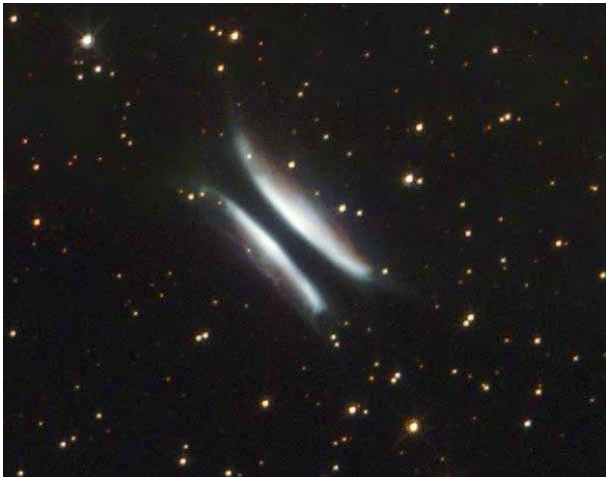
The Messenger
Mexborough & Swinton Astronomical Society
October 2017

Gomez's Hamburger



It looks like two galaxies building up to a fight however this strange image represents a single stellar object which is currently dividing opinion. The thing in the image is nicknamed Gomez's Hamburger for its resemblance to Wimpey's favourite food but more formally called IRAS 18059-3211. It was discovered in 1985 on sky photographs obtained by Arturo Gomez, support technical staff at the Cerro Tololo Inter-American Observatory near Vicuña, Chile.

The first idea was that, Gomez's Hamburger was thought to be a very young planetary nebula at an estimated distance of 6500 light-years. When a main sequence star such as the sun reaches the end of its life, it throws off its outer layers creating some rather intricate structures in the process. These objects are very short lived as the star dies and dims to the point where it is no longer able to sustain the nebula's vibrant colour. Short lived, in this case, means a few ten thousand or hundred thousand years; thus far, we've only discovered a few hundred of these nebulae.

More recent analysis, however, suggests the object is a protoplanetary disk and lies at a distance of 900 light-years. A protoplanetary disk is a dense disk of gas and dust that surrounds new stars. The two "buns represent light reflected through the top and bottom of the disk, whilst the black band is the dust and gas in the middle and the thickest part of the disk. We are observing the disk edge on.

We have a dying star on one hand and a new-born star on the other. Much of the confusion is caused because astronomers can't see inside the thick dark band in between the "hamburger buns." If we could, we'd quickly see if the star was dying, throwing off layers in one last hurrah or if the object is a new star with brand new planets.

The Thoughts of Chairman Les



Last month was quite busy yet again. We had one of our annual visits to Thrybergh County Park for a "Night Under the Stars" but was poorly attended by the public but very well attended by our members. Later in the month we attended their Fun Day and am told that it was a good day all-round, unfortunately I was unable to get there as I was having a few days holiday.

During September we have two guest speakers booked, first was Rod Hind who gave us the Life & Works of Edward Barnard, our second speaker was Paul Money giving us the Triumphs of Voyager part 2. Our first PVE of the season will be at the observatory as usual Fri 29 September. The actual month of October is full with our pretty much standard items of interest. We are to visit our friends at RSPB Sat 7 Oct and we will be there from 1800 to 2030 for some evening observations and an astronomical presentation by yours truly. The month has a full complement of speakers that I'm sure we will enjoy. A full report of our programme can be found on back of this publication.

Les Marsden

Chairman & Founder Member



Via: https://xkcd.com/

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Mike Hall's October 2017 Skynopsis



Diary (all times BST Greenwich, except Sunrise/Sunset, local (Sheffield) time).

1st	Sunrise 7.07 Sunset 18.44
5th	19:41 BST Full Moon
9th	Moon is at perigee (366, 859km) : 7pm Aldebaran 0.6° South of Moon
12th	Moon Last Quarter
15th	Sunrise 7.32, Sunset 18.11
19th	19h New Moon; 18h Uranus at opposition
21st	Orionid meteor shower peaks (21-24 Oct)
22nd	Sunrise 7.45, Sunset 17.55
24th	Saturn 3° South of Moon
25th	Moon at apogee (405,152km)
27th	Moon at First Quarter
29th	BST Ends; Sunrise 6.59, Sunset 16.41

The Solar System
Observations of **Mercury**, **Venus**, **Mars** and **Jupiter** are either very difficult or impossible for the month of October.
Saturn is an early evening object but lost to twilight at the end of the month
Uranus, comes to opposition in 19th, may be seen as a small disc 4" in size, will be 21° above southern horizon at best. At magnitude 5.7 will be visible in binoculars.
Neptune, past opposition last month, 28° above southern horizon at best. Currently mag 7.8 and 2½" in size, could be seen in good binoculars.
Meteors Orionid Meteor Shower; best viewed 21st October; radiant lies midway between Orion and Gemini after 20.00h

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Strings

The shortest string of letters that contains the words ONE, TWO, THREE, each spelt out in order but not necessarily using adjacent letters can be done in eight letters. The answer is THRWONEE. Now can you do the same for the names of all the planets, and we will include PLUTO. So that's MERCURY, VENUS, EARTH, MARS, JUPITER, SATURN, URANUS, NEPTUNE, & PLUTO.

Answer given elsewhere in the newsletter. (Hint – there are 26 letters in the answer!)

Keep Your Eyes Open



Phil Muffett

Saturday 7th October – RSPB Old Moor

The RSPB team at Old Moor and Mexborough and Swinton Astronomical Society are presenting an evening of natural spectacle. The RSPB staff take public on a guided walk to see the birds coming in to roost at sunset and then as the skies darken our members will show the public the wonders of the night sky.

We will need members to bring telescopes and to help out.



Carlton Baugh

Thursday 19th October – Mapping the Universe to measure dark energy

Professor Carlton Baugh will describe why we think there is dark energy in the Universe and how we can use maps of galaxies to understand more about the dark energy and will review the ways in which cosmic cartography has evolved over the years.
Carlton is Professor in the Department of Physics at Durham University and a member of the Institute for Computational Cosmology. His research interests include modelling the physics of galaxy formation and devising new ways to



Tony Morris

Thursday 26th October

Tony Morris will be showing us the results of his recent "expedition" to view the recent total eclipse in the USA.



Les Marsden

Saturday 11th November – RSPB Old Moor

The evening will start with a choice of guided walk to our hides to watch the wonderful wildfowl come in to roost. You may even see the barn owls return to their nests or even our elusive bitterns settling down in the reed beds. Following the walks the astronomy society will be on hand to show you the wonders of the night sky through their powerful telescopes. In the classroom will be an amazing presentation of film footage of the stars. Meanwhile in the visitor centre there will be a demonstration of a planetarium to show you the wider planetary systems. Up in our cafe soup and hot drinks are available to warm you up.



Dan Tovey

Thursday 23rd November:

Professor of Particle Physics at Sheffield University. Works on the ATLAS detector at the Large Hadron Collider in Cern

(See diary page for times and location)

Saturday September 16th – Thrybergh Country Park

Avoiding the plank and keel hauling, members of MSAS help out at the Pirate Fun Day at Thrybergh, Rotherham. Mick C and Tony H show young pirates and older land lubbers how to observe sun spots and prominences.



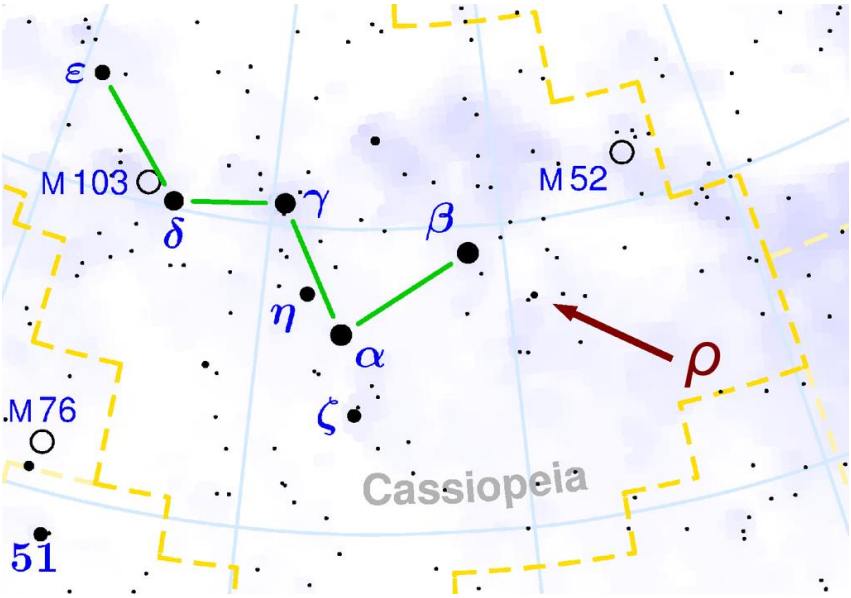


MSAS members attending HAWS weekend at Horncastle



Strings - MNVESARCPJLUPITHOURYANUSER

Rho Cassiopeia



Rho Cassiopeia (ρ Cassiopeia) is a yellow hypergiant star in the constellation Cassiopeia. It is around 8,200 light-years from Earth, yet can still be seen by the naked eye as it is 500,000 times brighter than the Sun. On average it has an absolute magnitude of −9.5, making it visually one of the most luminous stars known. Its diameter measures 450 times that of the Sun, approximately 630,000,000 kilometers, or about twice the size of the Earth's orbit. it is one of the rarest types of stars. Only around a dozen are known in the Milky Way.
ρ Cassiopeia usually has an apparent magnitude near 4.5, but in 1946 it unexpectedly dimmed to 6th magnitude and cooled by over 3,000 Kelvin, before returning to its previous brightness. A similar eruption was recorded in 1893, suggesting that it undergoes these eruptions approximately once every 50 years. This happened again in 2000–2001, when it was observed by the William Herschel Telescope.

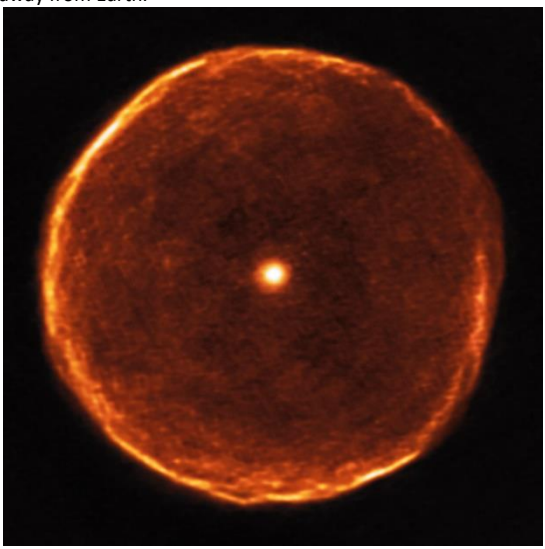
The nature of ρ Cassiopeia was eventually clarified as a massive luminous unstable star, pulsating and losing mass, and occasionally becoming obscured by strong bouts of mass loss.

As ρ Cassiopeia is one of the most luminous yellow stars known. It is close to the Eddington luminosity limit which is the maximum luminosity a star can achieve when there is balance between the force of radiation acting outward and the gravitational force acting inward.

ρ Cassiopeia normally loses mass at around 10^{-6} $M_\odot$/yr, hundreds of millions of times the rate of the solar wind. It has a measured temperature of over 7,000K, and a radius around 400 $R_\odot$, and pulsates irregularly producing small changes in brightness. Approximately every 50 years these larger outbursts blows off a substantial fraction of its atmosphere, causing the temperature to drop around 1,500K and the brightness to drop by up to 1.5 magnitudes. In 2000–2001 the mass loss rate jumped to 5×10^{-2} $M_\odot$/yr, ejecting in total approximately 3% of a solar mass or 10,000 Earth masses

Carbon Star U Antliae

New observations from the Atacama Large Millimeter/submillimeter Array (ALMA) have revealed a remarkably thin spherical shell around U Antliae, a star located in the southern constellation of Antlia, about 900 light-years away from Earth.



Around 2,700 years ago, U Antliae shed a small percentage of its mass at high speed from its outer surface over a time of only a few hundred years. The material making up the shell seen in the new ALMA data Examination of U Antliae's shell in further detail shows some evidence of thin, wispy gas clouds known as filamentary substructures.

Stellar shells of this type show a rich variety of chemical compounds based on carbon and other elements in the measured spectrum. They also help to recycle matter, and contribute up to 70% of the dust between stars."
U Antliae is about 830 LY from Earth, and can be seen from the southern hemisphere at apparent magnitude 5.3. It is however variable and sometimes dims down to magnitude 6.04. The star has a mass similar to the sun, but a radius of 350 times that of the sun, which would put the outer surface just past the orbit of Mars if placed in the solar system! The thin shell of material is moving at some 20 km/sec, and has a radius of 0.05 parsecs (0.16 LY or 1.5×10^{12} km).

The star is still losing mass from its surface, but at a much lower rate than the historic pulse of mass loss which gave rise to the shell (by a factor of 1000). The ALMA array also measured the velocity of the current mass loss which is only about 5km/sec

A similar star can be seen in the northern hemisphere - Y Canum Venaticorum. It is one of the "Reddest" stars in the sky and can easily be seen in binoculars shining at its best at magnitude 4.86 (variable 4.86 – 7.32). Again the star has a thin shell of ejected material (you need a really good infra-red telescope to see it! It has a nickname of "La Superba", and physically like U Antliae has a radius larger than the Martian orbit. La Superba is about 1,000LY from Earth.
Both these stars will eventually become white dwarves.

Diary

Date	Time	Location	Subject / Event	
Thu Oct 5th	**19:45**	**Club Room**	**Stars : Part 2 Brightness & Distance**	*Roy Gunson*
Sat Oct 7th	**18:00**	**Old Moor RSPB**	**Public Event**	*Les Marsden*
Wed Oct 11th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu Oct 12th	**19:45**	**Club Room**	**Time and Tide**	*Alan Dibbo*
Thu Oct 19th	**19:45**	**Club Room**	**Mapping the Universe to Measure Dark Energy**	*Prof Carlton Baugh*
Thu Oct 26th	**19:45**	**Club Room**	**Solar Eclipse Report**	*Tony Morris*
Fri Oct 27th	**19:45**	**Observatory**	**PVE**	*Les Marsden*
Thu Nov 2nd	**19:45**	**Club Room**	**Comets**	*Peter Jalowiczor*
Wed Nov 8th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu Nov 9th	**19:45**	**Club Room**	**Stars : Part 3 Age & Development**	*Roy Gunson*
Sat Nov 11th	**18:00**	**Old Moor RSPB**	**Public Event**	*Les Marsden*
Thu Nov 16th	**19:45**	**Club room**	**Scanning for Meteors**	*Phil Muffett*
Thu Nov 23rd	**19:45**	**Club Room**	**TBA**	*Prof Dan Tovey*
Fri Nov 24th	**19:45**	**Observatory**	**PVE**	*Les Marsden*
Thu Nov 30th	**19:45**	**Club Room**	**Winter Sky**	*Andy Kirton-Vaughan*

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

Anniversary

The committee has set a date of June 15th for next year's Solstice Dinner. We are looking at possibly hosting an anniversary conference, and maybe a "trip". If any member has suggestions please talk to a committee member below.

Les Marsden – Chairman
Shaun O'Dell – Secretary
Glenn Marsden – IT Officer
Paul D'Silva – Fundraising Officer
Andrew Kirton-Vaughn – Observations Officer
Roy Gunson – Deputy Chair
Mick Collinson – Treasurer
Tony Morris – Curator
Steve Taylor – Programme Coordinator
Phil Muffett – Member without Portfolio