

## Heacham at Night

Remember, remember the 5th of November, gunpowder, treason and plot. I like fireworks rockets shooting up towards the stars. However, the treason of 1605 effectively stopped experimentation in rocket propulsion, in the UK, right up to the 1950s and beyond. This was due to laws about using explosives. I used to make and launch recoverable model rockets and it wasn't until about the 1980s that solid fuel engines were available in this country. Americans had then been building very substantial devices in their basements for decades.

The Germans and Americans had many privately funded people, later scientists, dabbling with explosives and rockets which led to the V2 and then Apollo. The Russians independently followed a fast track through the work of legend Sergei Korolev. Since then, France (and the EU), China, India, Japan, and the UAE have all launched extensive missions into space.



American Robert Goddard 1926. The rocket engine is at the top. The bottom is the fuel tank. Internet

The UK hasn't; it made the error of giving up in the early 1970s. However, this year should see multiple satellite launches from Spaceport Cornwall, Space Hub Sutherland (Scotland) and SaxaVord Spaceport (Shetlands). The UK space and satellite industry now employs 47,000 people and generates over £16 billion through its activities, including over £5 billion from exports. A career worth getting into.



Spaceport Cornwall. Rockets carrying satellites are launched from beneath the 'plane which carries them to a high altitude first. Internet

Q. What is in the skies this month? A. Planets, Meteors and Stars. Very similar to last month with some subtle differences. At the time of writing, early October, I haven't yet seen all the things in my last article but I have managed to see 5 planets, Mars, Uranus, Jupiter, Neptune, Saturn (in the order they appear from SE to SW). Uranus and Neptune did require my telescope and the latter was not as clear as I have seen it before. Uranus will be brightening this month.

By luck, I caught the Galilean Moon closest to Jupiter, Io, appearing sat on the edge of Jupiter so that it vanished, passed behind the planet, as I observed. The rapid motion of these satellites makes observations over an evening or several nights interesting. Large binoculars or bird scopes will do the job.

I saw the spark of Titan, Saturn's largest moon, well off to the side of the planet. This is worth looking for if you can keep your eyes off the rings.

There was a 'clear' night at the time of the Gibbous Moon. The clarity was diminished by a thin, high veil of water vapour well lit up by the Moon. I didn't see any meteors which I had hoped for but Jupiter was shining brightly close to our nearest neighbour, Saturn was still easily visible to the naked eye low in the SW, and Mars was showing its red colouration quite high in the SE. So that's three planets without the use of any instruments, at the time of a bright Moon with a haze which blocked out all but a few bright stars.

It really is worth looking up to see what is in the night sky. If you can spare 15 minutes to let your eyes adjust to the dark, so much the better.

If you are interested in looking through telescopes then you may be interested in the observatory being constructed in Hunstanton, close to the Cliff Top car park. A planning application for it should have been decided by the time you read this. I have only been involved in a very minor way, attending two meetings. The Borough and County are paying for it on the back of the Visit West Norfolk badge, encouraging tourists out of season.



A 'virtual' impression of the Hunstanton Observatory site at the early design stage. BC

The design is of the roll off roof type – a 'shed' with a roof on rollers so it can be removed to allow telescopes inside to see the sky. There will also be pads outside where telescopes can also be stood. There are currently no plans to house telescopes on site, which is a pity as observation nights will rely on amateurs bringing kit with them. The King's Lynn Astronomy Society is likely to be involved from time to time and I am a member of that. As I live in Heacham, I will do my best to help out.

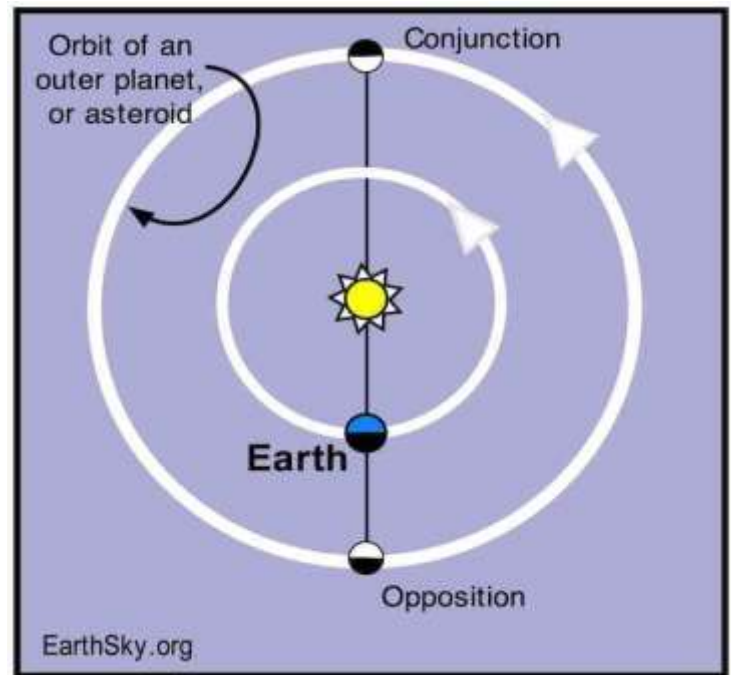
I hope locals will take advantage of the facility as it develops.

Before we take a look at what you can see in November, there is one thing that you won't see on the 8th Nov, a total eclipse of the Moon. This is heralded in a number of publications but the small print reveals that it is only visible from the Pacific.

Planets continue to put on a good show, rising earlier into darker skies. On the 1st, Saturn is just above the waxing Gibbous Moon. Jupiter will be off to the left shining brightly still and, on the 4th, it is close to and above the Moon. Saturn sets by 10.30pm in November so you need to get out earlier – the advantage of the nights drawing in. At 5pm, yes pm, on the 29th look due south to see Saturn close to a fat Crescent Moon. Look a little right and a tad above.

Jupiter will set about 2am so you can watch the late-night news.

I have mentioned Uranus several times in the last few months; theoretically a naked eye planet but it took telescopes to discover it – William Herschel in 1781. On the 9th, this blue planet is at opposition, A straight line could be drawn from the Sun, through Earth to Uranus, consequently it is both at its closest to the Earth this year and presents a full face to the Sun so is at its brightest. This is the time to look for it.



*Not to any scale. The opposition position is where Uranus will be, the conjunction position where Mercury will be hiding. Internet*

Closest means it's just 2,796 million km (1 billion 737 million miles) away from us so will still be faint at magnitude 5.6 which is bright enough to be discernible to sharp, young eyes. Binoculars will pick it up. It will always be some way to the left of Jupiter, between it and Mars.

Mars rises from teatime and is getting brighter all month. Remember that you will see it coming up in the SE and will likely have to wait until about 10pm for it to clear buildings. It will have a distinct red hue. Draw a line from it to Jupiter and about half way along it use binoculars to search for the blue dot of Uranus.

Venus and Mercury are too close to the Sun for observation this month. Mercury is actually at superior conjunction on the 8th which means a line from the Earth, through the Sun, would end on Mercury's sunlit surface which would be at 430°C. The other side, in night, would be -180°C. There is no atmosphere to retain heat and it takes 59 days for the planet to rotate.

Meteors – I am always hopeful. Several showers to look for, the Taurids all month, peaking on the 12th, and the Leonids peaking on the 17th. The Taurids come from the debris of Comet Encke which is usually pretty thin but, this year, the astrophysical pundits say that the Earth will pass through a patch which is denser that might lead to small rocks leaving bright trails. Parish's First Law of Astronomical Observation states, 'if you look up it won't happen and the converse applies too'. You might be luckier.

The Leonids are best viewed pre-dawn but the Moon rises after midnight so look as late as you can. They are around all month too but midnight on the 17th will be your best chance of seeing these remnants of Comet 55P/Temple-Tuttle. They are very fast meteors which leave long trails. 1833 was a good year.



'The Night the Stars Fell from the Sky'  
November 17, 1833  
from an engraving of the same year

I mentioned the Andromeda Galaxy last month. Whilst looking at the planets mentioned earlier, I tapped on 'view Andromeda Galaxy', the telescope rotated vertically, I selected a wide field lens and there it was, the misty swirls of that galaxy, far, far away. (I have been watching reruns of Star Wars). It was as good a view as I have had, still an amorphous cloud but a clear one. The fact that it was overhead meant there was less of the atmosphere in the way.

To see the classic lens shape of Andromeda needs an imaging device, a camera, I must get back to playing around with that.



Use good binoculars to scan for these clusters. Internet

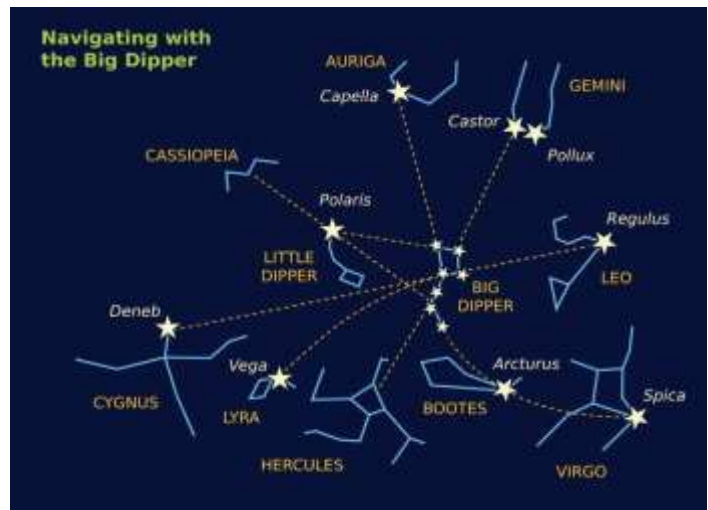
Look out for the Pleiades and Hyades high in the NE looking north or SE looking south. These two star clusters will be above Mars. On the 9th the Moon is between the two, on the 10th it is between Mars and them both. On the 11th, Mars will be just to the right of the Moon, the Hyades rather further to the right of Mars; the Pleiades above the Hyades.

Binoculars are all that is needed to see some detail in the clusters. The Pleiades, Seven Sisters, Messier 45, look particularly fine as there are many blue-white stars in an open cluster. They are young, just about 100 million years old. You only have another 250 million years to see them like this as they will then get pulled in different directions due to gravitational forces. They are about 444 light years distant.

The Hyades, Caldwell 41, Collinder 50, Melotte 25, are just 153 light years away and a ball shaped collection of hundreds of stars with similar characteristics. It is about 625 million years old.

The alternative names followed by numbers are how they appear in different catalogues. The age of the Sun, for comparison, is 4.6 billion years.

A few bright stars: Face south and towards the west. High up you will find Vega. Below it and to the right Deneb. These are two stars of the Summer Triangle. The third, Altair, will be down on the westerly horizon and may be lost to view. The *Summer* says it all.



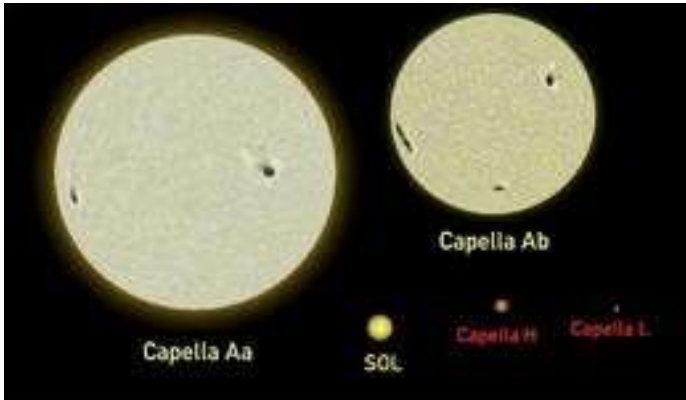
A few more stars. Internet

Face south and towards the SE. Orion will be rising. With Rigel at the bottom right corner, Betelgeuse the top left. Close to the easterly horizon, if you have one, is Procyon. This a binary star with a white star, about twice the size of the Sun, in a dance with a white dwarf. The principal star has almost used its hydrogen. The system is 11.5 light years away.

Go up from Orion towards the zenith (overhead) by the Hyades you will find Aldebaran. It is not part of the cluster being much closer to us. Mars will likely be around here too. The orange light of Aldebaran and the subdued red of Mars can confuse identification of both.

Above Aldebaran but well to the left of the zenith is the yellow giant Capella. This the third brightest star in the sky. It is a four-star system with two binary pairs. The two yellow stars are classed as giants and are now using up their helium having exhausted hydrogen. The other pair are cool red dwarfs and are a long way from their companions. The system is just 43 light years away.





*Sol is our Sun for comparison with stars in the Capella system. Internet*

Sirius, the dog star, is the brightest star in the sky and will appear low in the SE, around midnight, at the end of the month. More of that in December.

Enjoy November, Catherine wheels and conkers, Orion rising overhead and the first frosts to put sparkle on the grass. Keep fattening up any hedgehogs.

**Terry Parish**