The Messenger

Mexborough & Swinton Astronomical Society

Christmas 2014



Merry Christmas and Happy New Year

from all at M.S.A.S

The Thoughts of Chairman Les



At our committee meeting Wednesday 12th November'14 we had received notification from Yorkshire Water that they don't see any difficulties with an extension at the observatory so long as we keep it within our boundary. With this good news we have set a date for our second Feasibility Study Group meeting for Wednesday 3rd December'14. If any of you feel that you could help with the ideas at this meeting please attend a put you points forward as the more ideas we get the better the whole building will make a fulmination at the end of our efforts.

A lot of work has taken place on the telescopes at the observatory by our engineers. The UPS power has had items replaced to combat the 'burn out' we had a short time back. Work on the telescopes has also progressed so maybe this winter we can get on with our observing aims.

IF YOU USE THE UPS POWER PLEASE TURN IT OFF WHEN YOU HAVE FINNISHED

I wish you all a very Christmas and a Prosperous New Year

Les Marsden

Caption Competition



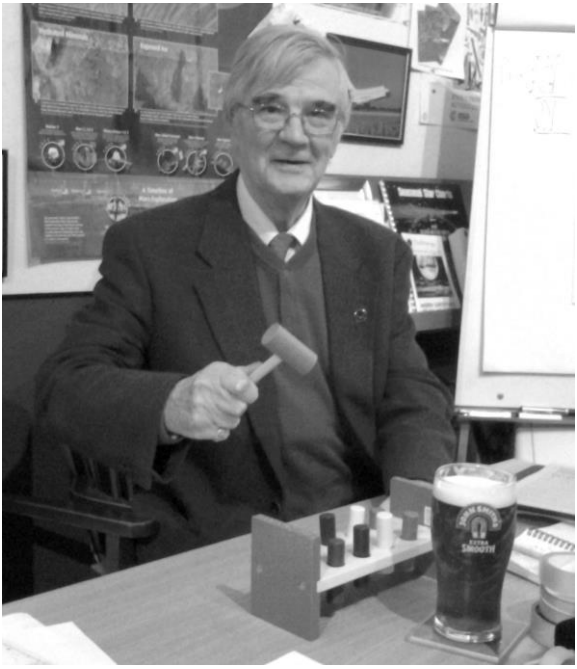
Entries via version on club wall

Christmas Puzzle

How many words can you form from the letters in the word square? You must use the letter in the central square. There is one 9 letter word. Proper nouns not allowed

A	B	D
E	L	A
R	A	N

15 - Good
20 - Very Good
25 - Excellent
30 - Brilliant
35 - Genius

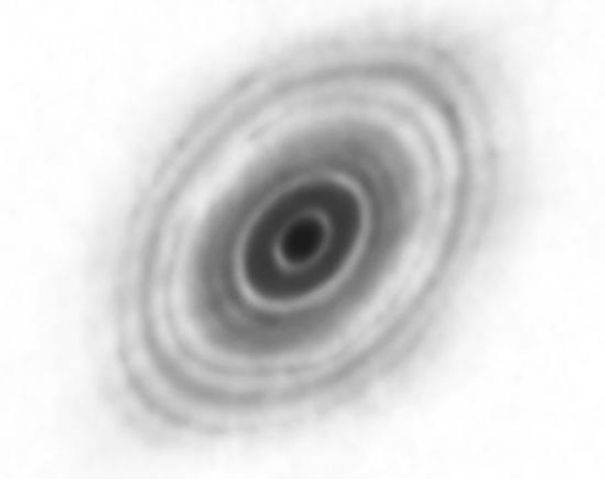


You hum it son and I'll play it

In the News

No contact has been made with Stereo B one of two of the two spacecraft launched in 2006 to study the sun. After passing behind the sun in August it failed to “wake up” properly. It now seems likely that the spacecraft suffered two faults, first the star tracker could not lock onto its correct guide stars, and then a laser gyro in Stereo B's Inertial Measurement Unit, which senses the craft's orientation, failed and started providing bad data to the attitude-control system.

Jupiter’s red spot is red due the Ammonia and aceletyne. Researchers at JPL tried irradiating a mixture of ammonia (NH_3) and acetylene (C_2H_2), both of which exist in Jupiter's upper atmosphere. The result was a red concoction of cyanide-like molecules with the general formula $H_xC_yN_z$ where x, y, and z vary. Better still, the reddish particles have a spectrum that closely matches what NASA's Cassini spacecraft recorded inside the Great Red Spot when it swept by Jupiter in late 2000 while on route to Saturn.



A photograph produced by the ALMA array in Chile shows the beginnings of a new solar system. Planets are forming around HL Tauri, a young, variable star just 1 million years old. They’re leaving their imprints in the dusty disk leftover from the star’s formation, a protoplanetary system that spans 235 astronomical units (the distance between Earth and the Sun). The innermost disk gap appears at a radius of 20-30 a.u., roughly the size of Neptune’s orbit around the Sun. A second gap appears further out at 70 a.u., which would lie outside Pluto’s orbit, and still more gaps appear beyond that.
ALMA (NRAO/ESO/NAOJ) / C. Brogan / B.

Hoober Observatory - C14 focuser 2inch adapter now in place

The special adapter that fits in the back of the C14 electronic focusser has been machined by Gary and kindly anodised by one of our occasional visitors Mr Mark Walton.
The extension tubes we need have been ordered and should be on their way from Germany soon. I have ordered 4 tubes of different lengths which should allow us to connect any camera to the C14 and get focus. Well that’s the theory anyway!
I am looking forward to the imaging competition as the imaging gang seem to have been capturing some really good data recently and with tips from Harry's visit I expect it to be a good night as usual

Tony Morris

Upcoming Spacecraft Launches

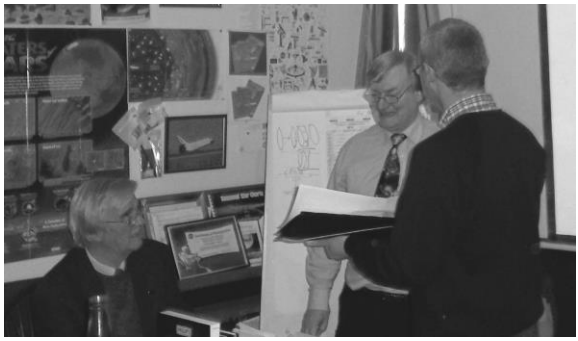
Dec. 4, 2014	NASA's Orion spacecraft will launch this year atop a Delta IV Heavy rocket from Cape Canaveral Air Force Station's Space Launch Complex 37. The Orion Flight Test will evaluate launch and high speed re-entry systems such as avionics, attitude control, parachutes and the heat shield.
Dec 4th 2014	Arianne Flight VA221 : Launch of the DIRECT-14 and GSAT-16 satellites. DIRECT-14 will provide better satellite TV for USA and Puerto Rico. GSAT-16 is a telecommunications satellite for the Indian Space Research Organisation
Dec 10th 2014	A Russian government Soyuz rocket will launch the Resurs P2 Earth observation satellite to collect remote sensing data for Russian government agencies and foreign customers. Launch site: Baikonur Cosmodrome, Kazakhstan
Dec 11th 2014	A United Launch Alliance Atlas 5 rocket will launch a classified spacecraft payload for the U.S. National Reconnaissance Office. The rocket will fly in the 541 vehicle configuration with a five-meter fairing, four solid rocket boosters and a single-engine Centaur upper stage. The rocket will also fly a new upper stage power plant designated the RL10C engine. Launched from Vandenberg Air Force Base, California.
Dec 12th 2014	An International Launch Services Proton rocket with a Breeze M upper stage will deploy the Yamal 401 communications satellite for Gazprom Space Systems of Russia. Yamal 401 will deliver C-band and Ku-band communications services to Russia and neighbouring countries. Launch site: Baikonur Cosmodrome, Kazakhstan
Dec. 16, 2014	Fifth SpaceX Commercial Resupply Services Flight with Cloud-Aerosol Transport System (SpaceX CRS-5)
Dec 18th 2014	An Arianespace Soyuz rocket, designated VS10, will launch on a mission from the Guiana Space Centre in South America. The Soyuz will carry four satellites for O3b Networks, which will provide broadband service to developing countries. The Soyuz 2-1b (Soyuz ST-B) rocket will use a Fregat upper stage. Arianespace will oversee the launch. Delayed from November.
Dec 25th 2014	A Russian Angara 5 rocket will launch on its first flight with a dummy payload. The rocket will fly with five Angara first stage cores strapped together and a Breeze M upper stage. Launched from Plesetsk Cosmodrome, Russia.
Jan 20th 2015	United Launch Alliance Atlas 5 rocket will launch the second Mobile User Objective System (MUOS) satellite for the U.S. Navy. Built by Lockheed Martin, this U.S. military spacecraft will provide narrowband tactical communications designed to significantly improve ground communications for U.S. forces on the move. Cape Canaveral Air Force Station, Florida
Jan 23rd 2015	A SpaceX Falcon 9 rocket will launch the Deep Space Climate Observatory for the U.S Air Force, NOAA and NASA. DSCOVR will be positioned at the L1 liberation point to monitor space weather and Earth's climate. Cape Canaveral Air Force Station, Florida
Jan. 29, 2015	Description: SMAP is an Earth satellite mission designed to measure and map Earth's soil moisture and freeze/thaw state to better understand terrestrial water, carbon and energy cycles. It will launch on a Delta II 7320 from Complex 2 at Vandenberg Air Force Base, Calif.

Moonlighting

PLAN FOR PREVENTING RAILWAY CARRIAGES FROM OVERTURNING.—Mr. Barry Jackson, a watchmaker of Durham, exhibited to Alderman Wilson, at the Mansion House, on Wednesday, the model of a design for preventing railway engines and carriages from being upset or accidentally forced off the rails. He said that his proposal was to run along the whole line of way between and at an equal distance from each rail a bar of iron or "fulciment" fixed to the ground, and reaching nearly to the bottom of the engine or carriage, from which on each side strong brackets should fall and enclose the bar, thereby effectually preventing the moving body from being overturned. As an additional security, in the model a groove

Durham County Advertiser , December 25th 1840

Paul Money



Paul regaled with his adventures to the North Pole at the club meeting of November 20th. We learnt about his encounters with a Russian lady after a husband, how not to cross the road to the Kremlin. There was advice on not to drink fruit juice laced with vodka, plus taking photographs on Nuclear powered aircraft carriers from Russian soil.
His photographs of polar bear wee and polar bear dung were particularly interesting!
No honestly though an entertaining talk by Paul, which lasted well over 90 minutes and was well received by all who attended. We look forward to his next visit.

Wife texts husband at work on a cold winter's morning; "Windows frozen, won't open."
Husband texts back; "Gently pour some lukewarm water over it."
Wife texts back 5 minutes later; "Computer still won't work."

Mike Hall's December Night Sky

Diary

2nd	Uranus close to Moon
3rd	The Moon occults Omicron Piscium in the early evening
6th	Full Moon
8th	Mercury at superior conjunction
9th	Moon occults Lambda Geminorium in the morning
11th	Moon occults Acubens, Alpha Cancri in the morning
	Moon form a triangle with Jupiter and Regulus
13th -14th	Geminids meteor shower peaks
14th	Moon at Last Quarter
16th	Moon lies below Regulus, late evening
17th	Crescent Moon close to Spica, morning
21st	Winter Solstice
22nd	New Moon, Ursids meteor shower peak
28th	Moon at First Quarter
31st	Venus and Mercury just 3deg. apart

Planets

Mercury	Superior conjunction 8th, close to crescent Moon and Venus evening of 23rd
Venus	Evening object, easier viewing at the end of the month, shortly after sunset in the SW, when Venus and Mercury are just 3deg. apart on the 31st
Mars	Low in the south west, moving through Capricorn, at twilight; close to the crescent Moon 24th and 25th.
Jupiter	Culminates in darkness at the beginning of December, viewing improves through the month
Saturn	Appears low in the morning sky throughout the month, in Libra progressing towards Scorpious
Uranus	Well positioned in Pisces
Neptune	Losing altitude through the month, poor viewing

Galactic Goodies

Meteors	Best seen in the evening, the Geminids peak on the 14th and the Orsids (Ursa Minor) on the 22nd (new Moon)
Auriga	Contains many 'open clusters': M36 [RA:5h 52m 18s, Dec: +32deg 38m 2s] M37 [RA: 5h 28m 42s, +35deg 51m 18s] M38 [RA: 5h 36m 12s, Dec: +34deg 08m 4sec], close to the 'Cheshire Cat' asterism
Andromeda	M31[Mag: +3.4, RA:00h 42m 44.3s, Dec: +41deg 16m 9s] Spiral galaxy, naked eye object in the 'Great Square of Pegasus'

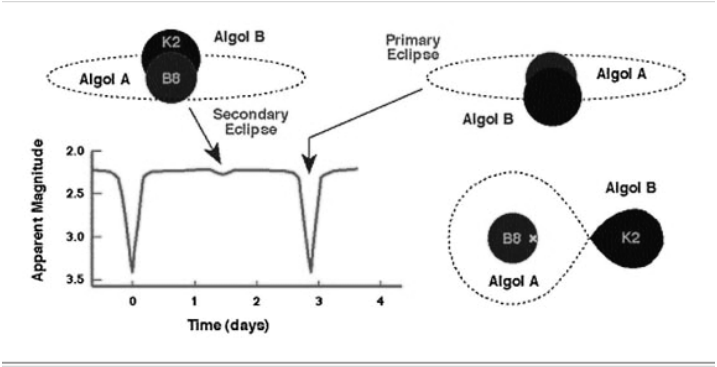
Mike Hall

Algol – The Demon Star

Sky & Telescope have now provided a little active Java Script application which lets you know when the next minima of this eclipsing binary will take place. This is alongside several other useful applications which let you know the positions of the moons of the giant planets of the solar system.

Check it out at http://www.skyandtelescope.com/observing/the-minima-of-algol/
(you'll need to register)

The minima occur every 3 days



The Algol System

The Algol system comprises of three stars: Algol A, a hot, bright B-class star; its eclipsing companion, Algol B, is a larger though fainter, K type orange subgiant ; and Algol C, is a much fainter star that orbits the AB pair every 1.86 years. Because the orbit of the two stars lies in Earth's line of sight, B glides over A like clockwork every 2 days, 20 hours and 49 minutes. Between the deep "primary" eclipses, there's a smaller dip of 1/10 magnitude when the bright star partially eclipses its companion. The separation between the A and B companions is only about 5 million miles, whilst the third star orbits at a comfortable 2.7 AU (about where the asteroid belt is around our sun).
Algol is currently 93 light years away from the Earth, however some 7½ million years ago it passed the solar system at only 9.8 light years and would have shone in the sky with a magnitude of -2.5. It is claimed that this passage may have perturbed comets in the Oort cloud, and we may be seeing the passage of some of these objects into the inner solar system today as many of these cometary object do have period in the order of millions of years.



The Algol system as it appeared on 12 August 2009. This is not an artistic representation, but rather is a true two-dimensional image with 1/2 milli-arcsecond resolution in the near-infrared H-band, reconstructed from data of the CHARA interferometer. The elongated appearance of Algol B and the round appearance of Algol A are real. The form of Algol C, however, is an artefact.

Dr Fabien Baron, Dept. of Astronomy, University of Michigan

Something Astronomical

On Monday 24th November a good turnout from club members at the Showroom in Sheffield to attend a lecture by Dr Stephen Lowry on "The Next Stage of Spacecraft Exploration of Comets", which included details and updates on the recent Rossetta-Philae missions to comet C/67P.



Dr Lowry is a Senior Lecturer at the University of Kent's Centre for Astrophysics and Planetary Science. He specializes in optical and infrared observations and modelling of Solar System Small Bodies, making use of both space-based and large ground-based telescope facilities.

Dr Lowry is a member of the science team for the OSIRIS optical camera instrument on board ESA's Rosetta spacecraft, currently orbiting comet 67P/Churyumov-Gerasimenko, and is Principal Investigator on a new Large Programme at the European Southern Observatory to study near-Earth asteroids.

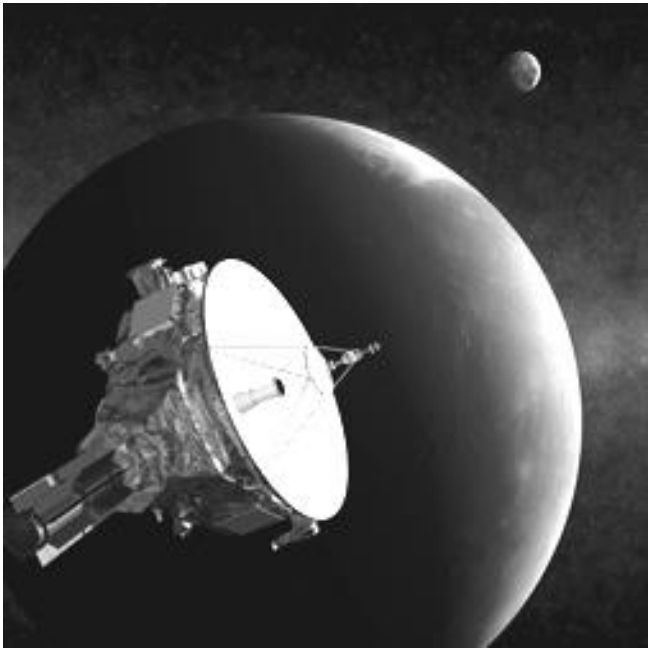


After the lecture our society had more success in winning two of the three raffle prizes (Well dome Mick and Jo – who can be seen with their prizes along with Dr Lowry)

New Horizons

The New Horizons probe on its way to Pluto and possibly some other Kuiper belt objects is due to be woken up from its deep sleep on December 6th.

"New Horizons is healthy and cruising quietly through deep space – nearly three billion miles from home – but its rest is nearly over," says Alice Bowman, New Horizons mission operations manager at the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Md. "It's time for New Horizons to wake up, get to work, and start making history."



Since its launch in January 2006 , the New Horizon's probe has spent two thirds of the time, some 1,873 days, "asleep" although it has had 18 waking periods in that time for course corrections and other tasks. The longest sleep period has been of 229 days. Whilst the spacecraft is asleep much of it is unpowered, the on-board computer monitors things and sends a weekly beacon status back to Earth.

New Horizons will begin observations of the Plutonian system in January 2015 and will have its fly by on July 14th 2015.

New Horizons has now got a second target to travel to after the Pluto encounter, dubbed PT1 (Potential Target 1), new Horizons will reach this object sometime in January 2019 some 44AU away from the sun. This object is estimated to be 30-45 km in diameter and will use 35% of the remaining fuel on board to reach. The object does not yet have a formal name and is called "1110113Y" on the Hubble website.

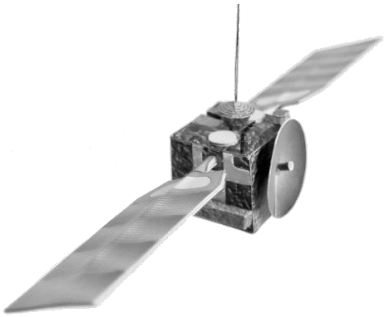
What do we know about PT1 so far? Its orbit is circular and close to the plane of the ecliptic, so it is a Cold Classical Kuiper belt object, meaning that it has had a very different history from Pluto. Pluto is a member of a population of objects in the Kuiper belt whose orbits were changed as Neptune migrated outward, scattering them. Pluto now has an inclined and elliptical orbit that is locked in a resonance with Neptune, such that Pluto orbits the Sun twice for every three times Neptune does. In contrast, Cold Classical objects were probably never tossed around in this way. So PT1 could be very pristine, a cold, never-heated relic of solar system formation.



Mons Huygens

Mons Huygensis the Moon's tallest mountain (but not its highest point). It is about 5.5 km high and is located in the Montes Apenninus. The Montes Apenninus were formed by the impact that created Mare Imbrium.

Venus Express



And now the end is near it faces the final curtain,
It's lived a mission that was full, and got results that is for certain
They planned its charted course, each careful step that the orbit lay.
But now there is no fuel and it will crash going "that" way!

Venus express is an ESA mission that was launched in November 2005. Currently the probe is conducting aerobraking experiments in the Venusian upper atmosphere looking and density changes with altitude and differences between the daylight side and the night side.
By mid-November the periapsis of the orbit (closest point to Venus) had got down to 200km and was reducing very rapidly. To keep the mission "alive" the spacecraft has to raise the periapsis distance, however the indicators show that there is no fuel left and the craft maybe "running on fumes". It's not actually empty yet as the spacecraft is still performing burns. The fuel that is left is so small that mission control have to perform orbit change burns in short "pulses" each at periapsis. It is hoped that the latest series of orbital changes will keep the spacecraft flying for a while.
A statement from ESA gave "We are within the error bands of our bookkeeping fuel measurements. That means that we could run out of fuel at any time; we just don't know. Every day we do minor momentum dumps, but the most likely time it will happen is during an orbital correction manoeuvre (OCM) used to do the regular pericapsis raising required at Venus. Our next set of OCM burns is beginning 23 November and is repeated for about 10 orbits. If we survive past that set of burns, the next set is in February. If we survive past that, the next set of burns is in June. And so on."

Goodbye to Mercury Messenger

The Messenger spacecraft currently orbiting Mercury is expected to use up the last of its remaining fuel on January 21st 2015 when it makes a scheduled orbital correction. The orbit will then decay and it is expected to impact on the planet on the weekend of 28th – 29th March 2015.
Messenger was launched in August 2004 before reaching Mercury orbit in 2011.
Trivia : One of the craters on Mercury "discovered" by Messenger has been named after John Lennon!

Programme for December, January & February

Date	Time	Location	Subject & Speaker
Tue Dec 2nd	17:00	Hicks Building Room LR7	**Using Cosmic Rays to help Climate Change** *Prof. Lee Thompson*
Thu Dec 4th	19:45	Meeting Room	**An Astronomers Guide to Chile** *Gary Gawthorpe*
Wed Dec 10th	19:45	Meeting Room	**Executive Meeting**
Thu Dec 11th	19:45	Meeting Room	*Big Bang Party* *Hannah Hudson-Lee*
Thu Dec 18th	19:45	Meeting Room	**History of Lunar Observing in Britain** **Bill Leatherbarrow**
Thu Jan 8th	19:45	Meeting Room	**Constellation Corner** *Paul D'Silva*
Thu Jan 15th	19:45	Meeting Room	**Planetary nebulae** *Albert Zijlstra*
Thu Jan 22nd	19:45	Meeting Room	**Observing the Moon Basics** *Philip Muffett*
Thu Jan 29th	19:45	Meeting Room	**Imaging Competition** *Tony Morris*
Fri Jan 30th	19:45	Meeting Room	**TBA** Allan Chapman
Sat Jan 31st	19:30	Observatory	**PVE** Les Marsden
Thu Feb 5th	19:45	Meeting Room	**TBA** *Mike Hall*
Thu Feb 12th	19:45	Meeting Room	**TBA** *Roy Gunson*
Thu Feb 19th	19:45	Meeting Room	**Cosmology** *Dr Wojet Hellwing*
Thu Feb 26th	19:45	Meeting Room	**TBA** *Steve Taylor*
Fri Feb 27th	19:00	Observatory	*PVE* *Les Marsden*

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.

Hicks Building is at the University of Sheffield

Observatory is at Lee Brook Lane, Hoober, S62 7SH

PVE – Public Viewing Event

TBA – To be announced

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