



OASI News

The newsletter of Orwell Astronomical Society (Ipswich)



Figure 1 Solar Eclipse from Tiffin Ohio - Neil Short

Trustees:

Mr Roy Adams Mr Neil Morley Mr David Payne

Honorary President:

Dr Allan Chapman D. Phil MA FRAS

Table of Contents

Society Notices.....	4
Editor’s Note	Error! Bookmark not defined.
Committee 2024	4
Committee Meeting.....	4
New members.....	4
Society Contact details.....	5
Social Media.....	5
Articles for OASI News	5
Reproducing articles from OASI News	5
Secretary's Report on OASI Activities in 2023	6
Meetings and events	7
OASI @ Orwell Park	7
Access into the School Grounds and Observatory Tower.....	7
OASI @ Newbourne	8
Forthcoming Outreach Programmes 2024	8
OASI and BAA Events	9
BAA news & webinars.....	9
The BAA Radio Astronomy Section	9
Answer to Question for May.....	10
June maths question.....	10
The Night Sky in June	11
Sun, Moon and planets	11
June 2024.....	11
Occultations during June 2024.....	11
Meteor showers during June 2024	12
Comets.....	12
Visible ISS passes >30° max altitude for June 2024	13
Bill Barton’s Radio Broadcast	13
NISAR –ISRO Synthetic Aperture radar (NISAR).....	14
The Q-Max Solar Spectrometer on the Tomline Refractor Bill Barton.....	17
Eclipse 2024 reports (continued).....	19
Nigel Evans, Universidad Automona de Chapingo, outside Torreón, Mexico.....	19
Eclipse Day!.....	19

Post Mortem20

Neil Short - Tiffin, Ohio21

Aurora 10th May 202422

 Martin Cook, north of Ipswich22

 Andy Gibbs, East Ipswich23

 Toni Smith, Grundisburgh23

 Mike Such – near Woodbridge24

 Steve McElvanney, Melton24

 Mike O'Mahony, Felixstowe25

 Nigel Evans, East Ipswich25

 Adam Honeybell, Needham Lakes and “The Strand” by the Orwell26

 Paul Whiting - Off the coast of Aberdeen.....27

Member’s Observation30

 John Hughes – Solar images30

 John Hughes – Collimation test on M5131

Society Notices

Wow! What an incredible display of the Aurora on Friday 10 May. It was great to see so many images submitted for the website and our Facebook page. This was the best display observable from Suffolk for over twenty years and, as we are at solar maximum, we might get lucky again in the coming months, although we have to contend with the short nights of Summer first.

We have three solar outreach events coming up in June, at Christchurch Park, Kirton and Mendlesham. As ever, we are always looking for volunteers to help safely run these events. If you can help out, in any way, you don't need to be an expert or bring any equipment, please let myself or any Committee member know.

Let's hope the Sun finally makes an appearance this month!

Andy Gibbs, Chairman.

Committee 2024

Chairman	Andy Gibbs	Set overall agenda for OASI, Chair committee meetings, Press and publicity
Secretary	Roy Gooding	Outreach meetings (jointly with Chairman), observatory decoration
Treasurer	Paul Whiting	Finance, Supervision of applications for grants. Visits by outside groups, Observatory tours, public appreciation of astronomy, Outreach activities
Committee	James Appleton	Committee meeting minutes, Web site
	Martin Cook	Membership, Tomline refractor maintenance & user testing
	Matt Leeks	Safety & security
	Peter Richards	Lecture meetings
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club
	Andy Willshere	Librarian
	Adam Honeybell	Newsletter
	Paul Whiting	OASI @ Newbourne

Committee Meeting

The next Committee Meeting will be on Friday 20th September at 8:00pm via Zoom. All members welcome.

New members

No new members this month

oasi.org.uk

Society Contact details

Website: <https://www.oasi.org.uk>

Events: <https://www.oasi.org.uk/Events/Events.php>

Email queries: info@oasi.org.uk

Submissions for Newsletter: news@oasi.org.uk

Members-only message board: <https://groups.io/g/OASI>

Observatory (meeting nights only): ☎ 07960 083714

Social Media

For other astronomy news and astro pictures try our socials:

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

YouTube: <https://www.youtube.com/@orwellastronomical425>

Articles for OASI News

News, pictures and articles for this newsletter are always welcome.

Please send tables as separate files in one of these formats (Excel, .csv, OpenOffice)

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."

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

The CLOSING date is the **15th** day of the month (i.e. 15th June).

The Newsletter archive is at www.oasi.org.uk/NL/NL_form.shtml

Authors, please note that your articles will 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.

Secretary's Report on OASI Activities in 2023

Roy Gooding

Your committee organises a large number of events and meetings each year. All members are welcome to attend any meeting. If you are not sure about the arrangements please go to the Events page on our web site, where you will find full programme and contact details. Programme details can also be found in the OASI newsletter.

What events in 2023 did you miss? Here is a summary of the events and meetings OASI held in 2023.

Orwell Park Observatory

The Observatory was open 73 times in the year. This includes Wednesdays and group visits. *How many were you able to attend?*

Meetings at Newbourne

A total of 22 meetings were held at Newbourne, including the OASI picnic. *How many were you able to attend?*

Outreach and Zoom Meetings

Outreach meetings		
Date	Venue	Activity
29 January	Cedarwood School	Star Party
16 th February	Norwich Science Festival	Festival
3 rd June	Christchurch Park	Solar Event
18 th June	Kirton Recreation Ground	Solar Event
22 nd July	Latitude Festival	Star Party
25 th July	Trinity Park	Solar Event
29 th August	Bawdsey Radar Museum	Solar Event
7 th September	Maison Margiela Star Gazing Event	Star Party

Zoom Meetings	
Numbers	Type
4	General Meetings
9	Paul's astronomy course
4	Committee meetings
4	Pre-recorded Youtube lectures
2	Dual lecture meetings

Two of the meetings were a dual live and Zoom meeting, held on 31st March and 10th November at St Augustine's Church Hall.

Social Events

There were two social events in 2023. The first was the OASI picnic at Newbourne on 8th July and the second the Christmas meal on 6th December at The Fox in Newbourne

Total number of Meetings

The total number of meetings OASI held in 2023 was 133. This is 2.5 meetings per week.

We are one of the most active astronomical societies in the country. Many Astronomical

Society's may hold one or two meetings a month. We occasionally hold as many meetings in a month, as other societies may hold in a year. Please come along and support our meetings and events, whenever you can.

Meetings and events

We have regular meetings on the 2nd and 4th Monday of the month (usually) at **Newbourne Village Hall**, and every Wednesday at **Orwell Park**. Night sky observing will usually take place when the skies are clear.

Date, Time & Location	Contact	Event
Weekly, every Wednesday, from 20:00 Orwell Park Observatory, Nacton	Martin Cook Roy Gooding	Observatory open
Thursday 20 th June 20:00 Zoom	Paul Whiting	Monthly Zoom Meeting
Monday 24 th June 19:30 Newbourne Village Hall	Paul Whiting	Newbourne meeting - beginners and new members welcome! <i>Sky Notes</i> by Bill Barton, FRAS. <i>Astro News</i> by Paul Whiting, FRAS.
Monday 8 th July 19:30 Newbourne Village Hall	Paul Whiting	Newbourne meeting - beginners and new members welcome!
Thursday 18 th July 20:00 Zoom	Paul Whiting	Monthly Zoom Meeting
Saturday 20 th July 13:00-20:00 Newbourne Village Hall	Peter Richards	Summer picnic, open to all members of OASI and their guests. Poster with further details.

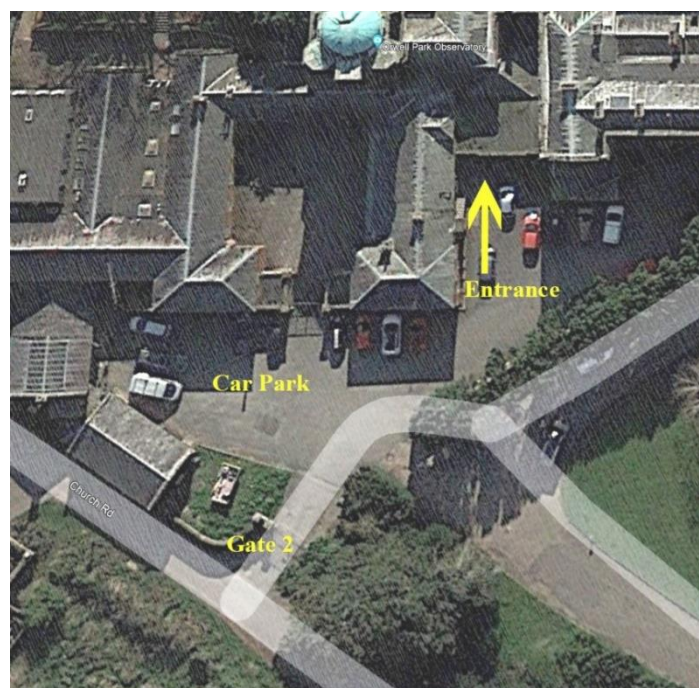
OASI @ Orwell Park

There are regular meetings every Wednesday evening from 8pm. Access is controlled by a gate and a fob. The entrance is gate 2 is on Church Road, What3Words is [tour.fuse.banks](#)

Access into the School Grounds and Observatory Tower

The route is as follows:

- Enter through gate 2 (gate 1 being the main gate) and park inside as per the attached map.
- Enter the school through the double black doors as indicated on the map. A key fob will be required to open the door.
- Continue straight through the next two sets of double doors.
- Turn left at the end of the short corridor then immediately right.
- Pass through the single door and on your left you will find the staircase leading to the observatory.
- On no account must you deviate from this route.



When leaving the observatory use the same route but in reverse. Please keep noise to a minimum as there are staff quarters nearby.

OASI @ Newbourne

newbourne@oasi.org.uk

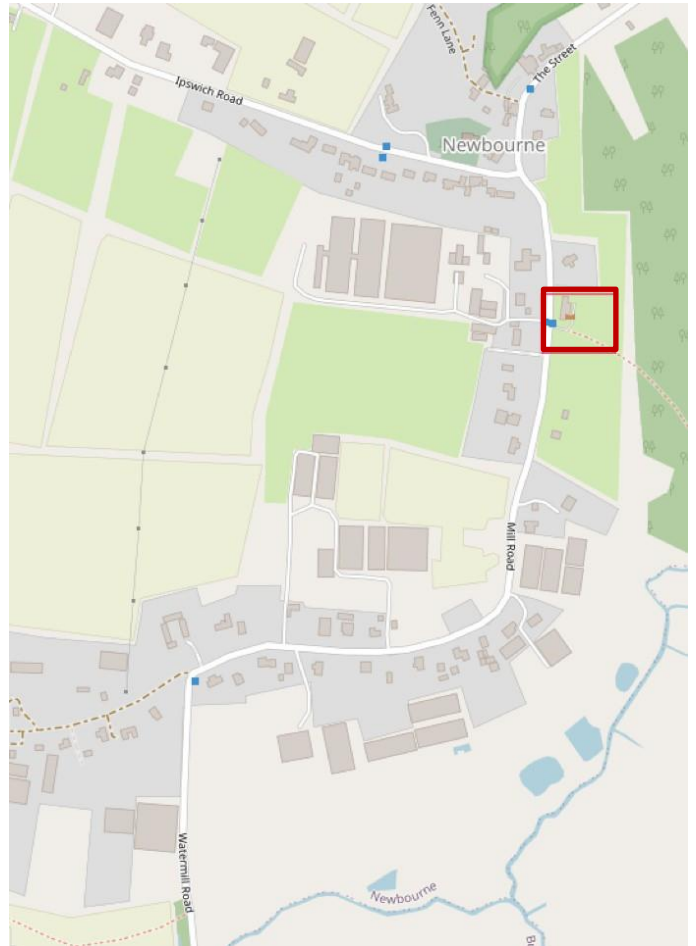
We meet at Newbourne Village Hall, Mill Lane, IP12 4NP on the 2nd and 4th Mondays from 19:30.

What3Words [scars.atlas.printing](https://www.what3words.com/scars.atlas.printing)

Visitors are welcome but we do ask you to join the Society after two visits.

<http://www.oasi.org.uk/OASI/Membership.php>

Newbourne dates for 2024		
June	10	24 (S)
July	08	22 (A/S)
August	12	26 (S)
September	09	23 (A/S)
October	14	28 (S)
November	11	25 (A/S)
December	09 (Q)	



We open up for all meetings at 7:30pm.

Astro News (A) / Star Guide (S) at 7:45pm followed by any Talks (T), Workshops (W) and occasional Quiz (Q).

indicates a change to the normal monthly pattern.

Forthcoming Outreach Programmes 2024

All members are welcome to come along and help out at these events – you don't need to be an expert in the subject. Just respond to the email call for help prior to the event.

Please note that not all events are open to the public.

<i>Saturday Jun 22nd</i>	<i>Solar observing, Mendlesham Village Fete, Mendlesham playing field behind the village hall. Open times: 12:00 to 18:00 (TBC). Roy Gooding</i>
<i>Friday 26th – Sunday 28th July</i>	<i>Latitude (to be invited)</i>
<i>Sunday Aug 25th</i>	<i>Solar Party at Bawdsey Radar Museum, Bawdsey Setup 10:00</i>
<i>Fri 25th & Sat 26th October</i>	<i>Observatory Open Evenings (TBC)</i>

OASI and BAA Events

For the latest event details, please check our website and social media.

BAA news & webinars

For full details of all meetings or cancellations, please go to <https://britastro.org/events/future-events>

Saturday 21st September 2024 BAA Autumn Meeting

Venue: Rutherford Appleton Laboratory

Wednesday 30th October 2024 17:30-20:00 BAA Meeting & AGM

Venue: INSTITUTE OF PHYSICS, 37 Caledonian Road, London, N1 9BU

The BAA Radio Astronomy Section

The BAA Radio Astronomy Section have been enjoying talks, seminars and tutorials via Zoom and these are available on the BAA YouTube channel <https://www.youtube.com/user/britishastronomical/playlists>.

-

Answer to Question for May

What is the figure at ?

6 8 5 4

9 8 8 7

8 7 6 4

7 6 4 ?

Line 1. $6+8=14$. $1+4=5$. $5+8=13$. $1+3=4$.

Therefore last line: $7+6=13$. $1+3=4$. $4+6=10$. $!+0=1$. $?=1$

June maths question.

5292312167

8412924389

9613129791

7292719683

67626?757?

The Night Sky in June

All event times are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E. Times are **GMT** unless otherwise stated.

Sun, Moon and planets

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

June 2024

Object	Date	Rise	Set	Mag.	Notes
Sun ☉	1	03:41	20:06		
	30	03:39	20:18		
Moon ☾	1	01:22	13:44		New moon 06 June 2024 12:38 First quarter 14 June 2024 05:19 Full moon 22 June 2024 01:08
	30	-	14:24		Last quarter 28 June 2024 21:53 New moon 05 July 2024 22:57
Mercury ☿	1	03:12	18:30	-0.8	
	30	05:01	21:23	-0.6	
Venus ♀	1	03:45	19:52	-3.8	
	30	04:13	20:43	-3.8	
Mars ♂	1	02:02	15:26	1.1	
	30	00:49	15:34	1.0	
Jupiter ♃	1	03:22	18:58	-1.8	
	30	01:48	17:40	-1.9	
Saturn ♄	1	01:08	12:01	1.2	
	30	23:12	10:11	1.1	
Uranus ♅	1	03:00	18:20	5.8	
	30	01:09	16:34	5.8	
Neptune ♆	1	01:22	13:05	7.9	
	30	23:24	11:13	7.9	

Occultations during June 2024

https://iota-es.de/moon/grazing_descrx101.html and
<http://www.lunar-occultations.com/iota/bstar/bstar.htm>

Observers are encouraged to download and install the [Occult](#) software program [Windows only] to generate predictions for their own particular site coordinates.

Meteor showers during June 2024

Shower	Normal limits	Maximum	ZHR at Max	Notes
June Bootid	22/06/24-02/07/24	27/06/24	1-2	Good luck!
Arietids	29/05/24-17/06/24	04/06/24	60	A so called "daytime" shower, usually visible an hour before dawn

See also <https://www.rmg.co.uk/stories/topics/meteor-shower-guide>

For radio observation, use reflections from Graves Radar on 143.049MHz or the Brams transmitter in Belgium on 49.97MHz and UK GB3MBA on 50.408MHz <https://www.ukmeteorbeacon.org/Home>

See also https://www.popastro.com/main_spa1/meteor/radio-meteor-observing-2020/.

Comets

Source : <https://heavens-above.com/Comets.aspx> on 07/06/24.

Comet	Brightness	Date of last reported observation	Angular separation from Sun	Constellation
12P Pons-Brooks	7.2	2024-Jun-07	49°	Canis Major
13P Olbers	7.7	2024-Jun-06	26°	Auriga
C/2023 A3 Tsuchinshan-ATLAS	11.3	2024-Jun-07	99°	Virgo
C/2021 S3 PANSTARRS	12.8	2024-Jun-07	88°	Cygnus
144P Kushida	13.2	2024-Jun-03	72°	Leo
C/2020 V2 ZTF	13.6	2024-Jun-07	94°	Phoenix
C/2022 E2 ATLAS	14	2024-May-29	27°	Gemini
29P Schwassmann-Wachmann 1	14.1	2024-Jun-03	48°	Cancer
C/2021 G2 Atlas	14.3	2024-Jun-07	111°	Corvus
62P Tsuchinshan	14.4	2024-Jun-04	109°	Virgo
32P Comas Sola	14.4	2024-May-13	36°	Gemini
C/2023 C2 ATLAS	14.4	2024-Jun-05	126°	Apus
130P McNaught-Hughes	14.7	2024-Jun-05	66°	Cetus
C/2019 U5 PANSTARRS	15	2024-Jun-07	65°	Canis Major
C/2020 K1 PANSTARRS	15.4	2024-May-30	62°	Columba
299P Catalina-PANSTARRS	15.6	2024-Jun-05	158°	Libra
C/2022 L2 ATLAS	15.7	2024-Jun-07	84°	Hydra

Visible ISS passes >30° max altitude for June 2024

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

Times are **GMT**.

Predictions are approximate (07/06/24) due to craft adjustments. Check the day before.

Date	Brightness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
7 Jun	-1.6	19:39:16	10°	WNW	19:41:47	20°	SW	19:42:01	20°	SW
08 Jun	-3.0	18:49:17	10°	NW	18:52:30	48°	SW	18:55:19	13°	SSE
10 Jun	-0.8	18:49:23	10°	WSW	18:50:20	11°	SW	18:51:17	10°	SW
11 Jun	-1.1	04:47:10	10°	SSE	04:49:11	15°	SE	04:51:11	10°	E
13 Jun	-3.7	04:45:42	38°	SSW	04:46:48	74°	SE	04:50:05	10°	NE
14 Jun	-1.1	03:58:45	20°	E	03:58:45	20°	E	04:00:10	10°	ENE
15 Jun	-2.1	04:44:34	20°	NW	04:44:34	20°	NW	04:46:48	10°	N
16 Jun	-0.8	03:57:25	13°	NNE	03:57:25	13°	NNE	03:57:54	10°	NNE

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>

NISAR –ISRO Synthetic Aperture radar (NISAR).

Short article from the library.

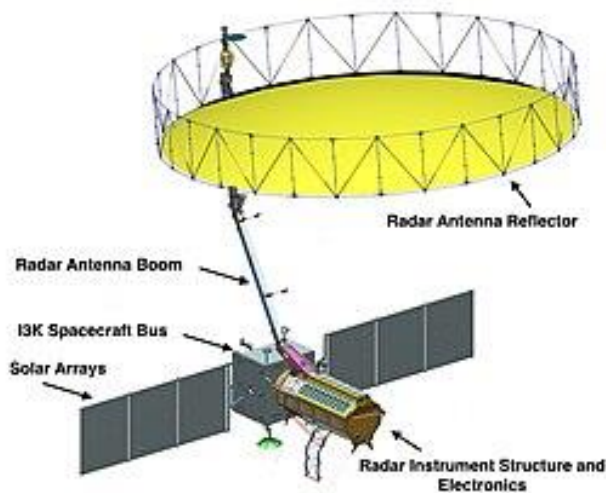
Andy Willshere

NISAR is a satellite that has been designed to gauge surface changes that may occur on our planet, as small as one centimetre. From this research, a myriad of Earth processes such as glacier and water movement to vigorous actions of volcanoes, earthquakes, ecosystem changes and the Antarctic cryosphere will be analysed. It will be used to collect radar data from two regions governed by the L-band and the S-band. Using these two bands scientists can gauge surface changes that may occur on our planet, as small as one centimetre. S-band radars are used to supply dependable and precise records, even competing with severe weather conditions. S-band radar operates at between 2 to 4 gigahertz. L-band radar operates between 1 and 2 gigahertz within a wavelength range of 15 to 30 cm. One reason to use L-band is that it contains a hydrogen line at 1420MHz and can be used to image atomic interstellar space, as well as being used for deep space communications. The Synthetic Aperture Radar (SAR) system will allow exceptionally high-resolution images to be acquired, with radar infiltrating clouds and darkness, allowing data to be collected at any time irrespective of the type of weather. Because the data collecting track width is wide, it allows Earth to be imaged in 12 days. As more and more data is acquired from the same designated sectors, any change will be immediately noted and reported.

NISAR is a joint project between NASA and ISRO (India), which will launch a dual frequency synthetic aperture radar on an earth observation satellite. This is the first type of dual radar imaging to be conducted. This will allow scientists to study everyday processes on Earth. With a total cost estimated at \$1.5 billion, it will be an extremely expensive earth imaging satellite.

The system will be capable of using highly developed radar imaging to plot how high and thick land and ice amassment is at least four to six times a month to a depth of between 5-10 meters. It has been developed to detect and measure Earth's more involved everyday processes, especially as these processes are always changing due to the effects of humanity and natural occurrences. These include tsunamis, avalanches, and rock-falls as well as those mentioned above.

It is a dual partnership mission in which NASA will provide the L-band SAR, as well as a telecommunications subsystem for GPS receivers, a solid state recording system and information about payloads. ISRO will be providing the satellite bus, S-band SAR as well as the launch transportation system and connected launch services. All of the data obtained from NISAR will be freely accessible one or two days after observation. If a natural disaster has occurred this data would be obtainable within a few hours. All data will allow scientists to understand how the planet is functioning especially due to global warming and allow them to consider future management.



Picture credit: Diagram of the joint NASA/ISRO NISAR satellite. NASA/JPL-Caltech

Mission Details.

Proposed launch date = 30 March 2024

Rocket = GSLV Mk II

Launch mass = 2,800 kg

Launch site = Satish Dhawan Space Center (India) Primary spaceport of ISRO.

Orbit Altitude = 747km : Sun synchronous

Orbit Inclination = 98.4°

Repeat Cycle = 12 days

Approximate Mission duration = 3 years

Wavelengths L and S bands 24 cm and 9 cm.

NASA and ISRO in combination have drawn up a minimum set of mission requirements. The following paragraph just mentions some of the more specific.

- a. The sampling interval will be approximately 12 days with a maximum time gap of 60 days, over pre - designated areas of Earth's land surface. This will include areas of land that may be considered to have a relative velocity of at least 1 mm a year over 50 km.
- b. Measurements of displacements of over 90% of Earth's ice covered surfaces.
- c. Sea ice velocity measurements of both Arctic and Antarctic over a specified area.
- d. Measurement of woody areas and report any worsening or recovery.
- e. Measurement of areas of farmland required for human/animal subsistence.
- f. Report occurrences and data of Earth catastrophes within a short time.
- g. Collection of both L-band and S-band information.
- h. Measurement of Coastal wind velocities especially within 200km of India's coast, and how much erosion has happened to India's coast.

One of the main problems of humanity, is that they live along coasts, and some of their industry is concerned with the coastal environment, as well as globally the seas are utilised for transportation. It is therefore essential that mapping of these areas is required to provide knowledge for future survival. NISAR will also be able to provide information about ground water in specific areas. With climate change and increasing populations both causing stress on the resources globally, indications of over water exploitation will result in subsidence. Information about flooded areas will give essential information to those working on the ground and allow safety protocols to be initialised. Rising sea levels caused by melting ice sheets have been a precursor to global warming for the last 100 years and will create risk to coastal areas especially from erosion. All measurements taken will provide data to forecast future changes, especially as inability to counter rising water levels will displace millions of people to dryer areas, which in turn will cause food shortages. Frequent and repeated data acquisition in specific areas, such as the Asian High mountain region will allow scientists to assess how fast climate change is effecting the reserve snow and ice and to calculate the point at which migration becomes essential.

The world's ever-growing population is participating in unwanted changes to our weather patterns. It is therefore essential that we try to provide ourselves with as much information to at least try to slow down the unwanted aspects of these changes to our climate, and to generate a manageable future. NISAR will therefore be an essential adjunct to our sustainable time ahead.

References:

[Home – NASA-ISRO SAR Mission \(NISAR\)](#)

[Quick Facts | Mission – NASA-ISRO SAR Mission \(NISAR\)](#)

[NISAR \(satellite\) - Wikipedia](#)

[Overview | Get to Know SAR – NASA-ISRO SAR Mission \(NISAR\)](#)

NASA/JPL-Caltech - <https://nisar.jpl.nasa.gov/mission/observatory/overview/> (image link)

The Q-Max Solar Spectrometer on the Tomline Refractor

Bill Barton

A 250mm (9¾ inch) diameter disc of Schott KG5 glass obtained through the U.K. agent SKAN of Solihull will set the Orwell Astronomical Society back approximately £900:00 (ex VAT). Although the Tomline Refractor has an aperture of 254mm (10 inches), SKAN are only able to supply discs up to this initial size. Why would we want to buy such a thing? Because it will allow us to fit a Questar Q-Max Solar Spectrometer to the Tomline Refractor. But again why would we want to do such a thing? Because in any telescope the size of the focal plane image of the solar disc can be approximated to the effective focal length of the instrument divided by 110 (or 100 to give a rough estimate). Of all the telescopes I know the Tomline Refractor has the longest focal length (3.894m) and hence the largest prime focus image (circa 35.4mm) and hence the greatest defining power. This also explains why dedicated solar observatories often use instruments of extreme focal lengths, sometimes 45m (150 feet) and, because astronomical seeing often breaks down close to the ground these instruments are operated vertically.

The ideal f ratio for this spectrometer is close to 19, but the Tomline's f ratio is 15.3 There are two ways it could be increased to 19, either by fitting a 1.25 times Barlow Lens or by stopping down the aperture to approximately 203mm (8 inches). If the Barlow Lens option was chosen life wouldn't be too hard for the lens as the KG5 objective filter would have removed the infra-red (heat) spectral component although the light that remained would be very intense. The odd amplification factor could be achieved by removing the lens from its supplied holder and substituting a shorter one (an extension tube?). The disc initially alluded above would have to be attached to the open end of the Tomline Refractor somehow. This would probably result in a loss of usable aperture. Maybe a disc intermediate in size between 203 and 250mm might be chosen.

The entrance slit of the Q-Max is 5mm by $4\mu\text{m}$ ($1/5^{\text{th}}$ by $1/100^{\text{th}}$ of an inch). In the following table it's dimensions through various telescopes have been mapped onto the solar surface.

instrument	focal length	solar focal plane image diameter	projected slit length	projected slit width
	mm	mm	miles	miles
Zeiss Telementor	840	7.6	569,100	450
Questar 3.5	1390	12.6	343,250	275
Questar 7	2540	23	188,000	150
Celestron C11	2794	25.4	170,275	136
The Tomline	3894	35.4	122,175	98

Originally Questar Instruments advertised two additional accessories for the Q-Max, a 'slit traker' (their spelling, not mine) and a 'limb scanner'. The former is a graticule eyepiece attached to a secondary port that allows the whereabouts of the Q-Max entrance slit on the solar disc to be known. The latter moves the Q-Max vertically against the optical axis of the telescope by an amount equal to the projected solar disc radius. The entrance slit would thus end up radially half on and half off the solar disc. The first accessory allows the observer to place the slit over a sunspot to observe the Zeeman effect. The second, on rotation of the Q-Max, allows different portions of the solar limb to be examined, for example, for prominences. I have devised that The operation of the 'slit traker' accessory can be replicated by the use of a flip mirror (to provide a secondary port), Herschel Wedge (to reduce the image intensity to a safe level) and astrometric eyepiece (to provide the graticule).



The Questar Q-Max Solar Spectrometer with a flip mirror, Herschel Wedge and a 12mm ($\frac{1}{2}$ inch) focus astrometric eyepiece. The graticule illumination LED (attached to the side of the eyepiece) would probably not be required in the final set-up due to the bright nature of the solar disc.



The same attached to the Tomline Refractor.



The objective end of the Tomline Refractor showing the holes in the dew-shield flange that could be used to mount a full aperture pre-filter.

Eclipse 2024 reports (continued)

A few more reports from Nigel Evens and Neil Short of the total solar eclipse of April 8th 2024 that didn't make it in last month's newsletter

Nigel Evens, Universidad Automona de Chapingo, outside Torreón, Mexico

Most eclipse-chasers set off for either Mexico or Texas where the probability of seeing the event was highest. We elected to travel with Astro-trails to the Universidad Automona de Chapingo outside Torreón in Mexico, where the eclipse would be of duration 4m 27s at an altitude of 70°. We flew from Mexico City to Monterrey, then took a three-and-a-half-hours coach journey to Torreón itself, arriving the night before the eclipse.

Eclipse Day!

We were due to leave our hotel for the observing site at 8.00am (local time), with the journey expected to take about an hour. C1 was just after 11.00am. First problem: no coaches! This is Mexico. Our coaches never arrived as someone else, somewhere had use of them... Oh, problem solved... the coaches that had brought us from the airport were available and were pressed into service, some 60 minutes behind schedule. We arrived at the observing site at about 10.00am, to find a soccer field full of our eclipse-chasing mates from other hotels, all set up. Or not.

Second problem: it was overcast. Before a total eclipse, the Sun has two vital functions to perform: first to act as a focus target for all the expensive imaging equipment and second to provide a signpost towards north to enable alignment of driven mounts. When it's overcast, neither function is possible!

For focussing, I pressed into service the rather low-contrast view of the distant horizon. Mr Compass came to the rescue for the (approximate) alignment of the driven mounts. The only redeeming feature of the clouds was that they stopped us from being boiled alive: in recent days it had typically been 28°C, exceedingly dry, dusty and windless but on eclipse day it was more like 15°C.

C1 came and went, invisible behind the cloud. With 30 minutes to go to C2, we saw the Sun – briefly. At about 10 minutes before C2 we could see darkness in one corner of the sky and I switched on the four video cameras, more in hope than expectation. At this time I realised that I had not focussed the flash spectrum camera. Normally I would focus it on the Sun with a solar filter in place - here the clouds were so thick that I was able to focus directly (via an electrical viewfinder).

With less than a minute to C2, the filters came off and equipment started to click and purr. A cheer went up as the shadow of the Moon reached us and we caught our first glimpse of the corona, albeit through some quite thick clouds. But one of my computer-driven cameras (it turned out to be Camera 1) was not purring. It was not obvious what was wrong so I followed the first rule of eclipse photography: don't try to fix anything during totality; just abandon it and watch the event!

Apart from the eclipsed Sun, Venus and Jupiter should have been easily visible in the sky, with Mars and Saturn a bit harder to find. But not even Venus was visible! I looked around at the colours of the horizon and in the latter minutes watched the development of a lovely pink prominence at the 5 o'clock position on the solar disk, following the Sun with binoculars all the way to C3 – and another round of cheering.

After C3 the skies became clearer. I restarted Camera 1 to record the outgoing partial phases then disassembled the mounts whose work was done. By fourth contact, C4, standing out in the Sun was pretty unpleasant.

As I trudged back to the bus, I started to suffer a bit – was it dehydration, sunstroke or just exhaustion in the heat? At 2:00am the following morning, the answer came when I had to hurry to the bathroom...

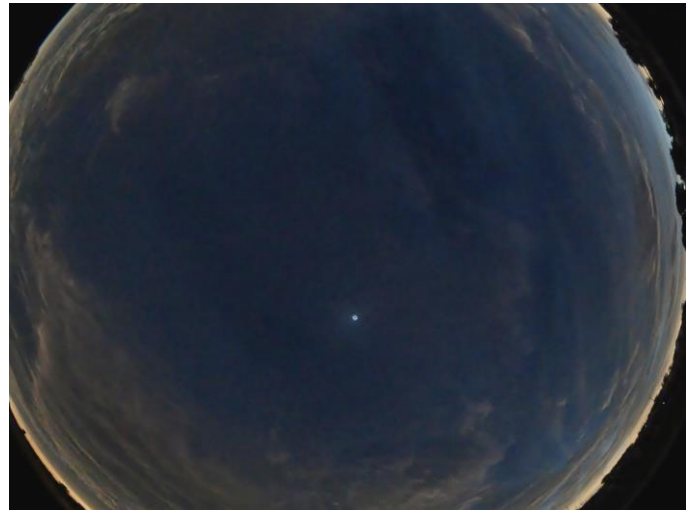
Post Mortem

Most of my efforts at photography were thwarted by the presence of cloud. In addition, for reasons unknown, Camera 1 lost contact with the laptop about 10 minutes before totality. Camera 2 dutifully photographed the same piece of sky again and again, hoping to catch the comet. It failed to catch the comet, but did occasionally capture Jupiter, some 6 magnitudes brighter. Cameras 3 and 4 worked, but conditions rendered worthless their images of the flash spectrum and shadow bands. Cameras 5 and 6 recorded memorable footage of such a cloudy event, even revealing a tiny white doughnut (the eclipsed Sun!) in the sky.

Many others in the group have their own tales of woe: cameras that recorded nothing useful, or caught out-of-focus views. However, some observers did capture very impressive images during fleeting gaps in the clouds. But the main thing is that we saw the eclipse.

Below are still images taken around mid-totality spanning from before C2 until.

Videos available at [OASI: eclipse](#)



Neil Short - Tiffin, Ohio



Hi to you all. I'm once again in the good old USA and, as with my 2017 Input from Idaho, I'm on a mission to see a further total solar eclipse. Again, as with the 2017 eclipse from Idaho, we had the luck that the path of totality once more passed over the location of one of my wife's family, this time her cousin Eric in Tiffin Ohio. Tiffin is a small town, population around 18,000, in the Northwest of the state.

That's the good news. The not so good news was, being in Ohio, the clear sky probability in April at this location was not too good being at best around 50%.

Come the day, April 8th, the early morning sky offered great promise with a largely blue, cloud free sky. Cousin Eric, our good friend Jim from "nearby" Cincinnati plus Katherine and myself settled down on Eric's driveway (not one of the great backdrops) to await the progression of the eclipse, starting around 13:00 (start of totality at 15:12) and finishing around 16:30. However, with a forecast for showers later in the day, cloud levels increased through the morning with matched increasing concern.

Fortunately, the heavy cloud stayed away, the light became monochrome, the birds were silent, and the odd dog barked, and, with the high but thin and wispy cloud present, the moment arrived...

Few words are required to describe totality, a tremendous event and gloriously moving. We had some 3mins 52 secs of totality at our location so, this time, I could take the odd photo but also still find the time to actually look at the eclipse.

All too soon it was over however, but fortunately the cloud and rain gods had remained silent. We could all now relax and enjoy the end of another wonderful day.

The next day we bought the required t-shirts of the event (see photo with Myself, Katherine, and Jim) before it would be time to move on. It's Chicago next and then a flight to Hawaii with the promise of another couple of sites of astronomical interest to see (with the potential for another Newsletter input or two to follow), watch this space...



Aurora 10th May 2024

Here are some reports and photographs of the amazing Aurora visible over the entire UK on May 10th 2024

Martin Cook, north of Ipswich

An aurora was predicted for the night of 10 May 2024 and the two apps that I use were screaming notifications and red alerts! At 20:45 UT I took test photos from the bottom of my garden. The sky was still quite bright and I could not see any sign of an aurora. Arriving back indoors, my phone pinged as I received a WhatsApp message from Toni Smith saying that she could see an aurora from Grundisburgh.

I quickly grabbed my camera equipment and set off towards Playford with Judith (Mrs Cook), arriving at a parking spot that I have used previously. I pulled in beside another car; usually, there is nobody else there, and few passing cars. A man was standing in front of the other car and it was obvious that he was there for the aurora. I set up my camera, a Canon ESO 850D, on the tripod and connected it to my tablet. I used the Android app DSLR Controller to change settings on the camera: it is easier than fiddling with the buttons on the camera in the dark!

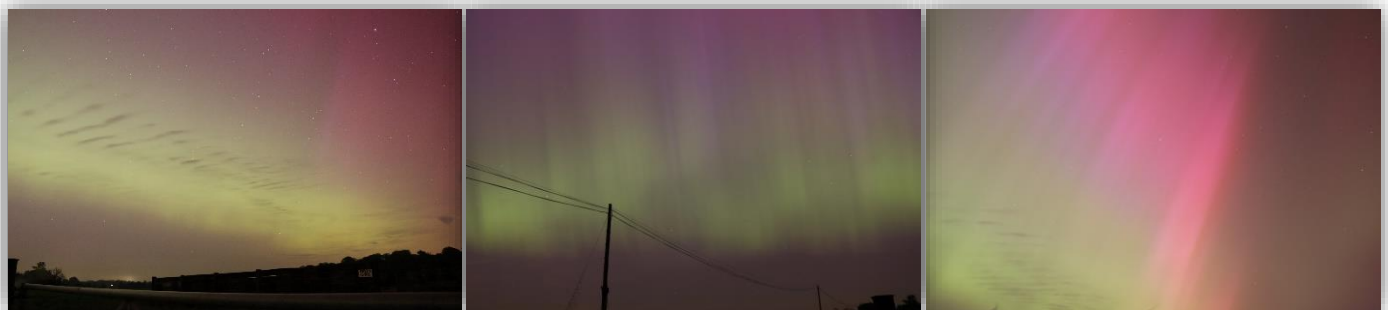
By 21:12 UT I had taken a few test shots towards the north, but without success. I struck up a conversation with the man standing in front of the car and he suggested that I try further towards the east. He showed me the live image on his iPhone screen, which clearly displayed an aurora; unfortunately it was not visible to the naked eye.

I fired off several shots until I found a suitable exposure of 15 s at 1600 ISO. At this time, it became apparent to the naked eye that a faint red glow was appearing, and very soon this developed into rays of red reaching high into the sky. I reduced the exposure time to 8 s and then 5 s and then... Wham! The whole sky was illuminated from east to west.

Cars kept arriving, parking further up the road, and people were standing on the roadside. Through traffic had to negotiate the parked cars: the drivers must have wondered what was going on! An observer standing near me was pondering whether to stay or go home and wake up his wife so that she could see the spectacle: he wasn't sure if she would be pleased to be woken! A family arrived and tried to photograph their daughter sitting on a five-bar gate with the aurora in the background.

As the aurora brightened, I reduced the exposure time of my camera to 2 s. The auroral display covered much of the sky so I repositioned the camera to capture a different view. The sky seemed to be alive with different colours and structures, appearing and then disappearing. It was difficult to know where to look!

At about 10.45 UT the camera flashed low battery. The aurora was fading so we decided to head home. The aurora was still visible as we arrived home but, when I looked out later, only stars were visible.



Andy Gibbs, East Ipswich

Just before 22:00 UT, despite the light pollution around my home, I could see a green glow and large arcs of red stretching across the sky. I hastily went into my garden, and for the next hour witnessed, by some margin, the finest auroral display that I have seen from Suffolk.

The images below were taken with an iPhone SE 3rd generation. Compared to some more expensive iPhones and Android phones, the camera is limited but, using the Nightcap app, I had some control over exposure



Toni Smith, Grundisburgh

Once the Sun had set and it was getting dark, I kept checking outside to see if there was any sign of an aurora. Just after 9.30pm, my phone camera revealed a faint pink colouration in the sky. I jumped into the car and drove to an area in Grundisburgh where I knew there would be little light pollution. Once there I wasn't disappointed! Initially, the aurora was not visible to the naked eye, but I could capture it with my camera, using a 10 s exposure, as a pink and green colouration. Just after 11.00pm the sky came alive with colour and I was totally amazed at what I could see with the naked eye, especially at a location so far south in the UK! The photos below were taken on an iPhone 12 Pro Max using a 10 second exposure.



Mike Such – near Woodbridge

The following photos were taken with an iPhone 11.



Steve McElvanney, Melton

The following photo was taken with a Canon EOS 800D.



Mike O'Mahony, Felixstowe

The following photo was taken with a Canon EOS 60D.



Nigel Evans, East Ipswich

The most intense auroral display visible over the UK for 20 years - and I missed it as I was away! An auroral display hangs in the sky like a series of curtain drapes and usually any auroral activity visible in Ipswich is the top of an aurora hundreds of km to the north. On this night however, auroral activity was much further south than usual. Fortunately, although I was absent, my meteor cameras were not, and captured the event!



All the cameras have had their IR filters removed so are very sensitive to red light and can record an aurora even if it is invisible to the naked eye. Each is equipped with 4 mm lens, giving a field-of-view of approximately 83°x47°. The video files below have been reduced in size and speeded-up by a factor of 100 to make them manageable. Note that several show initially light sky background, as it did not become really dark until approximately 21:30 UT.

My north-facing camera is normally the only one that records auroral activity low down on the horizon. At first, around 21:20 UT, something could be seen in the sky in the distance. By 21:45 UT a dark lane was visible under the feature. Usually, the dark lane would be cloud; however, on this occasion, things were different, and the dark lane was normal dark sky, and the feature above it was luminous. By around 22:07 UT the auroral glow became more intense and visible in other cameras.

Adam Honeybell, Needham Lakes and “The Strand” by the Orwell

I’ve seen the aurora before in Iceland a few years ago, but I have always wanted to see them from home turf too, especially since they’ve been seen before (and I missed them!). Usually the conditions aren’t favourable – full moon, cloudy sky or simply not strong enough. I did actually get the faintest glimpse of an aurora a few weeks earlier (see previous newsletter) and I’m not sure I actually saw it visually, it was just by reviewing a sequence of photos that I noticed it at all.

Since the aurora alert level had hit red and has a KP level up in the 1000nT range, I thought this was the best chance we’d get in a long time to see anything. But I live along a busy street and the light pollution would make it all but impossible to see anything from my house. So, Naomi and I went out to Needham Lake around 10pm as its not too far away, and plenty dark enough. I set up my camera and remote and took some quick but very high ISO images just to see if there was anything at all in the sky. At first the sky was its usual blue. But I continued for around 20 minutes and thought *maybe* there was something low on the horizon, but could have easily been the glow of housing estate in the distance so I wasn’t convinced. But...comparing a photo to one I took 20 minutes earlier showed a marked difference in colour, the sky was quite green! Zooming into the photo and scrubbing the dial back and forth showed distinct vertical rays shimmering. I have an animation of these takes over the 20 minutes. Had this been all there was to see, I’d have been quite pleased. But gradually I started to notice that there were pale bands of colour right overhead. Being relatively dim, they don’t register a strong colour to the naked eye, but taking a photo with my smartphone and DSLR showed very intense colour, red, pinks, greens and blues. The auroral arc was indeed right overhead and covered half the sky!

I took many photographs that night, but since I wanted to localize the images (because to be honest all the photos from that night do look pretty similar) Naomi suggested trying to get the Orwell Bridge in shot. So after maybe an hour, we went down to the strand – where a great many people had already gathered, and took some more photos. Since the towns lights are quite bright it was harder to get a good image, but I managed it eventually.

I use a Pixel 6 pro mobile, and a Canon 7D (Mk1) with a 24mm pancake lens and a Samyang 18mm (which needs to be manually focussed – which is rather difficult to do in the dark!).



Paul Whiting - Off the coast of Aberdeen



Little did I know that the cruise around the UK I was about to embark on would lead to one of the best auroral displays I have ever seen.

It was totally by chance that I had 50 minutes or so to kill before the taxi was due to take me to Dover to pick up the ship. So given the Sun was shining, I thought I would take a picture of the huge sunspot group that I had been following for a few days.

Figure 2: The sunspot region (AR3664) that caused the storm
(SeeStar S50)

I noted that the aurora forecast for Friday was for a Kp index of 5, but I thought no more of it, suspecting that the skies would be cloudy in Scotland in the North Sea. I also did not bother taking my Nikon camera with the trusty Samyang wide-angle lens, again thinking it would be no good for long exposures aboard ship.

Given the high latitude, there was a very late sunset – it was gone 11pm before it was properly dark. The BBC news was full of aurora reports around Europe, so I was quietly confident we might see something. Then I received the SPA and BAA aurora email alerts. By now the Kp index had increased to 8 with a very highly southerly geomagnetic field (Bz around -40). The game was on!

Luckily my balcony faced north so I spent the first hour from 10pm “patiently” waiting for it to get dark enough to see anything. Stubbornly the evening twilight hung on. By 11pm someone had managed to contact the bridge to get the observation deck lights switched off

After a slow start, first the reds then the purples and greens became obvious - to a camera. For over an hour the activity could be seen in every direction, for most of the time the centre of activity was overhead, producing the most magnificent corona formation effect I have ever seen.



Figure 3: corona structure seen from the ship

I tried taking images with my Sony compact camera and with my phone camera, but despite setting up night mode on both, I was very disappointed with the results. Diana’s phone camera on the other hand provided

magnificent live views of the auroral structure and colour, and she shot over two dozen images. However, they all turned out to be grossly underexposed. Was I wrong to expect what you see is what you get? Perhaps something can be done in “post-production” to rescue them.

After an hour or so bed called, despite the feeling of FOMO!

The following day, Saturday, the solar storm showed no signs of respite. By mid-morning the Kp index had topped at 9 (“Intense Storm”). However, from the UK the peak of auroral activity was during daylight hours so this time we missed out. By twilight (11pm) the Bz had turned positive (around +8), meaning the stream of solar particles was steered away from the Earth. So, despite a few possible sightings around midnight, no real joy.



Figure 4: The Author's Aurora Warning app

Sunday showed some abatement, with a maximum Kp of 7, the Bz also played fair. However, for us, now in Ullapool, the weather closed in. The next two days are forecast for the Kp index to be raised - >4, which meant that we may get a couple of more chances to see the results of this amazing storm. Of course the weather had other ideas!

There was some good news however. The ship's photographer took some wonderful images of the whole



were taken on board the ship.

evening. The following images

Figure 5: Images taken on board

“The once in 30 year event”

Apparently this was the most powerful solar storm since 2003, with the Kp index achieving a maximum value of 9 for over 24 hours, categorised as an Intense Storm. The official solar storm classification was class 5 Severe, again the maximum classification.

All this was fine, but for aurora to appear, the Earth’s magnetic field also had to play ball, with the Bz value becoming negative. The value at 9.30pm was around minus 40. And the icing on the cake - the sky was clear!

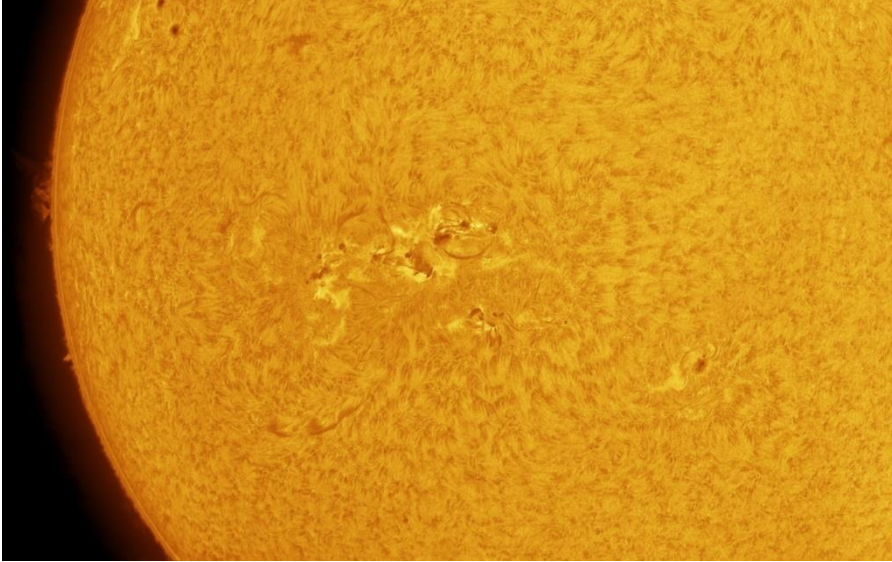
What caused it?

Major sunspot regions AR3663 and AR3664 repeatedly erupted between 3rd and 9th May, spewing much ionised plasma into the solar system. On 7-8th May seven CMEs erupted Earthwards, including several X class solar flares. This is what caused the storm and the magnificent displays of aurora seen pretty much all over the world, down to 26 degrees magnetic latitude (both North and South).

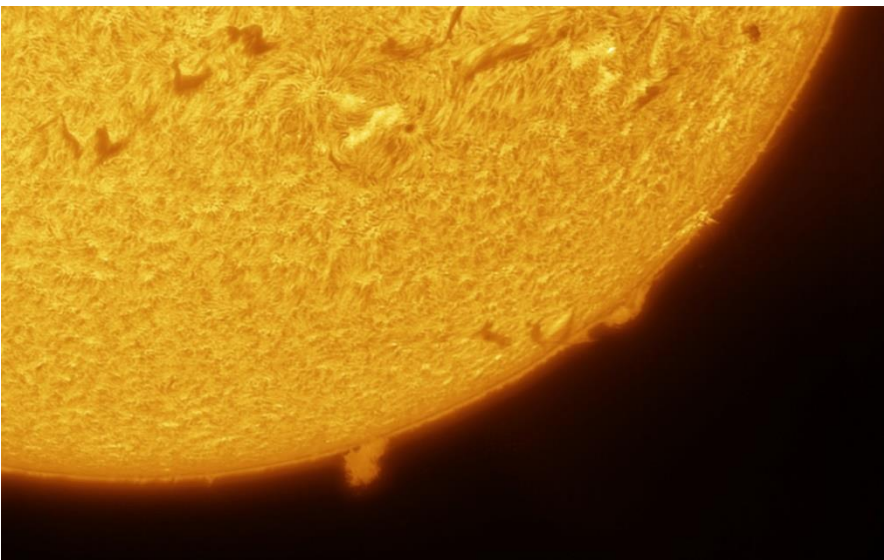
Member's Observation

John Hughes – Solar images

Active regions captured 18th April 2024 08:23 UTC using William Optics Z61 refractor, Sky-Watcher EQ6R-Pro mount, DayStar Quark Chromosphere, Tilt Adapter and ZWO ASI174mm camera. 200 from 1,000 frames stacked and flat calibrated using AutoStakkert3! Exposure time 18 ms, Gain 0. Resulting stacked image was processed in PixInsight using the new SolarToolBox.



Proms on the south west limb. Captured 08:18 UTC. Exposure time 14 ms. Frames stacked 250. Equipment as above including a Tele Vue 4x Powermate.



John Hughes – Collimation test on M51

After years of tinkering with the StellaLyra Ritchey-Chretien collimation I made a concerted effort to sort this out last week. On Monday 29th April 2024 I took the 8" RC out for a star test to check collimation and then pointed it at M51 which was just coming up to the Meridian. Attached is the resulting image which I am very pleased with.

StellaLyra RC8 scope, Sky-Watcher EQ6R-Pro mount, ZWO ASI294MC camera and Baader 1.25" UV/IR Cut filter. This image represents 34 minutes of integration time.

