No. 555 Registered Charity 271313 **July 2019**

OASI News

The newsletter of the Orwell Astronomical Society

Noctilucent Clouds at Newbourne on 21 June

Photo by Mike Harlow

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

Society Contact details

Observatory (meeting nights only) 07960 083714

Email queries: info@oasi.org.uk

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

Twitter: @OASIpswich

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

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

news@oasi.org.uk

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

Access into the School Grounds and Observatory Tower

Please use the third gate into the school grounds by the gym.

Areas out of Bounds

Access to the Observatory is **only via the black door** at the foot of the Observatory tower, which leads to the staircase and thence to the spiral staircase up to the Observatory. If the black door is locked, please phone the observatory mobile, **07960 083714** during meeting hours.

Please 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. Please send them to

news@oasi.org.uk

The CLOSING date is the 15th day of the month

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtfd, 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 now be publicly available worldwide!

Reproducing articles from OASI News

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

Committee 2019

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
	Peter Richards	Lecture meetings, Email distribution lists
	Martin Richmond-Hardy	Newsletter, OASI @ Newbourne
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club.
	Matt Leeks	Safety & security
	Andy Wilshere	Librarian

Signing in and out

Please ensure you sign in and out when visiting the Observatory and/or Newbourne. This is for fire safety precautions and also provides an historic record.

Next Committee Meeting

Friday 6 September 2019, 8pm at Horley Spiritualist Church, 345 London Rd, Ipswich IP2 0BG

OASI and BAA Events

For the latest event details, please see www.oasi.org.uk/Events/Events.php

There's a Google Calendar on the OASI web site with the latest dates (and corrections!). If you want to easily add OASI Events to your own computer/ phone/tablet calendar application click this button on the website Events page or use this address to access this calendar from other calendar applications.

https://calendar.google.com/calendar/ical/1jhs9db71ncki4sojo7092vfvc%40group.calendar.google.com/public/basic.ics

For other astronomy news and astro pictures try our

Twitter feed https://twitter.com/OASIpswich

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

Subscribe to the OASI Yahoo group by emailing oasi-subscribe@yahoogroups.com

Key:

OASI public events *BAA events* *Other events*

Date, Time & Location	Contact	Event
Weekly, every Wednesday, 20:15–22:00 Orwell Park Observatory	Martin Cook, Roy Gooding	General observation (weather permitting) using a variety of telescopes. Entry via the third gate left. NOT the main gate
29 June Newbourne Village Hall	Pete Richards lectures@oasi.org.uk	OASI Summer BBQ. Members and their guests.
Monday 8 July from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Sat 13 July	Pete Richards lectures@oasi.org.uk	OASI at Nacton Fete
Monday 22 July from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes 19:45 Workshop/Talk: Martin RH "Siding Spring & Parkes observatories" Bookswap
Tues-Wed 30–31 July	www.cimuseums.org.uk	Planetarium at Christchurch Park (see page 7). OASI in attendance with solar scopes and children's activities.
Monday 12 Aug from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.

Date, Time & Location	Contact	Event
Sat 24 Aug 10:00–17:00 9 Margaret St, Birmingham, B3 3BS	https://www.britastro.org/spectro2019	BAA Spectroscopy Software Training Workshop
Monday 26 Aug		NEAS visit to Newbourne and picnic. From 7pm OASI @ Newbourne
Fri 6 Sept		*BAA Autumn Weekend meeting*
Monday 9 Sept from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Fri 20 Sept 20:00 St Augustine's Church Hall	Peter Richards lectures@oasi.org.uk	Lecture. "Monsters in the Dark: Searching for the Most Massive Galaxies in the Universe." Dr Matthew Bothwell. University of Cambridge.
Monday 23 Sept from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap
28-29th Sept	http://las-skycamp.org	*Kelling Heath Autumn Star Party*
Sat 5 Oct		*BAA Back to Basics workshop*
Sat 12 October		*BAA Observers' Workshop*
Monday 14 Oct from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Fri 18 Oct 20:00	Peter Richards lectures@oasi.org.uk	Lecture. "Pulsars and our understanding of the cosmos" Dr Robert Ferdman. University of East Anglia.
Sun 27 Oct	Paul Whiting, FRAS treasurer@oasi.org.uk	**Bawdsey Astronomy Day**
Monday 28 Oct from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes 19:45 Workshop: 'Observing Transits of Mercury' Bookswap
28 Oct–4 Nov		*Haw Wood Autumn Star Party*
Wed 30 Oct		*BAA AGM*

Date, Time & Location	Contact	Event
Mon 11 Nov		Transit of Mercury. First contact 12:35 UTC
Monday 11 Nov from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Fri/Sat 15/16 Nov. Stoneleigh Park, Coventry CV8 2LH	https://www.ukastroshow.com	*International Astronomy Show*
Fri 15 Nov 20:00 St Augustine's Church Hll	Peter Richards lectures@oasi.org.uk	Lecture. "Neighbours - An Introduction to the Local Group". Dr Nick Hewitt. British Astronomical Association.
Sun 17 Nov, 05:30 TBC	James Appleton info@oasi.org.uk	Field trip to observe graze of ZC1128. More info.
Monday 25 Nov from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap
Monday 9 Dec from 19:00 Newbourne VH	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Fri 20 Dec 2019, 04:30	James Appleton info@oasi.org.uk	Field trip to observe graze of ZC1840. More info.
Monday 23 Dec from 19:00 Newbourne VH	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap

Planetarium Event at Ipswich Museum

Those of you with children/grandchildren, etcetera, may be interested in an event at Ipswich Museum during the Summer Holidays.

On **Tuesday 30th of July and Wednesday 31st of July** there will be an inflatable planetarium at Ipswich Museum. Sessions, which are suitable for age 4+, are £3.50 and have to be booked online in advance. The event is part of a Summer of Science at the Ipswich museums (Ipswich Museum – on High Street, Christchurch Mansion and Ipswich Art Gallery) during the Summer school holidays. More information can be obtained online at http://www.cimuseums.org.uk or by calling 01473 433100 (phone number is the Ipswich Regent theatre through which tickets can be bought). Now bookable on this site:

https://apps.ipswich.gov.uk/en-GB/shows/planetarium-%20discover%20the%20solar%20system/events

As part of the Ipswich Summer Science, we will be attending this event

Weather permitting, we will be providing Solar observing. In the event of cloudy weather, we have offered to do other activites, i.e. colouring-in, making craters. These would be aimed at children aged four and upwards.

We need around four helpers for both days, so if you can help on one or both days, please let me know.

Thank you *Andy Gibbs*

OASI @ Newbourne

Martin Richmond-Hardy newbourne@oasi.org.uk

We normally meet at Newbourne Village Hall, Mill Lane, IP12 4NP on the 2nd and 4th Mondays (with a few exceptions).

OASI @ Newbourne is a good place to start for beginners. If you are thinking of buying a scope or binoculars, come and try before you buy and talk to owners about the strengths and weaknesses of particular models. If you've already splashed the cash, bring your new scope along to use or for advice on setting-up and adjustment. All welcome, with or without telescopes. We would like visitors to join OASI to enjoy the full benefits of membership.

There are also **Stargazers' Guide (Sky Notes), Astronomy Workshops and the Book Swap.**

OASI@Newbourne Meetings

8 July	22 July (S+B+W)	
12 Aug	26 Aug (B/H)	NEAS visit & picnic.
9 Sept	23 Sept (S+B)	
14 Oct	28 Oct (S+B)	
11 Nov	25 Nov (S+B)	
9 Dec	23 Dec (S+B)	

We open up for all meetings at 7pm. Star Guide (S) at 7:30pm and Workshops (W) at 7:45pm. B = Book Swap night (see below).

Stargazer's Guide

On the last meeting each month Bill Barton FRAS will give a short presentation of what can be viewed in the following 4 weeks.

Astronomy Workshops/Informal talks

Contact Mike Whybray **Location: Newbourne Village Hall IP12 4NP**

Doors open at 7:00pm. **Workshops start at 7:45pm**

If you are a new OASI member, or haven't been to one of these informal workshops before, they are a mixture of events of different characters including beginners talks, interactive workshops, films, etc., suitable for all. They are also a chance to chat with other members over a cup of tea and a biscuit, in a venue rather warmer than the observatory dome on a winter's night!

Given a clear night, we can make use of the field for a workshop or continue afterwards with some observing.

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

22 July **Martin Richmond-Hardy, "Siding Spring and Parkes observatories".**

28 October **Bill Barton FRAS, "Observing Transits of Mercury"**

Astronomy Book Swap

Pete Richards

If you are anything like me you'll have a bookcase or two full of astronomy books and no room for any more but you know the next time you are at an astronomy event you'll be tempted again. OASI will be hosting an astronomy book swap event at Newbourne on a Monday evening to help you clear some space – or maybe you can provide a home for someone else's unwanted books?

If you bring any books and they are not taken you will need to take them home again as OASI has no spare storage space for books.

You can take away any books you are interested in but if you have not provided any books yourself you might like to make a small cash donation to OASI.

Any cash donations will help towards running OASI @ Newbourne.

The books can be on any area of astronomy, or space exploration, or related subjects. They can be factual or works of fiction including space related science fiction. As well as books you could bring DVDs on similar subjects, or maybe you have an astronomical jigsaw puzzle you'd like to give away or exchange.

The book swap will be held at Newbourne Village Hall on Monday Star Guide/Workshop nights.

Lecture Meetings

Contact: Peter Richards lectures@oasi.org.uk

We have an exciting and interesting set of lectures by guest speakers for the Autumn.

There is a new venue for lectures this year which is:

St Augustine's Church Hall
Bucklesham Road
Ipswich IP3 8TH.

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

OASI Guest Speaker Lectures

20th September	"Monsters in the Dark: Searching for the Most Massive Galaxies in the Universe." Dr Matthew Bothwell. University of Cambridge.
18th October	"Pulsars and our understanding of the cosmos" Dr Robert Ferdman. University of East Anglia.
15th November	"Neighbours - An Introduction to the Local Group". Dr Nick Hewitt. British Astronomical Association.

Other local astronomy society meetings

Athaneum Astro Society

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

We meet fortnightly on Thursdays, from 7.30pm, at our dark-sky site in the Walled Garden at Nowton Park, just outside Bury St Edmunds. If you're planning on joining us for the first time, please contact us in advance, just to make sure the meeting is going ahead. We recommend that you wear warm clothing (even summer nights can be chilly, especially when the skies are clear!) and bring a flask, or insulated mug, for a warm drink. We have tea and coffee-making facilities on-site. Events are listed here http://www.3a.org.uk/events.htm

LYRA Lowestoft & Yarmouth Regional Astronomers

www.lyra-astro.co.uk

LYRA Programme and Local Events 2019 – All talks (unless other wise stated) will commence at 7.30pm in the Coach House Room at Parkhill Hotel, just outside Oulton Village on the B1375 (Oulton Broad to Gt. Yarmouth Road) NR32 5DQ

All Talks £2.50 For Non Members

July 9	A talk "Midsummer madness? – Astronomy versus Pseudoscience, Flying Saucers & Conspiracy Theories" by Mark Shepherd.
July 23	LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7.30pm
Aug 13	Summer Social Evening at Parkhill Hotel
Sept 10	TBA
Sept 24	LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7:30pm
Oct 8	A Talk "Variable Stars – being a Professional-Amateur" by Michael Poxon
Oct 22	LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7:30pm
Nov 12	TBA
Nov 26	LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7:30pm

DASH Astro

Darsham And Surrounding Hamlets

http://dash-astro.co.uk

All DASH Astro observing sessions will take place at WESTLETON COMMON. ASOG observing sessions and locations may be arranged at the time of observation.

Unless stated all group meetings will take place from 7:30 pm.

May 19th will be the last of this season's meetings at Westleton village Hall. Due to building work to Westleton Village Hall, we will be moving to the New Darsham Village Hall, from September 8th until further notice.

Note these meetings are now on Sundays.

August 10	(Saturday) DASH Summer Social - confirmed. (Members and Guests only)
Sep 08	Meeting –.Dr. Sonali Shukla, Lecturer in Astronomy, Cambridge Univ.
Sep 21&22	Henham Steam Rally. Solar Observing and Displays
Sept 29	Dash Observing Session (Sunset 18:35 Moonset 19:24 1.1% Moon)
Oct 13	Meeting – Dr. Manda Banerji, Inst. of Astronomy, Cambridge Univ.
Oct 23&24	Family Stargazing Evening at Sutton Hoo N.T. Site 6-9pm
Oct 27	Dash Observing Session (Sunset 16:33 Moonset 16.46 0.9% Moon)
Nov 10	Meeting – Steve Hubbard, Ian Lomas & David Gwynn, plus "Q & A Panel" Title TBC
Nov 11	DASH Observing. "Transit of Mercury" start 12:35 ends 16:06 (sunset)
Nov 24	Dash Observing Session (Sunset 15:49 Moonset 15.10 6.7% Moon)
Dec 07	(Saturday) DASH Christmas Social – confirmed. (Members and Guests only)

The Night Sky in July

Martin RH

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

Moon

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

New Moon	1st Quarter	Full Moon	Last Quarter
02 July 20:16	09 July 11:55	16 July 22:38	25 July 02:18

Sun, Moon and planets

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

Object	Date	Rise	Set	Mag.	Notes
Sun	Jul 1	04:39	21:18		Solar eclipse (S.America) Jul-02
	Jul 31	05:15	20:47		
Moon	Jul 1	03:32	20:00		On the night of July 16-17, 2019, much of the world can watch a partial eclipse of the full moon. This will be the last time that the moon sweeps through the Earth's dark umbral shadow until the total lunar eclipse on May 26, 2021.
	Jul 31	04:01	20:39		
Mercury	Jul 1	06:55	22:17	1.2	Aphelion Jul-07, Inferior conjunction Jul-21
	Jul 31	04:26	19:34	2.3	
Venus	Jul 1	03:52	20:20	-3.8	
	Jul 31	04:53	20:38	-3.8	
Mars	Jul 1	06:25	22:25	1.8	
	Jul 31	06:17	21:12	1.8	
Jupiter	Jul 1	19:25	03:16	-2.4	
	Jul 31	17:17	01:09	-2.3	
Saturn	Jul 1	21:37	05:31	0.1	Opposition Jul-09
	Jul 31	19:32	03:22	0.2	
Uranus	Jul 1	01:26	15:40	5.8	
	Jul 31	23:25	13:46	5.8	
Neptune	Jul 1	00:08	11:09	7.9	
	Jul 31	22:05	09:09	7.8	

Paul's Astronomy Podcast for July

Paul Whiting FRAS Podcast, July 2019 www.oasi.org.uk/2019_07_pod.mp3

Occultations during July 2019

James Appleton

The table lists occultations during the month under favourable circumstances. The data relates to Orwell Park Observatory, but will be similar at nearby locations.

The events should be readily visible in small telescopes or binoculars. The first two columns list the date and time (UT) of the occultation. Column three gives the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. The table lists circumstances of disappearances and reappearances as dictated by the visibility of each phenomenon (determined by altitude, lunar phase, etc). Column four details the lunar phase ('+' for waxing and '-' for waning). Columns five and six give the altitude of the Sun and the star, both in degrees. (A negative solar altitude means that the Sun is below the horizon.) Columns seven and eight provide the star's magnitude and catalogue number.

The data relates to Orwell Park Observatory, but will be similar at nearby locations.

Please note that **times are shown in UTC**.

Date	Time (UT)	D/R	Lunar Phase	Sun Alt(°)	Star Alt(°)	Mag	Star
12 Jul	22:36:06	D	0.85+	-14	15	6.4	ZC2316
12 Jul	23:46:30	D	0.85+	-16	10	7.4	H79377
15 Jul	00:31:38	D	0.96+	-16	10	5.7	ZC2595
16 Jul	00:17:32	D	0.99+	-16	14	5.9	ZC2754

Meteor showers

Source: BAA Handbook 2019 p100-101

Shower	Maximum	Normal limits	ZHR at Max	Notes
June Bootids	June 28	June 22 – July 2	?	Unexpected outburst with ZHR ~100 m/h in 1998 June 27 after a quiescent period of several decades. Very favourable.
α-Capricornids	July 30	July 3 – Aug 15	5	A good proportion of bright, slow moving, colourful meteors. Very favourable.
Southern δ-Aquarids	July 31	July 12 – Aug 23	20	Fine southern shower with double radiant. S component is more active. Rich in faint meteors. Very favourable.
Piscis Austrinids	Aug 9 ?	July 15 – Aug 10	5	Southern shower in need of observation. Date of maximum and radiant location uncertain. Quite favourable.
Perseids	Aug 13d 07h	July 17 – Aug 24	80+	Rich and fast meteors. High proportion of bright events leaving persistent trains. Unfavourable.

1. For radio observation, use reflections from Graves radar on 143.050MHz or the Brams transmitter in Belgium on 49.97MHz,

Visible ISS passes ≥15º max altitude

Martin RH

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

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

A quiet month.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
07 Jul	-2.8	03:03:37	17°	SSW	03:05:37	32°	SSE	03:08:37	10°	E
08 Jul	-2.4	02:15:32	22°	SSE	02:16:04	23°	SSE	02:18:45	10°	E
09 Jul	-1.7	01:27:24	15°	ESE	01:27:24	15°	ESE	01:28:40	10°	ESE
09 Jul	-3.6	03:00:12	16°	SW	03:02:43	53°	SSE	03:05:58	10°	E
10 Jul	-3.3	02:12:01	30°	SSW	02:13:04	40°	SSE	02:16:13	10°	E
11 Jul	-2.7	01:23:46	28°	SE	01:23:46	28°	SE	01:26:24	10°	E
12 Jul	-1.7	00:35:27	15°	ESE	00:35:27	15°	ESE	00:36:26	10°	E
12 Jul	-3.8	02:08:14	23°	WSW	02:10:08	63°	SSE	02:13:26	10°	E
13 Jul	-3.6	01:19:50	42°	SSW	01:20:26	48°	SSE	01:23:40	10°	E
14 Jul	-3.0	00:31:14	34°	SE	00:31:14	34°	SE	00:33:51	10°	E
14 Jul	-2.2	23:42:19	21°	ESE	23:42:19	21°	ESE	23:43:58	10°	E
15 Jul	-3.9	01:15:02	17°	WSW	01:17:28	72°	SSE	01:20:47	10°	E
15 Jul	-2.2	22:52:06	17°	SE	22:52:06	17°	SE	22:53:53	10°	E

Astronomy on the radio

Bill Barton's Radio Broadcast

ICRFM (Ipswich Community Radio) 105.7 MHz at about 08:25 in the morning of the first Wednesday of each month. I aim to cover what there is to see in the sky and then a little bit on something topical. ICRFM is also available to listen to over the Internet and there is a listen again option on their website. http://www.icrfm.com

David Murton's Radio Broadcast

On 1st Tuesday of the month, 1.40pm on the Lesley Dolphin show on BBC Radio Suffolk – now digital (channel 10c) and FM 103.9 (Ipswich), 104.6 (west Suffolk), 95.5 (Lowestoft), 95.9 (Aldeburgh) and the internet. https://www.bbc.co.uk/radiosuffolk

BAA news

BAA meetings in July

Historical Section Annual Meeting Saturday, 2019, June 8 - 10:00, Newbury

Webb Deep-Sky Society Annual Meeting, Cambridge Saturday, 2019, June 15 (All day)

A short AGM followed by a day of talks from amateurs and professionals

BAA Summer Meeting “Astronomy and Space today” Saturday, 2019, June 22 - 10:00, Rutherford Appleton Laboratory

BAA meetings in August

Spectroscopy Software Training Workshop

Saturday, 2019, August 24 - 10:00 at 9 Margaret St, Birmingham, B3 3BS

An introduction to using BASS and ISIS software

BASS Project Downloads - https://uk.groups.yahoo.com/neo/groups/astrobodger/links/all/BASS_Project_downloads_001356094893

ISIS – A free Windows application dedicated to processing of astronomical spectral data. Download - http://www.astrosurf.com/buil/isis-software.html

Charon

On 22 June 1978, the largest known moon of Pluto was discovered by James W Christy.

Not to be confused with the minor planet 2060 Chiron.

Charon, also known as **(134340) Pluto I**, is the largest of the five known natural satellites of the dwarf planet Pluto. It has a mean radius of 606 km. It was discovered in 1978 at the United States Naval Observatory in Washington, D.C., using photographic plates taken at the United States Naval Observatory Flagstaff Station (NOFS).

With half the diameter and one eighth the mass of Pluto, Charon is a very large moon in comparison to its parent body. Its gravitational influence is such that the barycenter of the Plutonian system lies outside Pluto.

In Greek mythology, **Charon** or **Kharon** (/ˈkɛərɒn, -ən/; Greek Χάρων) is the ferryman of Hades who carries souls of the newly deceased across the rivers Styx and Acheron that divided the world of the living from the world of the dead. A coin to pay Charon for passage, usually an obolus or danake, was sometimes placed in or on the mouth of a dead person. Some authors say that those who could not pay the fee, or those whose bodies were left unburied, had to wander the shores for one hundred years. In the catabasis mytheme, heroes – such as Aeneas, Dionysus, Heracles, Hermes, Odysseus, Orpheus, Pirithous, Psyche, Theseus and Sisyphus – journey to the underworld and return, still alive, conveyed by the boat of Charon.

Sources: *https://en.wikipedia.org/wiki/Charon_(moon)*

https://en.wikipedia.org/wiki/Charon

OASI Outreach activities

Kirton & Falkenham Fete 8 June

We decided not to attend due to inclement weather and a last minute change of venue.

ESWR (The Ipswich Radio Rally) 9 June

Thank you to everybody who helped out at the event: Pete & Nicky Richards, Andy Gibbs, John Wainwright, Tina Hammond and Martin R-H

The weather was good, with long sunny spells and a bit of high cloud. Unfortunately, the Sun was quiet with no sunspots and little to observe in Hydrogen alpha.

There was much interest from rally goers, who observed the Sun and were keen to talk about astronomy and our Society.

Photos by Tina Hammond

Pete M6JUM explains the Hα telescope to the ESWR Organiser Kevin Ayriss G8MXV

Suffolk One 15 June

OASI was asked by Kinetic Science Foundation www.kineticscience.co.uk to provide an astronomy attraction which prefixed *The Kitchen Chemist* show.. The age range was rather younger than we anticipated but there was interest from several parents. The slime stall proved a greater attraction!

Andy, Roy & Martin RH attended and were later joined by Pete & Nicky.

Not too busy...

Solar halo

Alan Smith

Attached is a simple picture of a 22 degree Solar halo taken on 2/6/19 from Yoxford (Suffolk), using an Android mobile phone through a pair of reflective sunglasses!

Not quite up to the standard of most society members' images but does at least show the optical phenomenon caused by high altitude ice crystals.

The ISS

Andy Gibbs

My first attempt at imaging the ISS. Taken on 24 May 2019 at 21.37 BST. I used a Canon 1200D attached to a 200mm Meade LX200. I moved the telescope by hand. 35 exposures at 1/500 sec, ISO 800, processed in PIPP and stacked in Registax 6. (Thanks to Martin Cook for the processing advice).

Noctilucent Clouds at the Summer Solstice

Martin Cook

Photograph of noctilucent clouds taken from my back garden on 21/06/19 at 22:50 BST
The only way I could get a decent shot was to stand on my shed roof at the bottom of the garden.
Wonder what the neighbours thought!

Canon 1100d	¼ sec	F5.6	ISO 3200	55mm

Martin Richmond-Hardy

Taken with iPhone 6S+ looking NNE at 22:50 BST. Somewhat obscured by trees.

Mike Harlow

At the end of the longest day the clouds finally parted to reveal a nice display of noctilucent cloud over Newbourne. I managed to grab a few images before it faded and more tropospheric cloud got in the way!

NGC 7023

John Hughes

Located in Cepheus, NGC 7023 is a reflection nebula which is now clearing the TV aerial on my roof and rising! There is a small star cluster situated near its centre and it is a magnitude +7 star which lights up the surrounding gas and providing the blue hue. There are also dust clouds around the nebula which are not lit up by the star which obscure the stars in the background

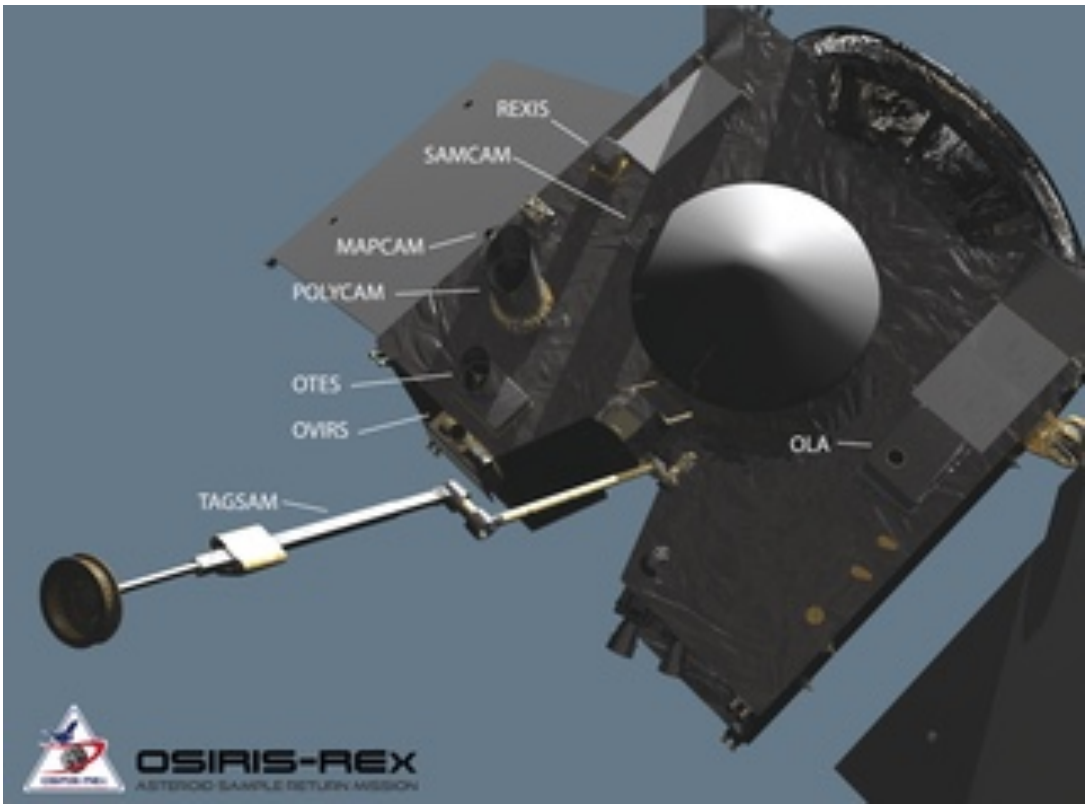
Taken on 21 May 2019, the image is made up of 20 exposures at 180s at a Gain of 300 using the ZWO ASI294MC and an IDAS D2 Light Pollution Suppressor attached to the William Optics Z103ED and Celestron AVX. Processed in PixInsight.

An article from the library.

OSIRIS Rex – A trip to a near-Earth asteroid and back.

Andy Willshere

OSIRIS-Rex is a spacecraft designed to travel to a near Earth asteroid and to return back with a carbonaceous sample. This study will elucidate how planets formed and how life as we know it began, as well as giving Earth scientists more information about the structure of asteroids. At present we know that they formed the building blocks of planet formation and propagation of life. The spacecraft name originates from Egyptian mythology as Osiris is the Lord of the underworld, judge of the dead and God of resurrection and fertility, as well as being able to take the shape of a bird.



Picture credit: NASA/University of Arizona

The spacecrafts name is also an amalgam of its functions.

'O' is for **O**rigins.

'SI' is for **S**pectral **I**nterpretation.

'RI' is for **R**esource **I**dentification.

'S' is for **S**ecurity.

Rex is for **R**egolith **ex**plorer. This will analyse the outer layer deposit of loose material at the point of extraction.

This is the first US mission to perform this task that samples, collects at least 60 grams and returns to Earth.

Osiris-Rex was launched on the 8th September 2016 and reached relatively close to the asteroid Bennu on the 3rd December 2018. The asteroid is a carbonaceous type which can be found in the Apollo group, and was originally detected on 11th September 1999. It is listed in the Sentry Risk Table with a prediction that it has a 3.7% chance of striking Earth between the years 2175 and 2199. It has a mean diameter of about 492m and has been investigated in depth by the Arecibo Observatory. The surface measurements will be fully investigated to ascertain Bennu's mass. Once this operation has been performed, an attempt to sample the regolith with a sample

mass of at least 60 grams and maybe as heavy as 2kg, will be executed at a later point in the mission.. The end of the mission will be 24th September 2023, with a landing time back on Earth of 15:00 hrs UTC, using a parachute at the Utah test and training range. Processing will take place at the Johnson Space Center. This gives a mission duration of 7 years with 505 days planned to surface map the asteroid, at a distance of about 5km. Using this information will define the site selection for regolith extraction.

The dimensions of OSIRIS-Rex are 2.44m x 2.44m x 3.15m, with a dry mass of 880kg. The launch site was Cape Canaveral and the Atlas V 411, AV-067 rocket was used. The cost of this mission in total will be approximately U.S $ 985.5 million.

Bennu was selected because apart from being fairly close to the proximity of Earth, the material selected will be unspoilt. It is a C-type (carbonaceous) asteroid, with a major carbon content and low albedo, and exists about 3.5 AU from the Sun. It is vaguely spheroidal in shape with a retrograde rotation and a tilt axis of 176^0 to its orbit. Bennu's composition originated from either a planetoid, or a proto-planet. Its original chemistry and mineralogy would have been laid down during the initial 10 million years of Solar System configuration.

June 4th 2019 was the point that the spacecraft has been in flight for 1,000 days, travelling about 2.5* 106 km since launch. During the week ending June 10th 2019 continuous scans of Bennu continued, with all data being added to that previously acquired to assess sample collection sites. Preparation is being made for the spacecraft to enter Orbital B, at which point OSIRIS-Rex will continue to chart Bennu at higher resolutions, specifically with extraction sites in mind. When surface contact has been made, by the touch and go sample acquisition mechanism (TAGSAM), regolith particles smaller than 2 cm will be blown into the sampler head by a blast of nitrogen gas. This process can be attempted three times. Once a sample has been acquired, it will be loaded on board the capsule, with the arm and sampler head being stowed prior to return to Earth.

References:

1. https://www.asteroidmission.org
2. https://www.nasa.gov/osiris-rex
3. https://en.wikipedia.org/wiki/101955_Bennu
4. https://www.nasa.gov/specials/moon2mars/

OASI Excursion 2019

And speaking of trips…

It has been many years since an OASI excursion has been organised. At present this is just a feasibility study. In previous years we have gone to Herstmonceux, RGO Greenwich, The National Space Centre Leicester, Newton's House, Mullard Radio Observatory Cambridge, Bletchley Park. Attendance will be open to any one and not just members. I am tentatively thinking about organising this for a Saturday in October, but only if I get sufficient response.

We can either hire a coach privately or join an existing excursion. Galloway coaches do a excursion to RGO Greenwich. The price includes a guided tour and a meal, but there are only a few a year. For this one we may have too book for next year now.

If you are interested, please contact me, Roy Gooding at secretary@oasi.org.uk

Message from FEDASTRO: Moon landing on the Beeb

The BBC will be celebrating the 50th Anniversary of the Moon landings with a special Star Gazing Live program Details here :-

Excitement is mounting as we approach the 20th July 2019 -- the 50th anniversary of the first Apollo Moon landing. The media is starting to swing into action and there is bound to be lots of interest generated over the coming weeks.

Professor Brian Cox and Dara O Briain will return to our screens in a BBC Stargazing Special on the 15th July. The BBC are also showing a feature length documentary "8 Days to the Moon and Back" on 17th July. More details of these and their other programmes can be seen at this recent BBC press release: https://www.bbc.co.uk/mediacentre/latestnews/2019/moon-landings-50

As you may know the Go Stargazing team are keen to promote any events that are taking place as part of the anniversary commemorations through our http://gostargazing.co.uk/apollo50 events page. The events we feature will be shared with our social media followers as well as syndicated to other online portals in an attempt to reach as wide an audience as possible.

Starlink observed

Nigel Evans

Recently (Friday 24 May UT) SpaceX launched a Falcon 9 carrying 60 Starlink broadband satellites. Soon there were videos
http://www.spaceweather.com/archive.php?view=1&day=26&month=05&year=2019
showing all the satellites strung out in a line from their carrier. They are now actively dispersing along a single orbital plane. By 28 May the line had extended to nearly 20 minutes and I took the opportunity, under clear but humid skies, to try and record their passage. The satellites are not evenly distributed and the resultant video is too large to post and is, at times, very dull.

I used a driven A7S with at 100mm f/2 camera objective running at ISO12800 with a FoV of about 12deg by 20deg. I inadvertently had the exposure setting at 1/4 second - this results in quite a jerky video, but the moving objects standout clearly.

The attached frame grab is from when the most satellites were in the FoV at the same time: 6 Starlink, moving right to left and, by chance 2 Naval Ocean Surveillance System (NOSS) satellites moving top to left. I counted 58 objects in the sequence in total, a couple definitely flashing but most were steady.

Quite a few were seen in binoculars and none were particularly bright under the rather damp skies - I can only dream of what they would have looked like earlier.

Further to yesterday's still from a video of over 20 minutes, I have built an edited version of said video.

To make it small enough to email the editing has:

(a) removed any footage that has no Starlink satellites in

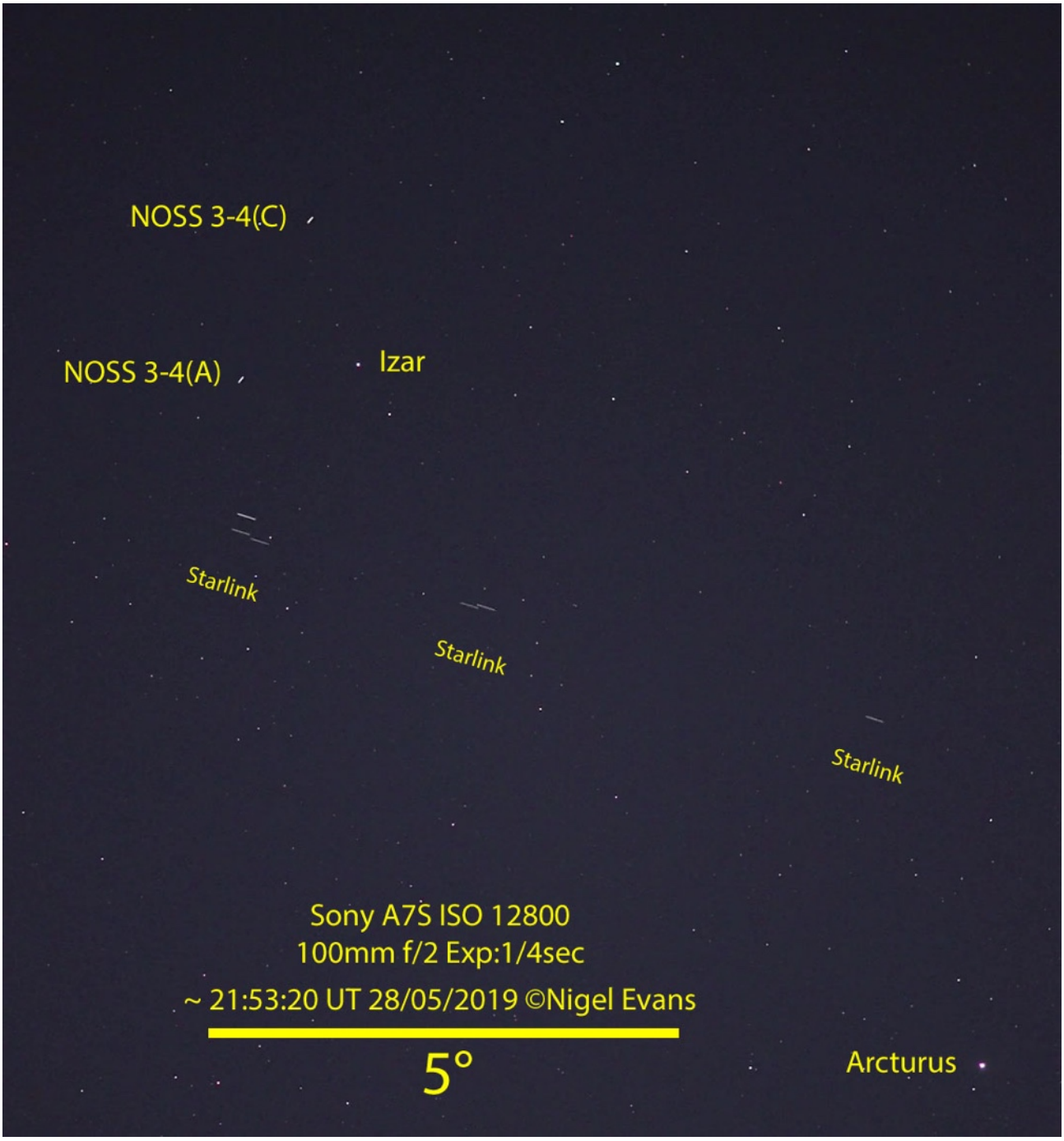
(b) taken every 6th frame (as the exposure is 1/4 second but the video records at 25 frames a second there are 6 or 7 identical frames)

(c) exported it at only 480 lines (as used on Youtube)

(d) kept the landscape format even though the camera was in portrait mode. This means that the satellites drop from the top and North is to the left

The orbits of the satellites are all in one plane and are following one another. The paths appear to climb (to the left) in this sequence because, in the 18 minutes of the sequence, the earth has rotated over 4 degrees underneath the orbit

Well it keeps me off the streets....



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Items for Auction

Mike Whybray

After last month's auction of astronomical equipment, only one Lot went: The winning bid was £721 for Lot 1 (Meade LX90), won by member Richard Knowles. We hope he will get great enjoyment from a super bit of kit!

As the equipment storage container for Newbourne is now ordered, the committee has decided that several eyepieces will be retained by the society for use at Newbourne. But the other items are now put up for auction a second time, with starting prices reduced by a half – see the list below, and refer to last month's newsletter for photos (or email Mike Whybray at workshops@oasi.org.uk to request a copy)

Bids must be submitted by email to the above address, or by hand or post to Mr M. Whybray, White House, The Street, Nacton, Ipswich, IP10 0HD, to arrive by the end of Monday 15th July 2019 latest. I will not be bidding for anything and will adjudicate bids with another committee member who has not bid, as soon as feasible after bidding closes. Any tied bids will be settled by random selection. For transparency, the names of winning bidders and amounts bid will be published in the newsletter, as well as by contacting the winners directly.

If on receipt of any items won a bidder is unhappy with their purchase due to a significant discrepancy with the description, the OASI committee will decide whether any adjustment or refund is to be made or not.

Notes
1 Bidding is open to OASI members only
2 To avoid confusion I've kept to the original numbers for the Lots still available

Lot 2

- Large wooden crate with Russian ТАЛ-2 Reflector Telescope. 150mm diameter mirror inside 1200mm tube (approx.). With eyepiece adaptor.

- Heavy column with motorised equatorial mount for ТАЛ-2. With 3 feet and about 1200mm high.
- Smaller crate with power supply for equatorial mount.
- 8x sighting telescope for ТАЛ-2.

[Note – telescope stored in crates in garage and has corrosion evident on the secondary mirror mount and support vanes - see photo]

Minimum Bid: £50

Lot 4

Three Eyepieces (probably originally purchased with Russian ТАЛ-2) (1¼ inch):

Kellner 15mm, Plössl 25mm, Kellner 42mm

Minimum Bid: £7

Lot 7

4x Barlow lens (1¼ inch)

Minimum Bid: £5

Lot 8

Starlight Xpress MX5 CCD 12 bit Imaging System (about 1997 USB) consisting of:

MX5 CCD camera (1¼ inch), 12V power supply, USB interface box, instruction leaflet.

[Note: No software comes with this. In response to an email question about software, Terry Platt of Starlight Xpress wrote back: It is difficult to get working on anything more modern than Windows98. To be accurate, you can use this camera on Windows10, but the driver does not accept the presence of other HID peripherals (USB mouse etc.). It also has problems with driver signing and so you would have to disable signing in Windows10 to get it to install. The original drivers are available from https://www.sxccd.com/downloads/usb11.zip and the software from https://www.sxccd.com/downloads/Starmx5usb.zip . The Windows10 version of drivers can be downloaded from https://www.sxccd.com/downloads/USB1_64bit_drivers.zip]

Minimum Bid: 50p !