Journal

of the

Nottingham Astronomical Society

March 2023

In this issue

Thursday, March 2nd

Nottingham Emmanuel School
Gresham Park Road,
West Bridgford,
Nottingham, NG2 7YF

7:45pm (doors open at 7:15pm)

This evening we welcome

Prof Frazer Pearce
University of Nottingham

who will be speaking on

'Adventures in the Goldilocks Zone '

Chairman's Message, March 2023

Hello everyone,

I hope you are all well, have watched the great show that Jupiter and Venus, and the Moon have been putting on recently. Lots going on in astronomy right now. Apart from the conjunction, we have had incoming meteorites tracked, photographed and collected, seen new ideas on dark energy, and some galaxies that appear to be too big and too early!
The track to the observatory is slowly drying out, and may be useable in a few weeks. We have plans to try again to make a lasting roadway - this time perhaps using hard core. When we have the details, we may be looking for volunteers to help move material around.
Keep looking up!

Julian,
NAS chair

Sky Notes
March 2023

Compiled by Roy Gretton

All times given below are in Universal Time unless otherwise stated

The Northward Equinox (Spring Equinox in the Northern Hemisphere) will occur at 9:24pm on March 20th.

British Summer Time begins on March 26th. Clocks should be advanced by one hour at 1 am on that date.

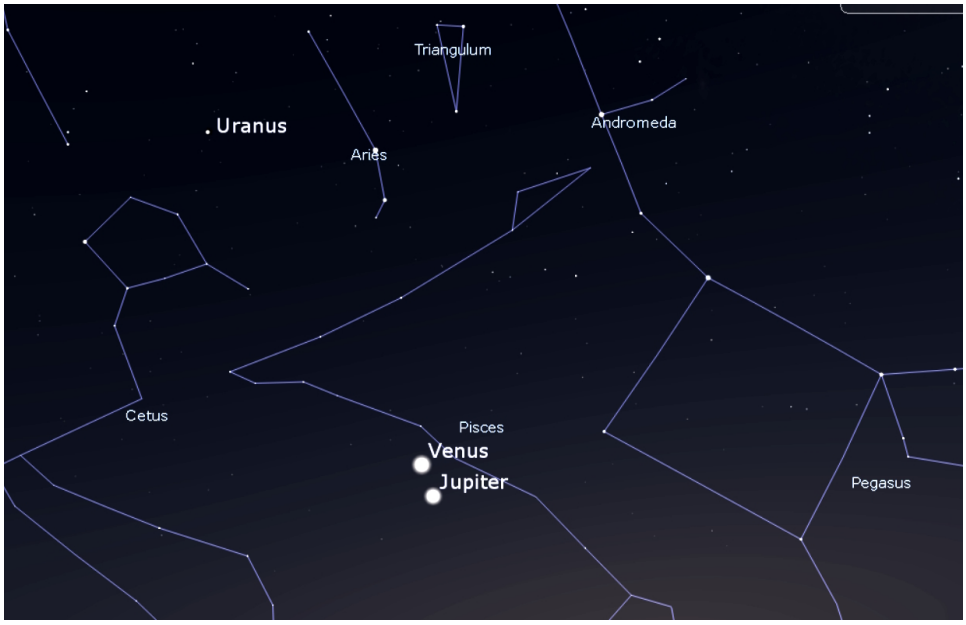
PHASES OF THE MOON

Phase	***Date***
Full Moon	March 7th
Last Quarter	March 15th
New Moon	March 21st
First Quarter	March 29th

This month the Moon is closest to Earth on the 19th, and furthest on the 3rd.

THE PLANETS

As March begins, the main spectacle in the evening sky will be the **close approach of Venus and Jupiter**, as the inner planet passes to the north of the gas giant (after a beautiful crescent Moon had passed by the pair on February 23rd). When the Moon next passes between them (on March 23rd) Jupiter will be fast disappearing into the sunset, while Venus will be getting more and more prominent on these spring evenings.



Looking west at 7 pm on March 4th

Mercury is unobservable this month.

Venus is an evening object, setting at 9 pm in mid-March. Before the month closes it will have brightened to magnitude -4, and will be 18 degrees north of the celestial equator in the constellation of Aries.

Around mid-March **Mars** reaches its most northly point, with a declination of just over +25.5 degrees. Unlike the other superior planets, Mars takes almost a whole year to reach solar conjunction after being at opposition, and during this long period of decline it will be diminishing in both angular size and brightness. By the end of this month it will have shrunk to a mere 6.5 arcseconds across, little more than a third of the angular diameter it achieved in early December.

Jupiter will be setting before 8 pm in mid-March, and before the close of the month it will have disappeared into the sunset glow as it heads toward conjunction on April 11th.

Saturn must be regarded as unobservable this month, having passed through solar conjunction on February 16th.

Uranus is an evening object in the constellation of Aries, setting at 11 pm in mid-March.

Neptune is unobservable this month.

METEORS

There are no notable meteor showers in March.

The Nottingham Astronomical Society: E - SERVICES

Whether or not you are a NAS member, you can keep up to date with details of the Society's meetings and other events by visiting the NAS website: www.nottinghamastro.org.uk

NAS on Facebook
You are welcome to connect with other members and friends of the NAS on Facebook by going to: http://www.facebook.com/nas.org.uk

NAS on Twitter
The Society has a Twitter account at https://twitter.com/NottinghamAstro

NAS Journal e-mailing list
To register for your monthly e-mailed link to the NAS Journal, and a copy of our SkyNotes, just e-mail secretary@nottinghamastro.org.uk

You don't have to be a Society member to take advantage of this service.
If you happen to change your email address, please remember to inform the Society by emailing us at treasurer@nottinghamastro.org.uk

DIARY DATES 2023

Monthly Meetings of the Nottingham Astronomical Society

1. Meetings at
Nottingham Emmanuel School
Gresham Park Road,
West Bridgford,
Nottingham, NG2 7YF

Held on the **FIRST Thursday** of each month **(unless otherwise stated)**
except **August**

Doors open at 7:15pm for 7:45pm start.

*These events are normally centred around a talk by a visiting speaker, except Quiz Nights, etc, when NAS members provide the activities. Normally we have a **Helpdesk** open at each meeting.*

Date	Topic	Speaker
March 2nd	**'Adventures in the Goldilocks Zone'**	**Prof Frazer Pearce** University of Nottingham
****March 30th**	**' How Stars affect planets, from Mars to Exoplanets, and into the Future'**	**Dr SimonJoyce** University of Leicester
May 4th	**Cosmic Rays**	**James Miller**
***June 8th**	**Space Debris and Astronomy**	**Prof Don Pollacco** University of Warwick

Note unusual dates: *second Thursday of the month
**** fifth Thursday of the month (no meeting in April)**

2. Social and Practical Astronomy Meetings at the Burnside Memorial Hall, Plumtree

Church Hill, Plumtree, Nottingham, NG12 5ND
Held on the **THIRD Thursday** of each month from **7:30pm**

These meetings are of a more informal nature, providing opportunity for members and guests to share their hobby over a cup of tea or coffee, as well as listening to a short talk or discussion

The next meeting will be on March 16th

Social and Practical Astronomy, Plumtree, February 2023

The February Plumtree meeting was prepared and delivered by Leigh Blake and a talk on cameras for astrophotography. The talk had been requested by Roy who is looking to potentially get a new camera. Leigh will be providing a brief summary and sharing the links within his talk. Chris made a lovely cake which didn't last very long and attendance at the

meeting was one of the best we've had.
The new portable speaker and headset worked a treat and a good night was had by all. The topic for the March meeting is yet to be decided and we will email the details nearer the time.

James Dawson
Observatory Director
observatory@nottinghamastro.org.uk

Observatory Update

Discussions are still on-going with Severn Trent about our track and how we can make it useable all year round, even during the wettest of times. We are still not using the track and as such the observatory remains closed for the time being.

Richard and Fred did some surveying to help with the track way discussions and planning and I am most grateful to them both for this.

Simon the farmer has very kindly cut the hedges at the site and they are looking very neat and tidy.
The usual helpers at the observatory have also been having a bit of a spring clean inside and out.
Thanks also to Brian Griffin for helping us work out where the ducts are outside with wires to the outside piers. More on this another time.

James Dawson
Observatory Director
observatory@nottinghamastro.org.uk

SATELLITES PHOTO-BOMBING OUR IMAGES

On 5th January this year the Guardian newspaper carried an article headed, “Light pollution from satellites is becoming an existential threat to astronomy".

While I wouldn’t pretend that the problem of satellite trails is currently anything like as serious for amateur astronomy as pollution from ground-based artificial lighting, it is a threat that is taken very seriously by professional astronomers. The Starlink fleet now has over 3,000 satellites in orbit, and SpaceX has approval for another 12,000 of these, and wants a further 30,000 next-generation satellites covering the entire globe. In addition, Russia and China apparently want to be in on the act with their own fleets of satellites. Fred Watson, an Australian astronomer, told the Astronomical Society of Victoria that the number of satellites could be heading for **100,000** by the end of this decade.

The time might not be very far away when, in order to obtain satellite-free images, we shall have to confine our imaging to the hours around midnight in the depths of winter, when all low-orbit satellites will be in the Earth’s shadow as they pass over the UK. It would be helpful if they could be coated in a matt black layer, but they all need solar panels to power them, and I don’t know how feasible it would be to make these less reflective.

At 19:40 on January 30th this year I was imaging M82 using single exposures of under two minutes, and happened to record a satellite trail cutting across the galaxy on one of them (see below). I guess I should have deferred the exercise until nearer to midnight, when the satellites would have been in shadow, but it was already clouding over before then.

Cropped image showing satellite trail through M82.
Exposure time 1min 49sec at ISO 1600.
Canon 450D camera at f/6.3 focus of Celestron C11

Thinking back to 19th August 2014, I was imaging M13 at 21:51UT when this object cut through the cluster. From its precise track and the timing I was able to identify it as a Russian Cosmos satellite.

By coincidence, earlier the same evening I was imaging M27 when another satellite crossed the field:

I didn't identify this one.

Walter Baade is on record as calling asteroids "the vermin of the skies", although he might not have been the first astronomer to use that term. One can only imagine what he would call artificial satellites if he were alive today.

Roy Gretton

NEW IMAGES ACQUIRED BY LEIGH BLAKE

using a 100mm refractor

1. M33

M33 is also commonly known as the Triangulum Galaxy, is the third-largest member of the Local Group of galaxies, both the Andromeda Galaxy and the Milky Way being larger. Triangulum may be home to 40 billion stars, compared to 400 billion for the Milky Way, and 1 trillion stars for Andromeda Galaxy.

2. The Rosette Nebula

Located off the left shoulder of Orion, the Rosette Nebula (also known as Caldwell 49) is an H II region located near one end of a giant molecular cloud in the Monoceros region of the Milky Way Galaxy. The open cluster within, NGC 2244 (Caldwell 50) is closely associated with the nebulosity, the stars of the cluster having been formed from the nebula's matter. A survey of the nebula with the Chandra X-ray Observatory has revealed the presence of numerous new-born stars inside optical Rosette Nebula and studded within a dense molecular cloud.

Some extra information relating to the talk given at the January Plumtree Meeting

Korean Airlines Flight 007 (August 31st – September 1st 1983)

Flight 007 was a regular overnight 747-230 flight between New York and Seoul operated by Korean Airlines with a technical & crew change stop in Anchorage, Alaska. The planned route took the aircraft initially westwards towards a radio beacon at Bethel in west Alaska at the head of Airway R-20 (a popular route for US-Far East flights) which goes down the eastern seaboard of Russia towards Tokyo before turning right for South Korea and Seoul. There were no navigational devices after Bethel till Japan. All that the aircrew had for positional fixes was the three inertial navigation systems on the aircraft, which should have been aligned and in sync.

What is known is that it flew to the north of Bethel, where it should have made a small course adjustment left to enter the R-20 airway. It continued straight on, passing the beacon to its left and therefore was to the right (northern) side of the airway on a divergent course ending up on the Russian side of Sakhalin, an island inside Russian territorial waters, about 180 nautical miles west of where the crew were expected to be, some three and a half hours after take-off. At this point the crew had just asked Tokyo for permission to climb to a higher altitude for fuel economy purposes not knowing that the Russian fighter was just outside the cockpit window…

Before the aircraft first flew into Russian airspace over the Kamchatka peninsular the crew of 007 tried, and failed, to reach Anchorage by VHF to make a mandatory report relying on KAL 015, which left Anchorage some 15 minutes after 007, to relay the conversation at or near the edge of 007's transmitter's range. The crew made the next report direct to Anchorage by HF (a longer distance radio but with much reduced quality) which should have indicated to the aircrew that they should consider the fact that 'they had lost situational awareness' at a time when they probably could have avoided flying over Russian territory. The flight overflew Kamchatka and re-entered international airspace above the Sea of Oshkosh, a large inlet between Kamchatka and Sakhalin north of Japan, continuing onwards towards Seoul and going back into Russian airspace without consent to overfly Sakhalin island.

As to the possibility of KAL007 having suffered some form of external navigational 'bending' or jamming would have been discounted due to the traffic that was on the correct flight path at the time and there were no usable ground based aids to interfere with. As to the availability of civilian or US radar coverage, it was mainly military and sporadic (at best) once the flight had left Anchorage and the flight was not under positive ATC control therefore responsible for its own navigation until it entered Japanese airspace.
Korean Air Lines Flight 007 - Wikipedia

In the lecture I referred to the possibility that the Flight Engineer had entered an incorrect lat/long co-ordinate into the aircraft's inertial navigation system as the starting position which would have had the effect of placing its gate position some 300 miles to the east of Anchorage as an explanation for the somewhat unexpected ground track that was flown once all the available, albeit sparse, radar information was collected. It is, and still, is a theory which has a high certainty of creditability but does not explain why the aircrew failed to notice the error, or at least question the information being displayed once airborne, and missed the left turn at Bethel which they passed 12 miles north of and were able to receive the beacon.

It is assumed that the flight engineer, who's responsibility it was to pre-enter the start position and the first set of waypoints into each of the three INSs separately used the shortcut of transferring the data between the sets so all three agreed with each other.

However, there is the possibility that, like most airlines, Korean AL offered the captain, if not the other crew members, financial incentives to reduce fuel consumption which would have been a good reason to incentivise the flight to go over Russia cutting out a sizeable chunk of flight time. If various US radar operators, military and civilian, observed 007's divergence from the airway, they did not try to correct 007's heading in real time for whatever reason. I very much doubt that this flight was the first experience for either the captain or co-pilot of operating on this route in the stated roles.

As it is unlikely that the West will get to hear the full and unabridged version of what went on in Russia that night, but I suspect that their command authority would be rather irritated by the repeated incursions over their eastern seaboard (which Moscow was expected to tolerate) from western airliners and the USAF's incessant reconnaissance flights over the Sea of Oshkosh which is largely international waters (and airspace).

Black Boxes

In simple terms, a 'black' box is a container of electronic components that are present (typically on an aircraft) that serves a particular function which the crew interact with via controls and/or displays in another part of the aircraft.

These boxes, first used during World War II for the Government, were always finished with a standard black exterior coating from which their generic name derives through the colour is unlikely to be all black in modern times as manufacturers prefer to use corporate designs.

The modern popular usage of 'black box' meaning either the Flight Data Recorder or the Cockpit Voice Recorder, which are hunted for after an incident, and mostly coloured dayglo orange comes from media reports using 'geek speak' shortcuts concerning their status.

Neil Mudford

Advertisements

For Sale

Meade ETX90EC telescope with Autostar #497 hand controller

Meade 26mm and 15mm Superplossl lenses and Meade x2 Barlow lens

Meade #884 tripod (surface rust on exposed chrome parts of legs due to having been stored in an outhouse) with accessory tray and carrying bag.

£195

Contact **Richard Jackson 07954555945**

For Sale

Contact Mark Fairfax at fairf77@icloud.com or at NAS meetings

Telescope accessories:
All in excellent condition

- Celestron X-Cel LX 1.25” eyepieces

Fully multi-coated, wide 60-degree field of view, 6-element optical design, twist-up eyecups giving a generous 16mm eye-relief.

- 18mm £45 [new £89]
- 25mm £45 [new £89]

- Celestron Neximage 10 Solar System Colour Imager (model 93708) £140 [new £369]

Easy to use colour camera, provides live video for quick focusing - High performance CMOS imaging sensor with exceptional sensitivity and low noise, High frame rate, Hardware ROI (Region of Interest).

- Celestron deluxe tele-extender (model 93643) £25 [new £99]

Allows you to use an eyepiece for eyepiece projection photography with your 5 to 14-inch Celestron SCT, to take magnified images of the Solar System.

- Solomark 1.25” Moon & Skyglow filter ~ multi-band pass £5 [new £13]

Nottingham Astronomical Society

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Mark Fairfax

Meetings
Our formal meetings, often with an illustrated talk by a guest speaker, **normally** are held on the first Thursday of each month (except in August) at:

Nottingham Emmanuel School
Gresham Park Road,
West Bridgford,
Nottingham, NG2 7YF

Doors open	7:15pm
Meetings start	**7:45pm**
Meetings end	9:15 pm

These meetings are open to the public, and visitors are welcome to attend, subject to a charge of £3 per meeting for adults.

Annual subscriptions 2023

Full	£30
Joint rate for partners living at the same address	£45
Under-18s and full-time students	£5

Subscriptions become due on 1st January. Half-price subscription is charged if joining after 30th June (minimum subscription £5).

Please make cheques payable to:
Nottingham Astronomical Society.

If you would like more information about the **Nottingham Astronomical Society**, or would like to become a member, please contact the Secretary secretary@nottinghamastro.org.uk or speak to any NAS committee member at one of the regular monthly meetings.