The Messenger

Mexborough & Swinton Astronomical Society

Christmas 2015



The Thoughts of Chairman Les



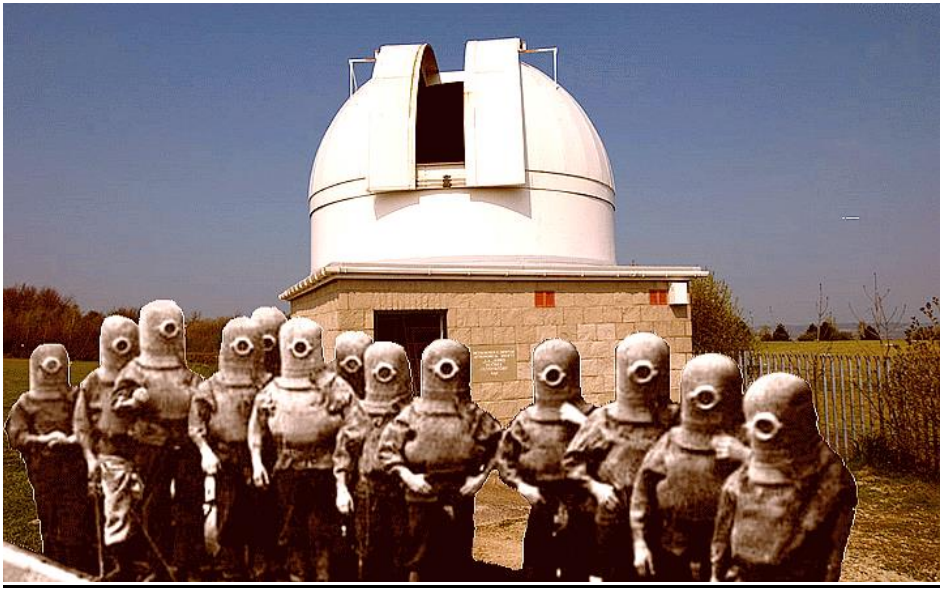
It's that time again for me to bring you up-to-date with things within the society. I would like to welcome those of you that have become a member of a fantastic society and hope that you have many years with us.

We are very busy with our community access and public outreach activities and many visits have made to scouts, cubs, guides and schools. We have recently visited Wentworth Castle which proved to be a disappointing time with not many visitors on the night, however we showed our resolve by proving a good number of telescopes and presentations.

Things are ongoing with the development for the observatory extension and development of ideas for the inside details to make good use of the observatory in the future. We haven't had any useful communications from Yorkshire Water which is becoming urgent. Members have been speaking to the farmer with good ideas being acted upon.

I wish you all a Merry Christmas and a Prosperous New Year.

Les Marsden



The Chairman's Minions in preparation for the work on the Observatory extension

Tuesday Night Imaging Group

The Imaging group meets every Tuesday from 19:30 (ish) until late at the Observatory.
Now that the nights are drawing in and getting darker, the likelihood of being able to gather data is improving.
Even when the clouds roll in, we still attend and discuss processing techniques and learn from each other.
All data captured on any evening is available to those that attend for personal processing. We all started somewhere, and it's a good environment to learn in. All levels catered for.
Please feel free to join us, no appointment necessary.

Mike Scollan

SOLSTICE DINNER

FRIDAY JUNE 17th 2016 **ROCKINGHAM ARMS – Wentworth 7pm**

Menu

STARTER	MAIN	PUDS
Whitebait	Half Roast Chicken	Chocolate Fudge Cake
Stilton Mushrooms (V)	Roast Beef Topside	Ice Cream Sundae
Soup of the Day	Roast Pork	Apple & Blackberry Crumble
	Halloumi & Chips	

Keynote Speaker – We are hoping to bring in Alan Chapman
Wives, Girlfriends, Significant others, and even family members are invited too.
Please indicate either on the form on the wall at the club room or by email to royg@gmx.co.uk – you will then be chased up for £5 deposit per person ASAP. At some stage near the event we will need to know your choice of menu. Estimated Cost £20 (on 50 attendees

Members Viewing Evenings

We will be starting a series of Member Only viewing evenings for ALL members of the Society to come along and get to use and look through out equipment. The first of these will be on Friday 4th December at 7pm at the Observatory – as usual this will be weather dependant – if the weather is bad then it will be cancelled – check with Andrew Kirton-Vaughan – his details are on the poster on the club wall.

The full schedule for the next 3 months are :-

Friday Dec 4th **Deep Sky, and Comets**
Sunday Dec 6th **Deep Sky and Comets**
Monday Jan 18th **Lunar Viewing**
Monday Feb 15th **Lunar Viewing**

What to look for in December & January

Dec 7th	Conjunction of the Moon and Venus. A conjunction of the Moon and Venus will take place on the morning of December 7. The crescent moon will come with 2 degrees of bright planet Venus in the early morning sky. Look to the east just before sunrise.
Dec 11th	December 11 - New Moon
Dec 13th, 14th	Geminids Meteor Shower.. It is produced by debris left behind by an asteroid known as 3200 Phaethon, which was discovered in 1982. It peaks this year on the night of the 13th and morning of the 14th. The crescent moon will set early in the evening leaving dark skies for what should be an excellent show. Best viewing will be from a dark location after midnight.
Dec 20th	Moon and Uranus conjunction, separation about 2 moon diameters at 1am
Dec 22nd	Winter Solstice, Officially at 4:48am!
Dec 21st, 22nd	Ursids Meteor Shower. Minor shower – 10-20 per hour in a dark location. Shower associated with comet 8P Tuttle. Not expected to be a good show this year.
Dec 23rd	Occultation of Aldebaran by the Moon – see notes elsewhere in newsletter
Dec 25th	Full Moon
Dec 29th	Mercury at greatest evening (eastern) elongation of 19.7°, however will still only be 6° above horizon at sunset.
Dec 31st	Conjunction between Moon and Jupiter – closest approach not visible in UK – but a nice show after they rise around 11:30pm
January 3rd	Moon and Mars in conjunction - just over a degree apart - unfortunately at 1 o'clock in afternoon – but they will make a nice pair in the morning sky.
January 3rd. 4th	Quadrantids Meteor Shower The Quadrantids is an above average shower, with up to 40 meteors per hour at its peak. It is thought to be produced by dust grains left behind by an extinct comet known as 2003 EH1, which was discovered in 2003. The shower runs annually from January 1-5. It peaks this year on the night of the 3rd and morning of the 4th. Club hope to have an event at the observatory for this night – so wrap up well!
Jan 10th	New Moon
Jan 24th	Full Moon
Jan 28th	Moon and Jupiter in conjunction 1° 20' at 0:25 in the morning (just after midnight on the 27th if you like!)
All Month	Comet Catalina – see elsewhere in newsletter – will be visible in binoculars, and maybe naked eye in a very dark location!
In General	Venus still putting on a good show in the early morning but is now rapidly moving towards the sun and getting lower in the sky. Mars will be rising earlier , the Moon passes close by on the 6th – missing by ½° - unfortunately the closest encounter occurs before both have risen so the moon is moving away when they both rise. Jupiter is becoming a good target especially later in the month. Saturn is badly placed being very close to the sun all month. Uranus is now setting before midnight and is starting to become unfavourable.





MSAS took part in the Scarecrow Festival held at St Margaret's Church, Swinton, the theme of the competition was Children's TV and Films.

Avoiding type casting Les in his Sunday best as Worzle Gummidge or Alan B. as Laa Laa we decided to base our entry on the 'Horrible History' programme and submit an entry about Charles Green, the local astronomer who was tasked with taking the observations for the transit of Venus in 1769 from Tahiti. Who could tackle such a role, standing still for four days? Barry J. ? No, too much standing about. Steve T.? No, we didn't want to scare the children as well as the crows! The only 'man' for the job was Herschel.

Once again our long suffering stunt double was fetched from Barry's loft and assembled. Barry lent us his new frock coat and tricorn hat. A rummage around the darker corners of Paul D.'s wardrobe provided Herschel with the remainder of a passible 18th Century costume. Along with a cut down display, the 2 inch telescope and a new poster explaining how Captain James Cook had failed to keep Charles Green alive by making him eat pickled cabbage, we were set to win our group (adult non-commercial).

However, dark forces were arrayed against us and we were pipped at the post by the Women's Institute (their scarecrow bore an uncanny resemblance to my late mother-in-law). However, a great deal of interest was generated and many people said how much they had enjoyed the stand and looked forward to visiting the society in the future.

Paul D'Silva

November's Guest



Paul Money made a welcome return to our hallowed hall on Thursday November 19th and gave an excellent talk on the New Horizon's mission to Pluto and beyond. He also brought along copies of his "Night Scenes" publication of observing hints for the 2016 season. Get yours from Phil Muffet at a club discount for members.

Phil Muffet's Ptolomys meridian disc,

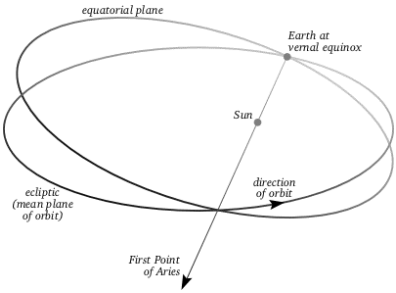


I have faithfully reproduced it from Ptolomys writings, it should be about 2m in diameter and made from turned bronze, one disc fits inside the other and revolves with a gun sight, it was used to measure the inclination of the sun at a given latitude, it was a challenging project and hope to make more of his instruments.

In the Almagest Ptolemy describes a meridian circle which consisted of a fixed graduated outer ring and a movable inner ring with tabs that used a shadow to set the Sun's position. It was mounted vertically and aligned with the meridian. The instrument was used to measure the altitude of the Sun at noon in order to determine the path of the ecliptic.

Back to Basics

Pesky First Point of Aries



The First Point of Aries is one of two imaginary points on the celestial sphere where the celestial equator crosses the ecliptic plane.

Well that helped no end! Let's break it down a little. The celestial sphere is the sky, usually at night. The celestial equator is an imaginary line projected from the centre of the earth, through the earth's equator and onto the celestial sphere and finally the ecliptic plane is the apparent path of the Sun across the celestial sphere.

There are two crossing points, also known as equinox, the other being the 'First Point of Libra'. These occur i.e. when the Sun's path crosses the celestial equator in the spring and autumn, the spring and autumn equinox. The First Point of Aries marked the spring crossing.

To make things even more complicated the First point of Aries (and by extension Libra) moves due to Earth's precession at a rate of about 1^{o} every 72 years. Since Hipparchus defined the First Point of Aries in about 130 BC it has moved 30^{o} and now lies in Pisces and the nearest major star is λ Piscium,($22^{h}\ 52^{m}\ 37^{s}$, −07° 34′ 47″).

Hipparchus' original position was used to mark a zero meridian for measuring Right Ascension(RA) but that is another story.

Paul D'Silva

Christmas Puzzle

Why is Christmas Day the same as Halloween?

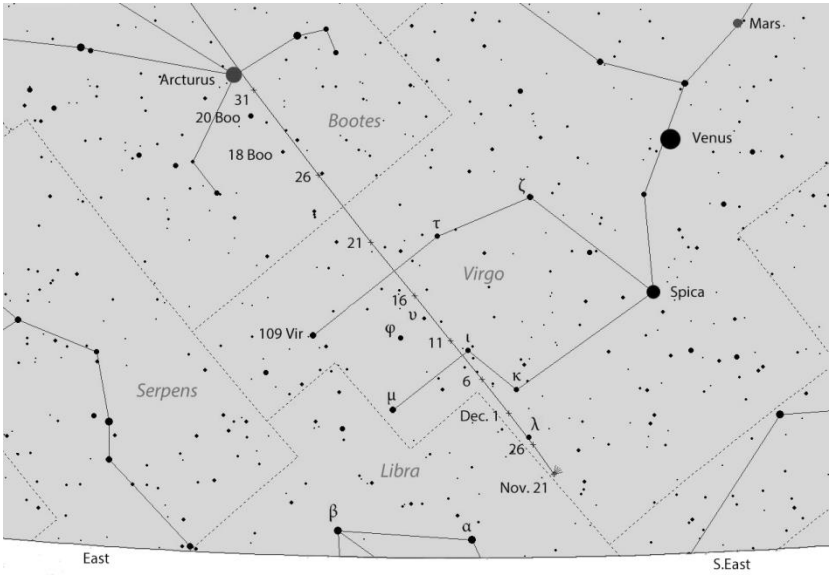
Comet Catalina

Comet Catalina [Comet C/2013 US10] is now in the morning sky just after dawn and will get successively higher in the sky throughout December. It may get as bright as magnitude 5 around the end of December, which will be on the threshold of naked eye visibility in a dark sky area. On Dec 7th it will be in the sky in close proximity to the Moon and Venus.

It should be capturable with a camera with only a few seconds exposure and visible through binoculars,

When Comet C/2013 US10 was first picked up by the Catalina Sky Survey observations suggested it was an asteroid. Additional photos and observations instead revealed a fuzzy comet on a steeply tilted orbit headed for the inner Solar System after a long sojourn in the Oort Cloud.

Its sunward journey has been nothing short of legendary, requiring several million years of inbound travel from the frigid fringe to the relative warmth of the inner Solar System. Catalina will pass closest to Earth on Jan. 12th at 66.9 million miles before buzzing off into interstellar space. Perturbations by the planets have converted its orbit into a trip into the depths of the galaxy. It was estimated that its fall from the Oort Cloud may have taken some 6 million years!
On November 28 the comet passes λ Virginis and will be 11° above the SE horizon at 6.30am . It could be as bright as 5th magnitude at this time but the low altitude will make it difficult to spot without optical aid. The comet then moves through Virgo and crosses the border into Bootes on December 24. Throughout December it stays roughly the same magnitude since the intrinsic fade as it moves away from the Sun is balanced by a decreasing distance to the Earth. If we are lucky it should be visible, just, to the naked eye in a clear, dark sky.
In the New Year the comet makes a very close approach to Arcturus on January 1 and continues moving north passing into Canes Vanatici on January 7 and past Alkaid in the tail of Ursa Major on January 15. In late 2016 January it will probably have faded to sixth magnitude as it passes near to Polaris..
Observations made in Arizona on 23rd of November indicate that the Comet has now grown two distinct tails

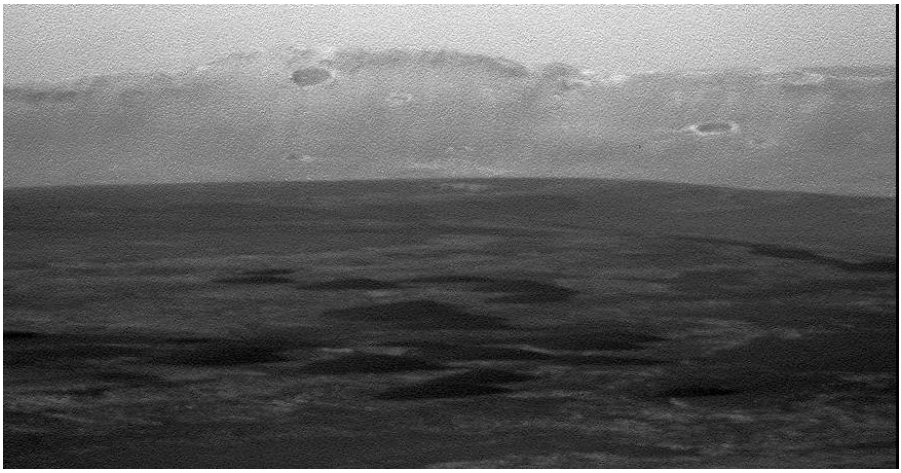


At the moment the comet is rapidly moving up to the zenith at almost 1 °a day!

Me and My Shadow ……



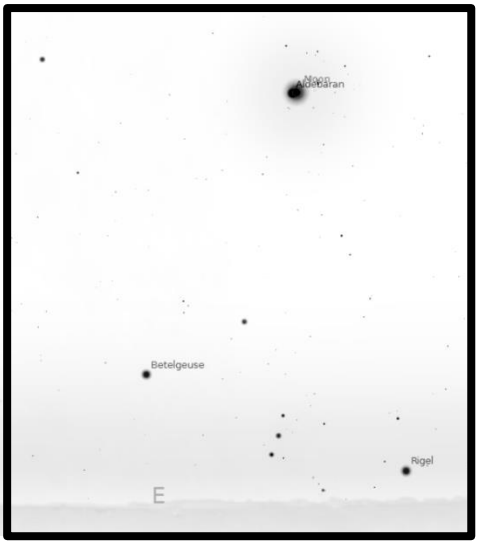
A picture taken on November 20th on the rim of Crater Endeavour in the Meridiani Plains of Mars by the Opportunity Rover – yes she's still going strong! It shows the rover's shadow stretching out in front by the rays of the setting sun.
Opportunity Rover landed on Mars on January 25th 2004, and so is approaching its 11th year of operation on the red planet – not bad for a mission only expected to survive for 6 months!
Crater Endeavour is 22 miles in diameter and the following image from Opportunity shows smaller craters in the side of the far rim

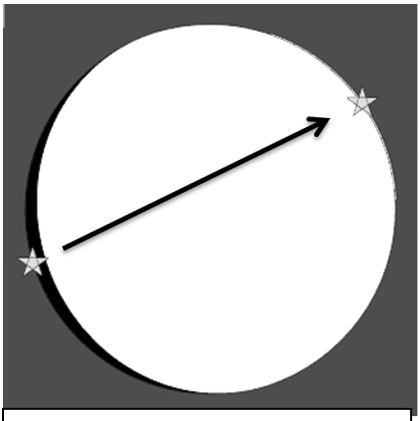


The Moon Occults Aldebran

Wednesday Dec 23rd

The Occultation should be easy to observe if we have clear skies. Stellarium gives the following picture of the Eastern horizon at the time of the start of the event (at 9 minutes past 6pm). The Moon (and Aldebaran) are positioned nicely above the rising Orion.





Apparent path of Aldebaran across the moon .
It's the moon that's moving right to left really, and Aldebaran is staying still!

Technically the occultation starts at 18 09:58 and lasts until 19:11:57 UT (Universal Time = Greenwich Mean Time). The Star Aldebaran will be 28.5° above the horizon at the start of the occultation and 37.7° at the end of the event.

Aldebaran is an Orange giant star, spectral type K5. There has been evidence of a planetary companion which is yet to be confirmed. Pioneer 10 probe, launched in 1972 will make a close approach to Aldebaran in about two million years!

Math's Test

$$
\begin{aligned}
b &= a \\
ab &= a^2 \\
ab - b^2 &= a^2 - b^2 \\
b(a-b) &= (a+b)(a-b) \\
b &= a+b \\
b &= b+b \\
b &= 2b \\
1 &= 2
\end{aligned}
$$

A Midsummer Night's Dream…….

Never in my wildest dreams, Midsummer or otherwise, did I think that I would build my own Observatory. What started out as a simple idea got completely out of hand this summer.
Someone close to me said that I am committed…..or did she say "ought to be"…….?

I only started digital imaging just over a year ago and taking the equipment out in the garden in three sections, tripod, mount and telescope and then polar aligning etc. (Just as the clouds rolled in) was ok at first but I then started to hesitate unless the visibility was really good.
The use of the excellent facilities (and knowledge of the Astro imagers) at the MSAS Observatory are just too far away from home for me to take advantage of.

I have seen a couple of equipment set ups on piers and thought that was the way to go, install something more permanent at home, and with help from MSAS Member Trevor Worrall I soon had a steel pier manufactured.
Now where to put it? At least with the tripod I could set up in different parts of the garden depending what I wanted to image, but the pier would have to be fixed in one position.
The best fixed position I could find was in part of the garden that was a bit too low, so I decided that I could build up some higher decking around the pier to elevate the location with the pier poking up through it.
But by gaining elevation it also meant that I would be more exposed and be in danger of having more street lighting on the equipment, more wind and neighbours garden flood lights.



The idea of enclosing the area around the telescope was starting to look attractive if not imperative. I sketched out various shed designs….but not enough room for a roll off top, and decided to check out a few friends Observatories to get a few ideas, most impressed by MSAS Member Steve Taylors Observatory in Swinton that had its top half manufactured by Pulsar UK, and to cut a long story short I decided to go for a complete Observatory Fibre Glass shell manufactured by the same company.

The Observatory kit arrived in April, by which time I had started work clearing old brick walls and hedges.
The main foundation was to be a cubic metre of concrete with a 14"concrete pipe sticking up to a (false) floor level 800mm above ground. On top of this I would mount the steel pier.
I had also started the concrete foundation ring around the concrete block; on top of which would be a ring of brickwork avoiding any contact with the main block.
On top of the brickwork I planned a decking floor, again avoiding contact with the concrete and upper steel pier.

The day of casting the main block and concrete pier came. I inserted four M16 hooked bolts fixed in a wooden template to sit on top of the cast pier with the bolts dangling in the concrete. I had worked out where true North should be and with a stick in the ground at 11.58 am on June 23rd the shadow cast would be true north. But what if it wasn't sunny? I had a few friends all booked in for the concreting. So I checked and found out that True North and Magnetic North are only 1.5 deg apart at the moment, and I had enough slots in the pier and scope mount to take that up if need be. So I got a magnetic compass, iPhone compass and sundial….just in case….as it happens it was a gloriously sunny day and all went well.



Put an armoured cable power supply in from the adjacent summer house. The circular bricking went up fairly quickly over the next few days, but temperatures in the shade hit 32 deg C, we were all wilting a bit, so it was 6.30 am starts and an early finish to avoid the heat…. doesn't sound like England does it.
False floor went in fine over a couple of days, and the steel pillar fitted a treat, and also built a brick and slab spiral to get from ground to false floor level.

My daughter and I assembled the observatory walls and then got the team around for lifting the dome on top, bit of a worry as the dome and the walls were out of oval to each other by about 1cm, but the dome dropped in to place and there was enough flex in the vertical walls to accommodate the difference in dimension.

The next task was to fit the EQ45 Mount and the scope. I had drawn out numerous times what kind of clearance I might expect between the objective of the scope and the inside of the dome. I left an extra 200mm of clearance which could be taken up with a 'top hat' spacer, if need be, which I did a few weeks later.

Next I built a central box around the pier to house the electrics and provide a desk around the pier for the lap top etc. Independent red and white lighting installed from cabling that I had pre fitted when making the decking false floor. Finally covered the decking with a diamond plate style rubber flooring for comfort and insulation, and just in case something gets dropped it has a better chance of survival.

The total finished height of the structure is 3.27 metres, the diameter of the dome is 2.2 metres and it gives a surprising amount of room inside and around the pier… enough for two people anyway.
The inclusion of two side pods is great for storage.
The dome rotates a treat on its rubber wheels with just one finger, and can be locked down when not being used. The viewing slot opens easily using a pulley and rope system and again, this too, can be locked down.

Still busy setting it up accurately, working on Drift Alignment at the moment, but now in the comfort of an Observatory, this Summers Project was hard work with a lot of head scratching but really well worth it, now I need to 'focus' on my imaging and processing techniques.

"My soul is in the sky."
— William Shakespeare, a Midsummer Night's Dream

Max D Freier

Programme for December 2015, January & February 2016

Date	Time	Location	Subject & Speaker
Thu Dec 3rd	19:45	Club Room	**Sun God** *Philip Muffett*
Fri Dec 4th	19:00	Observatory	**Members Viewing Night** *Andrew Kirton-Vaughan*
Sun Dec 6th	19:00	Observatory	**Members Viewing Night** **A***ndrew Kirton-Vaughan*
Mon Dec 7th	19:00	Observatory	**CAE – Chapeltown Scouts** *Alan Birch*
Wed Dec 9th	19:45	Club Room	**Executive Committee Meeting**
Thu Dec 10th	19:45	Club Room	**100 Years of Relativity** *Dr Susan Cartwright*
Thu Dec 17th	19:45	Club Room	**Intro to Astronomy & Space** *Jez Robinson*
Mon Jan 4th	20:00	Observatory	**Quadrantids Meteor Shower**
Thu Jan 7th	19:45	Club Room	**Measuring the Earth** *Mike Hall*
Wed Jan 13th	19:45	Club Room	**Executive Committee Meeting**
Thu Jan 14th	19:45	Club Room	**Observatories of the UK** *Steve Taylor*
Fri Jan 15th	19:45	Observatory	**PVE** *Les Marsden*
Sat Oct 17th	16:00	Old Moor RSPB	**Public Stargazing** *Les Marsden & Phil Muffett*
Mon Jan 18th	19:00	Observatory	**Members Viewing Night** *Andrew Kirton-Vaughan*
Thu Jan 21st	19:45	Club Room	***Beginners Guide to Astrophotography*** *Steve Bowden*
Thu Jan 28th	19:45	Club Room	**Astro Imaging Competition** *Tony Morris*
Fri Jan 29th	19:45	Club Room	**TBA** *Alan Chapman*
Thu Feb 4th	19:45	Club Room	**Venus** *Roy Gunson*
Wed Feb 10th	19:45	Club Room	**Executive Committee Meeting**
Thu Feb 11th	19:45	Club Room	**Back to Basics** *Paul D'Silva*
Mon Feb 15th	19:00	Observatory	**Members Viewing Night** Andrew Kirton-Vaughan
Thu Feb 18th	19:45	Club Room	**TBA** *Nate Bastion*
Thu Feb 25th	19:45	Club Room	**Spring Sky** *Andrew Kirton-Vaughan*
Sat Nov 21st	16:00	Wentworth Castle	**Stargazing @ Wentworth** **L***es Marsden & Phil Muffett*

Note there will be no club meetings on Thursday December 24th or Thursday December 31st

PVE – Public Viewing Event
CAE – Community Access Event
TBA – To Be Announced

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
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