NEWBURY ASTRONOMICAL SOCIETY
MONTHLY MAGAZINE – OCTOBER 2022

British Summer Time (BST) begins on 30th October so clocks will be put back one hour

ASTRONOMY FOR BEGINNERS

September brought the beginning of the new astronomy season, when the evenings begin to draw in and the skies are getting dark at a reasonable time. During the summer months it has been light until after 10:30 and sky has not been completely dark even at midnight. Now we can get out for a good look at all the interesting sights of the night sky and still get enough sleep to get up in time for the things we need to do the next day. So this month we will consider what we need to start out in astronomy, what we can expect to see, where and how to find it.

When starting out in astronomy it is not necessary to have a telescope to enjoy wonderful views of the night sky. All that is needed is to go to a dark location away from the glare of street lights. Somewhere comfortable to sit will make the observing more enjoyable so a simple reclining garden chair or deckchair is ideal. A star chart is a worthwhile purchase to help find your way around the sky although a simple chart like the one on the back page of this magazine will do fine to start with.

BINOCULARS

Once the new astronomer has become familiar with the night sky and the interest has begun to develop it is worth considering obtaining a pair of binoculars or a beginner's telescope. Binoculars are not as expensive as a decent starter telescope and can be obtained second hand. They will enable many more objects to be seen

The author's old 9 x 50 binocular

Binoculars for astronomy should have an aperture (lens diameter) of at least 50mm but it must be said binoculars over 50mm do tend to be more expensive and heavier so 50mm is a good size to start off with. An aperture of less than 50mm will not gather enough light to give a really good view of the night sky. A magnification of 7x or 8x is the best but up to 10x can be used. The 10x may be difficult to hold steady but if mounted on a tripod or supported on a wall or fence they can be used. So look for a 7 x 50 or 8 x 50. What about cost? Normally the old adage 'you get what you pay for' is true. About £50 should provide a good quality pair but spend as much as you can afford.

STAR CHARTS

The beginner to astronomy is unlikely to have a large telescope and may have no equipment at all. This does not mean that observations cannot be carried out. A star chart is the only other equipment that may necessary to get started.

The 'all sky' chart included on the last page of this magazine can be used as a simple guide to the sky for the current month. More detailed charts are available from bookshops and astronomy specialist shops. Star atlases are also very useful but may be a little complicated for the beginner to astronomy.

A planisphere chart is very useful and can be obtained from W. H. Smith and other large book shops or can be bought through the adverts in popular astronomy magazines such as 'Astronomy Now'.

Another option is to use a computer planetarium application. There a number of good applications on the market but some can be quite expensive. Another option is download a freeware sky chart application from the internet. A particularly good one is called 'Stellarium'.

SETTING UP

Make sure you start off dressed in warm clothes because once the cold has taken hold it is very difficult to warm up, even when extra clothes are put on. A small torch is needed to enable the chart to be read but this must shine with only with a dimmed light. A small cycle rear light or torch with a piece of red plastic secured over the lens will give enough light but will not spoil 'night vision'. It takes about 10 to 15 minutes for our eyes to become fully adjusted to the dark but a flash from bright light will spoil night vision in an instant. If the torch is still too bright fix a piece of cardboard, with a hole in it, over the lens to reduce the light.

Next find a dark area away from any lights. This may be difficult due to street lights but a strategically positioned screen made from a blanket or a garden umbrella may help. If all fails go out of town to a dark field or hill. If you are lucky enough to have an area in the garden that is sheltered from lights, a few comforts can be indulged. The first and most important would be a reclining chair to prevent neck ache from looking up for too long. On the following pages we will see some interesting things to look for in the night sky at this time of the year. In November we will consider buying a 'starter' telescope.

NEWBURY ASTRONOMICAL SOCIETY MEETING

7th October	The Square Kilometer Array
Website:	www.newburyastro.org.uk

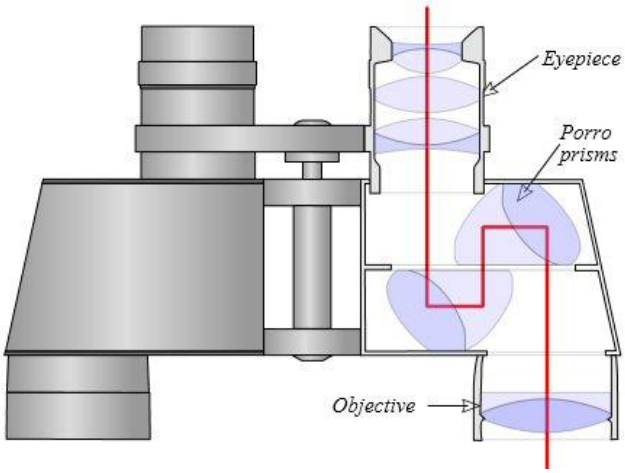
NEXT NEWBURY BEGINNERS MEETING

19th October	Constellations and Star Charts
Website:	www.naasbeginners.co.uk

USING BINOCULARS

Binoculars 8 x 50 (left) 15 x 70 (middle) 10 x 25 (right)

Nearly all amateur astronomers will have a trusted 'pair of binoculars' and will often recommend to a beginner that it should be the first instrument to be purchased. This article will endeavor to give some guidance in purchasing binoculars and using them to observe the night sky.



The typical light path through a binocular

The objective lens gathers light and focuses it into an image. The eyepiece is used to magnify the image and direct the light into the eye. Prisms are introduced into prismatic binoculars to enable the body to be physically reduced in length compared to that of a telescope. Prisms also ensure that the image is orientated the right way up and the right way round.

Binoculars come in many different designs to suit the purpose or requirements of the user. The picture at the top of this page shows a small selection of the very large variety of the range of binoculars available.

Binoculars for astronomy use should have an aperture (lens diameter) of at least 50mm (the second number in the descriptions seen earlier). The 10 x 25 instrument shown on the right of the picture above is too small to be much use for astronomy. An aperture of less than 50mm will not gather enough light to give a really good view of the night sky. Binoculars over 50mm like the 15 x 70 example above do tend to be more expensive and heavier so 50mm is a good size to start with.

A magnification of 7x or 8x is the best but up to 10x can be used. The 10x may be difficult to hold steady but if supported on a wall or fence they can be used. So look for a 7 x 50 to 9 x 50. What about cost? Normally the old adage 'you get what you pay for' is true. About £35 to £50 will provide a fairly good quality second hand binocular but spend as much as you can afford.

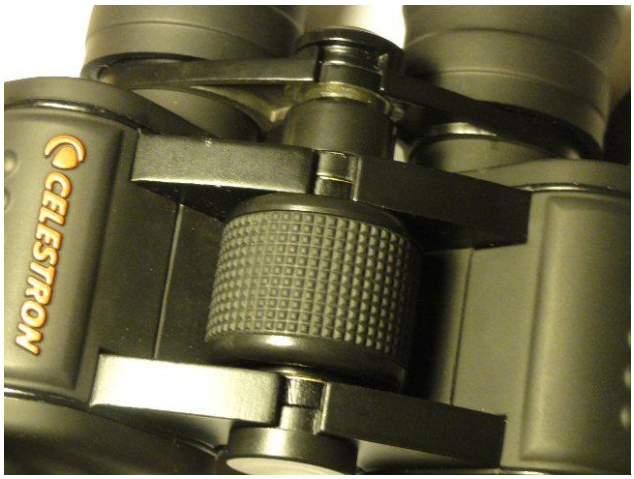
The binocular shown in the image below is a typical example of a good 10 x 50 instrument. Modern versions may be lighter than older versions but the important features are much the same.

A typical 10 x 50 binocular

The most important feature is of course the optical quality but most modern instruments costing around £70 (before special offer price reduction) are of a reasonable quality. Binoculars with an aperture of less than 50mm are not best suited for astronomy as they cannot capture enough light. Most binoculars have the following features that are designed into the instrument to allow it to be adjusted to suit the user and the purpose of use.

The two optical bodies are hinged together to allow them to be adjusted to the relative positions of the users eyes. By adjusting the angle of the hinge the eyepieces can be moved closer or further apart to achieve the most comfortable position to suit the user's eye spacing. See the image below.

Incorporated into the hinge between the two optical bodies is a focus adjuster often in the form of a rotating barrel. (The central focusing barrel can be clearly seen in the image below.) Rotating the barrel moves the two eyepieces in and out of the bodies. This allows the binocular to be focus on objects at different distances.



Focus adjuster

The right hand eyepiece can be rotated to adjust the focus of each optical body to suit both eyes this is called 'diopter adjustment'. See the image below.

Diopter adjustment

The way to do this is to find a bright star in the binocular (or any distant object can be used during the day). Close the right eye and adjust the focus to suit the left eye using the central focusing barrel. When the sharpest image is achieved (for a star the smallest point of light) open the right eye and close the left.

Now adjust the right eyepiece by rotating the dioptre adjuster each way until the sharpest image is achieved. Open both eyes and adjust the focus to suit both eyes working together using the central focusing barrel to check the quality of the view.

Finally binoculars are usually supplied with a strap for hanging the instrument around the neck. It is very important to leave this on and use it all the time. It saves putting the binocular down when not being used, it may be difficult to find again in the dark. It is also useful for resting the arms after holding them up for some time. Most of all it stops the binocular falling to the ground and being damaged if accidently dropped.

Some binoculars may have rubber cups fitted to the eyepieces. These are good because they help by excluding unwanted light from street lights or other sources. Lens covers may also the supplied to prevent dust accumulating on the glass so if supplied they should be fitted when the binocular is not in use.

Some cheaper binoculars may display a flare or spikes around the stars but this is not a big problem as long as the effect is not too noticeable. Using binoculars will mainly be to show the positions and patterns of stars so some distortion of the star images can be acceptable. Binoculars can show the large features on the Moon but not fine surface details on the Moon or the planets. So let us move on to using the binocular for astronomy.

The first thing to consider is getting comfortable for observing. All the usual advice given to beginners to astronomy applies. That is: dress to keep warm, make yourself comfortable and avoid lights that shine directly into your face. Little needs to be said about dressing to keep warm except to start observing in warm clothes and don't wait until cold has set in before dressing up.

To be comfortable a reclining garden chair will allow views of the sky overhead to be obtained without a resulting neck ache. It also avoids the feeling of swaying or falling over when looking up into the sky for a while. It is also more comfortable. If a star chart is to be used in conjunction with the binocular a small side table is handy and a not too bright red light should be used to read it.

Before starting to use the binocular have a look around the night sky for a few minutes to allow your eyes to adapt to the dark. This will take at least ten minutes. Pick out the brightest stars and try to identify them. Familiarise yourself with the positions of those bright stars because they do appear to move quite noticeably from east to west as Earth rotates.

Start at one of the bright stars then try to identify the star patterns on the star chart. This could be difficult at first because more stars will be seen when using binoculars than are shown on the chart. It takes a while to match the slightly brighter ones to the stars shown on the chart.

The good thing is, binoculars always show the stars the right way up and in the correct orientation. Gradually work outwards from the bright stars and you will soon start to become familiar with that part of the sky. Do stop occasionally and just sweep across the sky and marvel at the thousands of stars. Do the same for other bright stars. The bright stars of the Summer Triangle or the constellation of Orion in the winter are a good place to start. See pages 5 to 9.

STAR CHARTS AND CONSTELLATIONS

A very old and artistic star chart

Ancient star charts were very artistic but not very scientific compared to what we would expect today. Astronomy was not a 'stand alone' science like it is today, it was inextricably linked to nearly all other sciences. Things like medicine, chemistry, Geography and alchemy were based on ancient astrological and astronomical beliefs.

The first modern star charts were true representations of the sky but with artistic representations of the constellations. However some artists would reposition the stars on the chart to match the artistic representations of the constellations. This was not good for the scientific study of the sky. Gradually the charts became less artistic and more scientific.

As humans we have the rather strange ability to see shapes and patterns when we look at things around us. A good example is when we see shapes of animals as we look at the white clouds on a bright day. Another example is when we look up into the clear night sky. The brighter stars appear to form patterns or groups. We can recognise these patterns and use them to help us find our way around the night sky.

We join these patterns 'dot to dot' to make them a recognisable shape and call them 'Constellations'.

Mapping the night sky is actually rather difficult as there are only the stars to use as reference features and stars all look quite similar. The only difference to the untrained eye is that some stars appear brighter than others.

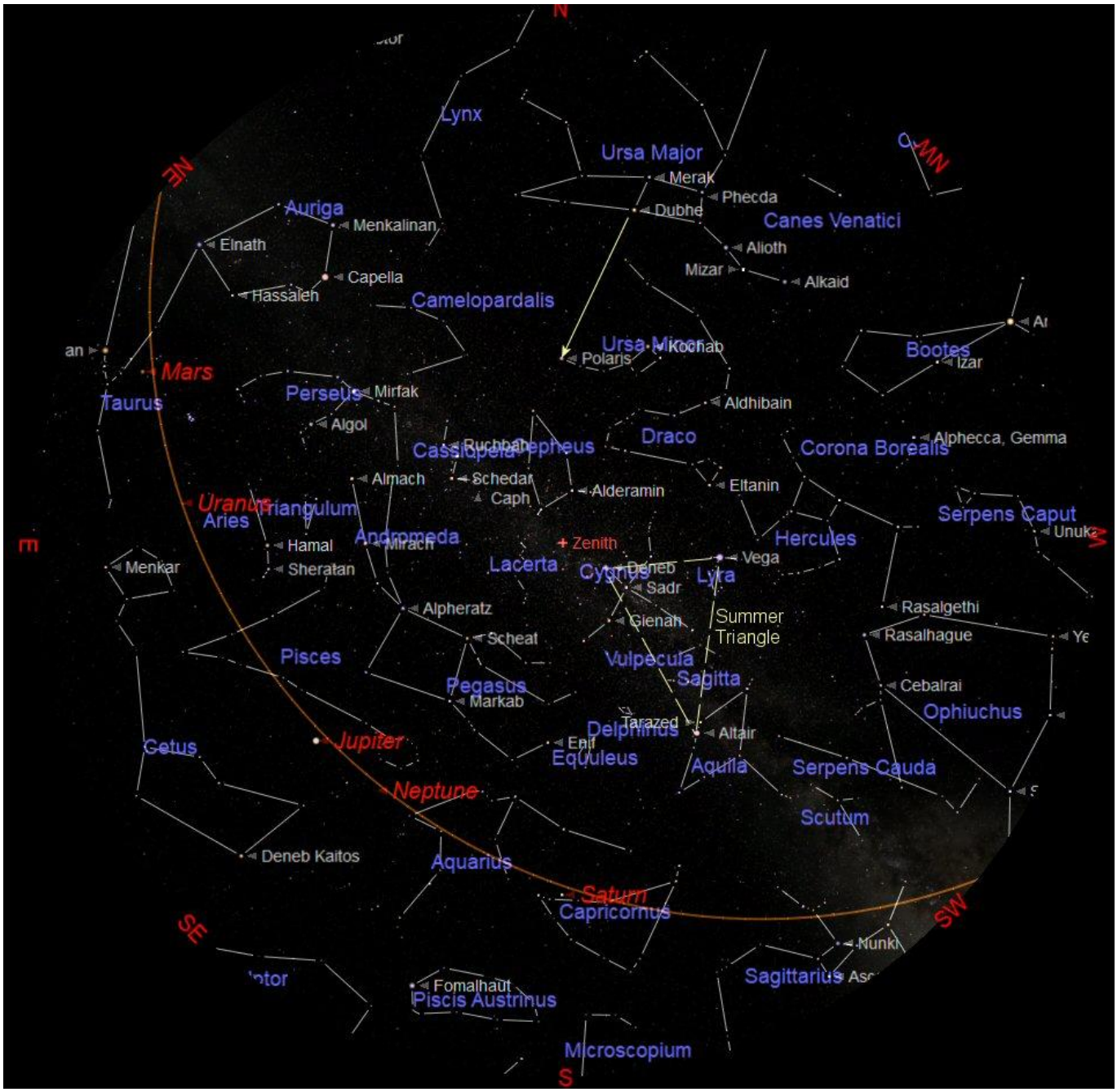
With our unaided eyes (astronomers call 'naked eye') we can see about 6000 stars in our good dark skies. The brighter stars do seem to form (all be it, sometimes indistinct) groups and patterns in the night sky.

From ancient times these patterns have been recognised by different cultures around the world and given special names. The names have traditionally been taken from characters in mythological stories and are often very old. In 1922, the International Astronomical Union (IAU) standardised the constellation names and adopted the modern list of 88 universally recognised 'Constellations'.

Modern star charts are purely scientific and accurately show the positions of stars and deep sky objects. With the introduction of personal computers (PC) we have moved away from paper charts and on to digital charts displayed on a computer screen. This has many advantages and is much easier to use when observing. They can also be used to directly guide a telescope on to a specified target.

The following pages give us a guide to finding our way around the night sky using computer generated charts.

AUTUMN CONSTELLATIONS - 23rd September



A star chart showing the night sky on the Autumn Equinox

The chart above shows the night sky looking south at about 23:00 BST on 23rd September. West is to the right and east to the left. The point in the sky directly overhead is known as the Zenith and is shown (in red) at the centre of the chart. The curved brown line across the sky at the bottom is the Ecliptic or Zodiac. This is the imaginary line along which the Sun, Moon and planets appear to move across the sky. The brightest stars often appear to form a group or recognisable pattern; we call these 'Constellations'.

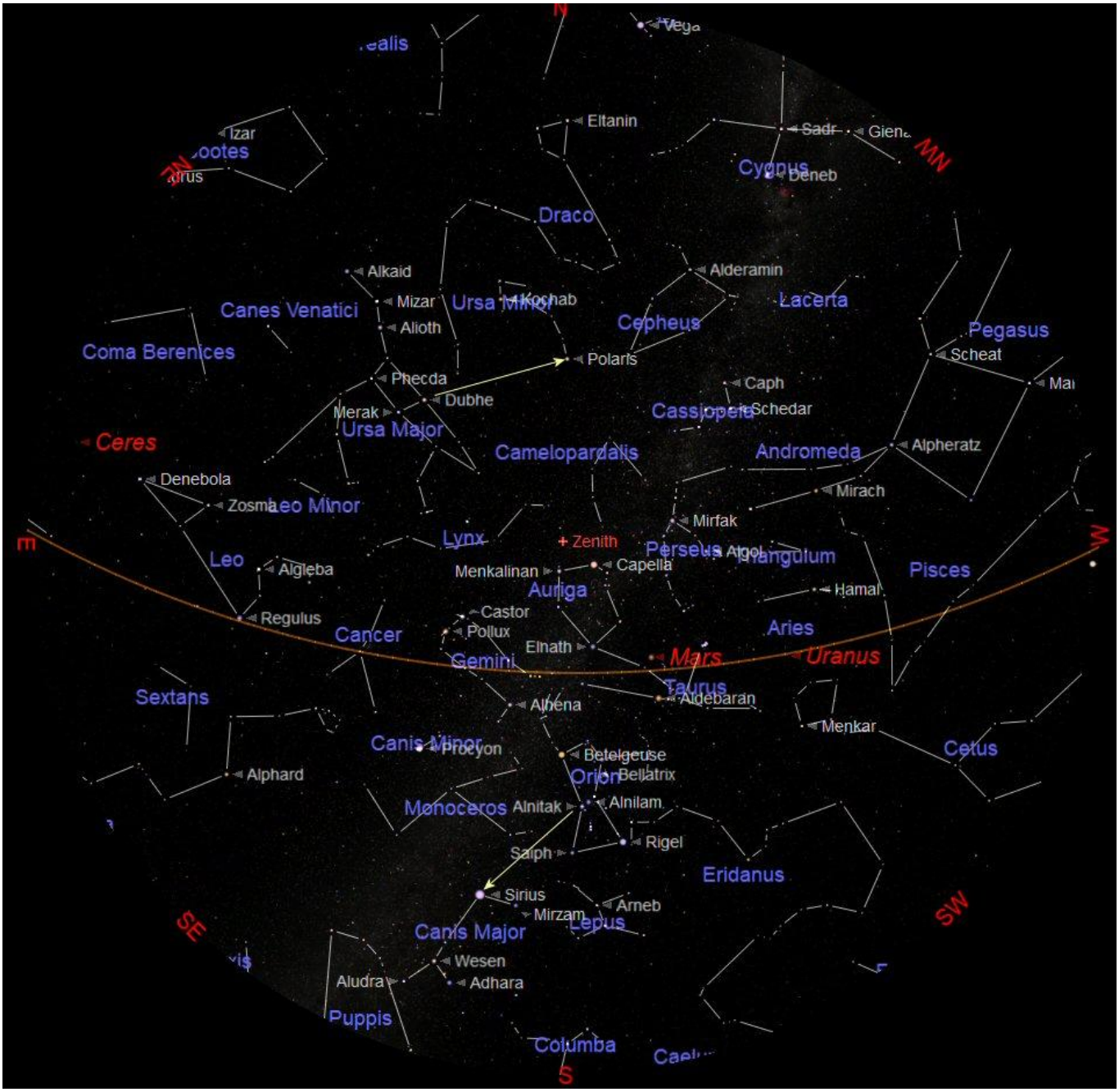
Constellations through which the ecliptic passes this month are: Scorpio (the Scorpion) Sagittarius (the Archer), Capricornus (the Goat), Aquarius (the Water Carrier), Pisces (the Fishes) and Taurus (the Bull).

Prominent in the southern sky is the Summer Triangle that dominates the Summer Sky and is described in detail on the following pages. The term Summer Triangle was first suggested by Sir Patrick Moore and is defined by 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. The Summer Triangle is bigger than may be expected but once it has been found it is very easy to find again. It is almost directly overhead in the later evening at this time.

As the Summer Triangle is so easy to find we can use it to identify the constellations surrounding it. To the upper west (right) is the interesting constellation of Hercules (the strong man). To the east are the 'linked' constellations of Pegasus (the winged horse) and Andromeda (a queen or princess). The two are joined at the star Alpheratz. Pegasus is bigger than might be expected but once found is easy to find again.

Above and to the east (left) of the Summer Triangle is the very distinct 'W' shape constellation of Cassiopeia the beautiful princess from mythology.

WINTER CONSTELLATIONS - 21st December



A star chart showing the night sky on the Winter Solstice

The Summer Triangle that dominated the Summer Sky and was shown in the previous chart is now moving over the western horizon. Constellations through which the ecliptic passes this month are: Aquarius (the Water Carrier), Pisces (the Fishes), Aries (the Ram), Taurus (the Bull), Gemini (the Twins), Cancer (the Crab) and Leo (the Lion) who does look a little like a lion resting.

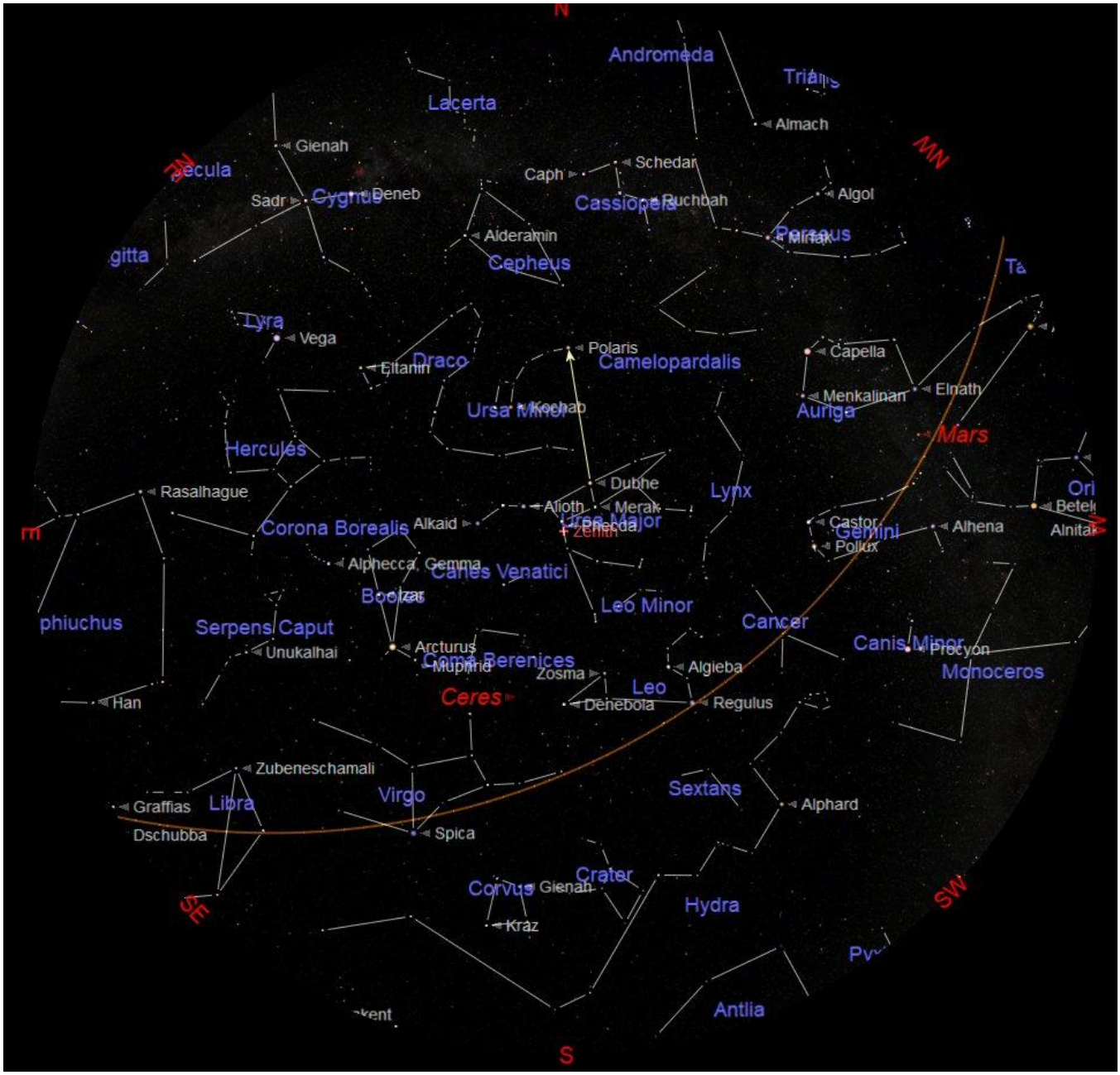
Prominent is the southern sky is the constellation of Pegasus (the Winged Horse). The main feature of Pegasus is the square formed by the four brightest stars. This asterism (shape) is known as the Great Square of Pegasus.

Moving into view in the southern sky is the constellation of Taurus (the Bull). The most obvious star in Taurus is the lovely Red Giant Star called Aldebaran. It appears slightly orange to the 'naked eye' but it is very obviously orange when seen using binoculars or a telescope. Aldebaran is located at the centre of the 'flattened' X shape formed by the brightest stars in Taurus. At the end of the top right (upper west) arm of the 'X' is the beautiful 'naked eye' Open Star Cluster Messier 45 (M45) known as the Pleiades (or the Seven Sisters). It really does look magnificent using binoculars.

Following Taurus is the constellation of Gemini (the Twins). The two brightest stars in Gemini are Castor and Pollux and they are named after mythological twins. To the north of Taurus is the odd pentagon shape of Auriga (the Charioteer). Dominating Auriga is the brilliant white star Capella which is almost directly overhead.

To the south of Taurus is the winter constellation of Orion (the Hunter). Orion is easily found by looking for his very obvious three stars of his belt. Orion is one of the few constellations that do actually look like the character it is named after. He has a club, held above his head with one arm and a shield held out in front. It almost looks as if he is fending off Taurus the charging bull.

SPRING CONSTELLATIONS 22nd March



A star chart showing the night sky on the Spring Equinox

Constellations through which the ecliptic passes this month are: Taurus (the Bull), Gemini (the Twins), Cancer (the Crab), Leo (the Lion), Virgo (the Virgin) and Libra (the Scales) just coming into view.

In the early evening southern sky is the constellation of Taurus (the Bull). The most obvious star in Taurus is the lovely Red Giant Star called Aldebaran. It appears slightly orange to the 'naked eye' but is moving towards the western horizon at this time of the year.

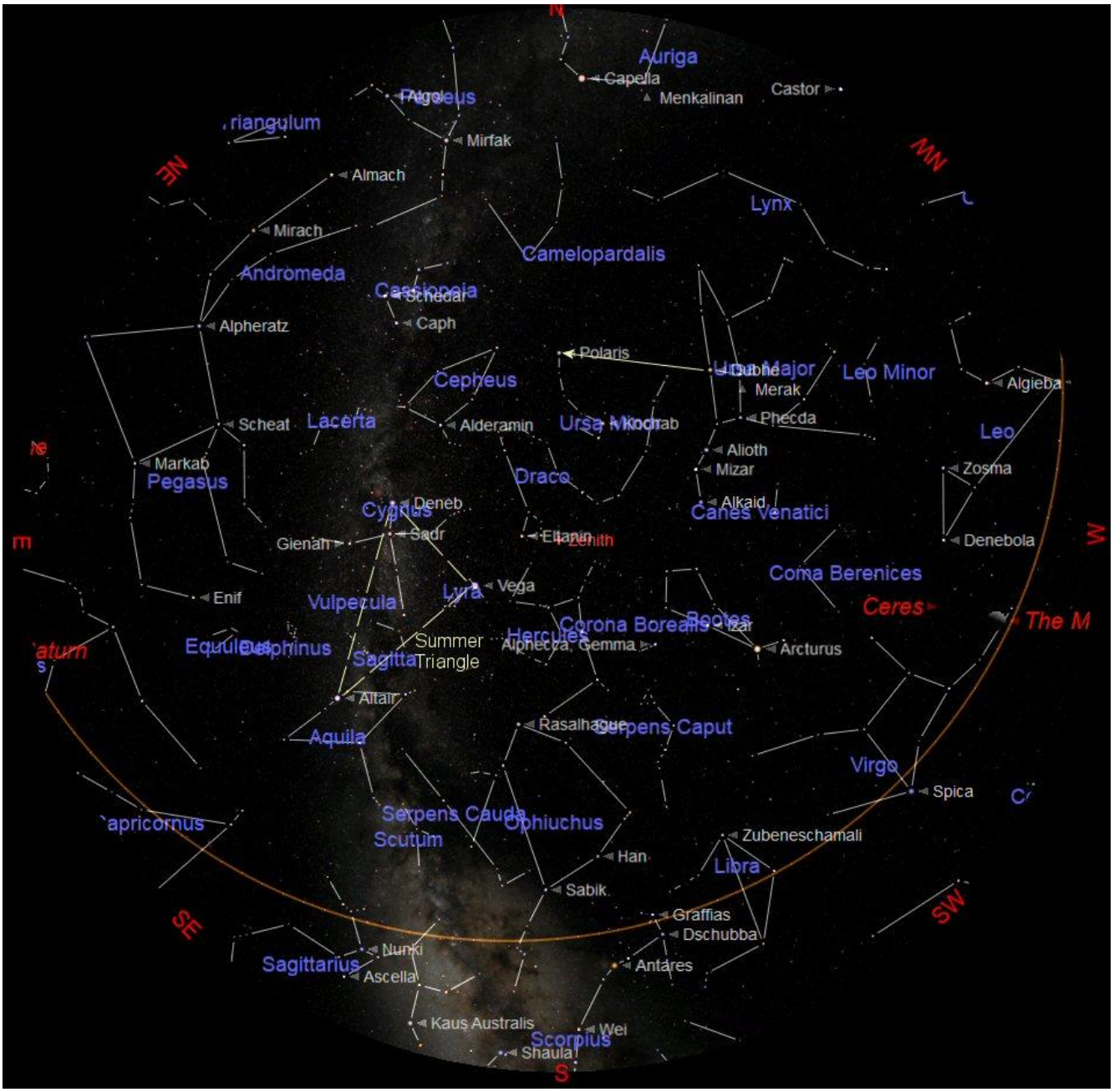
Following Taurus is the constellation of Gemini (the Twins). The two brightest stars in Gemini are Castor and Pollux and they are named after mythological twins. To the north of Taurus is the odd pentagon shape of Auriga (the Charioteer) with its brilliant white star Capella.

To the east (left) of Gemini is the rather indistinct constellation of Cancer (the Crab). The stars of Cancer are quite faint and can be difficult to discern especially in a light polluted sky. It is really worth searching out Cancer using binoculars or a telescope to see the Open Cluster M44 (the Beehive Cluster). The constellation of Leo (the Lion) follows Cancer along the Ecliptic and does actually look a little like a lion or the Sphinx in Egypt.

To the north of Leo is probably the best known of all the constellations Ursa Major (the Great Bear also known as the Plough). At this time of the year Ursa Major appears almost directly overhead (marked as 'Zenith' the point directly overhead). The seven brightest stars of Ursa Major form a pattern that looks remarkably like a giant saucepan.

We can use Ursa Major to find Polaris (the North Star). By following an imaginary line, from the two stars opposite the handle of the saucepan, up out of the pan we can find Polaris in the constellation of Ursa Minor (the Little Bear). Polaris is an important star because it is at the point in the sky where the northern axis of rotation of Earth points to. Consequently all the other stars appear to rotate around Polaris once every 24 hours as Earth rotates on its axis once a day.

SUMMER CONSTELLATIONS 22nd June



A star chart showing the night sky on the Summer Solstice

Constellations through which the ecliptic passes this month are: Leo (the Lion), Virgo (the Virgin), Libra (the Scales), Scorpio (the Scorpion), Sagittarius (the Archer), Capricornus (the Goat) and Aquarius (the Water Carrier).

The constellation of Leo (the Lion) is moving towards the western horizon. Following Leo is the less obvious constellation of Virgo but it does have one fairly bright star called Spica located close to the horizon. Virgo gives its name to a large cluster of Galaxies that is also spread over into the neighbouring constellations of Coma Berenices (the hair of Berenices) and into Leo.

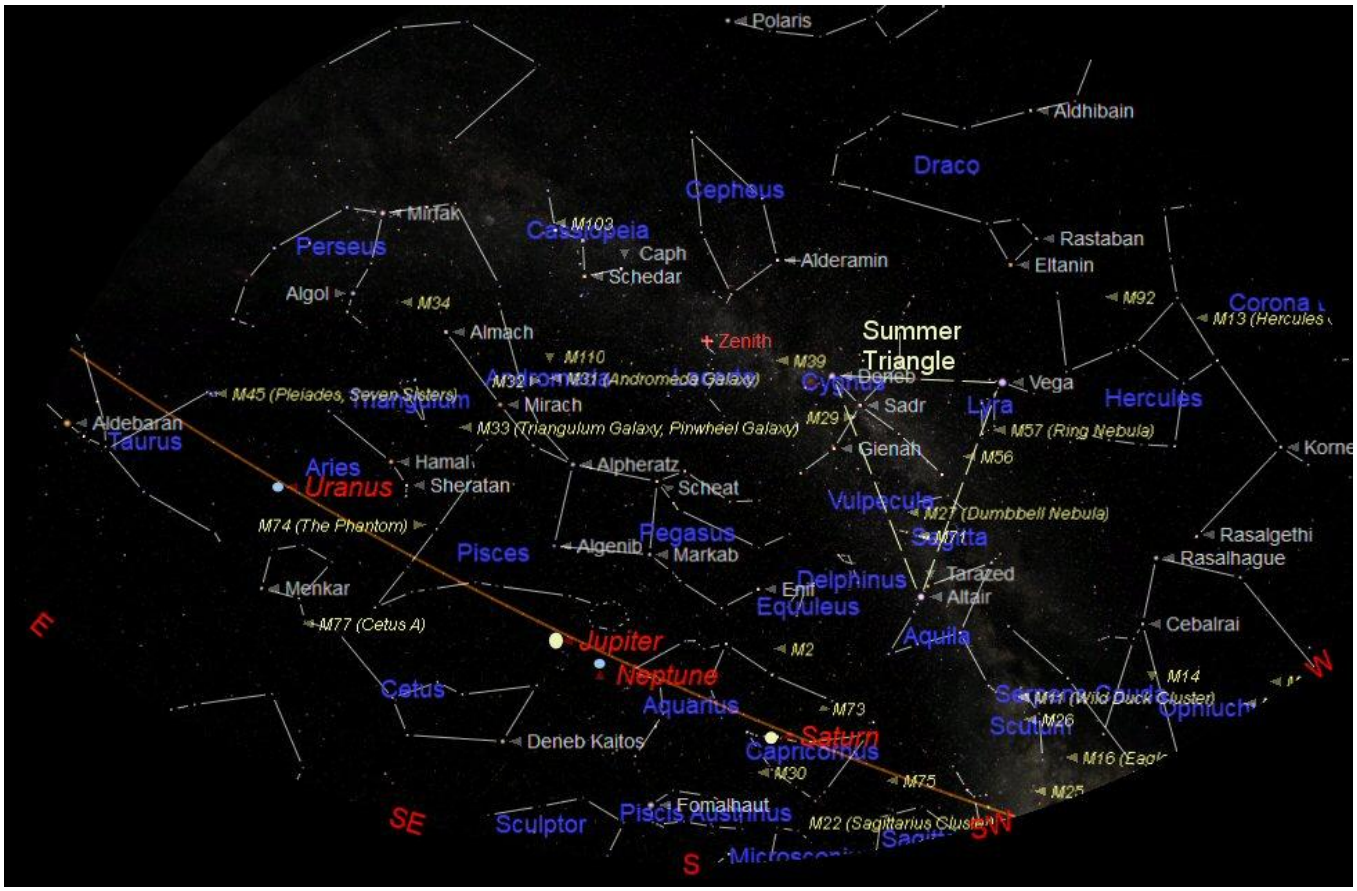
To the north of Virgo is the bright orange coloured star called Arcturus in the constellation of Boötes. Arctaurus is a Red Giant star that is nearing the end of its 'life' as a normal star. It has used almost all of its Hydrogen fuel and has expanded to become a Red Giant, 25 times the diameter of our Sun. At the moment it shines 115 times brighter than our Sun but it is destined to collapse and become a White Dwarf.

To the east (left) of Boötes is the constellation of Hercules (the Strong Man). Hercules has a rather distinctive distorted square shape, at its centre, called the 'Keystone'. This is due to its resemblance to the centre stone of an arch or bridge. The jewel of Hercules is without doubt is the Great Globular Cluster, Messier 13 (M13) there is also M92 a more distant Globular Cluster.

Prominent in the eastern sky is the Summer Triangle that is moving in from the east to dominate the late summer sky. The triangle formed by the stars Deneb, Vega and Altair dominates the Summer Sky and was described in more detail on page 5.

On the southern horizon is the constellation of Sagittarius (the Archer). Sagittarius is a southern constellation so is only half visible as it straddles the southern horizon. The centre of our Galaxy that we call the Milky Way is located in Sagittarius. It is difficult to see the centre of our galaxy from the UK because it is always in the thick, murky and turbulent air close to the horizon.

A TOUR OF THE NIGHT SKY - OCTOBER 2022



The chart above shows the night sky looking south at about 22:00 BST on 15th October. West is to the right and east to the left. The point in the sky directly overhead is known as the Zenith and is shown (in red) at the upper centre of the chart. The curved brown line across the sky at the bottom is the Ecliptic or Zodiac. This is the imaginary line along which the Sun, Moon and planets appear to move across the sky. The brightest stars often appear to form a group or recognisable pattern; we call these 'Constellations'.

Constellations through which the ecliptic passes this month are: Sagittarius (the Archer), Capricornus (the Goat), Aquarius (the Water Carrier), Pisces (the Fishes), Aries (the Ram) and Taurus (the Bull).

Still prominent in the southern sky is the Summer Triangle that dominates the Summer Sky. It is defined by three 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. The Summer Triangle is bigger than may be expected but once it has been found it is very easy to find again. As the Summer Triangle is so easy to find it is very useful to use as a starting place for finding our way around the night sky.

To the west (right) of the Summer Triangle is the constellation of Hercules (the Strong Man). Hercules has a distinctive distorted square shape, at its centre, called the 'Keystone'. This is due to its resemblance to the centre stone of an arch or bridge. The jewel of Hercules is without doubt the Great Globular Cluster, Messier 13 (M13) that can be found in the western vertical imaginary line forming the 'Keystone'. It is just visible using a good pair of 9 x 50 binoculars. The spherical cluster, of about a million stars can be seen using a 90mm *f*10 telescope but will look even more impressive when using a larger telescope. Globular Clusters are thought to be the dense centre of small galaxies that have ventured too close to our galaxy.

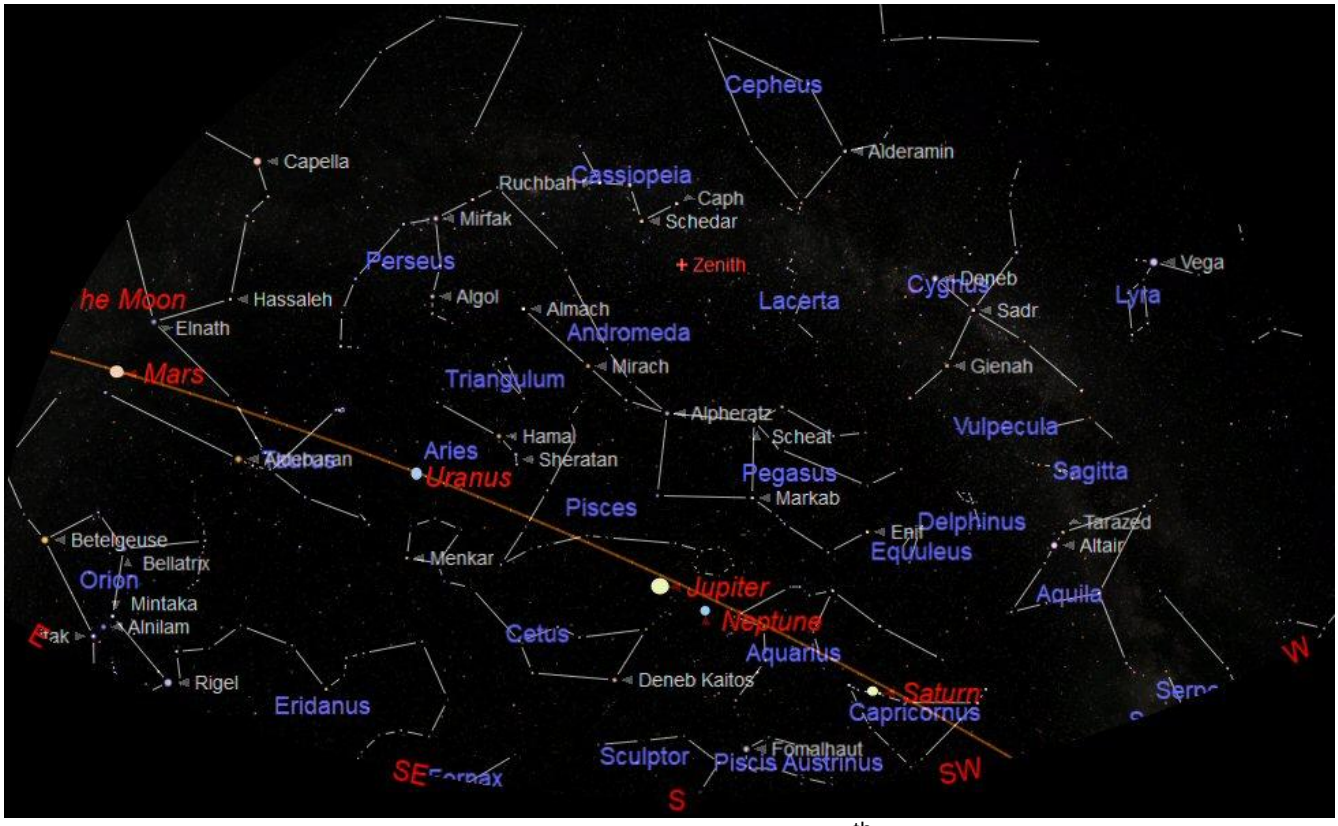
To the East (left) of the Summer Triangle is the constellation of Pegasus (the Winged Horse). The main feature of Pegasus is the square formed by the four brightest stars. This asterism (shape) is known as the Great Square of Pegasus. The square is larger than might be expected but once found is easier to find again.

The square can be used to judge the seeing condition of the night sky. Under perfect conditions about ten stars can be seen inside the square this would indicate a very good night for observing. If three to five stars can be seen then conditions will still be good. If fewer or none can be seen then just concentrate on looking at the Moon or planets. There is a very nice Globular cluster in Pegasus that is known as Messier 15 (M15) and is a lovely sight to see in a medium to large telescope.

The top easterly (left) star of Square of Pegasus is called Alpheratz and is shared with the constellation of Andromeda. In Greek mythology Andromeda is a princess who was chained to a rock as a sacrifice to a sea monster but she was saved from death by Perseus who married her and took her back to Greece to reign as his queen. The constellation of Andromeda is marked by two diverging lines of stars emanating from the star Alpheratz.

Just above the upper line of stars is one of the most remarkable objects to be found in the night sky. This is the Great Andromeda Galaxy called Messier 31 (M31). It is the closest Giant Spiral Galaxy to us and can be seen using binoculars or a small telescope. It is 2.54 million light years away from us and appears as a small elliptical smudge of light using a telescope.

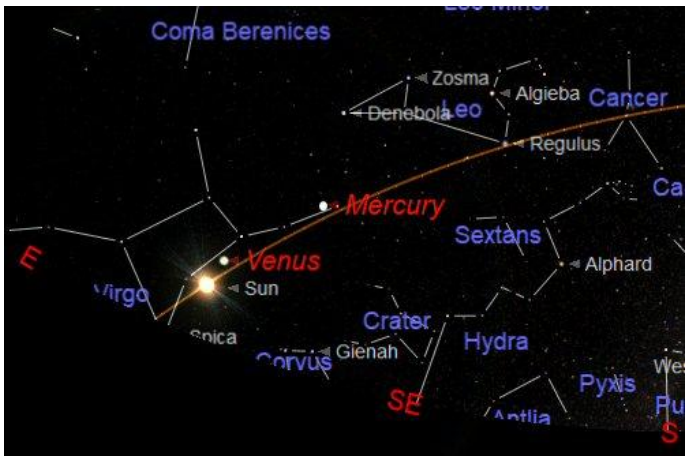
THE SOLAR SYSTEM - OCTOBER 2022



The location of the planets at 23:00 on 15th October 2022

The chart above shows the location of the planets along the Ecliptic in the early morning sky. The sky has been darkened to make the planets visible. The planets are: (in order as they appear) Saturn, Neptune, Jupiter, Uranus and Mars (midnight). Venus and Mercury are close to the Sun this month. These planets appear low in the sky, in the bright morning or evening sky so are not well positioned for observing.

MERCURY was at its Inferior Conjunction with the Sun on 23rd September this meant it was passing in front of the Sun. After conjunction it moved into the morning sky and now rises just before the Sun. Mercury will be at its greatest westerly elongation on 8th and 9th October when it will be at its apparent furthest point from the Sun.

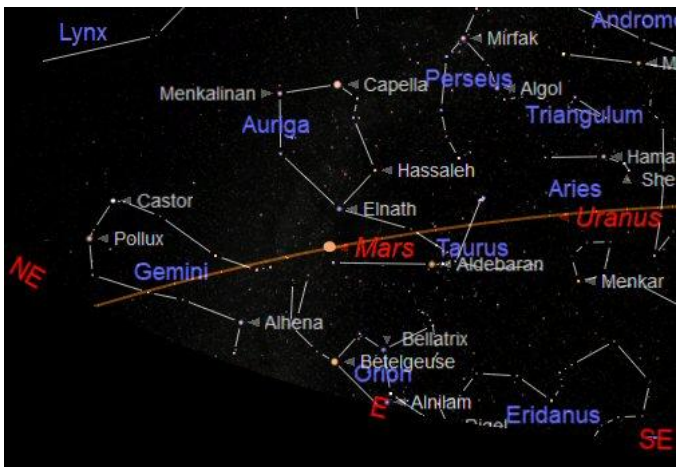


Mercury and Venus on 15th September

VENUS will be at its Superior Conjunction (behind the Sun) on 22nd October so it will not be visible this month. Over the next few months it will start to re-appear low over the western horizon in the early evening.

As Venus is located on the other side of the Sun it will appear smaller but fully illuminated. Initially it will be close to the Sun and difficult to see.

MARS will be best seen after midnight in the east and will move west throughout the night until sunrise. It is still some distance away but is approaching its closest position when it will be at Opposition on 8th December. The chart below shows Mars rising in the east in the late evening. It will be at its best after midnight this month.

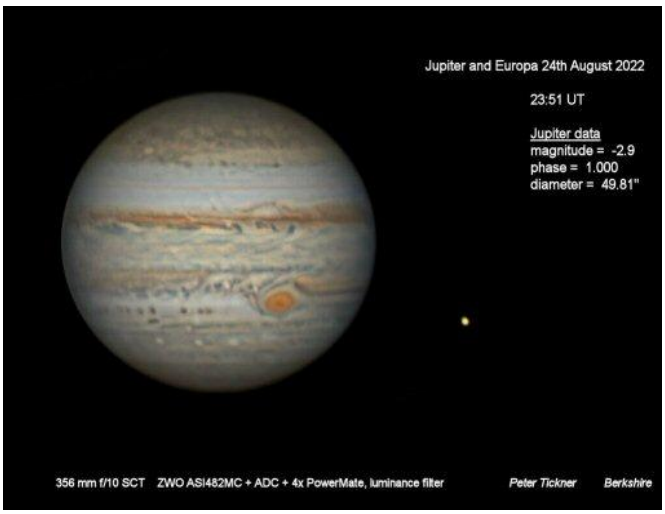


Mars rising in the east at 23:00

Mars will be at its best during December when it will be at or close to its opposition. Although Mars will not be as close to Earth as it can be, it will be high in the sky and away from the turbulent and contaminated air close to the horizon. So we should be able to obtain some good views of the Red Planet around Christmas time. A telescope of over 100mm aperture should be able to show the dark markings on the surface and one of the polar ice caps.

JUPITER was at Opposition (directly in line with the Sun and Earth) at midnight on 26th September. At this point Jupiter was at its best position for observing and will be higher in the sky than it was last year. So it will be better to observe as it will be higher above the horizon and in slightly clearer and less turbulent air. The cloud markings and the four brightest (Galilean) moons will be visible, using a smaller telescope, even with the turbulent air above the horizon.

The image below shows Jupiter imaged by Peter Tickner. For those with a smaller telescope, do not feel disappointed that the view is not as good as shown in the image below or in magazines and on the internet. The important thing is that we are using 'our own' telescope to see this beautiful object. The light from the planet has travelled through space and has entered our eye to produce a real image on our retina.



Jupiter and Moon Europa imaged by Peter Tickner

SATURN is the first planet to rise over the eastern horizon so it will be seen very low in the south eastern sky as soon as it gets dark. It will be quite low over the south eastern horizon at the beginning of September but it will now appear in darker sky earlier and will also appear higher towards the end of the month.

Saturn imaged by Steve Harris

Saturn will look small in a small telescope and not much bigger in a medium sized telescope but the ring will be visible even using a small beginner's telescope. The view of Saturn is very dependent on the seeing conditions. This is the term used by astronomers to describe how clear the sky appears. This depends on the brightness of the sky and how transparent it is and how steady the atmosphere is. The image above was taken on a night when the 'seeing' was very good. The shadow of the planet can be seen on the ring to the left.

The Cassini Division (gap in the ring) can be seen quite clearly. The ring is easier to see when Saturn is at its maximum tilt but becomes very difficult to see when the tilt is at minimum. When our view is edge on the ring becomes very difficult to see and all but disappears for a few of days. Although the ring is 282,000 km in diameter it is only about 100 metres thick.

URANUS is observable later in the evening in the east this month. It rises over the eastern horizon at about 19:00 this month. Uranus will be best seen later is the night as it rises higher in the sky. It will be best at about 02:30 when it is at its highest in the south.

NEPTUNE is a lot smaller and fainter than Uranus but is close to Jupiter so that makes it a little easier to find. It will still be difficult to see in the late summer sky and will need a bigger telescope and a high magnification to see, looking like a small blue 'fuzzy' star.

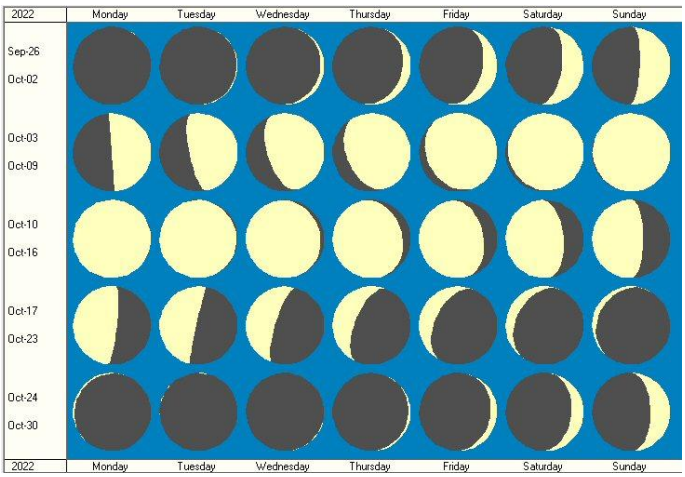
THE SUN

The Sun rises at about 07:00 BST at the beginning of the month and 7:45 BST by the end of the month. It sets at 18:30 at the beginning of the month and 17:50 at the end of the month. There have been a lot of very nice Sunspots and even some impressive groups of sunspots recently.

Sun spots can be seen and studied using most telescopes. However the telescope must be fitted with a special Solar Filter. This filter must be a specially manufactured solar filter and no other type of filtering device can be used. This special filter fits over the front of the telescope to hugely reduce the amount of sunlight that can enter the telescope. The telescope can be used as normal but only the Sun can be visible through the solar filter.

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/.

THE MOON



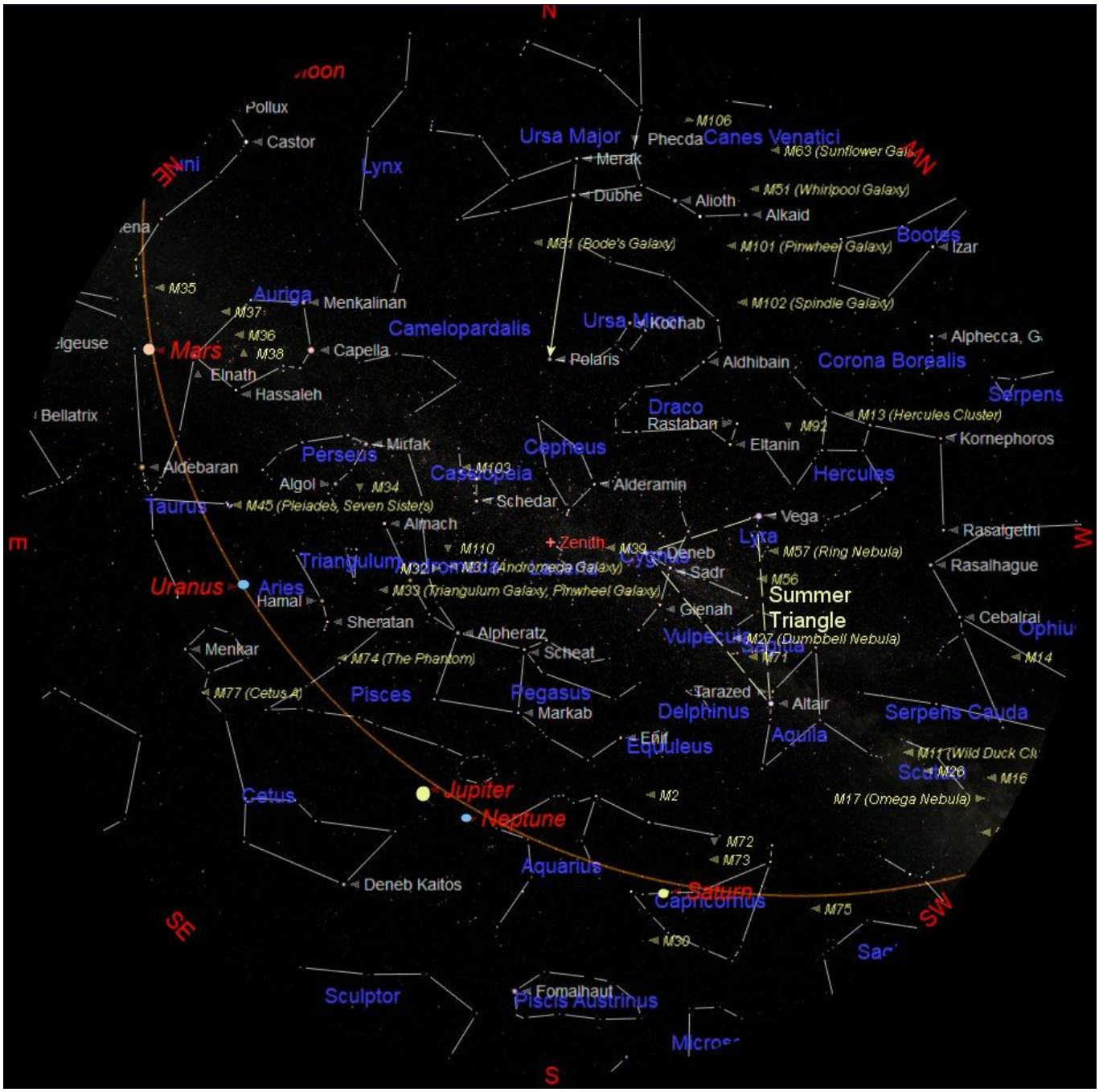
First Quarter will be on 3rd October

Full Moon will be on 9th October

Last Quarter will be on 17th October

New Moon will be on 25th October

THE NIGHT SKY – OCTOBER 2022



The chart above shows the whole night sky as it appears on 15th October at 22:00 (10 o'clock) British Summer Time (BST). 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 9 o'clock BST at the beginning of the month and at 11 o'clock BST at the end of the month. The stars also appear to move 15º (360º 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 located high in the North. 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 50º 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.

The planets visible in the evening sky this month: Saturn, Neptune, Jupiter, Uranus and Mars.

British Summer Time (BST) begins on 30th October so the clocks will be put back one hour.