

AAS : Notes for Discussion 25th November, 2019

Potential topics for our Discussion Group

Topic 1

Transits:-

The definition of an astronomical transit, from Wikipedia, is “*a phenomenon when a celestial body passes directly between a larger body and the observer*”.

A couple of weeks ago there was a transit of Mercury, see the website posting, when the planet crossed the surface of the sun.

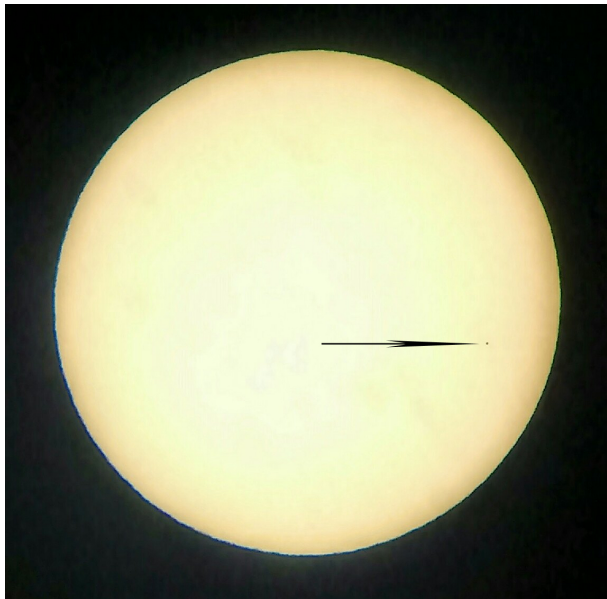


Photo taken with a mobile phone through a telescope.

The arrow points at Mercury

Nick Busby

Transits of the sun also occur when Venus passes between us and the sun. The next Mercury transit will be on the 13th Nov., 2032 with Venus following on on the 10th Dec., 2117. Venus may be a bit late for AAS members although some may be around for Mercury in 2032!!

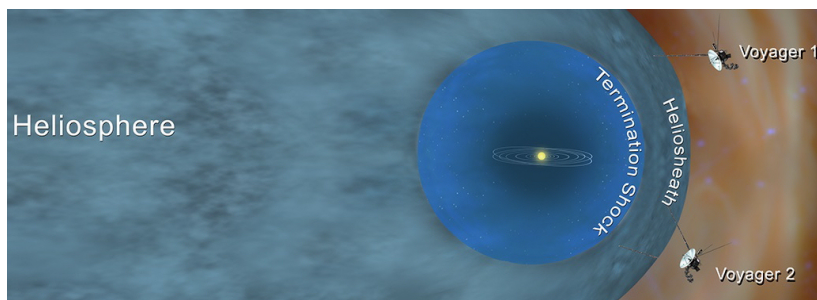
Transits have also proved useful for finding exo-planets and also trying to get a spectrum of the planet's potential atmosphere as the star light passes through it.

In our discussion we can also explore what solar transits have revealed to us and also the latest details on exo-planet transits.

Topic 2 : The Solar System

Aurora : when was the first written record of an auroral event. You may be surprised to hear that it is thought, by an Osaka University team, to be 587BC.

Voyager : Has Voyager 2 finally crossed into interstellar space? According to plasma density measurements it has.



On the edge: artist's impression showing the heliosphere and heliopause surrounding the Sun and its planets. The interstellar wind is blowing from right to left. (Courtesy: NASA/JPL-Caltech)

Topic 3 : Milky Way

The Hubble Space telescope has spotted the first confirmed inter stellar comet. Comet 2I/Borisov will be at its closest approach, about twice as far as the earth from the sun, on the 19th December.

Topic 3 : The Cosmos

What shape is the Cosmos. It is currently thought to be almost flat. However, one team from Rome, have published what is called a provocative paper in Nature claiming that analysis of the Planck CMB (Cosmic Microwave Background) data shows that the cosmos is in fact is closed, curled up like a ball. The Planck Team are sticking to their interpretation. Is this code for baloney??

Another non-standard claim, this time from a US university, is that there may well be wormholes around our own supermassive black hole, Sagittarius A*. They say that we should be able to detect them in the next couple of decades. Bit too far out for me, ignoring the fact that it's 26,000 light years from us.

The Japanese Gravity Wave Detector is due to join the 2 US and the Italian detectors before the end of the current detecting run. It is expected to improve precision 3 fold. Still with GWs a NASA researcher, trawling through recently released data, thinks they have found 2 events, in the same part of the sky within 20 mins of each other. So, is this an example of lensing, like with light, or just coincidence?

You may recall that it was claimed, at the time of the GW detections that heavy elements are formed in the collisions of neutron stars. This has now been confirmed with the detection of strontium.

Theory dictates how small of large a black hole can be. From 5 times the mass of the sun and, although theory allows for sizes above 130 solar masses there should be none between 50 and 130. Now a black hole has been discovered with a size of 3.3 solar masses and another with 100.

5 : Dark Energy (DE)

DE was discovered in 1998 when it was found that the expansion of the universe, rather than slowing down was actually increasing. So, there had to be a negative energy force that was overcoming the attractive force of gravity. This was called Dark Energy and it comprises 70% of the universe. Now a couple of papers from a team at Oxford, the Niels Bohr Institute and Paris claim that cosmic acceleration does not exist – hence no dark energy.

Meanwhile, the Dark Energy Spectroscopic Instrument (DESI) went live on the 22nd October. With this instrument they are hoping to help solve the nature of DE.