OASI News

The newsletter of the Orwell Astronomical Society

M45 from Tuesday 10 Nov 2020

Photo by Stephen Olley

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Society Notices

Dear Members,

We have moved to using a Zoom Pro account. If you would like to join in, email Paul Whiting, treasurer@oasi.org.uk

As a result of staying at home, plus many clear days and nights during the last three months, we have had many observations and astro images submitted.

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

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

Andy Gibbs, Chairman

Society Contact details

Email queries: info@oasi.org.uk

Facebook: Orwell Astronomical

Twitter: @OASIpswich

YouTube https://www.youtube.com/channel/UCHgxe3QAeRVWf7vkjKkCl2Q

Members-only message board

https://groups.io/g/OASI

Observatory (meeting nights only) 07960 083714

Please send material for the OASI

web site and newsletter

e.g. observations, notices of events, general interest articles, to

news@oasi.org.uk

The CLOSING date is the 15th day of the month

Access into the School Grounds and Observatory Tower

The Observatory is closed.

Articles for OASI News

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

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

Text:	txt, rtf, 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 2020

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

Committee Meeting

This will be held on a date to be determined after the AGM. Contact Paul Whiting for details.

The AGM

This will be held via Zoom on Saturday 16th Jan 2021 8pm. Usual zoom access via Paul Whiting. Members will be informed of the link by email.

In the event of anyone standing down, a nomination form is to be found on the last page of this magazine.

A Christmas Message from your Chairman

I'm sure everybody will agree, that 2020 has been a year to remember for all the wrong reasons.

But, due to the efforts of our members, OASI has continued to operate, via Zoom, with weekly meetings, on Wednesday's and twice-monthly "Newbourne" meetings, on Monday's, plus a series of lecture meetings. These have been well attended.

There is some light at the end of the tunnel, with promising results from a number of vaccine trials and the hope that we may be able to resume our normal activities at some stage in 2021.

I wish all members a safe and a Merry Christmas and I hope that we can all meet up face-to-face again next year.

Andy Gibbs, OASI Chairman.

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

Date, Time & Location	Contact	Event
Weekly, every Wednesday, from 20:00	Martin Cook, Roy Gooding	OBSERVATORY CLOSED Meet via Zoom.
Friday 4 Dec 20:00	Paul Whiting treasurer@oasi.org.uk	Rescheduled talk by Matt Bothwell, Institute of Astronomy, Cambridge, on *20th Century Cosmology*. Access via Zoom. If you applied for Nov 20th, there is no need to re-apply.
Saturday, 5 Dec 14:00 via Zoom	https://britastro.org/meetings/2020	BAA Christmas Meeting via WEBINAR
Monday 14 Dec from 19:30 via Zoom	Paul Whiting treasurer@oasi.org.uk	*"Bursts, bangs and things that go bump in the night"* Dame Jocelyn Bell-Burnell (recorded)
Wednesday, 16 Dec 19:00	https://britastro.org/meetings/2020	How to image the Sun in three wavelengths
Monday 28 Dec from 19:30 via Zoom	Paul Whiting treasurer@oasi.org.uk	Sky Notes by Bill Barton FRAS Show your astro prezzies There's also a Christmas quiz.
2021		
Monday 11 Jan from 19:30 via Zoom	Paul Whiting treasurer@oasi.org.uk	"Galaxy Collisions" Paul Whiting

Date, Time & Location	Contact	Event
Saturday 16 Jan 20:00 via Zoom	Roy Gooding secretary@oasi.org.uk Paul Whiting treasurer@oasi.org.uk	Annual General Meeting. Contact Paul Whiting for Zoom access.
Monday 25 Jan	Paul Whiting treasurer@oasi.org.uk	Meet via Zoom Sky Notes by Bill Barton

Please note that the listed events may change depending on the progress of the pandemic.

Meetings via Zoom

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

We meet on Wednesday evenings from 19:30 and on Newbourne evenings (see below) from 19:30.

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). BUT In view of the COVID-19 situation **all meetings at Newbourne are suspended.** If OASI members would like to meet up via Zoom on those evenings, please first contact Paul Whiting with your email address to receive an invitation. Members only, please.

OASI@Newbourne Meetings

Subsequent meetings will be assessed in line with the current Government Guidelines in place at the time. Thank you for your understanding.

Dec 14 (T)	Dec 28 (S, Q)	Jan 11 (T)	Jan 25 (S, T)
Feb 8 (T)	Feb 22 (S, W)	Mar 8	Mar 22 (S, T)

We open up for all meetings at 7:30pm. Star Guide (S) at 7:30pm Talks (T), Workshops (W) at 7:45pm and the occasional Quiz (Q)

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. During the COVID-19 isolation period these will be available on our website.

Astronomy Workshops/Informal talks

Meetings will depend on COVID-19 situation. Talks will be via Zoom during lock-down.

Contact Mike Whybray

Location: Newbourne Village Hall IP12 4NP
CLOSED (meetings currently via Zoom)

Meetings start at 7:30pm.

Workshops / Talks start at 8pm

If you are a new OASI member, or haven't been to one of these informal workshops before, they are a mixture of events of different characters including beginners talks, interactive workshops, films, etc., suitable for all. 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.

- 8pm Monday December 14th – OASI@Newbourne Zoom
  "Pulsars" a talk by Prof. Dame Jocelyn Bell Burnell (recorded)
- 8pm Monday December 28th – OASI@Newbourne Zoom
  A Christmas themed general knowledge quiz
- Monday January 11th – OASI@Newbourne Zoom "Galaxy Collisions" a talk by Paul Whiting
- Monday January 25th – OASI@Newbourne Zoom
  Sky Notes with Bill Barton followed by "Multi-Messenger Astronomy" a short talk
- Monday February 8th – OASI@Newbourne Zoom
  "Spacecraft I've known and loved" a talk by Prof. John Zarnecki (recorded)
- Monday February 22nd – OASI@Newbourne Zoom
  Sky Notes with Bill Barton followed by a Beginner's Q&A Session
- Monday March 22nd – OASI@Newbourne Zoom
  Sky Notes with Bill Barton followed by "Video Meteor Detection" (recorded)

All meetings are via Zoom. The OASI@Newbourne events are via the usual meeting ID. Contact Paul Whiting if you can't find the details.

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

- Bill Barton: 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 Appleton: Update on OASI All-Sky Meteor Cameras, date TBA.

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

Lectures – [eventually*] at St Augustine's Church Hall

*** Subject to COVID-19 restrictions**

Contact: Peter Richards lectures@oasi.org.uk

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

Once we're clear of C-19, the venue for lectures will be:

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.

Friday 4th December **via Zoom** (rescheduled from last month)

Matt Bothwell: "Big bangs to big rips: a history of 20th century cosmology".

Due to a diary malfunction Matt didn't appear on 20 November so your Editor stepped in with a draft presentation on *Astrophotography for beginners – what to see and how to photograph it.* This is a talk-in-preparation for its proper outing to Suffolk Mac User Group on 31 March next year.

Other local astronomy society meetings

Athaneum Astro Society

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

Meetings suspended during the Covid-19 situation.

We normally 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

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

DASH Astro

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

Meetings are normally held at New Darsham Village Hall and all DASH Astro observing sessions will take place at WESTLETON COMMON. ASOG observing sessions and locations may be arranged at the time of observation. Unless stated all group meetings will take place from 7:30 pm. on Sundays.

Meetings will be assessed in line with the current Government Guidelines in place at the time. Thank you for your understanding at this time. Stay Safe.

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

BAA news & webinars

For full details of all meetings or cancellations, please go to https://britastro.org/meetings/2020.

December

Saturday, 5 December – 14:00	BAA Christmas Meeting via WEBINAR
Wednesday, 16 December – 19:00	How to image the Sun in three wavelengths

2021

January

Saturday, 23 January – 14:00	BAA Meeting

February

Saturday, 20 February – 14:00	Solar Section Webinar

March

Saturday, 6 March (All day)	Deep Sky Section Annual Meeting – Webinar
Wednesday, 31 March – 17:00	Special General Meeting and BAA Meeting

From the interweb

Arecibo radio telescope **suffers** second cable failure and is due to be demolished

https://www.npr.org/2020/11/19/936677582/world-renowned-arecibo-telescope-set-to-be-dismantled?t=1605894851084

On the evening of Nov 6, one of the telescope's main support cables broke — the second cable failure in the span of three months. The cable ran from the observatory's southeast supporting tower and helped to support the 900-ton receiving platform, which hangs over the 1,000-foot (300 meters) reflector dish.

Interesting detail on the failures and difficulties in any repair are in this YouTube video by Scott Manley.

https://www.youtube.com/watch?v=IEe4WIc5Vp0

A 100m rotating liquid mirror telescope on the moon

https://www.universetoday.com/148857/a-100-meter-rotating-liquid-mirror-telescope-on-the-moon-yes-please/

Discovery of a Probable Nova in M31

http://www.astronomerstelegram.org/?read=14183

Image here http://www.asu.cas.cz/~asteroid/PNVJ00424851+4117039.png

The Night Sky in December 2020

Martin RH

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

Sun, Moon and planets

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

Times UTC

Object	Date	Rise	Set	Mag.	Notes
Sun	1	07:41	15:47		14 Dec: Total eclipse visible in southern Chile & Argentina 21 December 10:02 – Winter Solstice
	31	08:03	15:53		
Moon	1	16:30	08:42		Last quarter 08 December 00:37 New moon 14 December 16:17 First quarter 21 December 23:41 Full moon 30 December 03:28
	31	17:05	09:22		
Mercury	1	06:47	15:12	-0.7	Aphelion Dec-16 Superior conjunction Dec-20
	31	08:49	16:05	-0.9	
Venus	1	05:05	14:38	-3.9	The Moon is to the upper right of Venus in the morning sky.
	31	06:35	14:21	-3.8	
Mars	1	13:40	02:49	-1.1	23 Dec: Mars lies above the Moon
	31	11:54	01:51	-0.3	
Jupiter	1	11:05	19:03	-1.9	17 Dec: The crescent Moon is to the left of the close pairing of Jupiter & Saturn 21 Dec: Jupiter and Saturn are very close together.
	31	09:25	17:40	-1.8	
Saturn	1	11:10	19:15	0.6	
	31	09:21	17:34	0.6	
Uranus	1	14:20	04:45	5.7	
	31	12:21	02:43	5.7	
Neptune	1	12:59	23:57	7.9	
	31	11:01	22:01	7.9	

Occultations during December 2020

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(º)	Star Alt(º)	Mag	Star
11 Dec	05:14:38	D	0.16-	-23	14	5.5	95 Vir
	06:17:31	R		-14	21		
21 Dec	19:54:43	D	0.48+	-37	27	4.4	30 Psc, YY Psc
	21:05:44	R		-47	19		
21 Dec	22:02:12	D	0.49+	-54	13	4.6	33 Psc, BC Psc
22 Dec	23:06:26	D	0.59+	-60	14	6.6	ZC 106
23 Dec	17:41:09	D	0.66+	-16	38	6.6	ZC 210
24 Dec	18:16:40	D	0.75+	-21	42	5.6	64 Cet
24 Dec	19:36:13	D	0.75+	-34	47	4.4	65 Cet, ξ^1 Cet
25 Dec	20:31:09	D	0.83+	-42	52	7.3	ZC 437
26 Dec	00:19:35	D	0.84+	-61	32	7.4	Hip 14329
27 Dec	21:17:16	D	0.95+	-48	57	5.8	HU Tau

Further details are on the OASI website: http://www.oasi.org.uk/Occs/Occ_summary_2020.php

Please note that this is the last of James's contributions on occultations.
I would like to thank him on your behalf for his contributions on this subject over many years.

If you would like to know more about lunar occultations, please see:–

https://iota-es.de/moon/grazing_descrx101.html and

http://www.lunar-occultations.com/iota/bstar/bstar.htm

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

Meteor showers during December 2020

Source: BAA Handbook 2020 p100-101 and https://in-the-sky.org//newsindex.php?feed=meteors

Shower	Normal limits	Maximum	Max RA/ Dec.º	ZHR at Max	Notes
Northern Taurids	Oct 20 – Dec 10	Nov 12	03:57 +22.3°	5	Northern branch of the Taurid complex. Slow meteors. Very favourable.
November Orionids	Nov 13 – Dec 6	Nov 28		3	Not mentioned in the BAA pink book but details are here https://in-the-sky.org/news.php?id=20201128_10_100
Geminids	Dec 4 – 17	Dec 13d 20h	07:34 +32.3	100+	Richest of the annual showers, with slow meteors and a good proportion of bright event. Very favourable.
Ursids	Dec 17 – 26	Dec 22	14:40 +75.4	10	Under-observed shower whch has produced outbursts in 1945, 1983, 1986 ad 2014. Quite 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

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

Times are UTC. Predictions are approximate (20 Nov) due to craft adjustments. Check the day before.

A good month for ISS (Santa[1]) spotting!

Date	Bright –ness	Start			Highest point			End		
	(mag)	Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Dec	-3.7	16:25:27	10°	WSW	16:28:50	80°	S	16:32:12	10°	E
01 Dec	-3.7	18:02:15	10°	W	18:05:37	73°	SSW	18:05:39	73°	S
02 Dec	-3.8	17:14:38	10°	W	17:18:02	82°	S	17:20:03	22°	E
02 Dec	-1.2	18:51:30	10°	W	18:53:00	22°	W	18:53:00	22°	W
03 Dec	-3.7	16:27:02	10°	W	16:30:25	86°	S	16:33:48	10°	E
03 Dec	-3.1	18:03:51	10°	W	18:07:07	48°	SSW	18:07:27	46°	S
04 Dec	-3.3	17:16:13	10°	W	17:19:33	61°	SSW	17:22:00	17°	ESE
04 Dec	-1	18:53:25	10°	W	18:54:58	17°	WSW	18:54:58	17°	WSW
05 Dec	-3.5	16:28:35	10°	W	16:31:57	73°	S	16:35:19	10°	ESE
05 Dec	-1.9	18:05:33	10°	W	18:08:27	27°	SSW	18:09:39	21°	S
06 Dec	-2.3	17:17:48	10°	W	17:20:56	36°	SSW	17:24:04	10°	SE

1 https://ispotsanta.com/tracker/

Date	Bright –ness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
07 Dec	-2.7	16:30:06	10°	W	16:33:22	48°	SSW	16:36:38	10°	SE
07 Dec	-0.8	18:07:46	10°	WSW	18:09:35	14°	SW	18:11:24	10°	S
08 Dec	-1	17:19:37	10°	W	17:22:08	20°	SW	17:24:39	10°	SSE
09 Dec	-1.4	16:31:43	10°	W	16:34:38	27°	SSW	16:37:32	10°	SSE
11 Dec	-0.4	16:33:50	10°	WSW	16:35:40	14°	SW	16:37:30	10°	S
19 Dec	-0.7	06:59:08	10°	S	07:01:24	17°	SE	07:03:40	10°	E
20 Dec	-0.4	06:12:34	10°	SSE	06:13:50	12°	SE	06:15:07	10°	ESE
21 Dec	-1.8	06:59:15	10°	SW	07:02:17	32°	SSE	07:05:20	10°	E
22 Dec	-1.4	06:11:52	10°	SSW	06:14:36	23°	SSE	06:17:22	10°	E
23 Dec	-1	05:25:06	11°	S	05:26:59	17°	SE	05:29:14	10°	E
23 Dec	-3	06:59:58	10°	WSW	07:03:17	55°	SSE	07:06:36	10°	E
24 Dec	-2.6	06:12:51	14°	SW	06:15:31	42°	SSE	06:18:44	10°	E
25 Dec	-2.3	05:27:23	30°	SSE	05:27:48	31°	SSE	05:30:49	10°	E
25 Dec	-3.6	07:00:57	10°	WSW	07:04:20	78°	S	07:07:43	10°	E
26 Dec	-0.7	04:41:46	16°	ESE	04:41:46	16°	ESE	04:42:49	10°	E
26 Dec	-3.5	06:14:43	25°	WSW	06:16:30	67°	SSE	06:19:51	10°	E
27 Dec	-3.1	05:28:58	52°	SE	05:28:58	52°	SE	05:32:00	10°	E
27 Dec	-3.7	07:02:01	10°	W	07:05:24	87°	S	07:08:47	10°	E
28 Dec	-0.8	04:43:08	17°	E	04:43:08	17°	E	04:44:06	10°	E
28 Dec	-3.8	06:16:05	32°	W	06:17:32	85°	S	06:20:55	10°	E
29 Dec	-3.3	05:30:10	60°	ESE	05:30:10	60°	ESE	05:33:02	10°	E
29 Dec	-3.6	07:03:07	10°	W	07:06:25	75°	S	07:09:47	10°	ESE
30 Dec	-0.8	04:44:13	17°	E	04:44:13	17°	E	04:45:08	10°	E
30 Dec	-3.8	06:17:09	33°	W	06:18:32	83°	S	06:21:55	10°	E
31 Dec	-3.3	05:31:10	61°	E	05:31:10	61°	E	05:34:00	10°	E
31 Dec	-3.2	07:04:06	10°	W	07:07:20	51°	SSW	07:10:37	10°	SE

Starlink passes

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

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

Comets with magnitude brighter than magnitude 10

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

Click on the comet name for more information (remember to set your location in heavens-above.com).

Comet	Brightness	Location	
		1 Dec	31 Dc
C/2020 S3 Erasmus	**7.8**	Just below Venus before sunrise	Too close to the Sun
C/2020 M3 ATLAS	**7.9**	Close to Moon in Auriga at 8pm	Auriga
C/2020 P1 NEOWISE	**8.7**	Bootes	Serpens
88P Howell	**8.9**	Capricornus	Between Aquarius & Capricornus

Astronomy on the radio

Bill Barton's Radio Broadcast

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

David Murton's Radio Broadcast

On 1st Tuesday of the month, 2.40pm (note change of time) 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

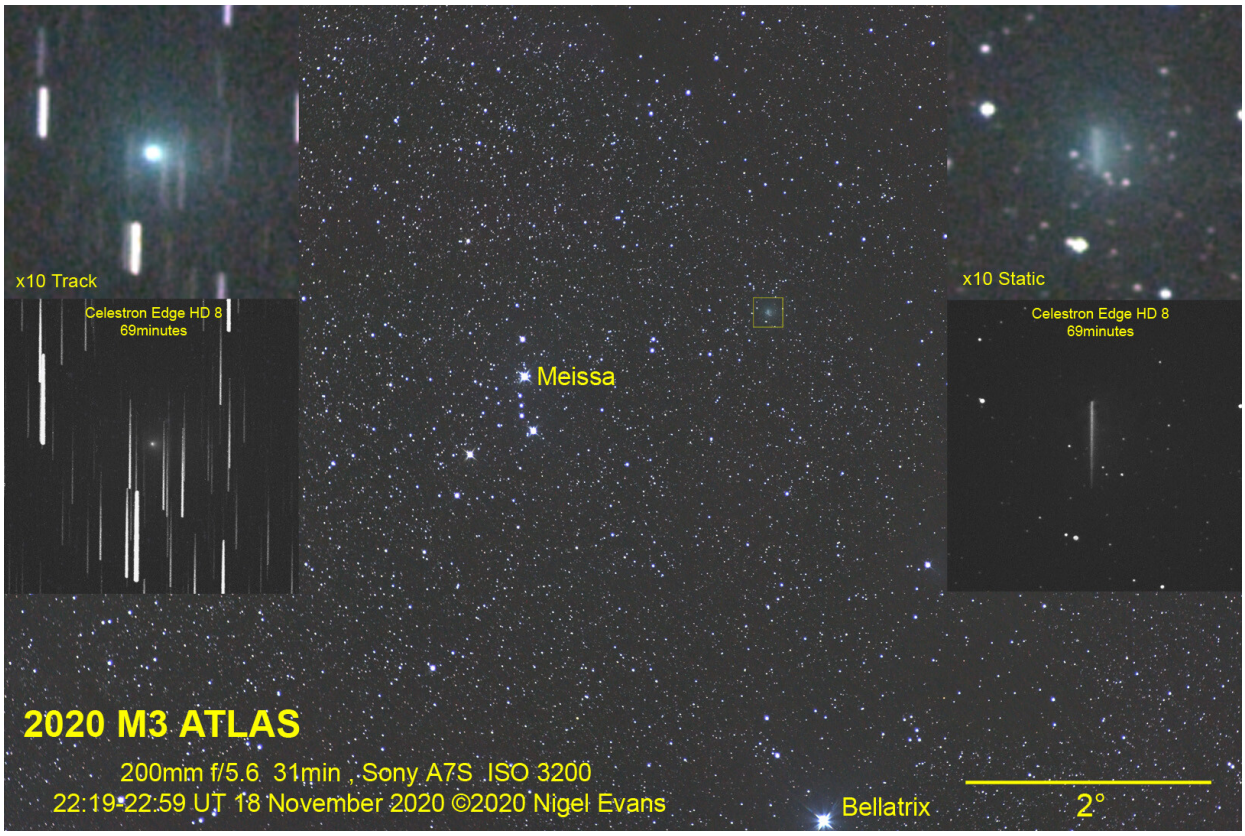
2020 M3 ATLAS

Nigel Evans

After the fabulous treat of naked-eye comet 2020 F3 NEOWISE in July 2020, normal service for comets has been restored - faint and unimpressive.

2020 M3 ATLAS has been passing through Orion recently and I took the opportunity to observe it on the evening of 18 November. In the 8inch scope it was another fuzzy dot. In the hour or so of observation it climbed from 30 degrees to 40 degrees and became noticeably brighter, but any coma it might have has been 'magnified away', leaving just a tiny fuzzy blob that moves

A driven still camera with a telephoto lens 10 times shorter than the main scope also captured this unimpressive object.



A heroic attempt to record Phobos

Nigel Evans

Recently (10 Oct 2020) I successfully recorded an image of Mars' outer moon, Deimos. The next challenge would obviously be to record the inner moon, Phobos. Although it is brighter than Deimos it is also always very close to Mars, some 10+ magnitudes brighter, some 20 arcseconds away at best.

The obvious way forward is to use some sort of occulting bar at prime focus to hide Mars, allowing Phobos to be seen by projecting the image of the focal plane onto another plane – eyepiece projection in other words. Eyepiece projection was used in the 'old days' to magnify the Moon and the planets for traditional film based photography. Nowadays this seems to have been replaced by digital camera with a high density of pixels and Barlow/Powermates. But I don't have many eyepieces, nor the adaptor (e.g https://www.rothervalleyoptics.co.uk/antares-variable-eyepiece-projection-adaptor-125.html) nor any experience in doing this technique.

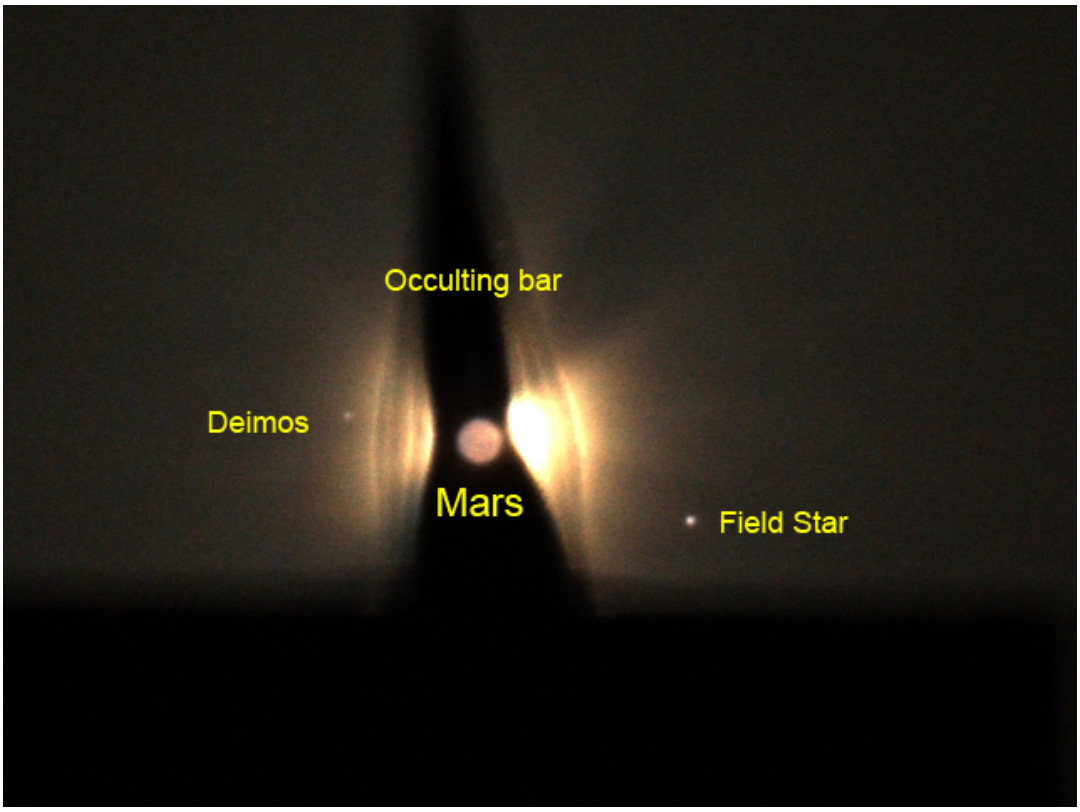
So I elected 'Plan B' – stick something opaque onto the glass cover of a camera, a Sony A7S. It would not be in focus as the focal plane would be about a millimetre lower, where all the chip's pixels are – I'll just have to live with that. How to attach it? – I elected for the sticky bit from a 'Post-it', hoping the there is no residue left when it is removed. What should I make the bar from? Here I decided that it did not need to be totally opaque, but merely attenuate a lot, so I chose a Baader Solar Eclipse filter (also because I have some)! There are two types, ND3.8 and ND5. In magnitude-speak they reduce the light by 9.5 and 12.5 magnitudes respectively. I chose the lighter grade to make a thin dart of material, tapered so that I can adjust how Mars sits on it. Mars is about 0.2mm wide on the focal plane in my scope.

This can only work when the weather is clear and the first opportunity came on the evening of 26th October 2020. It was very much a trial of what can I see, how can I record it and does the fuzzy edge of the occulting bar compromise the ability to see Phobos?

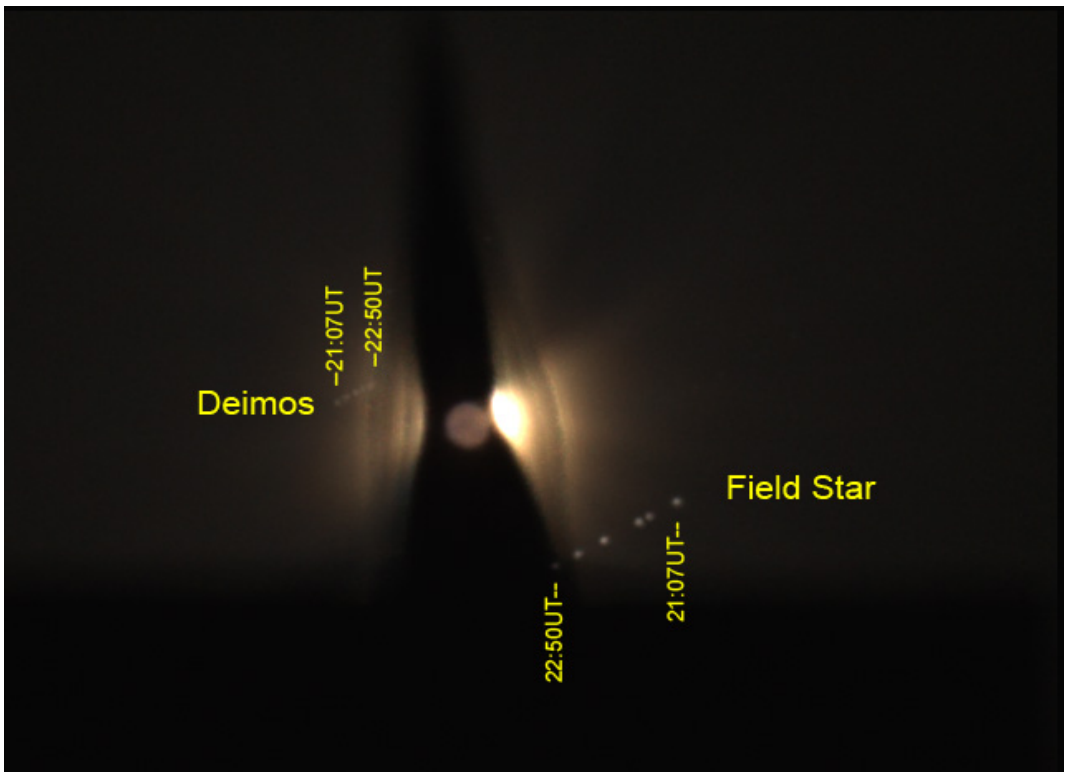
Mars is about 20 arcseconds across and moves about 1 arcsecond per minute of time relative to the background stars – far too fast to use an autoguider set on the stars. And the thing that drifts at the rate of Mars, i.e. Mars, is far too bright to track. So all exposures were unguided but, at only 1 second exposure, this should not be a problem.

My challenge was to keep Mars hidden from view by using the fast/slow buttons to fight the periodic error, while watching the live view mode. I could Mars through the solar filter and how it sat relative the edges. I recorded some photos using an intervalometer, stopping as soon as the image brightened on one side of the occulting bar, indicating that Mars was drifting into view. What I hoped for was for Mars to be just hidden and Phobos to be just visible. Initially Phobos was far too close to the planet but as time passed it moved to greatest elongation. While Phobos might be there I could not see it due to peculiar optical effects from the interaction of the filter material and the chip's glass cover. But this is what the test is all about. After Phobos had passed greatest elongation I called it a day.

So did I record Phobos? No, not knowingly. But I did record rather a lot of photos of Deimos. The photos are all the same exposure, but were not evenly spaced in time. Nevertheless they can be strung together as some sort of asynchronous movie. This can be aligned to either follow the stars or follow Mars. Finally, a few of the frames were aligned on Mars to show both the motion of Mars relative to the background stars and the motion of Deimos around Mars.



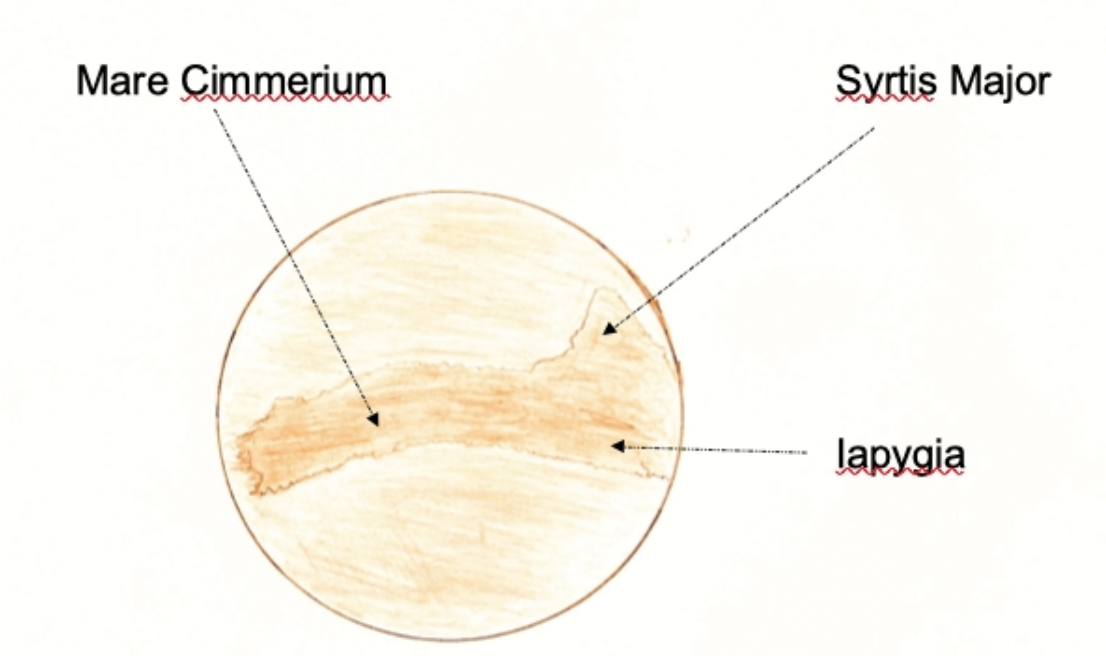
Mars shining through the occulting bar made of Solar Eclipse filter material. Deimos is clearly seen to the left. Phobos was too close to Mars at the time (21:07UT 26 Oct 2020 1sec ISO25600 A7S on 200mm EdgeHD – 10 frame median).



Composite centred on Mars, showing the field star moving to the lower left, while Deimos moves clockwise around Mars

Mars sketch with a 102mm refractor

Neil Morley



Observed on 6/11/20 in gaps between clouds between 19:45-20:15 UTC. The telescope was a Celestron C4-R with an EQ5 mount (non-motorised). A 9mm Star Plossl eyepiece provided 111x magnification with a 90 degree mirror diagonal. The sketch was drawn afterwards and the image scanned and post-processed in GIMP.

Surface features were determined using the Sky & Telescope Mars Profiler

https://skyandtelescope.org/wp-content/plugins/observing-tools/mars_profiler/mars.html

Fireballs

Alan Smith

There was a bright fireball imaged by the allsky camera running in Grundisburgh last night (12/11/20) at 2220 hrs UT low in the south. Also imaged by a camera close to Ypres (Belgium).

The gaps in the trail are caused by a liquid crystal shutter which chops the image to give an indication of speed.

The bright fireball trail 'captured' at about 2221hrs UT on the 12/11/20 by the allsky cameras running at Grundisburgh, Oostduinkirke and Ieper (Ypres), has been reduced by the Dutch Meteor Society to give the following:

It entered the atmosphere at about 80km altitude, and after reaching a velocity of around 29km/sec was seen at about magnitude -4, finally entering the dark phase of flight at about 45km altitude. It was a member of the Taurid group of meteors. The green colour of the meteor trail is genuine and probably caused by the ionisation of nickel on the surface of the object.

Bright fireballs at 0323 hrs and 0343 hrs, 18/11/20

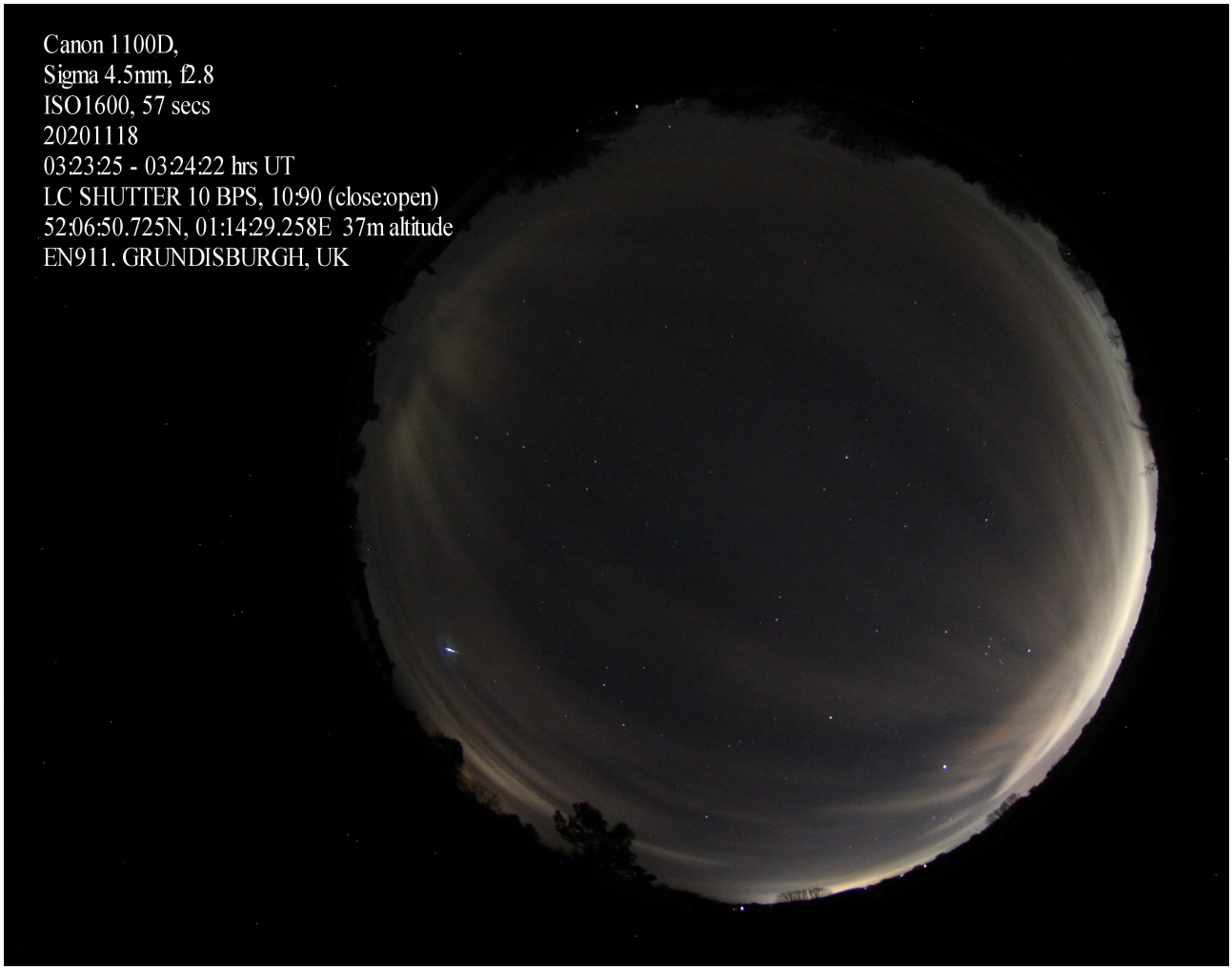
There was a very bright fireball recorded by the Allsky camera running at Grundisburgh and by another camera running at Leper (Ypres) in Belgium. This was the first of 2 very similar events captured between 0323 and 0343 hrs UT today. Both events produced a persistent ionization trail.

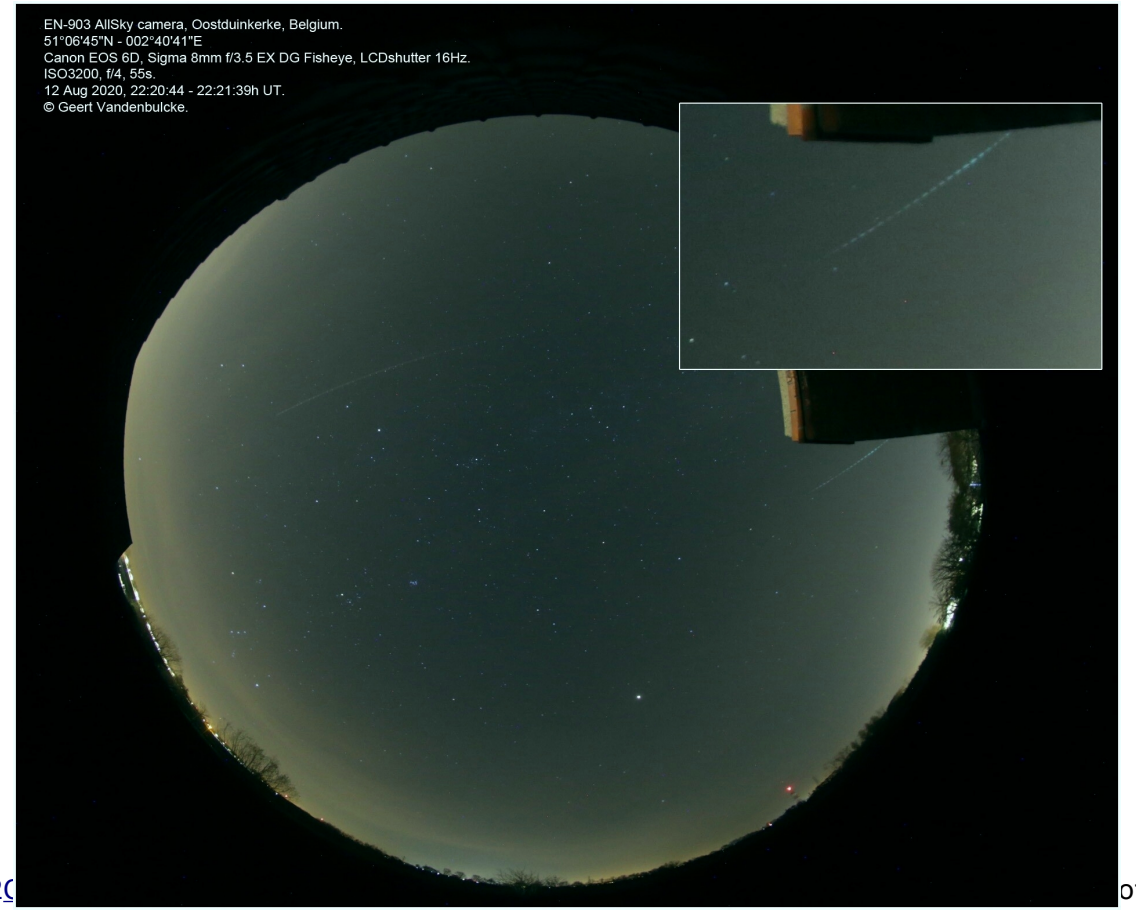
The Grundisburgh image was badly obscured by cloud!

Attached are the All-sky image from Grundisburgh and stills from a short movie made of both events taken by a member of the Dutch Meteor Society[1].

1 More on the Leonids all-sky images and radio detection here from the website of DMS member Franky Dubois:– http://www.astronomie.be/franky.dubois/Leoniden2020/leoniden2020.html and here:–

https://astrolab.be/algemeen/meteorenzwerm-de-leoniden-met-maximum-di-17-november-tussen-6-8-uur/

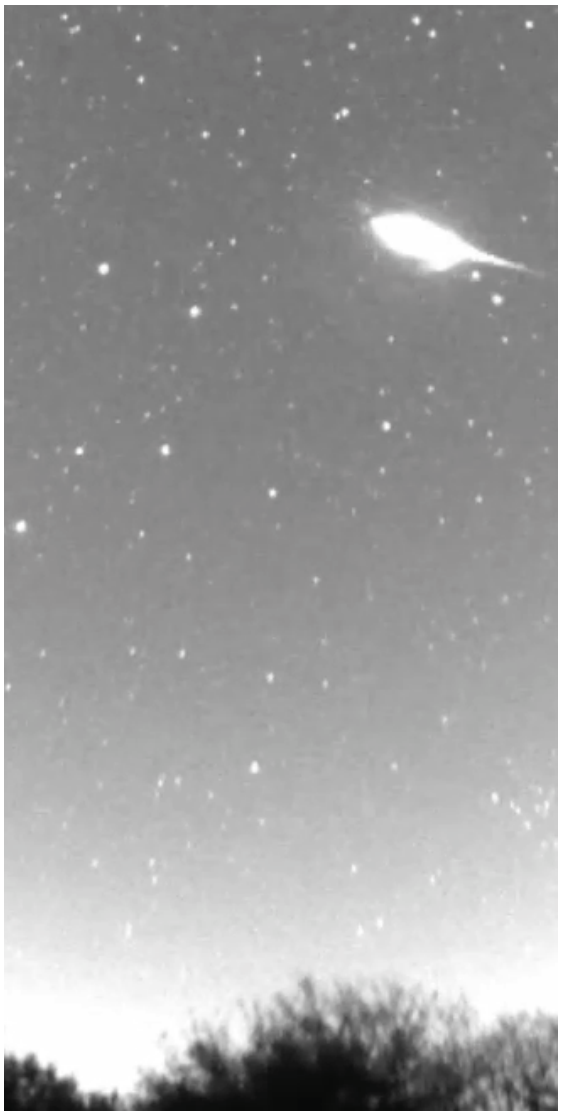

Canon 1100D,
Sigma 4.5mm, f2.8
ISO1600, 57 secs
20201118
03:23:25 - 03:24:22 hrs UT
LC SHUTTER 10 BPS, 10:90 (close:open)
52:06:50.725N, 01:14:29.258E 37m altitude
EN911. GRUNDISBURGH, UK

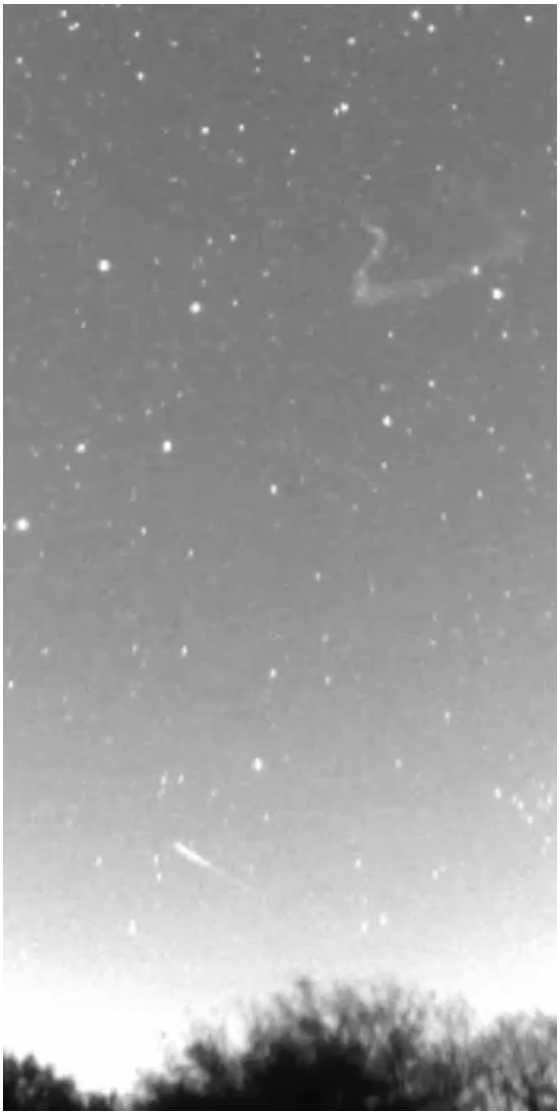

EN-903 AllSky camera, Oostduinkerke, Belgium.
51°06'45"N - 002°40'41"E
Canon EOS 6D, Sigma 8mm f/3.5 EX DG Fisheye, LCDshutter 16Hz.
ISO3200, f/4, 55s.
12 Aug 2020, 22:20:44 - 22:21:39h UT.
© Geert Vandenbulcke.

Frames from the Dutch Meteor Society movie

First fireball and trail

Second fireball and trail





Geminids meteor shower

Pete Richards

December brings us the festive gift of – possibly – the best meteor shower of the year.

The activity of the Geminids start slowly on the 4th of December peaking sharply on the 13th and 14th and tailing off rapidly to finish around the 17th. In the past the best regular meteor show of the year were the Persieds conveniently peaking around August the 11th making it the barbecue weather meteor shower, but the Geminds have become increasingly active over the years and in my experience they are overtaking the Persieds as the best regular shower of the year.

Most meteor showers occur when the earth passes through the trail of debris left by a comet but the Geminids is one of two showers (the other being the Quadrantids in January) for which the source of material has been identified with an asteroid: in the Geminids case 3200 Phaethon. This asteroid - which is about 3 miles (5km) wide and orbiting the Sun in about 1.43 years – may be the remnant – the rocky core – of a dead comet. As a consequence of the Geminids being debris from an asteroid the material is somewhat denser than that from a comet and the meteors are generally brighter as they burn up. The Geminids are a relatively new shower having been first detected in 1862.

The Geminids have the disadvantage for observers of happening when nights are colder and potentially cloudy. However, unlike most showers where you have to wait until after midnight to see reasonable

numbers of meteors (this is because you are then on the side of the earth after midnight which is the leading side of the Earth – the direction in which the earth is moving around the Sun and hence running into the dust streams) – the Geminds start to pick up around 9pm and you should start to see good numbers of meteors before midnight, although around 2am is the time when you might see the most because the radiant point is at its highest. The predicted peak night is the Evening of Sunday 13th of December and the early hours of Monday 14th December. There is a reasonable chance of seeing a good number of meteors on the two preceding nights as well.

Notes

A **meteor** – commonly referred to as a "shooting star" - is the thing you see: the object burning up in the atmosphere and ionising the atmosphere to create a visible flash or light or glow.

A **meteoroid** is the object in space which when being caught and burning up in the atmosphere creates the meteor.

A **meteorite** is the remains of the meteoroid which reaches the ground. The meteoroids in the regular meteor shower are to small and fragile to reach the ground.

The meteoroids associated with the regular showers are mostly quite small ranging from the size of a grain of sand to the size of the pea, and have a fluffy light consistency somewhat like coffee granules with masses no more than 1or 2 grams. Most appear and burn up at altitudes between 80 km and 120 km (50 to 75 miles) - The Meteoric Zone.

According to P. B. Babadzhanov - G. I. Kokhirova "Densities and porosities of meteoroids" Institute of Astrophysics, Tajik Academy of Sciences, Dushanbe 734042, Tajikistan, published in Astronomy and Astrophysics published by EDP Sciences https://www.aanda.org/, the Geminid meteoroids are found to have the highest bulk density average of 2.9 g cm^{-3}, the Leonid meteoroids have the lowest average bulk density equal to 0.4 g cm^{-3}. The mean bulk densities of meteoroids of other streams are between 0.9 and 2.4 g cm^{-3} and that of sporadic meteoroids equals 1.8 g cm^{-3}.

The typical speeds at which the meteoroids hit the atmosphere is between 11 and 72km/s (7 to 45 miles per second) and in the case of the Geminds – being medium speed) they hit at about 35 km/s (22 miles/s)

Meteor showers are named after the constellation in which the radiant - the point from which they appear to be radiating – is located. The radiant point is an optical illusion and is a convergence point like the lines of a long straight road or rail line that appears to be converging to a point in the distance. When observing a shower it is best to look a little away from the radiant but when the radiant is high in the sky the meteors could appear in any direction. The radiant for the Geminids is near the star Castor in Gemini.

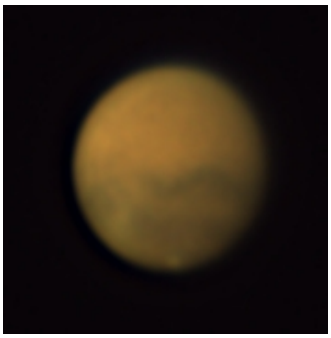
The standard benchmark measurement of the meteor rates is the theoretical rate called the ZHR* (Zenithal Hourly Rate) which would be seen by the unaided eye by one observer in the course of one hour at the place on the Earth where the radiant is directly overhead - at the zenith - and under perfect conditions of clear sky and no apparent light pollution. In the case of the Geminids the ZHR is expected to be between 120 and 150 although in practice you might hope to see up to around 50 meteors in an hour at the peak. The ZHR of the Leonids in a quiet year is around 10 to 20. The Perseids ZHR is usually around 80.

Meteor storms (rates of 1000 per hour or more) these are less common and the only shower to periodically produce storms fairly predictably are the Leonids in November, producing major outbursts every 33 years or so and the next peak is expected in 2031. In the intervening years the Leonids are a fairly quiet shower with the Geminids producing perhaps 5 or 10 times as many visible meteors.

The reason the Leonids have storms is that the debris trail must be relatively new and the debris is close to the parent object. Although the Geminids are relatively new as a shower the debris stream is spread out but has only recently crossed the path of the Earth's orbit.

Mars

Andy Gibbs



Mars was 84.5 million kms from Earth when this image was taken. It had decreased in brightness to mag -1.5 and its apparent diameter had shrunk to 16.5 arcseconds.

Equipment used, QHY 5 II L camera, 200mm Meade LX200 and 2.5x Barlow Lens.

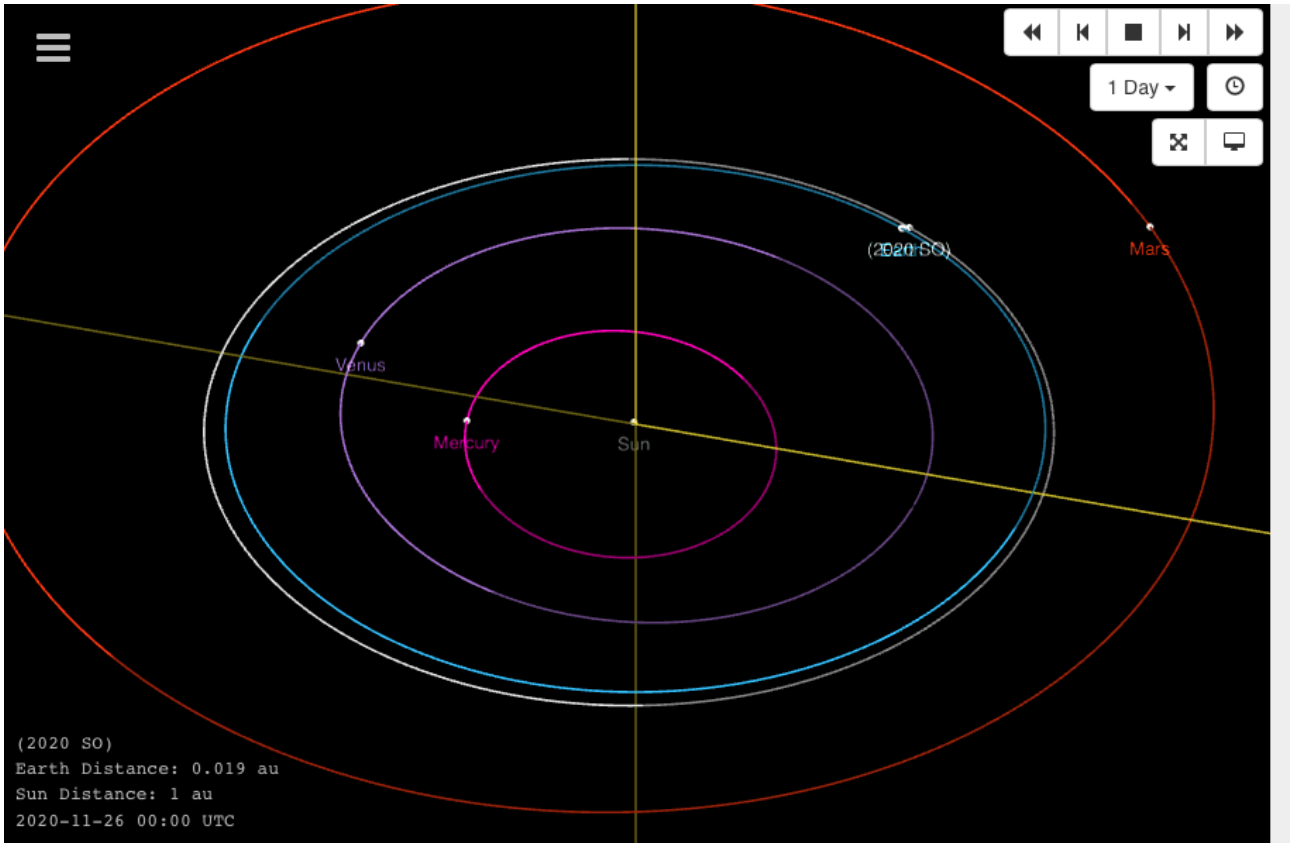
Software used, Sharpcap, PIPP, Registax and Affinity Photo.

Near Earth Object

2020 SO is a tiny near-Earth asteroid or artificial object discovered by the Pan-STARRS1 survey at the Haleakala Observatory on 17 September 2020. https://en.wikipedia.org/wiki/2020_SO

https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=2020%20SO

It looks like it it almost shares Earth's orbit but this is only temporary.



https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=2020%20SO;old=0;orb=1;cov=0;log=0;cad=0#orb

It comes very close on 1 Dec at 0.0003374 AU (50,475km)

https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=2020%20SO;old=0;orb=1;cov=0;log=0;cad=1#cad

M45

Steven Olley

M45 from Tuesday 10 Nov 2020 – first proper attempt at an image using my HEQ5 and Astro Pixel Processor. Still lots to learn but think it's a reasonable start. Skywatcher Evostar 72 / HEQ5 Mount / Nikon 3400 unmodded DSLR / 158 lights @ 60 secs / 30 darks /App / Lightroom — in Ipswich, Suffolk.

Core collapsing Supernova and the Detection of DARK MATTER

A short article from the Library. Andy Willshere

For many years scientists have been searching for dark matter, which is thought to provide an explanation and estimate for 85% of the matter in the universe, and about 0.25 of its total mass energy density. This is equivalent to 2.241*10-27 kg/m3.In 1884 Lord Kelvin gave a talk in which he estimated the number of dark bodies in the Milky Way, and in 1906 Henry Poncaré used Kelvin's work to discuss dark matter. Since then astronomers and scientists have been battling to provide the answer that still eludes us today.

Recently a study by Manuel Meyer from the Erlangen Centre for astroparticle Physics at the University of Erlangen-Nuremberg and Tanja Petrushevska from the Centre for Astrophysics and Cosmolgy at the University of Nova Gorica resulted in their published paper of 5th August 2020. This considered γ-Ray emission from a Core-collapse Supernova and the search for Axionlike particles.

Axionlike particles (ALP) are thought, or assumed to be, simulated Nambu-Goldstone bosons predicted by the standard model, and are molecular contenders for dark matter. Nambu-Goldstone bosons emerge from prototypes showing spontaneous breakdown of continuous symmetries. This means they change from a symmetric state to an asymmetric state. The boson is part of a category of elementary particles, the other being a fermion. One factor of the boson is that two of them can be in the same quantum state. They are affiliated to the axion, which is a contrivance to solve the strong CP problem, which is a charge + parity paradigm.

So how would this make any difference to detecting dark matter? They are considered to be able to 'flip'character with photons in electromagnetic fields. This means that a batch of axions zooming along or closeby charged particles could convert into photons and conversely back into axions. It follows therefore that when thermal γ rays are produced throughout a core-collapsing supernova, ALP's could be converted from ALP's in both proton and ion electrostatic fields. This is known as the Primakoff process. The next process is for the ALP's to escape the core whereby they could transform back into photons in astrophysical magnetic fields.

At present there are seven super nova early warning systems (SNEWS), which are neutrino detector systems. Neutrinos and γ rays are expected to arrive at the same time. This will allow astronomers time to search for the γ ray emission. Standard γ ray bursts which have not changed to ALP's will be delayed proportionally to the speed of the core collapse, taking much longer to arrive. They also have a burst peak of only tens or hundreds of keV and produce a dissimilar configuration to the ALP generated one. If therefore γ rays are noted at the same time as the arrival of neutrinos, it will be a good indication for ALP's.

The scientists in this paper selected Supernova events from the Open Supernova catalogue that were detected after the commencement of the Fermi-LAT (large area telescope) and were of the type Ib or Ic core collapsing SNe. These SNe's originated from Wolf-Rayet stars or blue supergiants, whose time delay between collapse and optical discharge would be less than one hour. Finally selecting SNe's with a redshift of <0.02. Light curves were then plotted and from the shock breakout phase of the SNe noted in these curves, they calculated when ALP –induced γ ray bursts should arrive. More γ ray events displayed by the Fermi-LAT between 60-600MeV were investigated, with a maximum time lag of 60 days from SNe discovery. They did not expect any meaningful ALP emission higher than 500 MeV for the original predecessor of 10M☉. All data was thoroughly investigated using computer programmes such as Fermitools (analyses Fermi data) and Fermipy, the latter being a python package that is designed to analyse data from the LAT.

Finally, the group did not this time find any evidence of γ ray bursts whilst detecting extragalactic SNe using SNEWS, Fermi-LAT and historic data. No scientific study is ever wasted. Although no γ ray bursts were noted in a sample of 20 core-collapse SNe, they were able to rule out photon-ALP coupling below ma <3*10-10 eV at 95% confidence with the originator of the supernova having a mass of 10☉. They concluded that the Galactic magnetic field (GMF) is given by JF12, a model proposed by Jansson & Farrar (2012) and that the optical emission can be replicated with the nickel-cobalt decay model (NiCo) in MOSFiT (Modular

Open Source Fitter for Transients). This open source code selects a Markov Chain Monte Carlo application (samples data from a probability distribution) to fit multiband light curves. This details Type1 SNe power sources that have no hydrogen lines in their spectra. This study therefore has upgraded all former demarcations obtained from other studies that also were unable to acquire γ ray bursts.

References:

- https://readthedocs.org/projects/fermipy/downloads/pdf/stable PDF file
- https://arxiv.org/abs/2006.06722 Search for Axionlike-Particle-Induced Prompt Gamma-Ray Emission from Extragalactic Core-Collapse Supernovae with the Fermi Large Area Telescope, Manuel Meyer, Tanja Petrushevska
- https://en.wikipedia.org/wiki/Spontaneous_symmetry_breaking
- https://en.wikipedia.org/wiki/Goldstone_boson

Brainteasers: General Knowledge and Astronomy

Andy Willshere

1	26 L of the A		21	1001 A N	
2	13 S in the USF		22	23 P of C in the H B	
3	90 D in a R A		23	66 B in the B	
4	24 H in a D		24	1805 B of T	
5	13 L in a B D		25	64 S on a C B	
6	9 P in S A		26	6 R around N	
7	15 M on a D M C		27	2 S of M	
8	E in G		28	229,228.3 E M D	
9	F in the G		29	56 P in the H B	
10	1 P in a P T		30	6 M S in a game of C	
11	3 C in a F		31	236 E of F	
12	8 N in a O		32	14 L in a S	
13	9 L of a C		33	1 W on a U	
14	10 M in a C		34	7 W of the A W	
15	5 G L		35	21 D on a D	
16	4 H of the A		36	206 B in a B	
17	3 S to the W		37	8 L on a S	
18	180 M S at D		38	M103 O C in C	
19	88 P K		39	4.3 km/sec E S from M	
20	79 A N of G		40	C of a C	

Sharpen AI (by Topaz Labs, $79.99)

A brief guide by Carl Baldwin, an imaging beginner during lockdown 1.

Those who joined the zoom talk from Nik Szymanek will have heard him extolling the virtues of Sharpen AI software for processing images. I have also seen extremely positive comments from Dave Eagle about another similar product from Topaz Labs, Denoise AI. With a number of free evenings for potential imaging being thwarted by the weather recently I decided to download the free trial of Sharpen AI to play with and here is a brief summary. Thanks to Martin Cook, Andy Gibbs and Paul Whiting for providing a few images of varying types to try, in addition to my own planetary images.

There are 3 processing modes in Sharpen AI:

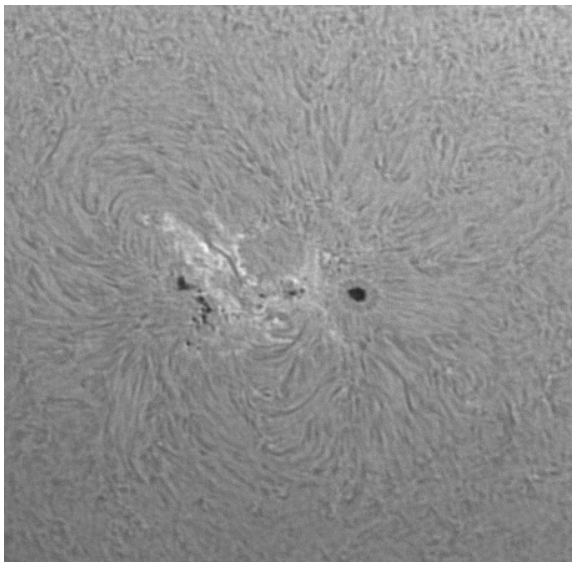
- Sharpen Mode "corrects softness without adding artifacts or halos, creating tack-sharp results and enhancing fine details".
- Stabilise Mode "specialises in fixing motion blur and camera shake".
- Focus Mode "ideal for sharpening out-of-focus eyes or correcting issues caused by in-camera focus".

Using the software is very, very easy. Your image is drag-and-dropped onto the screen with original and preview (processed) versions side-by-side. The mode selection appears to the right and an optional auto feature will move to the mode recommended to have the best effect for the image. Each mode features two sliders, "sharpness" and "noise suppression", and again these can be delegated to an auto setting option. There is a mask feature which allows areas of the image to be protected from processing, and that's it, no mammoth menus full of complicated sounding items, half of which you'll never use. If you wish to use more than one processing mode on an image you have to save the worked on version and reload that to use the next mode.

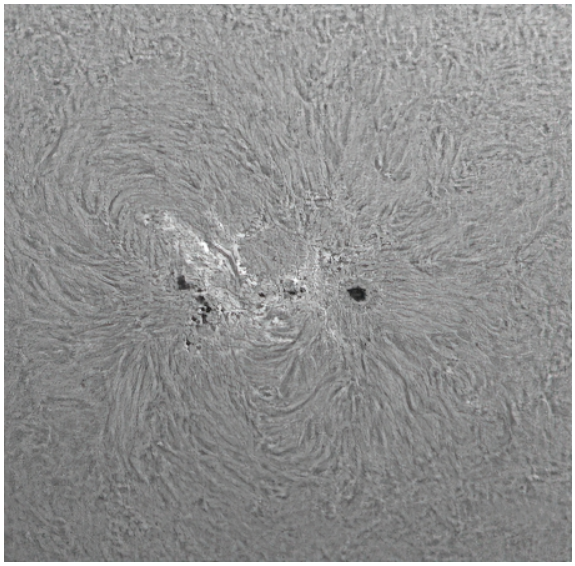
So let's look at some examples.

Here is a demonstration of Sharpen Mode on a recent sunspot image from Martin Cook.

Before



After



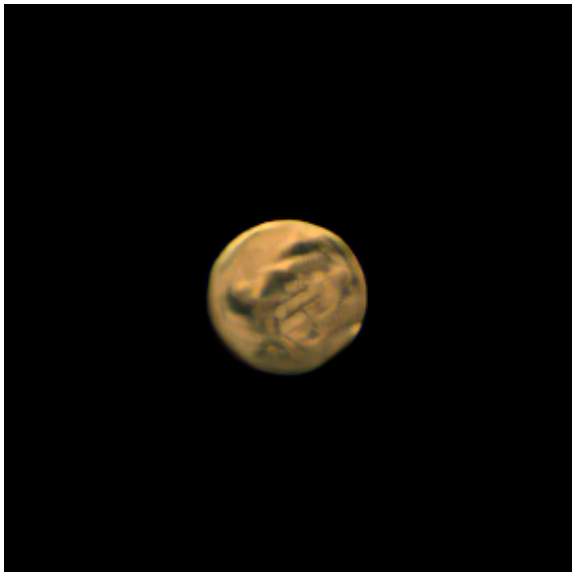
The improved clarity of the surface surrounding the sunspots is clear to see, in addition to the sharpening of the central features. The whole of the image is, too use their words, less soft.

And here is Focus Mode on my first recognisable Jupiter image from back in July.

Before **After**

This third image is with Stabilising Mode applied to the focus-processed version.

The features show even more strongly on this version, but it is always important to be aware over over-processing – the software could turn some flaws in the image into features or sharpen edges that aren't sharp. This point can be seen with this processed recent image of Mars:



The experience of working with many images is that usually either Sharpen Mode or Focus Mode had the best initial effect, rarely was there a big effect with Stabilise Mode on its' own. My assumption is that we are are mostly working with stacked images and this processing already irons out camera shake issues. It was only with single shot photos, such as of Comet NEOWISE that this mode was equal to the others in the size of effect. With such images, e.g. also with M42, the software did reduce blurring of background stars, making them sharoer points, but the software is not as impressive as it is with images of large objects.

So the big question is "is the software worth the $79.99?" If you are working with images of nebulae there isn't a clear benefit for you as far as I can see. For someone like myself who is mainly interested in planetary imaging then (especially as my focussing skills need to improve!) there is no doubt that many images can be significantly enhanced, although my best image, the Mars one from September 14th, has been resistant to improvement. With a higher quality initial image the differences are not so large. Will I buy it? I will certainly dither for a prolonged period, but ultimately, probably, yes.

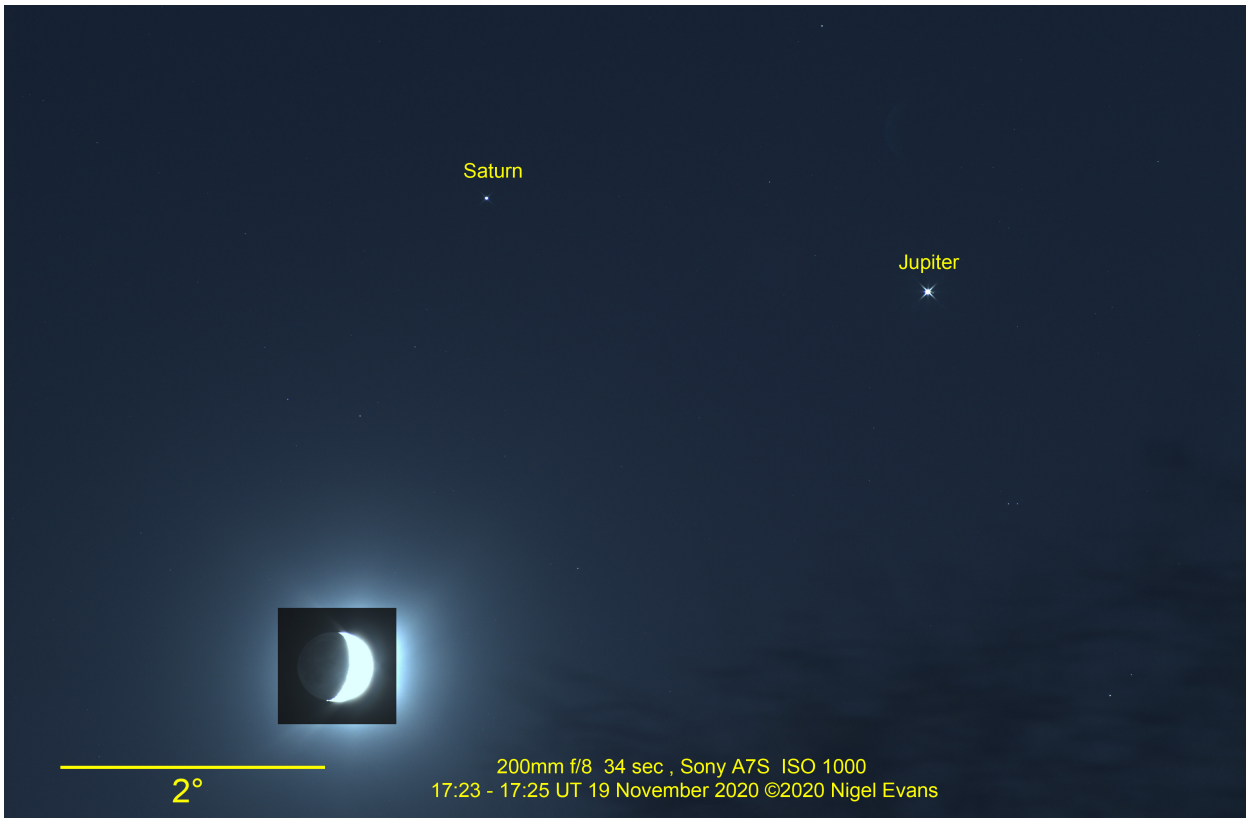
STOP PRESS: Topaz Labs https://topazlabs.com have just released an updated version of Sharpen AI. I cannot update my trial version, but in addition to tweaking the AI processes (a permanently ongoing exercise) they have amended the image viewing to offer a comparison view, allowing you to see the original alongside all of the three processed versions at the same time, plus they have added an "extra noise suppression" setting. Just in case the standard noise suppression isn't enough?

The Moon, Jupiter and Saturn

Nigel Evans

Jupiter and Saturn continue to close together for the 'Great Conjunction' on 21 December 2020. On the evening of the 19th November they were only 3.5 degrees apart and the Moon passed by them both.

The 5 day old Moon is rather dazzling, even when it is only 11 degrees high, so an artificial 'Moon filter' has been used.



OASI Officers & Committee – Nomination form

Nomination for 2021 committee

Name of Nominee: .....

Post: .....

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

Proposer (Print and sign)

.....

Seconded by (Print and sign)

.....

Any members who are nominated must have given their consent.

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

Members who are elected to the 2021 committee will be expected to attend as many committee meetings as possible. Committee meetings are usually held about every six to eight weeks.Every committee member is given an area of responsibility to help with the running of the society.

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

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