The Messenger
Mexborough & Swinton Astronomical Society
August 2016



The End for Philae

On 12 November 2014 the robot lander Philae touched down on the surface of Comet 67P/Churyumov-Gerasimenko.

On 27 July 2016, the Electrical Support System (ESS) on Rosetta, which is used to communicate with Philae, was switched off to save energy before September 30, the day the Rosetta mission will come to an end.

The robot lander Philae made it into history books: he didn't just land on a comet, it also told the world about it at the same time. The lander reported the landing, step by step, in real time, making everyone a part of his mission using twitter.

The landing tweet "Touchdown! My new address: 67P" was retweeted more than 36,000 times, and Philae had up to 448,000 followers on Twitter (@Philae2014).

Switching off the communication is part of the preparations for Rosetta's end of mission. By the end of July 2016, the spacecraft will be some 520 million km from the Sun, and will start facing a significant loss of power – about 4W per day. In order to continue scientific operations over the next two months and to maximise their return, it became necessary to start reducing the power consumed by the non-essential payload components on board.

No signal has been received by Rosetta from Philae since last July and earlier this year the lander was considered to be in a state of eternal hibernation. In spite of this, the communication system (ESS) was kept on until now in the unlikely chance that Philae would re-gain contact. Although Rosetta has reached altitudes well below 10 km over the surface of Comet 67P/Churyumov-Gerasimenko, however, no signal from the lander has been received since July 2015.

The Thoughts of Chairman Les



Hello everyone this is your chairman speaking and I hope that you are all well.
I don't have a lot of news about the extension to the observatory because a big problem is that we can't seem to get any sense or replies from Yorkshire Water Services. In the past few months we have had at least two site meetings with varying personal from YWS and discussed all the items of interest to us securing our site on a permanent basis. Until we get some answers we can't move on with much else.
It was decided at the last meeting of the Project Aquarius Design Group in May it was agreed that as we haven't got much to discuss because of the reasons mentioned above we would have the next meeting in late September hoping that there will be a few very important replies from YWS. However we were all tasked with continuing with our particular areas of expertise and therefore have some good reports for that meeting helping us to move forward with the extension. As far as my area of providing the working sketches I have been very busy and I have got a presentation of about 16 sketches to show the group. I have used the information from the previous meetings as directed by the minutes as to what we think is needed. After taking all things into account and put them on paper there has not been any approval to any of the ideas. I feel sure that come the September meeting and the sketch details being seen for the first time this might just change. There is NOTHING AGREE as yet.
But never fear all this will come to pass in the future.

I wish you clear skies

Les Marsden

Les Marsden FRAS

The Dalesman

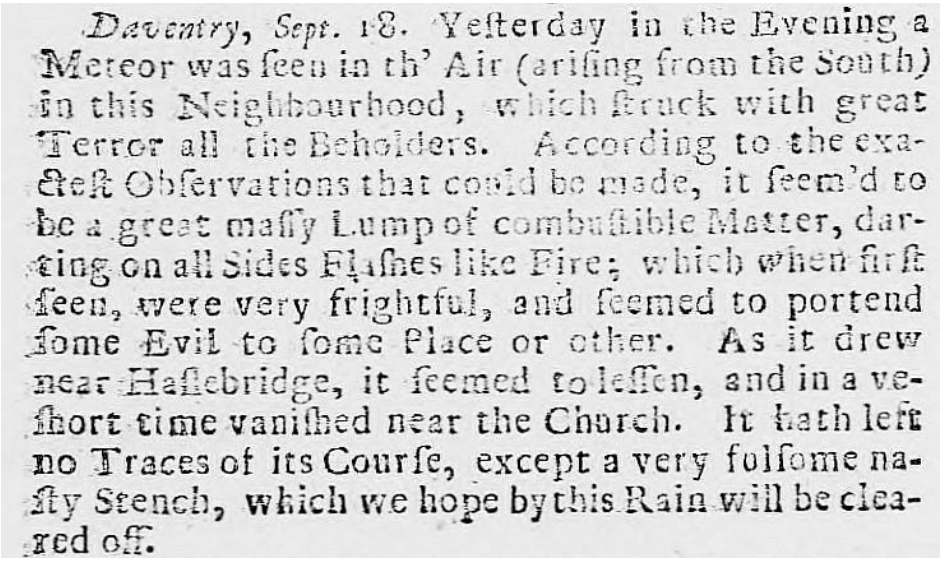
Our secretary (Shaun O'Dell) has received the following e-mail which may be of interest to members.

Hi,
In 2014, I wrote an illustrated article for the Dalesman magazine about Yorkshire's astronomical observatories. As part of my research, I visited your observatory and meeting/ talk, spoke to several members and took some photos.
Whilst I submitted the article shortly afterwards, it has taken a while to be published, as the magazine has had an over-supply of work.
However, I thought you might be interested to know that the article is due to be published in the September edition.
I would like to thank you for your assistance with my research, and I hope that I have managed to cover the subject in an engaging and positive way.
Thanks and best regards,

Adrian Ward

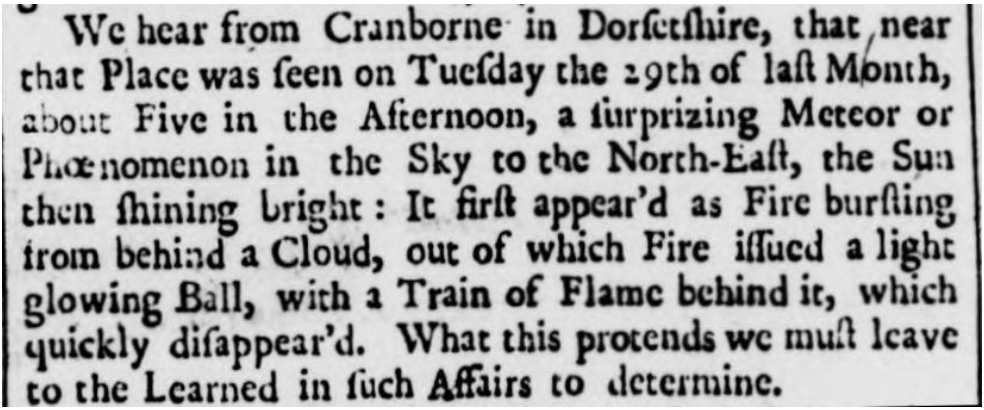
Strange Reports of Meteors

As we approach the time of probably the best observable meteor show from the UK, here are some old odd newspaper reports of what seems to have been spectacular fireballs.



Daventry, Sept. 18. Yeſterday in the Evening a Meteor was ſeen in th' Air (ariſing from the South) in this Neighbourhood, which ſtruck with great Terror all the Beholders. According to the exacteſt Obſervations that could be made, it ſeem'd to be a great maſſy Lump of combuſtible Matter, darting on all Sides Flaſhes like Fire; which when firſt ſeen, were very frightful, and ſeemed to portend ſome Evil to ſome Place or other. As it drew near Haſlebridge, it ſeemed to leſſen, and in a ſhort time vaniſhed near the Church. It hath left no Traces of its Courſe, except a very fulſome naſty Stench, which we hope by this Rain will be cleared off.

Caledonian Mercury - Thursday 25 September 1729



We hear from Cranborne in Dorſetſhire, that near that Place was ſeen on Tueſday the 29th of laſt Month, about Five in the Afternoon, a ſurprizing Meteor or Phœnomenon in the Sky to the North-Eaſt, the Sun then ſhining bright: It firſt appear'd as Fire burſting from behind a Cloud, out of which Fire iſſued a light glowing Ball, with a Train of Flame behind it, which quickly diſappear'd. What this protends we muſt leave to the Learned in ſuch Affairs to determine.

Stamford Mercury 7th September 1738

Mike Hall's August 2016 Skynopsis



Diary *(all times BST unless otherwise specified; Sunrise/Sunset local time)*

1st	*Sunrise 05.22, Sunset 21.46, twilight 21.46*
	Mars in Libra, Alt.11deg. South-South West
2nd	*20.46 New Moon*
4th	*06.00 Venus 3 deg North of Moon*
5th	*09.00 Venus 1.1 deg North of Regulus*
6th	*04.00 Jupiter 0.2 deg North of Moon*
8th	*Sunrise 05.34, sunset 21.31, twilight 20.58*
10th	*Moon First Quarter, Moon is at apogee 404, 264 km*
11th	*Mars at 8 deg. south of Moon*
12th	*24.00 Saturn is 4 deg South of Moon*
15th	*Sunrise 05.46, Sunset 20.19, twilight 20.58*
16th	*21.00 Mercury 27 deg East of Sun, greatest elongation*
18th	*10.28 Full Moon*
19th	*24.00 Neptune 1.1 deg South of Moon*
20th	*24.00 Asteroid Pallas at opposition mag +9.2*
22nd	*Sunrise 05.58, Sunset 20.19, twilight 20.58, Moon at perigee 367, 049km*
24th	*Mars 1.8 deg North of Antares*
25th	*04.42 Moon at last quarter, Sunrise 04.44, Sunset 21.45, 18.00 Mars 4 deg South of Moon*
27th	*05.00 Mercury 5 deg South of Venus*
29th	*Sunrise 06.10, Sunset 20.03, twilight 20.40*

The Planets

Mercury	*Even though Mercury reaches greatest Eastern elongation on 16th it will not be observable from out latitudes.being only 3° above horizon at sunset.*
Mars	*Best viewed 1st August, 21.00 in Libra, Alt. 110;In Scorpio, just below just below Deshubba (delta) on the 9th*
Jupiter	*Dissappearing fast into twilightBest, setting at 10:30pm on 1st and 8:30pm on 31st.*
Saturn	*Low in South, setting about 1am on 1st and 11pm on 31st.*
Uranus	*Magnitude 5.8 object, observable after rising a little before midnight on 1st and about 8:30pm ayt month end.*
Neptune	*Visible all month at magnitude 7.8 – see chart for position.*

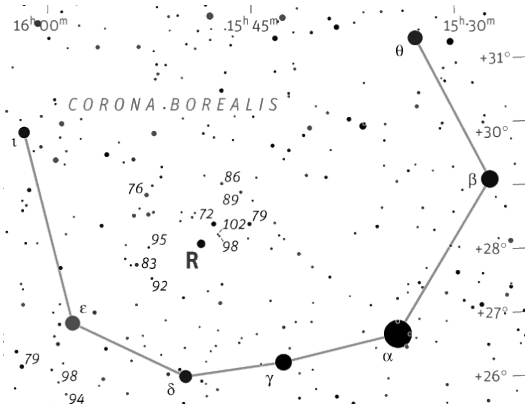
Galactic Goodies

Perseids	*from 17 July to 24 August, 9th to 12th highest zenith hourly rate*
Asteroid Pallas	*In opposition on 20th August, in Equleus, between Pegasus to the East and Delphinus to the West at mag. +9*
Double Stars	*61 Cygni, Alpha Herculis, Epsilon Lyra (double double), Xi Bootes*
Summer Triangle	*Vega in Lyra, Deneb in Cygnus and Altair in Aquila*
	M29 (RA 20h 23m 56s,Dec +380 31'), M71(RA 19h 53m 46s, Dec +180 46' 45"),
	NGC 6905 (Dec 20h 22m 23s, RA +200 06' 16")

An Unusual Variable Star

***R* CRB (R Coronae Borealis).**

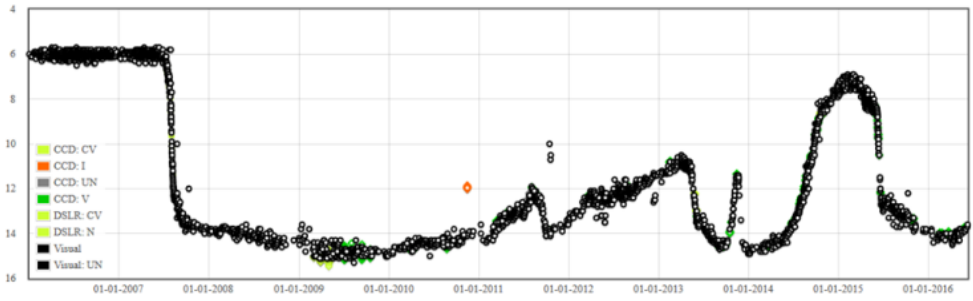
The ultimate “disappearing” star, it doesn’t disappear completely, of course, but it drops in brightness to less than 0.01% of its maximum brightness – that’s a drop down to $^{1}/_{10,000}{}^{th}$.
The prototype of this rare type of star is called R Coronae Borealis. At present only a mere 50 or so are known but none understood.



At its brightest R CrB itself is easy to find, just off to the centre of the curve of the constellation, as can be seen in the diagram to the left.
Normally, this impressive class G0 supergiant stands at a faint but accessible sixth magnitude (around 5.9). Then, on the average of every few years, but with stunning unpredictability, dropping to as faint as magnitude 12, even 15 and taking long periods of time to recover.

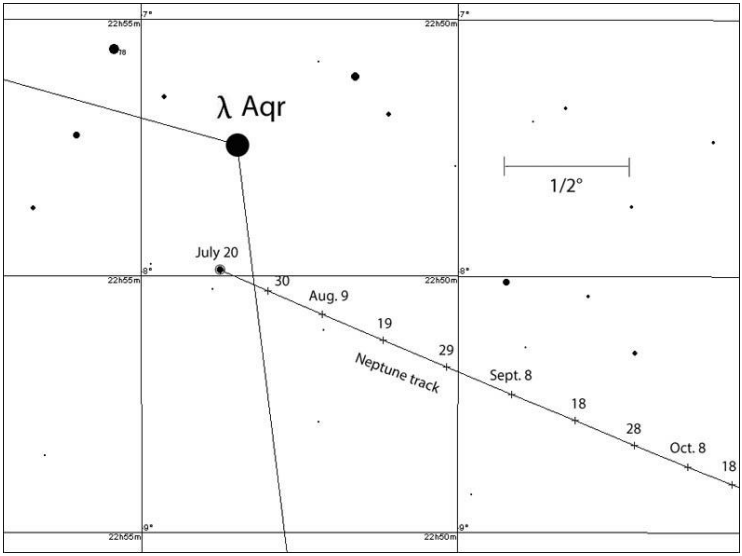
R CrB is much too far for direct parallax measure, but similar stars in the Large Magellanic Cloud have luminosities around 10,000 times that of the Sun. If similar, "R" would have to be between 4500 and 5000 light years away. An estimated temperature of 5000- 5500 Kelvin would give it a radius of some 100 times the sun, which is half the distance from Earth to Sun. R Cor Bor has a mass of 80% that of the sur, its great luminosity due to strange chemistry. The spectrum reveals only a trace of hydrogen, leading us to conclude that its outer layers are made largely of helium, the star's original hydrogen envelope long-since expelled. R CrB is rich in carbon, which is the result of helium fusion. The high luminosity drives heavy mass loss estimated at 100,000 times the rate in the solar wind. About one percent of the outbound gas condenses into carbon dust, but in discrete "puffs." if one comes off in the line of sight, the "soot star" then hides from our view. In support, we see an inner surrounding dust shell with a temperature of just under 900 Kelvin that starts 100 stellar radii from the star and that is encased in a huge, cold "fossil cloud" some 25 light years across. Why the star huffs and puffs is unknown. Moreover, the dust should be made where the gas sufficiently chills, at least 20 stellar radii out. However, the spectrum shows it to be made 10 times closer, perhaps as a result of outbound shock waves. If one of these carbon dust clouds happens to be in our line of sight, it blocks the light of R, causing it to dim. Think of the soot that forms on the inner glass of an old-fashioned oil lamp and you get the picture. Only when the cloud has expanded and thinned – or is blown away by continued winds – does the star return to its normal brightness.

Light Curve for R CRB



Finding Neptune

Neptune coming up to opposition on the

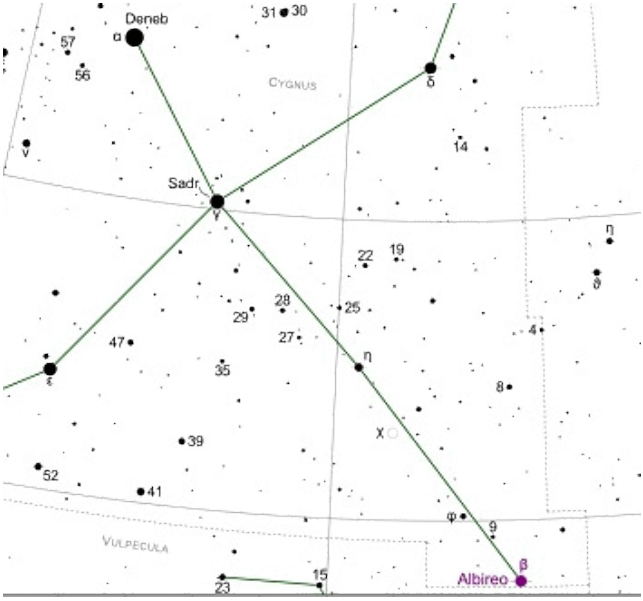




Albeiro

Stars in the Rotherham Sky
3: Albireo

Albireo or Beta Cygni is the fifth brightest star in the constellation Cygnus. In the Bayer designation it is classed as Beta, it is fainter than Gamma, Delta, and Epsilon Cygni.
Albireo appears to the naked eye to be a single star of magnitude 3 but through a telescope, even low magnification views resolve it into a double star. The brighter yellow star makes a striking colour contrast with its fainter blue companion star.
Albireo is about 430 light-years away from the Earth. The telescopically resolved double star, consists of Albireo A (amber, apparent magnitude 3.1), and Albireo B (blue-green, apparent magnitude 5.1).
Separated by 35 seconds of arc, the two components provide one of the best contrasting double stars in the sky due to their different colours. The orbital period of these two stars is thought to be of the order of at least 100,000 years with an orbital distance of 2500 AU.
The spectrum of β Cygni A was found to be composite when it was observed in the late 19th century, leading to the supposition that it was itself double. This was supported by observations from 1898 to 1918 which showed that β Cygni A had a varying radial velocity
] In 1976 speckle interferometry was used to resolve the pair at the 2.1-meter telescope at the Kitt Peak National Observatory. An orbit for the pair has since been computed, but as only approximately a quarter of the orbit has been observed, the orbital parameters must be regarded as preliminary. The period of this orbit is 100 years. The current angular separation between the components is around 0.4 arc seconds, (40AU) too close to be visually resolved except with instruments of at least 20" in aperture with exceptionally stable atmospheric conditions.
Albireo B is a fast-rotating Be star, with an equatorial rotational velocity of at least 250 kilometers per second. Its surface temperature has been spectroscopically estimated to be about 13,200 K.



The brighter yellow-coloured member, Albireo A, is a much closer double made of a third magnitude (3.3) class K3 bright giant and a hotter but dimmer (magnitude 5.5) class B9 dwarf, the two stars not readily separable in the telescope.
The K giant has a temperature of around 4400 Kelvin, a luminosity 950 times that of the Sun, a radius 50 times solar, and a hefty mass of about 5 solar, while the close companion comes in at 11,000 Kelvin, 100 solar luminosities, and 3.2 solar masses.
The visually-seen blue star, Albireo B, is similar to Albireo A's companion, and is a class B8 dwarf with a temperature of 12,100 Kelvin, a luminosity of 190 Suns, and a mass of 3.3 solar.

Programme for August & September 2016

Date	Time	Location	Subject / Event	
Wed Aug 3rd	**19:45**	**Club Room**	**Executive Committee Meeting**	
Thu Aug 4th	**19:45**	**Club Room**	**Astro Clinic**	***TBA***
Sun Aug 7th	**14:00**	**Observatory**	**CAE – Solar Observing**	
Thu Aug 11th	**19:45**	**Club Room**	**Perseids**	***Roy Gunson***
Fri Aug 12th	**19:30**	**Observatory**	**Perseids Meteor Shower**	
Sun Aug 14th	**10:00**	**Old Moor RSPB**	**View the Sun as Never Before**	
Thu Aug 18th	**19:45**	**Club Room**	**TBA**	***Marcus O'Flarherty***
Thu Aug 25th	**19:45**	**Club Room**	**Autumn Sky**	
Thu Sep 1st	**19:45**	**Club Room**	**A Celebration of Hubble**	***Jez Robinson***
Wed Sep 7th	**19:45**	**Club Room**	**Executive Committee Meeting**	
Thu Sep 8th	**19:45**	**Club Room**	**TBA**	***Phil Muffett***
Fri Sep 9th	**19:45**	**Observatory**	**PVE**	
Sat Sep 10th	**18:30**	**Thryberg Park**	**A Night Under The Stars - POI**	***Les Marsden***
Thu Sep 15th	**19:45**	**Club Room**	**Astronomy & Astro Photography with the Skywatcher Mak 180 Pro & Registax**	***Mick Nicholls***
Sat Sep 17th	**19:45**	**Boston Castle**	**PO Event (TBA)**	
Thu Sep 22nd	**19:45**	**Club Room**	**MSAS Astromind**	***Les Marsden***

Old Moor RSPB – Manvers Way, Barnsley, S73 0YF
RA – Rockingham Arms, Wentworth
Clifton Park –Clifton Lane, Rotherham, S65 2AA
Thryberg Country Park – Doncaster Rd, Rotherham, S65 4NU
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

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