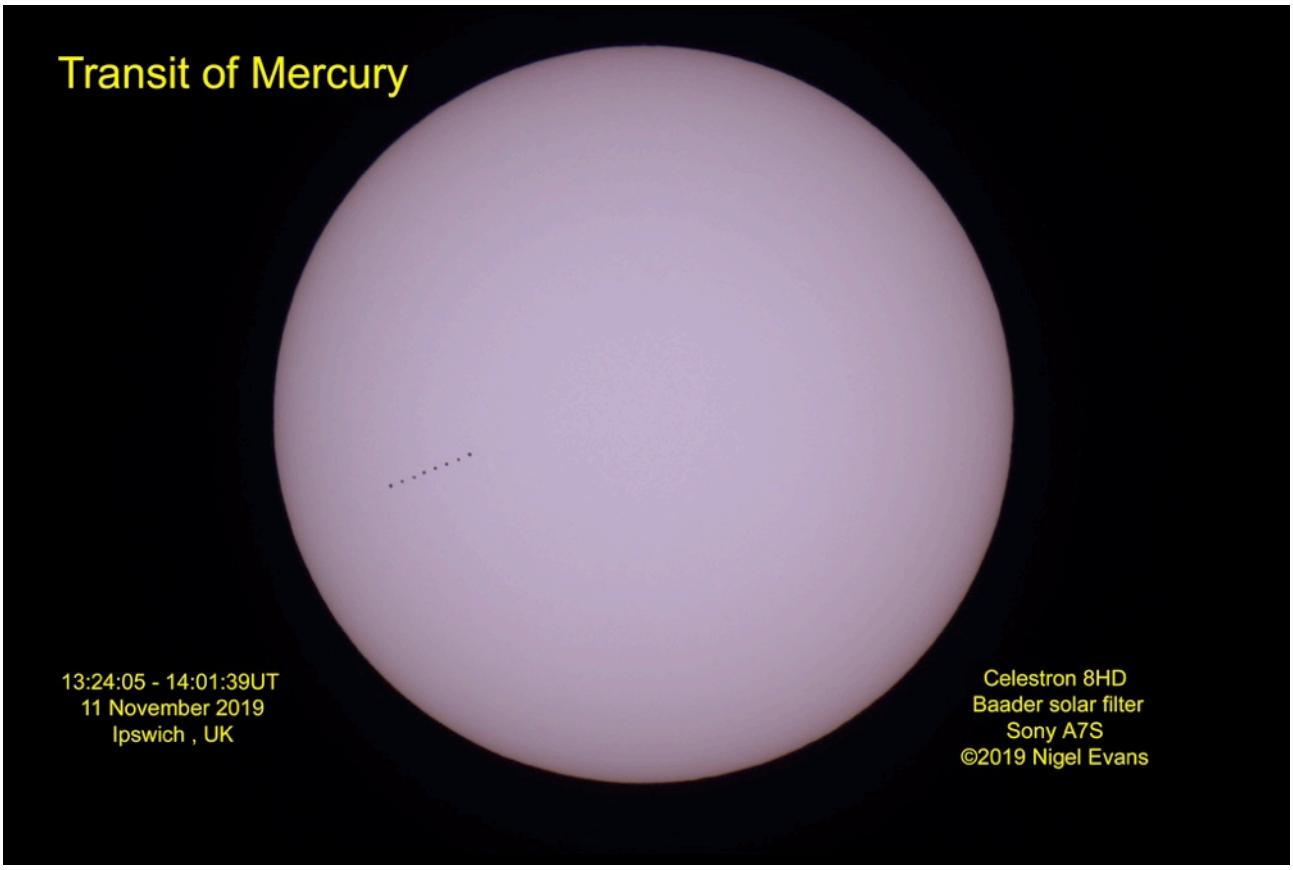
No. 560 Registered Charity 271313 December 2019

OASI News

The newsletter of the Orwell Astronomical Society



The Transit of Mercury

From a video by Nigel Evans

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:	Orwell Astronomical
Twitter:	@OASIpswich
https://groups.io/g/OASI	Members-only message board

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
	Matt Leeks	Safety & security
	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.
	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.

Annual General Meeting

Friday 17 January 2020, 8pm at Horley Spiritualist Church, 345 London Rd, Ipswich IP2 0BG

All members are invited to attend the AGM. A nomination form follows.

Please see map and location details on page 28.

OASI Officers & Committee – Nomination form

Nomination for 2020 committee

Name of Nominee .....

Post .....E.g. Chairman/Treasurer/Secretary/Committee.

Proposer .....

Seconded by .....

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 2020 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.

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 (bottom right of the calendar) 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
Monday 9 Dec from 19:00 Newbourne VH	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Wed 11 Dec 20:00 Coach and Horses, Melton	r.gooding908@btinternet.com	Christmas Party 2019
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
2020		
Friday 17 Jan 20:00	r.gooding908@btinternet.com	OASI Annual General Meeting

Date, Time & Location	Contact	Event
Sat 25 Jan 14:00 – 18:00 Institute of Physics, 37 Caledonian Road, London, N1 9BU.	https://britastro.org/meetings/2020	*BAA Meeting* Fred Nye “Latitude movements of solar prominences 2010–2017”. Dr Julian Onions “A universe from scratch” Sky Notes: Philip Jennings.
27 Jan (S+B) 19:00 Newbourne VH	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.19:30 Sky Notes
10 Feb 19:00 Newbourne VH	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
24 Feb 19:00 Newbourne VH	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.19:30 Sky Notes + talk at 19:45 by Paul Whiting “3000 years of eclipses”.
Sat 29 Feb. 19.30 to 22.00, set-up from 19.00 Kirton Recreation Ground	Andy Gibbs chairman@oasi.org.uk Martin Richmond-Hardy newbourne@oasi.org.uk	Star Party on Kirton Recreation Ground in support of KATCAG https://www.kirtontrimleycag.com/blog
7 March 10:00–17:30 Cottingham, near Hull	https://britastro.org/meetings/2020	*BAA Back to Basics Workshop.*
9 March	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
14 March Sheffield, The Diamond	https://britastro.org/meetings/2020	*BAA Deep Sky Section Meeting,*
23 March	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.19:30 Sky Notes + talk at 19:45 by Andy Gibbs on “Poppy” Northcott (former NASA flight cntroller.
25 March 17:00–20:00 Institute of Physics, 37 Caledonian Road, London, N1 9BU	https://britastro.org/meetings/2020	*BAA Special General Meeting,.* Grant Privett “Monitoring Variable Nebulae” Dr Andreu Font Ribera “Studying the expansion of the Universe across time” Sky Notes: Richard McKim

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

9 Dec	23 Dec (S+B)		
2020			
13 Jan	27 Jan (S+B)	10 Feb	24 Feb (T+S+B)
9 March	23 March (T+S+B)	13 April	27 April (S+B)
4 May[*]	25 May (B/H) (S+B)	8 Jun	22 Jun (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).

* 1st Monday due to Parish Council meeting on 2nd Monday

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 plus a reminder of OASI events.

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.

- 24 Feb: Paul: *3000 Years of Eclipses Visible from Orwell Park Observatory*.
- 23 March: Andy: *Frances "Poppy" Northcutt (former NASA flight controller)*.
- Paul: *Wartime Astronomy*, date 13 July TBC.

Paul Whiting, Bill Barton and James Appleton have offered to lead workshops as follows:

- Paul: *Galaxy Collisions*, date TBA.
- Bill: *Celestial Coordinates*, date TBA. New members at Newbourne have requested this workshop; Bill is willing to lead it but will defer if anyone else would rather do so.
- James: *Update on OASI All-Sky Meteor Cameras*, date TBA.

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

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

TBA

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

DASH Astro

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

Meetings are 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

Note * Guest Speaker Evenings - Admission Fees:- Members Free, Non Members £ 2:00

Meetings are now on Sundays.

12 Jan*	**Meeting:- Mike Poxon – Variable Stars**
18 Jan	Outreach:- Family Stargazing Evening at Dunwich Heath N.T. Site 6-9pm
26 Jan	Dash Observing Session (Sunset 16:27 Moonset 18:04 2.8% Moon)
09 Feb	**Meeting:- Prof. Michael Rowan-Robinson – Lost Time – When giants roamed the Earth.**
15 Feb	Outreach:- Suffolk Science Festival – Bury St. Edmunds.
23 Feb	Dash Observing Session (Sunset 17:19 Moonset 17:01 0.2% Moon)
08 March*	**Meeting:- Dr. Paul Whiting – Galaxy Collisions**
22 March	Dash Observing Session (Sunset 18:10 Moonset 15.59 3.5% Moon)

05 April	Meeting:- Talk T.B.C.
26 April	Dash Observing Session (Sunset 20:11 Moonset 23:57 11.3% Moon) Late one?
10 May*	**Meeting:- AGM plus talk by Amy Rankine from I of A, Active Galactic Nuclei**
24 May	Solar Observing - Location TBA
14 June	Outreach:- International SUNday - Location Dunwich Heath
25- July	(Saturday) DASH Summer Social (Members and Guests only)
06 Sept	**Meeting:- Ian Lomas - Quantum Mechanics for Beginners**
13 Sept	Dash Observing Session (Sunset 19:14 Moonset 17:46 21.5% Moon)
19&20 Sept	Outreach:- Henham Steam Rally. Solar Observing and Displays
04 Oct*	**Meeting:- Stewart Moore – Globular Clusters**
18 Oct	Dash Observing Session (Sunset 17:50 Moonset 18:57 4.7% Moon)
01 Nov	Meeting:- Talk T.B.C.
15 Nov	Dash Observing Session (Sunset 15:59 Moonset 16.21 0.2% Moon)
29 Nov	Meeting:- Talk T.B.C.
12- Dec	(Saturday) DASH Christmas Social (Members and Guests only)

Additional Dates for your diary.

15th -23rd February 2020	Haw Wood Spring Star Party (T.B.C.)
25th & 26th April 2020	Kelling Heath Spring Star Party
September 2020	Kelling Heath Autumn Star Party
Oct-Nov 2020	Haw Wood Autumn Star Party

BAA news

BAA meetings in December – March

7th December	BAA Christmas Meeting - Institute of Physics, 37 Caledonian Road, London, N1 9BU. Speakers are Prof Mark Kidger and Prof Emma Bruce with Nick James presenting the sky notes. We hope to again live stream this meeting after last year's success making it available to members unable to travel.
25 January	14:00 – 18:00 BAA Meeting, London – Institute of Physics, 37 Caledonian Road, London, N1 9BU. Fred Nye “Latitude movements of solar prominences 2010–2017”. Dr Julian Onions “A universe from scratch” Sky Notes: Philip Jennings.
7 March	10:00–17:30 Back to Basics Workshop, Cottingham, near Hull
14 March	Deep Sky Section Meeting, Sheffield, The Diamond.
25 March	17:00–20:00 Special General Meeting, Institute of Physics, 37 Caledonian Road, London, N1 9BU. Grant Privett “Monitoring Variable Nebulae” Dr Andreu Font Ribera “Studying the expansion of the Universe across time” Sky Notes: Richard McKim

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

Federation of Astronomical Societies (FAS)

The very successful FAS 2019 AGM & Convention was held at the Institute of Astronomy, Cambridge, on 14th September this year. In addition to the five excellent talks by invited speakers and the display stands by both astro-traders and local & national societies, the FAS held its AGM.

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

Moon

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

New Moon	1st Quarter	Full Moon	Last Quarter
	04 December 06:58	12 December 05:12	19 December 04:57

26 December 05:13

Sun, Moon and planets

Source: http://heavens-above.com/PlanetSummary.aspx **Times for 31 Oct are GMT (UTC)**.

Object	Date	Rise	Set	Mag.	Notes
Sun	1	07:40	15:47		Winter Solstice Dec 22, 04:19
	31	08:03	15:53		
Moon	1	11:56	20:26		Apogee 404,446 km 05 December 04:09 Perigee 370,265 km 18 December 20:26
	31	11:14	21:32		
Mercury	1	05:46	15:01	-0.5	
	31	07:54	15:08	-0.8	
Venus	1	10:08	17:19	-3.8	
	31	10:05	18:42	-3.9	
Mars	1	04:49	14:25	1.7	
	31	04:46	13:12	1.6	
Jupiter	1	09:27	16:58	-1.7	Superior Conjunction 2019-Dec-27
	31	07:58	15:30	-1.7	
Saturn	1	10:38	18:25	0.6	
	31	08:51	16:44	0.5	
Uranus	1	14:15	04:24	5.7	
	31	12:16	02:22	5.7	
Neptune	1	12:58	23:48	7.9	
	31	11:00	21:52	7.9	

Paul's Astronomy Podcast for November

Paul Whiting FRAS Podcast, December 2019 www.oasi.org.uk/2019_12_pod.mp3

Occultations during December 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
02 Dec	17:49:49	D	0.35+	-18	19	7.5	H107509
02 Dec	18:24:22	D	0.35+	-23	17	7.4	ZC3191
03 Dec	20:26:20	D	0.45+	-42	15	7.5	ZC3323
05 Dec	18:07:33	D	0.63+	-21	31	4.6	33 Psc
	19:19:07	R		-32	32		
05 Dec	21:37:22	D	0.64+	-52	25	5.8	ZC18
08 Dec	17:10:46	D	0.88+	-12	25	6.8	H10776
09 Dec	00:38:06	D	0.89+	-59	31	6.1	ZC368
10 Dec	23:19:26	D	0.98+	-60	55	5.9	ZC610
12 Dec	02:17:37	D	1.00+	-49	46	5.3	106 Tau
13 Dec	06:45:07	D	0.99-	-10	17	3.3	7 Gem, η Gem
	07:14:15	R		-6	13		
30 Dec	17:54:56	D	0.19+	-18	16	7.1	H110054

Graze

On 20 December at 04:29 UT there is a southern limit graze of the magnitude 8.0 star ZC1840. Details are on the OASI website: http://www.oasi.org.uk/Occs/Occ_summary_2019.php. An observing trip will be organised if weather conditions are favourable; contact Alan Smith or James Appleton if your are interested in participating.

Meteor showers

Source: BAA Handbook 2019 p100-101

Shower	Maximum	Normal limits	ZHR at Max	Notes
Northern Taurids	Nov 12	Oct 20 – Dec 10	5	Northern branch of the Taurid complex. Slow meteors. Unfavourable.
Geminids	Dec 14d 14h	Dec 4–17	100+	Richest of the annual showers, with slow meteors and a good proportion of bright events. Unfavourable.
Ursids	Dec 23	Dec 17–26	10	Under-observed shower which has produces outbursts in 1945, 1982, 1986,and in 2014. Very favourable.

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

Date	Brightness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Dec	-3.5	16:36	10°	WSW	16:40	63°	SSE	16:43	10°	E
01 Dec	-3.3	18:13	10°	W	18:16	62°	W	18:16	62°	W
02 Dec	-3.8	17:25	10°	W	17:28	86°	S	17:29	32°	E
02 Dec	-0.8	19:01	10°	W	19:02	18°	W	19:02	18°	W
03 Dec	-3.7	16:36	10°	W	16:40	83°	S	16:43	10°	E
03 Dec	-3.3	18:13	10°	W	18:16	59°	WSW	18:16	59°	WSW
04 Dec	-3.7	17:24	10°	W	17:28	79°	S	17:29	29°	ESE
04 Dec	-0.8	19:01	10°	W	19:02	17°	W	19:02	17°	W
05 Dec	-3.7	16:36	10°	W	16:39	85°	S	16:43	10°	E
05 Dec	-2.8	18:13	10°	W	18:16	43°	SSW	18:16	43°	SSW
06 Dec	-3.2	17:24	10°	W	17:27	56°	SSW	17:30	20°	SE
06 Dec	-0.7	19:01	10°	W	19:02	15°	WSW	19:02	15°	WSW
07 Dec	-3.5	16:36	10°	W	16:39	70°	SSW	16:42	10°	ESE
07 Dec	-1.8	18:13	10°	W	18:15	24°	SSW	18:16	21°	S
08 Dec	-2.2	17:24	10°	W	17:27	34°	SSW	17:30	10°	SE
09 Dec	-2.6	16:35	10°	W	16:38	45°	SSW	16:42	10°	SE
10 Dec	-0.9	17:24	10°	W	17:26	18°	SW	17:29	10°	S
11-Dec	-1.4	16:35	10°	W	16:38	26°	SSW	16:41	10°	SSE

Date	Brightness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
21 Dec	-0.6	06:54	10°	S	06:56	15°	SE	06:58	10°	ESE
23 Dec	-1.7	06:52	10°	SSW	06:55	29°	SSE	06:58	10°	E
24 Dec	-1.2	06:04	10°	SSW	06:06	21°	SE	06:09	10°	E
25 Dec	-2.9	06:51	10°	SW	06:54	50°	SSE	06:57	10°	E
26 Dec	-2.4	06:03	16°	SW	06:05	37°	SSE	06:08	10°	E
27 Dec	-1.9	05:17	27°	SSE	05:17	27°	SSE	05:19	10°	E
27 Dec	-3.6	06:50	10°	WSW	06:53	74°	S	06:56	10°	E
28 Dec	-3.4	06:03	33°	SW	06:04	61°	SSE	06:08	10°	E
29 Dec	-2.3	05:16	37°	ESE	05:16	37°	ESE	05:19	10°	E
29 Dec	-3.8	06:49	13°	W	06:52	86°	S	06:55	10°	E
30 Dec	-3.8	06:02	47°	WSW	06:03	81°	S	06:07	10°	E
31 Dec	-2.3	05:16	37°	E	05:16	37°	E	05:18	10°	E
31 Dec	-3.8	06:49	15°	W	06:51	80°	S	06:55	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

Astronomy events on your e-calendar

As well as adding OASI events to your e-calendar (see page 5), you can add moon information.

https://cantonbecker.com/astronomy-calendar/

As the author states:

"Subscribing to this public calendar (.ics file) will insert dates and times of events of astronomical significance into your iPhone / iCal / other calendar program / cybernetic mutant brain chip. This calendar is something I curate by hand at the beginning of each year to highlight full moons, new moons, eclipses, solstices, equinoxes, mercury retrogrades, plus a meteor shower or two and some other surprises. This calendar has been running continuously since 2007 and has over 110,000 subscribers."

Norwich Science Festival 2019

Roy Gooding

The Norwich Science Festival has now been running since 2016. It takes place during the school half term week in October. The principle location is at the Forum, but there are numerous other locations around the city that host events. This year it ran between the 18th to 26th October, with events in the Forum running from 10:00 to16:00. This is the second year OASI have contributed. Five members attended Andy Gibbs, Paul Whiting, Pete and Nicky Richards and myself.

Astronomy day this year was on Saturday 26th. Three astronomical society's had stands, the other two were DASH and Norwich. Last year we were in the Forum, but this year we were all in a large marque outside the Forum's entrance.

The event is aimed for children at junior school level, as a half term event. It is difficult to estimate numbers, but there must have been a few thousand passing through the marque. However, the organises estimated it was up to 10,000 a day, but I think this is probably an over estimate.

Paul presented a lecture on the Solar System in the morning. We presented a selection of hands on activities and demonstrations. At the peak we had five tables in use, backed by a number of display boards covered in various astronomical posters.

- Word search
- Planetary colouring
- Gravity and mass simulation
- Answering any astronomical related questions
- How use a planisphere
- Laptops were bought along to demonstrate planetarium and related software.

It was very busy day.

My observations of the event

This was my third day at the event having helped the Hawk and Owl Trust on the Monday and Tuesday. Each day seemed to have a different ambiance.

- On Monday there were more families with lots of children all day.
- On Tuesday there were more adults. I was talking to the visitors more than on Monday.
- On Saturday the event started slower than earlier in the week. It was well into the morning before the marquee looked full.

The organisers report that "A staggering 137,000+ visits were made to #NorwichSciFest 2019 during the 9-day main programme!"

The OASI stall at the Norwich Science Festival

Photo by a member from DASH

Photo by Roy Gooding

Transit of Mercury, 11 November 2019

OPS Observatory Report: James Appleton

Martin Cook and I coordinated observing arrangements for the transit of Mercury using the Tomline Refractor at Orwell Park. As usual for transits, we aimed to project an image onto a sheet of white card. A high-contrast image necessitated an effective sunshade to block stray light entering the dome via the aperture, and we had spent the last three weeks constructing the "best-ever" sunshade (the Mark V).

On 11 November at Orwell Park there was intermittent light rain for much of the morning, and an increasing wind. Because of the poor weather, and profound pessimism about being able to observe anything at all, Martin and I delayed opening the dome until approximately 12:00, much later than planned, by which time the weather seemed to be slightly improved. There then ensued a frantic scramble to engage the Tomline Refractor with the sunshade and prepare for observations. All was in place by approximately 12:20.

The solar disk not fit fully onto the projection screen, which was positioned to capture the ingress phase of the transit. The portion of the disk projected onto the screen was devoid of sunspots or any other obvious feature. (There was a suspicion that some granulation was visible, but this was not confirmed.) The image was turbulent, especially around the solar limb. We set up two cameras, a Canon 1100D and a Canon 6D MkII, in video mode, mounted on a bracket attached to the refractor. Throughout the observation we also used various stills cameras.

At 12.30, I adjusted the position of the sunshade and, unfortunately, because of its coupling to the telescope, the position of the latter also changed, slewing away from the Sun. Fortunately, Martin was able to reposition the telescope and, by 12:33:30, with only two minutes until first contact, observations resumed. Phew – that was close!

Paul Whiting joined us to observe ingress. We called first contact at 12:35:47 (geometric prediction 12:35:35). Analysis of my video later indicated that the first hint of first contact occurred at approximately 12:35:39, although this timing is very uncertain because of the turbulent limb. At approximately 12:36:49, the black drop effect began. It ended, with the planet visibly fully inside the solar disk, at 12:37:11 (geometric prediction 12:37:16). Once Mercury appeared fully inside the solar disk, the difference in size between the Sun and the silhouette of the planet became very pronounced: the former was some 75cm in diameter, the latter only approximately 4mm).

Parties of school children began arriving at 12:45 to see the transit. Some pupils asked very intelligent questions, indicating a good appreciation of they physics of the situation. My favourites were:

- Why does the solar limb appear turbulent? (Atmospheric unsteadiness.)
- Is it possible for Mercury and Venus to be simultaneously in transit? (It is, although any intending observer should note that there will be a lengthy wait, as the next such event is not until AD 69,163!) [*and it may be cloudy. Ed.*]

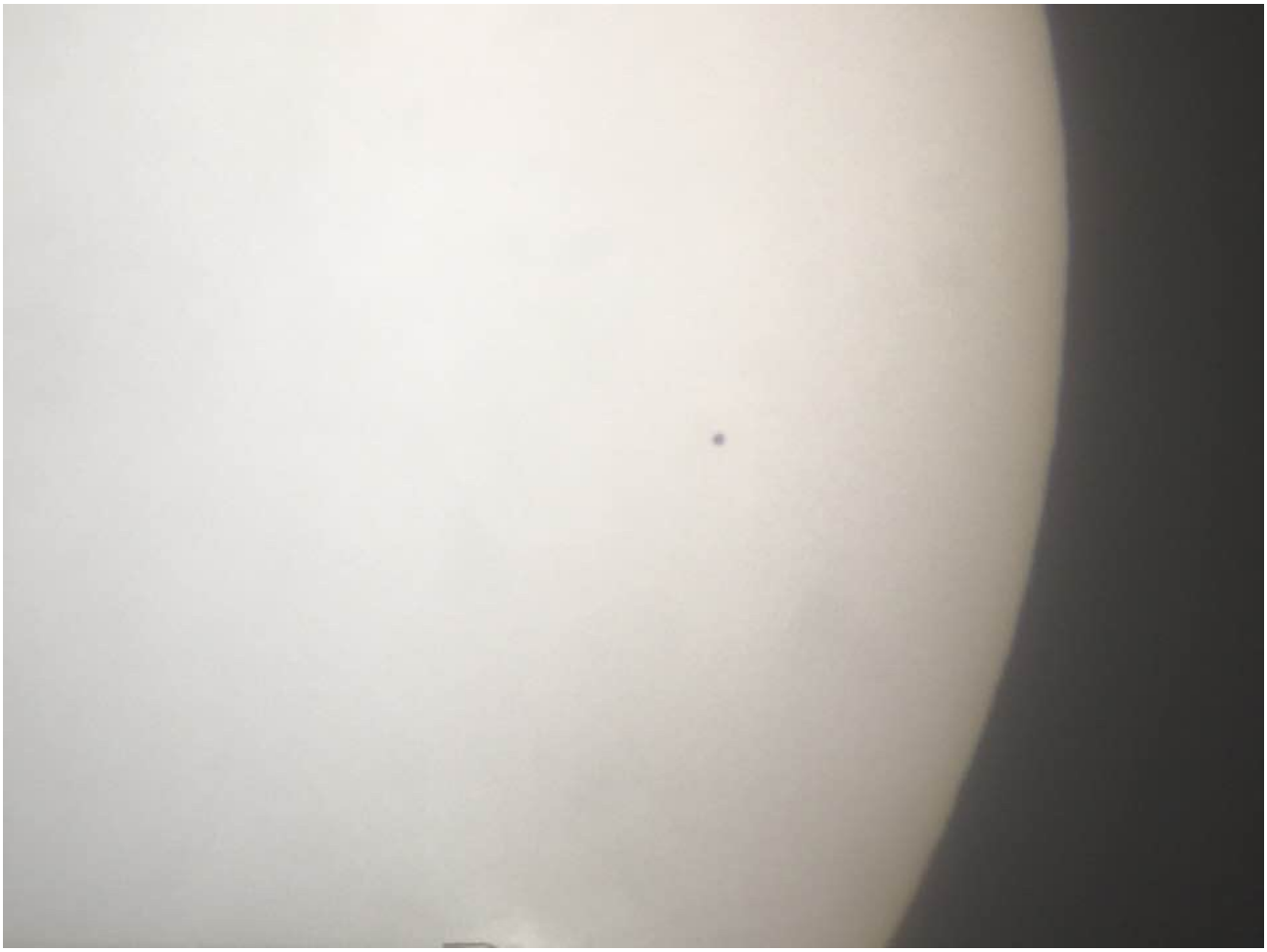
Would it be possible from outer planets to see transits of the Earth or Mars? (Indeed, it would.)

While the children were visiting, we saw two spectacular silhouettes of aeroplanes transiting the Sun's disk. They appeared large, in focus, and travelled fast. The children were impressed!

The weather deteriorated after lunch and the Sun was, unfortunately, clouded out when some groups of pupils came to visit. We began packing up around 15:15.

Observers attending Orwell Park at various times throughout the day were: Roy Adams, Merlyn Adams, James Appleton, Bill Barton, Martin Cook, Andy Gibbs, Caroline Newman, Mike O'Mahony, Paul Whiting. Over 100 children from the School also attended and most were able to see something of the transit.

Attached is an image of a very pronounced black drop effect taken at 12:37:06.



Transit of Mercury projected through the Tomline refractor, Orwell Park, Nacton.

Photo by Andy Gibbs

Chairman's thanks

Thankfully, the weather yesterday was not as bad as forecast and we managed a successful observation of the Transit of Mercury at Orwell Park Observatory.

A big "thank you" to all members who attended, with special thanks to James Appleton and Martin Cook for their hard work in fitting Sunshade mark V and to Paul Whiting for keeping the school pupils entertained with his talks.

There were many positive comments from pupils and teachers, the Headmaster and Deputy Head Academic have emailed thanks to OASI for running the event.

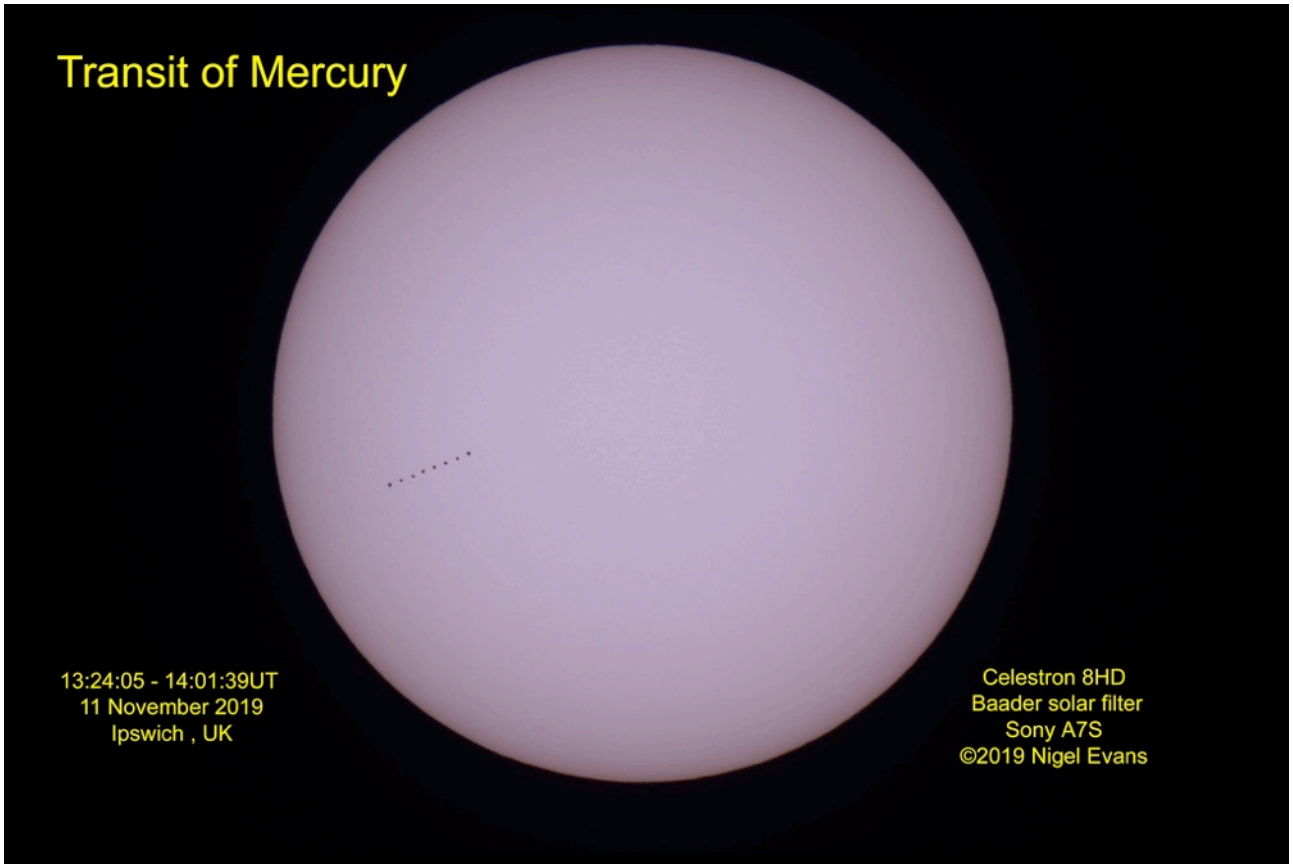
Report: Nigel Evans

The weather didn't promise much for seeing the transit today. About midday it did brighten up, although somewhat windy. Setting the exposure was problematic with clouds scooting by, causing the image to be either black or burnt out, and the lack of anything to focus on (no sunspots), other than the limb of the Sun, made setting-up quite difficult. In the end Mercury itself was the focus aid. By the time this had happened the Sun then slid behind a neighbour's rather bushy tree ;-(

The skies than cleared for a while, but periodically clouds came and went, then a large cloud bank appeared. By the time this past the Sun was now vanishing into yet more foliage and I called it a day.

The animation 191111ToM2_NSE.avi [download is available only to members of https://groups.io/g/OASI – you may need VLC Media player to view it] at least does show I was not recording a sunspot or a piece of dirt in the camera.

Below is a single composite frame.



Report: Alan Smith

Observing From Grundisburgh

I used the following equipment for observation and imaging:

- Skywatcher AZ goto mount
- Canon 1100D DSLR camera.
- Konusmotor 90mm refractor, stopped down with 70mm mylar filter lens cap. 26mm Plossl eyepiece projection. Exposure set to 1/1250 s at ISO 100.
- Direct imaging to laptop PC.

Observations made from Grundisburgh, IP13 6RE.

I had originally intended to use the same equipment as I had previously used to capture the 2016 transit. However, a lack of time meant that I used a newly acquired Skywatcher motor driven mount coupled to a poor quality refractor type telescope. If I had thought more about things, I would have made a mount adapter to fit the same telephoto lens arrangement used last time to the Skywatcher mount. Next time!

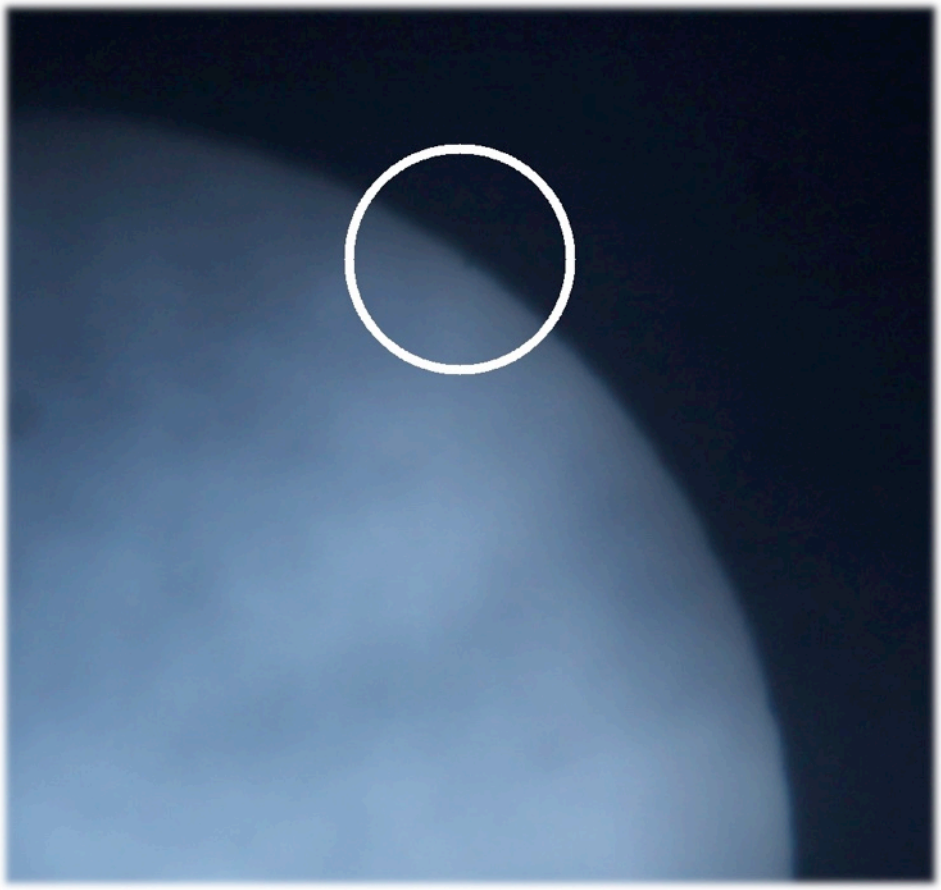
Thick, fast moving cloud (and occasional rain showers), prevented any sort of telescope focusing until just a few minutes before 1st contact. Owing to high winds gusting to 30mph, the observation was performed from inside the lounge (with the patio door open)!

I was unable to focus the complete disc of the sun, owing to some sort of problem with the telescope optical train, coupled wind shake (even indoors!).

I started imaging at around 1214 UT with occasional exposures between the thick clouds. During the ingress phase, from 12:30 to 12:48 UT, I used live view to track, and ad-hoc timing to record images every few seconds. There was still much cloud coming and going which meant that there were several seconds (sometimes minutes) when I could not see the sun to track. Although the Skywatcher would have tracked Mercury automatically, there was no chance to go through the 3 star alignment procedure required by the mount to begin auto tracking (it was daylight and no stars visible).

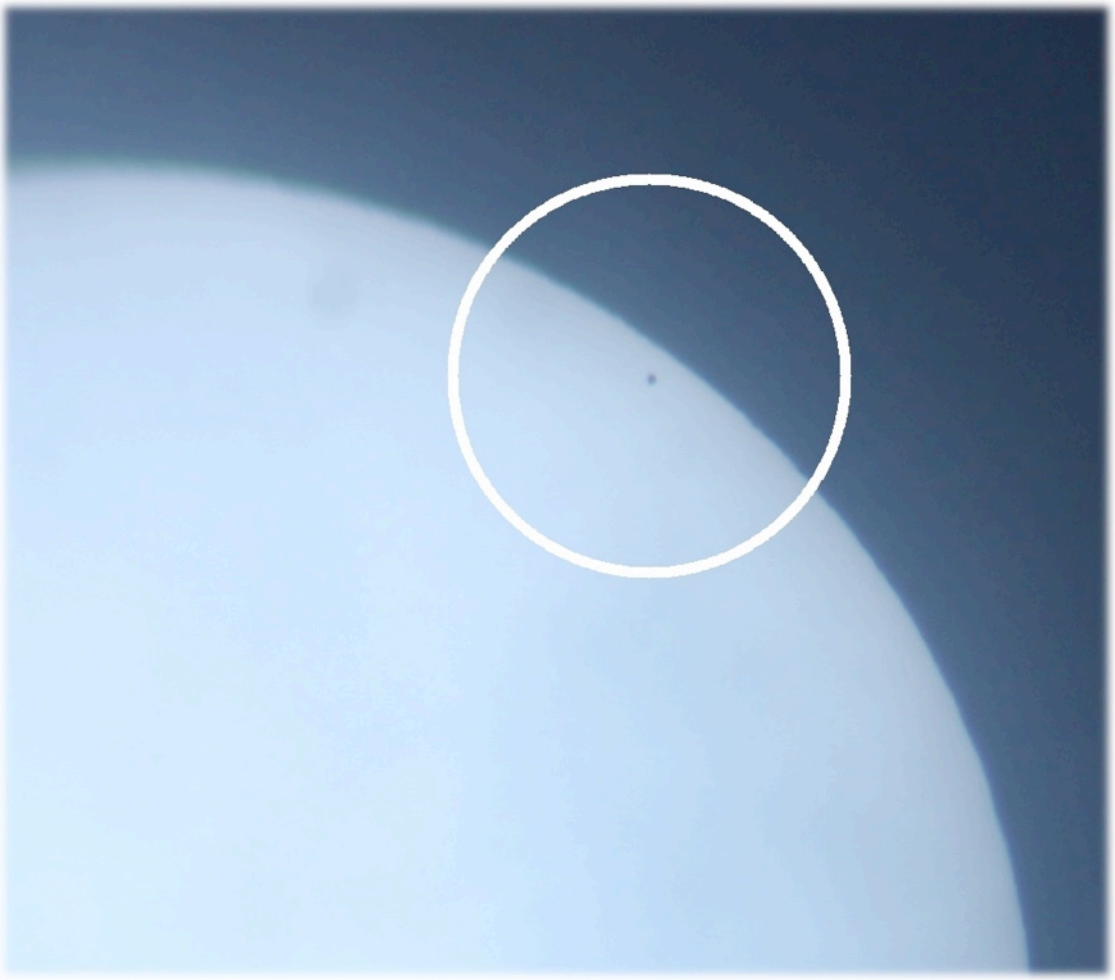
However, manual guiding proved adequate and I did manage to get a few odd images of Mercury. Ingress timings (1st and 2nd contact) were completely missed!

Theoretical 1st contact, (12:35:11 hrs UT) showing typical cloud cover. Nothing obvious!



12:36:46 hrs UT. Increased cloud but Mercury clearly visible! 1st contact missed! Tear drop effect noted at Orwell park.

12:37:17 hrs UT. Increasing cloud and limb very diffuse. Orwell Park report Mercury fully inside limb.

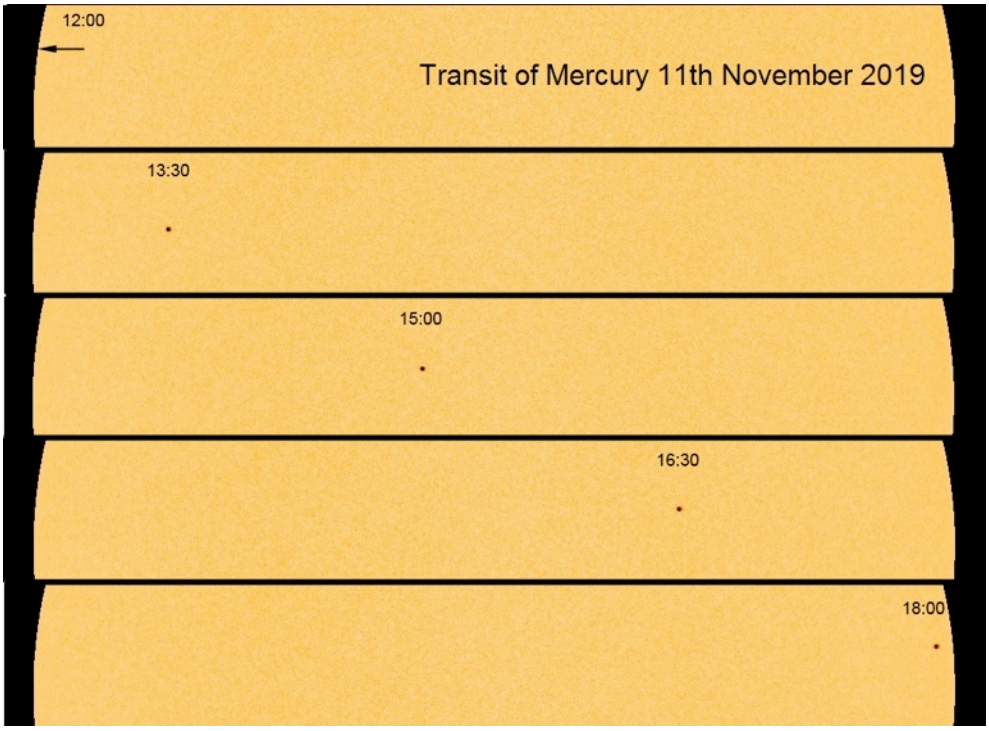


12:41:54 hrs UT. Less cloud but Mercury now well clear of the limb. 2nd contact missed!

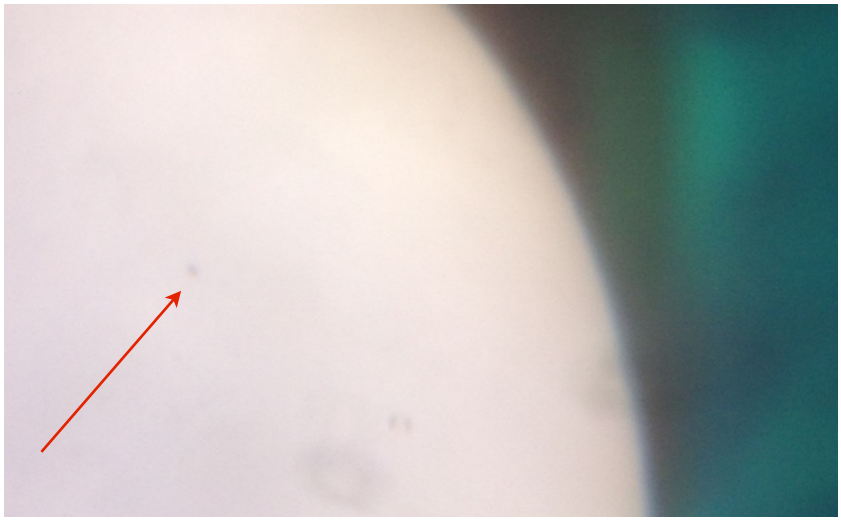
Equipment used. Note that the patio was slid to one side for the actual observation!

Report: Mike Harlow

Couldn't see it from home mainly due to trees but the rain, wind and cloud didn't help either!!! So I downloaded images from the SOHO satellite and put them together in the attached composite. MDI Continuum images taken every 1.5 hours, starting at 12:00UT before the start of the transit. A narrow slice was taken from each images as the rest of the Sun looks rather boring at the moment...!



Report: Mike Whybray



Observing from Nacton, IP10 0HD. Equipment: Helios 114mm Newtonian with focal length 910mm on EQ1 mount, with 20mm eyepiece. It was very windy so the telescope wobbled about a lot on its rather flimsy mount. Mainly cloudy with occasional patches where full sunlight shone through during which I visually observed the tiny black disc of Mercury for several minutes total time. No sunspots were visible. I attempted several photographs with an iPhone5 camera held up to the eyepiece, and then with a compact camera on a mount clamped to the eyepiece. Due to difficulties focusing, and telescope wobble, only one photo actually showed Mercury (taken at 13:50 with the iPhone 5) - along with a lot of crud on various lenses etc!

Report: Roy Gooding

The morning of the 11th started out wet and overcast, however around 12:30 the sky started to brighten up. There were several clear patches visible, some 20 minutes later. I got out my 70mm Maksutov telescope for solar projection but unfortunately I did not see anything. The projected image was much fainter then usual, this was probably caused by a thin layer of cloud. The sky did look very milky. I then used my solar binoculars to attempt to see Mercury, again with out any success. I abandoned these observations around 12:55.

I did not resume observations again, until around 14:45. This time I used my 90mm Maksutov with a white light solar filter. This was setup in the front garden. I stayed there until the sun disappeared behind the houses, at about 15:45. During this hour, there were a few fleeting gaps

in the clouds. I did see Mercury for a minute or two when totaled over about 4 or 5 good clear patches.

Between the two observations I went to town.

Report: Martin Richmond-Hardy

Observed successfully from Kirton using Dobsonian mounted 200mm Newtonian fitted with Baader filter but with intermittent cloud & obscuration by neighbour's trees. No successful photo.

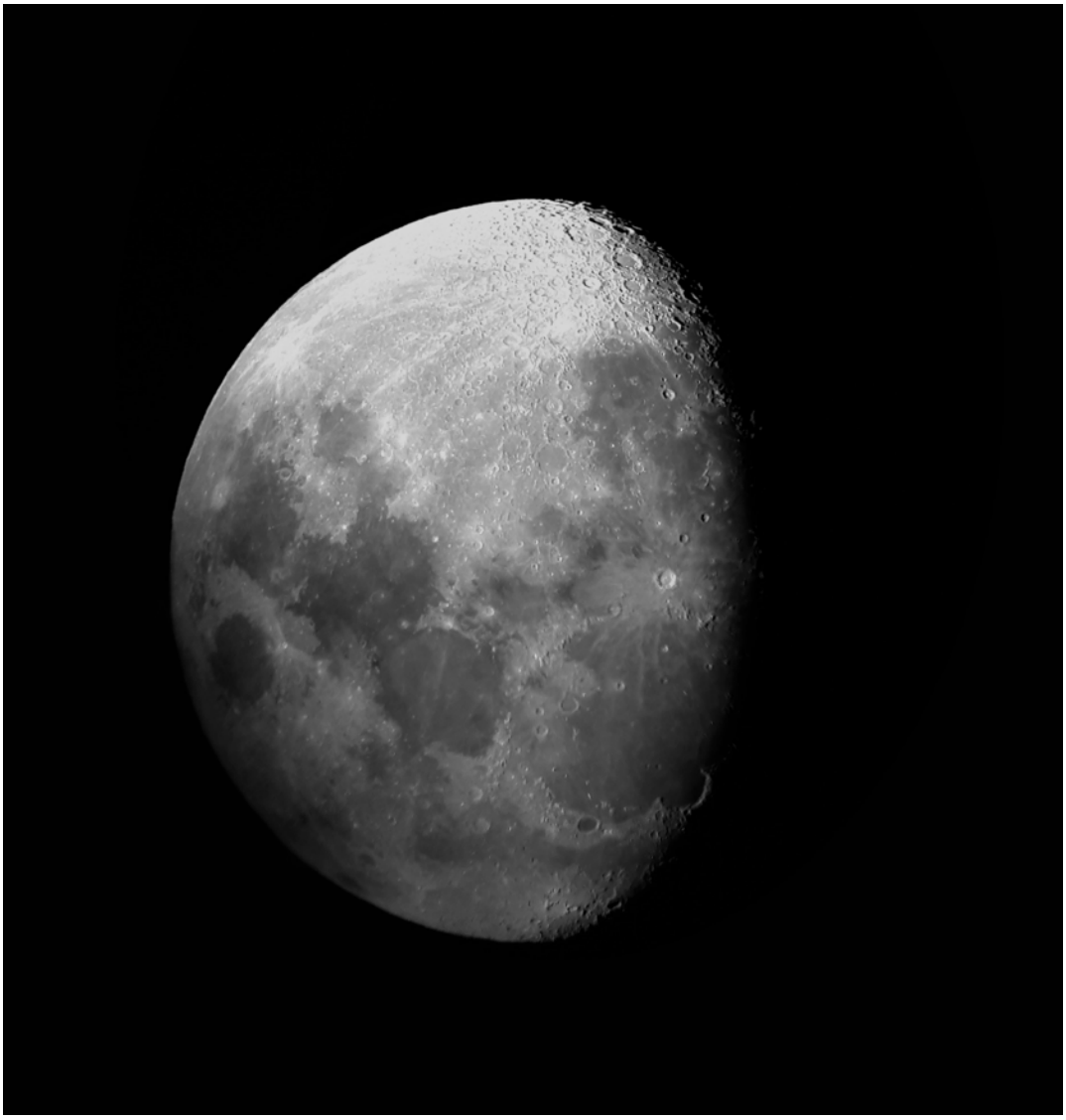
James Appleton has compiled a more detailed report, available on our website at

http://www.oasi.org.uk/Obsvns/20191111_ToM/20191111_ToM.php

Astrophotography without a DSLR

Neil Short

Don't know if of any use but I for one am very impressed at the attached – take on my smartphone (Samsung A5 (2017) so not very new or of impressive spec) in default auto photo settings down the eyepiece (26mm) of a Dobsonian 10inch telescope. I personally think it's quite good, helped by a beautiful clear night last Thursday…



Moon (cropped)

It shows that for some (easy) targets no great equipment is required,

Hacking your Canon "point & shoot" camera

Martin Richmond-Hardy

In perusing some of the other groups.io groups, I came across this in the QCUIAG group (Quick Camera and Unusual Imaging Astronomy Group) – an international group of astronomers producing astronomical images with unconventional electronic imaging devices such as modified webcams, video surveillance cameras and digital cameras. https://groups.io/g/QCUIAG

Canon Hack Development Kit

https://chdk.fandom.com/wiki/CHDK_1.4.0_User_Manual

CHDK is a unique software application developed by enthusiasts that enables extra features for ported Canon™ "Point&Shoot" cameras. (Note: it will not run on DSLR cameras.)

What can it do?

CHDK enhances the capabilities of your camera in a non-destructive, non-permanent way.

After loading CHDK, your camera will have the following extra functionality:

- Shutter-priority (Tv) exposure - via shutter value override feature
- Aperture-priority (Av) exposure - via aperture value override feature
- Shooting in RAW, with RAW Average, RAW Sum, and RAW Develop features
- DNG (Digital Negative) in camera conversion, and USB download options
- Bracketing -Tv, Av, ISO, and Focus bracketing, using scripts, or in continuous or custom timer modes
- Live histogram (RGB, blended, luminance and for each RGB channel)
- Zebra mode (a live view of over and under-exposed areas of your picture) for many cameras
- Depth-of-field (DOF)-calculator, Hyperfocal-calculator with instant Hyperfocal and Infinity focus-set, and more
- Battery indicator
- RAW and Video space-remaining gauges with custom low-limit alerts
- USB cable remote shutter release
- Motion-detection trigger - automatically fires camera on motion detection. - Ability to capture lightning strikes.
- Adjust Video quality and size (compression) adjustable while recording
- Elimination of 1 Gig video-size limit (for most DIGIC II cameras)
- Zoom during video function - for cameras without this feature
- Shutter, Aperture, and ISO Overrides
- Ultra-long shutter speeds - at least up to 64 seconds - and longer for supported cameras
- Ultra-fast shutter speeds - up to 1/10,000" and higher
- High-speed Flash Sync at all speeds up to 1/64,000"
- Custom, user-editable visible grids for framing, cropping, and alignment (not all cameras)
- File browser
- Text reader
- Text editor
- Calendar
- Games
- Fully customizable CHDK display, info placement, user colors, fonts in menus, etc.
- Multi-language Interface - CHDK supports many languages
- Custom CHDK User Menu - for instant recall of up to 10 favorite functions
- Scripts execution - including intervalometer, motion detection, etc
- And many others.

These new features are accessed through CHDK-specific menus, rather than the default camera menus. Experiment with care! I will be experimenting with my PowerShot SX210IS.

InSight: A NASA MISSION TO STUDY MARS IN DEPTH.

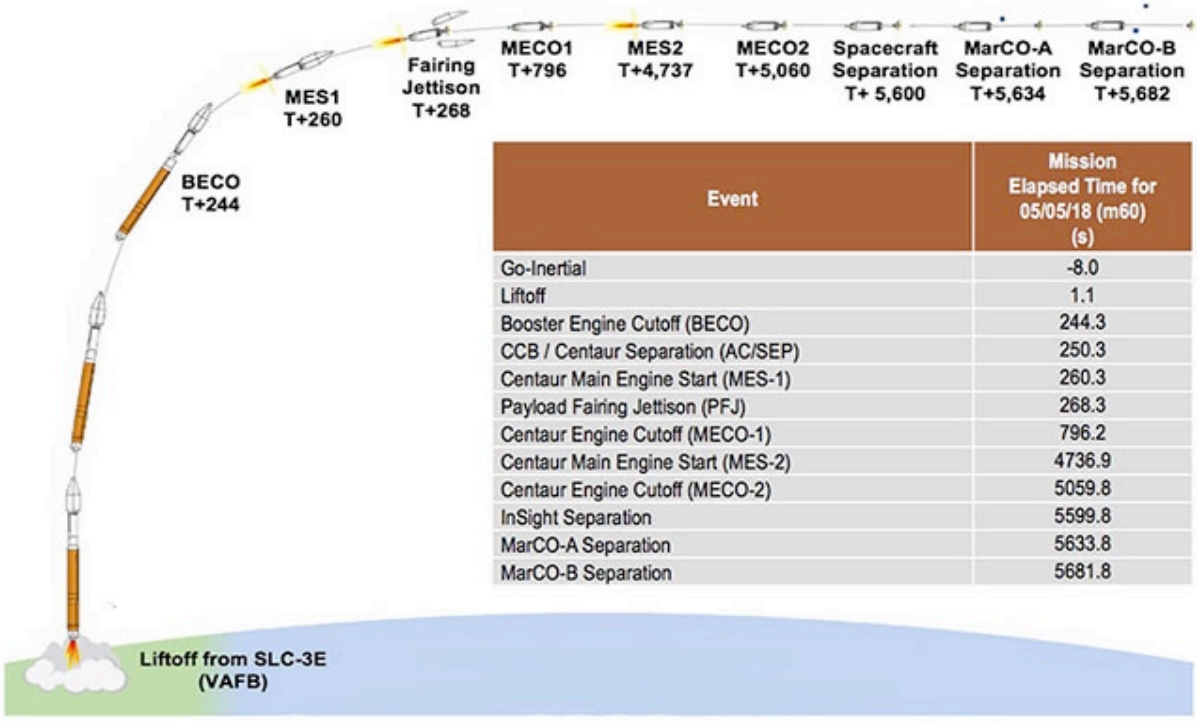
A short study of the InSight mission from the library.

Several months ago I wrote a short missive about WALLE and EVE, who flew to Mars alongside InSight. This short essay is to add more detail to this mission.

For NASA, InSight is a mnemonic which stands for ' Interior Exploration using Seismic investigations, Geodesy and Heat Transport'. With the information NASA obtains from the work with Mars, they are hoping that this can be extrapolated to other rocky planets. Perhaps in time this will give us a better understanding of our solar system. The total mass of the system during the cruise phase is 694 kg, with the lander being 358 kg.

Insight was launched by a two-stage Atlas V-401 rocket from Vandenburg Airforce Base, California, on 5th May 2018: 7.05 a.m. ET. It landed on the Elysium Planitia :Mars , on 26th November 2018: 2:52:59 p.m. ET. The mission duration scheduled for approximately 2 years. This is a joint venture of the Lockheed Martin Corporation and Boeing. The 401 number attached to the Atlas rocket nomenclature breaks down as follows: 4 is the nose cone diameter in meters: 0 is the number of solid rocket boosters and :1 is the number of engines on the upper stage. About 850,000 pounds of thrust is provided by the common core booster at full throttle. You may remember that the last study of InSight was concerned mainly with the MarCO-A and MarCO-B CubeSats, named WALLE and Eve. These were stored in the upper part of the rocket body called Centaur, which has its own flight control electronics enabling it to release its payload at the correct altitude and rotation. It also communicates both mechanically and electronically to InSight to which it is connected at its distal end. The space vehicle is shrouded with a protective covering , 12.2 m long and 4.2 m at its widest point, which is ejected just before escaping Earth's atmosphere.

Upon launching, at a speed of 2.77 km/s. there was a burn of 244 seconds by the primary stage of the common core booster engine, and a further 6 seconds later the primary stage was discarded, falling into the Pacific Ocean. At the end of approximately a further 18 seconds, the interstage adapters and the protective covering was jettisoned, and the Centaur engine started its first burn for about nine minutes, allowing a parking orbit for the craft.



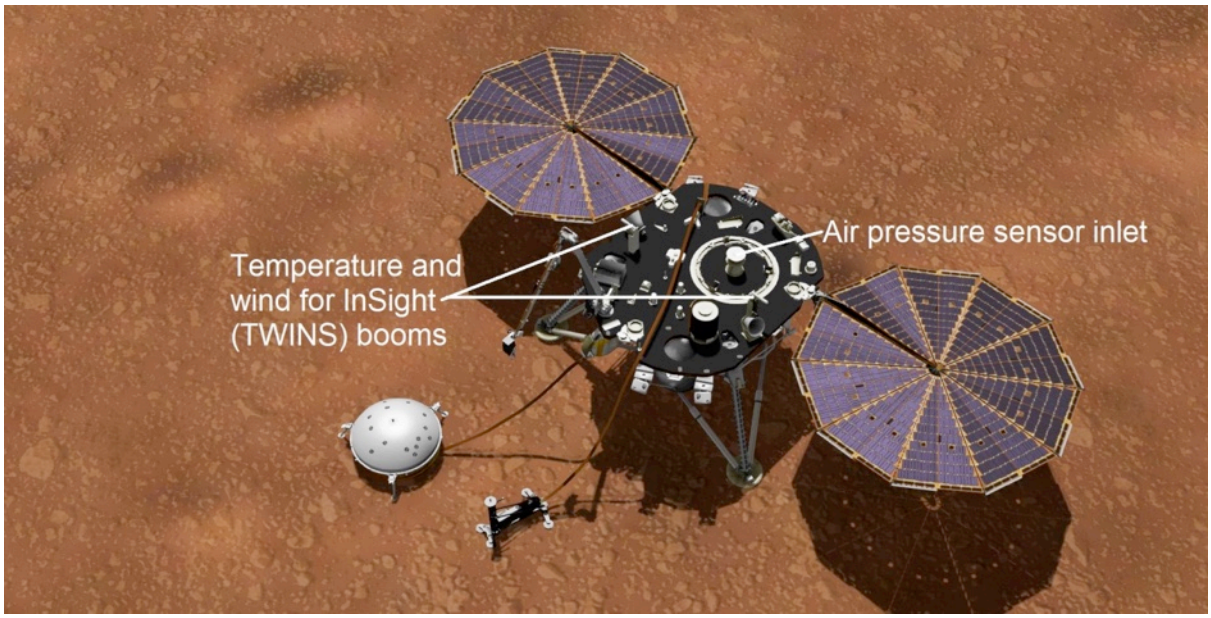
Event	Mission Elapsed Time for 05/05/18 (m60) (s)
Go-Inertial	-8.0
Liftoff	1.1
Booster Engine Cutoff (BECO)	244.3
CCB / Centaur Separation (AC/SEP)	250.3
Centaur Main Engine Start (MES-1)	260.3
Payload Fairing Jettison (PFJ)	268.3
Centaur Engine Cutoff (MECO-1)	796.2
Centaur Main Engine Start (MES-2)	4736.9
Centaur Engine Cutoff (MECO-2)	5059.8
InSight Separation	5599.8
MarCO-A Separation	5633.8
MarCO-B Separation	5681.8

Picture credit: https://www.jpl.nasa.gov/news/press_kits/insight/launch/mission/#edl

After the first engine burn, the remaining space craft continued on track without using power for about an hour, to the point calculated for the second engine burn. This second burn provided the power to propel the craft out of Earth orbit, to head in the direction of Mars. This burn lasted about 5 minutes. Nine minutes later, the atlas second stage released the InSight module with enough momentum to push it away from the rocket casing. This occured at about 90 minutes post lift-off. A short time later MarCo-A and MarCo-B were released, allowing them to begin their own transmissions. Up to this point, NASA's Tracking and Data Relay Satellite had been monitoring the functionality and status of the modules. InSight was also activated so that it could obtain data for orientation and transmissions commencement. The acquisition time of these signals was up to 107 minutes after initial launch, picked up first by the Goldstone, California station and then Canberra in Australia.

Having launched on 5th May 2018 it took 205 days to reach Mars. During its cruise phase, it continued to run self diagnostics and perform basic flight correction tasks, following a type I trajectory. At this point, the InSight lander remained within its cover attached to the Cruise module. The stability of the craft was conserved by thrusters controlling three separate axis. There are eight thrusters that will be used throughout the mission, the four larger ones being called the 'trajectory manoeuvre thrusters' and the remaining ones are described as 'reaction control system thrusters' taking care of altitude and roll control. Throughout this phase, NASA's Deep Space Network antenna posts in California, Madrid and Canberra, controlled navigation and communications. Within the last two weeks, appropriate times were allowed for the on board software to be updated.

At 47 minutes prior to entry, the thrusters catalyst beds heaters were switched on. At the seven minute point prior to entry, the medium gain antenna was discarded along with the cruise stage, leaving a carrier only signal operating working through an omni directional antenna on the entry vehicle. It transmits at 8 kilobits/sec in the UHF band. Thirty seconds after this, the entry position to Mars was adopted.



Picture credit:

https://mars.nasa.gov/insight/multimedia/images/?page=0&per_page=25&order=pub_date+desc&search=&category=51%3A183&fancybox=true&url_suffix=%3Fsite%3Dinsight

InSight's entry, plunge towards Mars and landing was monitored by Mars Reconnaissance Orbiter (MRO) which recorded transmissions, later to be passed on to Earth's receiving system. Depending upon their position, WALLE and EVE were to be in position to also receive transmissions and pass this data swiftly to Earth. Both systems were supervised by radio telescopes in Effelsbury:Germany, and Green Bank: West Virginia USA. Upon entering the atmosphere at 5.5km/s, 90% of the descent velocity was reduced by friction, within 3.5 minutes,

with a maximum temperature of 1,500 ^{0} C. being reached after 1.5 minutes. At the end of the 3.5 minutes the parachute system was instigated, at 11.1km high plummeting at 415 m/sec. Descent using the parachute took a further 3 minutes , with the heat shield being ejected and InSight's tripod stability system extended in this time. We have now reduced descent speed to 60 m/sec, with the lander jettisoning its hard shell and parachute approximately 1.2 km above the Mars plateau. At this point, 12 engines designed to assist descent fire up. Further control is performed by guidance software. At 50m above ground speed is regulated to 2.4m/sec and 30" later it touches down. InSight has landed at Elysium Planitia on Mars, on 26th November 2018, where it will function for 1 Martian year and forty days. Each Martian year takes 1.88 Earth years with each day being 39'35" longer than an Earth day.

Since landing, InSight has been performing some of its functions. The Mars wind was recorded for the first time. The range is sub-woofer level, and was recorded on the 7th December 2018.

Beginning on the 19th December 2018, the seismometer was placed onto the surface of the planet by the landers robotic arm. With this facility ground movements in a variety of frequencies can be quantified. This became operational by the 4th February 2019, with the heat probe positioned 12th February 2019. This instrument is designed to determine the volume of escaping heat generated internally by the planet.

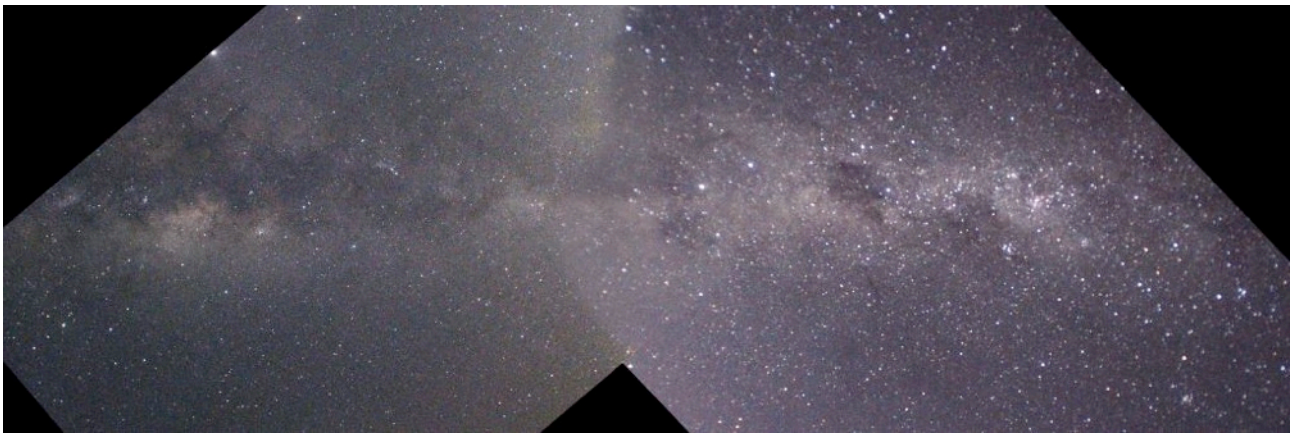
One of InSight's capabilities is to drill. The Heat and Physical Properties Package probe [HP3] began this operation on 28th February 2019 with an intention of getting as far as 5m. However 7 days later it had only managed to dig 30cm leaving both HPL and NASA perplexed as to the underperformance. The HP3 also contains a radiometer to use infrared brightness to assess local surface temperatures at ground level.

References:

1. https://mars.nasa.gov/insight/
2. https://www.nasa.gov/mission_pages/insight/main/index.html
3. https://www.jpl.nasa.gov/news/press_kits/insight/launch/mission/#launch_sequences

Errata: An Alice Springs Experience

Re Neil Short's article last month: One small error in translation, however, on the Alice Springs input – the two pictures identified to be from Aus 2019 and NZ 2018 are both from Aus. The only picture from NZ 2018 is the last one the wide joined image and the Aus 2019 – NZ 2018 identifier should be below this combined image.



Australia – September 2019 **New Zealand – March 2018**

OASI Annual General Meeting

Friday 17 January 2020, 8pm at Horley Spiritualist Church, 345 London Rd, Ipswich IP2 0BG

The church has ample parking but it can be a bit tricky to find. Satnav may be less than helpful!

Do not approach eastbound from the A12 into Ipswich as there is no right turn into the church.

As you leave Ipswich you will pass the Orwell Housing Association building on your left, next to it is the entrance to another building then the entrance to the church car park.

Google maps gives this satellite view.

Alpha Monocerotids Expected Outburst 2019 November 22

Paul Whiting

The alpha Monocerotids (AMO) meteor shower is a very obscure annual event over three days 21st – 23rd November. The published zenithal hourly rate (ZHR) is officially variable, but they typically produce about 1-4 quite fast (68 metre per second) meteors per hour.

Occasionally this meteor shower, which is associated with an unknown long-period comet, produces a fantastic storm display. In 1925 and 1935 they produced ZHR values of 1000+, and in 1985 and 1995 values between 400 and 700.

Two astronomers, Peter Jenniskens, of SETI and NASA, and Esko Lyytinen of the Finnish Fireball Network suggested that this year could also be a bumper year, with suggestions of a ZHR along the lines of the 1985 and 1995 displays. The snag being the window of maximum would only be about 20 minutes wide around 04:30 on the morning of November 22nd.

Despite being on holiday in the Isle of Wight, I rose at 4am to check the sky conditions. Unfortunately, it was mostly cloudy, with a very few small clear patches. By 4.30 conditions had got worse and it was clear that there would be no chance of any observations.

So, I decided to "observe" the potential storm via the on-line meteor detection website *Meteorscan* at http://meteorscan.com/meteor-live.html, which uses the French Graves Radar system as a reflection signal from ionised trails left by meteors burning up in the Earth's atmosphere over the south of France. The display (figure 1) takes the form of a 3D graph of time versus received frequency versus signal strength.

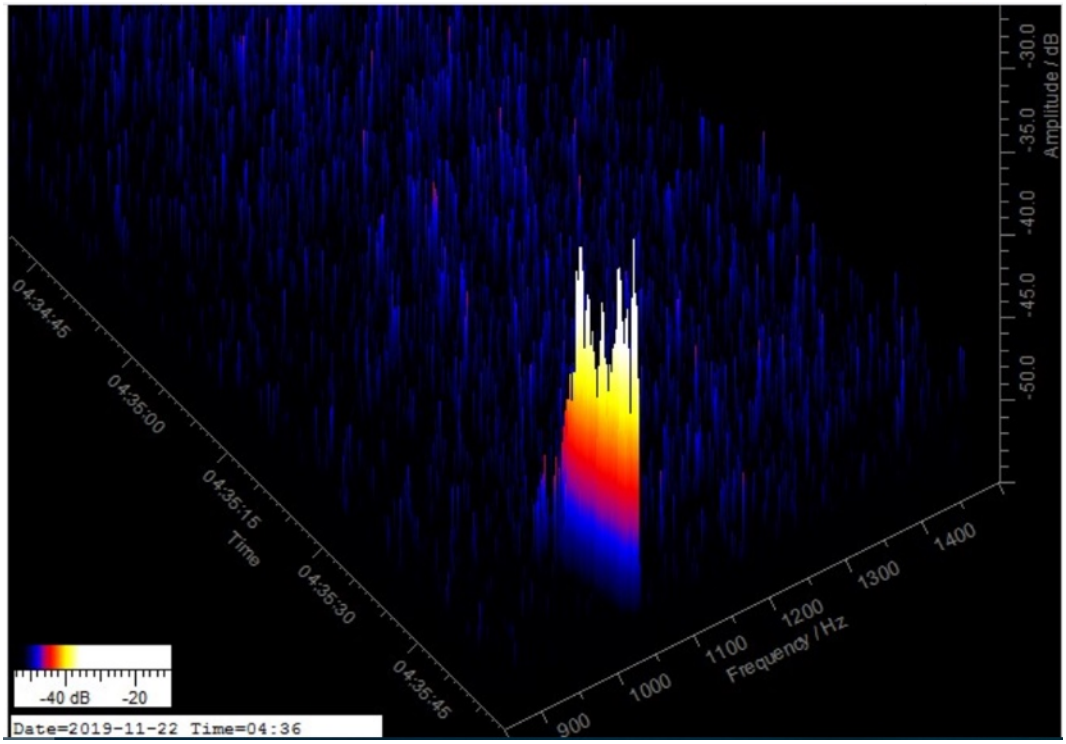


Figure 1: The Meteorscan image, showing a meteor ping

I took an image every minute from 04:29 to 05:30 for later analysis, although I have to admit I was greatly underwhelmed by the lack of any form of meteor storm.

The Analysis

A straightforward signal count from the captured images produced the graph shown in figure 2.

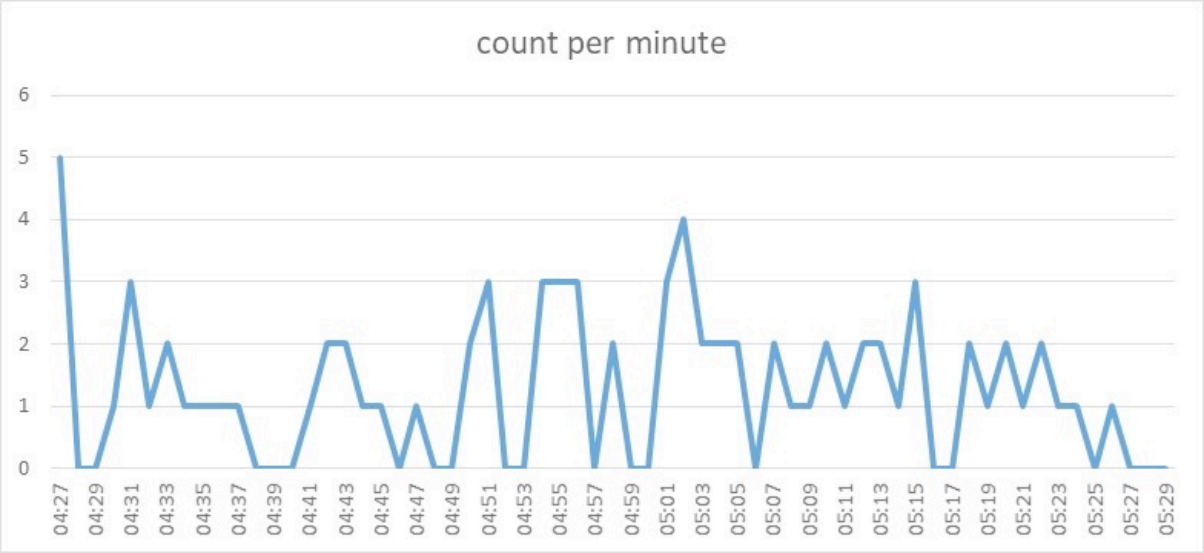


Figure 2: Count of distinct meteor pings captured

Visually there is an approximate peak around 04:51 and 05:03. Using a trend analysis tool, this can be narrowed to a maximum occurring at 04:54.

A simple count gives a ZHR of around 75. This of course is a radio ZHR. Only about 10% of radio pings would have produced a visible meteor trail, so this would suggest a visual ZHR of around 8 – a long way from the expected 400-700!

The use of Meteorscan for this purpose is a blunt instrument. Unlike visual observing, which can usually distinguish between a required meteor and a sporadic, these results include every object "seen" across southern France during this observation window. There is also a potential error in counting meteor signals accurately. Sometimes very weak return signals from a meteor are indistinguishable from background noise spikes, and vice-versa.

A Christmas Message from Your Chairman

It has been another busy year for the Society, with various activities taking place throughout the year.

This wouldn't have happened without members of OASI helping out to ensure events run smoothly. I would like to thank all members who have given up their time to help out.

We are already arranging events for next year, plus our regular meetings at Orwell Park and Newbourne, and I look forward to seeing you in the new year.

Finally, I would like to wish all members and their families, a Merry Christmas and a Happy New Year. I hope Santa delivers the astronomy kit you asked for and we have clear skies!

Andy Gibbs, OASI Chairman.