



OASI News

The newsletter of the Orwell Astronomical Society



OASI at the Framlingham Show on Saturday 7 April

Photo: Pete Richards

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

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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.

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, 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
	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 22 June 20:00 at Museum St Methodist Church rooms, Black Horse Lane.

Welcome to new members

Zoe & Mason Hearne

Andrei Trimbitas

Eric Tsang

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 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
Saturday 5 May	Discovery School Blandford Street, Newcastle upon Tyne	http://britastro.org/node/11254	BAA 1-day Spring Meeting
* Monday, 7 May 19:00	Newbourne Village Hall	Newbourne@oasi.org.uk	OASI @ Newbourne observing+Skynotes+ Book Swap
* Monday, 21 May 19:00 Workshop at 19:45	Newbourne Village Hall	Newbourne@oasi.org.uk	OASI @ Newbourne + Workshop at 19:45. Olaf Kirchner: Atmospheric Effects are Looking Up
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	MartinRH	Public event: OASI @ Kirton Village Fete.
Sunday 10 June from 10:00 Set-up 09:00	Kirton Recreation Ground	chairman@oasi.org.uk	Public event: OASI @ East Suffolk Wireless Revival
Monday, 11 June 19:00	Newbourne Village Hall	Newbourne@oasi.org.uk	OASI @ Newbourne observing+Skynotes+ Book Swap
Thursday 14 June	Orwell Park Observatory	chairman@oasi.org.uk	Observatory Visit for OASI @ Newbourne
Saturday & Sunday 16 & 17 June	Sutton Hoo	Roy Gooding	Public event: Solar observing @ Sutton Hoo
Friday 22 June 20:00	Museum St Methodist Church room	Roy Gooding	Committee Meeting

Date and Time	Location	Contact	Event
Monday 25 June from 19:00	Newbourne Village Hall	Newbourne@oasi.org.uk	OASI @ Newbourne observing
Monday 2 July 01:40	http://www.oasi.org.uk/Occs/Occ_summary_2018.php#Grazes	James Appleton info@oasi.org.uk\	Field trip to observe the graze of γ Cap.
Wednesday 4 July 02:50			Field trip to observe the graze of ψ 1 Aqr.
Weekend 7 & 8 July	University of Warwick	https://britastro.org/summer2018	BAA Summer Meeting and BAA-AAVSO Joint Variable Star Meeting
Monday 9 July from 19:00	Newbourne Village Hall	Newbourne@oasi.org.uk	OASI @ Newbourne
Saturday 14 July 14:00 to late	Newbourne Village Hall	Pete Richards lectures@oasi.org.uk	OASI BBQ: Open to members and their guests
Tuesday 17 July	Sutton Hoo	Roy Gooding	Public event: Evening observing
Monday 23 July From 19:00 Workshop 19:45	Newbourne Village Hall	Newbourne@oasi.org.uk	OASI @ Newbourne Astronomy Workshop presented by Andy Gibbs: Basic Astrophotography. + Book swap.

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

Outreach meetings

Kirton Fete: Saturday 02 June

Venue: Kirton Recreation Ground.

OASI is putting on a stand demonstrating safe solar observing and the work of our Society. Please bring a telescope or just yourself to help.

East Suffolk Wireless Revival

Venue: Kirton Recreation Ground.

OASI is putting on a stand demonstrating safe solar observing and the work of our Society. Please bring a telescope or just yourself to help.

Sutton Hoo Solar Event June 16th & 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 02 September (TBC).

Broomhill Library, 28 September. Paul Whiting is not available to attend, so asked for other members of OASI to attend and give a presentation aimed at children.

Norwich Science Festival Astronomy Day, 22 October.

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.



OASI Guest Speaker Lectures for 2018

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 Augustines Church Hall in Bucklesham Road Ipswich. For those of you using sat nav or online route planning the post code of the venue is IP3 8TH. The start time for all talks will be 8pm and, as usual, the talks will be held on Friday evenings.

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.

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 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.

There are also **Stargazers' Guide, 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

7 May (S+B)	21 May (W+B)	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 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

21st May 2018: Atmospheric Effects are Looking Up

Presented by Olaf Kirchner

Halo, rainbows, glories, sundogs, sun pillars or circumzenithal arcs - all these beautiful optical effects caused by liquid water or ice in the atmosphere can be seen in daytime as we habitually look up at the sky. This presentation is about what the more common atmospheric effects are, where and when they can be seen, and what they tell us about the weather. A brief look at the basic physics and optics behind these displays illustrates why they are so varied and interesting.

23 July Andy Gibbs on Basic Astrophotography.

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

Special visit to the OPS Observatory for OASI@Newbourne

Thursday 14th June from 8:15pm

New members' night "up the dome", primarily as an introduction for the folk we only ever see at Newbourne. If you've not visited the Observatory for a while (or not at all), this is your opportunity for a guided tour.

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). **The next event will be held on 7 May**

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>

- | | |
|---------|---|
| 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 |

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

- | | |
|---------|--|
| 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 |
| 12 June | Talk by Steve Hubbard & Malcom E Brown, "Thinking about Astronomy – a century of change and continuity" |
| 26 June | LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7.30pm |
| 10 July | Inaugural talk by President Matthew Bothwell, From Big Bang to the Big Rips! A History of Modern Cosmology |
| 24 July | LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7.30pm |

DASH Astro

Darsham And Surrounding Hamlets

<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.

- | | |
|----------|---|
| 29 April | Meeting – Nick James: Comets. |
| 13 May | Dash Observing Session (Sunset 20:39 Moonset 17:57 6% Moon) Late one? |
| 27 May | Meeting – Solar Astronomy. Solar Team. |
| 24 June | International SUNday - Location Dunwich Heath |
| 15 July | Solar Observing - Location TBA (Sunset 21:09 Moonset 22:48 9% Moon) |





DASH Astro

**INVITE YOU TO JOIN THEM FOR A TALK BY
Nick James – Space Engineer.**

From: Chelmsford Essex.

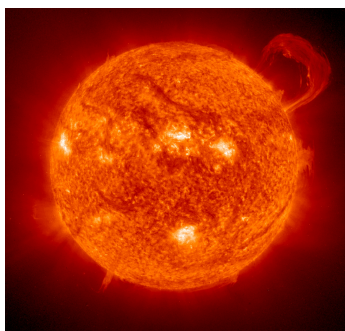
Title: Comets.

Sunday 29th April 2018

7:30 pm

Village Hall, Westleton, Suffolk IP17 3AH

This talk should be accessible to all levels of astronomical ability.



Free Admission



All DASH Astro Enquiries to:

Email: dashastro.info@gmail.com

Why not visit our website at: www.dash-astro.co.uk

OASI at Framlingham Festival on 7 April

Due to heavy rainfall, this event was moved to Trinity Park.

Six members of OASI attended the Framlingham Country Show on 07 April and, between clouds, were occasionally able to observe a completely featureless Sun! The forecast for 08 April was not good so OASI did not attend for the second day of the event.



GDPR (General Data Protection Regulation)

Your attention is drawn to this extract from the OASI Privacy Notice

http://www.oasi.org.uk/OASI/Privacy_Notice.php

GDPR comes into force on 25 May 2018.

Under GDPR, OASI's legal basis for processing personal data will be *legitimate interest*, in that the processing is necessary for administration of membership of the Society.

Purpose of Data Processing

The Committee uses membership details for the purpose of administering membership of the Society.

When a member leaves OASI, the Committee archives and retains his/her membership details. No further processing of the former member's details takes place.

Registration with the Information Commissioner's Office (ICO)

OASI is not registered with the ICO under the Data Protection Act 1998, being covered by the exemption for small, non-profit organisations.

OASI will not register with the ICO under GDPR as it will be covered by the exemption for organisations which only process personal data for recreational purposes.

The Night Sky in May

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	1st Quarter	Full Moon	Last Quarter
15 May 12:48	22 May 04:49	30 April 01:58 29 May 2018 15:20	08 May 03:09

Sun, Moon and planets

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	05:26	20:20		
	31	04:42	21:04		
Moon	1	21:51	06:37		Apogee: 404,457 km on 06 May 2018 01:36 Perigee: 363,776 km on 17 May 2018 22:06
	31	22:40	06:19		
Mercury	1	05:00	17:29	0.5	Maximum western elongation 29 April
	31	04:28	20:20	-1.5	
Venus	1	06:34	22:51	-3.8	Perihelion 2018-May-15
	31	06:57	23:44	-3.9	
Mars	1	02:10	09:50	-0.4	
	31	00:56	08:49	-1.2	
Jupiter	1	20:52	05:59	-2.4	Opposition 2018-May-09
	31	18:33	03:52	-2.3	
Saturn	1	01:04	08:50	0.4	
	31	22:57	06:46	0.2	
Uranus	1	05:12	19:01	5.9	
	31	03:17	17:12	5.9	
Neptune	1	04:01	14:52	7.9	
	31	02:04	12:57	7.9	

Paul's Astronomy Podcast for May

Paul Whiting FRAS Podcast, April2018 www.oasi.org.uk/2018_05_pod.mp3

Occultations during May 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
08 May 2018	02:26:17	D	0.50-	-13	5	4.3	32 Cap, 1 Cap
	02:56:17	R		-10	9		
09 May 2018	03:09:45	D	0.40-	-8	7	6.0	39 Aqr
	03:31:35	R		-6	10		
18 May 2018	20:53:50	D	0.15+	-9	17	7.4	Hip 33477
19 May 2018	21:11:15	D	0.25+	-10	23	7.1	ZC 1202
19 May 2018	22:53:13	D	0.25+	-17	8	6.2	ZC 1217
29 May 2018	01:35:49	D	1.00+	-13	16	5.5	49 Lib

Meteor showers

Source: BAA Handbook 2018 p97-99

Shower	Maximum	Normal limits	ZHR at Max	Notes
η -Aquarids	May 5-6	Apr 24 – May 20	40	Fine southern shower, poorly seen from the UK. Broad maximum and multiple radiant.
α -Scorpiids	April 28 – May 12	Apr 20 – May 19	5	Part of the Scorpio-Sagittarius complex. Several weak radiants April – July
Ophiuchids	Jun 10 – Jun 20	May 19 – July	5	Weak activity from several radiants. Best for southern skies.

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 (25 April) due to craft adjustments. Check the day before.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
07 May	-2	03:53:55	13°	S	03:55:57	21°	SE	03:58:28	10°	E
09 May	-2.9	03:45:25	18°	SSW	03:47:21	34°	SSE	03:50:22	10°	E
10 May	-2.4	02:54:46	23°	SSE	02:55:05	23°	SSE	02:57:45	10°	E
11 May	-3.6	03:36:41	19°	SW	03:38:47	53°	SSE	03:42:00	10°	E
12 May	-3.2	02:45:56	36°	S	02:46:25	38°	SSE	02:49:30	10°	E
12 May	-3.8	04:19:27	10°	W	04:22:44	83°	S	04:26:00	10°	E
13 May	-2.1	01:55:09	22°	ESE	01:55:09	22°	ESE	01:56:54	10°	E
13 May	-3.9	03:27:46	16°	WSW	03:30:16	73°	SSE	03:33:31	10°	E
14 May	-3.8	02:36:56	40°	SW	02:37:48	58°	SSE	02:41:02	10°	E
14 May	-3.8	04:10:56	10°	W	04:14:13	86°	S	04:17:30	10°	E
15 May	-3	01:46:03	37°	ESE	01:46:03	37°	ESE	01:48:30	10°	E
15 May	-3.9	03:18:40	12°	W	03:21:43	85°	S	03:25:00	10°	E
16 May	-1.5	00:55:08	15°	E	00:55:08	15°	E	00:55:55	10°	E
16 May	-4	02:27:44	30°	WSW	02:29:12	77°	S	02:32:29	10°	E
16 May	-3.9	04:02:22	10°	W	04:05:39	75°	S	04:08:55	10°	ESE
17 May	-3.9	01:36:44	63°	SSE	01:36:44	63°	SSE	01:39:57	10°	E
17 May	-3.9	03:09:51	10°	W	03:13:08	84°	S	03:16:24	10°	E
18 May	-2.4	00:45:39	27°	E	00:45:39	27°	E	00:47:25	10°	E
18 May	-3.9	02:18:14	18°	W	02:20:36	86°	S	02:23:52	10°	E
18 May	-3.7	03:53:46	10°	W	03:56:59	55°	SSW	04:00:12	10°	ESE
19 May	-4	01:26:57	39°	WSW	01:28:03	81°	S	01:31:19	10°	E
19 May	-3.9	03:01:13	10°	W	03:04:29	71°	SSW	03:07:44	10°	ESE
20 May	-4	00:35:11	62°	SSW	00:35:30	68°	SSE	00:38:45	10°	E
20 May	-4	02:08:39	10°	W	02:11:56	82°	S	02:15:12	10°	E
20 May	-3.2	03:45:10	10°	W	03:48:12	36°	SSW	03:51:14	10°	SE
20 May	-2.2	22:04:58	10°	S	22:07:01	16°	SE	22:09:04	10°	ESE
20 May	-3.8	23:39:46	10°	WSW	23:42:58	53°	SSE	23:46:11	10°	E
21 May	-4	01:16:04	10°	W	01:19:21	86°	S	01:22:38	10°	E
21 May	-3.7	02:52:32	10°	W	02:55:43	50°	SSW	02:58:54	10°	SE
21 May	-3.4	22:47:24	10°	SW	22:50:28	38°	SSE	22:53:32	10°	E
22 May	-4	00:23:29	10°	W	00:26:46	83°	S	00:30:03	10°	E

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
22 May	-4	01:59:56	10°	W	02:03:11	66°	SSW	02:06:27	10°	ESE
22 May	-2.6	03:36:41	10°	W	03:39:17	22°	SSW	03:41:52	10°	SSE
22 May	-2.8	21:55:13	10°	SSW	21:58:01	26°	SSE	22:00:49	10°	E
22 May	-4	23:30:54	10°	WSW	23:34:11	73°	SSE	23:37:27	10°	E
23 May	-4	01:07:20	10°	W	01:10:36	79°	S	01:13:52	10°	ESE
23 May	-3.1	02:43:52	10°	W	02:46:51	32°	SSW	02:49:48	10°	SE
23 May	-3.8	22:38:22	10°	WSW	22:41:35	58°	SSE	22:44:49	10°	E
24 May	-4	00:14:42	10°	W	00:18:00	86°	S	00:21:16	10°	E
24 May	-3.6	01:51:11	10°	W	01:54:20	45°	SSW	01:54:54	40°	S
24 May	-3.4	21:45:56	10°	SW	21:49:02	42°	SSE	21:52:10	10°	E
24 May	-3.9	23:22:05	10°	W	23:25:22	85°	S	23:28:40	10°	E
25 May	-4	00:58:32	10°	W	01:01:47	61°	SSW	01:02:29	46°	SE
25 May	-3.9	22:29:28	10°	WSW	22:32:44	77°	S	22:36:00	10°	E
26 May	-4	00:05:54	10°	W	00:09:10	76°	S	00:11:01	24°	ESE
26 May	-2	01:42:29	10°	W	01:43:36	17°	WSW	01:43:36	17°	WSW
26 May	-3.8	21:36:52	10°	WSW	21:40:07	63°	SSE	21:43:22	10°	E
26 May	-3.9	23:13:14	10°	W	23:16:32	85°	S	23:19:46	10°	E
27 May	-3.2	00:49:43	10°	W	00:52:21	38°	SW	00:52:21	38°	SW
27 May	-3.9	22:20:34	10°	W	22:23:51	86°	S	22:27:09	10°	E
27 May	-3.8	23:57:01	10°	W	00:00:16	56°	SSW	00:01:13	38°	SE
28 May	-3.9	23:04:21	10°	W	23:07:37	72°	SSW	23:10:07	16°	ESE
29 May	-2.2	00:41:00	10°	W	00:42:43	21°	WSW	00:42:43	21°	WSW
29 May	-3.9	22:11:39	10°	W	22:14:56	83°	S	22:18:13	10°	E
29 May	-3.2	23:48:09	10°	W	23:51:13	37°	SSW	23:51:40	34°	S
30 May	-3.6	22:55:25	10°	W	22:58:37	51°	SSW	23:00:38	20°	SE
31 May	-3.8	22:02:41	10°	W	22:05:57	67°	SSW	22:09:11	10°	ESE
31 May	-2.4	23:39:23	10°	W	23:42:02	23°	SSW	23:42:13	22°	SSW

Iridium flares

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

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

30 March: JBAA April 2018 is on line now.

BAA Jupiter Section Director John Rogers is on the imaging processing team which recently published in Nature stunning images of Jupiter's polar polygons. The new Journal opens with his report, describing how Jupiter's polar cyclones are grouped into these persistent patterns; taken by the Juno spacecraft. Truly stunning.

This month there are three refereed papers. Paul Luckas describes how to use commercially available spectrographs to identify and measure basic characteristics of planetary nebulae. He used his 0.35m Ritchey-Chrétien design telescope, in urban light polluted skies in Perth Western Australia.

Nigel Longshaw entertains us with an account of the story of the 'Lost City in the Moon' according to Franz von Paula Gruithuisen. Gruithuisen was a prolific author and also produced many drawings of the lunar surface which are beautifully reproduced in Nigel's paper. Finally, Richard McKim's report on the 2004-05 apparition of Saturn is presented reporting for the Saturn, Uranus and Neptune Section.

Those of you who were unable to attend the October 2017 meeting will be able to catch up on the fully illustrated address by the then President, Jeremy Shears, on cataclysmic variable star astronomy.

Paul Abel calls for our observations of Venus in his role as Venus Co-ordinator (page 70), as well as submitting an excellent introduction to the Pole Star in his Absolute Beginners series. And keeping with Venus, John Chuter charms us with two beautiful slides from the BAA lantern collection of E.L.Trouvelot's astronomical drawings of his observations of Venus, first published in the April 1893 edition of the Journal.

In a warm obituary to the late Richard Baum appears his impression of Comet West (1975a) which he painted at dawn in March 1976. He had considered a career as an artist, and one can clearly understand why. He described this as capturing, "a fragment of time when all the world was sunny".

3 April: Saturn

An observation made by Brazilian observer Maciel Bassani Sparrenberger shows a bright and distinct spot at 67 degrees north on Saturn. This observation was made on 2018 March 29 at 08:16 UT.

Later that day (from 18:20 to 1957 UT), this spot was imaged by Trevor Barry in Australia.

To date, it has also been recorded by Damian Peach, Manos Kardasis and Anthony Wesley.

Further observations of this object are urgently required to see how this storm evolves.

Observations can be sent to the Saturn, Uranus and Neptune section via saturn@britastro.org

Mike Foulkes Saturn, Uranus and Neptune Section Director

16 April: Equipment and Techniques Section

Today I am pleased to announce the establishment of the Equipment and Techniques Section. This section aims to provide advice to members on matters to do with astronomical "kit". And an equally important aspect of the Section is to facilitate the exchange and dissemination of information among members about equipment, equipment construction & modification and observing techniques at all levels.

To achieve the aims and objectives we are looking to recruit a volunteer Section Director. If you feel this might be an interesting way to contribute to the work of the Association, [please look at the full article on the BAA website](#) and feel free to contact me for an informal discussion.

Formal expressions of interest, outlining why you would like to take on the role, should be sent to me

Callum Potter, President, British Astronomical Association

president@britastro.org

BAA Diary Dates

5 May 2018 - [Spring Meeting](#) - Discovery School, Blandford Street, 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.

(some places still available, but hurry)

26th May 2018 - [Historical Section Meeting 2018](#) - Smith Gallery and Museum, Stirling. Make a note in your diary. Alice Grace Cook, Calton Hill Observatory, Fear and loathing: the moons of Mars, and more.

30th May 2018 - [BAA Ordinary Meeting & George Alcock Memorial Lecture](#) at Burlington House, Piccadilly, London W1J 0DU. George Alcock Lecture to be delivered by Dr Lee MacDonald, 'Kew Observatory and the origins of modern solar astronomy'

7-8th July 2018 - [BAA Summer Meeting and BAA-AAVSO Joint Variable Star Meeting](#) at Warwick University. 'Exploring Solar Systems, near and far'.

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

From the Interweb

Gaia data

Read ESA's press release summarising the latest issue of its high-quality star catalogue - Gaia Data Release 2.

<http://sci.esa.int/gaia/60192-gaia-creates-richest-star-map-of-our-galaxy-and-beyond/>

ESA's Gaia mission has produced the richest star catalogue to date, including high-precision measurements of nearly 1.7 billion stars and revealing previously unseen details of our home Galaxy. For example, the high quality astrometry delivered by Gaia will revolutionise occultation astronomy.

Astronomers Figure Out How to use Gravitational Lensing to Measure the Mass of White Dwarfs - Universe Today

<https://www.universetoday.com/138832/astronomers-figure-use-gravitational-lensing-measure-mass-white-dwarfs/amp/>

A team of scientists from the [Harvard-Smithsonian Center for Astrophysics](#) (CfA) recently determined that Gravitational Lensing could also be used to [determine the mass of white dwarf stars](#). This discovery could lead to a new era in astronomy where the mass of fainter objects can be determined.

CHEOPS Paper Model - Assemble your own planet watcher

Print out and build a paper model of CHEOPS, the CHAracterising ExOPlanet Satellite.

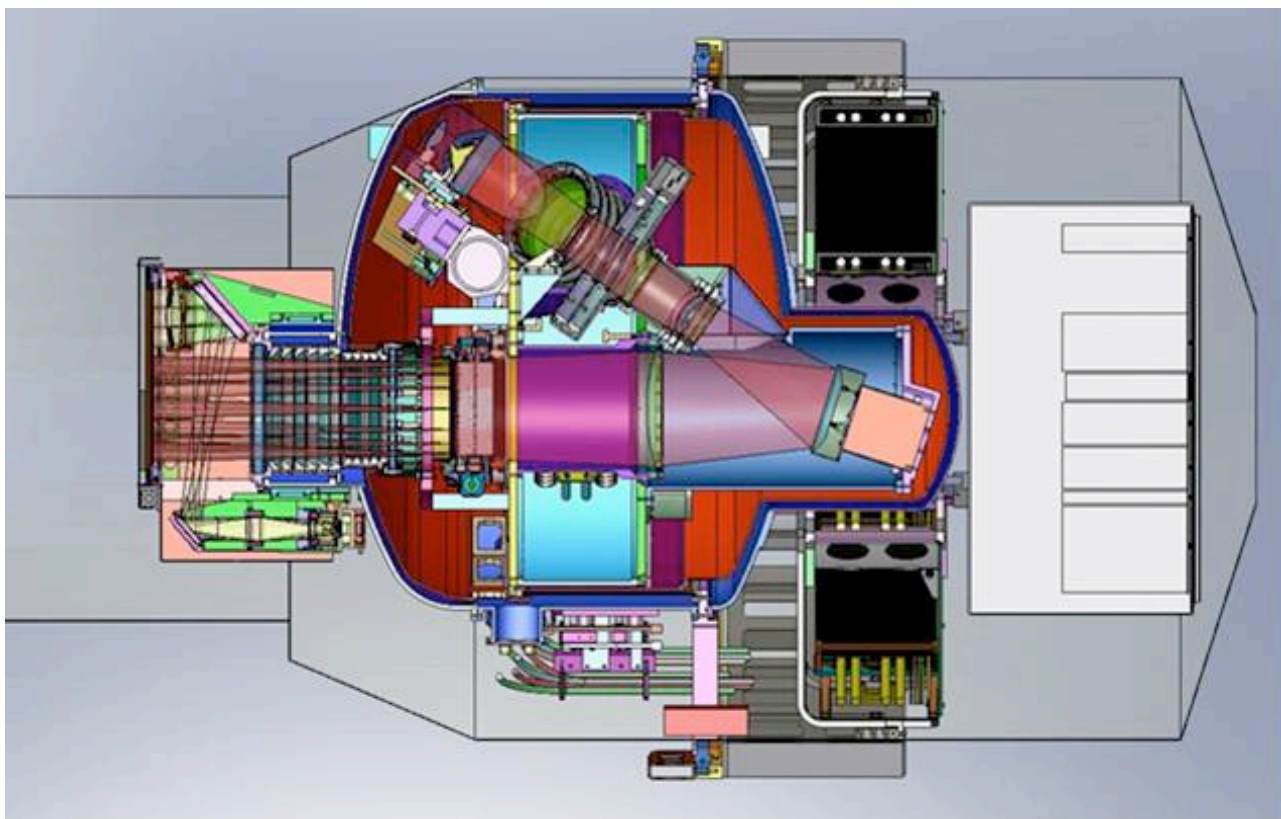
CHEOPS is a space science mission dedicated to the study of known exoplanets orbiting bright, nearby stars. It will use the technique of ultra-high precision photometry to measure accurate sizes of a large sample of Earth to Neptune-sized planets. By combining the accurate sizes determined by CHEOPS with existing mass measurements, it will be possible to establish the bulk density and composition of the planets; these, together with information on the host stars and the planets' orbits will be used to determine the planets' formation and evolutionary history.

CHEOPS is a small satellite with a total launch mass of approximately 300 kg and dimensions of 1.55m (height) × 1.49m (width, measured from solar array edge to edge) × 1.4m (depth)

Look Back in Wonder – A glimpse of a galaxy far far away

Another library missive from Andy Willshire

Early in 2015 data was gathered by the Hubble Space Telescope and Spitzer space telescope which indicated that the galaxy EGS8p7 should be more fully investigated. A group of scientists used the MOSFIRE (multi-object spectrometer for infrared exploration) which can seize chemical identities of distant galaxies at near infrared wavelengths (0.97 - 2.41 microns). It can measure infrared light from up to 46 galaxies each time.



MOSFIRE optical arrangement.

Picture credit : <https://www2.keck.hawaii.edu/inst/mosfire/home.html>.

They discovered that the Lyman alpha line appeared in this faint galaxy at a redshift of $z = 8.68$ (spectrographic redshift), about the time the universes hydrogen atoms would have been absorbing specific radiation; including the Lyman-alpha line; that newly formed galaxies emitted. On the 28th of August 2015 an article was published in 'Astrophysical Journal Letters', by the group including, Adi Zitrin, a Postdoctoral Scholar in Astronomy, Richard Ellis now a Professor of Astrophysics at University College, London. and a group of Caltech researchers. The article described evidence that a galaxy called EGS8p7 was more than 13.2 billion years old. This is 95.6% of the way back to the Big Bang.

Ellis stated that prior to their discovery the farthest galaxy found was at redshift $z = 7.73$, known as EGS-zs8-1. They considered that as there was a possibility that hydrogen reionization did not occur in a constant process it therefore allowed EGS8p7 to be viewed. Zitrin also considered that although "some objects are so bright they form a bubble of ionized hydrogen", however, directional vectors are not consistent.

MOSFIRE is situated in Hawaii and was utilized to measure galactic distance, by analysing data to establish its redshift.

The further back in time we go however, the more difficult it is to determine this distance. As the universe expands, objects moving quickly away from Earth produce a shift of their light to the red end of the spectrum. It is because of this that infrared light is measured. The main difficulty was that in the universal soup of charged particles caused by the Big Bang, light photons were diffused by free electrons and therefore unable to transmit light. It wasn't until 380,000 years post Big Bang that the universe had cooled enough for free electrons and protons to unite and form neutral hydrogen atoms spreading throughout the universe and allowing light to travel. At 0.5×10^6 to 1.0×10^6 years post Big Bang, the initial galaxies switched on and reionized the neutral gas. Before this happened however, great swathes of neutral hydrogen atoms would have absorbed radiation discharged by these infant galaxies including the Lyman alpha line. This is a spectral line of hydrogen emitted when the electron falls from the second orbital ($n=2$) to the first ($n=1$), with 'n' being the principal quantum number.

This is used as an indicator of star formation and is found when hot hydrogen is heated due to ultraviolet emission from new stars. This should in theory have made it impossible according to the standard cosmological model to view these Lyman alpha lines from EGS8p7, but view it they did. The discovery may also have been assisted by gravitational lensing which increased its magnification.

References:

www.wired.co.uk/article/oldest-galaxy-in-the-universe-egs8p7

www.caltech.edu/news/farthest-galaxy-detected-47761

https://en.wikipedia.org/wiki/Lyman-alpha_line

https://imagine.gsfc.nasa.gov/features/cosmic/farthest_info.html

<https://www.sciencedaily.com/releases/2015/09/150904144505.html>

Notes from the Library.

Donated Books.

The library would like to thank Mr Eddy Smith and Mr Mike Norris for their kind donations to the OASI library. Adding the books to our spreadsheet is ongoing, and at present we have increased the number by a further 78 books.

For Sale:

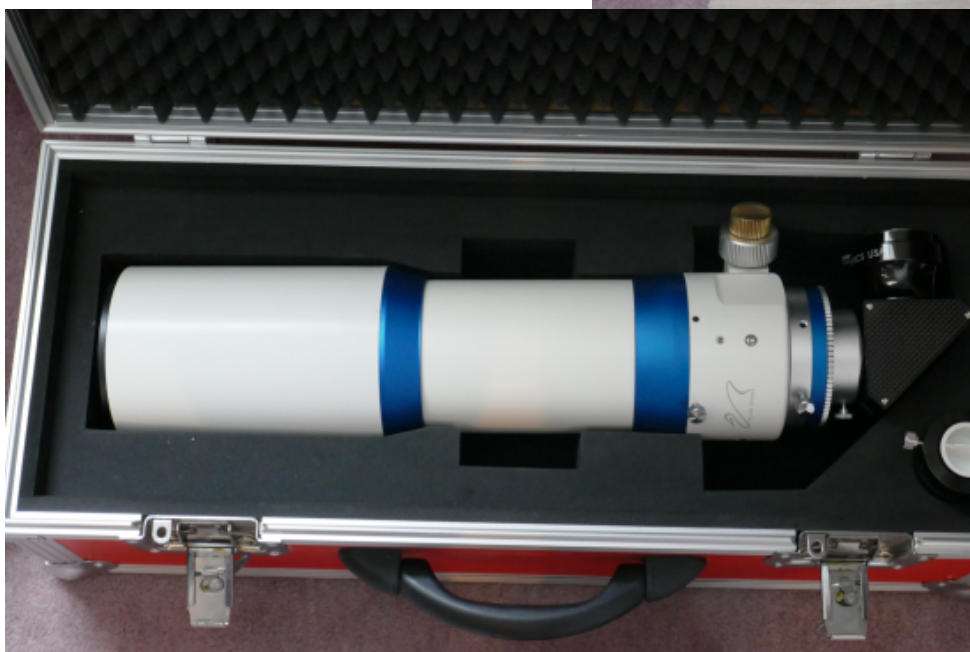
Mr Eddy Smith has several telescopes for sale, the price of which can be negotiated. If you are looking for this type of scope you may be able to acquire it at a bargain price.

Contact: eddyang <at> talktalk.net

1. An F360 : 50m : 90° Astronomical Refractive telescope. There are several other pieces of equipment, such as telescope mounts.



2. An APM 152/1200 f/12 ED APO Refractor telescope. There are two of this style of scope,

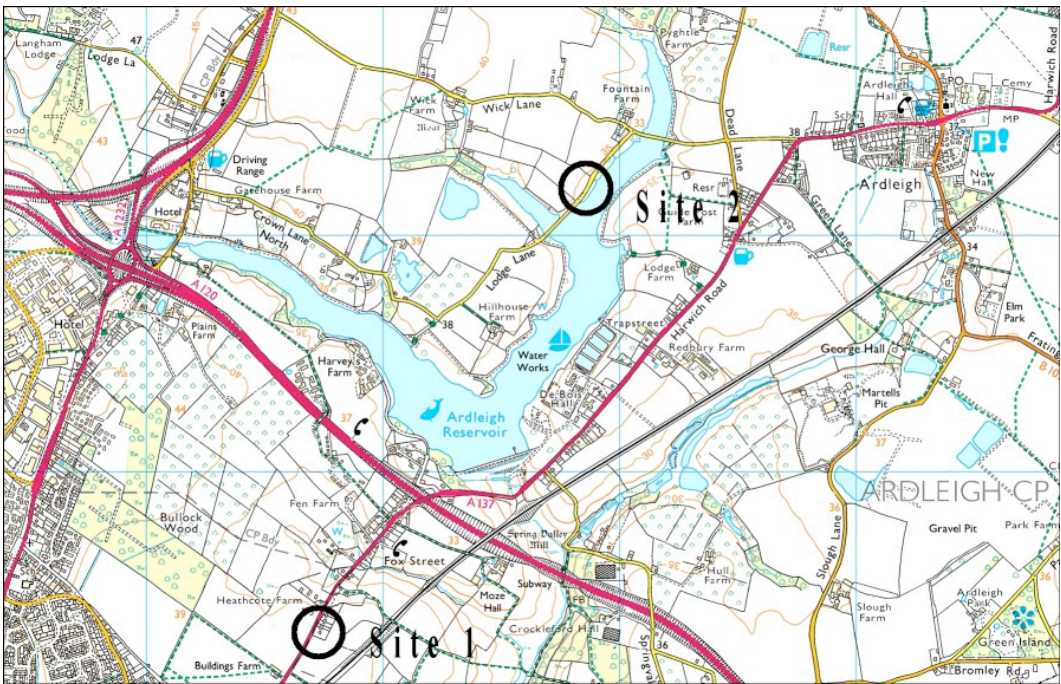


The Graze of ZC1130

Alan Smith

A grazing lunar occultation of the star ZC1130 was predicted for 20:40 UT on the evening of Sunday 25 March 2018. The star is of magnitude 7.2 and although the occultation was a south limb event, the astronomical circumstances were not perfect. As I was to be unavailable to actually observe the event, I attempted to get the ‘usual suspects’ interested observing the phenomenon.

I performed my usual virtual act to identify some ‘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. See below for a map of the rural sites. Site 1 was located in the garden of a friend’s house and site 2 on the grass verge adjacent to a very little used minor road.



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. On this occasion I was unable to get any interest from OASI members so I decided that there was no point in having a conference. The friend who lives at the preferred site (site 1) has an 8” telescope so I had already arranged for them to be ‘on standby’. At 20.00hrs on Sunday I called them only to discover that at the site although the moon was visible it was covered in light haze. As could be seen on the online infra red satellite images, a clear weather window was not due to arrive until later that evening, and given that the star was quite faint we decided that there was no point in trying the observation. Within 4 or 5 hours the skies cleared and the moon could be clearly seen!

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

Monday 2 July	http://www.oasi.org.uk/Occs/Occ_summary_2018.php#Grazes	James Appleton info@oasi.org.uk\	Field trip to observe the graze of γ Cap.
Wednesday 4 July			Field trip to observe the graze of ψ 1 Aqr.

Variable Nebula Update

Mike Harlow, April 2018

After a break from astronomy to concentrate on other things I finally got my telescope working again in March. After the initial set-up and testing I revisited an old friend...Gyulbudaghian's variable nebula in Cepheus [1]. (*Numbers in square brackets denote additional information given at the end of the article*).

The Telescope

While the observatory was out of action I stored the telescope mirror in the house to keep it dry and prevent any damage to the reflective coating [2]. So the first job was to install the mirror back in the telescope, align the optics and focus ready for imaging. Collimating the mirror is quite straightforward as the optics comprise the primary mirror with a Wynne corrector [3], filter [4] and CCD [5] camera mounted at the top end of the tube on the optical axis...there is no secondary mirror to complicate matters. This does mean that the telescope can only be used for imaging but eliminates light loss from a secondary reflection. A laser collimator mounted in place of the CCD reflects light from the centre of the mirror back on itself when the mirror is properly aligned.

Focussing is also relatively easy as it is a 'fixed focus' system. The mirror cell and top end holding the camera are held rigidly in place using Invar rods. Invar has a very low thermal expansion not that much greater than carbon fibre so once focussed it stays that way almost independent of temperature. For my focal length of 1150mm the focus changes by about 1 micron for every 1°C change in temperature! Focus is achieved by watching the image of a star in the CCD 'focussing mode' and adjusting the position of the mirror with three wingnuts securing the mirror cell.

First light (again!)

With the telescope aligned and focussed I looked around for a suitable test object to image. February's *Astronomy Now* magazine had a feature on M109 in Ursa Major so that seemed like a good first test object as the magazine had a nice colour image to compare with. Figure 1 is the result showing some structure in the spiral arms and some fainter galaxies in the background.



Figure 1: Messier 109 on 8th March 2018. 12inch F/3.6 telescope with 35 x 30 second exposures

So all appeared to be working just fine. All I needed now was some good weather to attempt my image of Gyulbudaghian's nebula (known by some as 'MrG' for short!) which at this time of year is highest just before dawn.

MrG at last

Well it was a couple of weeks before a suitable window of clear sky and minimal interference from the Moon. So in the early morning of 26th March I got my first image of MrG from home since early 2016(!). I had done some remote imaging after that so my last image of MrG was taken on 3rd May 2017 using the Gemini telescope which is part of the Sierra Stars Observatory Network (SSON) [6]. This is a 0.51M telescope on a mountain in Arizona so has a bit of an advantage over my 0.3M reflector at sea level in Suffolk! Then a few weeks later on 20th April I managed a longer integration to give a better image which is shown in figure 4. The three images show how the nebula has changed between January 2016 and April 2018 and the highly stretched negative images highlight the change in shape between May 2017 to April 2018.



**Figure 2: My last image of MrG from home on 19th January 2016.
12inch F/3.6 telescope with 118 x 30 second exposures**



**Figure 3: MrG on 3rd May 2017 taken with the 0.51M Gemini telescope in Arizona.
5 x 3 minute exposures**



**Figure 4: MrG on 20th April 2018 from home.
12inch F/3.6 telescope with 137 x 30 second exposures. Field of view ~14 x 14 arc minutes.**

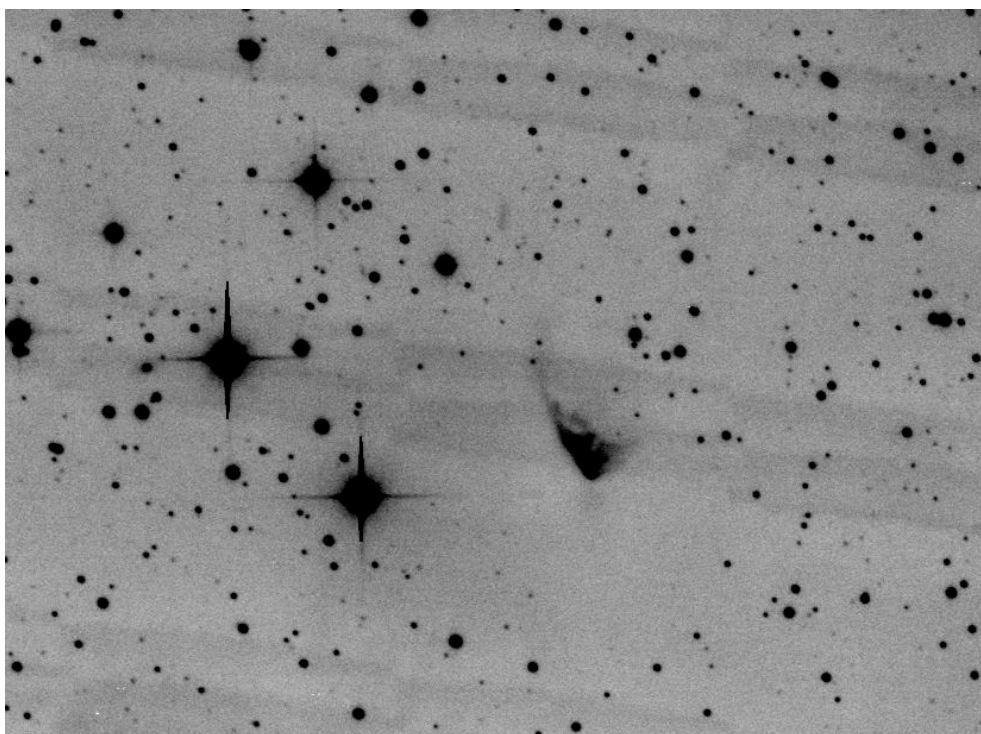


Figure 5: Extreme stretch of figure 3 shown as negative

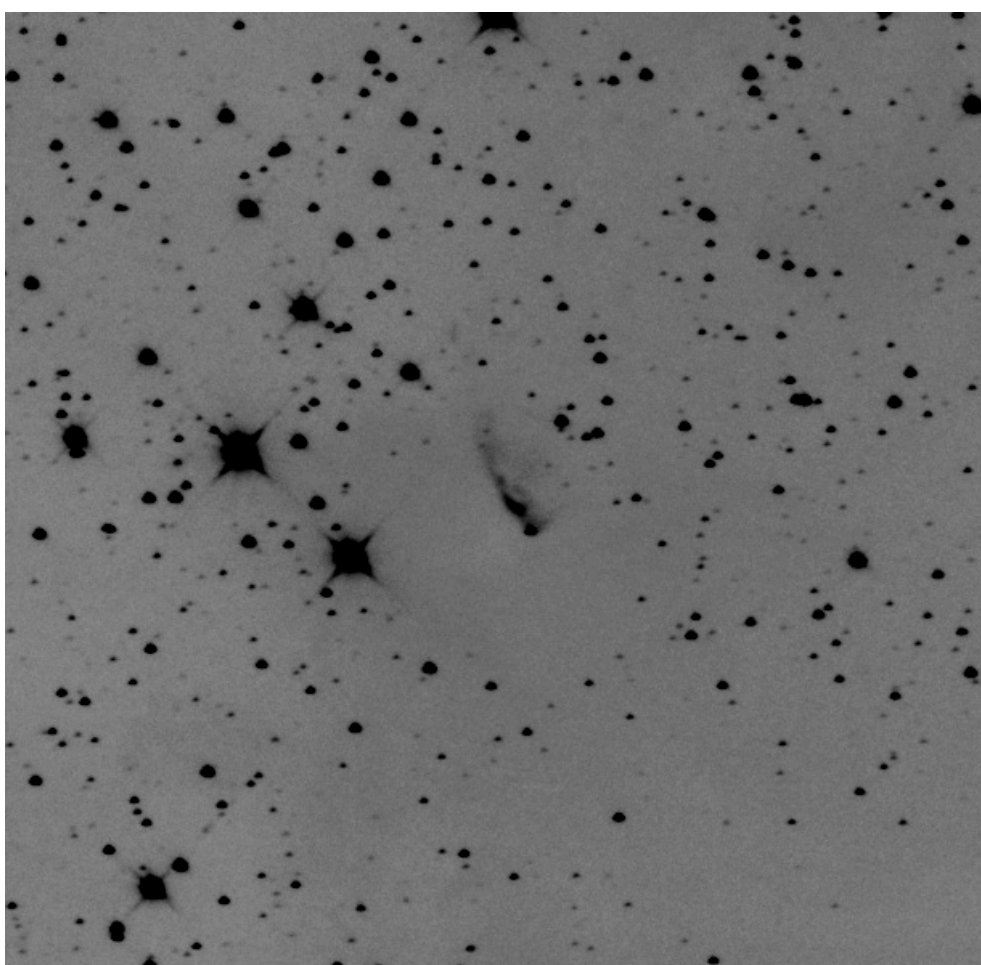


Figure 6: Extreme stretch of figure 4 shown as negative

So it can be seen that the shape of the nebula has changed noticeably over this two year period and who knows how it may change in the next few months and beyond?

A nice review by Nick Hewitt of recent activity of MrG and the other northern hemisphere variable nebulae appears in the February 2018 BAAJ pages 46-47.

Upgrades

Having got the telescope working again I'm want to make it easier to use in the future with some upgrades. I've already played with one improvement which is to make my telescope remotely accessible by networking the observatory laptop, which runs the CCD camera, with a computer in the house. That way I can sit in the warm and watch the images appear on the computer screen. I'm sure there are many ways to do this but one recommendation from others was to use Teamviewer software [7] which when loaded on to both computers enables them to talk to each other. This appears to work well so now I don't have to be out in the cold with the telescope if I don't want to!

The next experiment will be to install an autoguider so I can take longer exposures and make the telescope more productive. This is a bit of a challenge as the stepper motor drive is home built (but not by me) as is the telescope mount so there is no 'Autoguider socket' to plug in to! Some suitable interface will have to be built.

But before all that I want to get back in to spectroscopy...but that's another story...

Additional information

- [1] Gyulbudaghian's nebula is associated with the variable star PV Cephei located at RA 20h 45m 56s Dec +67d 57m 44s (2000). As my telescope doesn't have 'GoTo' capability I find the object by starting at Alpha Cephei and star hop north via 6 and 7 Cephei and then west across to 4 Cephei. PV is just north of 4 in the same field through my finderscope.
- [2] My mirror has a HiLux coating by Orion optics which is a multilayer coating giving 97% reflectivity across much of the visible spectrum. <http://www.orionoptics.co.uk/OPTICS/opticalcoatingsh.html>
- [3] The 3 inch Wynne corrector gives a well corrected flat field ideal for CCD imaging. It is made by Astro Systeme Austria (ASA) who make a range high quality correctors and telescopes. <http://www.astrosysteme.com/shop/3-wynne-korrektor-0-95x/> .
- [4] Astrodon filters are used between the Wynne corrector and the CCD. For general imaging a luminance filter is used (L filter) which has sharp cut-offs at wavelengths below 400nm and above 700nm but allows all visible light through. Red, green and blue filters can be used as well as a V filter for photometry and narrowband filters for H alpha and OIII. <http://www.astrodon.com/index.html>
- [5] A Starlight Xpress SXVF H16 CCD camera is used which has a 2048 x 2048 pixel chip which is 15 x 15mm square. This gives a prime focus field of view of 49 x 49 arc minutes. <http://www.sxccd.com/products>
- [6] The Sierra stars observatory network had three telescopes available for remote imaging up to the beginning of 2017. But then the main 0.6m instrument was suddenly closed down to be sold leaving one telescope in Australia and one in the USA. The remaining telescope in the US, the 0.51m Gemini instrument, is run by the University of Iowa and isn't available all year which is why I stopped using it. <http://sierrastars.com/> .
- [7] TeamViewer software enables a wide range of computer operating systems and mobile devices to be networked for remote access and control. <https://www.teamviewer.com/en/features/#gref>

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.

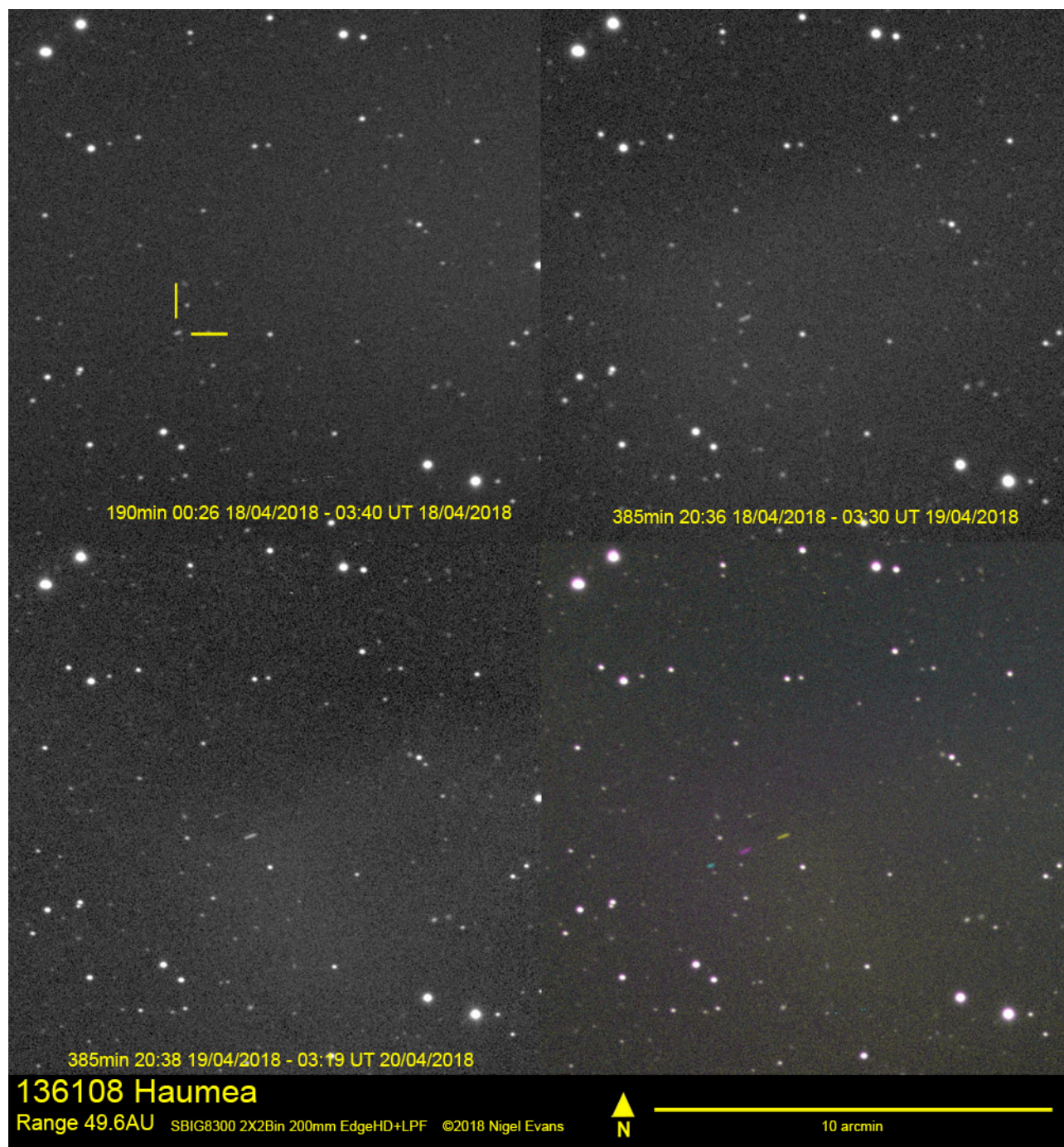
Of course you could come up with your own ideas. Only one rule – enjoy yourselves!

Paul

TNOs and a Quasar

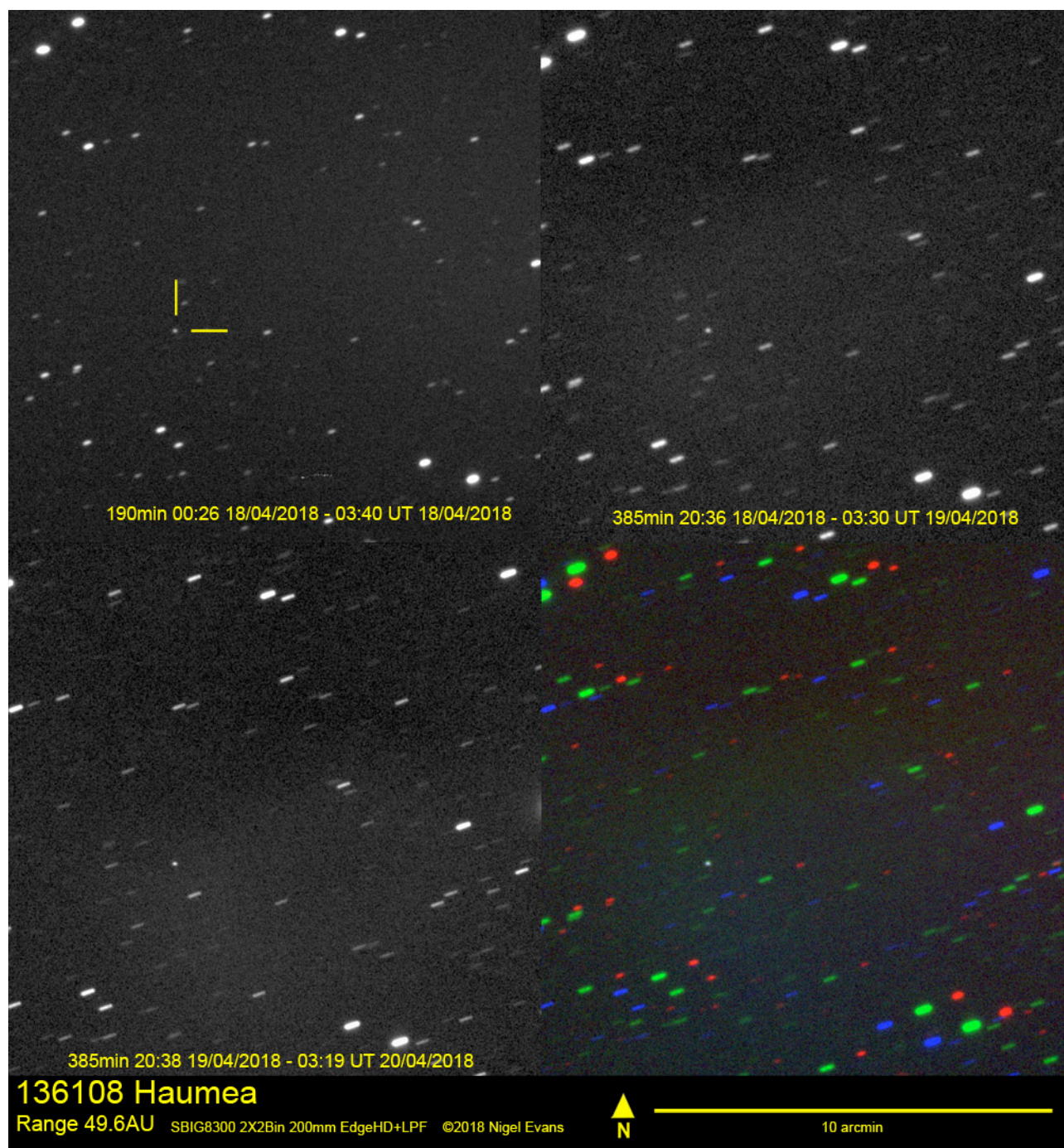
Nigel Evans

The recent sunny weather by day should have meant clear skies at night. Although the nights were cloud-free they were fairly hazy, so much so that I wondered if I could get any decent images. I was rather surprised.

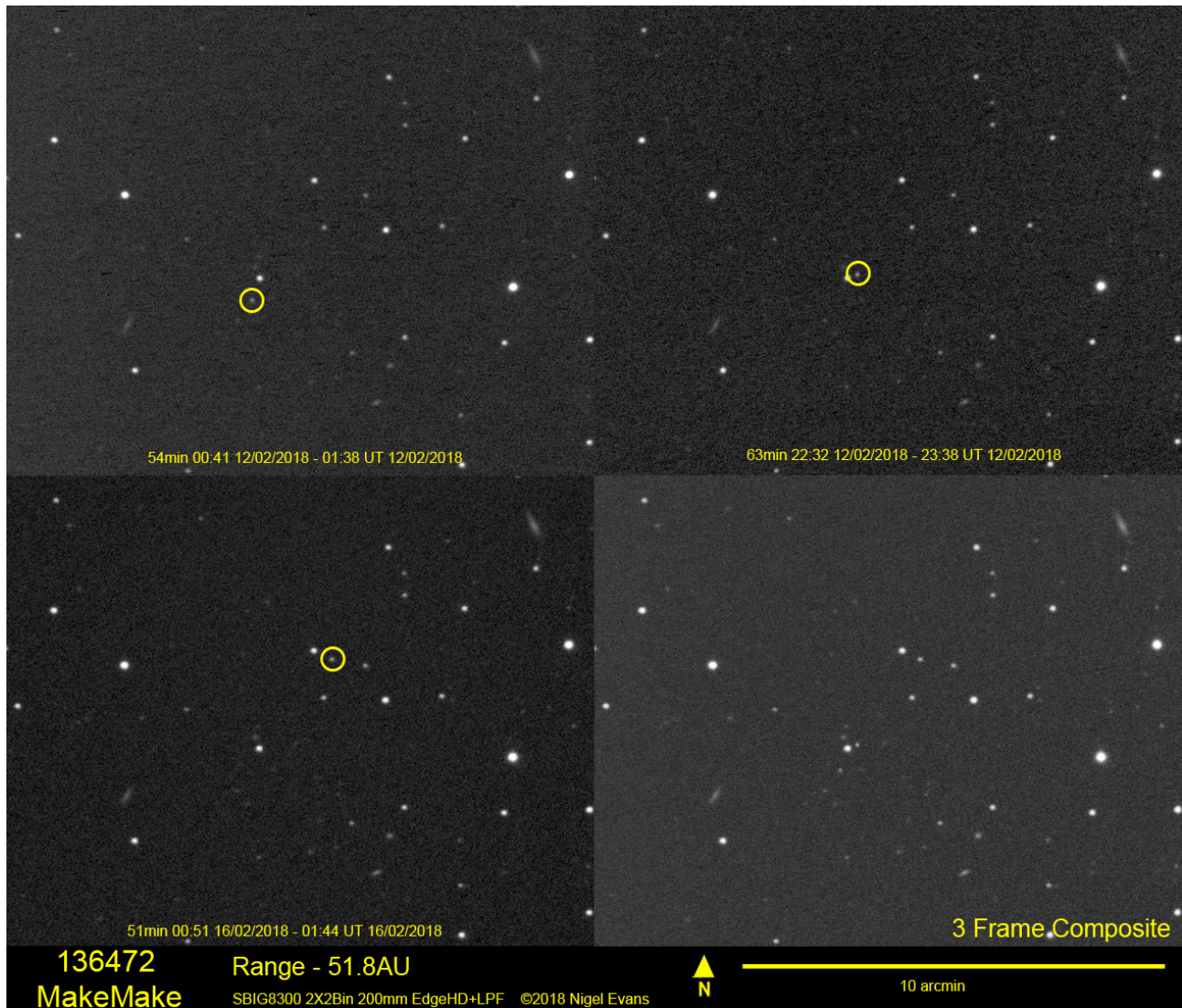


The TNO [Trans Neptunian Object] **Haumea** is currently visible all night but rather faint at mag 17.3. Nevertheless I was able to capture it on 3 nights.

With a motion of around 2.5 arcsec per hour, a long sequence of sub-exposures gives a trail, but these can also be stacked to freeze the motion of the asteroid and have the stars trail (as is often done for comets)

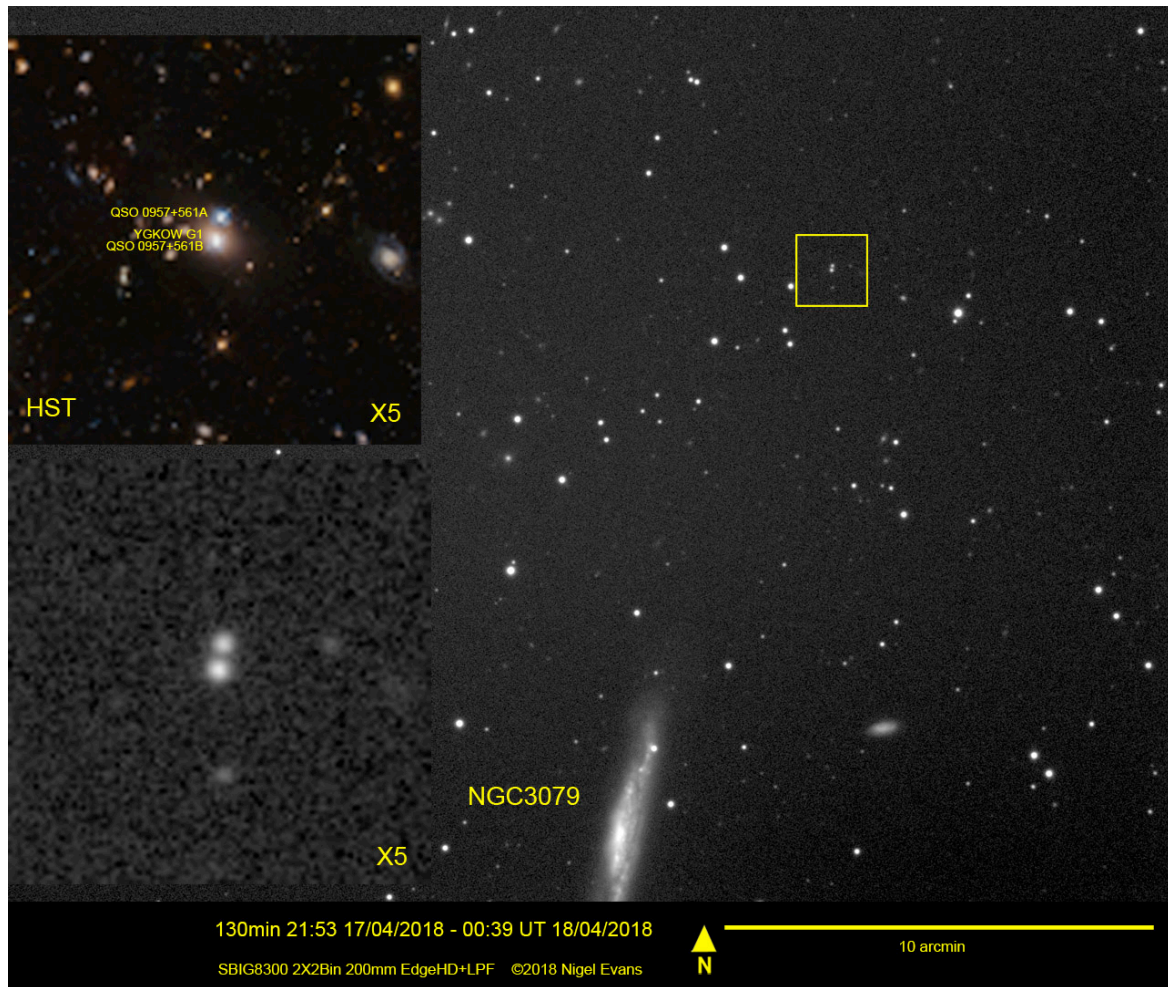


In the previous clear spell in February I also caught the TNO **MakeMake**, slightly brighter at 17.1



Makemake

Another object I tackled was the twin quasar **QSO 0957+561**. This is where a foreground galaxy creates a double image of a far more distant quasar – one component is clearly seen, but the second component is coincident with the host galaxy image in my 'tiny' 8 inch scope. You need a bigger scope and clearer skies to see both separately! In the inset image the Quasars at about mag 17 and the 2 stars are about mag 19



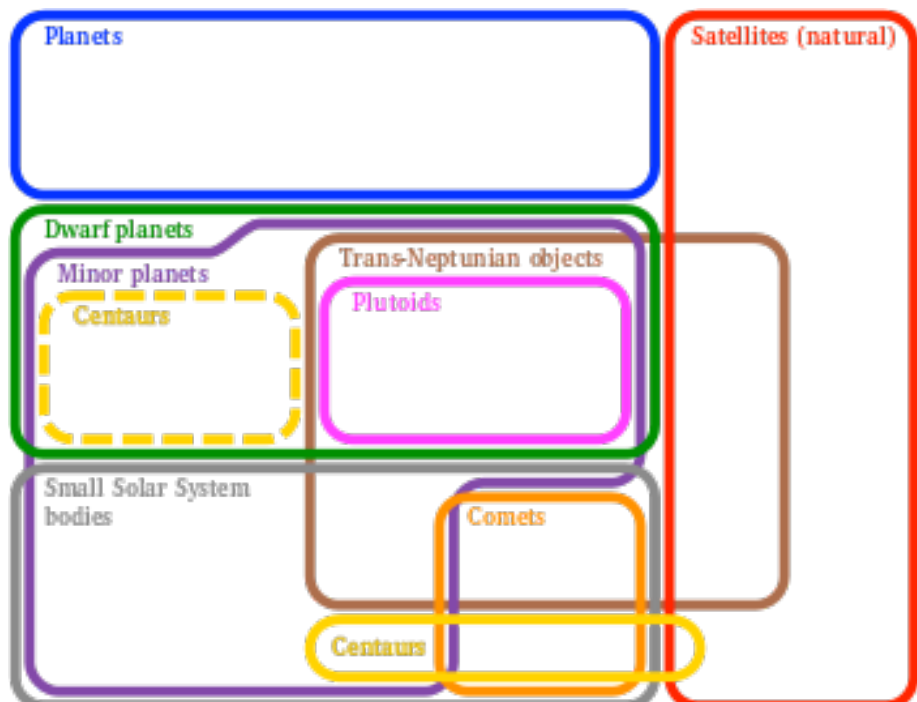
Twin quasar QSO 0957+561

Now back to normal weather!

Editor's footnote

[Euler diagram](#) showing the types of bodies in the Solar System.

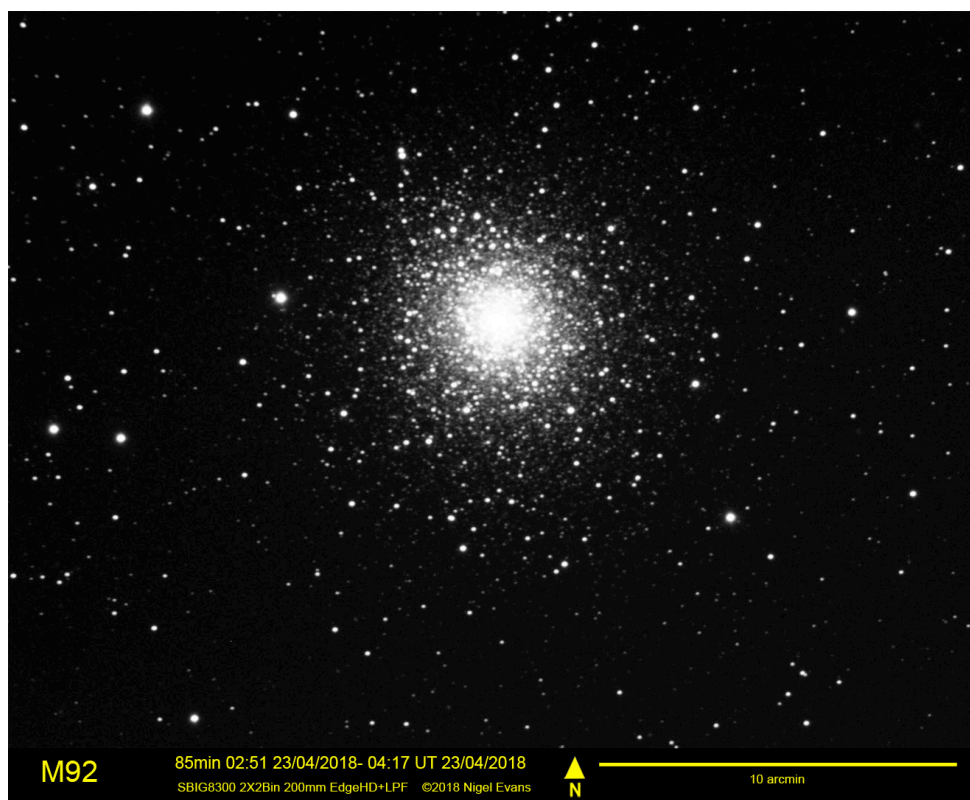
Source: [Wikipedia](#)



Three Galaxies

Nigel Evans

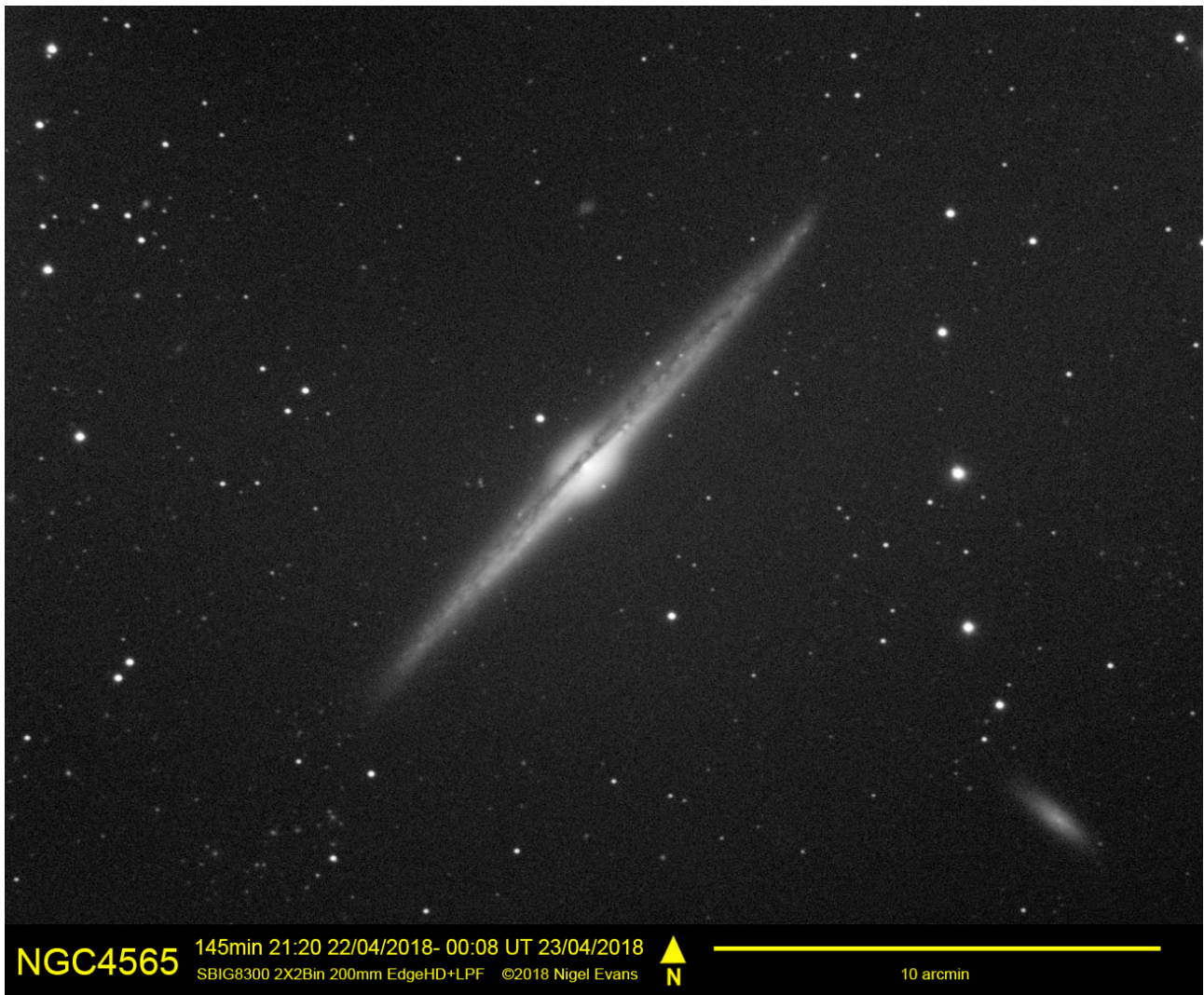
Another night of poor transparency.



M92 - a nice globular cluster, usually overshadowed by its larger neighbour in Hercules, M13



NGC4535 - a nice face on galaxy in Virgo



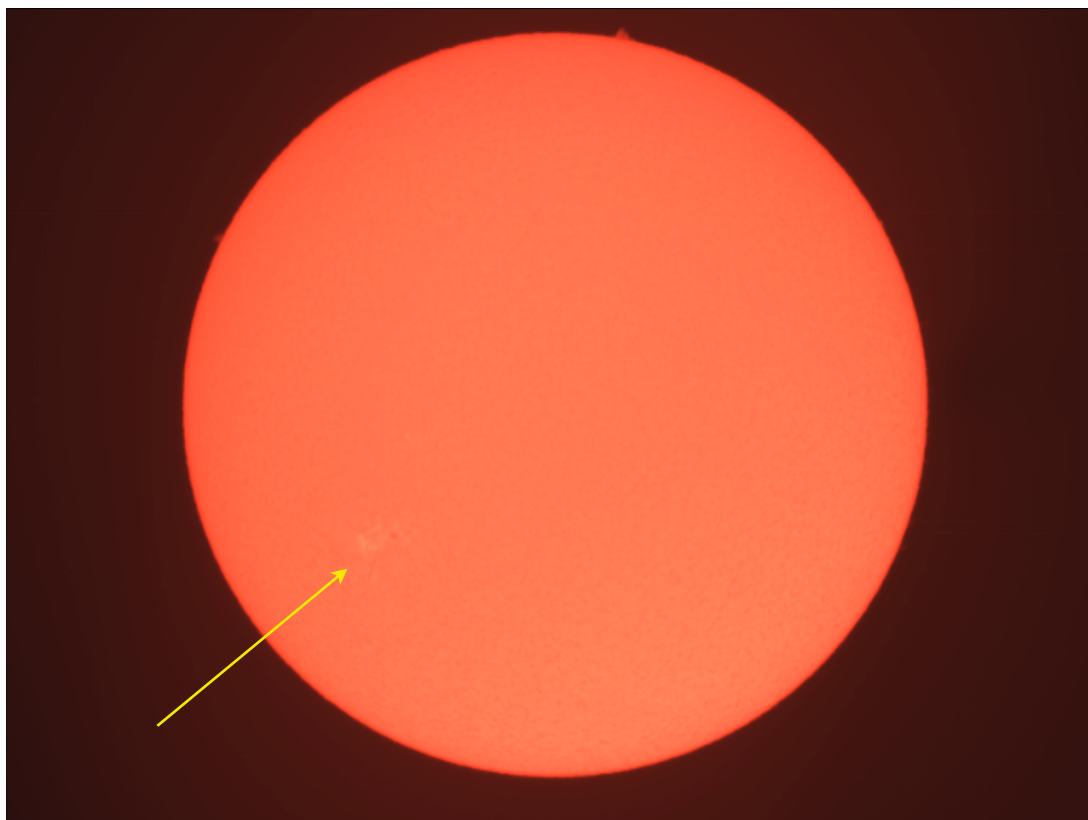
NGC4565 - a lovely edge-on galaxy

A Sunspot & a Solar Prominence

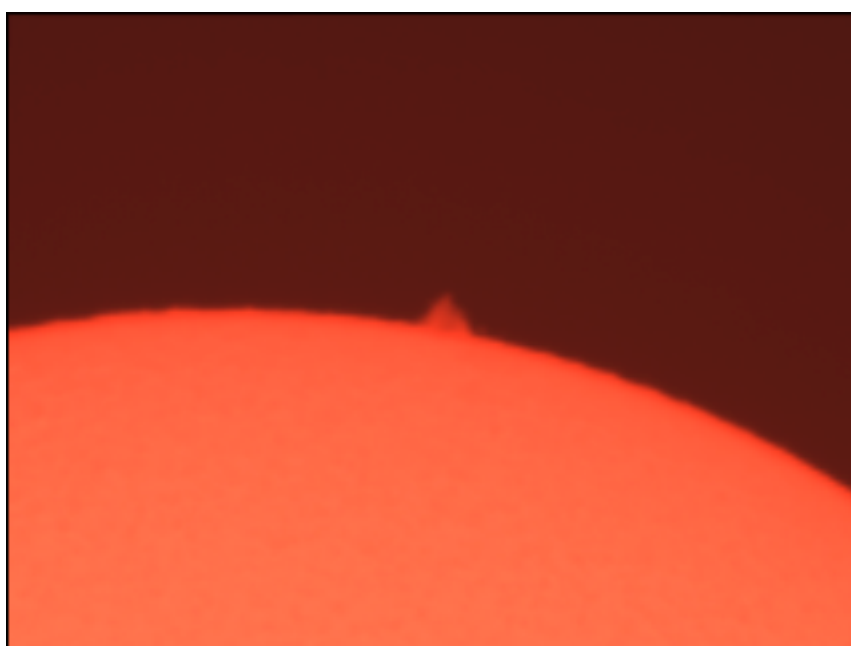
Martin Cook

A small solar prominence.

Two photos of the Sun taken on the 22/4/2018 14:00h with a Lunt ls50pt H-alpha solar scope and a QHY5L-II Colour camera.



**Full sun showing a flare at the top and a small flare at 10 o'clock.
At 7 o'clock you can see sunspot 2706**



Close up of flare at the top