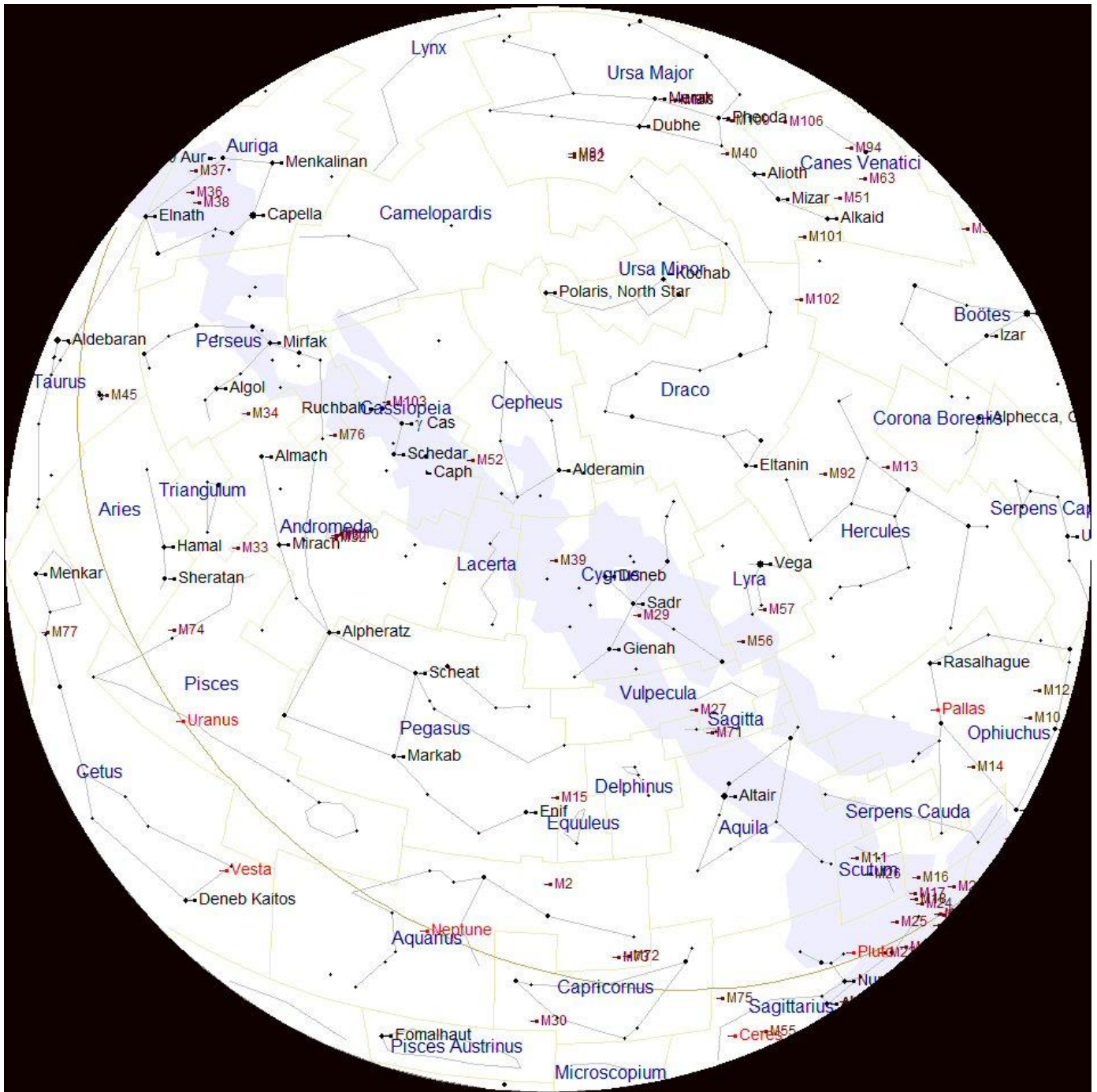


WHAT'S UP THIS MONTH - OCTOBER 2015

THESE PAGES ARE INTENDED TO HELP YOU FIND YOUR WAY AROUND THE SKY



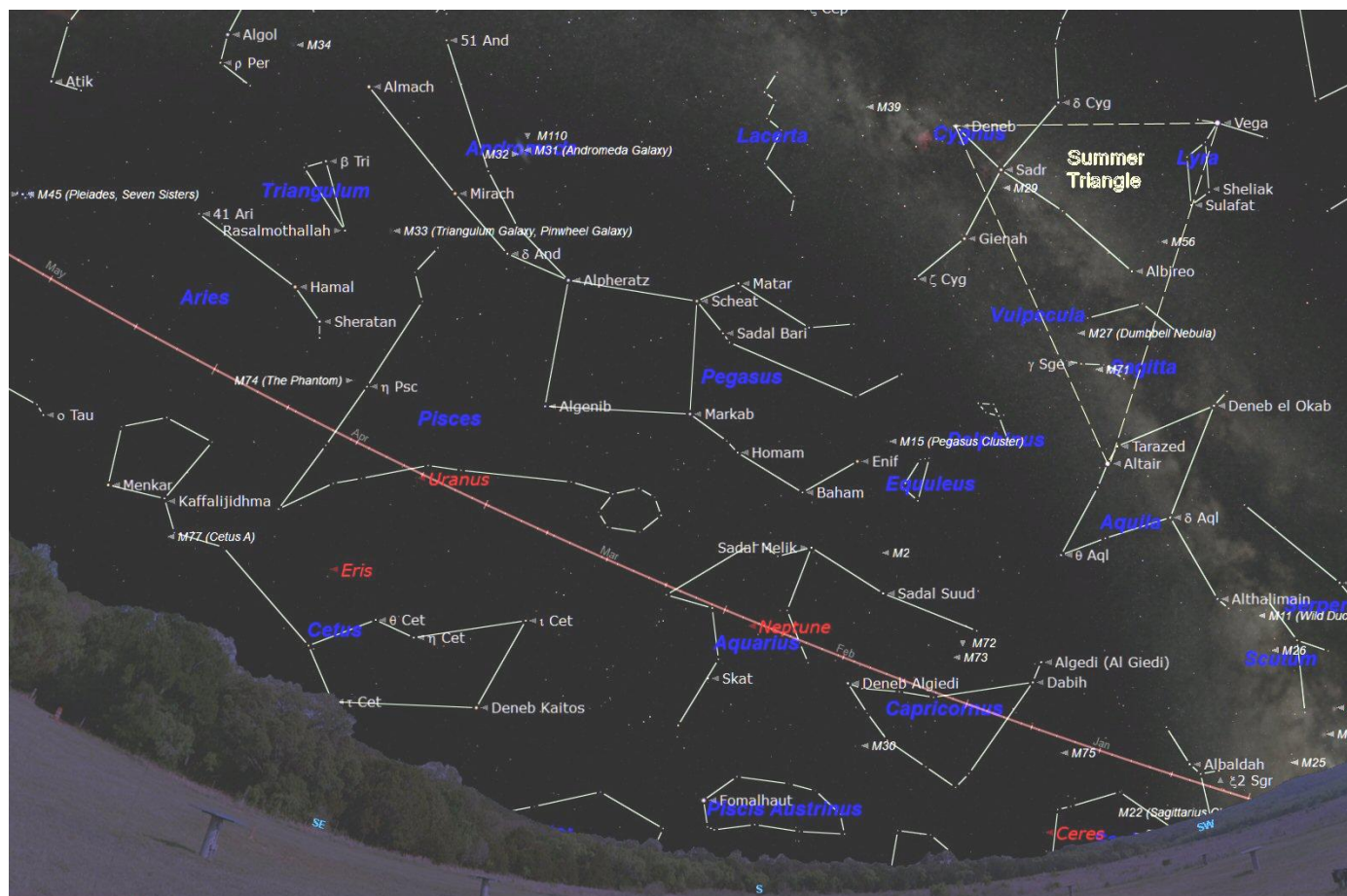
The chart above shows the night sky as it appears on 15th October at 10 o'clock in the evening **British Summer Time (BST) - Remember Summer Time ends on 25th October.** As the Earth orbits the Sun and we look out into space each night the stars will appear to have moved across the sky by a small amount. Every month Earth moves one twelfth of its circuit around the Sun, this amounts to 30 degrees each month. There are about 30 days in each month so each night the stars appear to move about 1 degree. The sky will therefore appear the same as shown on the chart above at 11 o'clock BST at the beginning of the month and at 9 o'clock BST at the end of the month. The stars also appear to move 15° (360° divided by 24) each hour from east to west, due to the Earth rotating once every 24 hours.

The centre of the chart will be the position in the sky directly overhead, called the Zenith. First we need to find some familiar objects so we can get our bearings. The Pole Star **Polaris** can be easily found by first finding the familiar shape of the Great Bear 'Ursa Major' that is also sometimes called the Plough or even the Big Dipper by the Americans. Ursa Major is visible

throughout the year from Britain and is always quite easy to find. This month it is on the northern horizon. Look for the distinctive saucepan shape, four stars forming the bowl and three stars forming the handle. Follow an imaginary line, up from the two stars in the bowl furthest from the handle. These will point the way to Polaris which will be to the north of overhead at about 50° above the northern horizon. Polaris is the only moderately bright star in a fairly empty patch of sky. When you have found Polaris turn completely around and you will be facing south. To use this chart, position yourself looking south and hold the chart above your eyes.

Planets observable in the night sky: Neptune and Uranus with Mercury, Venus, Mars and Jupiter before sunrise.

EXPLORING THE NIGHT SKY THIS MONTH



The night sky looking south on 15th September

The chart above shows the night sky looking south at about 21:00 on 15th October. West is to the right and east to the left. The curved line across the sky is the ecliptic. This is the imaginary line along which the Sun, Moon and planets appear to move across the sky. The constellations through which the ecliptic passes are known as the constellations of the 'Zodiac'.

Constellations through which the ecliptic passes are (west to east): Sagittarius, (the Archer), Capricornus (the Goat), Aquarius (the Water Carrier), Pisces (the Fishes) Aries (the Ram) and Taurus (the Bull) just appearing over the south eastern horizon.

The summer constellations are still very much in full view. The familiar formation of the Summer Triangle is shown in the chart above. The Summer Triangle is made up of the three bright stars: Deneb in the constellation of Cygnus, Vega in Lyra and Altair in Aquila. Messier 57 (M57) in Lyra is the beautiful 'Ring Nebula' which is the remnant of a star similar to our Sun that has reached the end of its time as an active star. There is another 'Planetary Nebula' within the Summer Triangle called M27 but it is 'Butterfly' shaped and can be seen using binoculars or a small telescope.

The Milky Way can be seen arched across the sky and passing through the Summer Triangle. This is the galaxy in which we live and our Sun is just one of the 200 billion stars that reside in

this large spiral galaxy. It is difficult to see from light polluted towns and cities but can just be seen away from the glare of lights on a clear dark and Moonless night even from the centre of towns. To really appreciate the beauty of the Milky Way it is best to go a short distance out of town and away from street lights.

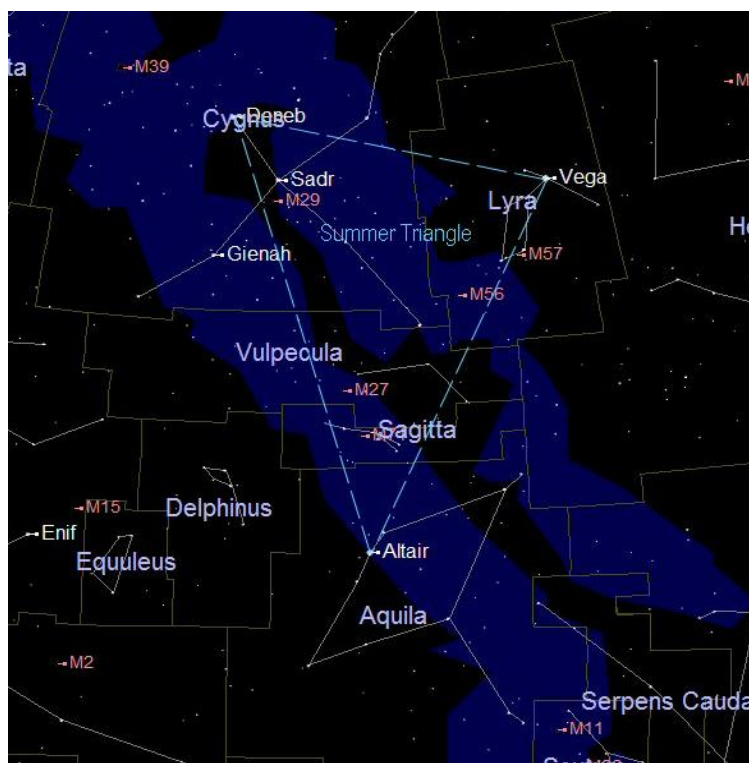
To the east (left) of the Summer Triangle is the Great Square of Pegasus. The square is probably larger than expected when being searched out for the first time. The 'square' can be used to judge the condition of the sky for observing. If four or five stars can be seen within the square then the conditions should be good, any more stars could indicate seeing may be very good. M15 in Pegasus is a very nice Globular Cluster.

From the top, left (north east) star of the Great Square of Pegasus called Alpheratz are two diverging lines of stars that mark out the constellation of Andromeda. The star Alpheratz is in fact designated as the brightest star in the constellation of Andromeda but to the observer it is obviously part of the Great Square. Andromeda is best known for the Great Spiral Galaxy M31 that is located in the constellation. Messier 31 (M31) is the closest large spiral galaxy to us and is just visible to the naked eye.

Just to the south of Andromeda is the small constellation of Triangulum. The three brightest stars of Triangulum form a rather nice little triangle shape. There is another spiral galaxy within the boundaries of Triangulum known as the Pinwheel Galaxy Messier 33 (M33). This is a smaller galaxy than M31 but we see it face on so using a large telescope and in a dark sky the spiral arms look very impressive and even better when photographed.

The only two planets visible at the moment are Neptune in the constellation of Aquarius and Uranus in Pisces. They can be seen using a pair of binoculars looking like slightly 'fuzzy' blue stars. They do however need a telescope to see well. Uranus appears larger at high magnification and can be seen as a noticeable disc. Uranus appears as a smaller and fainter disc.

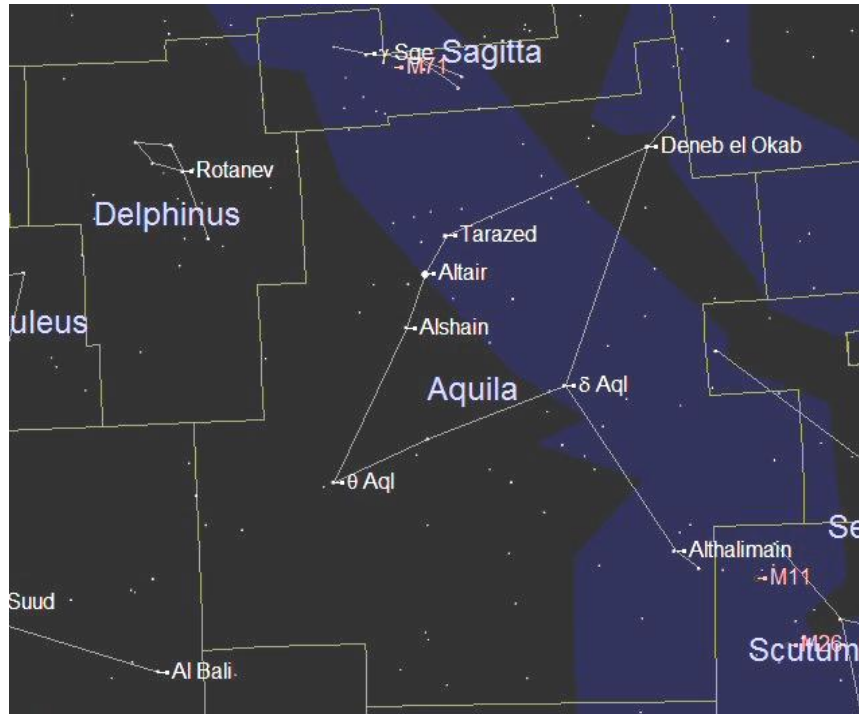
THE SUMMER TRIANGLE



The Summer Triangle

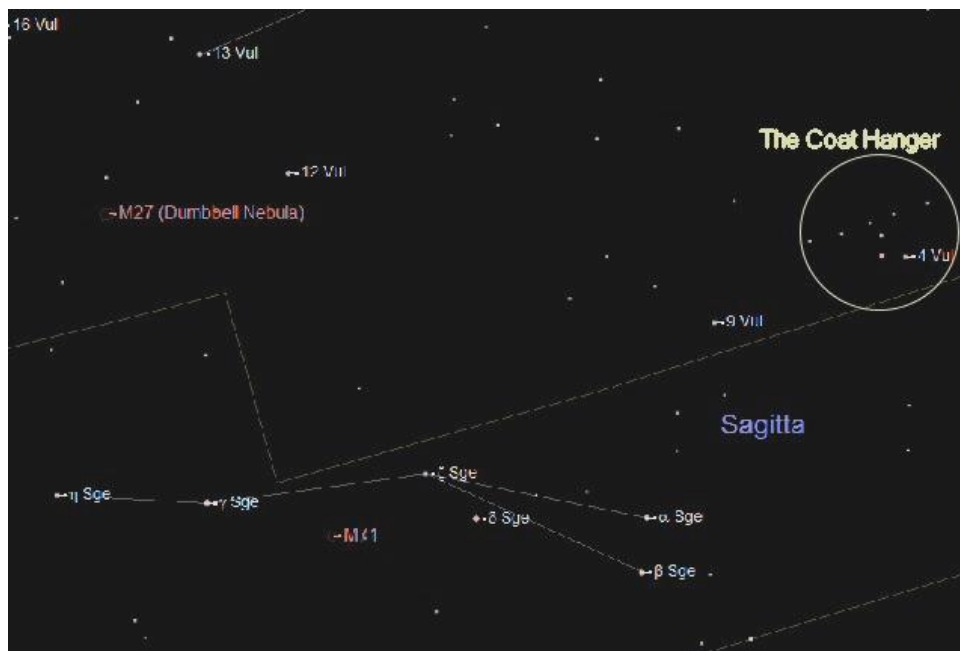
The term 'Summer Triangle' was suggested by Sir Patrick Moore and has now become the best known feature of the summer night sky. The corners of the imaginary triangle are positioned on the three obvious bright stars: Deneb in the constellation of Cygnus, Vega in Lyra, and Altair in Aquila. The Milky Way (our Galaxy) flows through the Summer Triangle and passes through Aquila and Cygnus. Above Aquila is the lovely little constellation of Sagitta (the Arrow) and to the east is Delphinus (the Dolphin) appearing to be leaping out of the water.

SAGITTA, DELPHINUS AND VULPECULA



In the lower part of the Summer Triangle is the small but rather 'fun to find' constellation of Sagitta (the Arrow) and it does really look like an arrow when seen in a dark sky. It has a shaft and flight feathers formed by a '<' of stars (using a bit of imagination). Just above and to the right (west) of the flight feathers is a little asterism of stars that look like and are called the 'Coat Hanger'.

The arrow can be seen with the naked eye but a pair of binoculars are required to see the Coat Hanger. The Coat Hanger is actually located in the indistinct constellation of Vulpecula just above Sagitta.



The Coat Hanger in Vulpecula

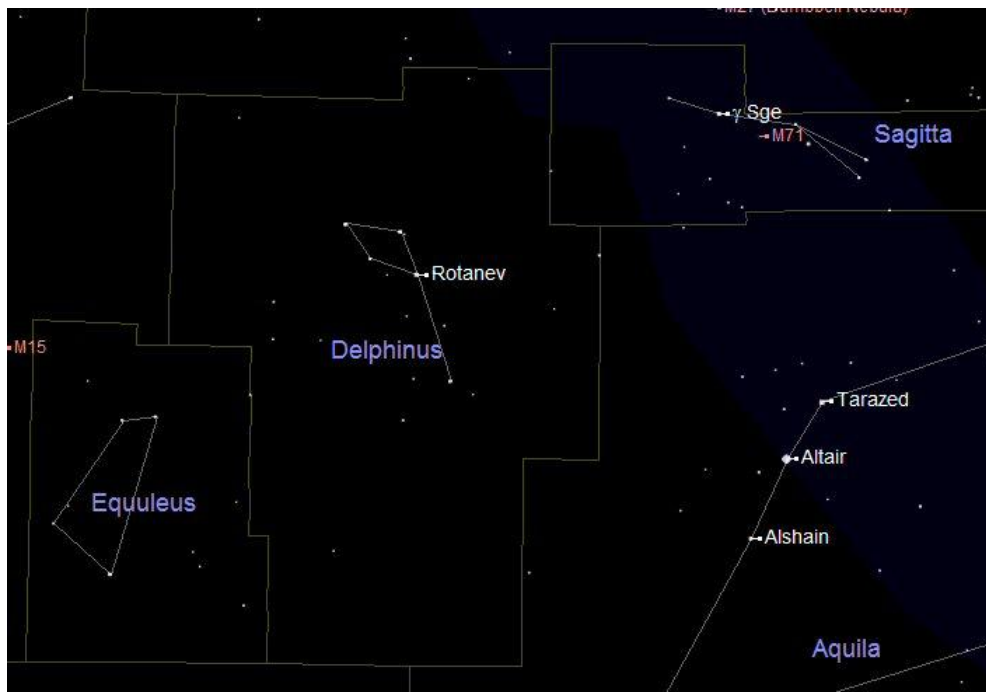
Also in Vulpecula is a large and fairly bright planetary nebular Messier 27 (M27) also known as the Dumbbell Nebula. It is the remains of a star much like our Sun but it is more advanced in its stellar lifetime. It has passed through its time as a Red Giant and has collapsed to form a tiny but very hot and dense White Dwarf Star. During its transition from Red Giant to White Dwarf it lost a large amount of its outer layers that were blown away to form a large bubble around the dying star. In the case of M27 the bubble of gas and dust formed a 'butterfly' shape rather than the 'smoke ring' shape like M57 the Ring Nebula in the constellation of Lyra.



Messier 27 (M27) the Dumbbell Nebula

Messier 27 can be seen using a pair of binoculars in a dark sky looking like a small 'fuzzy' patch of light. A telescope will show it as a 'butterfly' shaped patch of light. The White Dwarf at the centre of M27 is about 1360 light years from us and is thought to have formed about 14,600 years ago.

Just to the east (left) of Sagitta is another interesting little constellation to find. It is called Delphinus (the Dolphin) and with a little stretch of the imagination it does look like a dolphin leaping out of the water. It is comprised of four stars forming a diamond shape and one star for the tail.



The constellation of Delphinus (the Dolphin)

THE SOLAR SYSTEM THIS MONTH

MERCURY rises over the eastern horizon at 05:00 at the beginning of this month. It will be visible very low over the eastern horizon before sunrise.

VENUS is now a very bright morning object rising about 02:00 BST in the east. It has a diameter of about 27 arc-seconds. It appears as a crescent widening through the month but getting smaller in diameter as it moves back towards the Sun and superior conjunction..

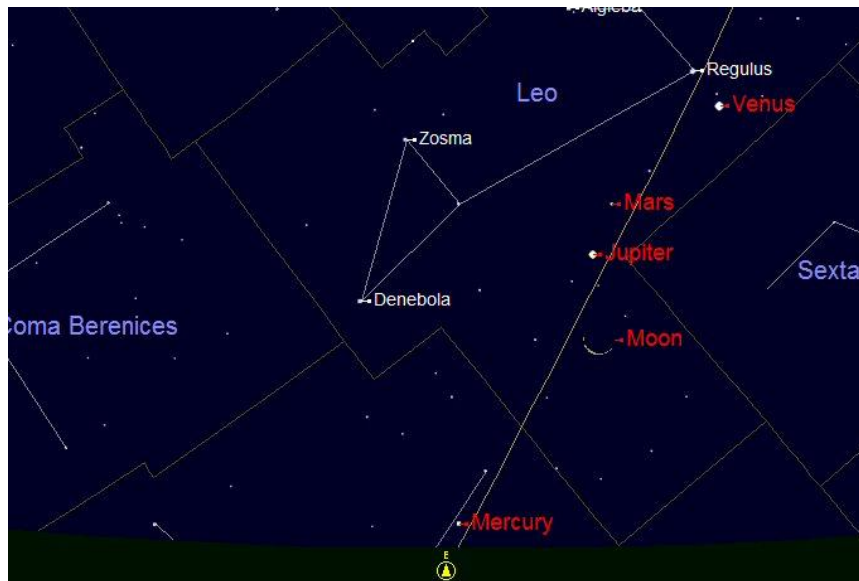
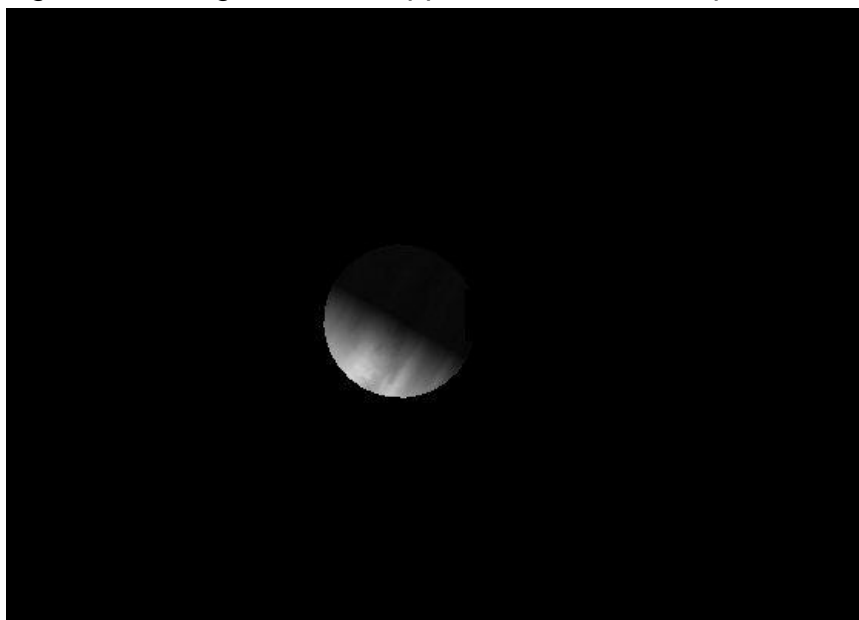


Chart showing Venus, Mars and Jupiter at 05:00

Venus will be at its Greatest Western Elongation from the Sun on 26th October, this means it will be at its furthest apparent distance from the Sun. It will then begin to move back towards the Sun and superior Conjunction. As it moves back towards the Sun it will gradually get smaller but it will develop into a wider crescent shape so its brightness will remain almost the same at about magnitude -4.5. At greatest elongation it will appear 'half Moon' shaped as shown below.



Venus as it will appear on 26th October

MARS is an early morning object rising at 02:30 about four hours before the Sun. It will be close to Venus which will help in finding it. Mars appears small at just 4.0 arc-seconds and quite faint at magnitude +1.8.

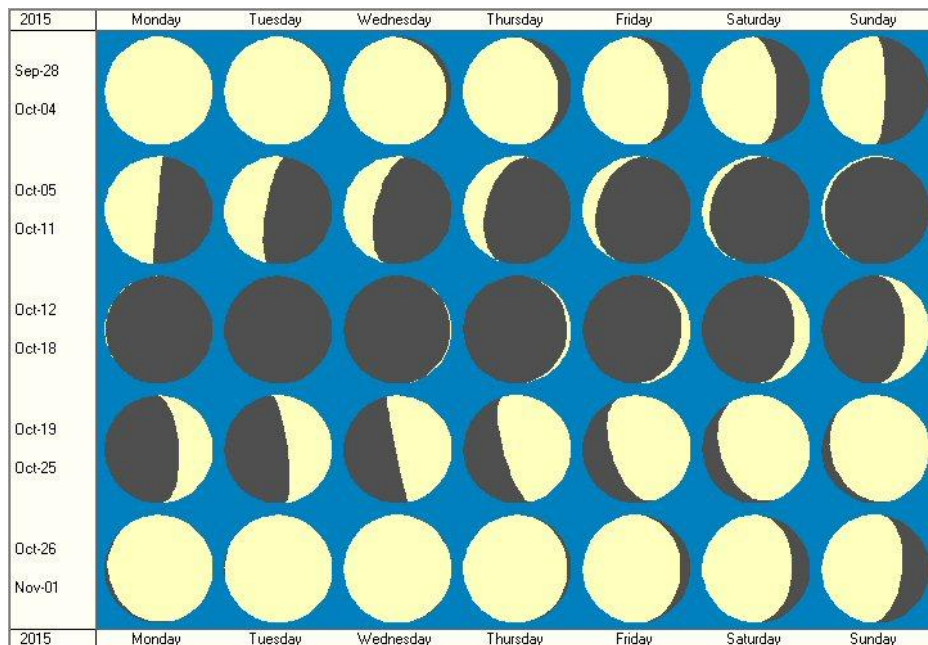
JUPITER is also an early morning object rising over the eastern horizon at 03:00 at the beginning of the month and 02:15 by the end of the month. It will be worth looking out for at the end of the month but it will require a good clear view to the eastern horizon. Jupiter appears large at 32 arc-seconds and bright but it will be lost in the morning twilight by about 06:00.

SATURN is now moving closer to the western horizon and will be all but lost in the glare of twilight. It is moving toward conjunction with the Sun on 30th November. Unfortunately Saturn has been very low in the southern sky this year so it has not been at its best observing position but it was never-the-less still very impressive.

URANUS rises in the east at about 17:00 and will be at opposition, due south at midnight GMT on 12th October. It will be at its best position for observing this year.

NEPTUNE rises in the east at about 15:45 so will be visible all night.

THE MOON PHASES IN OCTOBER 2015



Last Quarter will be on 4th October

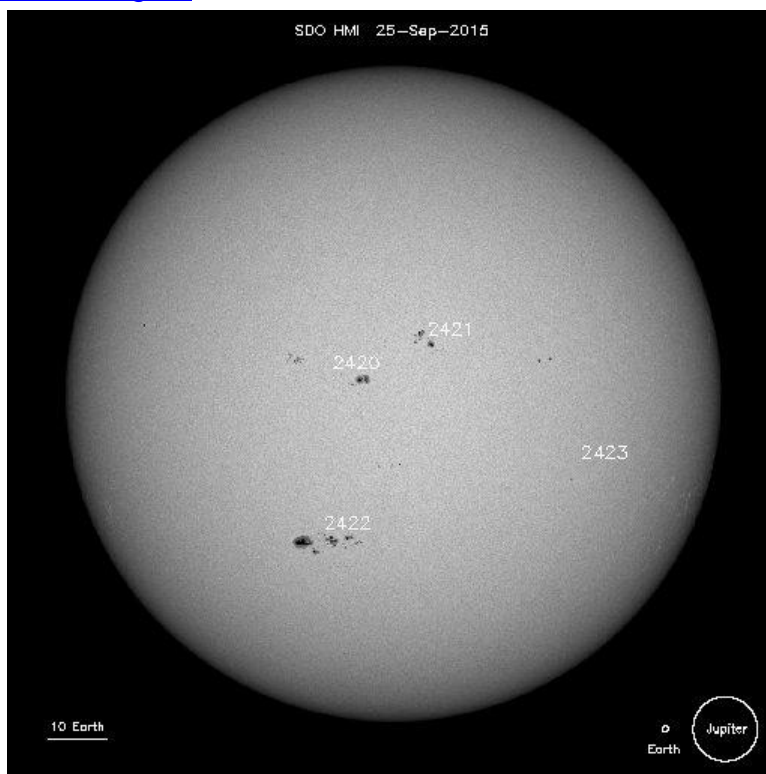
New Moon will be on the 13th October

First Quarter will be on 20th October

Full Moon will be on 27th October

THE SUN

The Sun rises at about 06:30 mid month and sets at about 17:15. Sunspots and other activity on the Sun can be followed live and day to day by visiting the SOHO website at: <http://sohowww.nascom.nasa.gov/>.



Sunspots seen on 25th September, SOHO image

A special solar filter must be fitted to a telescope to view the Sun or alternatively the image can be projected on to a screen.

DO NOT LOOK DIRECTLY AT THE SUN AS IT WILL CAUSE BLINDNESS

