CELEBRATING 40 YEARS 1978 - 2018

The Messenger

Mexborough & Swinton Astronomical Society

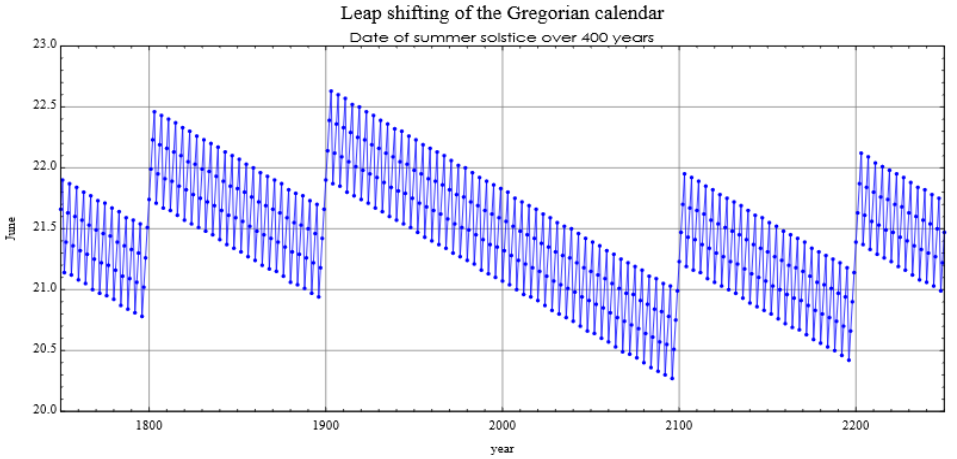
June 2019

The Solstice

We Know that the Earth goes around the sun in an elliptical orbit and this takes 365 days 6 hours 9 minutes and 9.76 seconds. The Earth also has an axial tilt so that at a particular point in the orbit the Sun appears to reach the farthest northern or farthest southern point in the sky. The word solstice is derived from the Latin sol ("sun") and sistere ("to stand still"), because, the seasonal movement of the Sun's daily path in the sky has a northern or southern limit before reversing direction. So, for us here in South Yorkshire, the solstice where the sun reached its most northerly point in the sky becomes the Summer Solstice.

Due to precession, the Earth's axial tilt slowly changes over time. As time progresses, the locations on the Earth's orbit at which equinoxes and solstices occur will change. Thus, the location of the current summer solstice will become the location of winter solstice 13,000 years hence. However because of how the Gregorian calendar works this will still be in June on the calendar

The graph below shows the date and time of the solstice “moment” from 1990 to 2050. The four yearly sinusoidal pattern is due the the progression of the addes 0.25 of a day – which is then reset by the addition of the leap yearDate of the northern hemisphere's summer solstice over time. The ~25 drops per century are leap years when the date shifts back one day due to the insertion of February 29. There was no leap year in 1800 or 1900, which explains why there is no drop those years.



Graphic courtesy of Bas Zoetekouw (Creative Commons)

The Thoughts of Chairman Les



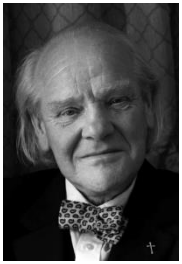
The observatory extension is complete with a little more work to be done on the landscaping. Things are being organised for the official opening to take place Saturday 22 July 2019 when the mayor of Rotherham will do the honours. Plans are that after the actual opening there will be a short presentation and few astro images around with tea and sandwiches.
For those of you that haven't visited the site for a while you will be pleasantly surprised with the amount of work that has been done with the landscaping. It is intended that a few bushes will be planted to the north of the observing pad, the overall site looks amazing.
As you know we celebrated our 40 Anniversary in 2018 which is a long time for any small group to reach but we've done it. It has been work work work for the whole of that time for us to get where we are today which is place to be proud of.
During the building period we have had two or three contractors that have needed to be paid but we have had a lot of people who willingly gave their time effort with no payment needed that have helped us reach the complete the job.
If the weather is kind to us, we can now get on with some observing with a bigger and better observatory and improved observing instruments.
Should any of our visitors be reading this you are welcome to book and evening with us, just contact us at msas.org.com for details and we will be grateful for your support.

Thank you for all the work that has been done throughout the past year.

I wish you clear skies,

Les Marsden

Keep Your Eyes Open



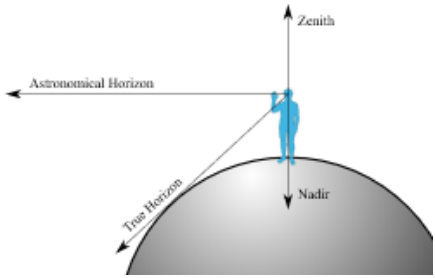
Friday 21st June "There was an Englishman, Frenchman and a Spectroscope" Allan Chapman -Our favourite Society President returns with another of his famous talks, come early as the club room is bound to be busy.
Alan will also be present at the Observatory opening the following day and will delight those attending with a short presentation.
Paul Money will also be there that day and give another of his delightful insights on astronomy.



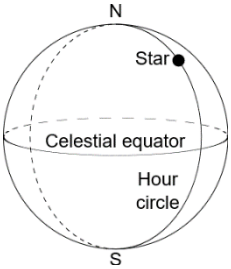
Thursday 18th July – Neil Haggarth, Programme Secretary of Cleveland and Darlington A.S, will give us a talk on the "Celebration of Apollo".
Neil graduated from the University of Leeds, England, in 1983, with an honour's degree in Physics with Astrophysics. He is a software engineer by profession. He has had a lifelong interest in astronomy and spaceflight. Born in 1961, just a few months after Yuri Gagarin's flight, so it's fair to say that he "grew up with the Space Age", in the exciting times of the early Space Race and the Apollo programme. The resultant fascination with spaceflight has stayed with him.

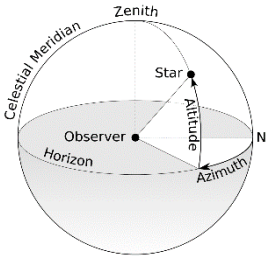
Some Astronomical Terms

The Poles of the heavens (Celestial Pole) are those points in the sky toward which the earth's axis points. The one near Polaris is called the north celestial pole, the poles are a projection of the Earths rotational poles vertically upwards.
The Celestial Equator is a great circle of the sky distant 90 from the poles, and can be considered the projection into space of the Earth's equator
The Zenith is that point of the sky, 90° overhead of any point on the Earth's surface where that measurement is made.



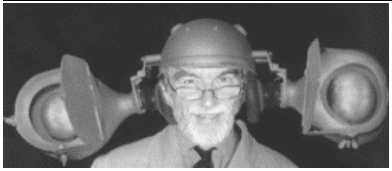
The Nadir is the opposite direction to the Zenith
The Horizon is a great circle of the sky 90 distant from the zenith.
The Hour Circle is any great circle of the sky which passes through the poles and an astronomical object. Every star has its own hour circle, and is used to define a star's "Right Ascension" in the position of astronomical objects





The Meridian is that hour circle which passes through the zenith and the due south and north horizon points.
The Declination of a star is its angular distance north or south of the celestial equator. It is measured in degrees, minutes and seconds.
Right Ascension (abbreviated RA; symbol α) is the angular distance of a particular point measured eastward along the celestial equator from the Sun at the March equinox to the (hour circle of the) point above the earth in question. When paired with declination, these astronomical coordinates specify a point on the celestial sphere in the equatorial coordinate system.
The Altitude of a star is its angular distance above the horizon.
The Azimuth of a star is the angle between the meridian and the vertical circle passing through the star. A star
due south has an azimuth of 0. Due west, 90. Due north, 180. Due east, 270. However, in modern astronomy azimuth is nearly always measured from the north, 180° away.
The Hour Angle of a star is the angle between its hour circle and the meridian. It is measured from the meridian
in the direction in which the stars appear to travel in their diurnal motion i.e., from east toward west.

Mike Hall's June 2019 Skynopsis



Diary (all times GMT).

1st	Sunrise 4:42, Sunset 21:21
3rd	New Moon
5th	20.00 Mars 1° 34' from the Moon, difficult to see 12° above horizon
8th	Sunrise 4:37, Sunset 21:28
10th	Moon at First Quarter, Jupiter at Opposition
15th	Sunrise 04.35, Sunset 21:34
17th	Full Moon
20th	Jupiter 3.5°. West of Moon
21st	Solstice
22nd	Sunrise 04:35, Sunset 21:36
25th	Moon at Last Quarter
29th	Sunrise 04:38, Sunset 21.36

Galactic Goodies:

Objects Persistent Twilight makes observing difficult even looking South. constellation Libra lies almost due South; red supergiant star Antares in Scorpius visible slightly to the East of the meridian. Higher in the sky is the constellation Ophiucus, lying between the two halves of the constellation Serpens; Serpens Caput; to the East. Higher in the Southern sky, the three constellations Boötes, Corona Borealis and Hercules.

Messier Objects

– Virgo Cluster: - M49, M58, M59, M87, M88, M60, M84, M86, M87, M91, M90, M104
- Canis Venetic: - M3, M51, M94
- Coma Berenices: - M64, M99, M100

Mike Hall

From the Final Frontier: -

"Everybody's trying to get into the act" (1)

July is the 50th anniversary of the Moon landings. Since the last landing mankind has not ventured any further than near-Earth orbit.

In the early days of space exploration there were just two contenders – the USA and Soviet Union. Now there are numerous players, national space agencies, private and state financed and international collaborations. The US has stated the aim of sending humans back to the moon by 2024. Other countries are also aiming to establish permanent space bases.

The driving force for the early space race was the 'Cold War' where the USA and Soviet Russia were not only at daggers drawn but were also trying to show the world, especially their allies and enemies, their superiority in technology. The Cold War ended with the collapse of the Soviet Union which left the US as the only serious contender. However, there followed collaborations such as the international Space Station. Jointly operated by NASA, Roscosmos (Russia), JAXA(Japan), Europe (ESA) and the Canadian Space Agency.

New contenders are China, who has established itself as a space superpower, on a level with NASA and Russia, Israel and India, who have also developed a significant space capability.

In total thirteen nations plus the 22 that collaborate in ESA have rocket launch capabilities together with 72 separate national space agencies.

1) Catch phrase, courtesy of comedian Schnozzle Durante

Mike Hall

Backyard Worlds

Back in April Peter Jalowiczor gave us an insight into the "Planet 9 Project", the Citizen Science project. His presentation was divided-up into two parts consisting of two different presentations. Dr Adam Schneider of the University of Arizona, sent a presentation over specially to MSAS! The second presentation included ways of looking for Brown Dwarfs in the Backyard Worlds Project through the professional Astronomical software available…

1. The First Presentation

This started with an introduction to the Science team and the Super Citizen Scientists… There was a discussion of earlier citizen science projects leading to BYW: P9. How was the project addressing the Sun's immediate neighbourhood? For example, the third and fourth closest systems to the Solar System were only found relatively recently. How were they overlooked? The answer was in their proper motions. These nearby objects are also Brown Dwarf (BD) systems! The reason for looking for BDs is that the nearest objects make exceptional laboratories for individual studies and as a group nearby stars and BDs tell us about the efficiency of star formation (the mass function). The mass function shows the number of objects per mass bin and describes how efficient star formation is at different masses

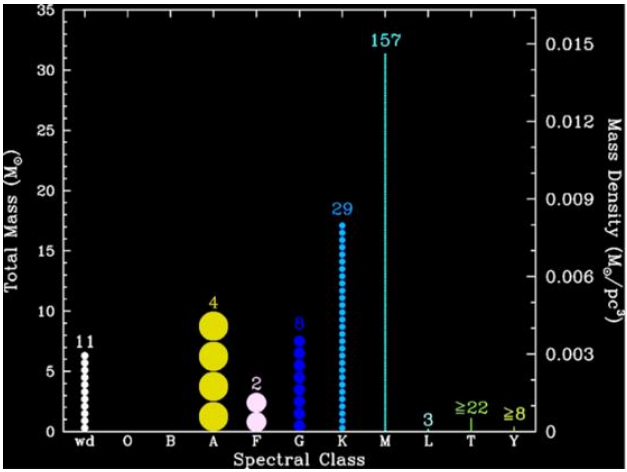


Fig 1. The Mass-function

2. The Second Presentation

This started with a comprehensive description of brown dwarfs, the three main categories (L, T and Y) and the breakdown of associated spectral classes for each category. This included several charts particularly when does fusion start? When does a gas-giant become a Y-Dwarf? With new evidence that this boundary seems to be closer to 8Mj (not 13Mj).

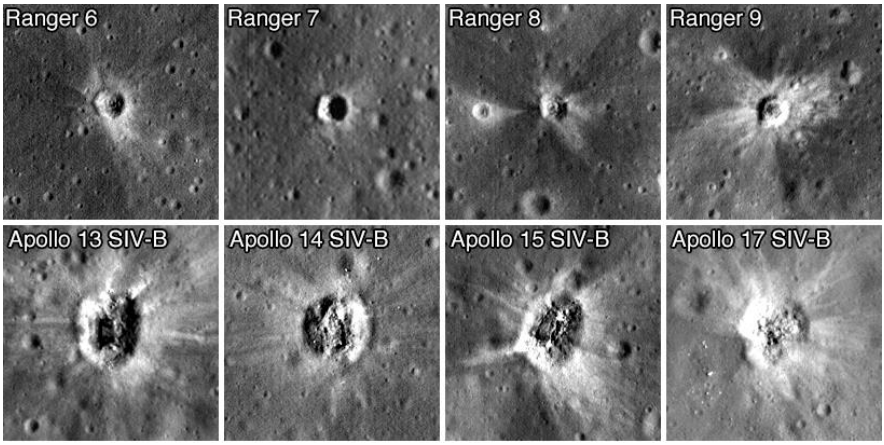
A review of the mass-radius relationship from solar-type stars to the terrestrial planets demonstrates the decrease (compression) of BD radii with increasing mass before the critical mass is reached as a BD turns into a star. After this point the radius increases dramatically.

Peter Jalowiczor

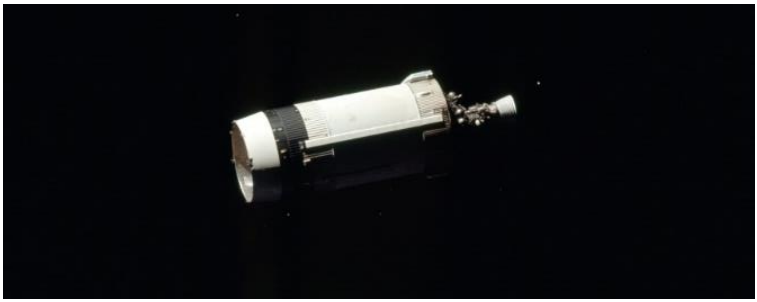
Project Ranger

A few weeks ago, I was asked about if there are any visible remains from the Ranger missions, especially impact craters. A few minutes searching on the internet provided the answer, Yes!

The Lunar Reconnaissance Orbiter (LRO), launched in 2009 returned many images from low lunar orbit which not only include images of Ranger impact sites but also some surprises. These included the upper stages of Apollo missions.



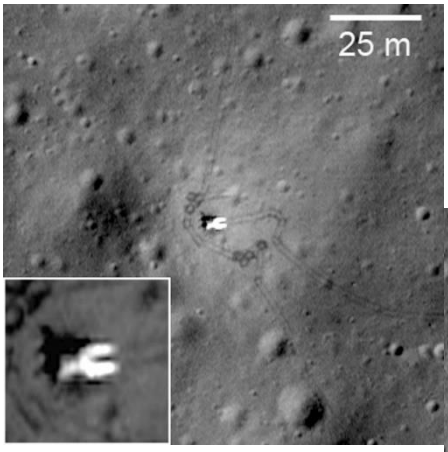
Images from LRO Ranger and Apollo impact sites



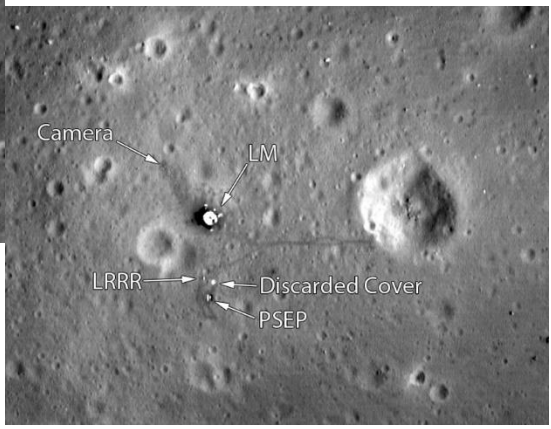
Apollo 17's expended third stage

The SIV-B as shown in the images above represents the third stage of the Saturn V rocket (It was pronounced as “ess four bee”. For lunar missions it was fired twice: first for the orbit insertion after second stage cut off, and then for translunar injection

SIV-B-212 was converted into the Skylab space station – it burnt up in the Earth’s atmosphere July 11, 1979

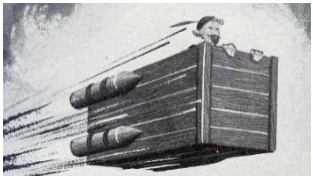


There are plenty of images from the LRO and its sister orbiter Lunar Crater Observation and Sensing Satellite (LCROSS) but here is a more unusual one. The image left is of the area around the Russian Lunokhod 1, the first lunar rover. The picture below shows the Apollo 11 landing site as imaged by LRO



Paul D'Silva

Science Fiction from Cyrano De Bergerac



Cyrano De Bergerac, the noted French Author, wrote three novels, published in 1657– Arthur C Clarke credits these novels as the first account of rocket propelled space travel.

In part one, an attempt to reach the Moon to prove there is a civilization that views Earth as its moon leads the narrator to soar from Paris into the sky by strapping bottles of dew to his person, but he fails and lands back on Earth. Believing to have travelled straight up and down, he is confused by local soldiers who tell him he is in France; they escort him to the provincial governor who informs him that it is in fact New France. The narrator explains to the governor that all matter is formed inside and expelled from stars, and that once the Sun has run out of fuel it will consume the planets and restart the cycle.

The narrator tries again to construct a way of reaching the Moon, this time through a flying machine that he launches off a cliff's edge. Though the craft crashes, local soldiers attach rockets to it, hoping that it will fly to celebrate the feast day of St. John the Baptist. Dismayed at this use of his machine, the narrator attempts to deconstruct it while the fuse is lit, but the machine takes off and sends him into space. He meets inhabitants who have four legs, musical voices, and amazing weapons.

In part two, a new machine that focuses solar energy through mirrors to generate bursts of air sends the narrator to the Sun. Those living on a Sun spot teach him about the Solar System by relating it to how atoms move. Upon the surface of the Sun, he is tried for all the crimes humanity has committed by birds, but one who knows him sets him free.

Cyrano died at the early age of 36 in 1655, either from being run over by a carriage or by a falling wooden beam. There was evidence that his death was the result of a failed assassination attempt – probably involving his brother!

Ron N Gousy

Diary

Date	Time	Location	Subject / Event	
Sun Jun 2nd	**13:00**	**Observatory**	**Members Only – Solar Observing**	
Thu Jun 6th	**19:45**	**Club Room**	**Take it to the Bridge**	*Kris Huson-Lee*
Wed Jun 12th	**20:00**	**Club Room**	**Executive Committee Meeting**	Wed May 8th
Thu Jun 13th	**19:45**	**Club Room**	**Looking for Life**	*Alan Dibbo*
Thu Jun 20th	**19:45**	**Club Room**	**Astro Clinic**	*Various*
Fri Jun 14th	**19:45**	**Club Room**	**An Englishman, Frenchman and a Spectroscope**	*Alan Chapman*
Sat Jun 22nd	**12:00**	**Observatory**	**Official Opening Observatory, Food & Fun**	*Mayor of Rotherham*
Thu Jun 27th	**19:45**	**Club Room**	**Destination Moon**	*Phil Muffett*
Thu Jul 4th	**19:45**	**Club Room**	**Ranger & Surveyor – Apollo's Vanguard Pt 2**	*Paul D'Silva*
Sun Jul 7th	**13:00**	**Observatory**	**Members Only – Solar Observing**	
Wed Jul 10th	**20:00**	**Club Room**	**Executive Committee Meeting**	Wed May 8th
Thu Jul 11th	**19:45**	**Club Room**	**TBA**	
Thu Jul 18th	**19:45**	**Club Room**	**One Small Step – A Celebration of Apollo**	*Neil Haggarth*
Thu Jul 25th	**19:45**	**Club Room**	**TBA**	

(Details correct to time of publication)
PVE – Public Viewing Event – Bookable Only

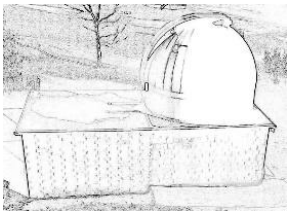
TBA – To be announced – (otherwise – We don't know!)

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 Nº 1064103 in England & Wales

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

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The View from the Ob



We have a good selection of talks and events scheduled for the coming summer months. Especially we have the "Official Opening of the Observatory" We have a day's events planned for this – Not only the official opening ceremony by the Mayor of Rotherham, Councillor Jenny Andrews and the Mayoress, Councillor Jeanette Mallinder, but we will have presentations during the afternoon by Paul Money and Allan Chapman (Alan will also be speaking at the club the night before. During the month we are going to have talks by club members Kris Hudson-Lee who will talk about fantasy space craft from fiction & video games and how the ideas can make it into real life. Alan Dibbo is going to talk about looking for life. We end the month with Phil Muffett's talk on "Destination Moon" concerned with the build up to the 50th anniversary of the Apollo 11 landings in July 1969.
We also have a solar Sunday event on the 2nd at the observatory, beginning at 1pm until 4pm.