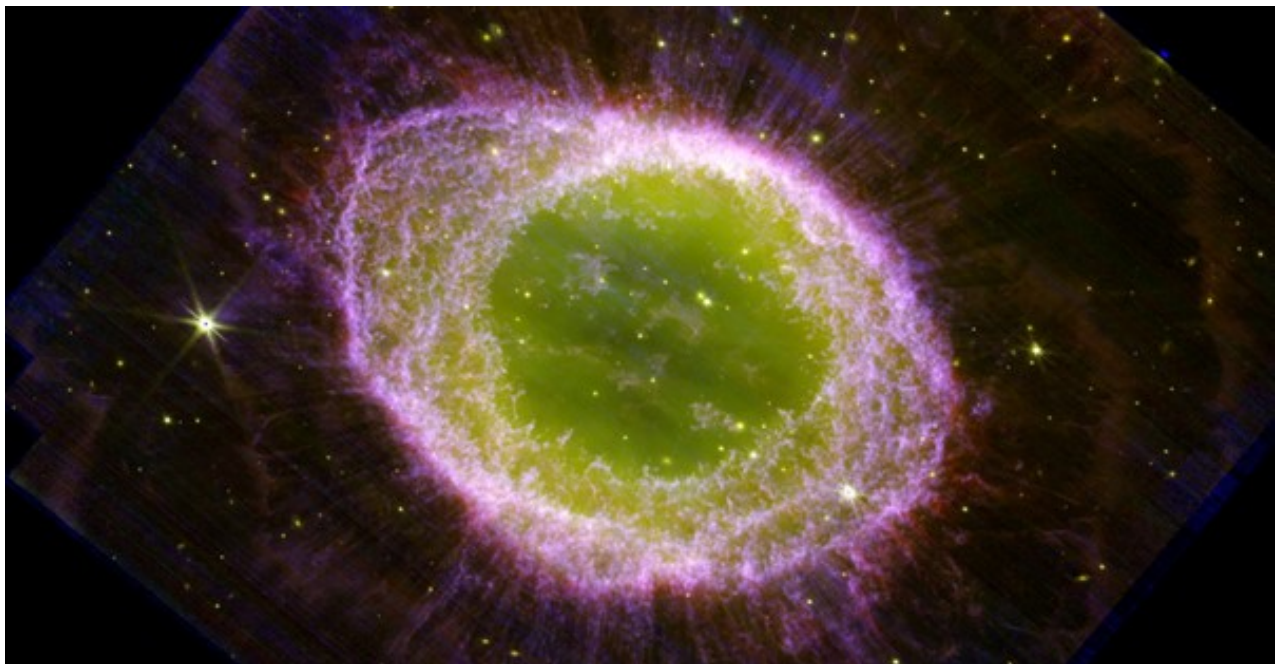




OASI News

The newsletter of Orwell Astronomical Society (Ipswich)

James Webb Telescope snaps old favourite in greatest detail yet



The Ring Nebula in all its new enhanced composite detail

Trustees:

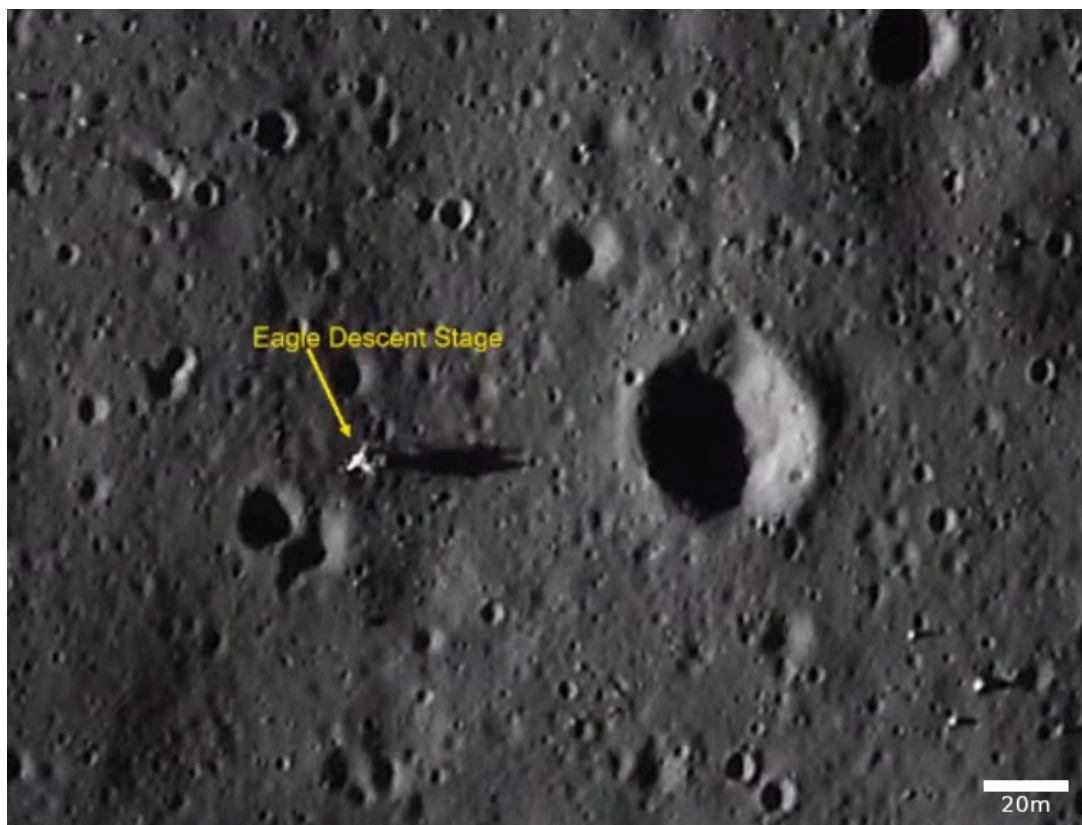
Mr Roy Adams Mr Neil Morley Mr David Payne

Honorary President:

Dr Allan Chapman D.Phil MA FRAS

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Apollo 11 LEM (Eagle) descent stage taken by India's Chandrayaan- 2 Lunar orbiter.

Society Notices

Dear Members,

I hope that you have been enjoying the recent run of warm, clear nights. The Summer Triangle has been almost overhead, with the Milky Way winding through Cygnus and the popular targets, M57 The Ring Nebula and M27 the Dumbbell Nebula. There are also the stunning Double Stars Albireo and the Double Double, (Epsilon Lyra). Plus, of course, Saturn is a prominent sight in the evening skies and Jupiter is also now visible in the late evening.

Don't forget that Bill Barton presents a Night Sky guide for the month ahead at our Newbourne meetings held on the 4th Monday every month.

At our recent Committee Meetings we decided to postpone our proposed Open Evenings at Orwell Park Observatory, which we planned to hold in October, until February 2024. We need to have a plan in place which would prevent the overcrowding which occurred during our last event in October 2022. To run any future event safely, would involve a large number of members to help out. Unfortunately, three of our regular helpers have passed away in the last few months.

We would gratefully thank anybody who could step forward to fill the roles of Meeters and Greeters, Car Parking Stewards and Operators of telescopes on the sports field, (you can bring your own or use one of the Society's instruments). You don't have to be an expert and training can be provided for any role. If you would be prepared to help out in any way, please let myself or any Committee Member know.

The Open Evenings are OASI's most important outreach event of the year, giving OASI the chance to showcase the Observatory and Astronomy to the public. It would be a shame that we would be unable to safely hold any future events, due to a lack of volunteers.

Thank you and I hope to see you at a meeting during October.

Clear skies!

Andy Gibbs, Chairman

Society Contact details

Email queries: info@oasi.org.uk

Facebook: Orwell Astronomical

Twitter: @OASIPswich

YouTube:
<https://www.youtube.com/channel/UCHgxe3QAeRVWf7vkjKkCI2Q>

Members-only message board

<https://groups.io/g/OASI>

Observatory (meeting nights only)

07960 083714

**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

Access into the School Grounds and Observatory Tower

Orwell Park School have changed our access route to the observatory.

The new route will be 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.

Articles for OASI News

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

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."

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.

OASI Lecture

The Optical Tracking of Spacecraft

Friday 10th November 2023

Nick James will be giving us a lecture starting at 8pm at St. Augustine's Church Hall, Bucklesham Rd, Ipswich IP3 8TH

Committee 2023

Chairman	AndyGibbs	Set overall agenda for OASI, Chair committee meetings, Press and publicity
Secretary	RoyGooding	Outreach meetings (jointly with Chairman), observatory decoration
Treasurer	PaulWhiting	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
	MartinCook	Membership, Tomline refractor maintenance & user testing
	Matt Leeks	Safety & security
	Peter Richards	Lecture meetings, Email distribution lists
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club
	Andy Willshere	Librarian Newsletter, OASI @ Newbourne

For newsletter and Newbourne please contact Paul Whiting,

Committee Meeting

The next Committee Meeting will be on Friday 1st December at 8:00pm via Zoom. All members welcome.

Welcome to new members

no new members this month.

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.

If you want to easily add OASI Events to your own computer/phone/tablet calendar

application click this button on the website Events page (bottom right of the calendar)



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

<https://calendar.google.com/calendar/ical/Ijhs9db7Incki4sojo7092vfvc%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>

Date, Time & Location	Contact	Event
Weekly, every Wednesday, from 20:15 Orwell Park Observatory, Nacton	Martin Cook, Roy Gooding	Observatory open
Tuesday 3 rd , 17 th , 31 st October 19:00 Zoom	Paul Whiting	Beginners Astronomy Course continues
Monday 9 th October from 19:30 Newbourne Village Hall	Paul Whiting	OASI@Newbourne Beginners and new members welcome Talk: "So who's this STEVE then?" Paul Whiting
Thursday 19 th October 20:00 Zoom	Paul Whiting	Monthly Zoom Meeting
Monday 23 rd October from 19:30 Newbourne Village Hall	Paul Whiting	OASI@Newbourne Bill Barton : Night Sky Guide Astro News : Paul Whiting Beginners and new members welcome

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.

**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 2023

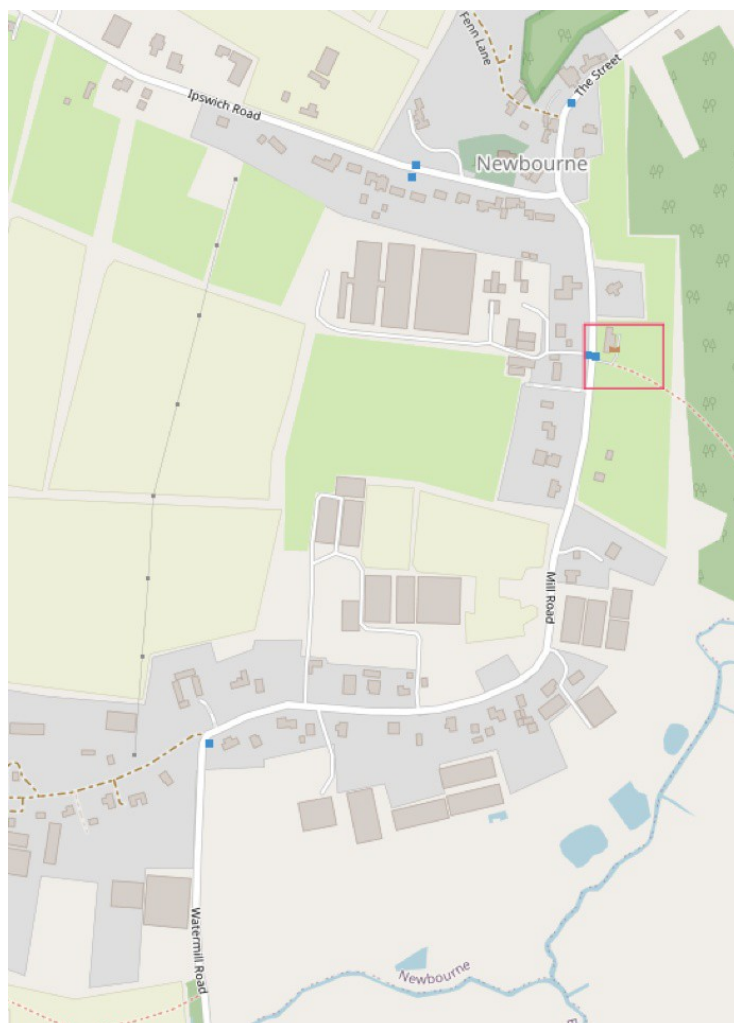
October	9 (T*)	23 (S/A)
November	13	27 (S)
December	11 (A/Q)	

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).

***Monday October 9th – Newbourne**

"So who's this STEVE then?"

**Paul will give a talk about the aurora, introducing
its new, strange forms**



BAA news & webinars

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

25 October 2023

BAA AGM 2023

9 December 2023

BAA Christmas Meeting 2023

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>.

<p>Fri. Oct. 6th</p> <p>19:30 BST</p>	<p>Marcus Leech</p> <p>President. Canadian Centre for Experimental <i>Radio Astronomy</i></p>	<p>Amateur SDR based interferometry, hardware and software.</p> <p>(Getting started)</p>
<p>Monday Nov. 13th</p> <p>19:30 GMT</p>	<p>Prof. Sean Paling</p> <p>STFC UKRI</p>	<p>Deep Science at Boulby Underground Laboratory</p> <p>The search for Dark Matter and Beyond.</p>
<p>Christmas lecture</p> <p>Fri. Dec. 1st.</p> <p>19:30 GMT</p>	<p>Prof Clive Tadhunter Department of Physics and Astronomy University of Sheffield</p>	<p>Active Galactic Nuclei (AGN) emit at least as much radiation by themselves as the integrated light of all the stars in a typical galaxy, yet this radiation is produced in a region that is smaller than the solar system.</p>

Member's Images of Saturn



Carl Baldwin. 2023Sep03
Telescope: Sky-Watcher Skymax 180 Pro
(Maksutov-Cassegrain)



Andy Gibbs. 2023Sep03
Meade 200mm LX200 ACF telescope with 2x Barlow lens,
ZWO ASI 178MC camera.

The Night Sky in October 2023

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

Sun, Moon and planets

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

October 2023

Object	Date	Rise	Set	Mag.	Notes
Sun	1	06:55	18:33		
	31	06:47	16:29		
Moon	1	20:58	10:39		Last Quarter 06 October 14:48 Apogee 10 October 04:42 New Moon 14 October 18:55
	31	17:30	10:24		First Quarter 22 October 04:30 Perigee 26 October 04:03 Full Moon 28 October 21:24
Mercury	1	05:31	18:16	-1.0	
	31	07:34	16:34	-0.7	
Venus	1	02:58	16:52	-4.4	
	31	02:24	15:06	-4.2	
Mars	1	08:23	18:54	1.7	
	31	07:23	16:34	1.5	
Jupiter	1	19:43	10:22	-2.7	
	31	16:38	07:04	-2.8	
Saturn	1	17:37	03:25	0.6	
	31	14:37	00:21	0.7	
Uranus	1	19:55	11:14	5.7	
	31	16:55	08:10	5.6	
Neptune	1	18:15	05:47	7.8	
	31	15:16	02:45	7.8	

Occultations during October 2023

https://iota-es.de/moon/grazing_descr%101.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 October 2023

Shower	Normal limits	Maximum	ZHR at Max	Notes
Draconids	06/10 – 10/10	08/10 - 09/10	10	Associated with Comet 21/P Giacobini-Zimmer
Southern Taurids	10/09 – 20/11	10/11	5	Few, very slow meteors
Northern Taurids	20/10 – 10/12	12-13 Nov	5	Very slow meteors
Epsilon Geminids	29/09 - 02/11	18/10	3	

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_spa/meteor/radio-meteor-observing-2020/.

Comets

Source : <https://heavens-above.com/Comets.aspx> on 22/9/23.

Comet	Brightness	Date of last reported observation	Angular separation from Sun	Constellation
C/2023 P1 Nishimura	4	2023-Sep-21	14°	Virgo
C/2023 H2 Lemmon	9.3	2023-Sep-18	44°	Ursa Major

Visible ISS passes >30° max altitude for October 2023

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

Times are **BST**.

Predictions are approximate (22/9/23) due to craft adjustments. Check the day before.

Date	Bright-ness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
23-Oct	-3.2	06:52:20	10°	WSW	06:55:37	56°	SSE	06:58:54	10°	E
24-Oct	-2.8	06:04:30	18°	SW	06:06:41	42°	SSE	06:09:52	10°	E
25-Oct	-2.4	05:17:40	31°	SSE	05:17:44	31°	SSE	05:20:45	10°	E
25-Oct	-3.7	06:50:51	10°	WSW	06:54:12	77°	S	06:57:33	10°	E
26-Oct	-3.6	06:03:36	29°	WSW	06:05:08	66°	SSE	06:08:28	10°	E
27-Oct	-2.9	05:16:34	46°	SE	05:16:34	46°	SE	05:19:20	10°	E
27-Oct	-3.7	06:49:26	11°	W	06:52:41	84°	S	06:56:01	10°	E
28-Oct	-3.8	06:02:20	37°	W	06:03:31	82°	S	06:06:53	10°	E

29-Oct	-2.8	04:15:10	47°	E	04:15:10	47°	E	04:17:42	10°	E
29-Oct	-3.7	05:48:02	13°	W	05:51:01	74°	S	05:54:21	10°	ESE
30-Oct	-3.8	05:00:50	43°	W	05:01:48	82°	S	05:05:09	10°	E
31-Oct	-2.5	04:13:36	41°	E	04:13:36	41°	E	04:15:55	10°	E
31-Oct	-3.3	05:46:27	14°	W	05:49:09	52°	SSW	05:52:25	10°	ESE

Starlink passes

<https://heavens-above.com/AllPassesFromLaunch.aspx>

For a dynamic 3-D display, see <https://heavens-above.com/StarLink.aspx>

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>

Forthcoming Outreach Programmes

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.

Norwich Science Festival, The Forum, Norwich

Thursday 22nd February



Telescopes "Under the Stars"

Four members were out in the Suffolk Wilderness on 7th September with telescopes. Literally – there is a place called The Wilderness, it's a very posh venue for weddings and corporate events in the middle of some woods, miles from nowhere on the Sibton Estate. We were there to help launch a new perfume called "Under the Stars", initially only sold by Harrods!

All the glossy magazine people and the "influencers" were there. I had to give a two minute introduction to the stargazing that had to include Namibia! Apparently this is where the fragrance was thought up. The guests were tucking in to champagne and some delicious 5 star food, meanwhile we were offered orange juice and coke!

The evening couldn't have been better – fantastic weather (apart from a thickening mist) with Jupiter, Saturn and the Milky Way proving to be the favourite objects to look at.

PW

History Corner

Rev Robert William Barber (1853-1928)

Bill Barton FRAS

Robert William Barber was born in Heage, Belper, Derbyshire to the Reverend Richard Barber (1811-1883) and his wife Ann (1826-1908) in 1853. All together Richard and Ann had five sons and three daughters. This was a religious family as not only was the father a minister in the Church of England, but three of the four sons that survived to adulthood also became clergymen. The subject of this biography, Robert William Barber, entered Magdalene College, Cambridge on July 1, 1872 at the age of 19 years. He gained a B.A. (Bachelor of Arts) degree in 1876 and an M.A. (Master of Arts) in 1879. Robert's first step in the Church was to be ordained a deacon, which also happened in 1879. Following several promotions he was appointed as Vicar at Thurston, West Suffolk between 1896 and 1903. After a period out of the county he returned to Suffolk to be Rector of St Mary at Stoke, Ipswich from 1907. He left Suffolk eight years later in 1915 and, in retirement lived in Canterbury, Kent. He died there on April 22, 1928, at the age of 73 years.

As far as family life is concerned he married Adeline Elizabeth Guinness (1865-1955) at St. George's Church, Hanover Sq. London on July 30, 1884. They went on to have three children, two sons and a daughter.

Although he occasionally wrote to local Suffolk newspapers on non-astronomical subjects, Robert Barber had four letters published concerning his observations of the inner planets of our Solar System. He used a 2¾inch (70mm) aperture refracting telescope of unknown focal length or maker. Also how his instrument was mounted is, again, not known.

Transcriptions of his letters are appended below:

OCCULTATION OF VENUS.

TO THE EDITOR.

SIR,- Some of your readers may like to know that on Sunday last, May 22nd, the re-appearance of Venus behind the moon's limb was favourably observed here at 7.32 p.m. The planet looked like an exquisite pearl hanging on the edge of the thin crescent. It occurred in daylight (the sun not setting till twenty minutes later), but was easily visible without the aid of a telescope.

I may add that on the previous evening I saw the youngest moon I ever remember. It was only 31½ hours old.

Yours faithfully,

ROBERT W. BARBER

Thurston, May 23rd.

[Bury & Norwich Post, May 24, 1898, p.8]

THE PLANET VENUS.

TO THE EDITOR.

SIR,-It may interest some of your readers to know that the planet Venus (now such a beautiful object in our evening sky) is at present easily visible in broad daylight, and will be so for the next month. Between two and three o'clock the planet may be looked for about due south, only almost overhead, as high in fact as the sun is at midday about June 21st. Just now Venus through a telescope resembles the moon a little past the third quarter. The planet itself will rapidly become larger, as it approaches us, while the beautiful crescent will become thinner, till at last it is lost in its nearness to the sun. This year, owing to its high altitude, we ought to follow it much longer than usual.

Should any of your readers be passing this way any bright afternoon, if I happen to be at home, I should be glad to show them what there is to see through a 2¾in. telescope. After sunset the planet is almost too dazzling to be favourably observed.

I am, Sir, yours, &c.,

ROBERT W. BARBER

Thurston Vicarage,
May 14th, 1900.

[Bury & Norwich Post, May 22, 1900, p.7]

After a period out of Suffolk, and after his re-location to Ipswich.

THE PLANET VENUS.

To the Editor.

Sir,- This beautiful object, which after sun-set is too dazzling for observation, may be well viewed through the telescope at an earlier hour. I cannot vie with Miss Grace Cook, of Stowmarket, but if any would like to see Venus through my much smaller telescope I shall be happy to show the planet any clear day during the next fortnight between 4.30 and 5.30 p.m. It is interesting to note its rapidly narrowing crescent as it approaches the sun.- I am, etc.,

ROBERT W. BARBER

St. Mary Stoke Rectory, Ipswich,
March 2nd, 1913.

[East Anglian Daily Times, March 4, 1913, p.5]

And finally.

TRANSIT OF MERCURY.

To the Editor.

Sir- May I supplement Miss Grace Cook's letter, in the East Anglian Daily Times of November 5th, by saying that, if the weather is clear on Saturday, between 10 a.m. and 2 p.m., I shall be happy to show through a moderate sized telescope (2¾in. refractor) what is to be seen of Mercury's passage across the Sun's disc.

Mercury is a very small planet (about half the size of Africa), at a great distance from us. It will only appear as the tiniest black dot. It is of no use to come to Stoke Rectory after 2 p.m. and the sky must be quite clear.- I am, etc.,

ROBERT W. BARBER.

Stoke Rectory, Ipswich.

[East Anglian Daily Times, November 6, 1914, p.4]

The Miss Cook referred to in the last two letters is Alice Grace Cook (1877-1958) of Stowmarket, who had the use of a much larger 5 inch (125mm) aperture refracting telescope at the time.

We can gauge the each of Robert Barber's observational reports against contemporary ephemerides to check his skill as an observer:

Venus in 1898.

Venus passed through superior conjunction (far side of Sun) on February 15, followed by greatest eastern elongation (evening apparition) on September 21.

1, A lunar occultation of Venus was predicted as occurring between 6:54 p.m. and 7:32 p.m. on May 22.

2, Sunset on May 22 was predicted as 7:52 p.m. (i.e. twenty minutes after the end of the occultation).

3, New moon occurred at 12:58 p.m. on May 20, and on May 21, Sunset was around 7:53 p.m., moonset was at 9:23 p.m., and Venus set at 10:02 p.m. So a new moon could have been seen on that evening around 8:30 p.m. when it was 31½ hours old. [Data from *The Observatory*, vol. 21 (1898), pp. 2, 7 & 10]

Venus in 1900.

Greatest eastern elongation (evening apparition) was on April 28 followed by inferior conjunction (between us and the Sun) on July 7. So in mid-May its phase would have been somewhat less than half. The planet's maximum northerly declination was on May 21, at 26° 53'. [Data from *The Observatory*, vol. 23 (1900), p. 7]

Venus in 1913.

Greatest eastern elongation (evening apparition) was on February 12, followed by inferior conjunction on April 24. So in the first half of March, again, it's phase would have been somewhat less than half, a very similar presentation to three years earlier. [Data from *The Observatory*, vol. 36 (1913), p. 6]

Finally, the transit of Mercury in 1914.

The accepted times of this event are for a start at 9:57 a.m. and end at 2:09 p.m. on November 7, 1914. So would have been easily visible between 10:00 a.m. and 2:00 p.m. The planet is around 3000 miles in diameter, and Africa is something like 5000 miles by 4600 miles.

Conclusion: Every data point verified, the Reverend Barber was clearly a skilled astronomer.

To conclude here is a contemporary illustration of the 1898 lunar occultation of Venus by Lucien Rudaux (1874-1947) from his observatory at Donville-les-Bains, Normandy, France. The crescent is the Moon and the bright star-like point is Venus just emerging from behind it. [*Bulletin de la Societe Astronomique de France et Revue Mensuelle d'Astronomie, de Meteorologie et de Physique du Globe*, vol. 12 (1898), p. 289].



1898 lunar occultation of Venus by Lucien Rudaux (1874-1947)

**Nigel's at it again! This time Venus, despite being only 8° from the Sun!
He used a 'luxury executive parasol', pictured below. Be very careful if you try this at
home – you only have one pair of eyes.**

Venus 2023

Time&Date (UT)	23-08-10 10:55	23-08-12 08:23	23-08-15 08:39
Disc Illumination -	1.1%	0.9%	1.1%
Angular separation -	8.7°	7.8°	8.4°
Angular Size -	57.5"	57.8"	57.7"
Position Angle -	346°	5°	39°

DMK21AU04.AS +742IR filter
90mm Megrez+2.5X Powermate ©2023 Nigel Evans



Nigel's 'luxury executive parasol'

STAR-X , OUR OBSERVATORY IN SPACE

Survey and Time-domain Astrophysical Research Explorer

Short article from the Library

NASA has selected four mission proposals for their Explorer program. This is the second of four short articles, about them. The first was published last month in the OASI magazine and titled 'Ultraviolet Explorer (UVEX)'. We hope that this will provide the reader with just enough information to stimulate interest and allow for further investigation.

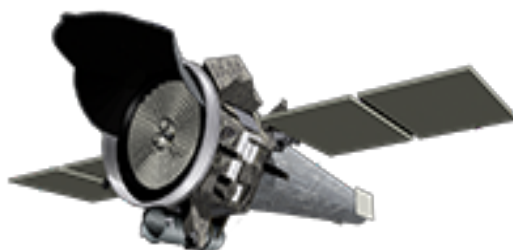
Basically, STAR-X will be an observatory in space that will use a very powerful, large field of view X-ray telescope, with an extensive collecting area. It will accomplish all of its objectives by using a meticulously polished single crystal mirror and state of the art CCD detector technology.

Why has it been decided to send a craft of this design into space in the near future? It would appear that there were no present plans to allow for both X-ray and UV studies, and so it was decided to fill the gap. Hence the appearance of STAR-X.

The X-ray telescope assembly (MA) is manufactured in three sections. The first is the high-resolution X-ray mirror construction; the second is a focal plane assembly with X-ray observation obtained with quantum efficiency, and finally a resilient composite telescope tube. The Mirror Assembly is built with five subassemblies (meta-shells) into which are placed 5,972 silicon mirror components. Each meta-shell comprises many sections arranged and bonded into batches of shells.

The optical design capacity is restricted by telescope focal length, mirror lengths and tube baffle lengths, the latter acting as a form of heat shielding for the telescope construction. Telescope focal length is 5.0m with mirror lengths of 100mm.

Using nested telescopes that utilize a large field of view, there is a complication of spurious light invasion. Several of the baffle sets are designed to reduce this unwanted light from reaching the telescope detector.



Picture credit: <http://star-x.xraydeep.org>

STAR-X's science goals are to obtain data from the most ferocious eruptions that can be produced by the Universe, for example, supernova explosions, and will have the ability to locate faint afterglow from Gamma-Ray Bursts (GRB). It will also reveal hitherto hidden black holes providing data to investigate how cosmic time, mass scale and black holes are co-linked as well as unearthing how the Universe heats the bulk of baryons.

Astronomical entities that contain very hot gasses at between a million to hundreds of millions of Kelvin are expected to produce X-ray emission. These emissions have wavelengths of between 0.01nm to 10nm, with a frequency range from 30 peta-hertz to 30 exa-hertz and energy levels of 100 eV to 100 keV.

When launched (during the period 2027 to 2028) STAR-X will provide an important adjunct to astronomical data by acquiring X-ray information. This will add to the astronomical perspective being influenced by wide area imaging studies with such as the Large Synoptic Survey Telescope (LSST, optical), Wide-Field Infrared Space Telescope (WFIRST, infrared) and Square Kilometre Array (SKA, radio).

Star-X's ability is an alliance of the following:

- a) A wide field of view
- b) Sizeable effective area
- c) Consistent point spread function (5 arcsec half power diameter over entire field of view, FOV) guaranteeing the performance of the imaging system. FOV 1.0 deg².
- d) Ability to rotate to an object quickly (slew rate).

Main points of the telescope:

- a) Internal diameter of mirror is 480 mm.
- b) Focal length is 5m.
- c) Bandpass is 0.5-6keV.
- d) Field of view is 1.1 deg².
- e) CCD size is 100mm x 100mm (4 chips).
- f) Total mass is 265kg.
- g) Will operate in the energy band of 0.2-6 keV.
- h) UV telescope energy band 160 – 300 nm.

When launched STAR-X will be the most effective survey X-ray observatory that has been sent into space. It will provide the ability to boost survey speed of a large content of X-ray and UV data acquired from the large X-ray collecting area, and provide astrophysical information from zones around black holes and neutron stars.

References:

<https://ntrs.nasa.gov/api/citations/20170007513/downloads/20170007513.pdf>

[STAR-X \(xraydeep.org\)](http://star-x.xraydeep.org)

[The STAR-X X-Ray Telescope Assembly \(XTA\) - NASA Technical Reports Server \(NTRS\)](#)

<http://star-x.xraydeep.org>

To finish, here is a little maths problem:

Have a go!!!!

C (484) S
B (15625) W
F (614656) V
K (?) T

Open Letter from the President of the FAS

You may be aware of the growing threat to amateur astronomy posed by the surge in the number of satellites placed in low Earth orbit (LEO). Most of the satellites should be fainter than naked eye brightness but they still pose a problem to telescopic observations, astrophotography, spectroscopy and radio astronomy.

According to the [Union of Concerned Scientists' satellite database](#), up to the end of 2022 there were 6,718 functioning satellites in Earth orbit of which 5,938 were in LEO and over 80% of those were launched in just the past 3 years. There are proposals for an estimated 250,000 satellites to be launched into LEO over the next decade. This represents about a 40-fold increase over the current number.

Jonathan McDowell maintains a list of planned constellations on [Jonathan's Space Pages](#) where, up to 22-Aug-2023, he shows a maximum total of 543,811 LEO satellites from 18 different planned constellations. He doesn't give a timescale but, if all are launched as planned, this would eventually represent a more than 90-fold increase over the current number!

The FAS is organising a survey to investigate the effect that these satellites have had on amateur astronomy observations. The survey will run until midnight on 22nd September 2023 after which the results will be collated and analysed and presented at IAU Symposium 385 Astronomy and Satellite Constellations: Pathways Forward (2nd-6th October 2023, La Palma, Canary Islands, Spain). The recommendations from that symposium will be used to advise the international bodies that make policy on the operation of satellites and the sustainable use of space (particularly LEO).

This survey is open to all. *Whether or not the growth in the number of satellites has affected you, the FAS urges all astronomers to take part in the survey. Can I ask that you take part – the survey should only take about 5 minutes to complete.*

This is an opportunity for members' contributions to make a positive difference to the future of astronomy!

The link to the survey form is at:

<https://form.jotform.com/232251987986069>

Editor's Note: This survey is fully supported by RAS, BAA and SPA