

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

Next Talk
10th December 2018
The formation of Planets
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EDITORIAL

This version of Spacwatch comes in two forms the print version and the PDF version downloadable from the website. Unfortunately I could not fit the whole Night Sky guide into the four pages we have available for the print edition so to see the whole article please download the version from the website. We are also probably going to be starting entering the period of hype of comet 46P Wirtanen. Steve covers some of this in his Night Sky piece but for a sober indication of what is likely to happen Nick James has published this piece on the BAA website <https://www.britastro.org/node/16287>.

A new comet has also been discovered by Don Macholz. Although it is not unusual to find new comets this was discovered visually and this is a first in a very long time. It is also Don's 12 comet discovery. Orbital elements are still rough at this time but the comet is in the morning sky in Virgo.



Pelican H-Alpha Tony Boer

THE NIGHT SKY THIS MONTH

by Steve Creasey

So, at last the long nights are here, we can almost do astronomy straight after work!

However, there is always a Yin to the Yang, we now have the cold weather and the cold weather issues of, getting motivated to go out in the cold, dew on everything and trying to keep yourself warm.

The transition from summer constellations to winter constellations is now well under way, the summer triangle (Vega, Deneb and Altair) is now moving away to the west. Pegasus is now overhead, and Orion is well and truly up by 22:30 from the 1st of November.

For those brave enough and enthusiastic enough to venture outside November has some great things to look at and look forward too.

Planets

Mercury - It reaches its greatest elongation east from the Sun on November 6th but, as the angle of the ecliptic to the horizon in the evening is shallow at this time of the year, it will be lost in the Sun's glare as it moves towards inferior conjunction (between us and the Sun) on the 27th of the month.

Venus - This planet passed between us and the Sun (inferior conjunction) on October 26th and will be seen in the east before sunrise from around the 6th of the month. A low eastern horizon will be needed though. As, at this time of the year, the ecliptic at dawn has a steep angle to the horizon, Venus rapidly increases in elevation as November progresses and will have an elevation of 20 degrees before sunrise by month's end. Its angular size reduces from 60.6 to 41.4 arc seconds during the month as it moves away from the Earth but, at the same time, the percentage illuminated disk (its phase) increases from just 1% to 25% - which is why the brightness actually increases from -4.6 to a dazzling -4.9 magnitudes.

Mars - Although fading from magnitude -0.6 to -0.1, it actually becomes more prominent in the southern sky as it climbs higher in elevation from 17 degrees

at the start of the month to 27 degrees by its end. Its angular size falls from 11.9 arc seconds to 9.3 arc seconds during the month. Moving from Capricornus to Aquarius on November 11th, it should still be possible with a small to medium sized telescope to spot details, such as Syrtis Major, on its salmon-pink surface.

Jupiter - It is now moving towards its superior conjunction behind the Sun on November 26th and will not be visible this month.

Saturn - It will be visible in the southwest at an elevation of 11 degrees after sunset at the beginning of November but disappears into the Sun's glare by the end of the month. Its disk has an angular size of 15.7 arc seconds falling to 15.2 during the month as its brightness reduces from +0.5 to +0.6 magnitudes. The rings were at their widest last year but are still well open and spanning ~2.5 times the size of Saturn's globe. Saturn is moving slowly westwards over the 'teapot' of Sagittarius to the left of M8, the Lagoon Nebula.

Uranus - reached opposition on October 23rd and so is visible all night. It will be highest in the sky in the south around 1 am BST shining at magnitude 5.7 and with a disk 3.7 arc seconds across. It lies in Aries, close to the border of Cetus and Pisces. Its turquoise green colour should be seen in a small telescope and it will be easily spotted in binoculars

Neptune - came into opposition - when it is nearest the Earth - on the 7th of September, so will still be well placed to spot this month. Its magnitude is +7.9 so Neptune, with a disk just 3.7 arc seconds across, is easily spotted in binoculars lying in the constellation Aquarius as shown on the chart. It rises to an elevation of 27 degrees when due south. Given a telescope of 8 inches or greater aperture and a dark transparent night it should even be possible to spot its moon Triton.

Meteor Showers

In the hours before dawn, November gives us a chance to observe meteors from two showers. The first that it is thought might produce some bright events is the Northern Taurids shower which has a broad peak of around 10 days but normally gives relatively few meteors per hour. The peak is around the 10th of November but then the Moon is close to New Moon so its light will not intrude. The meteors arise from comet 2P/Encke. Its tail is especially rich in large particles and, this year, we may pass through a relatively rich band so it is possible that a number of fireballs might be observed!

The better-known November shower is the Leonids which peak on the night of the 17th/18th of the month. The Moon is just after First Quarter, so its light will

hinder our view early on. As one might expect, the shower's radiant lies within the sickle of Leo and meteors could be spotted from the 15th to the 20th of the month.

Up to 15 meteors an hour could be observed if near the zenith. The Leonids are famous because every 33 years a meteor storm might be observed when the parent comet, 55P/Temple-Tuttle passes close to the Sun.

In 1999, 3,000 meteors were observed per hour but we are now halfway between these impressive events hence with a far lower expected rate.

Deep Sky Objects

NGC 246 - The Skull Nebula, is a planetary nebula in the constellation Cetus

NGC 7293 - The Helix Nebula, is a large planetary nebula located in the constellation Aquarius

NGC 40 - The Bow-tie Nebula, is a planetary nebula discovered by William Herschel in 1788, and is composed of hot gas around a dying star. The star has ejected its outer layer which has left behind a smaller, hot star with a temperature on the surface of about 50,000 degrees Celsius

NGC 488 - Is a face-on spiral galaxy in the constellation Pisces, 90 million light-years

NGC 7814 - Is a spiral galaxy about 40 million light-years away in the constellation Pegasus. The galaxy is seen edge-on from Earth. It is sometimes referred to as "the little sombrero", a miniature version of Messier 104

NGC 474 - Is an elliptical galaxy about 100 million light years distant in the constellation Pisces. This large galaxy is known to possess tidal tails, although their origins remain unknown

NGC 1807 - Also known as the Poor Man's Double Cluster, Is a random formation of stars at the border of the constellations Taurus and Orion near the open cluster NGC 1817.

NGC 1342 - Sometimes referred to as The Little Scorpion Cluster, is an Open Cluster in the constellation of Perseus.

NGC 1039 (M34) - The Spiral Cluster, It was probably discovered by Giovanni Batista Hodierna before 1654, and included by Charles Messier in his catalogue of comet-like objects in 1764.

NGC 1333 – The Embryo Nebula, is a Reflection Nebula in the constellation of Perseus. NGC1333 is currently the most active region of star formation in the Perseus molecular cloud. It was first discovered by Eduard Schonfeld in 1855.

Comets

38P/Stephan-Oterma - On the night of 08/09 November, Comet 38p will lie very close to the deep sky object NGC 2392 (The Eskimo Nebula) separated by just 8 arcmins, a good photographic opportunity. The comet will remain well placed in the evening skies for the remainder of the year and on in to 2019

46P/Wirtanen – Becoming better positioned as we head towards December, Comet 46P/Wirtanen is a small short-period comet with an orbital period of 5.4 years. Discovered by Carl A. Wirtanen in 1948 at the Lick Observatory, California, USA. The comet reaches perihelion on 12 December, 2018 and is expected to reach magnitude 3, well within naked eye visibility. This would make it the brightest comet since C/2011 L4 (PANSTARRS) reached a similar magnitude during the twilight hours in April 2013. 46P will be well placed in December residing in Taurus. The ice rock will then pass between the Pleiades and Hyades star clusters just before closest approach where it will reach a distance of 0.078 AU (11.6m kilometers) from the Earth on 18 December. Given the relatively close approach to the Earth, the nucleus of Wirtanen should appear reasonably large in the sky.

64P Swift-Gehrels = at the start of November 64P is passing close to M31 and should make a nice photo opportunity. It is fainter than the other two comets but it was still easily visible in my 37cm scope.

Moon

1st November – waning gibbous, moonrise 23:57, illumination 43.5%

7th November – New moon, moonrise 06:23

15th November – First quarter, moonrise 13:29

23rd November – Full moon, moonrise 16:41

30th November – Third quarter, 23:04

LAST MONTHS TALK

by Gwyneth Hueter

October 2018's talk

Dr Lee Macdonald's PhD thesis was about the history of Kew Observatory.

This place was never meant for public use, and can be found at the end of a long drive through a golf course.

It was set up for George III to observe the Venus transit of 1769. He had a great enthusiasm for Astronomy and used it for his instrument collection and to set his clocks. He had a 'King's Observer', Stephen Demainbray, who was also a children's tutor. More famously John Harrison The film 'Longitude', based on Harrison's clock, was filmed there. The building was designed by the famous architect Sir William Chambers.

1772

After the death of George III it faded out of use. Astronomy did not interest his descendants, so, in 1842 it was offered to the Royal Society. In the decade before this, there had been growing concern about the lack of knowledge about global weather, and why there were fluctuations in compass needles, so you couldn't determine where north was, exactly. John Herschel called it a 'magnetic crusade', but wanted a place on the south coast, where he could set up standards for sea levels. But then the Tories came into power under Robert Peel and they weren't supportive of the sciences.

We now come to some more names, some of which you recognise. Karl Friedrich Gauss and Alexander von Humboldt worked on magnetism and found the magnetic equator, but they were based in Berlin. Edward Sabine was in the scientific division in the army, from a young age. He lobbied for a system of colonial observatories and an Antarctic expedition so that electrical activity could be monitored all around the globe. Not so fantastical when you consider the British empire had outposts worldwide at the time. In June of 1842 the BAAS (British Association for the Advancement of Science) moved into Kew. Charles Wheatstone of electric telegraph fame, and Francis Ronalds (a wealthy telegraphy supporter) carried out the first meteorological and electrical observations. The observatory building had a big lightning conductor put up. But, lack of funding caused the BAAS council to close it down twice in the 1840s. More politics to blame, it seems. William Radcliff Birt (of lunar crater fame) became the first paid superintendent and he was interested in atmospheric waves, but there was a personality clash and he was replaced by John Welsh (a Scot). At that point Kew became a proper centre for the standardisation of equipment and instrument testing.

By the 1850s Kew was now established as a site for permanent recording of phenomena. 1852 was a good year: four Kew staff went up in a balloon to 22,000 feet, Sabine confirmed the ten year

sunspot cycle, and his wife Elizabeth was also busy translating Humboldt's memoirs. She had found a mention of Heinrich (also known as Hofrath) Schwabe's notes on the sunspot cycle and Edward saw it tied in with his magnetic variations. John Welsh proposed that the Sun was a giant magnet and wrote to John Herschel in April of 1852. These two and Warren de la Rue became pioneers in solar photography. The Sun was ideal for photography as the technology of the day needed such long exposures. Welsh also designed a simple shutter system which was activated when you burned through a string that held it. Clever stuff! Sadly, Welsh died when only 34, in May of 1859. Which means he missed the huge solar flare (the Carrington event) of September 1859. Balfour Stewart, an experimental physicist who took over from Welsh, found that the Kew magnetometers had noted the flares and the magnetic storm. The sunspot was recorded on August 28th and on a couple of the following days. The photo from 3rd September was from after the explosion. It is still the most powerful flare ever recorded. Luckily telegraphy was in its infancy at that time but if it happened today it would wreak havoc with our electricians. The second most powerful one was in October 2003, fortunately on the limb, so we were lucky there too.

In 1860, Warren de la Rue photographed the total solar eclipse from Spain and proved the prominences belonged to the Sun, not the Moon. His camera had a focal length f77 and the sensitivity of the wet collodion photographic medium was equivalent to an ISO of one. !

From all that, a link between sunspots and aurorae was established.

Sabine and Stewart concluded that there must be some ether that carries all this stuff.

One of the people who worked regularly in taking photos was a young Elizabeth Beckley, who therefore became one of the first women observational scientists and whose descendants include astronomer Fred Whipple. She worked with her father Robert one of the technical staff, and seems to have been paid piecemeal.

Kew had been subsidised by a large donation from a wealthy John Peter Gassiot, but that was running out, and in 1871 it was closed by the BAAS. After that, the various instruments were redistributed: Astronomer Royal George Airy got the photoheliograph and the sextant ended up in Oxford, where it is now in the Museum for the History of Science.

The National Physical Laboratory spent two years at Kew before moving to Teddington in 1902.

FURTHER DISCUSSION

If you are not already on our internet mailing list, then why not log on to YahooGroups. The list is called

'abingdonas'. Members use the list to alert each other about celestial events and to chat about amateur astronomy. The list is quite active, with several messages most weeks. To read through previous messages click on:

<http://groups.yahoo.com/group/abingdonas/> .

To join the abingdonas list, please go to <http://www.yahogroups.com> . You can also unsubscribe from the list here.

More information on society activities can also be found on the Facebook page - <https://www.facebook.com/AbingdonAstroSoc/> Although confusingly we seem to have two groups on Facebook.

DATES FOR YOUR DIARY

26th November 8pm Beginners' Meeting in the Main Hall., talks to include Meteors, Supernovae and Venus (although subject to change)

Observing evening: The next observing meeting of the new session will be on the FCN 3rd – 5th Dec 2018 at Frilford Heath Tubney Golf driving range, note that this is a new location and maps will be on the website. As always go/no go notes will be posted on the newsgroup as well as the Facebook page so please look there for more info or contact Trevor Pitt or Steve Creasey for details.

Early Planning for AstroFest Feb 8/9 at Kensington Town Hall details at <http://europeanastrofest.com/>

