



OASI News

The newsletter of the Orwell Astronomical Society



Snow on the observatory dome around lunchtime on 28 February.

Photo: Mike Whybray

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

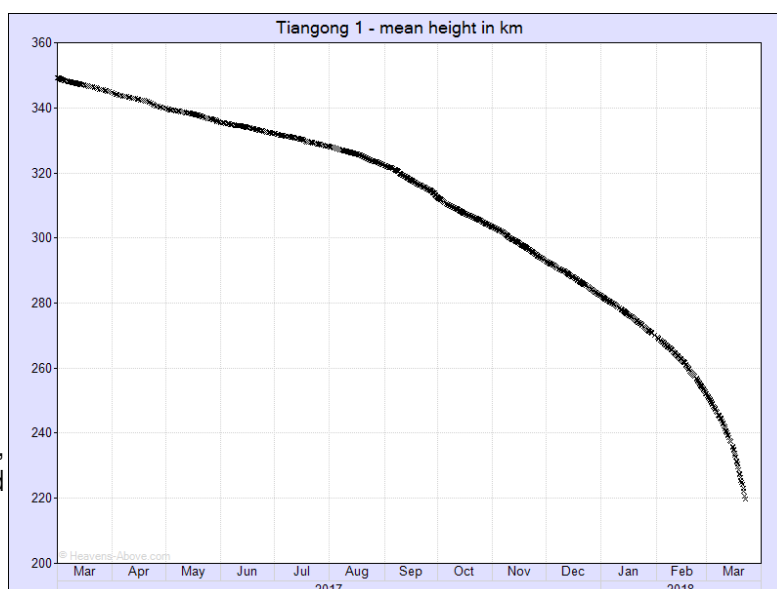
Contents

Cover picture: Snow on the observatory dome around lunchtime on 28 February	1
Tiangong 1 incoming	3
Society Notices	3
Society Contact details	3
Articles for OASI News	4
Committee 2018	4
Next Committee Meeting	4
OASI and BAA Events	5
Outreach meetings	6
Framlingham Country Show April 8th and 9th	6
Sutton Hoo Solar Event June 16th or 17th	6
Other meetings in planning	6
Lecture Meetings	7
Astronomy Workshops	7
OASI @ Newbourne	8
Stargazer's guide	8
Astronomy Book Swap	8
Other local astronomy society meetings	9
DASH Astro Events – 2018	9
LYRA Lowestoft & Yarmouth Regional Astronomers	9
Athaneum Astro Soc	9
The Night Sky in April	10
Moon	10
Sun, Moon and planets	10
Paul's Astronomy Podcast for April	10
Occultations during April 2018	11
Meteor showers	11
Visible ISS passes $\geq 15^\circ$ max altitude	12
Iridium flares	12
David's Radio Broadcast	12
Bill's Radio Broadcast	12
Bentley Star Party, Bentley Village Playing Field.....	13
Sundog over the Russian border at Kirkenes, NE Norway	13
The Graze of μ Ceti	14
The BAA's latest newsletter	15
Finding your way - Part 2 Starting out in Astronomy?	15
Diary Dates	15
From the Interweb	15
Taking Radio Astronomy to the Next Level	15
Unprecedentedly Wide and Sharp Dark Matter Map	16
Schrödinger Evolution of Self-Gravitating Disks	16
More from the Library: WFIRST and why it will not launch on time!!!!	17
M82 – The Cigar Galaxy	19
A little bit of Orwell Park history	19
Chairman's Challenge	20
2 supernovae in rather obscure galaxies, NEO and Midas	21
Old postcards of Orwell Park	25
Professor Stephen William Hawking 1942 – 2018	28

Tiangong 1 incoming

<http://heavens-above.com/TiangongHeight.aspx>

This plot shows the orbital height of the Chinese space station Tiangong-1 over the last year. Tiangong-1 is out of control and will re-enter the atmosphere early in 2018. It is probable that some large pieces will survive re-entry and hit the Earth's surface. It's impossible to say when and where the re-entry will take place, but it's unlikely to be over a populated area.



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: @OASlpswich

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

Other contact details will be issued to members on a separate printed list.

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

news@oasi.org.uk

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, rtf, doc, docx, odt, Pages, pdf

Spreadsheets: xls, xlsx, OpenOffice/LibreOffice, Numbers

Images: tiff, png, jpg

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

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

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

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

Reproducing articles from OASI News

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

Committee 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 Wilshire	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

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
Sunday & Monday 8 & 9 April	Framlingham	Roy Gooding	OASI @ Framlingham Country Show
* Monday, 2 April 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne: observing+Skynotes+ Book Swap (see p8)
Tuesday 10 April 20:00	OPS	chairman@oasi.org.uk	Observatory Tour Booking essential.
Friday 19 April	Museum St Methodist Church, Blackhorse Lane, Ipswich	Roy Gooding	Committee meeting
Sunday 22 April	Bedford School, MK40 2TT	https://britastro.org/node/11440	BAA Deep Sky Section Annual Meeting
* Monday, 16 April 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne
Saturday 12 April 10:00 – 17:00	Institute of Astronomy Madingley Road, Cambridge, CB3 0HA, England (map)	https://societyforthehistoryofastronomy.com	SHA Spring Conference
Sunday 22 April (all day)	Bedford School, MK40 2TT	https://britastro.org/node/12078	BAA Deep Sky Section Annual Meeting
Monday 23 April at 21:43	OPS	www.oasi.org.uk/Occs/Occ_summary_2018.php	Graze of the magnitude 8.3 star ZC1374 See p12.
Saturday 5 May	Discovery School Blandford Street, Newcastle upon Tyne	http://britastro.org/node/11254	BAA 1-day Spring Meeting

Date and Time	Location	Contact	Event
* Monday, 7 May 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne observing+Skynotes+ Book Swap
* Monday, 21 May 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne
Wednesday, 30 May 17:30pm – 20:00	Burlington House Picadilly London W1J 0DU	https:// britastro.org/ node/11255	BAA Ordinary Meeting + The George Alcock Memorial Lecture:
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 Set-up 09:00	Kirton Recreation Ground	chairman@oasi.o rg.uk	Public event: OASI @ East Suffolk Wireless Revival
Monday, 11 June 19:00	Newbourne Village Hall	OASI @ Newbourne	OASI @ Newbourne observing+Skynotes+ Book Swap
16 or 17 June	Sutton Hoo	Roy Gooding	Public event: Solar observing @ Sutton Hoo

* Please note OASI @ Newbourne date changes due to Newbourne Parish Council meetings.

Outreach meetings

Framlingham Country Show April 8th and 9th

Arrangements still in progress by Roy Gooding.

Sutton Hoo Solar Event June 16th or 17th

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

Option 1	Saturday 16 th	Option 2	Sunday 17 th
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.

Lecture Meetings

Contact: Peter Richards
lectures@oasi.org.uk

These will take place in our new venue:

St Augustines Church Hall
Bucklesham Road
Ipswich IP3 8TH

Start time 8pm.



Friday 21st September

"Can the World's Largest Digital Camera Answer Cosmological Questions?"

Dr Lorne Whiteway, University College London,

Friday 26th October

"Imaging with a Dobsonian"

Martin Lewis, Lunar and Planetary Imager,

Friday 23rd November

"Monsters in the Dark: searching for the Universe's most massive galaxies"

Dr Matt Bothwell, Institute of Astronomy, University of Cambridge, Friday 23rd November.

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

OASI @ Newbourne

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.

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, W)	26 March	2 April (S+B)	16 April
7 May (S+B)	21 May	11 June (S+B)	25 June
9 July (S+B)	23 July	13 Aug (S+B)	27 Aug
10 Sept (S+B)	24 Sept		

* Please note OASI @ Newbourne date changes due to Newbourne Parish Council meetings.

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 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 nights (a normal oasi @ newbourne night). **The first event will be on 2 April.**

Other local astronomy society meetings

DASH Astro Events – 2018

<http://dash.moonfruit.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.

- 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

- 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 May 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>

- | | | | |
|----------|---|---------|---|
| 29 March | Presentation on astrophotography
What's topical in astronomy | 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 |
| 12 April | Presentation on Venus
What's in the night sky | 7 June | Hertzsprung-Russell diagram and the study of stellar evolution
What's topical in astronomy |
| 26 April | How to do objects in the night sky
What's topical in astronomy | 21 June | Sundials and astronomy
What's topical in astronomy |
| 10 May | Presentation on Mercury
What's in the night sky | | |

The Night Sky in April

Martin RH

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

Times are in BST unless otherwise stated

Moon

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

New Moon	1 st Quarter	Full Moon	Last Quarter
16 April 02:57	22 April 22:46	31 March 13:37 30 April 01:58	08 April 08:18

Sun, Moon and planets

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	06:30	19:29		
	30	05:28	20:18		
Moon	1	20:39	07:21		Apogee: 404,144 km on 08 April 06:32
	30	20:44	06:10		Perigee: 368,714 km on 20 April 15:42
Mercury	1	06:18	19:31	5.2	Inferior conjunction 01 April
	30	05:02	17:27	0.5	Aphelion 23-April Maximum western elongation 29 April
Venus	1	07:13	21:15	-3.8	
	30	06:35	22:48	-3.8	
Mars	1	03:07	10:36	0.3	
	30	02:13	09:52	-0.3	
Jupiter	1	23:07	08:04	-2.2	
	30	20:56	06:03	-2.3	
Saturn	1	03:01	10:47	0.5	Aphelion 17 April
	30	01:08	08:54	0.4	
Uranus	1	07:07	20:49	5.9	Superior conjunction 18 April
	30	05:16	19:04	5.9	
Neptune	1	05:58	16:45	8	
	30	04:05	14:56	7.9	

Paul's Astronomy Podcast for April

Paul Whiting FRAS Podcast, April2018 www.oasi.org.uk/2018_04_pod.mp3

Occultations during April 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(°)	Star Alt(°)	Mag	Star
20 Apr	20:03:45	D	0.27+	-9	35	5.8	68 Ori
	20:58:30	R		-16	27		
20 Apr	22:33:22	D	0.28+	-24	13	7.5	Hip 29909
21 Apr	21:23:56	D	0.38+	-18	32	7.4	Hip 35126
21 Apr	23:02:06	D	0.39+	-25	17	7.2	ZC 1109
24 Apr	00:25:43	D	0.62+	-25	19	6.6	ZC 1385
24 Apr	23:43:35	D	0.73+	-25	30	7.3	ZC 1501
26 Apr	21:29:52	D	0.89+	-17	41	6.7	ZC 1728

On 23 April at 21:43 there is a northern limit graze of the magnitude 8.3 star ZC1374. Details are on the OASI website: http://www.oasi.org.uk/Occs/Occ_summary_2018.php. Orwell Park Observatory is well placed for observing the graze. Details of observing arrangements will be provided via the OASI email list.

Meteor showers

Source: BAA Handbook 2018 p97-99

Shower	Limits	Maximum	ZHR at Max	Notes
Virginids	Mar-Apr April 6-17	April 11-12	5	The two most prominent of several radiants in Virgo, active March-April. Slow, long paths.
Lyrids	April 18-25	April 22	10	Normally rather moderate activity, but fine displays in 1803, 1922, 1982. Very favourable.

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

Martin RH

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

Times are BST. Predictions are approximate (23 March) due to craft adjustments. Check the day before.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Apr	-3.9	20:46:44	10°	W	20:50:02	86°	S	20:51:59	22°	E
01 Apr	-1.7	22:23:12	10°	W	22:24:38	23°	W	22:24:38	23°	W
02 Apr	-3.9	21:30:50	10°	W	21:34:07	68°	SSW	21:34:21	65°	SSE
03 Apr	-3.9	20:38:28	10°	W	20:41:46	80°	S	20:44:03	18°	ESE
03 Apr	-1.8	22:15:01	10°	W	22:16:41	23°	WSW	22:16:41	23°	WSW
04 Apr	-3.3	21:22:35	10°	W	21:25:45	47°	SSW	21:26:22	41°	SSE
05 Apr	-3.6	20:30:10	10°	W	20:33:25	63°	SSW	20:36:03	15°	ESE
05 Apr	-1.7	22:06:58	10°	W	22:08:42	19°	SW	22:08:42	19°	SW
06 Apr	-2.5	21:14:20	10°	W	21:17:16	30°	SSW	21:18:24	23°	S
07 Apr	-3	20:21:50	10°	W	20:24:58	42°	SSW	20:28:06	10°	SE
07 Apr	-1.2	21:59:38	10°	WSW	22:00:45	11°	SW	22:00:45	11°	SW
08 Apr	-1.6	21:06:18	10°	W	21:08:37	18°	SW	21:10:30	12°	S
09 Apr	-2.1	20:13:34	10°	W	20:16:22	26°	SSW	20:19:10	10°	SSE

Iridium flares

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

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>

Bentley Star Party, Bentley Village Playing Field

Andy Gibbs

Saturday 24th February 2018

Despite the biting Easterly wind, there was a good turn out of villagers and other visitors to our Star Party. Although hampered by some high clouds from time to time, we were able to observe various objects, including, M42, M31, M45, NGC457 and, of course, the Moon.

There were four telescopes in operation and the event was also supported by, Pete and Nicky Richards, Paul Whiting FRAS, Mike Whybray and Roy Gooding.

Many thanks to those who helped out.

After the event, some members of the OASI team decided to go for a warm-up in the nearby pub. Coincidentally, there was a quiz being held, where the OASI team came within four points of victory!

Sundog over the Russian border at Kirkenes, NE Norway

Mike O'Mahoney

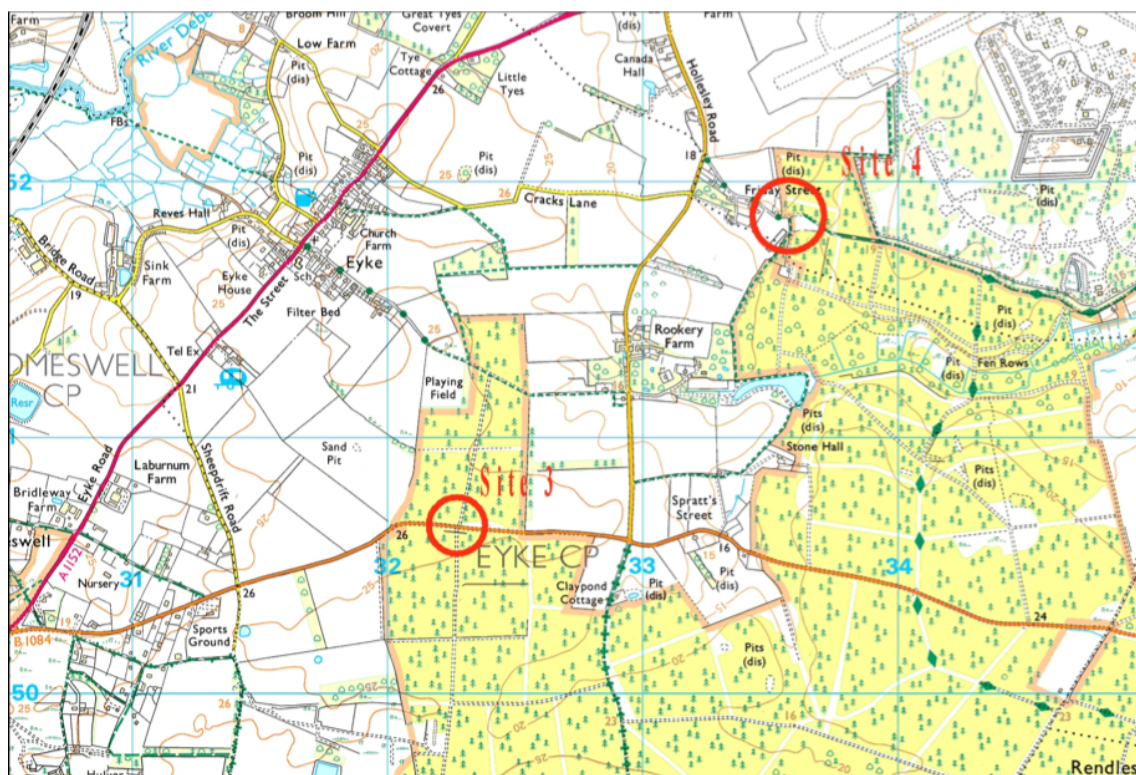


The Graze of μ Ceti

Alan Smith

A grazing lunar occultation of the star μ Ceti was predicted for 17:35 UT on the evening of Wednesday 21 February 2018. The star is of magnitude 4.3 and the occultation was a north limb event, so the astronomical circumstances were not perfect. In addition, the event was to take place just a few minutes after sunset, with the pre-graze setting up in daylight! For the first time in the history of attempting these events, the graze track passed directly over Ipswich, with at least 3 current committee members having their home based observatories well inside the 'zone'. As usual a number of OASI members decided to attempt to observe the phenomenon.

I performed my usual virtual act to identify some additional 'rural' observing sites from the prediction given by 'Occult 4.0' (a freely available occultation prediction program). Using Google Earth and OS maps I examined the track and identified a shortlist of two potential observing sites, choosing them to be off-road, away from sources of light pollution and with an unobstructed southern aspect. 3 other sites chose themselves being located at the homes of the committee members! I performed my usual physical site survey and found them to be perfectly good, although each had its own problems. Sites 1-2-3 were each affected by major roadworks causing gridlock around the area at 'graze time', site 4 was waterlogged, but Site 5 was however just right. See below for a map of the rural sites.



With days to go to the graze, the usual cloudy weather was forecast for the early evening, but with some clear patches.

Our standard practice for occultation observations is to hold a telephone conference on the evening of the event to make a go/no-go decision. At 15.00hrs on Wednesday we held the conference, and the decision to cancel the observation was an easy one, as there was no chance that a clear weather window would arrive in time.

No surprise then, at the appropriate time: complete cloud cover ! And, unusually, complete cloud cover was also present during the 'graze window' and for the rest of the night.

Obviously, just 24 hours later, the skies were completely clear for the whole afternoon/evening!

This graze track and those for the remaining opportunities later this year can be seen on the OASI web site at: http://www.oasi.org.uk/Occs/Occ_summary_2018.php

The BAA's latest newsletter

Finding your way - Part 2 Starting out in Astronomy?

An earlier article discussed the various ways of working out what is in the sky at any particular time. This article will show how to move from a chart in front of you be it paper, planisphere or software to actually finding the constellations in the sky.

Diary Dates

22 April The Deep Sky Section annual meeting for 2018 will be held at Bedford School, Bedford, hosted by Bedford Astronomical Society and Bedford School.

Please note that this meeting is being held on Sunday April 22.

Details <https://britastro.org/node/11440>

Programme:

- 10:00 Doors open - tea & coffee available on arrival
- 10:30 Welcome and review of the Deep Sky year - Callum Potter
- 10:45 Nick Hewitt - Variable Nebulae
- 11:30 Break, tea/coffee
- 11:50 TBA
- 12:45 Lunch
- 13:50 Alan Snook - Visual observing the Arp Catalogue
- 14:45 Paul Downing - Astro imaging
- 15:40 Break, tea/coffee
- 16:10 Dr. Matt Bothwell - University of Cambridge - Monsters in the Dark: hunting for the Universe's most extreme galaxies
- 17:10 Closing remarks

5 May Spring Meeting - Discovery School Blandford Newcastle, NE1 3BT. The theme of this meeting, organised in conjunction with the Newcastle Astronomical Society, is 'Astrophysics and Astronomy today'. The aim of the day is to give a 'snap-shot' of amateur astronomy through to current professional research in astrophysics. Kindly hosted by Newcastle Upon Tyne Astronomical Society, founded in 1904.

26th May Historical Section Meeting 2018 - Smith Gallery and Museum, Stirling. Alice Grace Cook, Calton Hill Observatory, Fear and loathing: the moons of Mars, and more.

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

From the Interweb

Taking Radio Astronomy to the Next Level

<https://cacm.acm.org/news/225906-taking-radio-astronomy-to-the-next-level/fulltext>

These days, fast radio bursts (FRBs) are one of the hottest mysteries in astronomy.

FRBs are intense extragalactical point-sources of radiation at radio wavelengths lasting only milliseconds and of unknown origin; only a few dozen have ever been detected. An FRB might result from a cataclysmic event on a neutron star, or something else entirely, but each FRB's release of energy in milliseconds equals the energy output of the sun over several years. As there is no pattern to where they flare up in the sky, detecting them is a matter of having a wide angle 'lens' on your radio telescope, with a very short shutter time, and luck.

Upgrades to the Westerbork Synthesis Radio Telescope allow it to capture 10,000 images of the sky per second, resulting in a data stream so large it needs to be processed in real time by a supercomputer.

Unprecedentedly Wide and Sharp Dark Matter Map

<https://www.subarutelescope.org/Pressrelease/2018/02/26/index.html>

March 1, 2018

A research team of multiple institutes, including the National Astronomical Observatory of Japan and University of Tokyo, released an unprecedentedly wide and sharp dark matter map based on the newly obtained imaging data by Hyper Suprime-Cam on the Subaru Telescope. The dark matter distribution is estimated by the weak gravitational lensing technique (Figure 1). The team located the positions and lensing signals of the dark matter halos and found indications that the number of halos could be inconsistent with what the simplest cosmological model suggests. This could be a new clue to understanding why the expansion of the Universe is accelerating.

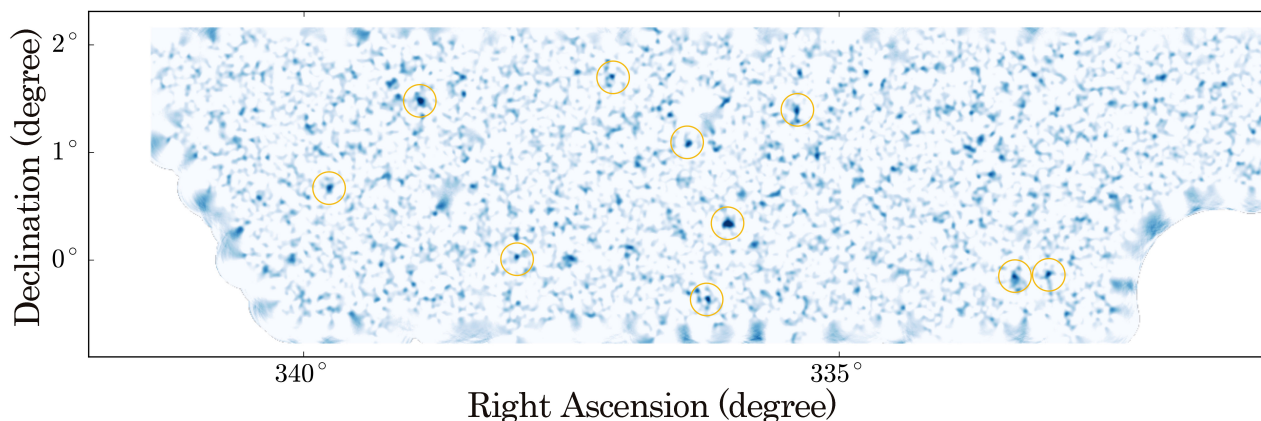


Figure 1: 2 dimensional dark matter map estimated by weak lensing technique.

The dark matter is concentrated in dense clumps. We can identify massive dark matter halos (indicated by orange circles). The area shown in this figure is approximately 30 square degrees (a total of 160 square degrees were observed this time). The distribution map without the orange circles is available [here](#). (Credit: NAOJ/University of Tokyo)

Schrödinger Evolution of Self-Gravitating Disks

Konstantin Batygin

Division of Geological and Planetary Sciences, California Institute of Technology.

MNRAS 000, 1–14 (2018) Preprint 6 March 2018

ABSTRACT

An understanding of the long-term evolution of self-gravitating disks ranks among the classic outstanding problems of astrophysics. In this work, we show that the secular inclination dynamics of a geometrically thin quasi-Keplerian disk, with a surface density profile that scales as the inverse square-root of the orbital radius, are described by the time-dependent Schrödinger equation. Within the context of this formalism, nodal bending waves correspond to the eigen-modes of a quasiparticle's wavefunction, confined in an infinite square well with boundaries given by the radial extent of the disk. We further show that external secular perturbations upon self-gravitating disks exhibit a mathematical similarity to quantum scattering theory. Employing this framework, we derive an analytic criterion for the gravitational rigidity of a nearly-Keplerian disk under external perturbations. Applications of the theory to circumstellar disks and Galactic nuclei are discussed.

Source: <https://arxiv.org/pdf/1803.01258.pdf>

See also https://www.space.com/39881-massive-space-structures-quantum-mechanics-math.html?utm_source=twitter&utm_medium=social for a lighter explanation.

More from the Library: WFIRST and why it will not launch on time!!!!

Andy Willshire.

The Wide Field Infrared Survey Telescope (WFIRST) is an infra red space observatory that was recommended in 2010 by the United States National Research Council Decadel Survey committee. It was considered a high priority for the next ten years of astronomy. It was designed by NASA to examine questions about dark energy, infrared astrophysics and exoplanets. Perhaps it will show that dark energy is a cosmological constant? It will have a field of view as much as 100 times superior to that of the Hubble infrared device, allowing it to seize far more of the sky, taking much less time. The mission is scheduled for 6 years, and is hoped to launch from Cape Canaveral, and is designed to take over from the James Webb telescope as the follow up astronomical mission.

WFIRST uses a 2.4m astrophysics-focused telescope assets (AFTA) telescope which has been contributed by another group.(National Reconnaissance Office). The mission is destined to accomplish a sophisticated science program. A Wide Field Instrument (WFI) functions in the 0.5 to 2.0 microns range, having 7 imaging filters, a grism¹ used to measure red shift and an integral field channel specifically designed for observing a spectrum of radiation or light from supernovae. A coronagraphic instrument which operates in the 0.4 to 1.0 micron area, has both an imaging detector and unit to measure exoplanet spectroscopy. The coronagraph was added as a "New Worlds Technology Development programme" which makes it a high priority investigation into dark energy and exoplanets. Using WFIRST, a high latitude survey will be initiated to take about 2 years, and cover over 2,200 square degrees. A three tiered (shallow, medium, deep) WFIRST supernova survey will attempt to find supernovae at the following red shifts : <0.4, <0.8, <1.7. These filters cover 27, 9, and 5 square degrees apiece. (square degree = $\pi/180^2$). It will also perform a Milky Way Bulge microlensing survey taking approximately 1 year, creating an index of distances to thousands of Type 1a supernovae up to $z=2$ red shift. This will allow scientists to view how matter is structured all around the universe. It will also check 100 million stars using its microlensing survey to look for planets with an expectation rate of about 2,500.

The whole idea of the operation with its wide field of view, is to produce a large picture of the universe in greater detail than anything as yet seen, and may help in our understanding of the accelerating expansion of the universe, and to discover if Einstein's theory of relativity is beginning to breakdown.

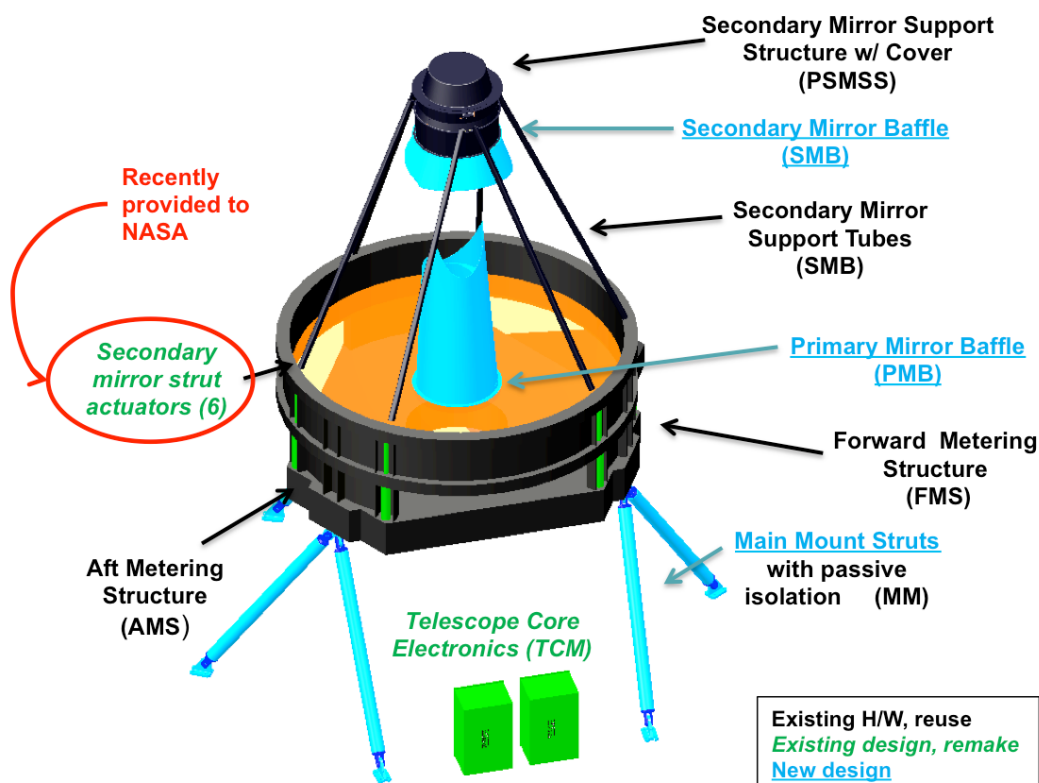
All results obtained would make WFIRST an model partner to such missions as Keplar and Transiting Exoplanet Survey Satellite (TESS). All data obtained would be publicly available allowing scientists around the world to study any facet of WFIRST as they wish. It would also be used as an adjunct to the James Webb telescope.

In 2014 and 2015, \$50 million and \$56 million was donated by Congress. In 2016, \$90 million was put into the spending bill. This allowed the mission to move forward to the 'formulation phase' in February 2016. On 18th February WFIRST was given full project status. WFIRST was then scheduled for a 2020 launch date. The total costs for the project was calculated in 2010 as \$2.7 billion, but this escalated to \$3.6 billion. In April 2017 an independent review was carried out to emphasise that costs and mission were fully understood. The review directed that the cost estimate was reduced to \$3.2 billion, which NASA took on board and announced reductions.

However the budget proposals for the 2019 fiscal year, released by Donald Trump's administration do not now include WFIRST citing "higher priorities" at NASA and its costs. It states that coming just after the James Webb telescope it is not a priority, even though the James Webb is looking into rare and interesting objects, and not the specificity of WFIRST. The James Webb Space telescope was devised to make observation of distant galaxies whose light has been stretched into the infrared obtainable. Its mission goals are to search for the first galaxies or

¹ <https://en.wikipedia.org/wiki/Grism>

luminous objects just after the big bang, and to determine how galaxies evolved from formation to today, and to measure physical and chemical resources of planetary structures.



Credit for picture : <https://wfirst.gsfc.nasa.gov/gallery-illustrations.html>

Alan Boss, an astronomer at the Carnegie Institute, and one of the people who helped start WFIRST off, states " There has been a long tradition of support by Congress, the administration and others to respect the priorities of past decadal surveys. It would set a devastating precedent for future decadal surveys if the FY 2019 proposal is to stand". More than a year after President Trump took office, NASA remains without an official Senate approved administrator. The National Space Council with the Vice President in control is more interested in near-Earth and lunar missions only. This curtailment of WFIRST is a great pity as we need missions like this to stretch our capabilities and eventually get us out of this galaxy, and as 'Star Trek' maintains , "To Boldly Go!!!!".

References:

<https://wfirst.gsfc.nasa.gov/>

<http://www.stsci.edu/wfirst>

<https://www.whitehouse.gov/wp-content/uploads/2018/02/msar-fy2019.pdf>

M82 – The Cigar Galaxy

Andy Gibbs



Image taken on 15-02-18. Atik Titan camera and Explore Scientific ED80 CF Refractor. 13x 90 second exposures, plus darks. Processed with Atik Dawn software and Photoshop 2018 CC. I have to deal with a lot of light pollution in the Northerly direction from my garden, (this galaxy is in Ursa Major).

A little bit of Orwell Park history

Marshalling Area camp R5, Orwell Park, Nacton

Location Type: Troop Camp

This was one of several camps in Marshalling Area R, in Suffolk. Troops in this camp were part of follow up force 'L' which landed on the British beaches in Normandy in the days after D-Day. Among the units camped in this region before D-Day were the British 7th Armoured Division, the 'Desert Rats', who landed on Gold Beach on 7 June, and the British 49th (West Riding) Infantry Division who began landing in Normandy on 10 June. Units in Marshalling Area R embarked through ports on the east coast, such as Felixstowe and Lowestoft.

Source: www.ddaymuseum.co.uk/d-dayonyourdoorstep/details/marshalling-area-camp-r5-orwell-park-nacton



Chairman's Challenge

Paul Whiting FRAS

How about getting out of that armchair and doing some real astronomy?

Here are some observational tasks that are part of the Astronomy GCSE syllabus. Why not pick one or two and have a go over the next few months? Get the family involved. We will then have a feedback session at Newbourne when you can present your findings, possibly at the annual barbecue.

Some of the tasks may take a bit of research and thought, but they are fairly straight forward. If you get stuck there are enough people around to ask. Sadly I'm not in a position to award a GCSE, but hopefully we should all have some fun and maybe even learn something!

Here are the tasks:

1 easy: Estimating levels of light pollution

Use estimates of the magnitude of the faintest stars visible with the naked eye to conduct a survey of the astronomical effects of light pollution in an area.

1 advanced: Measuring levels of light pollution

Use estimates of the magnitude of the faintest stars visible on photographs to conduct a more detailed survey of the astronomical effects of light pollution in an area.

2 easy: Estimate the solar rotation period using drawings of sunspots

Use a series of drawings from pin hole projections to estimate the length of the Sun's average rotation period.

2 advanced: Determine the solar rotation period using photographs of sunspots

Use a series of photographs or drawings from telescopic projections of sunspots to estimate the length of the Sun's average rotation period.

3: Finding longitude using a shadow stick

Use measurements of shadow length around local noon to estimate the observer's longitude.

4: Demonstrate the range of objects in the Messier Catalogue

Use detailed drawings or photographs of objects from the Messier Catalogue to demonstrate the range of different objects it contains.

5: Calculation of the length of the sidereal day

Use long-exposure photographs of the area around the celestial pole to produce an accurate measurement of the length of the Earth's sidereal period.

Of course you could come up with your own ideas. Only one rule – enjoy yourselves!

Paul

2 supernovae in rather obscure galaxies, NEO and Midas

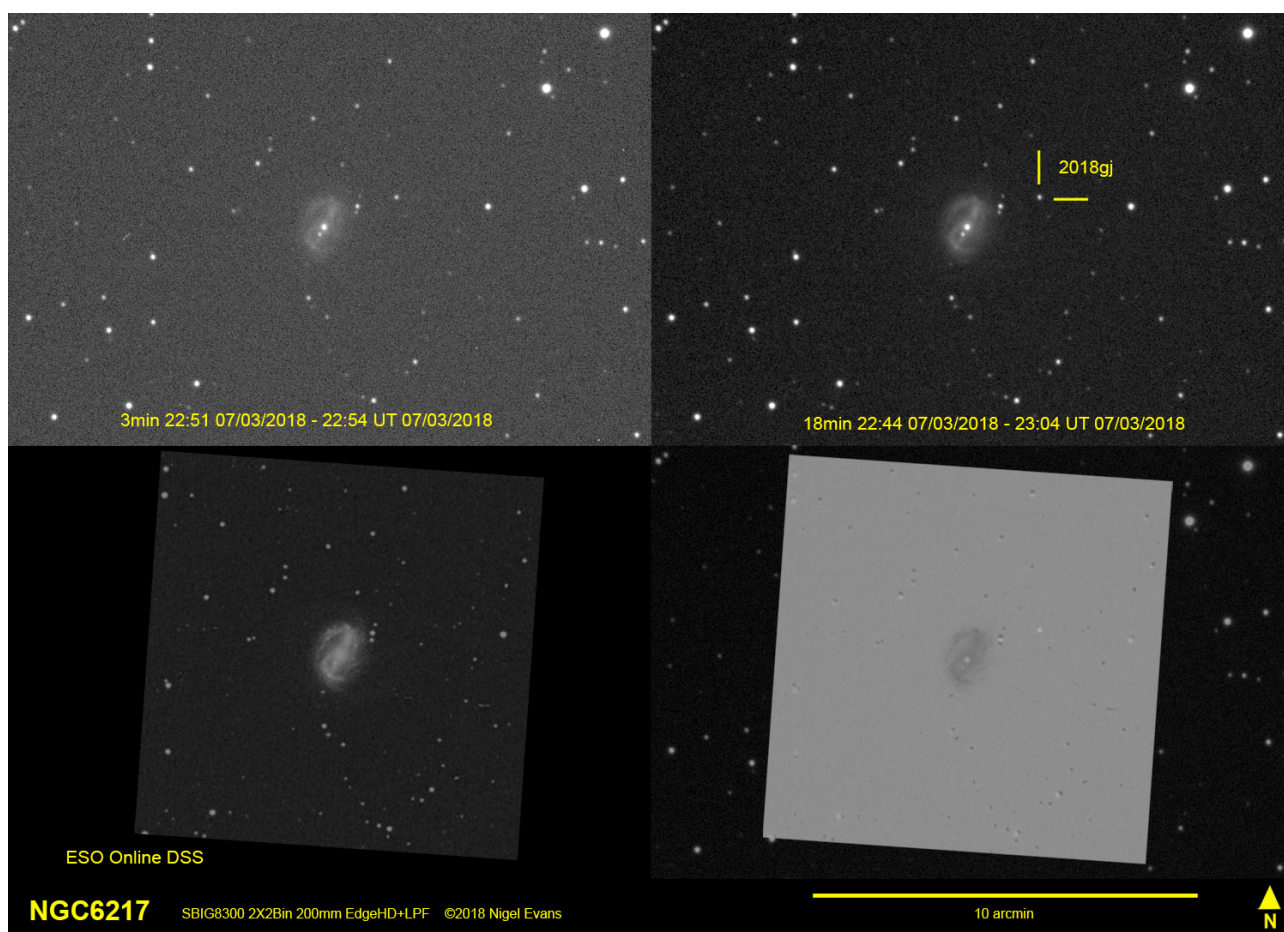
Nigel Evans



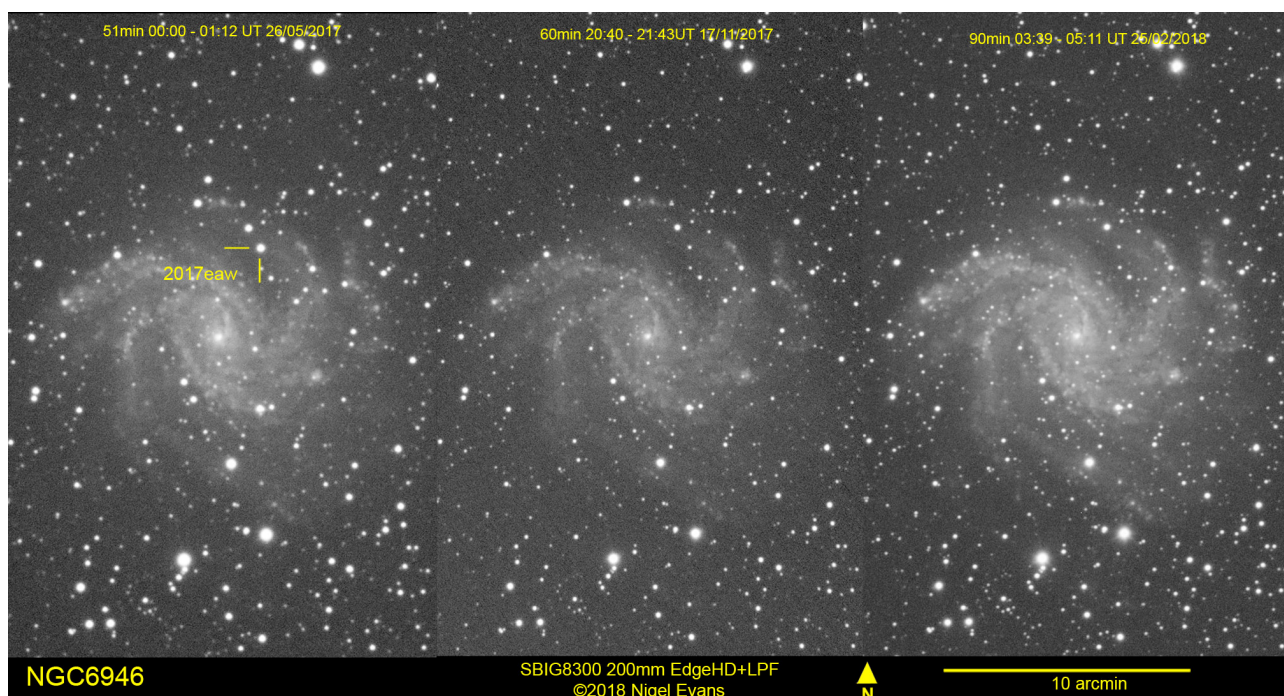
NGC2359 in Canis Major, commonly known as Thor's Helmet (rotate CC 90° to see it more clearly)



NGC 1888

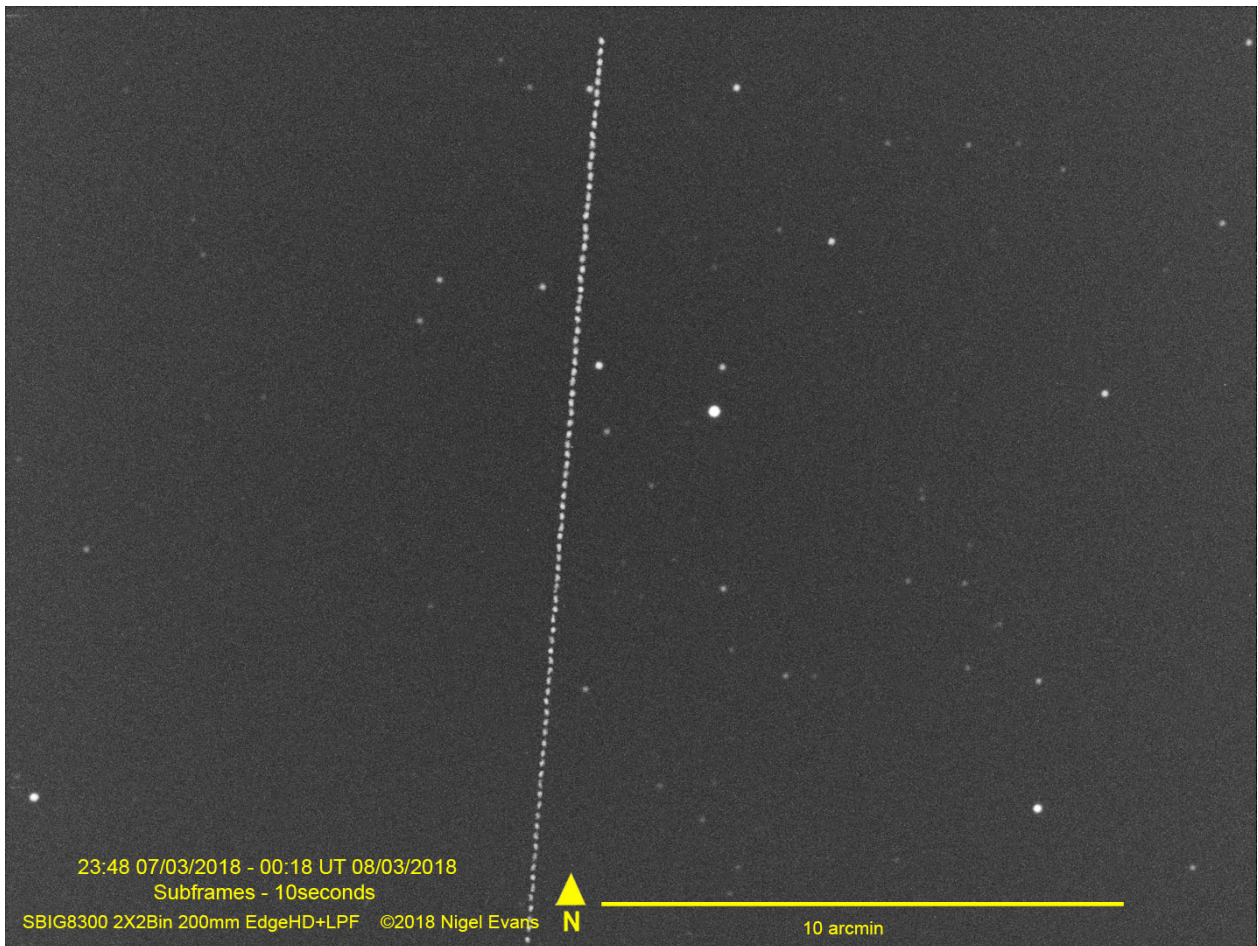


NGC 6217



NGC6946

SN 2017eaw came to prominence in May 2017. While it has faded significantly it is still within range of modest scopes. NGC6946 is also known as the 'Fireworks Galaxy' as 10 supernovae have been discovered there

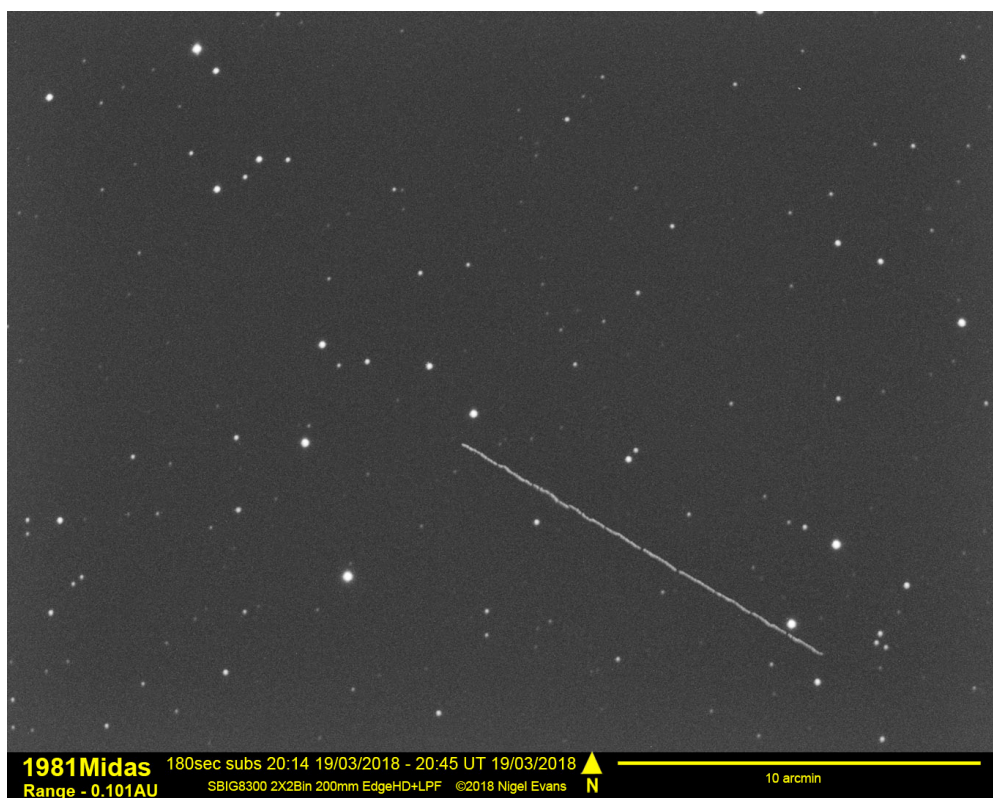


2017VR12 - a near earth asteroid that passed within 0.01 AU of Earth.

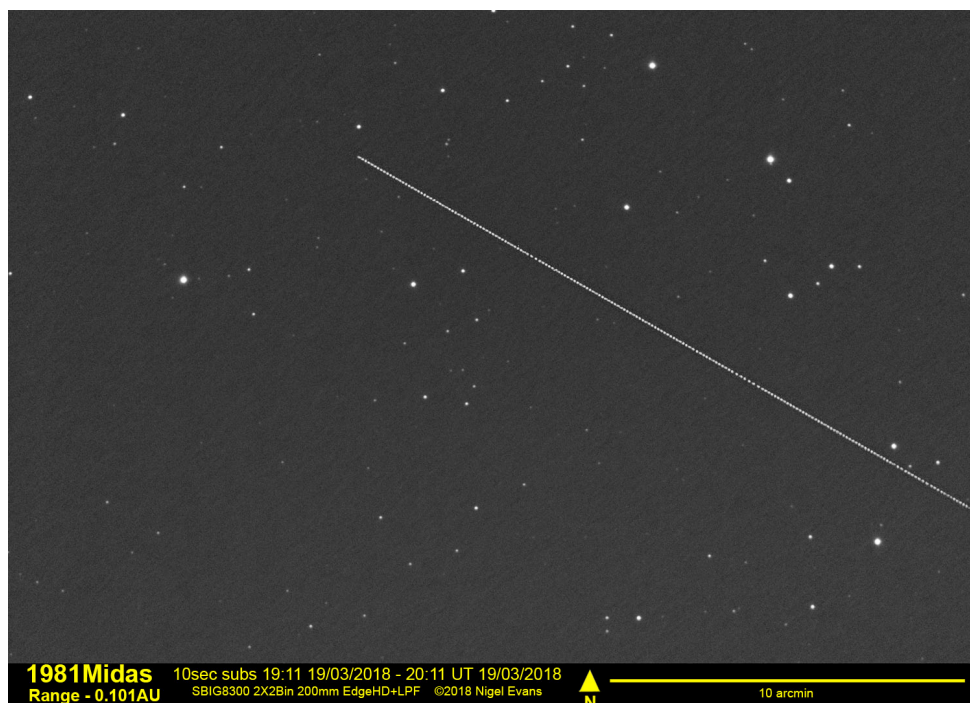


Image taken from Nigel's video of the event. [Ed.]

Well the weather closed about 20:45 [19 March] but that was sufficient time to look at 1981Midas, about 12th mag and a range of 0.1AU and moving at about 20arcsec a minute at an altitude of around 80 (!) degrees.



First frame is a composite of many (~200) 10second sub-frames - the stars are quite faint in any one frame. The motion looks slightly uneven, as if the exposures were not all evenly spaced



The second is a composite of 10 180 second sub-frames - the stars are stronger but the auto-guider was following quite a faint star with a long (3 second) integration time and so gives a crinkly appearance to the motion of Midas

Midas will still be visible this week, with closest approach will be on the evening of the 21st.

<https://ssd.jpl.nasa.gov/horizons.cgi>

Old postcards of Orwell Park

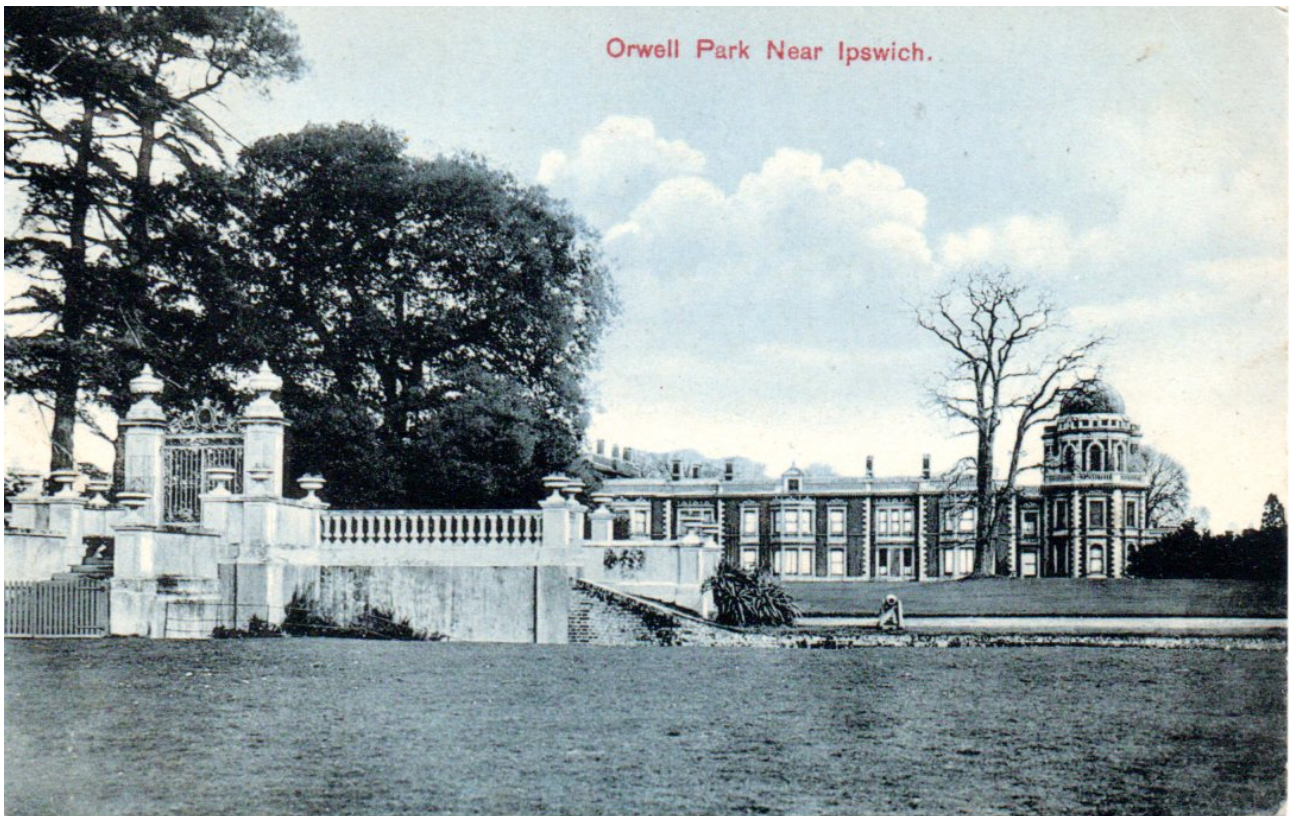
Martin Cook has been ferreting about on eBay and found these postcards.



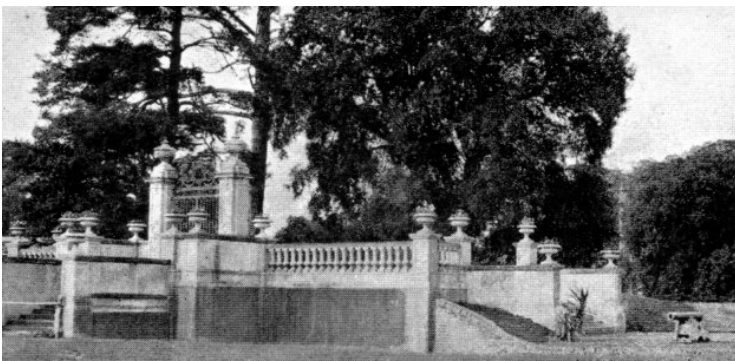
The King's (Edward VII) visit to Orwell Park October 9 1908



Orwell Park entrance



View from the river side



View from the field.



Postmarked 23 August 1909



An earlier view postmarked 13 June 1907

Professor Stephen William Hawking 1942 – 2018

Source: https://en.wikipedia.org/wiki/Stephen_Hawking



Hawking at NASA's StarChild Learning Center, 1980s

Stephen William Hawking CH CBE FRS FRSA (8 January 1942 – 14 March 2018) was an English theoretical physicist, cosmologist, author and Director of Research at the Centre for Theoretical Cosmology within the University of Cambridge.

His scientific works included a collaboration with Roger Penrose on gravitational singularity theorems in the framework of general relativity and the theoretical prediction that black holes emit radiation, often called Hawking radiation. Hawking was the first to set out a theory of cosmology explained by a union of the general theory of relativity and quantum mechanics. He was a vigorous supporter of the many-worlds interpretation of quantum mechanics.

Hawking was an Honorary Fellow of the Royal Society of Arts (FRSA), a lifetime member of the Pontifical Academy of Sciences, and a recipient of the Presidential Medal of Freedom, the highest civilian award in the United States. In 2002, Hawking was ranked number 25 in the BBC's poll of the 100 Greatest Britons. He was the Lucasian Professor of Mathematics at the University of Cambridge between 1979 and 2009 and achieved commercial success with works of popular science in which he discusses his own theories and cosmology in general. His book, *A Brief History of Time*, appeared on the British Sunday Times best-seller list for a record-breaking 237 weeks.

Hawking had a rare early-onset slow-progressing form of motor neurone disease (also known as amyotrophic lateral sclerosis or "ALS" and Lou Gehrig's disease), that gradually paralysed him over the decades. Even after the loss of his speech, he was still able to communicate through a speech-generating device, initially through use of a hand-held switch, and eventually by using a single cheek muscle. He died on 14 March 2018 at the age of 76.