

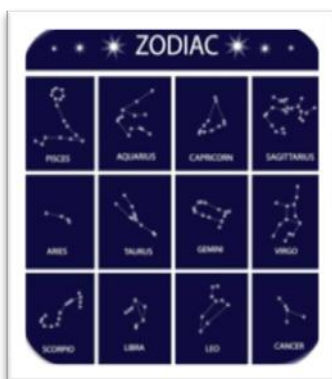
Issue: September 2016



## >>> Ayrshire Astronomical Society Newsletter

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### **Forthcoming Events:**

**19<sup>th</sup> May 2017**

Prof Brian Cox tours the UK with his live show to explore the wonders of the universe. He is at the SSE Hydro on the 19<sup>th</sup> May 2017. It is still far away, but tickets do sell quickly.

### **Next Meeting:**

**26<sup>th</sup> September**

**At Prestwick Academy**

### **Equipment and Beginners Night and Workshop**

Whilst this is a beginner night and we will have different corners again such as imaging, setting up telescopes, solar corner etc think of it as beginning a new area or moving up in astronomy rather than just being a total novice. In that way we can all get something out of the evening by sharing our knowledge at all levels. The evening will be open to the public, so it will be great if we have a variety of items to display and members will be on hand to answer questions. There are no formal presentations planned but short ad hoc talks are on the cards.

### **September Night Sky**

Hopefully you all had a glimpse at the Perseid Meteor Shower even though it was cloudy the night they peaked. If you managed to take some photos, please share them with us.

September is a good month to spot Neptune. It came into opposition at the beginning of the month (closest to Earth). Its magnitude is +7.8 and is easily spotted with binoculars. By using a small telescope you can even see Triton.

The Double Double. There is a lovely double star called Epsilon Lyrae. It's located up and to the left of Vega, the 5th brightest star in the sky. You might even see them with the unaided eye. With good seeing conditions, using a telescope, you could see that there are two stars each - hence - The double double.

The Moon this month:

1st New Moon 9<sup>th</sup> First Quarter 16<sup>th</sup> Full moon 23<sup>th</sup> Last quarter

## Update on The Juno Mission

On 27<sup>th</sup> August, 12.51UTC, Juno passed by only 2600 miles above the clouds of Jupiter, the closest pass ever achieved. It will also be Juno's closest approach to Jupiter out of all the orbits planned on its mission. (See image in last newsletter) Juno took some amazing pictures which are still getting analysed as it passed Jupiter at 130000 mph. There have been some pictures released taken by JunoCam. We are still awaiting high resolution images.

Here is one of the South Pole

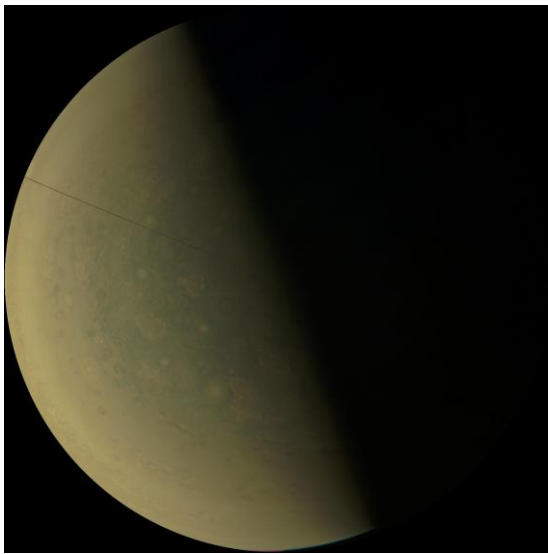
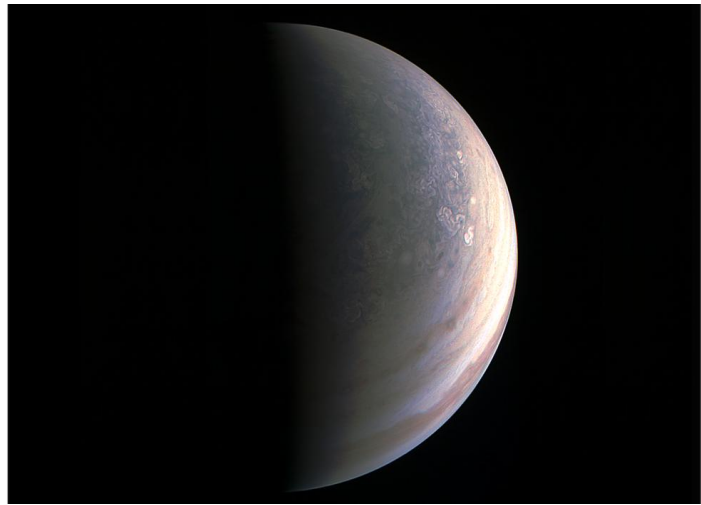


Image of Jupiter (angled towards the north pole) taken at 703000km away



For those who use Internet, there is an app you can download from NASA to track Juno. It is called NASA's eyes and a section is 'Eyes on the Solar System'. You can track and get information about planets and spacecraft.

## Trip to Asteroid Bennu

On the 8<sup>th</sup> September, NASA launched an Atlas V rocket off Cape Canaveral, Florida, starting a 7-year mission to fly to Bennu and return to Earth, bringing back a sample of the asteroid. The mission is called OSIRIS Rex which is an acronym for

O = Origins

SI = Spectral Interpretation

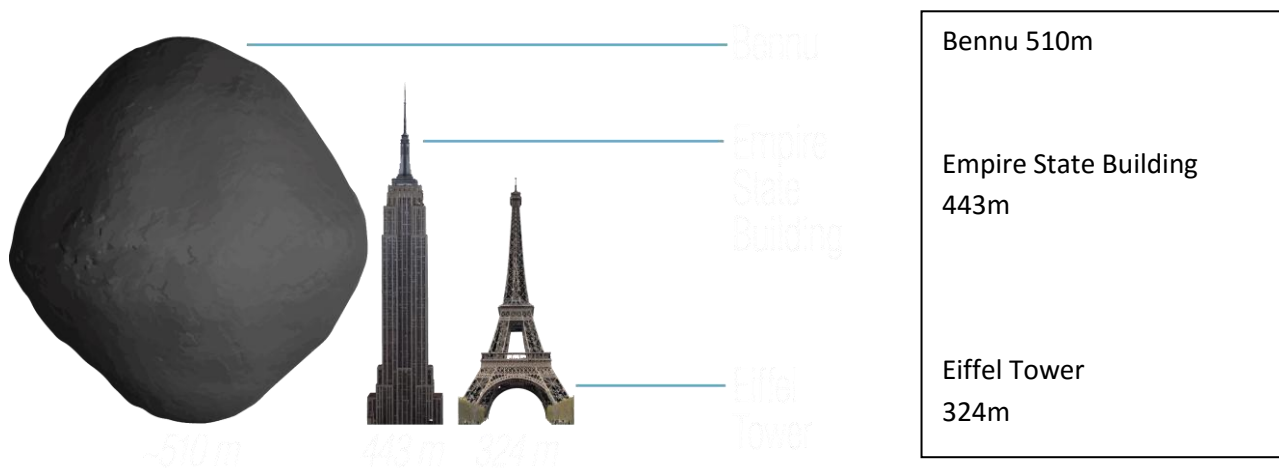
RI = Resource Identification

S = Security

Rex = Regolith Explorer



In mythology there is an Egyptian God called Osiris and shows some parallels to this mission. Osiris was believed to have spread the understanding of agriculture throughout the Nile Delta hence bringing life to the ancient world. Well, NASA's mission seeks to return samples of the asteroid which may contain organics which could have led to life on earth.



Bennu has a polar diameter of about 510m. It has been chosen by scientists due to its size, distance to Earth and composition. It is a rare carbon rich asteroid and is expected to have organic compounds and water-bearing minerals. Bennu is also a potential Earth impactor and is listed on the Sentry Risk table (see below). This is NASA’s first mission to return an asteroid sample. It is designed to bring back a sample as large as 2km.

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### Presidents’ Word

As we did last year, we are starting the season with a Beginners Night. This has several objectives; first to help complete beginners and hopefully draw in some new members; second to help existing members “up their game” by chatting to more knowledgeable members and finding out how to get to the next step in whatever they are interested in, e.g. imaging, solar, image processing or just buying better kit; third it allows members a time to meet each other and new members and have a chat – not necessarily about astronomy – something we always seem to run out of time for at normal meetings. So hopefully there is something for everyone and I hope to see you all there (and have time for a chat).

You will have noted from the newsletters last year and the occasional announcement that we have teamed up with KESS (Kilmarnock Engineering and Science Society) to share talks and in particular visit local schools with a view to raising interest in STEM subject (Science, Technology, Engineering and Mathematics). This year we intend to do the same and the selected school is Netherkind School, Cumnock. If you would like to get involved please let me know. Also with KESS we have a couple of up to the minute joint talks which will be held in Kilmarnock at the New Ayrshire Academy building. On the 8th of November, Dr Colin McInnes will talk to us on Solar Sails with particular emphasis on the engineering aspects and on the 25<sup>th</sup> Of October, Professor Martin Hendry will talk to us about Gravitational Waves. Both speakers are acknowledged experts in their subjects and the talks should be very interesting and informative. Please put the dates in your diary. As these are joint meetings they are free to AAS members.

Our own speaker programme is now on the website, and is set out below from which you will see that we have a number of new and familiar speakers and a diverse array of topics. It is difficult to select any one above the others as they will all be interesting and well delivered, but an opportunity to hear about the Prestwick Spaceport in March must be one for an asterisk in the diary.

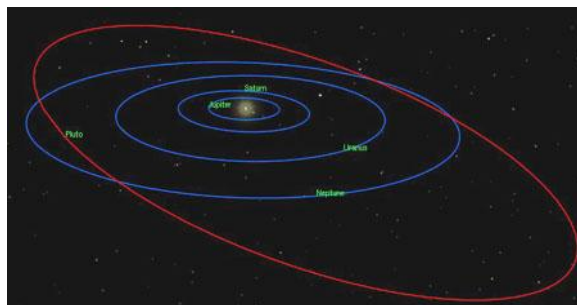
**AAS Speaker Programme for 2016 2017**

26th September 2016		Beginners and Equipment Night
24th October 2016	Prof. Danny Goreman	James Clark Maxwell his Life, Work and Impact - from Radio to Saturn
28th November 2016	Dr Alex McKinnon	Gamma Ray Astronomy of the Sun and Moon
12th December 2016	Provisional date	Christmas Meal venue to be determined
23rd January 2017	Dr Paul Harknesses	A Sample Retrieval Campaign from a Mars Analogue Environment
27th February 2017	Mark Klimex	Light Sources their Emission Spectra and Problems they cause for Astronomy
27th March 2017	Richard Jenner	Director Prestwick Spaceport Title TBC ( but about the Spaceport)
24th April 2017	TBC	TBC
15th May 2017	AGM	Speaker/events after AGM TBC

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**Alex's Space**

It is a well-known fact that living on planet Earth can be expensive, but let's not forget it does include an annual free trip around the Sun! This trip takes 365 ¼ days which is ample time to enjoy the fantastic views. However, anyone living on planet Pluto doing the same trip would have considerably longer to view their surroundings. 90520 Earth days to be exact. No, it's not a misprint. It really does take 248 years for Pluto to orbit the Sun, which means since Pluto was discovered in 1930 it has yet to make one complete orbit of the Sun, whereas Earth has made 86 orbits since then and planet Mercury has made a staggering 344 orbits. Now, that's what I call motoring in the fast lane!



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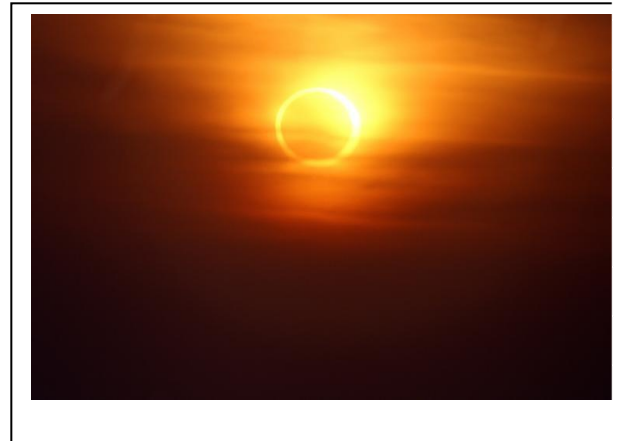
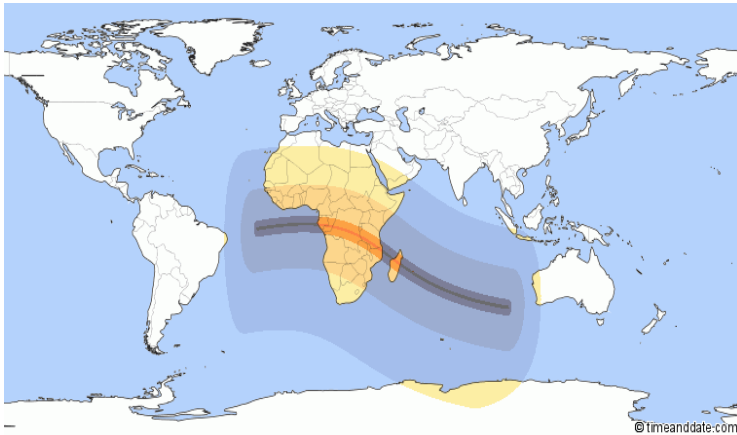
## Isabelles' Solar Corner



On the 1<sup>st</sup> of September was an annular solar eclipse visible in the southern part of Africa as shown on the map below.

An **annular solar eclipse** happens when the moon covers the Sun's centre but leaves the outer edge of the Sun visible, creating a 'ring of fire', also called an annulus.

When a solar eclipse happens, the moon covers the full disk of the sun.

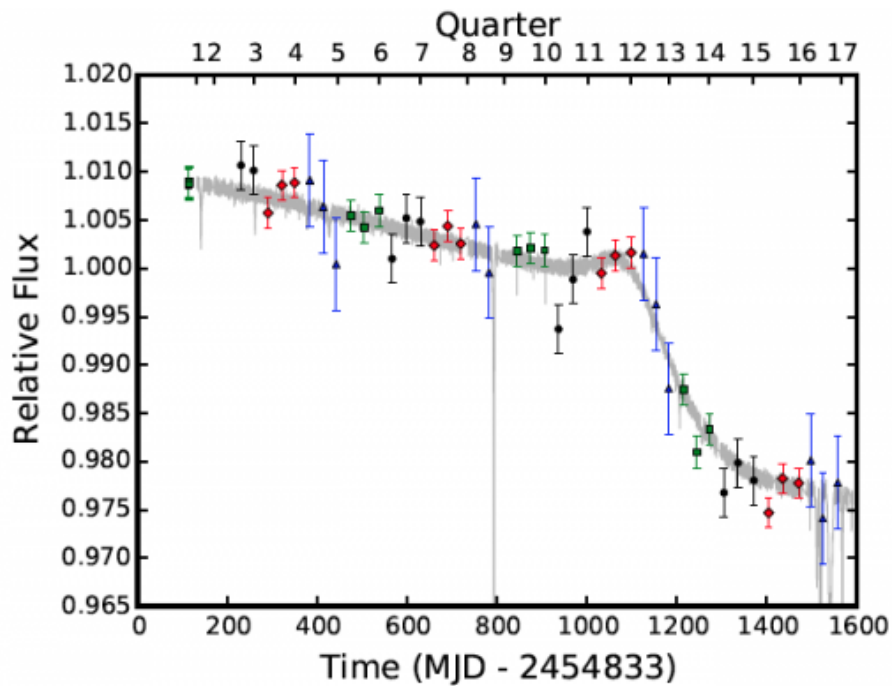


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## Feature Article by Nick Martin

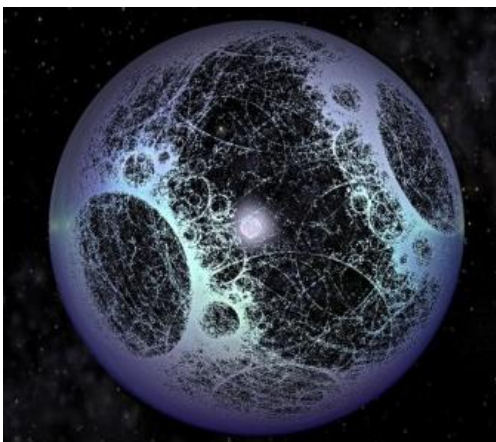
### Tabby's star KIC 8462852

Great excitement has been caused in the media and among astronomers by the Kepler mission's discovery of a star which showed strange but brief dimming events of up to 20%, which lasted from 5 to 80 days. On top of this was the equally strange long term (about 3 ½ year) light curve shown here with a total change in brightness of 3.5%. This may seem rather insignificant but the Kepler mission is designed to detect planets orbiting other stars (extrasolar planets) by the small change in brightness caused when they pass in front of (transit) their parent star. On the level of sensitivity this requires, 3.5% is a very large change indeed.



Light curve for Tabby's star relative brightness against time in days

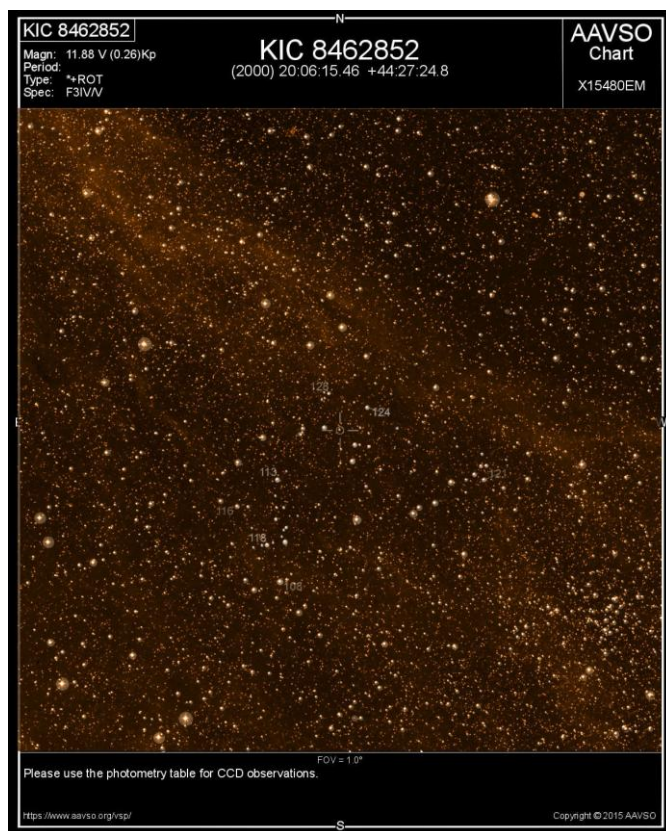
The light curve shows the strange pattern – a long slow decline followed by a much steeper fall off with some brief, short lived dimming events showing up more clearly near the end of the measurement period. When these results were initially presented, it was clear that they did not represent any normal planetary transit nor did infrared observations suggest any other known process. This led to suggestions that these results could indicate the presence of a very large alien megastructure around the star such as a partially constructed Dyson sphere( as in the picture above).



This would be huge shell constructed around a star, to harness all or a lot of its radiation and provide a huge living space for a technologically advanced civilisation. Sadly this idea has now been mostly but not entirely discarded, partly because there was no other evidence of a technologically advanced civilisation. An intensive study by the Allen radio telescope array found no evidence of artificial radio signals.

**Tabby's star in centre of circle of this one degree field of view(Digital Sky Survey picture) overlaid over an AAVSO chart of the star.**

This still leaves the problem of what is producing the unusual light curve with the long term decline and short lived but large dimmings. The pattern is entirely atypical of the light curve any regular or irregular variable star nor has there been any evidence from infrared measurements of interstellar or orbiting dust clouds being involved. What the data does indicate is that there is a large amount of material orbiting the star and that it must be in clumps of some sort to produce the observed short lived, up to 20%, dimmings as they transit in front of the star. Transiting debris clouds left over from a collision between large asteroids could produce the short lived events in the brightness of the star.



These would have a strong infrared signal from all the heat produced in such an energetic event and would not explain the longer term decline. Another suggestion has been comet swarms resulting from the gravitational disturbance caused by of the close passage of another star but this, like all other theories so far, cannot explain all the observations. Tabby's star still remains a mystery.

A note for the astrophotographers. The numbers on the chart are the magnitudes for comparison stars. So CCD camera users, who have the software to measure star brightness, can use these stars for calibrating their measurements of the star. A great opportunity to do some real, original astronomy.

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## AAS Library

**Open for business!**

**THE LIBRARY IS A RESOURCE FOR MEMBERS -PLEASE SUPPORT IT AND MAKE USE OF IT**

The Library list is also available on the website under “links” and can be downloaded



The library is now full up - if you would like to obtain a list or borrow an item

– contact Alex at the next meeting or give him a call on 01563 520887.

Unfortunately Alex does not have email, however messages via [library@ayrastros.com](mailto:library@ayrastros.com) will reach him the old fashioned way after a short delay but please contact him directly if at all possible.

THE LIBRARY IS WAITING FOR YOUR CALL!! There are a lot of interesting items to borrow.

**And finally.....**

Instead of a picture, here are some lame Astronomy jokes and humour....☺

Q: Why did the star get arrested?

A: Because it was a shooting star!

Q. What do you do if you see an aggressive alien?

A. Give it some space!

Q: Where does an astronaut dock his spacecraft?

A: At a parking meteor.

Q: What did Mars say to Saturn?

A: Give me a ring sometime!

\*I was up all night wondering where the Sun had gone... then it dawned on me.