No. 609 Registered Charity 271313 March 2024

OASI News

The newsletter of Orwell Astronomical Society (Ipswich)

1NGC 1528 - Open Cluster in Persues - By John Hughes

Table of Contents

Society Notices

Dear **Members,**

This month we have a new editor for the Newsletter. I would like to thank Adam for volunteering to take on the role and thank Paul for taking over as editor last year, ensuring that the Newsletter reached the milestone of 600 editions. Please keep those articles and photos coming in!

We are now in the process of confirming our outreach events for the rest of the year. We hope to again be able to hold our open evenings at Orwell Park Observatory in the Autumn. As ever, the smooth running of these events depends on the support of the membership. So if you are able to help out, in any way, please let myself or any Committee member know.

I hope to see you at a meeting or event in the coming weeks, we just need those pesky clouds to clear!
Andy Gibbs, Chairman

Committee 2024

Chairman	Andy Gibbs	Set overall agenda for OASI, Chair committee meetings, Press and publicity
Secretary	RoyGooding	Outreach meetings (jointly with Chairman), observatory decoration
Treasurer	Paul Whiting	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
	MartinCook	Membership, Tomline refractor maintenance & user testing
	Matt Leeks	Safety & security
	Peter Richards	Lecture meetings
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club
	Andy Willshere	Librarian
	Adam Honeybell	Newsletter
	Paul Whiting	OASI @ Newbourne

Committee Meeting

The next Committee Meeting will be on Friday 31st May at 8:00pm via Zoom. All members welcome.

New members

Welcome to new members:

Nick Tipping

Society Contact details

Website:	https://www.oasi.org.uk
Events:	https://www.oasi.org.uk/Events/Events.php
Email queries:	info@oasi.org.uk
Submissions for Newsletter:	news@oasi.org.uk
Members-only message board:	https://groups.io/g/OASI
Observatory (meeting nights only):	☎ 07960 083714

Social Media

For other astronomy news and astro pictures try our socials:

Facebook:	https://www.facebook.com/groups/445056098989371
X (formerly twitter) feed:	https://twitter.com/OASIpswich (access to account needs to be renewed)
YouTube:	https://www.youtube.com/@orwellastronomical425

Articles for OASI News

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

Please send tables as separate files in one of these formats (Excel, .csv, OpenOffice)

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."

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.

The Newsletter archive is at 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.

Visiting

We have regular meetings on the 2nd and 4th Monday of the month at **Newbourne Village Hall**, and every Wednesday at **Orwell Park**. Night sky observing will usually take place when the skies are clear.

Date, Time & Location	Contact	Event
Weekly, every Wednesday, from 20:00 Orwell Park Observatory, Nacton	Martin Cook Roy Gooding	Observatory open
Monday 11th Mar from 19:30 Newbourne Village Hall	Paul Whiting	OASI@Newbourne Beginners and new members welcome Sky Notes & talk
Thursday 21st Mar 20:00 Zoom	Paul Whiting	Monthly Zoom Meeting
Monday 25th Mar from 19:30 Newbourne Village Hall	Paul Whiting	OASI@Newbourne Beginners and new members welcome Sky Notes & talk

OASI @ Orwell Park

There are regular meetings every Wednesday evening from 8pm. Access is controlled by a gate and a fob. The entrance is gate 2 is on Church Road, What3Words is **tour.fuse.banks**

Access into the School Grounds and Observatory Tower

The route is as follows:

• Enter through gate 2 (gate 1 being the main gate) and park inside as per the attached map.

• Enter the school through the double black doors as indicated on the map. A key fob will be required to open the door.

• Continue straight through the next two sets of double doors.

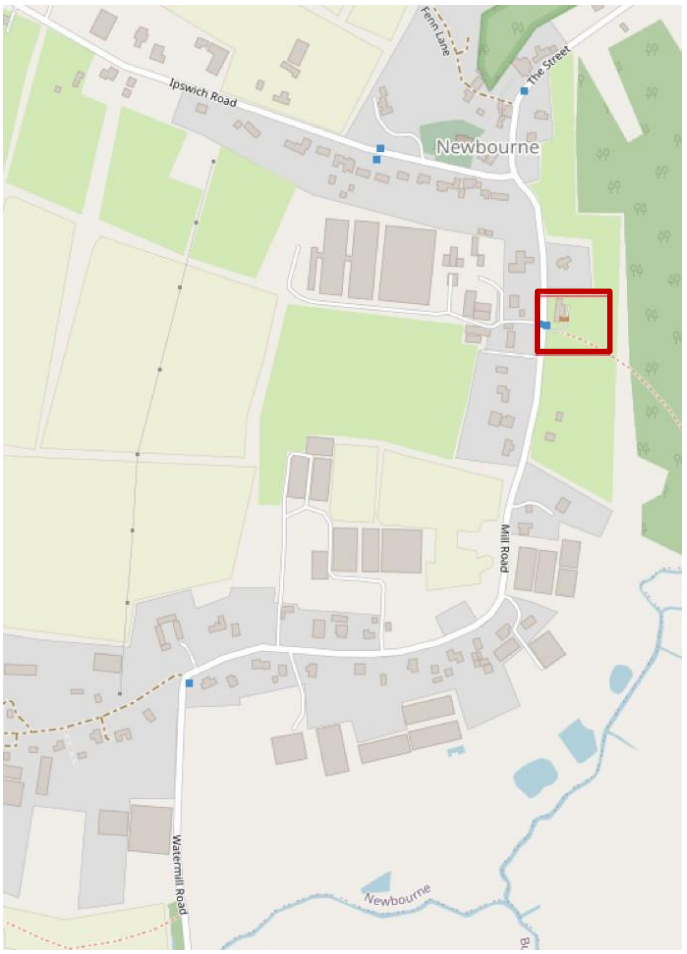
• Turn left at the end of the short corridor then immediately right.

• Pass through the single door and on your left you will find the staircase leading to the observatory.

• <u>On no account must you deviate from this route</u>.

When leaving the observatory use the same route but in reverse. Please keep noise to a minimum as there are staff quarters nearby.

OASI @ Newbourne



newbourne@oasi.org.uk

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

What3Words **scars.atlas.printing**

Visitors are welcome but we do ask you to join the Society after two visits.

http://www.oasi.org.uk/OASI/Membership.php

Newbourne dates for 2024		
March	11	25 (A/S)
April	01#	22 (S)
May	06#	27 (A/S)
June	10	24 (S)
July	08	22 (A/S)
August	12	26 (S)
September	09	23 (A/S)
October	14	28 (S)
November	11	25 (A/S)
December	09 (Q)	

We open up for all meetings at 7:30pm.

Astro News (A) / Star Guide (S) at 7:45pm followed by any Talks (T), Workshops (W) and occasional Quiz (Q).

# indicates a change to the normal monthly pattern.

Forthcoming Outreach Programmes 2024

All members are welcome to come along and help out at these events – you don't need to be an expert in the subject. Just respond to the email call for help prior to the event.

Please note that not all events are open to the public.

Sat March 23rd	***Star Party at Cedarwood Primary School**, Kesgrave* *Setup at 18:00*
Sunday Jun 16th	*Solar Party at **ESWR Radio Rally**, Kirton Sports Ground*
Sunday Aug 25th	*Solar Party at **Bawdsey Radar Museum**, Bawdsey* *Setup 10:00*

OASI and BAA Events

For the latest event details, please check are website and social media.

BAA news & webinars

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

Wednesday 27th Mar 2024 17:30-20:00 BAA Meeting
Venue: INSTITUTE OF PHYSICS, 37 Caledonian Road, London, N1 9BU

Friday-Sunday 12-14th Apr BAA Winchester Weekend
Venue: Sparsholt College, Winchester

Saturday 11th 2024 May BAA Spring Meeting, Greenock

Saturday 18th May 2024 10:00-17:00 Historic Section Meeting, Ipswich
Venue: Museum Street Methodist Church, Ipswich (tbc)

Wednesday 5th June 2024 17:30-20:00 BAA Meeting & George Alcock Lecture
Venue: INSTITUTE OF PHYSICS, 37 Caledonian Road, London, N1 9BU

September (dates tba) BAA Autumn Meeting
Venue: Rutherford Appleton Laboratory

Wednesday 30th October 2024 17:30-20:00 BAA Meeting & AGM
Venue: INSTITUTE OF PHYSICS, 37 Caledonian Road, London, N1 9BU

The BAA Radio Astronomy Section

The BAA Radio Astronomy Section have been enjoying talks, seminars and tutorials via Zoom and these are available on the BAA YouTube channel https://www.youtube.com/user/britishastronomical/playlists.

Answer to January / February maths teaser:

O	18	14	K	16	12
8	T	12	8	8	U

1260 1664 ?

The letters are in reverse Caesar. A=26, Z=1

O=12, T=7, K=16, U=6

Add the first vertical line. 12+8 =20. Multiply the second 18*7 = 126. Multiply both answers together = 126*20 =2520 /2 = 1260. Other two sets the same. Therefore? = 864

Here is problem that is slightly more convoluted than normal.

Generation Z would have no problems with this?

5 rows of letters and numbers. Change the letters into numbers to solve? situated at the middle of the block.

3	C	12	16	4
7	41	26	8	B
4	18	?	16	C
N	21	34	23	8
4	F	13	27	9

The Night Sky in March 2024

All event times are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E. Times are **GMT** unless otherwise stated.

Sun, Moon and planets

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

March 2024

Object	Date	Rise	Set	Mag.	Notes
Sun☉	1	06:40	17:36		
	31	05:31	18:28		
Moon ☽	1	-	08:19		Last Quarter: 03 March 15:24 New Moon: 10 March 09:01 Perigee: 10 March 07:05 First Quarter: 17 March 04:11 Apogee: 23 March 15:46 Full Moon: 25 March 07:00
	31	00:59	07:38		
Mercury ☿	1	06:59	17:35	-1.6	
	31	05:43	20:02	1.2	
Venus ♀	1	06:03	15:05	-3.8	
	31	05:17	16:39	-3.8	
Mars ♂	1	05:57	14:41	1.3	
	31	04:47	14:58	1.2	
Jupiter ♃	1	08:36	23:06	-2	
	31	06:50	21:42	-1.9	
Saturn ♄	1	06:53	17:13	1	
	31	05:02	15:36	1.1	
Uranus ♅	1	08:50	23:55	5.8	
	31	06:55	22:04	5.8	
Neptune ♆	1	07:19	18:51	8	
	31	05:22	16:59	8	

Occultations during March 2024

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 March 2024

No meteor visible showers from UK.

Shower	Normal limits	Maximum	ZHR at Max	Notes
γ-Normid	25/02/24 – 28/03/24	14/03/24	6	Below horizon, but a stray may be visible just before sunrise

See also https://www.rmg.co.uk/stories/topics/meteor-shower-guide

For radio observation, use reflections from Graves Radar on 143.049MHz or the Brams transmitter in Belgium on 49.97MHz and UK GB3MBA on 50.408MHz https://www.ukmeteorbeacon.org/Home

See also https://www.popastro.com/main_spa1/meteor/radio-meteor-observing-2020/.

Comets

Source : https://heavens-above.com/Comets.aspx on 23/01/24.

Comet	Brightness	Date of last reported observation	Angular separation from Sun	Constellation
12P Pons-Brooks	7.1	2024-Feb-24	47°	Andromeda
62P Tsuchinshan	8.8	2024-Feb-21	149°	Virgo
C/2021 S3 PANSTARRS	10.5	2024-Feb-20	67°	Ophiuchus
144P Kushida	10.7	2024-Feb-18	104°	Taurus

Visible ISS passes >30º max altitude for March 2024

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

Times are **GMT**.
Predictions are approximate (25/2/24) 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-Mar	-3.3	04:21:42	59°	ESE	04:21:42	59°	ESE	04:24:31	10°	E
01-Mar	-3.1	05:54:37	11°	W	05:57:46	42°	SSW	06:00:59	10°	SE
02-Mar	-3.5	05:08:28	31°	W	05:09:47	54°	SSW	05:13:06	10°	ESE
03-Mar	-3.3	04:22:19	53°	SE	04:22:19	53°	SE	04:25:05	10°	ESE
04-Mar	-2.8	05:09:06	26°	WSW	05:10:08	32°	SSW	05:13:10	10°	SE

05-Mar	-2.6	04:22:59	33°	SSE	04:22:59	33°	SSE	04:25:14	10°	SE
16-Mar	-2.9	20:13:03	10°	WSW	20:15:27	40°	SW	20:15:27	40°	SW
17-Mar	-3.3	19:24:20	10°	SW	19:27:32	42°	SSE	19:28:51	27°	ESE
18-Mar	-2.8	18:35:41	10°	SW	18:38:41	31°	SSE	18:41:42	10°	E
18-Mar	-3.8	20:11:49	10°	WSW	20:14:58	74°	SW	20:14:58	74°	SW
19-Mar	-3.8	19:22:51	10°	WSW	19:26:10	67°	SSE	19:28:05	23°	E
20-Mar	-4	20:10:25	10°	W	20:13:47	87°	S	20:13:56	81°	ESE
21-Mar	-3.8	19:21:19	10°	W	19:24:41	84°	S	19:26:50	20°	E
22-Mar	-3.9	20:08:50	10°	W	20:12:11	77°	S	20:12:30	68°	SE
23-Mar	-3.8	19:19:38	10°	W	19:22:59	85°	S	19:25:15	19°	E
24-Mar	-3.5	20:07:02	10°	W	20:10:19	55°	SSW	20:10:48	48°	SSE
25-Mar	-3.7	19:17:42	10°	W	19:21:01	69°	SSW	19:23:28	17°	ESE
26-Mar	-2.6	20:05:05	10°	W	20:08:08	33°	SSW	20:08:57	28°	S
27-Mar	-3	19:15:34	10°	W	19:18:47	45°	SSW	19:21:34	13°	SE

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

Aurora Expedition, 19-22 Jan 2024

Helligskogen – 69° 12’ N 20° 43’ E

Paul Whiting

When booking this expedition, I relied on the fact that nothing would have changed since I last visited Tromsø exactly 2 years to the day, before. I even checked that the flights, hotel, and aurora tour company were all still in business. What I did not allow for was the change to the flight times. For over 10 years (even both sides of Covid), the flight times had not changed by more than a few minutes – early evening arrival in Tromsø and mid-morning departure. This time I found out AFTER booking that the new arrival time was just before midnight and departure was 6am.

Apart from being very anti-social, it also meant that there would not be any bus service between the airport and the hotel, leading to a huge, out-of-hours taxi fare – twice: there and back - if indeed there were any taxis to be had in the wee hours at the airport. I had visions of being stood alone at the taxi rank in the cold, cold snow – and this vision haunted me constantly after booking.

However, a week before travel I checked the airport bus timetable on line, and it had been updated. There was now a special bus, Fridays only, to meet this new later flight time. Bravo for Norwegian transport infrastructure. There was also an early bus on Mondays to meet the early return flight. Great I thought.

To ensure I was not held up at the airport awaiting the carousel of doomed luggage, I managed to cram everything into a carry-on sized bag. This should ensure I get the bus. To add to the good fortune, the flight landed 10 minutes early.

However, fate was not going to let me get away so easily. Having allowed for the luggage, I did not allow for the full flight trying to get through the single passport officer. Forty-five minutes, of the thirty I had in hand, were used up waiting for my passport stamp. Result: I missed the bus. Funnily enough most of the rest of the passengers had transport waiting for them of one kind or another. So, I was left all alone in the cold, cold snow waiting for a taxi, just as I had predicted. Luckily, I only had to wait 15 minutes or so before a taxi pulled up. And it was only £30 for the 10-mile ride – not bad for 1am on a Saturday morning in Norway!

During the flight we saw a rather nice auroral display out of the airplane window. It showed the classic progression from horizontal bar to a more excited crenelated form.

So, when safely in bed, I actually managed a small laugh!

The aurora safari started at 18:45 on the Saturday, just as the snow storm started. However, this is normal. The minibus will travel up to 150km to find clear sky. In this case we did travel for over 2 hours to a camp site at Helligskogen (“The Sacred Forest”), some 142km south-east of Tromsø.

Minus 17°C, 80cm standing snow but a cloudy sky with some breaks. As luck would have it, early in the session an active auroral display appeared virtually overhead, that was partially visible through a break in the cloud cover. Typically, the other side of the sky, where the Moon and Jupiter shone clearly, was totally devoid of cloud. Figures 1 and 2 demonstrate the sort view we had.

Unfortunately, that was it for the evening. Despite the cloud mostly clearing, the aurora did not play ball. Perhaps this was a blessing, as my fingers and the camera battery were suffering badly from the cold. In fact, both stopped functioning properly towards the end of the evening. Luckily the Company had built a nice camp fire, with picnic

tables and chairs around, with reindeer skins to sit on. Finally, they broke out the coffee, hot chocolate and the lefse, the Norwegian brown cheese and cinnamon butter wrap. Sounds dodgy, tastes wonderful.

Figures 2 & 2: Aurora seen through a window in the clouds.

Sunday 21st January was literally Sun Day. The first re-appearance of the Sun for 2 months. Because of the mountains on the mainland blocking view to the south-east, I did not actually see the sunrise, but I did see the reflection in some of the taller buildings on top of the mountains.

Now to travel back home. What is this Storm Isha I keep hearing about?

Figure 3: The Campsite

Basic Insight into Compton Scatter Polarimetry.

A preface to the following article.

The Compton effect is the scattering of a polarised photon off a polarised electron, and was discovered by Arthur Holly Compton, an American physicist, in 1923, for which he received a Nobel prize in 1927. It is one of the building blocks of understanding wave – particle duality and validates the particle nature of electromagnetic radiation and is therefore very useful to measure such quantities as the polarization of an electron beam. This can give particular data about electron momentum allocation of target material electrons and therefore their electronic attributes. The Compton polarimeter can be considered to be either single phase (identical medium used for scattering and absorption detectors) or dual-phase.(dissimilar materials). Using this tool in astrophysics allows data to be obtained that would not normally be generated using other methods.

Large Area gamma-ray burst Polarimeter (LEAP)

Short article from the library by Andy Willshere.

LEAP is designed to function as a Compton scatter polarimeter and is the fourth and last of NASA's mission proposals for their explorer programme, which has been developed to untangle how the structure of astrophysical jets and black holes and their progression occurs, from the physics oriented standpoint. The way that LEAP will execute this is by observing and concentrating on gamma-ray bursts (GRB), in order to study polarization. These bursts are the most energetic detonations in the universe, which, when either the core of a massive star collapses, or two neutron stars collide, produce intense relativistic jets of ejected medium. These jets are generally detected along an accretion disk's rotation axis. Ultra-relativistic jets can also be used to evaluate sciences' conceptual grasp of the characteristics of space-time surrounding black holes. At this point LEAP comes to the fore, as it is fully capable of measuring the polarization of the GRB radiation.

LEAP can infer five significant science objectives that can complement the primary science aim. The first four of these examine the basic physics principles of GRB jets:

i. How are the magnetic fields of jets constructed?
ii. What is the composition of the jets?
iii. Establish how jet energy dispersal occurs.
iv. What system is used in order to provide for an instant emission?

The fifth of these scientific objectives is for LEAP to respond swiftly to each GRB so that it is able to conduct follow up surveillance in alternative wavelengths. This will provide the scientific community with up to date LEAP data.

LEAP will be able to differentiate between three different models for GRB's. The first of these is a synchrotron emission model where the magnetic fields are placed in order, the second, similar to the first model except with random emission fields and the third, utilises Compton Drag emission with again random magnetic fields. This baseline research project needs the observation of 65 GRB's and a sensitivity of 30% minimum detectable polarisation (MDP). These models are classed as the SO, SR and finally the CD respectively. It is designed as a Compton wide field of view polarimeter with the ability to investigate GRB polarization in the 50 – 500keV energy scale, as well as being capable of concurrently measuring GRB spectra in the 20keV – 5MeV energy range. At the point when LEAP perceives the existence of a momentary event it will switch into its transient mode and will proceed to record all essential data. The Instrument Operations Centre situated at the University of Alabama is

tasked with keeping the data analysis software updated and disseminating GRB data swiftly to the scientific society. The downlink provided by the International Space Station (ISS) is ideal for the rapid dissemination of the GRB alert. All LEAP data are housed at the astrophysics archive research centre NASA and are available to scientists. The mission length will be three years, which is enough time to attain the baseline science goals.

The ISS will be used to house LEAP, providing a stable base from which to work as well as utilising the well tried and tested capabilities of the space station. The polarimeter can be housed on any of the external structures provided by the ISS as long as there is an unobstructed view towards the zenith. Because radiation effects may occur from ISS components, passive shielding will be used to decrease this effect. LEAP's payload comprises seven identical autonomous polarimeter units as well as a central electronics module and a data processing unit. These are coupled to a star tracker system and a GPS receiver. Each polarimeter contains an array of 144 self-governing detector elements and the circuitry to provide a high voltage that is used to allow processing of the analogue signals and create digital event data. The arrangement of these detector elements provides for the utilisation of the largest productive area and polarization response.

LEAP will have all of its instruments calibrated at pre-flight and will be assessed by four evaluation algorithms during flight, one of which is to localise a gamma –ray burst. This will allow the data to be analysed to indicate if the correct response by LEAP is being executed.

It is hoped that LEAP will be positioned in 2025 as an external payload of the ISS, prior to proceeding on its three year mission, during which it will act as a responsive monitor for short GRB's and due to its positioning near solar maximum, provide useful data from solar flares.

References:

The LargE Area Burst Polarimeter (LEAP) a NASA Mission of Opportunity for the ISS (unlv.edu)

The LargE Area burst Polarimeter (LEAP) a NASA mission of opportunity for the ISS (spiedigitallibrary.org)

LEAP — A Large Area Gamma-Ray Burst Polarimeter for the ISS - NASA/ADS (harvard.edu)

LEAP Mission Study - STI (usra.edu)

Transient_Science_with_LEAP.pdf

The Large Area Burst Polarimeter (LEAP) Prototype Detector · Vol. 54, Issue 6 (AAS240 Abstracts)

Arthur Compton - Wikipedia

The Operations manual for Compton Polarimeter (jlab.org)

[2301.09934] Compton Polarimetry (arxiv.org)

Member's Observations

The Sun - Martin Cook

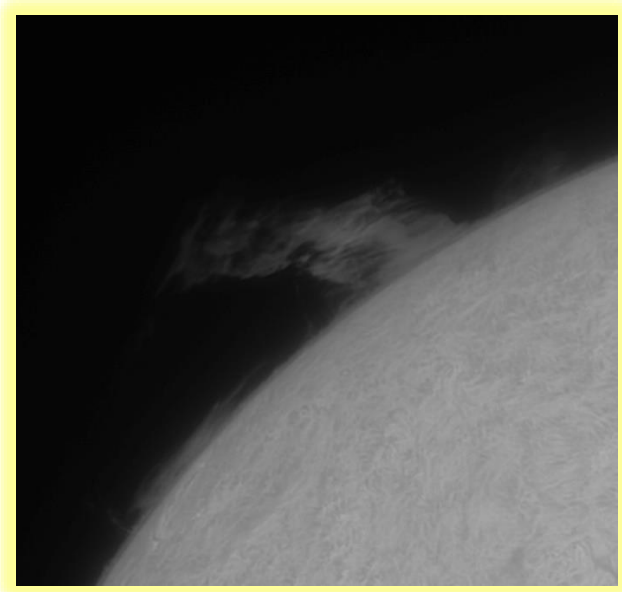
The Sun on 12/02/2024 at 13:15UT in H-Alpha

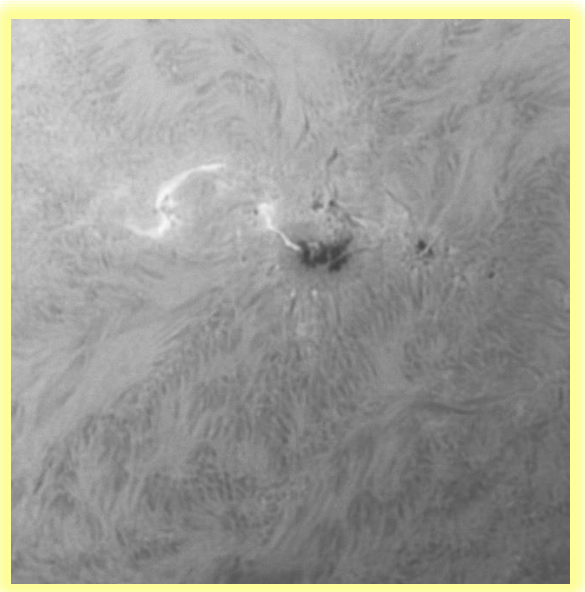
Lunt LS60THa/B1200 telescope and Zwo 178MM camera.

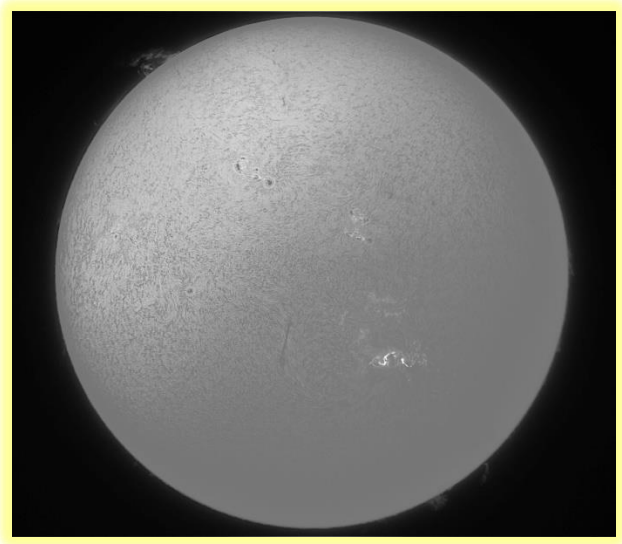
Had to wait for the low clouds to drift past, but worth the wait.

The enlarged images of the sunspots, prominences and filaments was taken using a 2.5x Barlow lens.

I think this is the largest prominence I have ever seen.







Peregrine (Part 2) - Nigel Evans

Jan 10th

So I recorded the Centaur stage of Peregrine. Why did I not record Peregrine, albeit in a different part of the sky? I was looking at yesterday's position!

Next few days were cloudy as Peregrine passed though apogee.

Jan 14th

Two targets tonight – Peregrine and the larger, brighter Centaur stage. I use two sources of Predictions: JPLHorizons and ProjectPluto.com. Some objects are available in both, such as interplanetary probes.

I followed the JPLHorizons ephemeris, for no particular reason. As the probe is quite faint I have to stack the images on the predicted motion, yet I could find nothing. I casually looked at the ProjectPluto ephemeris and found quite a difference between the two:

- 2024-Jan-14 23:00, 06 49 14.08 +28 10 19.1 JPL
- 2024 01 14 23:00 0 06 49 36.7 +27 49 43 ProjectPluto

There is a difference of 22.1 seconds in RA and 20.75 minutes in Declination. As I was centred on the JPL position, the declination shift put the ProjectPluto position outside my Field-of-View!

But the Centaur was only available through ProjectPluto and was seen. **240114 Centaur NSE.jpg**

Jan 15th

While JPLHorizon prediction lacked a certain something, I did not know that the ProjectPluto position was right. As the spacecraft has been venting propellant its actual trajectory and predictions for it may not be in agreement.

Tonight I will point at the mid-point

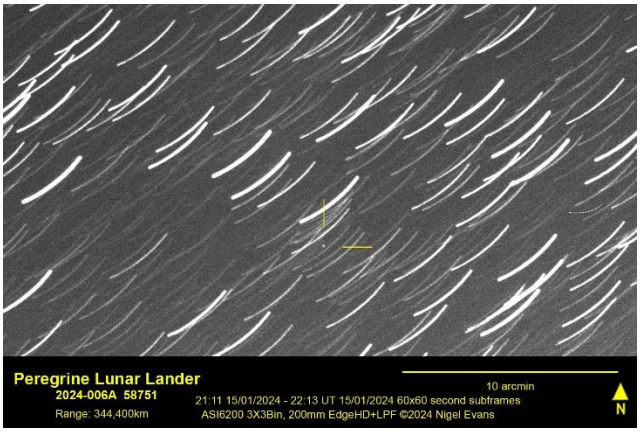
2024-Jan-15 23:00 07 00 14.19, +28 22 54.6 JPL

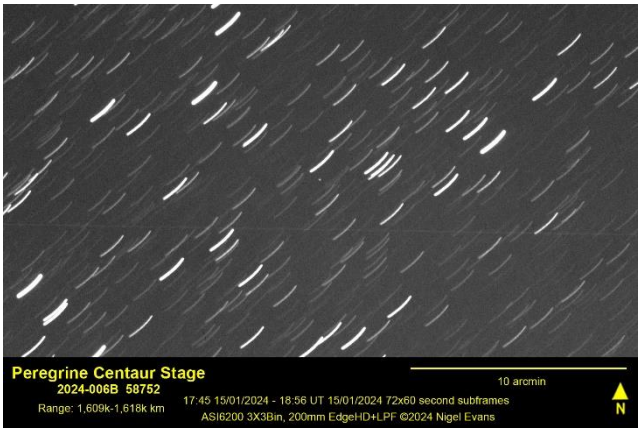
2024 01 15 23:00 07 00 19.8 +27 58 12 ProjectPluto

So, an error 5.6 seconds in RA and 35.3 minutes in Dec.

The spacecraft was located an few arc seconds from the ProjectPluto Predictions (hard to be definite as I can't see it in a single frame) **240115 Peregrine NSE.jpg**

Centaur was also seen **240115 Centaur NSE.jpg**

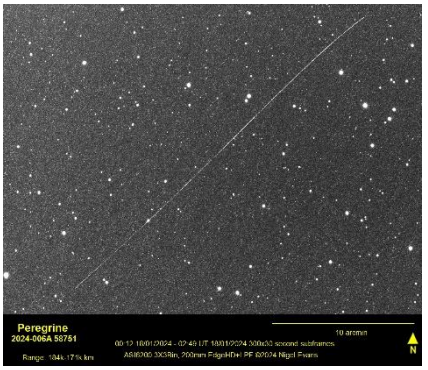




Jan 16th

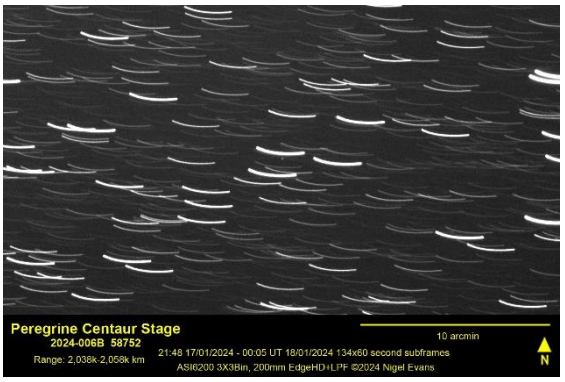
Peregrine is now falling towards the Earth, with re-entry at around 21:00 UT on Jan 18th over the Pacific. The looping action seen in the sky is due to the rotation of the Earth. Both Peregrine and Centaur seen. **240116 Centaur NSE.jpg**

Jan 17th



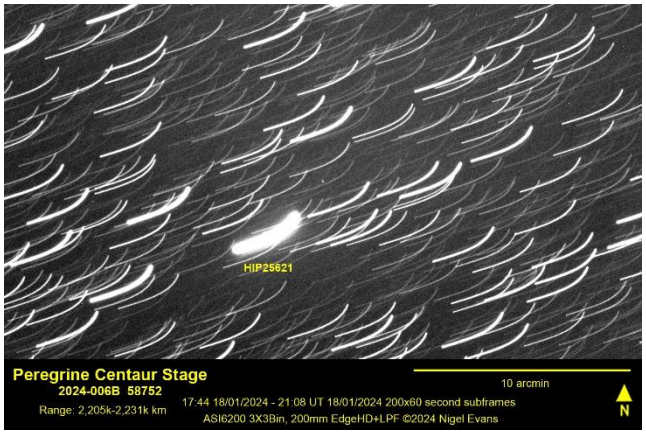
This is the last night to see Peregrine from the UK. At Jan 18 0:00UT Peregrine is moving around 6 arc seconds per minute, but by 4:00UT will be moving at over 20 arc seconds per minute. I elected to use 30 second exposures. There is some degree of brightness variation as Peregrine plunges earthwards. In the final part of the video Peregrine becomes dash-like, due to its motion within the 30 second exposure. **240117 Peregrine.jpg**

The Centaur continues to move further away, now some 2 million km distant. **240117 Centaur NSE.jpg**



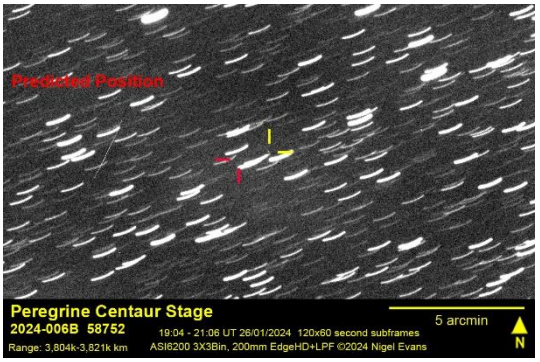
Jan 18th and 19th

By 21:00 UT, Peregrine had splashed down in the Pacific. The Centaur however, remained visible as below.



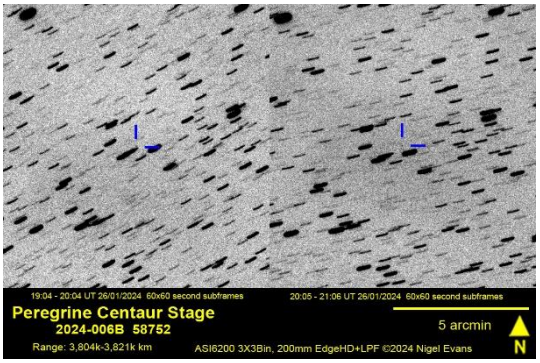
26 January

During the early part of the night, the sky was clear and the almost-full Moon had not yet reached a troublesomely high altitude. I made one last, mad attempt to photograph the *Centaur* stage even though, by now, it was 3.8m km distant and *circa* magnitude 19.



I left the camera running for three hours, terminating the run when the telescope reached the meridian; by that time I would either have captured the *Centaur* or not, and there was no point in taking further images.

On initial processing of the images, the limiting magnitude appeared to be short of what was required, and I was pessimistic about detecting the *Centaur*. Conscious that such a faint object could be lost in the glare of a star, and that a hot pixel could masquerade as the object, I compiled a stack of all available images and also several partial stacks, revealing changes in the field of view over time.



The below video shows a stationary object, initially lost in the glare of a star, that becomes visible approximately half-way through. I believe that the object is the *Centaur*. Originally, the video also showed several random hot pixels masquerading as the *Centaur* - I tracked them down to the individual frames in which they appeared, and removed them. (I left the passing "space-worm" on the LHS in peace. Genus: *pixeles calientes*.)

Newbourne 12th February

It was a clear night for observing at the Newbourne session, so we got out the Millenium scope to look at M42 in Orion. Having previously spent some time commuting to Sheffield I keep thinking its M62! We also viewed the M41 open cluster near Sirius. Andy was demonstrating the live stacking feature of a new telescope.