CELEBRATING 40 YEARS 1978 - 2018

The Messenger

Mexborough & Swinton Astronomical Society June 2018

Aryabhata



Indian mathematician and astronomer who lived from 476AD to 550 AD, born in what is now the modern day city of Patna in the state of Bihar (Eastern India, on the Ganges river, famous for its rice!).

Aryabhata was one of the earliest proponents of a heliocentric system for the solar system – writing down his theories some 1,000 years before Copernicus did so in the western world.

Aryabhata correctly insisted that the earth rotates about its axis daily, and that the apparent movement of the stars is a relative motion caused by the rotation of the earth, contrary to the then-prevailing view, that the sky rotated. He writes in his major publication called, where he gives the number of rotations of the earth and equates what we see as the motion of the sky to a man in a boat;

"*In the same way that someone in a boat going forward sees an unmoving object going backward, so someone on the equator sees the unmoving stars going uniformly westward. The cause of rising and setting is that the sphere of the stars together with the planets apparently turns due west at the equator, constantly pushed by the cosmic wind*".

Aryabhata described a geocentric model of the solar system, in which the Sun and Moon are each carried by epicycles. They in turn revolve around the Earth. In this model, the motions of the planets are each governed by two epicycles, a smaller manda (slow) and a larger śīghra (fast). The order of the planets in terms of distance from earth is taken as: the Moon, Mercury, Venus, the Sun, Mars, Jupiter, Saturn, and the stars.

The positions and periods of the planets were calculated relative to uniformly moving points. In the case of Mercury and Venus, they move around the Earth at the same mean speed as the Sun. In the case of Mars, Jupiter, and Saturn, they move around the Earth at specific speeds, representing each planet's motion through the zodiac.

Solar and lunar eclipses were scientifically explained by Aryabhata. He states that the Moon and planets shine by reflected sunlight. He explains eclipses in terms of shadows cast by and falling on Earth. Thus, the lunar eclipse occurs when the moon enters into the Earth's shadow. He made measurements and calculations regarding the size and extent of the Earth's shadow and the size of the eclipsed part during an eclipse. Later Indian astronomers improved on the calculations, but Aryabhata's methods provided the core.

His calculations were so accurate that 18th-century scientist Guillaume Le Gentil, during a visit to Pondicherry, India, found the Indian computations of the duration of the lunar eclipse of 30 August 1765 to be short by 41 seconds, whereas his charts were long by 68 seconds.

India's first satellite Aryabhata and the lunar crater Aryabhata are named in his honour.

Guy Ronson

The Thoughts of Chairman Les



The past month has been very busy with a lot of work being done on Project Aquarius. The footings were dug by a digger and a dumper to get rid of the soil excavated. A couple of days later the concrete was poured and left to settle for a couple of days. The site has been surrounded by site fencing and signs displayed to give fair warning to anyone approaching site. The ordering of major materials is the next thing to be done and building can start as we have bricklayers standing by.

The coming of June will see the start of the excavating for the water supply working towards the waste tank being put in the ground, all this is one of the major tasks of the project and we are all hoping there are no technical hitches along the way.

The sketches at the back of our meeting room are being scrutinised and some new ideas are being put forward.

The forgoing is our priority but there are other things happening too such as the Solstice Dinner and a lot of other things to celebrate our 40th Anniversary.

As I have said there is a lot going on but we shouldn't forget to enjoy ourselves as well.

I wish you clear skies

Les Marsden FRAS, Chairman

Keep Your Eyes Open



Thursday June 14th **"Who Wants to be an Astronomaire"**

Roy will be looking for volunteers in the quiz based on the famous TV show.- Contestants will have three "lives" including "50/50", "Ask the Audience" and one for MSAS "Ask Les"!
(Astronomaire is a made up word!).



Thursday July 19th **"Solar Flares"**

Prof Philippa is Professor of Astrophyiscs at the Jodrell Bank Centre for Astrophysics at the University of Manchester, where she does a range of undergraduate and postgraduate teaching as well as research. Her research is into the interaction of plasma with magnetic fields in the atmosphere of the Sun, especially solar flares. She also has research interests in magnetically-confined fusion power.



Saturday August 18th – Society Visit to Oxford

This will include a guided tour by Dr Allan Chapman.

Mike Hall's June 2018 Skynopsis

Diary (all times BST).

1st	Sunrise 04.44 Sunset 21.23; Saturn 1.6° South of Moon at 1.00am
2nd	Moon at apogee 17.00
3rd	Mars 3° South of Moon 12.00
6th	Last Quarter Moon 19.00; Mercury in superior conjunction 02.00, Neptune 2° North of Moon
8th	Sunrise 04.39, Sunset 21.30;
10th	Uranus 5° North of Moon
12th	04.00 Iapetus at Western elongation (Mag. 10.1)
13th	New Moon 20.00
15th	Sunrise 04.37, Sunset 21.36; Moon at perigee 00.00; asteroid Amphitrite at opposition (Mag. +9.5)
16th	Venus 2° North of Moon 13.00; asteroid Métis at opposition (Mag. +9.7)
19th	Neptune stationary 12.00; Asteroid Vesta at opposition (Mag. +5.3)
20th	Moon at First Quarter 11.00
21st	Solstice 11.00
22nd	Sunrise 04.37, Sunset 21.38
23rd	Jupiter 4° South of Moon
27th	Saturn at opposition 13.00; Vesta 0.3° South of Moon
28th	Full Moon; Mars stationary 14.00; Saturn 1.8° South of Moon
29th	Sunrise 04.40; Sunset 21.37
30th.	Moon at apogee

The Solar System
Generally poor viewing this month

Venus	Bright, can be seen in gathering twilight but increasingly less observable toward month end
Mars	Rises around midnight reaching a maximum 16°. by dawn; not easy to spot with naked eye
Jupiter	Max elevation of 22° in the twilight, setting in the early hours. By month end will set by midnight
Saturn	In opposition, see above; Best viewed towards the end of the month but only reaching altitude 15°.
Uranus	In the morning in sky late in the month but too close to the Sun to observe in UK
Neptune	Visible before dawn in south-eastern sky

May's Messier Objects – A gallimaufry of Galaxies:
M63, M94 Just above Beta Canes Venatici
M11 (NGC 6705); lies in Scutum North-Easter quadrant, South of Beta Scutum
M13 in Hercules' right arm-pit
M85, 100, 91, 98, 56, 58, 59, 60, 86, 87, 84,88, 64
Low in South West corner of Coma Berenices

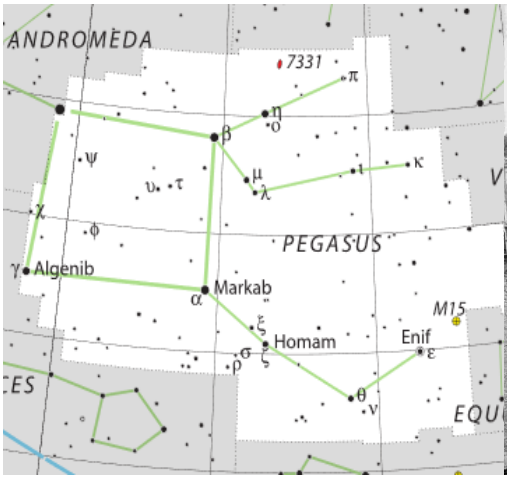
The Summer Solstice

In the Northern hemisphere is that point in time when the North Pole, rotational axis, of the Earth has its maximum tilt towards the Sun. This will occur at 11:07 am on Thursday June 21st this year
Sunrise will be at 4:36am and will set at 9:37pm. Technically we don't have any night – just astronomical twilight

PEGASUS

Pegasus is dominated by a roughly square asterism, “The Square of Pegasus” although one of the stars, Alpheratz or Sirrah, is officially considered to be Alpha Andromedae, part of Andromeda.
The “square” is considered to be the body of the horse, the star ζ Pegasi (Homam) ids considered to be the neck of the horse and ϵ Pegasi (Enif) is its nose!

M15 is a globular cluster of magnitude 6.4, 34,000 light-years from Earth.





Pegasus has a notable connection with the history of British armed forces.

Sir Frederick Browning (“Boy Browning”) was the first commander of the Airborne Division in 1941 and chose the design of Bellerophon riding on Pegasus as the shoulder flash for the troops along with the famous maroon beret.

Even more famously, on the night of 5th June 1944 the 6th Airborne Division was involved with “Operation Deadstick” as part of the Normandy Landings. They were instructed to capture intact two bridges across the river Orme and the Caen canal which were heavily defended and wired for demolition. They had to hold the bridges against counter attack until relieved. Landing in 6 Horsa gliders , the bridges were quickly captured.

The bridge over the Caen canal is now known as “Pegasus Bridge” being renamed after the war in honour of the operation and the troops that captured it, being based on the insignia.
The troops that landed that night were led by Major John Howard, and amongst the men under his command was a young Captain Richard Todd, who became an actor and portrayed Major Howard in the film “The Longest Day”



Work on the Observatory Extension



MSAS EXTENSION
Removing Kitchen
22 May 2018



MSAS EXTENSION
Bricklayers on site
doing footings
26 May 2018

Pack Your Binoculars for the Holidays

As you are packing your suitcases for your summer holidays don't forget your binoculars. Your holiday destination may have some dark sites from which to continue the Messier Binocular Challenge. If you are travelling south across the continent it is worth remembering that for every 60 miles travelled towards the equator the stars will tilt 1 degree upwards in the southern sky (and downwards in the northern sky).
If we consider Sagittarius, mentioned in Andy Kirton-Vaughan's latest night sky briefing, from the observatory on the 1st August it will appear as in fig 1. Nunki (σ Sag, mag 2.05) is just 10° above the Horizon.



Figure 1



Figure 2

If you are on your way to the south coast, say Poole, you would be some 190 miles further south and Nunki appears 3° higher in the sky (Fig 2). If you are lucky to travel further south across the channel and are holidaying in the Loire, France (a favourite holiday destinations for teachers for some reason) you are some 420 miles further south and Nunki is 8° higher than at Hoober (Fig 3).

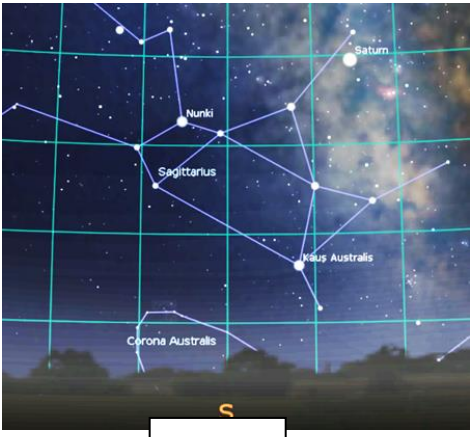


Figure 3

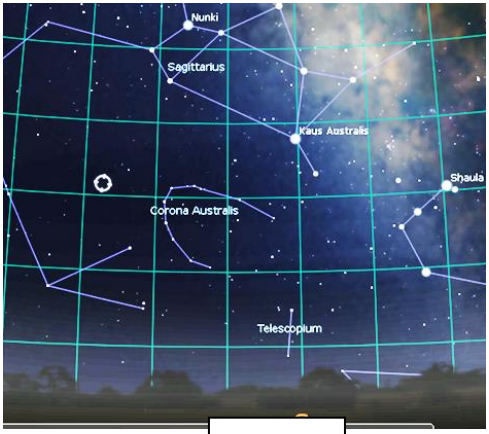


Figure 4

Lastly, if you are off to the south of Spain or the Mediterranean, typically Malaga (Fig 4 and 5), for the you beach and party animals, you have travelled some 1100 miles further south and Nunki is over 26° above the horizon. This makes a lot more Messier objects in Saggitarius visible. There is the added bonus that Saturn and Mars are also well away from the horizon. So think about a few less shoes/hats/swim suits to make room for a small telescope in the baggage?

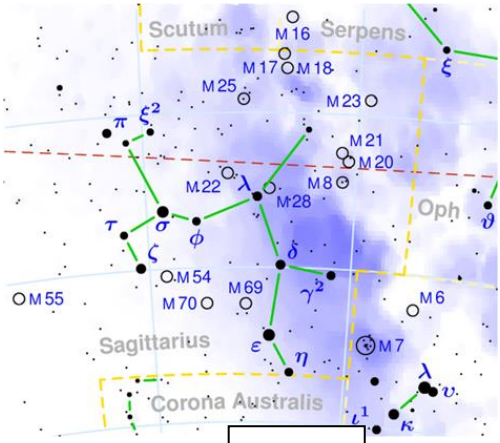


Figure 5

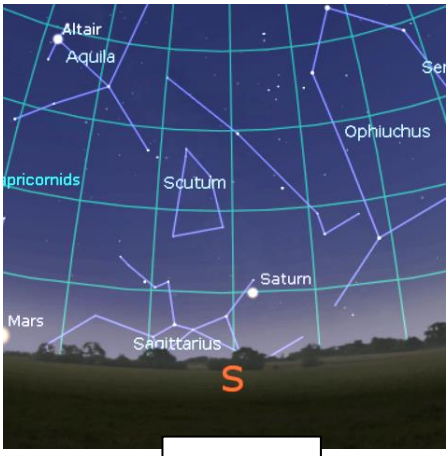


Figure 6

Finally, if you happen to moving north not only will the days be shorter still but for every 60 miles travelled the southern stars sink by the same rate. Inverness is some 280 miles further north and Nunki is observed some 4.5° further south making it more difficult to observe those Messier objects in Saggatarius (fig 6).Wherever you go on holiday, have a good time. Don't forget your sun block and star guide.

Paul D'Silva



Ed Daws auditions for the role of House Pianist

Diary

Date	Time	Location	Subject / Event	
Thu June 7th	**19:45**	**Club Room**	**AGM**	
Wed June 13th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu June 14th	**19:45**	**Club Room**	**So You Want to be an Astonomaire?**	*Roy Gunson*
Friday June 15th	**19:30**	**Rotherham Golf**	**Anniversary & Solstice Dinner**	*Alan Chapman*
Thu June 21st	**19:45**	**Club Room**	**TBA**	*Phil Muffett*
Thu June 28th	**19:45**	**Club Room**	**Deep Sky Observing & Techniques, Pt 4**	*Tony Morris*
Thu July 5th	**19:45**	**Club Room**	**TBA**	*Alan Dobbie*
Wed July 11th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu July 12th	**19:45**	**Club Room**	**TBA**	
Thu July 19th	**19:45**	**Club Room**	**Solar Flares**	*Prof. Philippa Browning*
Thu July 26th	**19:45**	**Club Room**	**Video Presentation**	*Glen Marsden*

(Details correct to time of publication)

Old Moor RSPB – Manvers Way, Barnsley, S73 0YF
TCP - Thryberg Country Park
PVE – Public Viewing Event – Bookable Only
CAE – Community Access Event
PO – Public Outreach
TBA – To be announced – (otherwise – We don't know!)

Web site: http://msas.org.uk
Meeting room is at Swinton Working Men's Club, Station Street, Swinton, South Yorkshire, S64 8AU.
Observatory is at Lee Brook Lane, Hoober, S62 7SH
Mexborough & Swinton Astronomical Society is Registered Charity N° 1064103 in England & Wales

For submissions to The Messenger - Editor: Roy Gunson: royg@gmx.co.uk

The Spacecraft Is Doing Well

Every week, the New Horizons spacecraft sends back a little signal that it's still alive and kicking, even as it snoozes its way toward its next target. It's a "green light" signal and every time it shows up, the NH team, as well as its fans around the world, breathe easy. They know that all's well out in the Kuiper Belt. Later this year, New Horizons will 'wake up' and start operations for the next target. It's on the way out to Ultima Thule, the next (and probably final) flyby on its tour of the Belt. That'll happen on the last day of December into January 1, 2019. We're all hoping the data return will be spectacular.

The astronomer quit his job to become a barber - Eclipse hair now.