



OASI News

The newsletter of the Orwell Astronomical Society



The Cave Nebula

Photo by John Hughes

Trustees:

Mr Roy Adams

Mr Neil Morley

Mr David Payne

Honorary President:

Dr Allan Chapman D.Phil MA FRAS

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Society Notices

Dear Members,

We use a Zoom Pro account for online meetings. If you would like to join in, please email Paul Whiting, treasurer@oasi.org.uk

In the coming months, we will be guided by advice from the Government and Public Health England, as to when we can resume some of our activities. These are likely to be very limited at first, the Committee will decide what could be done, with the health and safety of everybody being the highest priority.

I would like to wish everybody clear skies, stay safe and I hope to see you soon.

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

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 during meeting hours. Kindly check/amend the number shown on your 2021 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

Articles for OASI News

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

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

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.

Committee 2021

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 FRAS	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, Email distribution lists
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club.
	Andy Wilshere	Librarian
	Avtar Nagra	OASI @ Newbourne
Assistants	Martin Richmond-Hardy	Newsletter, OASI @ Newbourne

Committee Meeting

The date for the next Committee Meeting will be decided after the AGM.

Chairman's Message

Dear OASI Members,

I would like to thank everybody who has supported our Society over this past year. We were in lockdown for the first part of the year, but it was heartening to see members joining in with our various on-line meetings and talks.

We were finally able to resume our face-to-face meetings, initially at Newbourne in July and at Orwell Park in September. It was good to see some familiar and new faces.

As I write this message, the course of the Covid-19 pandemic looks uncertain again. Let's hope that this will not have any further impact on our activities.

Finally, I would like to wish all members and your families, a Merry Christmas and a Happy and Safe New Year.

Andy Gibbs, Chairman.

WANTED – Deputy Editor

In the event of a stray bus, hospitalisation or just holidays, it would be helpful to have someone to act as Editor in my absence.

You may use whatever word processor or DTP system with which you are comfortable. The only proviso is that it can produce a pdf file. Enquiries and offers to Martin via news@oasi.org.uk or speak to me at Newbourne.

Thank you in anticipation.

Martin Richmond-Hardy

OASI and BAA Events

Please note that the listed events may change depending on the progress of the pandemic. 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 (bottom right of the calendar) or use this address to access this calendar from other calendar applications.



<https://calendar.google.com/calendar/ical/1jhs9db71ncki4sojo7092vfv%40group.calendar.google.com/public/basic.ics>

For other astronomy news and astro pictures try our

Twitter feed <https://twitter.com/OASlpswich>

Facebook page <https://www.facebook.com/pages/Orwell-Astronomical/158256464287623>

Date, Time & Location	Contact	Event
Weekly, every Wednesday, from 20:15	Martin Cook, Roy Gooding	Ob.servatory open except 8 Dec Meet via Zoom.
Wednesday 8 Dec 20:00	Paul Whiting treasurer@oasi.org.uk	Zoom Lecture by Dr Belinda Wilkes - Former Director of Chandra X Ray Observatory. "NASA's Chandra X-ray Observatory: Leading a Revolution in X-ray (And All) Astronomy" NB Observatory CLOSED
Monday 13 Dec 19:30 Newbourne Village Hall	Martin R-H newbourne@oasi.org.uk	OASI @ Newbourne
Thursday 16 Dec 20:00	Paul Whiting treasurer@oasi.org.uk	OASI on Zoom. Our monthly on-line chat session.
Monday 27 Dec 19:30 Newbourne Village Hall	Martin R-H newbourne@oasi.org.uk	OASI @ Newbourne
2022		
Monday 10 Jan 19:30 Newbourne Village Hall	Martin R-H newbourne@oasi.org.uk	OASI @ Newbourne
Thursday 20 Jan 20:00	Paul Whiting treasurer@oasi.org.uk	OASI on Zoom. Our monthly on-line chat session.

Date, Time & Location	Contact	Event
Saturday 22 Jan 20:00 Newbourne Village Hall	Roy Gooding secretary@oasi.org.uk	OASI AGM
Friday 28th January 2022	Pete Richards lectures@oasi.org.uk	Dame Jocelyn Bell Burnell will deliver a talk to OASI live on Zoom.
Monday 14 February	Martin R-H newbourne@oasi.org.uk	OASI @ Newbourne
Monday 28 February	Martin R-H newbourne@oasi.org.uk	OASI @ Newbourne Sky Notes by Bill Barton FRAS

Meetings via Zoom

Paul Whiting has set up an OASI account on Zoom Pro which allows us to accommodate more participants.. To join, please first contact Paul, treasurer@oasi.org.uk – OASI members only. Be sure to install/update to the latest version of Zoom – there's no need to set up an account. Go to <https://zoom.us/join> and enter the meeting ID or personal link name. You will have received a link from the meeting organiser.

OASI @ Newbourne

Martin Richmond-Hardy newbourne@oasi.org.uk

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

In view of the ongoing Covid situation, we kindly request that attenders wear masks in the village hall to protect others and themselves. Hand gel is available.

Newbourne dates for 2021-22

13 Dec 27 Dec – New astrotoys? Bring & Show.

2022 dates

January	10	24 (A)
February	14	28 (A)
March	14	28 (A)
April	11	25 (A)
May	9	23 (A)
June	13	27 (A)
July	11	25 (A)
August	8	22 (A)
September	12	26 (A)
October	10	24 (A)
November	14	28 (A)
December	12	26 (may omit as it's Boxing Day)

We open up for all meetings at 7:30pm. Astro News/Star Guide (A) at 7:45pm followed by any Talks (T), Workshops (W) and the occasional Quiz (Q).

Stargazer's Guide

On the last meeting each month, at 19:45, Bill Barton FRAS will give a short presentation of what can be viewed in the following 4 weeks plus a reminder of OASI events. These will be available on our website.

Astronomy Workshops/Informal talks

Meetings will depend on COVID-19 situation.

Contact Mike Whybray Monday meetings start at 7:30pm. Workshops / Talks start at 8pm

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.

Do you have a subject you could workshop/talk? You could do a short one, or share the effort with a partner. Drop Mike Whybray a line! workshops@oasi.org.uk

Lectures – via Zoom

Contact: Peter Richards lectures@oasi.org.uk

The start time for all talks will be 8pm and, as usual, the talks will usually be held on a Friday evening.

All meetings are currently via Zoom. Contact Paul Whiting if you can't find the details.

Wednesday 8 Dec	20:00	Zoom Lecture by Dr Belinda Wilkes - Former Director of Chandra X Ray Observatory. "NASA's Chandra X-ray Observatory: Leading a Revolution in X-ray (And All) Astronomy"
Friday 28th January 2022	20:00	Dame Jocelyn Bell Burnell will deliver a talk to OASI live on Zoom. The talk title will be confirmed at a later date. Other local astronomy society meetings

Athaneum Astro Society

www.3a.org.uk/index.htm

Meetings suspended during the Covid-19 situation.

LYRA Lowestoft & Yarmouth Regional Astronomers

www.lyra-astro.co.uk

Due to current Corona Virus outbreak all LYRA meetings are cancelled until further notice.

DASH Astro

Darsham And Surrounding Hamlets <http://dash-astro.co.uk>

Meetings are normally held at New Darsham Village Hall and 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 from 7:30 pm. on Sundays.

Meetings will be assessed in line with the current Government Guidelines in place at the time.

BAA news & webinars

For full details of all meetings or cancellations, please go to <https://britastro.org/meetings/2021>.

2021

Saturday, 4 December 14:00 BAA Christmas Meeting

Booking for the British Astronomical Association 2021 Christmas Meeting has just opened. Tickets are free, but you will need one in order to attend as the organisers need to keep an eye on numbers due to Covid.

Date: Saturday, 2021, December 4 - 14:00 to 18:00

Venue: Royal Society of Medicine, 1 Wimpole Street London W1G 0AE

Programme

14:00 Doors open

14:30 BAA President - Welcome and OM, notices etc

14:45 Awards

14:55 Prof Catherine Heymans - The Mysteries of the Multiverse

15:45 Tea

16:15 Prof Sara Russell - Winchcombe Meteorite

17:00 Sky Notes: Nick James

17:45 Close

2022

Saturday, January 22 – 14:30 BAA Meeting

Wednesday, 2022, March 30 – 17:30 Special General Meeting and Ordinary Meeting

Friday, 2022, April 8 – 19:00 The 2022 Winchester weekend at Sparsholt College, Winchester

Saturday, 2022, April 23 (All day) BAA Spring Meeting, Leeds

Wednesday, 2022, May 25 – 17:30 BAA Special General Meeting, Ordinary Meeting & George Alcock Memorial Lecture

The BAA Radio Astronomy Section

Thanks to an initiative by Paul Hearn, the BAA Radio Astronomy Section have been enjoying talks, seminars and tutorials via Zoom.

These are/will be available on the BAA YouTube channel.

<https://www.youtube.com/user/britishastronomical/playlists>

Dec 3rd 19:30 GMT

'SARA presents...' Pablo Lewin "Building a Radio Telescope for HI observations"
Dr Richard Russell Deep Space Exploration Society (DSES) 'Pulsars for Galactic Navigation'

Dec 10th 19:30 GMT

Christmas Lecture Prof. Anna Scaife. Professor of Radio Astronomy at the University of Manchester and Head of the Jodrell Bank Centre for Astrophysics 'Jodrell Bank, the cold war and the space race'

From the Interweb

<https://chime-experiment.ca/en>

The Canadian Hydrogen Intensity Mapping Experiment is a revolutionary new Canadian radio telescope designed to answer major questions in astrophysics and cosmology.

CHIME is a novel radio telescope that has no moving parts. Originally conceived to map the most abundant element in the universe - hydrogen - over a good fraction of the observable universe, this unusual telescope is optimized to have a high "mapping speed", which requires a large instantaneous field of view (~200 square degrees) and broad frequency coverage (400-800 MHz). The digitized signals collected by CHIME will be processed to form a 3-dimensional map of hydrogen density, which will be used to measure the expansion history of the universe. At the same time, these signals can be combed for fast, transient radio emission, making CHIME a unique telescope for discovering new "Fast Radio Bursts" and for monitoring many pulsars on a daily basis.

<https://www.sciencenews.org/article/atomic-clock-general-relativity-time-warp-millimeter-physics>

An atomic clock measured how general relativity warps time across a millimeter

Advanced Astronomy

A Course at the Ipswich Institute

This course builds on the introductory course 'Astronomy is Looking Up'. It is less of a 'chalk & talk' type format and more about self-learning through personal research, designed to be highly interactive. Each week 2 or 3 students will be asked to research a topic and prepare a short presentation for the class on a particular subject, to be presented the following week. These will be followed by a discussion on the week's topic, guided by the tutor. The first session will also cover research and presentation techniques.

Tutor: Paul Whiting Duration: 10 weeks (excl. 22 Feb)

Starts: 18 Jan 2022 Ends: 29 Mar 2022

Times: 18:30-20:30

Price: £90 , £70 (concessions)

The Night Sky in December

Martin RH

All event times (UTC) are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E.

Sun, Moon and planets

Sources:

<http://heavens-above.com/PlanetSummary.asp>

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	07:41	15:47		4 Dec 07:34 Solar eclipse (not visible from UK)
	31	08:03	15:53		Winter solstice 21 Dec, 15:59
Moon	1	03:27	14:23		New 04 December 07:43 Perigee 04 December 10:05 First Q 11 December 01:36 Apogee 18 December 02:16 Full 19 December 04:36 Last Q 27 December 02:24
	31	05:23	13:33		
Mercury	1	07:58	15:36	-1.1	Inferior conjunction 23 Jan
	31	09:22	17:05	-0.7	
Venus	1	11:08	18:19	-4.5	Inferior conjunction 9 Jan
	31	08:37	17:09	-4.2	
Mars	1	06:07	14:51	1.6	December 7th/8th Moonrise 15:00, full Moon 04:08, Moon occults Mars 05:00(DD)-05:59(RD), Moonset 09:30 Mars opposition 17.0" (25", 0.68 max)
	31	06:06	13:51	1.5	
Jupiter	1	12:19	21:48	-2.1	
	31	10:30	20:19	-2	
Saturn	1	11:42	20:13	0.7	
	31	09:51	18:32	0.7	
Uranus	1	14:29	05:10	5.7	
	31	12:30	03:08	5.7	
Neptune	1	13:04	00:15	7.9	
	31	11:06	22:14	7.9	

With acknowledgements to Bill Barton for occultation information.

Occultations during December 2021

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.

There will be a lunar occultation of η Leonis mag. 3.5, on Dec. 24, DB 04:25, RD 05:09

Meteor showers during December 2021

Source: BAA Handbook 2021 p26-27 and <https://in-the-sky.org/newsindex.php?feed=meteors>

Shower	Normal limits	Maximum	Max RA/Dec.°	ZHR at Max	Notes
Geminids	Dec 4 – 17	Dec 14 02h	06:04 (091°) +32.3	100+	Richest of the annual showers, with slow meteors and a good proportion of bright events. Some Moonlight interferes
Ursids	Dec 17 – 26	Dec 22	03:16 (049°) +75.4°	10	Under-observed shower which has produced outbursts in 1945, 1982, 1986 and 2014. Unfavourable

For radio observation, use reflections from Graves radar on 143.050MHz or the Brams transmitter in Belgium on 49.97MHz. See also https://www.popastro.com/main_spa1/meteor/radio-meteor-observing-2020/

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

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

Times are BST. Predictions are approximate (23 July) 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.
01 Dec	-3.7	17:43:20	10°	W	17:46:44	73°	SSW	17:47:39	44°	ESE
02 Dec	-3.7	16:56:12	10°	W	16:59:36	82°	S	17:02:32	13°	E
02 Dec	-2	18:33:05	10°	W	18:35:32	32°	SW	18:35:32	32°	SW
03 Dec	-2.9	17:45:54	10°	W	17:49:12	48°	SSW	17:50:31	29°	SE
04 Dec	-3.3	16:58:44	10°	W	17:02:06	60°	SSW	17:05:27	10°	ESE
04 Dec	-1.4	18:35:58	10°	W	18:38:30	19°	SW	18:38:38	19°	SSW
05 Dec	-1.7	17:48:36	10°	W	17:51:30	26°	SSW	17:53:55	13°	SSE
06 Dec	-2.2	17:01:20	10°	W	17:04:28	35°	SSW	17:07:37	10°	SE
08 Dec	-0.9	17:04:11	10°	W	17:06:40	19°	SW	17:09:08	10°	S
19 Dec	-0.8	06:49:08	10°	SSW	06:51:38	19°	SE	06:54:09	10°	E
20 Dec	-0.6	06:02:49	10°	S	06:04:37	14°	SE	06:06:25	10°	ESE
21 Dec	-2.2	06:50:35	10°	SW	06:53:42	36°	SSE	06:56:51	10°	E
22 Dec	-1.7	06:03:41	10°	SSW	06:06:35	27°	SSE	06:09:31	10°	E
23 Dec	-1.4	05:18:34	18°	SSE	05:19:31	20°	SE	05:22:03	10°	E
23 Dec	-3.3	06:52:34	10°	WSW	06:55:55	61°	SSE	06:59:15	10°	E
24 Dec	-2.9	06:06:44	21°	SW	06:08:43	48°	SSE	06:12:00	10°	E
25 Dec	-2.4	05:21:43	36°	SE	05:21:43	36°	SE	05:24:42	10°	E
25 Dec	-3.7	06:54:48	10°	W	06:58:11	82°	S	07:01:35	10°	E

Date	Bright -ness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
26 Dec	-0.6	04:36:34	15°	E	04:36:34	15°	E	04:37:20	10°	E
26 Dec	-3.7	06:09:33	32°	WSW	06:10:57	74°	SSE	06:14:19	10°	E
27 Dec	-2.9	05:24:19	50°	ESE	05:24:19	50°	ESE	05:27:03	10°	E
27 Dec	-3.7	06:57:18	11°	W	07:00:30	85°	S	07:03:53	10°	E
28 Dec	-0.6	04:39:01	16°	E	04:39:01	16°	E	04:39:46	10°	E
28 Dec	-3.8	06:12:00	37°	W	06:13:14	87°	S	06:16:38	10°	E
29 Dec	-3	05:26:39	54°	E	05:26:39	54°	E	05:29:21	10°	E
29 Dec	-3.5	06:59:37	12°	W	07:02:46	68°	SSW	07:06:07	10°	ESE
30 Dec	-0.7	04:41:15	16°	E	04:41:15	16°	E	04:42:05	10°	E
30 Dec	-3.8	06:14:14	35°	W	06:15:30	79°	S	06:18:52	10°	ESE
31 Dec	-3.2	05:28:50	57°	ESE	05:28:50	57°	ESE	05:31:37	10°	E
31 Dec	-2.9	07:01:48	11°	W	07:04:54	43°	SSW	07:08:08	10°	SE

Starlink passes

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

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

Starlink G4-3 launch planned for 23:20 UTC on 1st December from Cape Canaveral Space Force Station.

Comets with magnitude brighter than magnitude 10

Source: <https://heavens-above.com/Comets.aspx> and BAA Handbook p95.

Comet	Brightness	Peak
C/2021 A1 Leonard	7.8	For those of you wanting to image Comet Leonard there is a great opportunity on 3rd Dec at 03:00 UT (GMT) when it is very close to globular cluster M3.
67P Churyumov-Gerasimenko	8.5	
C/2019 L3 ATLAS	9.8	
19P/Borrelly	8.8	Dec 31
104P/Kowall	9.3	Dec 31

The Night Sky in January 2022

Martin RH

All event times (UTC) are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E.

Sun, Moon and planets

Sources:

<http://heavens-above.com/PlanetSummary.asp>

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	08:03	15:54		
	31	07:37	16:41		
Moon	1	06:53	14:14		New 02 January 18:34 Perigee 01 January 22:56 First Q 09 January 18:11 Apogee 14 January 09:27 Full 17 January 23:49 Last Q 25 January 13:41 Perigee 30 January 07:12
	31	07:46	15:21		
Mercury	1	09:21	17:10	-0.7	
	31	06:37	15:19	1.6	
Venus	1	08:30	17:04	-4.2	
	31	05:26	14:29	-4.5	
Mars	1	06:06	13:49	1.5	
	31	05:51	13:15	1.4	
Jupiter	1	10:27	20:16	-2	
	31	08:40	18:55	-1.9	
Saturn	1	09:47	18:28	0.7	
	31	07:57	16:50	0.7	
Uranus	1	12:26	03:04	5.7	
	31	10:28	01:05	5.8	
Neptune	1	11:02	22:10	7.9	
	31	09:05	20:17	7.9	

Occultations during January 2022

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 January 2022

Source: BAA Handbook 2021 p26-27 and <https://in-the-sky.org/newsindex.php?feed=meteors>

Shower	Normal limits	Maximum	Max RA/Dec.°	ZHR at Max	Notes
Quarantids	Dec 28 – Jan 12	Jan 3 17h	15:18 (229°) +49.9°	80+	High activity, but with a rather narrow peak. Good in 2014. Bright events leave persistent trains. <i>Very favourable.</i>

For radio observation, use reflections from Graves radar on 143.050MHz or the Brams transmitter in Belgium on 49.97MHz. See also https://www.popastro.com/main_spal/meteor/radio-meteor-observing-2020/

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

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

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

Too far ahead to predict reliably.

Starlink passes

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

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

Comets with magnitude brighter than magnitude 10

Source: <https://heavens-above.com/Comets.aspx> and BAA Handbook p95.

Comet	Peak Mag.	Peak
C/2021 AI Leonard	6	1 Jan
I04P/Kowal	9.3	1 Jan
I9P/Borelly	8.7	22 Jan

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, 2.40pm on the Lesley Dolphin show on BBC Radio Suffolk and the internet. <https://www.bbc.co.uk/radiosuffolk>

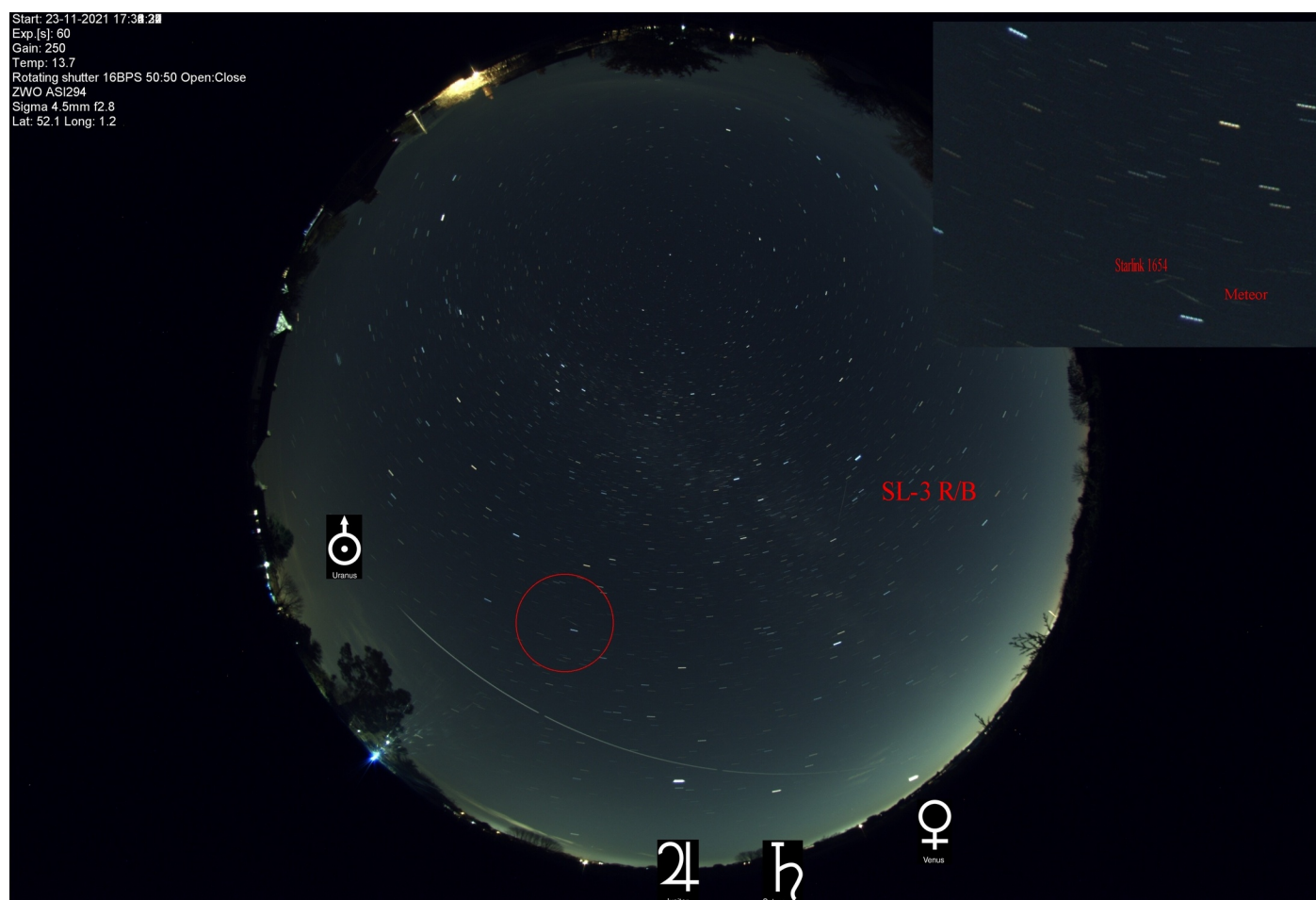
All-Sky camera reports

ISS and the planets

Alan Smith

Following Martin's note that the ISS would pass close to 3 bright planets this week, I've stacked some images from the allsky camera at Grundisburgh.

5 Images from 1732 to 1737hrs UT 23/11/21. Each image 60 seconds



It was a busy time! Starlink 1654 and a small meteor passed close to Markab (alpha Pegasus) and a redundant Russian rocket body launched in 1962 (SL-3 R/B) passed close to Vega in that small 5 minute window. Zoom in to see events!

PS

Those of you that saw the compilation image (above) from a couple of days ago with a meteor crossing the path of the ISS might be interested in this message from the UK Meteor network:

Hi all,

just an FYI - the GMN data of the Andromedids is currently being used by NASA as one of the components in their risk assessment of astronaut safety onboard the International Space Station. Apparently, they are planning a space walk and are very interested to see if this outburst is going to pose any potential threat.

Keep those cameras running!

Remember that the ISS is cruising at around 408km up, and this meteor easily penetrated the Earth's atmosphere to start glowing at about 100km up!

A busy time indeed!

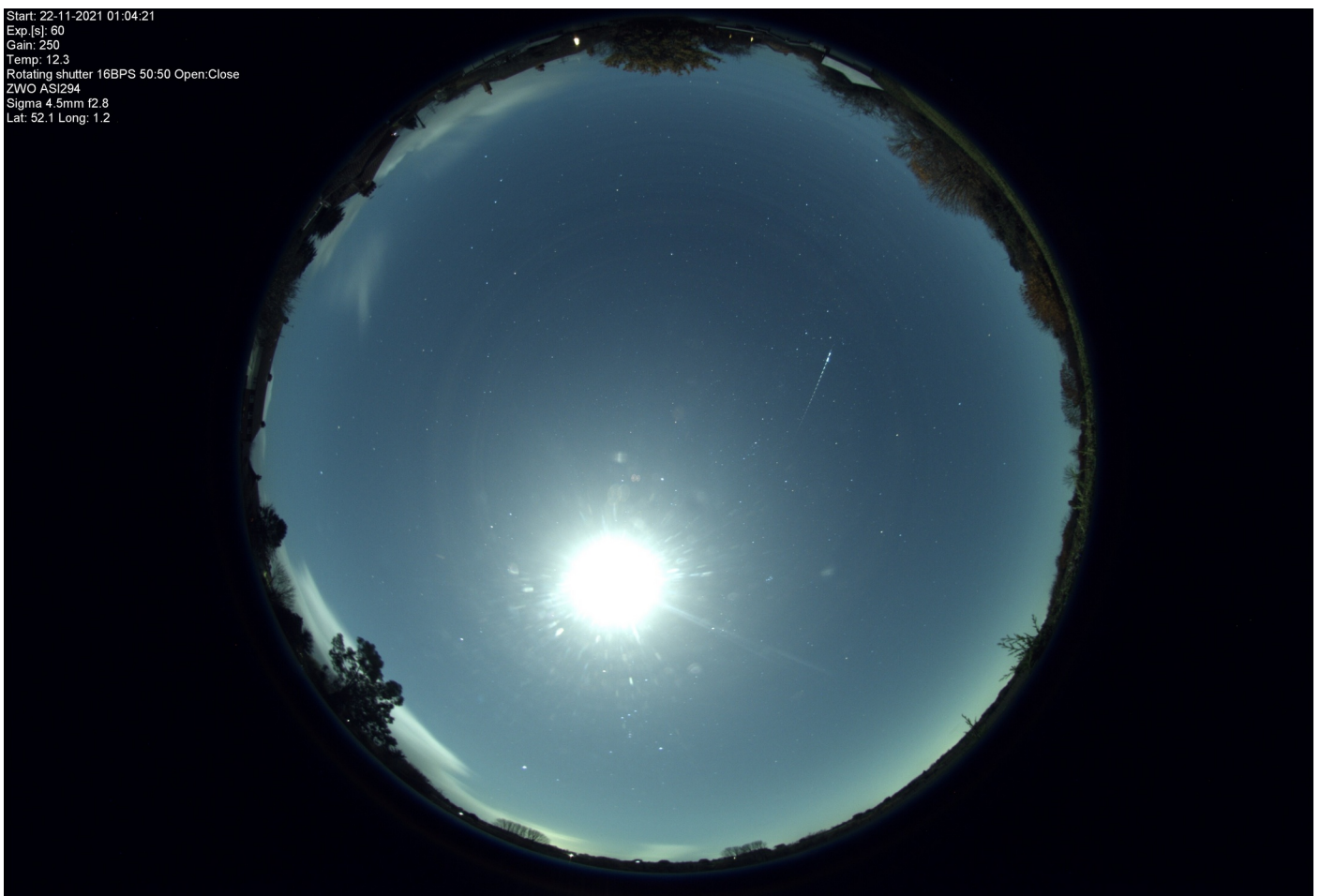
Meteor 22 Nov 01:04UTC

Alan Smith

I've now got the final results from the event imaged by all three of the allsky cameras operated by OASI members.

The object, weighing around 0.76kg entered the atmosphere at about 94km altitude and travelling at 30km/sec over the village of Hawkedon (west Suffolk). Atmospheric friction caused the object to glow at about magnitude -8.5 slowing it down as it plunged towards the ground, ending its visible flight at about 57.3km altitude , travelling at 22km/sec and weighing 0.24kg over the village of Wordwell (Suffolk). It is unlikely that any debris survived to reach the ground (although it would have been 'nice' to go for a search so close to us)!

All images from the cameras operated by OASI members are attached, as are the Google Earth plot (from information provided by the Dutch Meteor Society) and the estimated plot by IMO using visual reports. The faint track from Twisk (Netherlands) used by the DMS is also attached.



GrundisburghCam: Alan Smith



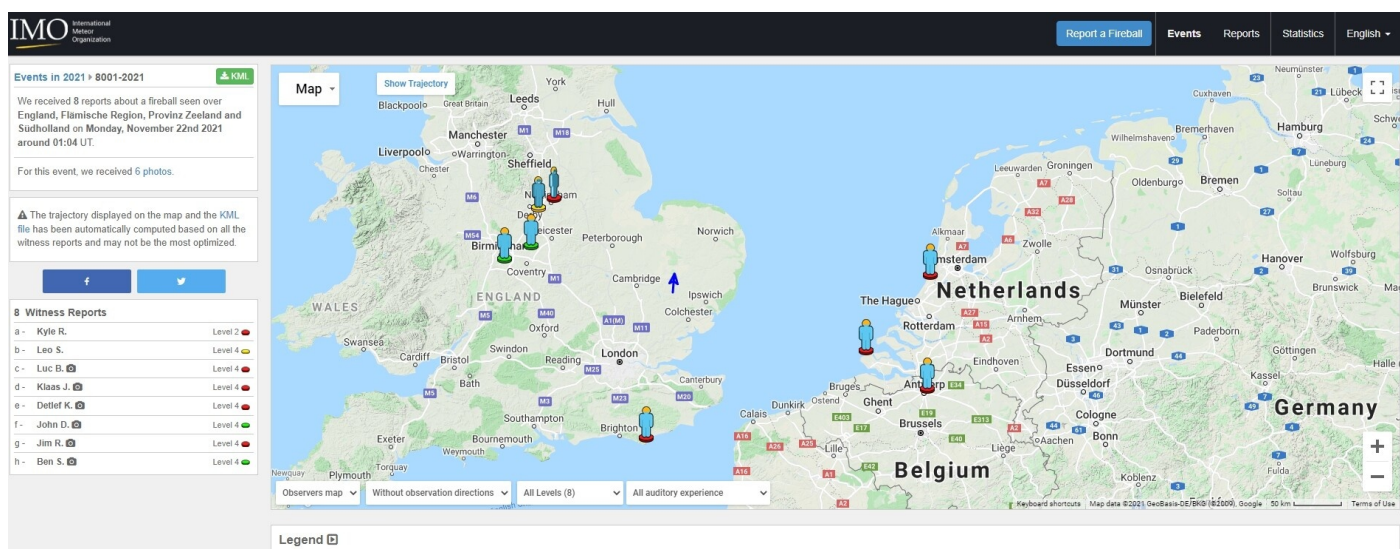
KirtonCam: MartinRH: ZWO ASI 120MM camera, 1.55mm lens



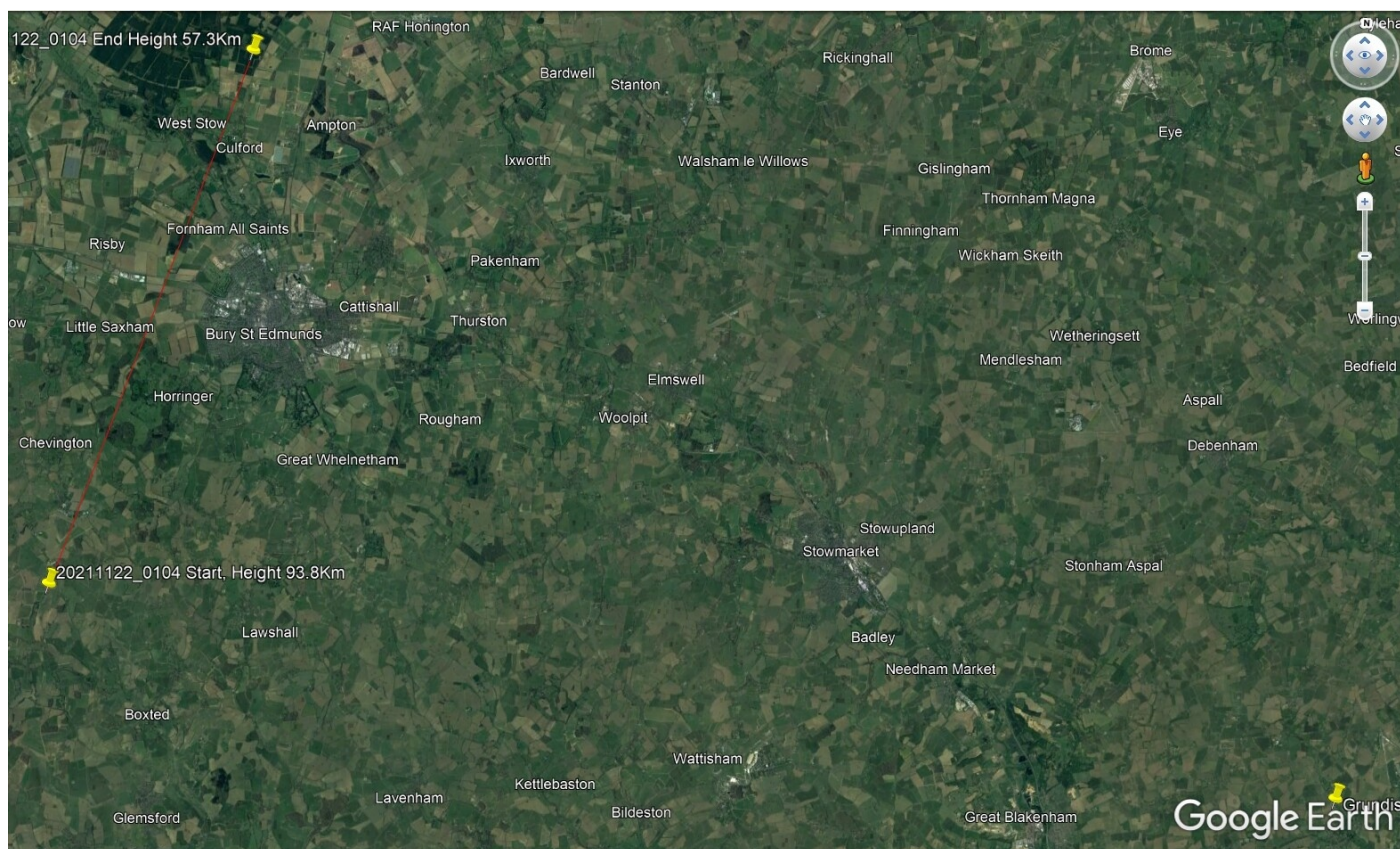
AppCam: James Appleton



Faint track seen from Twisk, Netherlands



Estimated plot by the International Meteor Organisation <https://www.imo.net/>



Google Earth plot (from information provided by the Dutch Meteor Society)
The track (red) over west Suffolk

More Fireballs over Kirton

Martin Richmond-Hardy



image-2021:11:2205:5400



image-2021:11:17:054509

Another Fireball

James Appleton

Appcam captured two of the meteors featured above, but the third one was too far north for me.

Image of the one on 22 Nov at 03:54 attached.



2021:11:22:03:5406_annotated

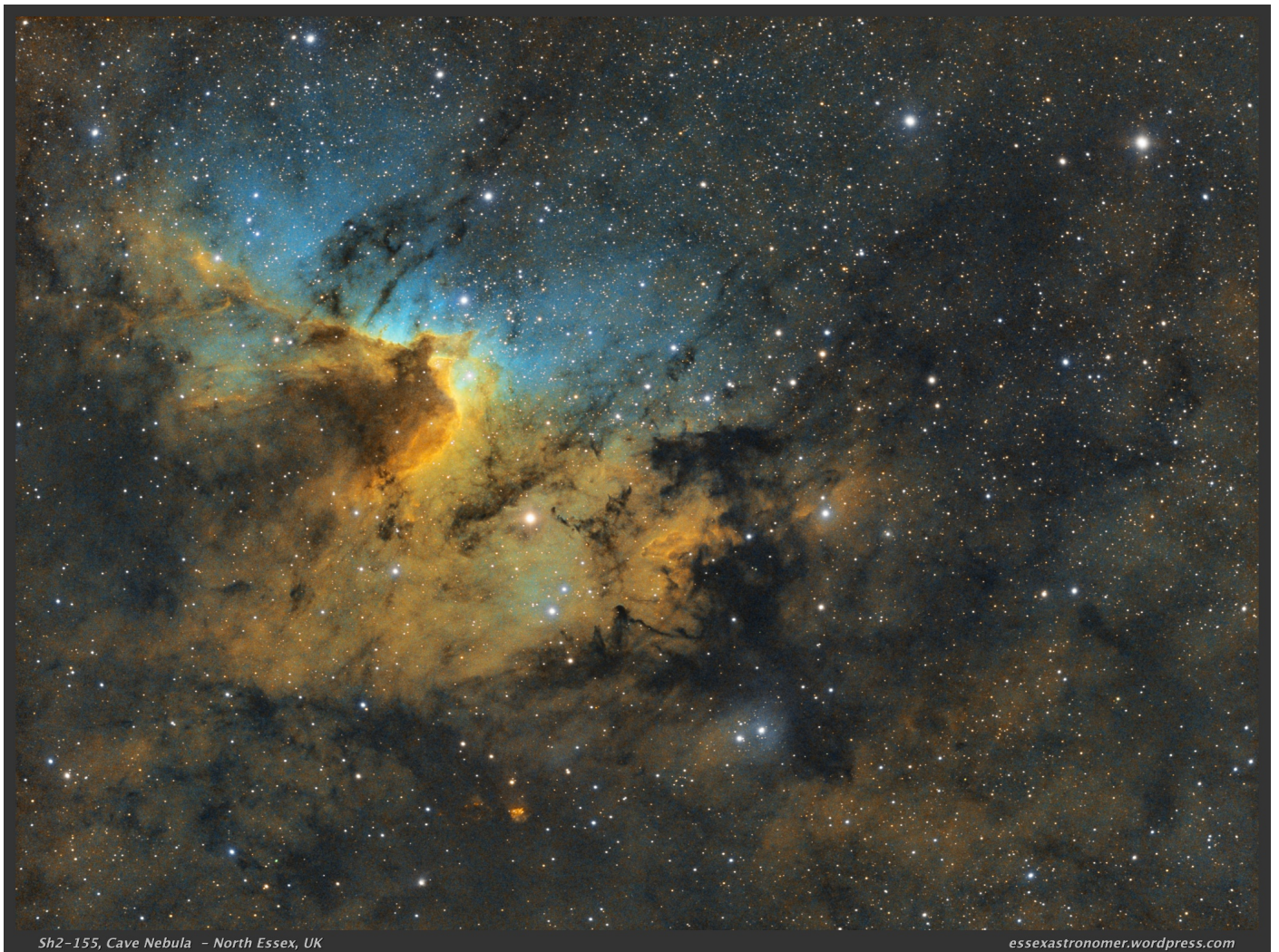
- Location: 52.05371°N, 1.21210°E, 42m above MSL.
- ZWO ASI178mc.
- Fujinon fish-eye lens, CF2.7HA-L1, 1:1.8, 2.7mm.

In this image, the meteor trail lies just below a chromatic aberration caused by the bright moonlight.

Single frames, 30s exposure, gain 100. (The camera control software has turned down the gain to reduce glare from the Moon, resulting in only the brighter stars being visible.)

The Cave Nebula

John Hughes



The Cave Nebula

Having already submitted to the Group a H α version of Sh2-155, I carried on capturing more data in Oiii and Sii to create this nebula in the Hubble palette. Only took six separate nights. I would have liked to have taken more Sii data but there are other targets I want to focus on now so I have called a stop to this one.

Sh2-155 captured using a William Optics Z103 refractor, ZWO ASI1600mm mono camera and Chroma 1.25" 3nm filters in H α , Oiii and Sii. H α - 113 x 300s; Oiii 52 x 300s & 31 x 600s; Sii 51 x 300s. Total integration time is 23 hours.

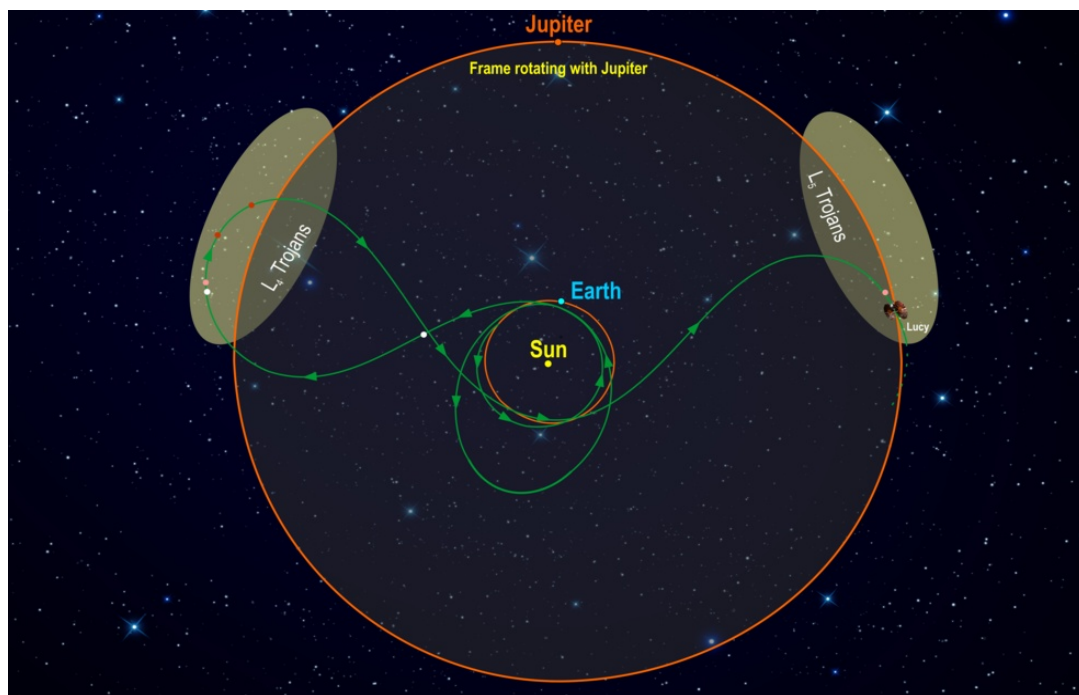
NASA's Trojan Asteroid Adventure

LUCY

Andy Willshire. Library

At 11:34 am C.E.T. on the 16th October 2021 an Atlas V 401 AV-096 rocket blasted off from Space launch Complex 41 at Kennedy Space Centre, Cape Canaveral, clutching a solar powered assisted spacecraft on its first day of a twelve year epic voyage.

This was the start of the spacecraft Lucy whose task is to explore the assorted community of Jupiter's Trojan asteroids. These are a small collection of rocky bodies that can be classed as leftovers from our early Solar Systems giant planets, 4.5 billion years ago, that were captured to exist on stable orbits related to the gas planet Jupiter. They will also contain evidence about the constituents of all the Sun's planets, which were originally formed out of a protoplanetary disk. They orbit the Sun in two separate groups, one group a quarter lap in front of Jupiter, the other a quarter lap behind. They lay at Lagrangian points L4 and L5, at which point, the effects of the gravities of Jupiter and the Sun as well as orbital motion are able to gravitationally stabilise the Trojans. Over the next twelve years, which is the period for its primary mission, and some 6.3 billion km, some of these bodies will be investigated in order to obtain data about our early solar system. Lucy will also whizz by the Earth three times in flybys for gravity assists. This will also make it the only spacecraft to come back home from the outer solar system for a short period before zooming off again. Her dimensions are 15.82m wide and 7.28m in height when the solar arrays are opened; 3.95m closed. When fuelled the craft will weigh 1500kg.



Picture credit: [Lucy: The First Mission to the Trojan Asteroids | NASA](#)

Why call the mission Lucy I hear you ask. Well she is named after an Ethiopian fossilized skeleton of an early hominid excavated in 1974 and named by the paleoanthropologists who unearthed her. This fossil provided the world with new awareness into human evolution. The team thought that this would be a good premise for a mission that would fundamentally change human knowledge of how the Solar System was formed, and planetary derivations. In the Lucy Thermal Emission Spectrometer, the manufacturers have placed a diamond beamsplitter maybe making the Beatles song "Lucy in the sky with diamonds" more scientific to understand.

As Lucy flies away to look at the Trojan asteroids, she will encounter a Main belt asteroid called (52246) Donaldjohanson on 20th April 2025. Donald Johanson an American Paleoanthropologist was the co- finder of the “Lucy” hominid fossil. The asteroid is a carbonaceous type C Erigonian type, found in the inner regions of the asteroid belt, and is approximately 4km in diameter. It orbits the Sun at a distance of between 1.9 – 2.8 Au every 3 years and eight months. Then Lucy will fly by the following:

Number	Name	Date of visit	Type
	Earth	16 October 2022	
	Earth	13 December 2022	
L4 Trojans			
52246	Donaldjohanson	20 April 2026	C-type asteroid
3548	Eurybates and its Satellite Queta	12 August 2027	C-type asteroid
15094	Polymele	15 September 2027	P-type asteroid
11351	Leucus	18 April 2028	D-type asteroid
21900	Orus	11 November 2028	C-type asteroid
L5 Trojans	3 rd Earth flyby	December 2030	
617	Patroclus and its twin		P-type asteroid
	Binary Menoetius	3 March 2033	P-type asteroid

C-type asteroids. These are carbon based and are charcoal in appearance. They have albedos 0.03 to 0.10 range.

D-type asteroids. It is suggested that these are composed of organic- rich silicates, anhydrous silicates and carbon, as well as a very low albedo. 0.02 to 0.05.

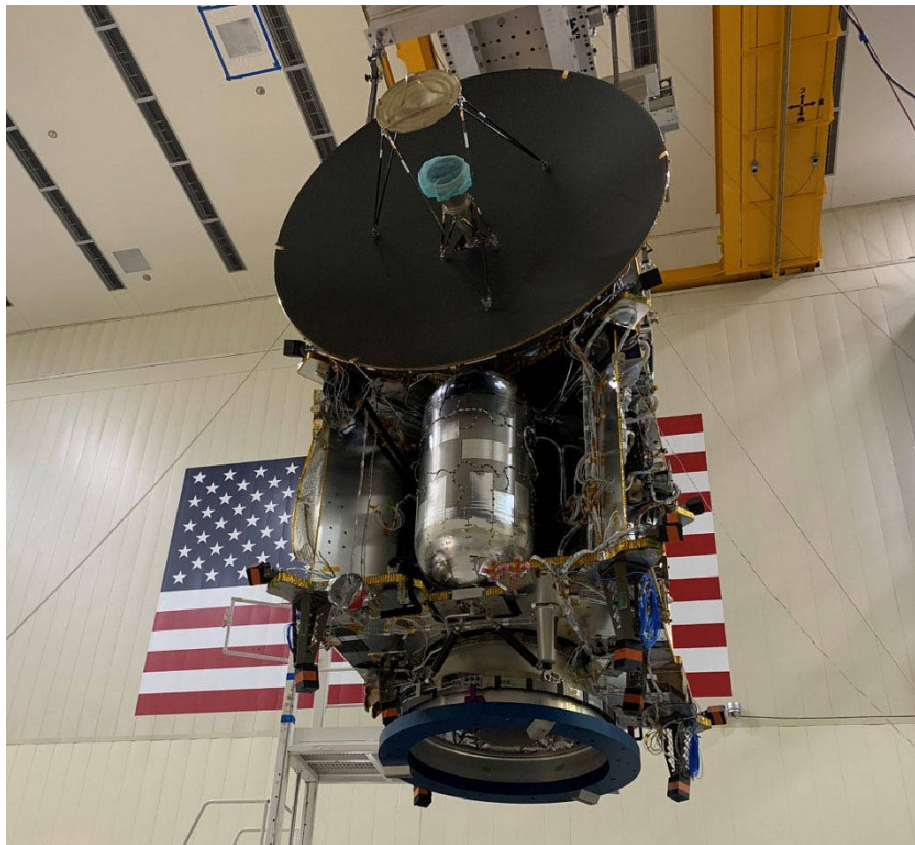
P-type asteroids. Commonest about 4 Au out in the main asteroid belt. They have a spectrum between the C-type and D-type. Again a low albedo. 0.02 to 0.06.

Fresh snow has an albedo of 0.80 to 0.90.

At the end of the fly- by of the L4 Trojans, Lucy will head back on 25 December 2030 to the vicinity of Earth for its third gravity assist before heading off for the L5 Trojans.

What is expected to be found by examining these Trojan asteroids? It is thought that these are remains of the same prehistoric components that formed the outer planets. This would mean that they would be approximately four billion years old and therefore contain a history of their formation. Not all Trojan asteroids are composed of the same outer surface structure, suggesting that they were initially formed in different areas and carried to their present orbits during the outer planets formation.

Lucy’s main objectives are to look at the asteroids from the surface geological perspective. That would be their sizes, crater density, albedo, shapes and establish their ages. Having acquired this data, then Lucy will look at colour, composition and mineral dissemination, leaving her only with mass, density and occasional satellites as an encore.



Picture credit: [Lucy: The First Mission to the Trojan Asteroids | NASA](#)

Instruments:

Lucy has a group of sensing instruments to survey these asteroids. The first of these is the Long Range Reconnaissance Imager (L'LORRI). This is Lucy's highest resolution and most sensitive camera. It takes black and white photographs, via a charge-coupled device (CCD). Its mass is 12kg and it has a primary mirror of 20.8cm, with a focal length of 262cm. The wavelengths covered are 450 – 850 nm. From 1000km away, L'LORRI will easily be able to spot 70m diameter craters, allowing scientists to comprehend the surface geology of individual asteroids. It was built by the Applied Physics Laboratory at Johns Hopkins, and is based on the LORRI apparatus used in New Horizons, an interplanetary space probe, which produced amazing images of Pluto in 2015 and the Kuiper Belt object called Arrokoth in 2019. New Horizons was part of NASA's New Frontiers program. The second instrument is called L'Ralph. This will hunt for organic compounds and hydrated minerals on the asteroids surfaces, and with its photos will classify surface composition. L'Ralph is in fact an amalgam of two instruments: a Multispectral Visible Imaging Camera (MVIC), a colour imager, and a Linear Etalon Imaging Spectral Array (LEISA), an infrared spectrometer. The infrared light is forwarded from a beamsplitter to LEISA and visible light to MVIC, which uses six CCD arrays, each with up to 64 rows of 5000 pixels each, to take the pictures.

Scientists have chosen five colour bands that cover most of the visible spectrum, to aid in the identification of formation elements found on the exterior of the Trojans.

On board LEISA there is a thin, somewhat tilted sapphire transmitting layer encircled by two reflective surfaces, that splits light into a spectrum. When LEISA receives the images, they are analysed using an assimilation of light wavelengths technique. This will give information about the contrasting types of rock and natural compounds found in the asteroids. Both L'LORRI and L'Ralph do not have any device to focus, so the manufacturers produced nearly all of L'Ralph out of a block of aluminium, which includes the mirrors. This will curtail any temperature change effects. The photographs taken require quite a large section of onboard memory, so 256 gigabits are set aside for it.

L'TES is the Lucy Thermal Emission Spectrometer, which is able to detect solar radiation. The Trojans although a considerable distance from the Sun still use its light to produce heat which produces far infrared radiation. L'TES can detect this radiation, and can act as a thermometer. This means that various points on each of the asteroids will yield the individual point temperatures, and when this data is aggregated a more specific picture of the asteroids physical attributes will be known. It will also assess how fast the surface of the asteroids heats up and how fast they cool down. From these results, they can calculate what comprises the regolith, which may be sand, dust, or crushed rock adhering to the Trojans.

Finally we have T2CAM. This is the terminal tracking system, which aids Lucy to pilot to and keep track of the asteroids. It will also take wide- field pictures to understand their configuration. This, with the pre-determined mass will establish rock density.

Hopefully Lucy will now go about her business and fly unheeded to the outer solar system, despite a small glitch occurring just after take-off. One of the giant solar panels refused to fully lock in place. However scientists are hopeful that this problem will not curtail this very important enterprise and Lucy will continue to boldly go!!!.

References:

[Lucy: The First Mission to the Trojan Asteroids | NASA](#)

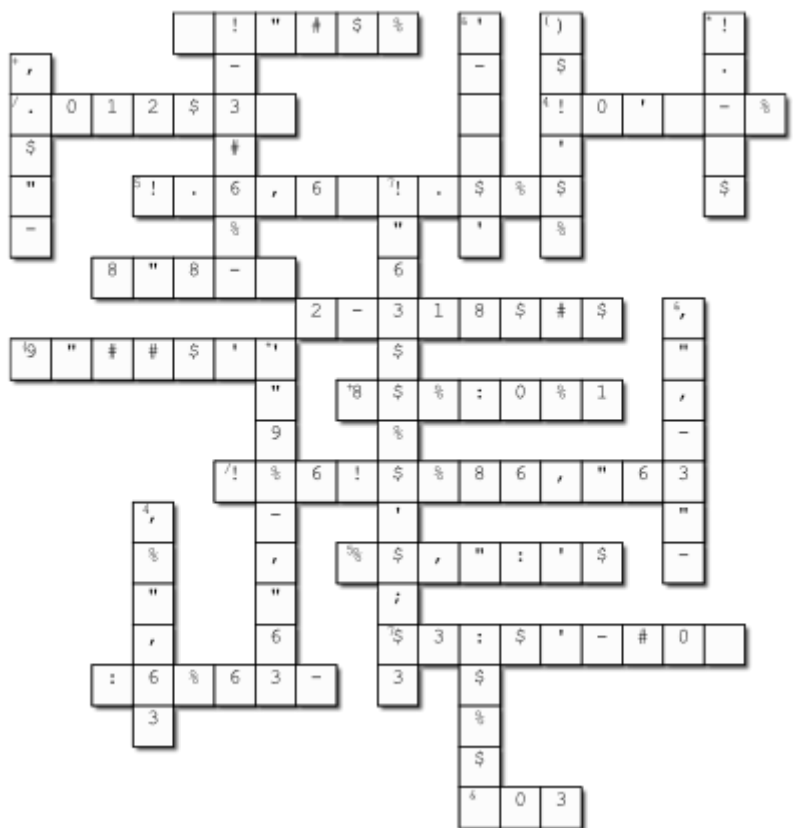
[Lucy \(spacecraft\) - Wikipedia](#)

[In Depth | Lucy – NASA Solar System Exploration](#)

[lucy_fact_sheet_final_1.pdf \(nasa.gov\)](#)

Answers to last month's Crossword

Andy Wilshere



Created using the Crossword Maker on TheTeachersCorner.net

Across

1. Telescopic support vane (**spider**)
7. discovered the rings of Saturn (**huygens**)
8. rapidly rotating magnetized neutron star (**pulsar**)
9. Visible 'surface' of the sun (**photosphere**)
11. One of Saturn's moons (**mimas**)
12. Jupiter's moon named after a Trojan prince (**ganymede**)
14. GeorgeAiry. Seventh Astronomer Royal (**biddell**)
16. Your weight on this planet is 38% of weight on Earth (**mercury**)
17. Angular velocity of a star across the sky (6-6) (**propermotion**)
19. Eye piece crosshairs (**reticle**)
20. Saturn moon that may hold an ocean of liquid water (**enceladus**)
22. Outer solar atmosphere (**corona**)
23. Closest star to earth (**sun**)

Down

2. One of the Shepherd moons (**pandora**)
3. discovered Ariel, satellite of Uranus (**lassel**)
4. best known for his laws on planetary motion (**kepler**)
5. Lunar stage cycle (**phase**)
6. hypothetical protoplanet that struck earth to form Moon (**theia**)
10. first craft to flyby Saturn (7-6) (**pioneereleven**)
13. fairy queen of Uranus (**titania**)
15. Wobbling motion of our moon (**libration**)
18. retrograde moon of Neptune (**triton**)
21. largest asteroid in Solar system (dwarf planet) (**ceres**)

OASI AGM 2022

The AGM will be held at Newbourne Village Hall on Saturday 22nd January 2022.

The Hall will be open from 19:30 and the meeting will start at 20:00.

OASI Officers & Committee – Nomination form

Nomination for 2021 committee

Name of Nominee:

Proposer (Print and sign)

.....

Seconded by (Print and sign)

.....

Any members who are nominated must have given their consent.

Forms must be returned to the secretary (Roy Gooding secretary@oasi.co.uk) before the AGM.

Members who are elected to the 2022 committee will be expected to attend as many committee meetings as possible. Committee meetings are usually held about every six to eight weeks. Every committee member is given an area of responsibility to help with the running of the society.

You can copy the text on this page from the pdf and paste into an email, where you will be able to edit it.

Please email to Martin Cook membership@oasi.org.uk