed.

What does the future offer? The next cycle will nominally peak on 26 Nov 2018. Mira will be on the upward side of its light curve and about magnitude 6 early in November 2018. It will be then on the meridian soon after 2300 BST. The Moon will be after last quarter, and below the horizon. These are excellent conditions, with the Moon never becoming a threat on the following evenings if you can't find it. But bear in mind that it is obviously much more difficult to see something appear out of nothing than it is to see something whose position you are familiar with gradually fade away. Even with binoculars, the 5˚ field chart from the BAA may be useful.

Mira's fall from peak brightness will be down to magnitude 7 in late February 2019. At 1900 BST it will be in the SW but still with an altitude of over 20˚. The Moon will be well out of the way, but the tail end of the observable part of Mira's cycle may become quite difficult.

The following peak occurs nominally on 24 Oct 2019. This will also be a favourable opportunity, depending on how late you wish to venture out. Mira will have brightened to magnitude 6 in early October. It will not cross the meridian until about 0200 BST. However, the star will have risen to over 25˚ altitude by midnight. Again, the Moon will not be a problem. Observing the downward side of the light curve will just get easier and easier. For the final observations in late January 2020, with Mira at magnitude 7, the Moon will be out of the way and the meridian crossing will be around 1800 BST, which will allow plenty more time before Mira gets uncomfortably low.

So I have made a note in my diary for late October 2018. If you have the slightest interest in variable stars, Mira will then be a great opportunity.

There are plenty of other variable stars you can observe, but for most of them you need a telescope. A good place to start is the OASI website, in the Observing/Observations section pulled together by James Appleton. Mike Nicholls' reports on Variable Stars will give you plenty of ideas.

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 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 *** (a normal oasi@newbourne night)."

The BAA's latest newsletter

4 March 2018 - Deep Sky Section Annual Meeting - Victorian deep sky photography, Double stars, Arp catalogue, astro-imaging and Monsters in the Dark! Bedford School MK40 2TT click

10 March 2018 - Back to Basics Workshop - Bristol Photographic Society, Station Road, Montpelier, Bristol, BS6 5EE click.

For full details of all meetings please click https://britastro.org/meetings

The BAA's Sky Notes for February & March have recently been published in the February BAA Journal. As usual we are making these freely available to both members and non-members. They can be read online at our website.

There is other open access content in the current edition of the Journal which readers may find interesting, including:

- 75 years in Burlington House
- Nova fireworks on New Year's Eve
- Absolute Beginners No 12. The motion of the planets
- As well as my President's round up

Also new on our website:

- Finding the way - part 1
- Mira a 'Wonderful' Maximum
- Light pollution - penetrating the veil
- And lots of observations uploaded by BAA members to the Member Pages

I'd also like to let you know about some upcoming meetings for the amateur astronomer.

- Deep Sky Section Annual Meeting, Bedford, Sunday, 2018 March 04
- Back to Basics Workshop, Bristol, Saturday, 2018 March 10
- Ordinary Meeting, London, Wednesday, 2018 March 28 - 17:30. Featuring talks on studies of Venus and amateur observations of Neptune.

And I'd like to let you and your society members know about our exciting new category of membership of the BAA - the Digital Subscriber. This has all the usual benefits of membership at a greatly reduced cost, with the Journal and Handbook provided digitally by download from our website.

You can find out more about our offering by visiting https://britastro.org/digital

I am very keen to hear from you if there are ways you think the BAA can help support local clubs and societies, as well as amateur astronomers in general - please do get in touch.

Callum Potter

President, British Astronomical Association

president@britastro.org

M42 + plane

Martin Cook

M42 15 2 2018

12 lights 10 darks combined in deep sky stacker.
Played around with in Photoshop cs.
15/02/2018 20:33:52 Skywatcher 200p on HEQ5 mount Coma corrector
Canon 1100d 30 sec 800 iso

Plane went across image note the red and flashing white light. The joys of living on a flight path

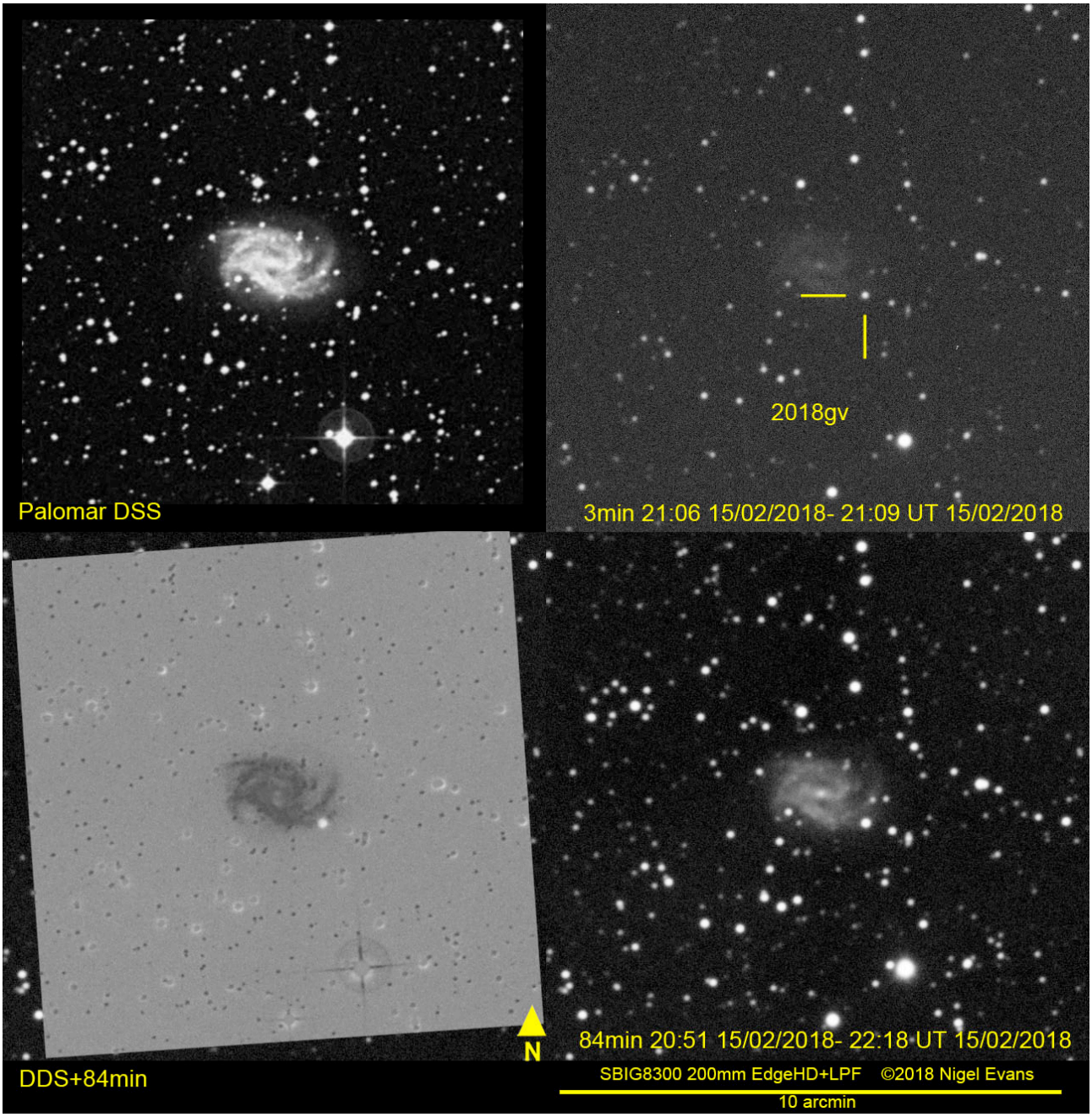
Viewing Supernovae with modest instruments

Nigel Evans

For those that might want to see supernovae with modest instruments, check out http://www.rochesterastronomy.org/snimages/snactive.html

These are my efforts for 2 of the brightest currently visible

NGC3941



NGC2525

Did I mention the Chairman's Challenge? – see p13..