

A new year and a change to the way I present the monthly podcast!

In an attempt to make the podcast more practical I will be introducing specific targets for you to find and explore each month.

These targets will include naked eye, binocular and telescopic objects with tips on how to locate them and, once you've found them, what to look for.

Each podcast will include:

- suggested features on the Moon to find and to follow as the Moon completes its monthly orbit of the Earth
- an exploration of a constellation
- events such as the appearance of a comet or an interesting planetary conjunction

So, starting with the Moon on January 3rd the Sun will be illuminating the Moon from the right-hand side. This results in the configuration known as "First Quarter". The Sun illuminates half of the face of the moon that faces us. At Sunset the Moon will be roughly in the south.

Seven days later, on January 10<sup>th</sup>, the Moon will have moved a quarter of the way round its orbit. The Sun will now be illuminating the whole of the side of the Moon facing us and the Moon will be Full. The Sun and the Moon will be on opposite sides of the sky with the Moon rising around sunset.

This month's full Moon will be interesting as the Moon will move into the outer part of Earth's shadow producing what is known as a penumbral lunar eclipse. This will not be spectacular!

The maximum eclipse will occur at 19.11 hrs and will present as a slight darkening of the Moon. Have a look and see if you can spot it.

After another 7 days, on the 17<sup>th</sup>, the Moon will have moved another quarter of the way round its orbit and will be at "Last Quarter". The Sun is now illuminating the Moon from the left-hand side. The Moon will rise about 18 hours after the Sun and thus will not be seen in the evening sky. Look for it in the early morning in the south west.

The Moon will be new on January 24<sup>th</sup>. This means its orbit round the Earth has taken it past the Sun. For a few days, either side of January 24<sup>th</sup>, it will be invisible, lost in the Sun's glare. The Sun will be illuminating the half of the Moon that is facing away from us.

As the days pass the Moon will move further away from the Sun. Look for it after sunset. It will first appear as a narrow crescent which will gradually broaden as it moves towards first quarter.

All the lunar targets this month (Moon at first quarter; Moon at Full; Signs of Penumbral Eclipse; Moon at Last Quarter; Moon around New) are observable with the naked eye. In each case, note the time of observation and position of the Moon relative to the Sun.

Next month we will begin to look more closely at the surface features of the Moon.

This month's constellation is Orion, currently prominent in the south in the mid evening.

It is one of the most well-known and easily recognised constellations, often depicted as a hunter or a warrior.

In Greek mythology Orion was the son of Poseidon. He was stung to death by a scorpion. At the request of his lover, Artemis, he was placed in the sky. Orion sets in the west as his killer, in the form of the constellation Scorpius, rises in the east. In another story Orion is taken with the seven sisters in the form of the star cluster Pleiades. The Pleiades rise before Orion and Orion is doomed to spend eternity chasing them around the sky but never catching them.

The main part of the constellation of Orion consists of four stars forming the body, with a line of three stars forming a belt. Hanging from the belt is a sword. The top left-hand star, forming the body, is the famous Betelgeuse. This star is a supergiant. If the centre of Betelgeuse was at the centre of our Sun, the outer layers of the star would nearly reach the orbit of Jupiter. It is one of the most likely of our local stars to explode as a supernova. It is in the order of 300 light years away so, despite being referred to as local, is too far away to do us damage if it goes supernova.

Betelgeuse is noticeably red to the naked eye but this is more obvious through binoculars or a telescope. Compare it to Rigel (rhymes with Nigel!) the star forming the bottom right-hand corner of Orion's body. This star is another supergiant but has a much hotter surface and so glows blue white. Its surface temperature is 12,000 Kelvin compared to Betelgeuse at 3,000 Kelvin. It is the brightest star in Orion shining at +0.1. It is a double star having a companion of magnitude +6.8 which is easily seen through a 100mm telescope.

The most spectacular feature of Orion is the sword. This is made, in part, of a gas cloud which is collapsing and in the process is forming new stars. These stars are generating radiation which is blowing the gas

away. At the centre of the action is a group of stars called the trapezium; visible with a small telescope. There is a lot of nebulosity around the sword which includes two Messier objects M42 and M43.

Finally, January has a comet which should be relatively easy to find. Between the 24th and 30th January, comet 2017 T<sub>2</sub> (PanSTARRS) passes to the north of the Double Cluster in Perseus. The Double Cluster is easily found as it is clearly visible in a pair of binoculars. On 28th to 30th January the comet will be directly above the Double Cluster at a distance slightly larger than the Double Cluster. The comet is predicted to be glowing at a magnitude +9 to +10 and so will require a telescope for a good view.

Until next month Clear Skies