The Messenger

Mexborough & Swinton Astronomical Society December 2013, January 2014



MERRY CHRISTMAS TO ALL AT M.S.A.S

THE THOUGHTS OF CHAIRMAN LES



Some of members have been successful at getting sight of Comet Lovejoy and Comet ISON, then again most of us have not been so fortunate as we have had very cloudy skies recently. It seems that those who have seen the comets have been getting up about 4.00am to get half a chance of seeing anything.

The society has been running quite smoothly over the past 12 months and its all due to having a first class committee, I as chairman, past my thanks to the committee as a whole, you are doing a fantastic job.

I must thank and wish the new recent members and hope that you have many years with us and that your chosen hobby of astronomy goes well for you.

Each weekly meeting is always well attended with just less 50% getting to the meetings and enjoying both our guest speakers and member speakers alike. I would like to remind you all that should you like to hear a speaker deal with a subject that you particularly enjoy just let any committee member know and we will do our best to meet your request.

The festive season is upon us once again and I wish you all the compliments of The Season and may all you want from your astronomy wishes come true.

I wish you Clear Skies

Your chairman Les Marsden FRAS

Dawes' limit is a formula to express the maximum resolving power of a telescope. It is so named for its discoverer, W. R. Dawes, although it is also credited to Lord Rayleigh.

The formula takes different forms depending on the units.

R = 4.56/D D in inches, R in arcseconds

R = 11.6/D D in centimeters, R in arcseconds

where D is the diameter of the aperture and R is the resolving power of the instrument

So a 6” telescope should resolve down to R=4.56/6 = 0.76 arcseconds

A Day out at the Federation of Astronomical Societies Convention 2013.

The Convention was held this year at the Institute of Astronomy at the University of Cambridge.
I had asked our Deputy Chairman Gary if he could get me a ticket, thinking that as the President of FAS there would be no problem. What a letdown all 180 sold. Not to be put off I arranged a free ticket to view the trade stands, intending to go into Cambridge if they were not up to much. So I scrounged a lift off Gary. He did come in useful after all.
There was good news at Cambridge in that some tickets had been returned and so I could hear the speakers after all. We were greeted with free tea, coffee and toast. Just time for a quick look around at the trade stands before the Convention started at 9.30am.

The programme for the day was:-
Dr Samuel George – University of Birmingham "Magnetic Fields in the Universe"
Andrew Robertson "Building a large (600mm) Dobsonian Telescope"
Lunch – Telescope Tours
Prof. Andrew Coates – Mullard Space Science Laboratory, UCL "Mars exploration – and the ExoMars mission"
FAS AGM
Sean Elvidge – University of Birmingham "Space Weather effects on the near Earth environment"
Dr Robin Catchpole – University of Cambridge "Climbing the Distance Scale ladder to the Edge of the Universe"

I enjoyed the Telescope Tours they were very interesting being able to view three out of the four telescopes at the Institute. We could not view the Northumberland as it was under repair. Use this link to find more about the telescopes and the Institute of Astronomy. http://www.ast.cam.ac.uk/about

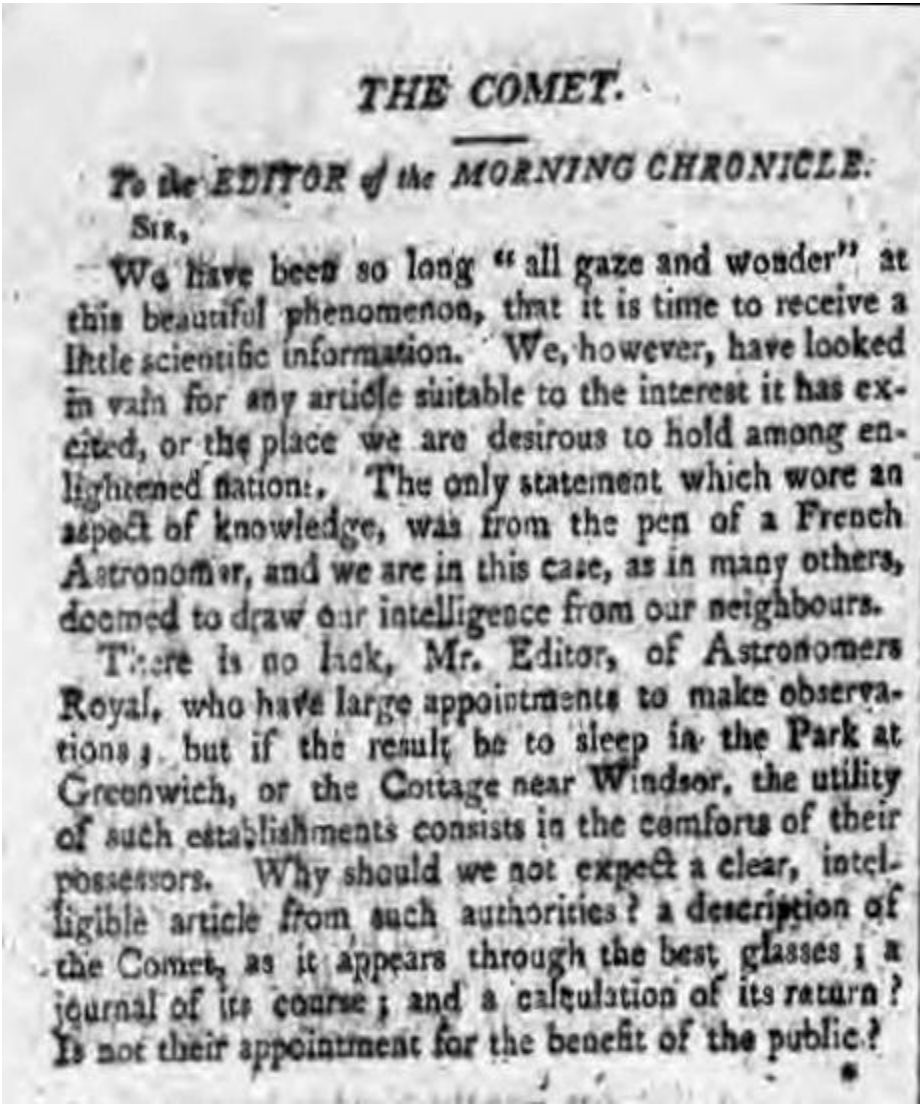
The following trade stands and displays were on show.

Astronomia	Space Rocks
Cambridge University Press	Aurora Books
BAA	The Campaign for Dark Skies
North Essex Astronomical Society	Virtual Image
Peter Clark (Unfortunately)	

A good day out if you enjoy listening to the speakers they were all excellent.
The AGM was much the same as any other. Don't expect too much from the trade stands, they do not bring large amounts of stock.
Steve Taylor

Blast from the Past – Complaints in the press

Nothing really changes does it - excerpt from the Morning Chronicle dated Thursday October 10th, 1811



THE COMET.

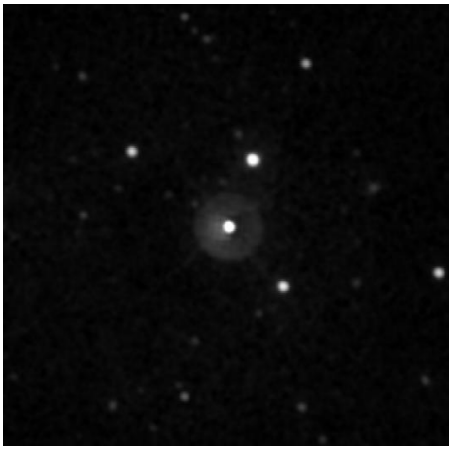
To the EDITOR of the MORNING CHRONICLE.

SIR,

We have been so long "all gaze and wonder" at this beautiful phenomenon, that it is time to receive a little scientific information. We, however, have looked in vain for any article suitable to the interest it has excited, or the place we are desirous to hold among enlightened nations. The only statement which wore an aspect of knowledge, was from the pen of a French Astronomer, and we are in this case, as in many others, doomed to draw our intelligence from our neighbours.

There is no lack, Mr. Editor, of Astronomers Royal, who have large appointments to make observations; but if the result be to sleep in the Park at Greenwich, or the Cottage near Windsor, the utility of such establishments consists in the comforts of their possessors. Why should we not expect a clear, intelligible article from such authorities? a description of the Comet, as it appears through the best glasses; a journal of its course; and a calculation of its return? Is not their appointment for the benefit of the public?

THE STAR



GRB 080319B was a remarkable gamma-ray burst (GRB) detected by the Swift satellite at 06:12 UTC on March 19th, 2008. The burst set a new record for the farthest object that could be seen with the naked eye; it had a peak apparent magnitude of 5.8 and remained visible to human eyes for approximately 30 seconds. The magnitude was brighter than 9.0 for some 60 seconds.
The GRB's redshift was measured to be 0.937, which means that the explosion occurred about 7.5 billion (7.5×10^9) years ago, and it took the light that long to reach Earth. This is roughly half the time since the Big Bang. The first scientific paper submitted on the event suggested that the GRB could have easily been seen to a redshift of 16 (essentially to the time in the universe when stars were just being formed, well into the age of reionization) from a sub-meter sized telescope equipped with near-infrared filters.
The afterglow of the burst set a new record for the "most intrinsically bright object ever observed by humans in the universe", 2.5 million times brighter than the brightest supernova to date.
Until this gamma-ray burst event, the Triangulum Galaxy, at a distance of about 2.9 million light years, was the most distant object visible to the naked eye. The galaxy remains the most distant permanent object viewable without aid.
It was soon suggested that this spectacle be named the Clarke Event, as it first reached Earth just hours before the death of Arthur C. Clarke,

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Nick's Talk on Halley

On November 7th, Nick Reynolds gave us a short talk on Edmund Halley, his contemporaries and also a little about a replica pocket watch that Edmund Halley had in his possession.

Well done Nick



THE CHRISTMAS PUZZLE

Gary and four members of the club often spent nights together using laptops and digital cameras connected to their telescopes; they scan the sky for astronomical phenomena to photograph. On Friday night, the five of them met for the evening. It was a beautiful night for astronomy. Weather conditions were perfect for viewing, the sky clear and brilliant with stars; even the temperature was pleasant, not too cold. As a result, some of them stayed out quite late and all shot some great photos. Each had two photos in particular that were just fantastic images. By happy coincidence, each happened to be shooting something different when those photos were taken so by the end of the night, they had a phenomenal collection of images to show off (each managed to capture a different planet and a different nebula). Determine the name of each club member astronomer, his scope, the time each packed up for the night (between midnight and 4am), and the planet and nebula each captured with a fantastic image.

1. The person with the Skywatcher scope got a terrific picture of the Ring Nebula. Alan didn't get a picture of the Orion Nebula.

2. Roy using a Meade telescope didn't get a picture of the Crab Nebula but he left two hours later than the one who got a picture of Saturn.

3. Mick, who wasn't using the Celestron, left two hours after the one who photographed Jupiter.

4. The friend who took a picture of Venus also got a picture of the Cat's Eye Nebula. The person using the Takahashi got a picture of the Omega Nebula.

5. The five amateur astronomers were Gary, the one who photographed Neptune, the one who left at 2am, the one using a Tasco telescope, and the one who photographed the Omega Nebula.

6. Alan left at 4am but he didn't get a photograph of Mars. Tony wasn't using the Tasco and he didn't leave at 3am. The club member who got a picture of the Orion Nebula left at 1am.

Determine the name of each club member astronomer, his scope, the time each packed up for the night (between midnight and 4am), and the planet and nebula each captured with a fantastic image.

YORKSHIRE ASTROMIND.



On 26th October our society hosted, yet again, this longstanding inter society quiz. It has been running now for some 30 years and we have shown our colours on many an occasion by winning in fine style for a lot of years.

The contestants were Darren from Sheffield, Marcus from Huddersfield, Peter from East Yorkshire and of course our very own Gary. These kinds of numbers of contestants have been about the same in the past few years. Back in the day we used to be nearly in double figures and the contest was a real battle because no one wanted to lose back then.

I'm pleased to say that the day ran like clockwork and we all had a real good time. The question master and question provider was the one and only Neil Haggath who has been doing this job for many years. He is a master at this job and the final scores are always very close. You will see from this years scores what I mean. Peter, a new-comer from East Yorkshire with 22 points, Darren from Sheffield with 57 points, Marcus from Huddersfield with 51 points and our very own Gary the winner with 60 points. There are lots of people to thank but suffice say a good job done well. It is very pleasing when we win and we shall try and do the same next year.

The hosts for 2014 will be Sheffield Astronomical Society. We are looking forward to that already.

Les Marsden



Mrs Tiggy-Winkle couldn't wait to show
Benjamin Bunny her new telescope

Supernovae



Sam Falle, Professor of Astrophysical Fluid Dynamics at the University of Leeds presented a talk on Supernovae on 14th November 2013.

A supernovae occurs when a star that is too massive to die quietlyexplodes at the end of its life. The energy released in this explosion is so great that the star becomes more than a hundred billion times as bright as the Sun for a period of six months to a year.

The talk described these events and explained the mathematical theory of explosions to illuminate the relationship between supernovae and explosions on Earth, particularly nuclear explosions.

Light Grasp of a Telescope

The primary function of a telescope is to gather light and funnel it into the observer's eye. The larger the telescope, the greater the amount of light captured. Light gathering ability is a function of the area of the objective lens or primary mirror. Thus the aperture, or diameter, determines the light grasp of a telescope. Since for a circular aperture;

$$\textbf{Area} = \pi r2$$

as the aperture is increased, the light grasp increases by the square of the aperture. This means an 8" aperture collects 4 times as much light as a 4" aperture. The 8" aperture has an area of 50 in^2, while the 4" aperture has only 12.5 in^2.

How much more light a telescope gathers compared to the unaided eye is determined by the ratio between the light-gathering area of the telescope and the light-gathering area of the eye. The aperture of the eye is determined by the size of the pupil (see the section below on The Human Eye for more details). In general, the average pupil will open up to about 7mm in diameter. Note that this means if the beam of light coming out of the telescope eyepiece is larger than the maximum size of the eye, the eye becomes the limiting factor and effectively reduces the aperture of the telescope. This is described more later. The light gathering area of the 7mm pupil is then 0.06 in^2. For the 8" telescope, this gives a ratio of 50/0.06 = 833, meaning an 8" telescope gathers 833 times more light than the unaided eye.

An additional advantage of aperture that comes into play when magnification is considered is image brightness at a given magnification. Through a given telescope, doubling the magnification reduces the brightness of an extended object fourfold. Doubling the aperture of a telescope makes the image four times brighter at the same magnification, or allows twice the magnification to be used while retaining the same image brightness.

The direct ratio between telescope brightness and unaided eye brightness still holds for point sources. For this reason, stars will appear brighter than they do with the eye, independent of magnification. The magnitude scale used to describe the brightness of stars is a logarithmic scale. Each magnitude is a difference of 2.5 in brightness. A 1st magnitude star is 2.5 times brighter than a 2nd magnitude star. A 2nd magnitude star is 2.5 times brighter than a 3rd magnitude star. And the difference between a 1st magnitude star and 3rd magnitude star is 2.5 x 2.5 = 6.25 times. A telescope which can make stars appear 833 times brighter than the unaided eye will allow stars 7.3 magnitudes fainter to be seen. If you can see 6th magnitude stars with the unaided eye, you should be able to see 13th magnitude stars through an 8" telescope

Trevor Worrall's Christmas Skies

The **Geminids** meteor shower is the final major meteor shower of the year and also the most consistent shower in terms of putting on fruitful display. Some shooting stars will be visible each night from 7 Dec to 16 Dec, but the best show will be expected on or around 14 December 2013. The maximum number of meteors expected to be visible from a dark location is around 100 per hour (ZHR). The Moon will be 11 days old at the time of peak activity, and being so close to Full Moon, will severely limit the observations that will be possible.

January 2nd, 3rd - **Quadrantids** Meteor Shower. The Quadrantids is an above average shower, with up to 40 meteors per hour at its peak. The shower runs annually from January 1st-5th. It peaks this year on the night of the 2nd and morning of the 3rd. The thin crescent moon will set early in the evening leaving dark skies for what could be an excellent show. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Bootes, but can appear anywhere in the sky
December is likely to be the best month to see **Comet ISON**, assuming it has survived its close pass near the sun intact. The comet will be visible both in the evening sky after sunset and in the morning sky before sunrise.
Best viewing between December 10th and 14th when the comet will be best seen just before dawn in the East after the moon sets.
On January 8th, 2014, the comet will lie only 2° from Polaris,
January 14th-15th, 2014, after the comet itself has passed but when Earth is sweeping near the comet's orbit, it might produce a meteor shower, or at least some beautiful night-shining or noctilucent clouds*.
* NLC used as a sensitive guide to changes in the upper atmosphere.

Planets
Venus , Extremely bright , low in the southwest at Sunset during December
Mars: During both months rises well after midnight in the constellation of Virgo
Jupiter : Found in the constellation of Gemini , rises after sunset, high in the east late in the evening. It will be a great target for telescopes in January, and will be brilliant all night

December Moon : New 3rd , 1st Quarter 9th, Full 17th,Last Quarter 25th
January Moon : New 1st , 1st Quarter 8th, Full 16th,Last Quarter 24th
Constellations : Orion is for the third month is ideally situated for viewing with either telescope or binoculars in the South East , check out the famous Nebula in Orion's sword. The **Pleiades** (or seven sisters) an open star cluster in the constellation of Taurus is an amazing site through Binoculars.

Stargazing Live is Coming Soon



Stargazing live returns to BBC 2 on the 7th, 8th and 9th January 2014
We have our own "outside broadcasts" for Stargazing Live in January and February 2014. As ever we will need members to pull together and help with our activites at these event, so bring your telescopes, binoculars, and yourselves.
Friday 3rd January 10.00pm – 3:00am **Observing the Quadrantids Meteor Shower**, The observatory will be open to view the Quandrantids meteor shower, and also Jupiter and other night sky targets, so join us at the Observatory for what should be, weather permitting, a jolly good show!
Saturday 11th January 3:00pm – 6:30pm, **Stargazing Live at RSPB Old Moor**
A Walk around the sanctuary as well as our usual observing area
Saturday 8th February 6:00pm – 8:30pm **Stargazing Liv**e at Wentworth Castle and Gardens
Saturday 22nd February 6:00pm – 9:00 pm, **Planets in the Park III** at Clifton Park Walled Garden

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South Africa



On November 21st Gary Gawthorpe gave us a guided tour of some of the South African Observatories visited by a number of the club members earlier this year. We also enjoyed photo's of some of the wild life Gary took during his travels, even the ones that tasted of chicken!

Programme for December, January & February

Date	Time	Location	Subject & Speaker
Thurs Dec 5th	7:45pm	Club Room	**Massive Stars** *Prof Rene Oudmaijer*
Fri Dec 6th	7:45pm	Observatory	**PVE**
Sat Dec 7th	7:45pm	Wentworth Castle	**Public Outreach**
Thurs Dec 12th	7:45pm	Club Room	**Kuiper Objects** *Roy Gunson*
Thurs Dec 19th	7:45pm	Club Room	**Christmas Lectures**
Thurs Dec 26th	**NO MEETING**		
Thurs Jan 2nd	7:45pm	Club Room	**Winter Sky** *Trevor Worrall*
Fri Jan 3rd	10:00pm	Observatory	**Observing the Quanrantids** *Stargazing Live Event*
Thurs Jan 9th	7:45pm	Club Room	
Thurs Jan 16th	7:45pm	Club Room	**Astro Imaging** *David Adshead*
Thurs Jan 23rd	7:45pm	Club Room	**An Old Spy Glass** Phil Muffett
Thurs Jan 30th	7:45pm	Club Room	**Club Astro Imaging Comp** *Tony Morris*
Thurs Feb 6th	7:45pm	Club Room	**Celestial Navigation** *Steve Taylor*
Sat Feb 8th	6:00 pm	Wentworth Castle	**Stargazing Live Event**
Thurs Feb 13th	7:45 pm	Club Room	**Observing Jupiter** *Roy Gunson*
Thurs Feb 20th	7:45 pm	Club Room	**Ice Worlds of the Solar System** *Paul Money*
Sat Feb 22nd	6:00pm	Clifton Park Garden	**Planets in the Park III** *Stargazing Live Event*
Thurs Feb 27th	7:45 pm	Club Room	**Spring Sky** *Trevor Worrall*

Note items may be subject to change

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

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