



OASI News

The newsletter of the Orwell Astronomical Society



NGC1499 The California Nebula

Photo by Andy Gibbs

Trustees:

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Mr David Payne

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Society Notices

Dear Members,

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

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

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

Andy Gibbs, Chairman

Society Contact details

Email queries: info@oasi.org.uk

Facebook: Orwell Astronomical

Twitter: @OASIpswich

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

Members-only message board

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

Observatory (meeting nights only)
07960 083714

**Please send material for the OASI
web site and newsletter
e.g. observations, notices of events,
general interest articles, to
news@oasi.org.uk**

The CLOSING date is the 15th day of the month

Access into the School Grounds and Observatory Tower

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

Areas out of Bounds

Access to the Observatory is only via the black door at the foot of the Observatory tower, which leads to the staircase and thence to the spiral staircase up to the Observatory. If the black door is locked, please phone the observatory mobile during meeting hours. Kindly check/amend the number shown on your 2021 membership card.

Please do NOT explore other routes. When in doubt, ask or call the Observatory mobile.

Remember this is a school and straying into the main part of the school where the pupils reside would cause the society big problems and could see us losing the use of the observatory. Any member found to be anywhere other than the approved access route or the observatory area will face serious sanctions up to and including expulsion from OASI.

Please note that access time for all observatory member nights is after 20:15

Articles for OASI News

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

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

Text: txt, rtf, rtf, doc, docx, odt, Pages, pdf

Spreadsheets: xls, xlsx, OpenOffice/LibreOffice, Numbers

Images: tiff, png, jpg

Please send tables as separate files in one of the above formats.

If you don't feel up to writing a major article, perhaps you might write a short note for OASI News along the lines of "This month I have mostly been observing/constructing/mending/reading/etc."?

Newsletter archive www.oasi.org.uk/NL/NL_form.shtml

Authors, please note that your articles will be publicly available worldwide!

Reproducing articles from OASI News

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

Committee 2022

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 Wilshire	Librarian
	Avtar Nagra	OASI @ Newbourne
Assistants	Martin Richmond-Hardy	Newsletter, OASI @ Newbourne

Committee Meeting

The next Committee Meeting will be on Friday 27 May at 8:00pm via Zoom.

Welcome to new members

Matthew Adams

Mark Blake-Thomas

OASI and BAA Events

Please note that the listed events may change depending on the progress of the pandemic. For the latest event details, please see www.oasi.org.uk/Events/Events.php

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



<https://calendar.google.com/calendar/ical/1jhs9db7lncki4sojo7092vfvc%40group.calendar.google.com/public/basic.ics>

For other astronomy news and astro pictures try our

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

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

Date, Time & Location	Contact	Event
Weekly, every Wednesday, from 20:15	Martin Cook, Roy Gooding	Observatory open
Monday 28 March	Martin R-H newbourne@oasi.org.uk	OASI @ Newbourne Sky Notes by Bill Barton FRAS
Monday 11 April 19:30 Newbourne Village Hall	Martin R-H newbourne@oasi.org.uk	OASI @ Newbourne
Friday 15 April	Paul Whiting treasurer@oasi.org.uk	Zoom Talk (Recorded) with Dr Katie Mac "The End of Everything (Astrophysically Speaking)"
Thursday 21 April	Paul Whiting treasurer@oasi.org.uk	OASI on Zoom
Monday 25 April 19:30 Newbourne Village Hall	Martin R-H newbourne@oasi.org.uk	OASI @ Newbourne Sky Notes by Bill Barton FRAS

Meetings via Zoom

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

OASI @ Newbourne

Martin Richmond-Hardy newbourne@oasi.org.uk

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

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

Newbourne dates for 2022

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

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

Stargazer's Guide

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

Astronomy Workshops/Informal talks

Meetings will depend on COVID-19 situation.

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

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

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

Lectures – via Zoom

Contact: Peter Richards lectures@oasi.org.uk

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

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

Athaneum Astro Society

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

Meetings suspended during the Covid-19 situation.

LYRA Lowestoft & Yarmouth Regional Astronomers

www.lyra-astro.co.uk

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

DASH Astro

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

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

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

BAA news & webinars

For full details of all meetings or cancellations, please go to <https://britastro.org/meetings/2022>.

2022

Friday April 8 – 19:00	The 2022 Winchester weekend at Sparsholt College, Winchester
Saturday April 23 (All day)	BAA Spring Meeting, Leeds
Saturday May 14 14:00	Historical Section Webinar by Professor Wayne Orchiston and Darunee Lingling Orchiston
Wednesday May 25 – 17:30	BAA Special General Meeting, Ordinary Meeting & George Alcock Memorial Lecture given by Mike Foulkes 'Great Storms on Saturn'. Hugh Allen 'Observing the 2017 – 2019 primary eclipse of VV Cephei in a low-resolution spectroscope'. Sky Notes: Nick James.

Webinar recording – “The history of silvering telescope mirrors” is available to watch at <https://britastro.org/videos/wednesday-webinar-the-history-of-silvering-telescope-mirrors>

The BAA Radio Astronomy Section

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

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

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

From the Interweb

Trajectory, recovery, and orbital history of the Madura Cave meteorite

<https://www.meteornews.net/2022/03/07/news-from-the-meteor-library-madura-cave-meteorite/>

This article has been submitted by *Hadrien A. R. Devillepoix, Eleanor K. Sansom, Patrick Shober, Seamus L. Anderson, Martin C. Towner, Anthony Lagain, Martin Cupak, Philip A. Bland, Robert M. Howie, Trent Jansen-Sturgeon, Benjamin A. D. Hartig, Marcin Sokolowski, Gretchen Benedix, and Lucy Forman.*

Abstract: On the 19th June 2020 at 20:05:07 UTC, a fireball lasting 5.5 s was observed above Western Australia by three Desert Fireball Network observatories. The meteoroid entered the atmosphere with a speed of 14.00 ± 0.17 km/s and followed a 58° slope trajectory from a height of 75 km down to 18.6 km. Despite the poor angle of triangulated planes between observatories (29°) and the large distance from the observatories, a well constrained kilo-size main mass was predicted to have fallen just South of Madura in Western Australia. However, the search area was predicted to be large due to the trajectory uncertainties. Fortunately, the rock was rapidly recovered along the access track during a reconnaissance trip. The 1.072 kg meteorite called Madura Cave was classified as an L5 ordinary chondrite. The calculated orbit is of Aten type (mostly contained within the Earth's orbit), the second time only a meteorite is observed on such an orbit after Bunburra Rockhole. Dynamical modelling shows that Madura Cave has been in near-Earth space for a very long time. The NEO dynamical lifetime for the progenitor meteoroid is predicted to be ~ 87 Myr. This peculiar orbit also points to a delivery from the main asteroid belt via the ν_6 resonance, and therefore an origin in the inner belt. This result contributes to drawing a picture for the existence of a present-day L chondrite parent body in the inner belt.

You can download this paper for free: <https://arxiv.org/pdf/2202.06641.pdf> (12 pages).

ExoMars mission suspended over Ukraine conflict

<https://eandt.theiet.org/content/articles/2022/03/exomars-mission-suspended-over-ukraine-conflict-satellite-launches-also-affected/>

Following the decision by Roscosmos to withdraw its personnel from Europe's Spaceport in French Guiana, all missions scheduled for launch by Soyuz have also been put on hold.

These relate to four currently planned missions, Galileo M10 and Galileo M11, which will bolster Europe's satellite navigation system, Euclid, which is a space telescope designed to explore dark energy and dark matter, and EarthCare, which is a satellite designed to examine the role clouds and aerosols play in trapping infrared radiation emitted from Earth's surface.

Estimating trajectories of meteors: an observational Monte Carlo approach – I. Theory

<https://academic.oup.com/mnras/article/491/2/2688/5626361?login=false>

Paper available as pdf here <https://academic.oup.com/mnras/article-pdf/491/2/2688/32408246/stz3160.pdf>

Comet Leonard has disintegrated

<https://earthsky.org/space/comet-leonard-has-disintegrated/>

Our brightest comet of the past year has disintegrated. This comet passed nearest the sun at perihelion on January 3, 2022 and is now moving away from the sun. It has not only faded, but is now missing its two most important parts: its nucleus (core) and its coma (temporary atmosphere).

The remnants of Comet C/2021 A1 (Leonard) are presently in the morning sky as seen from Earth's Southern Hemisphere.

Astronomers reveal best image yet of mysterious odd radio circles in space

<https://www.sciencedaily.com/releases/2022/03/220321132205.htm>

<https://skyandtelescope.org/astronomy-news/new-image-reveals-possible-origins-of-odd-radio-circles/>

Astronomy's newest mystery objects, odd radio circles or ORCs, have been pulled into sharp focus by an international team of astronomers using the world's most capable radio telescopes.

Scientists observe mysterious death of a star emitting six rings

<https://www.sciencedaily.com/releases/2022/03/220328153937.htm>

Astrophysicists studying in unprecedented detail a red giant star named V Hydrae have witnessed the star's mysterious death throes. Researchers discovered that the carbon-rich star has expelled six slowly expanding molecular rings and two hourglass-shaped structures ejecting matter out into space at high speeds.

Scientists solve solar secret

<https://www.sciencedaily.com/releases/2022/03/220324122555.htm>

The further we move away from a heat source, the cooler the air gets. Bizarrely, the same can't be said for the surface of the Sun, but scientists may have just explained a key part of why.

The Night Sky in April 2022

Martin RH

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

Times are BST unless otherwise stated.

Sun, Moon and planets

Sources:

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	06:30	19:29		
	30	05:28	20:18		
Moon	1	06:58	19:48		New Moon 01 April 07:25 Apogee 07 April 20:11 First Quarter 09 April 07:48 Full Moon 16 April 19:55 Perigee 19 April 16:14 Last Quarter 23 April 12:56 New Moon 30 April 21:28
	30	05:31	20:03		
Mercury	1	06:40	19:10	-1.7	Superior Conjunction 02 April Perihelion 13 April Max. eastern elongation 29 April
	30	06:01	22:22	0.5	
Venus	1	05:10	15:00	-4.2	
	30	04:26	16:02	-4	
Mars	1	05:12	14:18	1.1	
	30	04:01	14:29	0.9	
Jupiter	1	06:09	17:21	-1.9	
	30	04:25	16:04	-2	
Saturn	1	05:16	14:32	0.9	
	30	03:27	12:50	0.9	
Uranus	1	07:36	22:17	5.9	
	30	05:45	20:32	5.9	
Neptune	1	06:13	17:33	8	
	30	04:21	15:45	7.9	

There are some planetary conjunctions this month (sadly, none visible from the UK).

See <https://in-the-sky.org/article.php?term=conjunction&year=2022>

Occultations during April 2022

https://iota-es.de/moon/grazing_descrx101.html and <http://www.lunar-occultations.com/iota/bstar/bstar.htm>

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

Meteor showers during April 2022

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

Shower	Normal limits	Maximum	Max RA/Dec.°	ZHR at Max	Notes
April Lyrids	April 14–30	April 22	18.07 (272°) +33.1°	15	Normally rather moderate activity, but fine displays in 1803, 1922, 1982. Quite favourable

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

Visible ISS passes ≥15° max altitude

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

Times are UTC until 27 March then BST. Predictions are approximate (28 February) due to craft adjustments. Check the day before.

Date	Bright-ness (mag)	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Apr	-2.6	20:02:18	10°	W	20:05:27	36°	SSW	20:08:34	10°	SE
02 Apr	-1.2	20:51:49	10°	WSW	20:53:39	14°	SW	20:55:28	10°	S
03 Apr	-1.5	20:03:14	10°	W	20:05:46	20°	SW	20:08:18	10°	SSE
26 Apr	-1.2	04:48:35	10°	S	04:50:19	14°	SE	04:52:04	10°	ESE
28 Apr	-2.2	04:46:57	10°	SSW	04:49:48	26°	SSE	04:52:39	10°	E
29 Apr	-1.8	03:59:42	13°	S	04:01:30	19°	SE	04:03:55	10°	E
30 Apr	-1.4	03:12:59	13°	SE	03:13:14	13°	SE	03:14:49	10°	ESE
30 Apr	-3.1	04:46:08	10°	SW	04:49:22	45°	SSE	04:52:36	10°	E

Starlink passes

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

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

Astronomy on the radio

Bill Barton's Radio Broadcast

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

David Murton's Radio Broadcast

On 1st Tuesday of the month, 2.40pm on the Lesley Dolphin show on BBC Radio Suffolk and the internet. <https://www.bbc.co.uk/radiosuffolk>

All-Sky camera reports

Alan Smith

Fireball in the east 2022-03-24 at 0227hrs UT



Also caught on video by Chris Albins.

James Appleton also caught this image

Appcam image for 20220324 022748 UT (end of frame) attached. Very hazy at low altitude, but relatively clear at the altitude of the meteor.

There's a significant parallax between my image and Alan's, and just about sufficiently many background stars, so I'll try to crunch out a triangulation at the weekend.

Parameters:

Filename is frame time at end of frame (UT).

Location 52.053729°N, 1.212109°E, 42m above MSL.

ZWO ASI178mc.

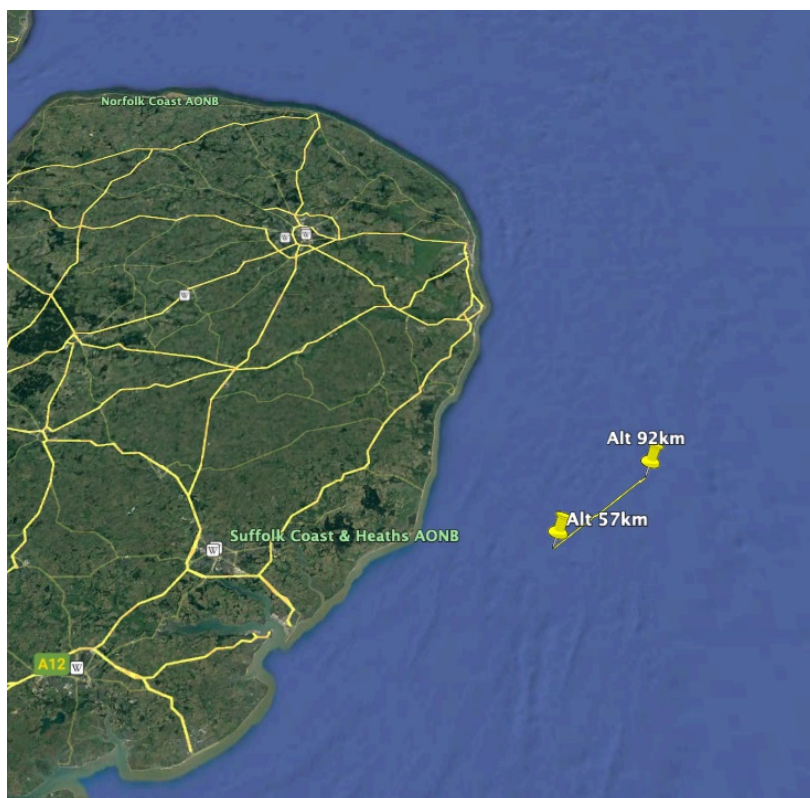
Fujinon fish-eye lens, CF2.7HA-LI, 1:1.8, 2.7mm.

30s exposure.

Gain 200.



James has also computed the track, shown here on Google Earth.



Meanwhile, if you missed the meteorites, there's always the ISS, as spotted by John Hughes with his new all-sky camera.

He writes:

Sadly, all the fireballs and meteors you have seen over the last few days are either too low for my camera or between exposures. I am sure that will change though.

Having said that, my camera does seem to enjoy satellites and last night (22/03/26) managed to capture the ISS as it passed by again.



Exposure commenced 20:38:53 UT

56s exposure.

Gain 20.

ZWO ASI120mm-s

Constellation Gemini

Mars Sample Return

Short article from the Library.

Andy Willshire

The Perseverance rover landed on Mars on 18th February 2021, with one of its tasks to collect Martian rock samples which it is hoped when examined will determine if there is any ancient microscopic life present.

Getting to Mars is a tremendously difficult task in itself, without having to land a rover on its soil. The scientists at NASA now want to go several stages better. They have conceptualised a Mars Sample Return (MSR) programme, which will allow them to construct a system whereby samples of Martian soil and rock are collected and eventually returned to Earth. This is just a small part of NASA's Mars Exploration Program, which will robotically acquire Perseverance's stashed rock and soil samples, and has been planned to take place between 2026 and 2031. The Sample Return Lander (SRL) and the Earth Return Orbiter (ERO) will be launched in 2026. It is a collaborative enterprise utilising most of NASA's satellite centres and the European Space Agency (ESA), who over a designated time frame will develop the necessary equipment and scientific understanding required to fulfil this mission. September 01, 2021 saw the Perseverance rover drill 6 centimetres into the Martian surface to extract a rock core, which it later sealed in a small tube, by pushing a small metal cap over the opening. On board there are forty-three small geological specimen tubes, five of which are called Witness tubes.

It is anticipated that the platform from which the Mars Ascent Vehicle(MAV) will be launched will be about 2,400 kgs in weight. This is approximately twice the weight of Perseverance, which had the use of a rocket powered Jet pack to lower it by cable to the Martian floor. A new method will have to be designed for the MAV to land. Consideration is being given to using familiar retrorockets to slow descent and spring loaded legs to absorb touchdown impact. JPL engineers have already begun to test theories, by dropping a prototype lander from various heights, using high speed cameras especially to film the leg system and analysing results. This data, some of which is slow motion video, is used to continually improve their computer models, especially to check energy dissipation. Another problem of landing is the ground formation of Mars. Whether this is comprised of soil or rock, the landing gear must be able to accommodate all types, enabling it to be able to land safely. At present, most of this data is obtained using a one third size prototype, which is similar to the weight of a fully laden craft in reduced Mars gravity. When all data has been analysed, a full sized model will be manufactured and rigorously tested.

The craft will have landed onto Martian soil hopefully, in the area of the Jazero Crater, where Perseverance will have stockpiled the samples. As has been stated there are forty-three specimen tubes (made mostly of titanium) on Perseverance, but only a maximum of thirty-eight will be used to hold Mars rock and soil. The other five are called Witness tubes. When sending machines into space, tremendous care has to be made to make sure that when saving, in this case Martian specimens, contamination with terrestrial contaminants must be avoided. To safeguard the samples, Perseverance carries five pre-loaded sample tubes filled with a diversity of materials that can be utilised to seize molecular and fragmentary contaminants. These may for example have been discharged from different materials found on the rover, as well as organic and inorganic substances that could have landed with the rover on Mars. The witness tubes will be opened individually on the surface of Mars to observe or 'witness' the surrounding environment around the sample collection areas. This means that when samples are being collected they will be exposed to the local conditions. These tubes will also be sealed and stored similarly to Mars samples. When opened on Earth, they will be able to ascertain which Earth pollutants if any were present when the samples were taken, allowing scientists to dismiss these as non -Mars. Once a sample has been gathered an interior robotic arm will place it where it can be examined hermetically sealed and stored. These samples are then deposited on the surface of Mars in a designated cache depot. When this is to be done will be decided by the Mars team.

The next problem is to pick them up. To do this, the Sample Retrieval Lander comes with the Mars Ascent Vehicle and ESA's Sample Fetch Rover.

The Fetch Rover will acquire the samples from the cache and relocate them onto the ascent vehicle. At this point, Perseverance could also carry some samples and place them directly into the same vehicle. The next problem is getting them airborne.

This task will be performed with a two stage 2.8m long rocket, which will be positioned on the top of the Landers deck. NASA engineers are working on a system whereby the rocket will be thrown into the air at about 5m per second before it ignites. At present they are working with a 400kg prototype rocket and using gas powered pistons to throw the rocket into the air. In order for the experiment to be comparable with the Martian gravity, 13m cables

are attached from the prototype to the surrounding structure to offload over half of the Earth/rocket weight. This system is known as VECTOR (Vertically Ejected Controlled Tip-off Release), which when utilised will slightly rotate the rocket away from the Martian surface. This means that the Landers position does not have to be critical for a successful rocket launch. As many as 23 test launches have been performed during the last year during which they have changed both the mass of the rocket and its centre of gravity. Over the following months, tests on a heavier rocket will occur with it being thrown even higher.

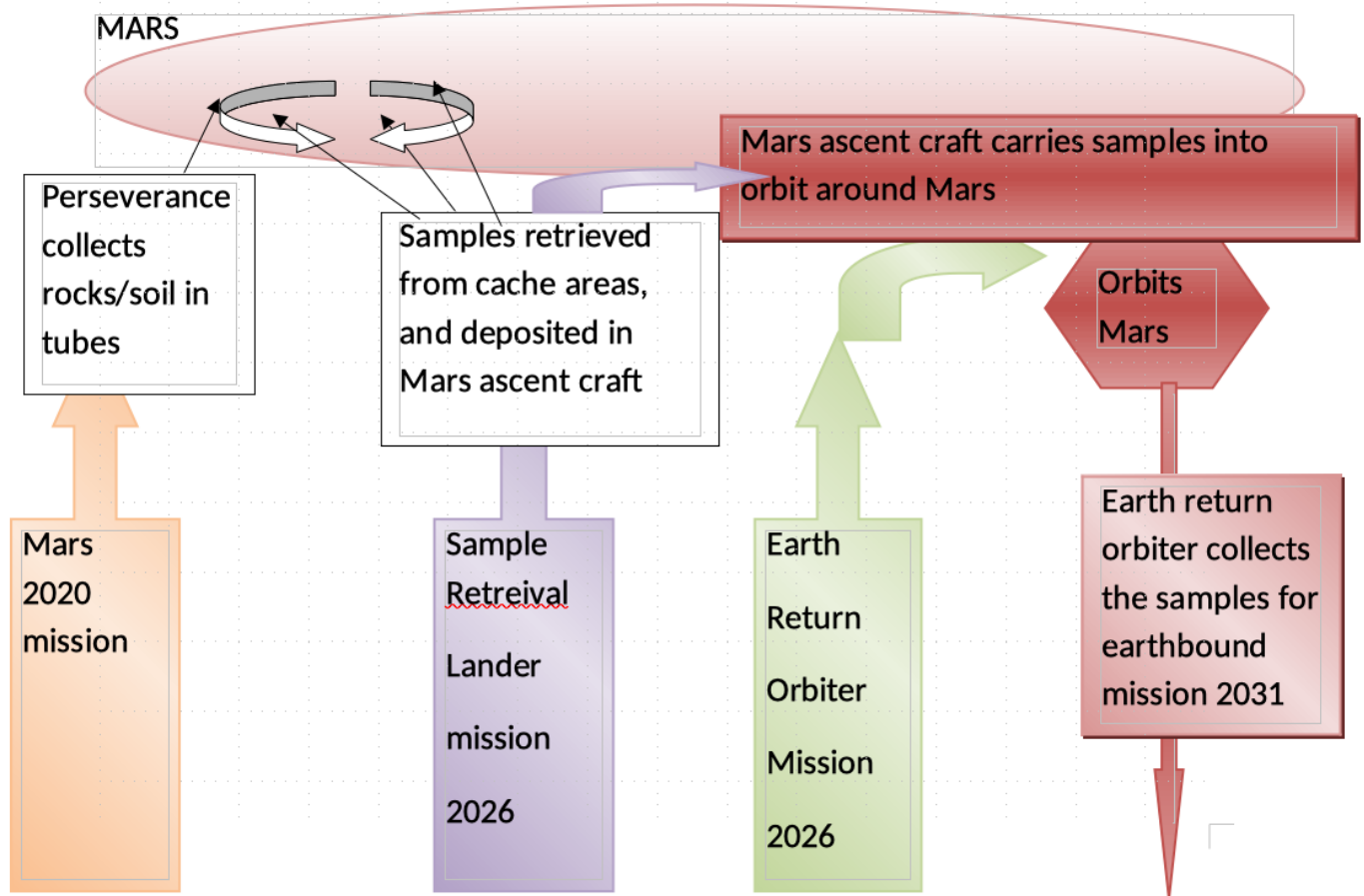


Diagram of How Mars samples get back to Earth

We have now reached the point at which all of the cached samples have been placed into the Mars ascent craft, and its new trajectory calculated, will meet up with the Earth Return Orbiter (ERO). The rocket would dispatch the specimen storage craft to Martian orbit, where the ERO will pick it up. At this point, the samples will be made ready by putting them into a clean container and sterilizing the seal. How this is to be done will be a difficult pre-mission problem. A robotic arm will then place it into a capsule ready for Earth-entry. The mission will then head to Earth where official sample receiving facilities (SRF) will be waiting for the rock/soil filled tubes. These SRF's will be ready to maintain and distribute the specimens to pre-designated laboratories, as well as conserving biocontainment, to meet with necessary safety criterion. Some tests on the samples will be time and/or sterilization sensitive, so the initial receiving SRF's will have the capability to execute these. Safety is paramount. Between now and 2031, these SRF's will be constructed as a facility that amalgamates both high performance clean room operations and bio-safety Level 4 (highest safety). This has not been needed before and will require exacting organisation. These SRF's must be fully functioning and have a considerable laboratory analysis potential in order to achieve the objectives before the arrival of the Mars samples.

NASA will fulfil all requirements and more of the Outer Space Treaty 1967 that requires all nations to prevent contaminating celestial bodies with organisms from Earth and vice-versa. In order to comply, NASA is collaborating with ESA and 19 other U.S. Government departments and agencies, including Disease Control and Prevention.

This whole project will transform human comprehension and perception of Mars. The samples returned to Earth will be scientifically examined by the most ultra-modern and sophisticated instruments found around the world. Perhaps when all experiments have been conducted, a new understanding of the past life on Mars will unfold.

References:

<https://www.hou.usra.edu/meetings/lpsc2021/pdf/1708.pdf>

[Concepts for Mars Sample Return | Missions – NASA's Mars Exploration Program](#)

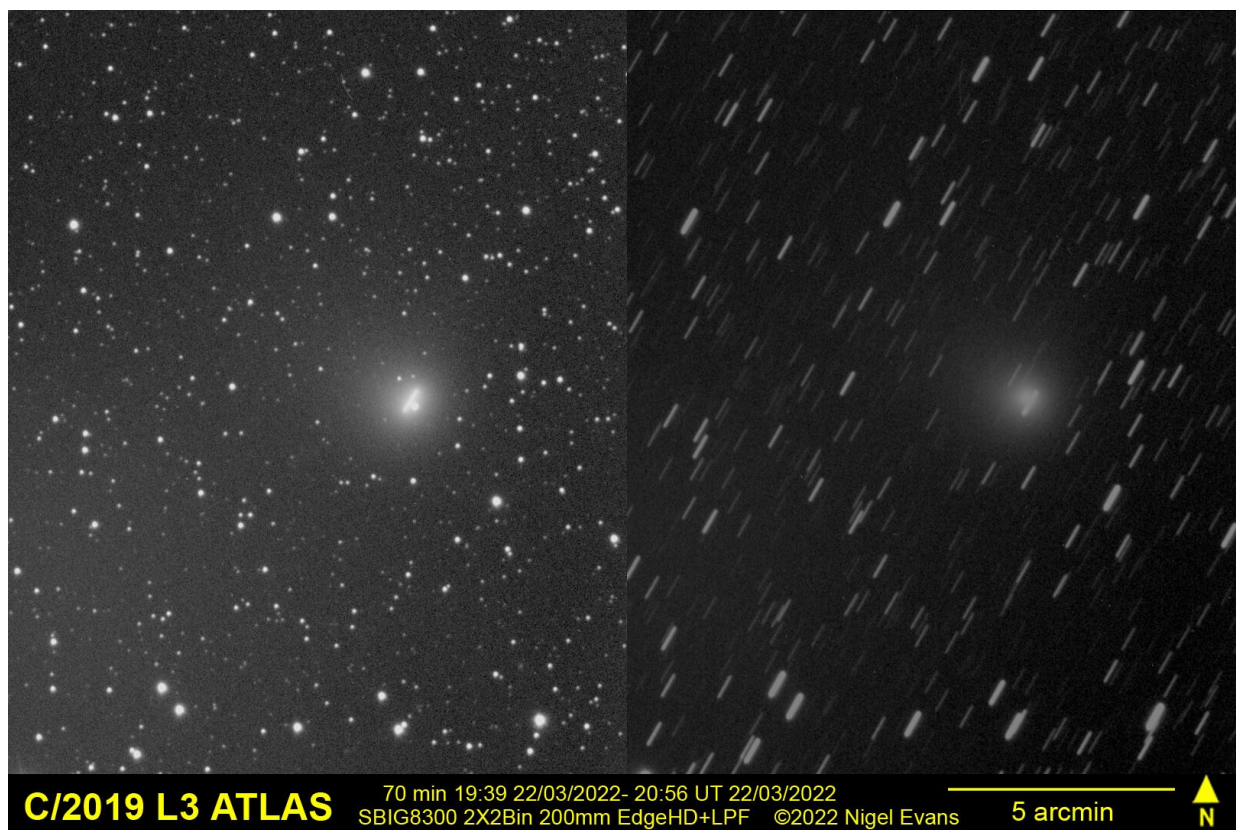
[bsl-4-level containment - Search \(bing.com\)](#)

[NASA Moves Forward With Campaign to Return Mars Samples to Earth](#)

Comets

Nigel Evans

Yes, there are comets about and this is one of them. Nothing that looks like a tail was spotted and it just unlucky that it happened to be passing very close to an 11th mag star.



NGC1499 – The California Nebula

Andy Gibbs



NGC1499 The California Nebula, captured in Narrowband, between 4 and 25 February 22.

10x 600 sec exposures in Hydrogen alpha, 12x 600sec exposures in Oxygen III and 13x 600 sec exposures in Sulphur II.

Equipment used: Atik One 6.0 camera, Explore Scientific ED80 CF refractor, Skywatcher HEQ5 mount. Controlled by a PrimaluceLab Eagle 3.

Software used: Sequence Generator Pro and Affinity Photo.

Messier 106

John Hughes

Below is an update to Messier 106 which I originally captured in January 2021. Sadly I was unable to finish the image by acquiring more data as I had an accident and was unable to image for a month.

Fast forward to February 2022, I concluded the project. Data captured as follows;

21/01/2021 R:G:B 3 minute exposures (25:39:29)

26/27 Feb 2022 L:R:G:B 2 minute exposure (130:60:55:60).

Total integration time is 14.8 hours..

Messier 106 is located in the constellation Canes Venatici. Accompanying M106 in the field of view are the galaxies NGC4346, NGC4217 and NGC4220 (bottom left, bottom right & top right respectively). M106 is approximately 23 MLY from Earth in comparison with NGC4346 (35 MLY), NGC4217 (61 MLY) and NGC4220 (63 MLY).

The Moon was 89% illuminated which resulted in a large gradient on the left hand side of the image especially in the red channel, but easily removed with PixInsight's DynamicBackgroundExtraction tool.

RGB data set - 20/31/36 subframes respectively using 3 minute exposures.

Image acquired using my William Optics Z103 refractor and ZWO ASI1600mm mono camera.

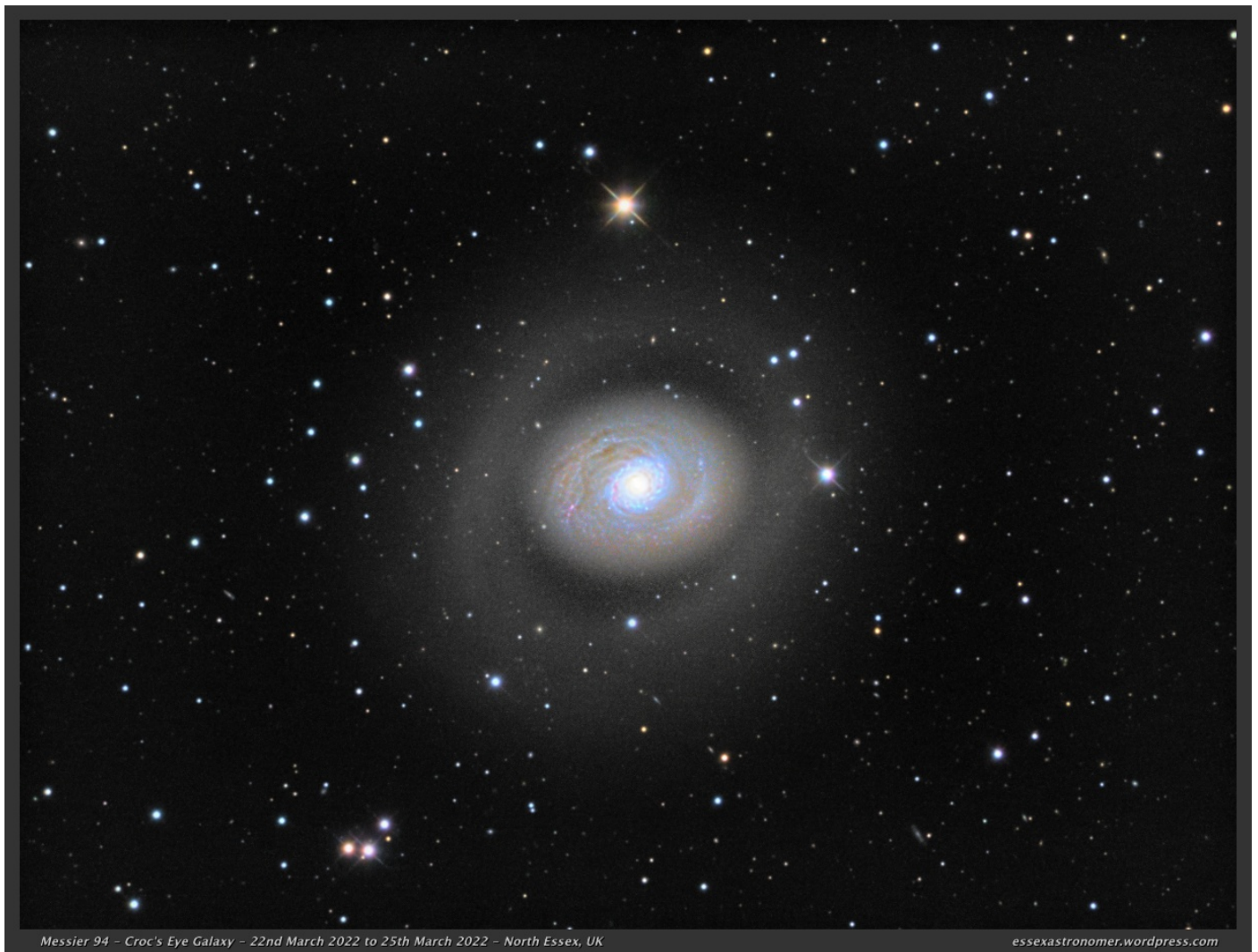


Messier 94, Croc's Eye Galaxy

John Hughes

With Galaxy season upon us and a few clear nights last week, I tried once again with the 8" Ritchey Chretien scope to capture one of the many galaxies visible.

Target of choice was Messier 94 in Canes Venatici and at an altitude of 40 degrees at 8pm it was ideally placed for me to photograph as it rose towards the meridian. This image was captured across the nights of 22nd, 23rd, 24th and 25th March 2022 in LRGB. Equipment and data as follows; Exposure time was 120 s for each sub frame. Number of subs L:R:G:B (229:70:74:75), total integration time 14.9 hours. StellaLyra Ritchey Chretien scope f/l 1600 mm, ZWO ASI1600mm camera, gain 139, offset 30, sensor temp -10 c, bin 2x2, Chroma 1.25" LRGB filters.



Messier 94 - Croc's Eye Galaxy - 22nd March 2022 to 25th March 2022 - North Essex, UK

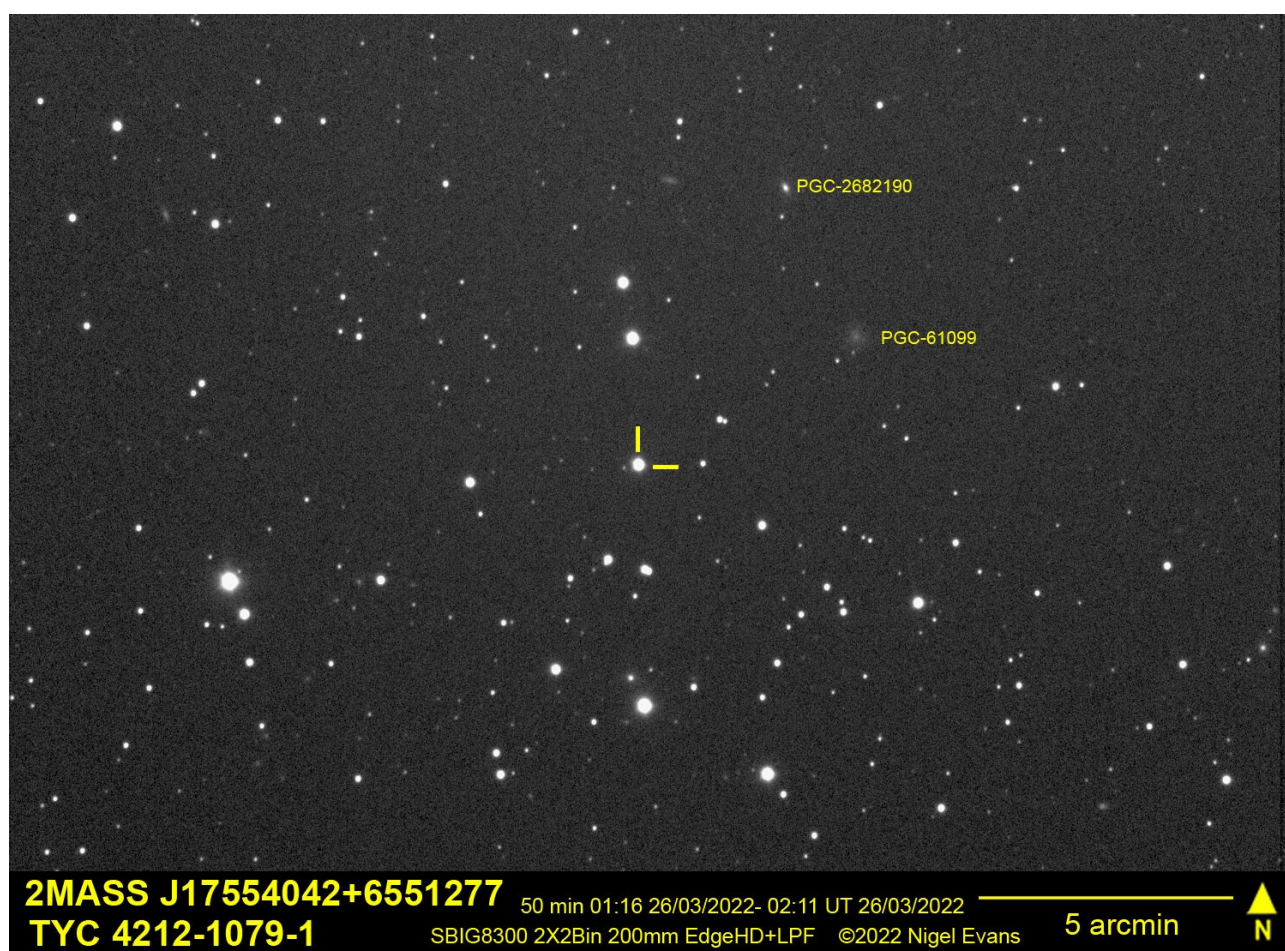
essexastronomer.wordpress.com

More on the James Webb telescope

Nigel Evans

The first star used by the James Webb space telescope to achieve focus was HD84406 in Ursa Major (shown previously). Later another star was used for the final focussing - 2MASS J17554042+6551277 (also known as TYC 4212-1079-1) which showed many faint galaxies in the background. (https://en.wikipedia.org/wiki/HD_84406)

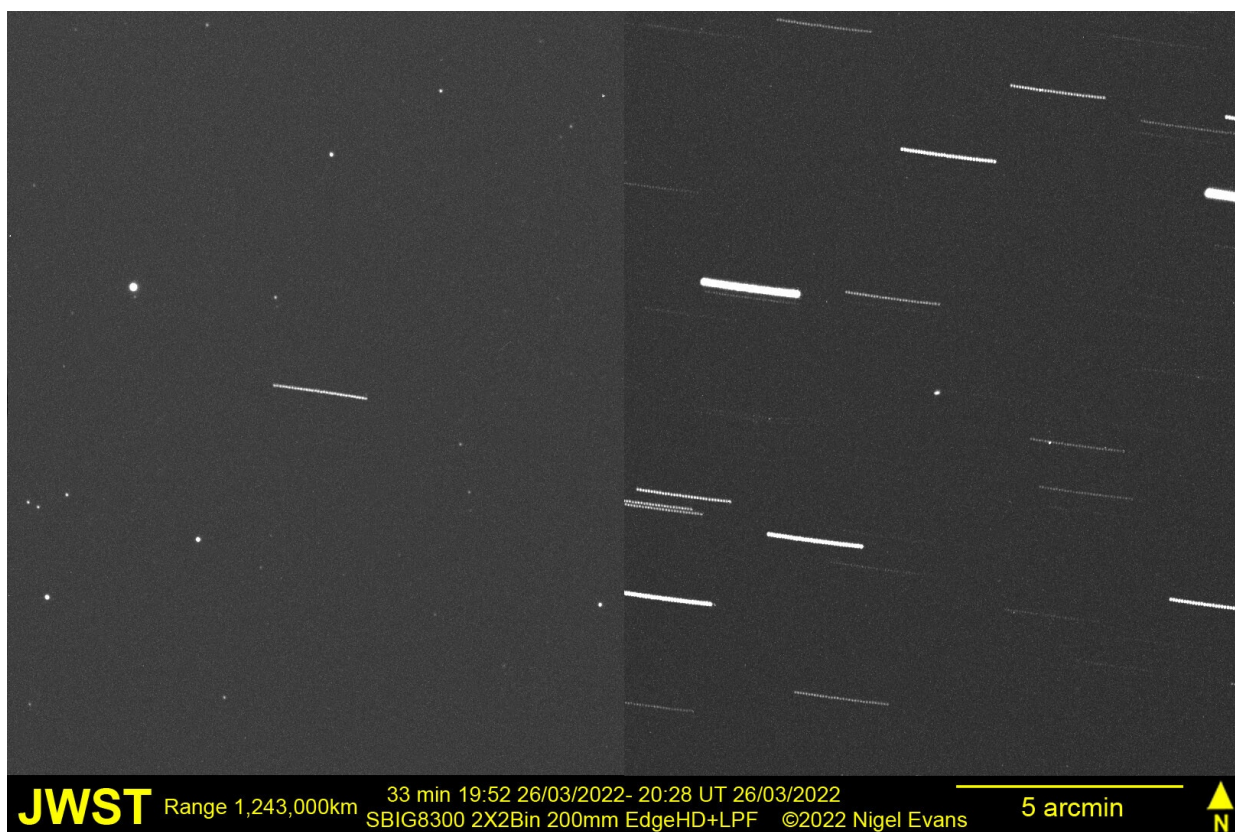
Now I hear you say "And what does that look like to mere mortals?" Where is it? It is an 11 mag star in Draco and it looks like - see attached! The star next to the marked star is some 17 arcseconds away and may, or may not be, in the JWST image.



I also took another opportunity to look at the JWST itself. This was a filler observation, waiting for other things to rise from behind the trees, so I was not expecting much. Before it was around mag 17, whereas now it around mag 15 and is easily found in a single 1 minute exposure.

The left-hand portion of the image on p21 shows the JWST moving amongst the stars. The right-hand portion is fixed on JWST and shows the background stars moving behind it. (I do the same thing on comets)

While the telescope is still staring at 2MASS J17554042+6551277 in order to focus the other instruments, we are now seeing the effect of different phase angles of the Sunshield as the JWST moves south



Sun Dog

Paul Whiting FRAS



Image of a sundog and a surprised looking bird!