

# NEWBURY ASTRONOMICAL SOCIETY

## MONTHLY MAGAZINE - JUNE 2014

### NEW METEOR SHOWER

During the early morning hours of 24<sup>th</sup> May astronomers all across North America and Canada were on the look-out for a brand new meteor shower. Scientists were not sure how many shooting stars people might see but this year's new Camelopardalids meteor shower had hopes that they would see a better than a one-per-minute meteor rate.

This is the first time Earth directly crossed the dusty trail left behind by a recently discovered comet. This comet, named 209P/LINEAR, was discovered in 2004. Its path had been slowly altered by Jupiter's gravity over the last 200 years and the leftover dust would now cross Earth's path. That was good news for those in North America who would have a front-row seat to see Nature's celestial display of fireworks. Astronomers in North America and Canada eagerly waited for the meteors to appear from a radiant point in the northern constellation of Camelopardalis.

Unfortunately sky watchers were disappointed when the new Camelopardalid meteor shower produced just 5 to 10 shooting stars per hour. This was at least 10 times less than the number expected. In fact, they were there but most were faint and only few were visible to the human eye. The shower was quite strong as seen by radar but almost exclusively in faint echoes revealing it was rich in faint meteors (i.e., 6th to 7th magnitude). Local astronomers said "If only it had been an outburst of *visible* meteors, it would have been a great new shower".



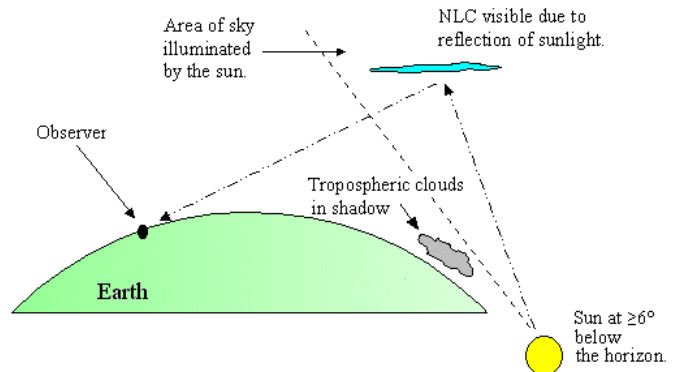
One of the new Camelopardalid meteors

The radar detectors identified about one hundred orbits from the stream, making this comparable to the 2011 Draconids in terms of strength as seen by the radar. Compared to other minor showers, activity on 24<sup>th</sup> May from the Camelopardalids was at the top of the list – numerically speaking it was a major outburst.

Clearly, the debris stream of parent comet 209P/LINEAR did not contain as many large particles as forecasters anticipated. This gave the advantage to the radar. Even so, a few naked-eye Camelopardalids meteors were seen by the keen meteor watchers.

### LOOKING FOR NOCTILUCENT CLOUDS

An interesting and elusive phenomenon to look out for during the month of June is the appearance of Noctilucent Clouds. These are very unusual clouds located high in the upper atmosphere. Most clouds are found in the 10 kilometres or so above sea level but these special clouds are at the very top of the atmosphere up to 80 kilometres above sea level.



When the Sun is below the horizon and all the other types of cloud are in darkness, they will be seen in silhouette against the night sky in the north after sunset and through the night. The Noctilucent Clouds are so high they remain in sunlight and appear as spectacular silver wisps and ripples. Noctilucent Clouds do look quite different to normal clouds and the formations can change perceptibly over a few minutes.



Noctilucent Clouds imaged by Richard Fleet

This will be the last magazine of this session the next issue will be in September.

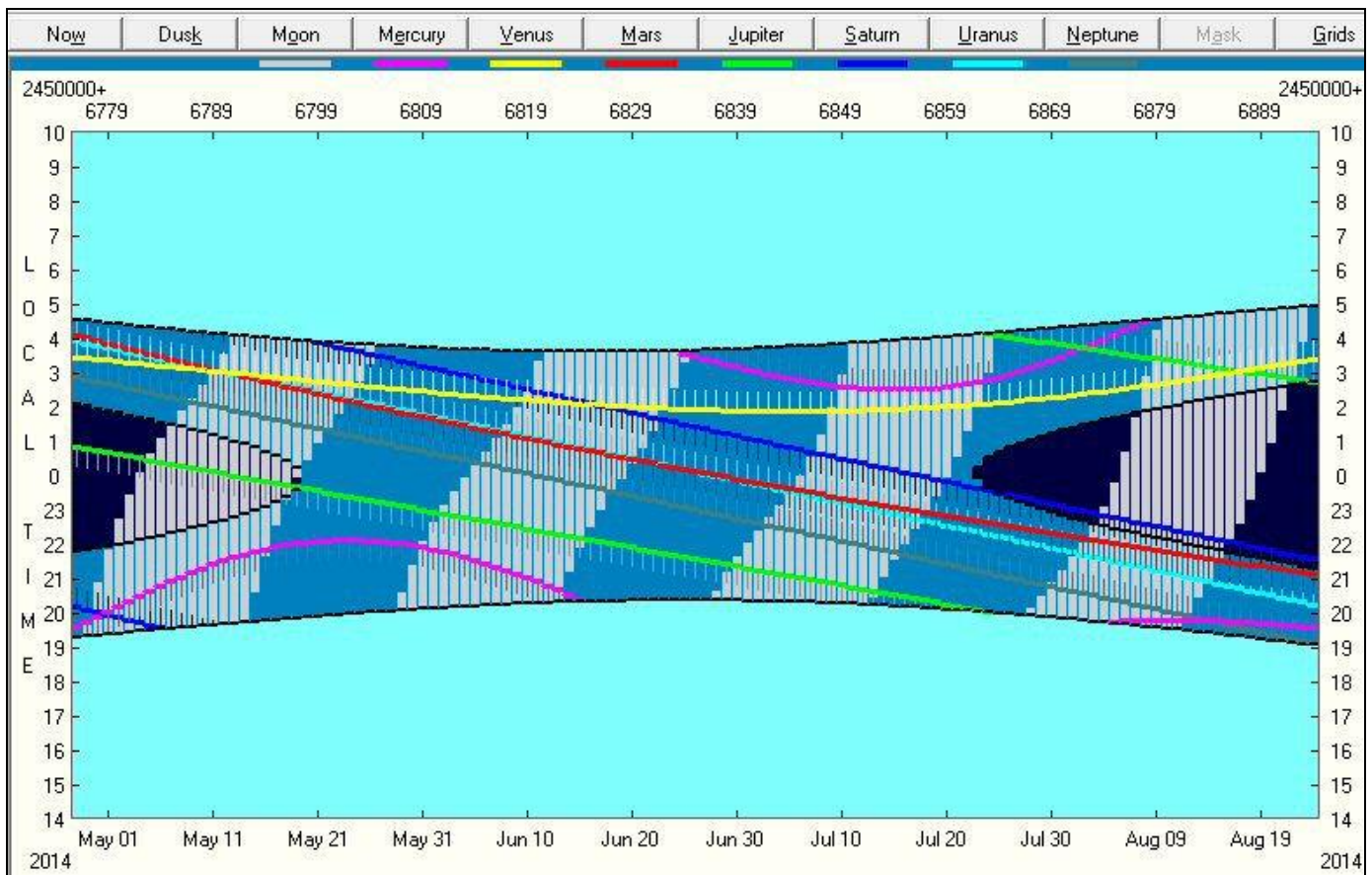
#### NEWBURY ASTRONOMICAL SOCIETY MEETING

6<sup>th</sup> June Astronomy for Map Makers and AGM  
Website: [www.newburyas.org.uk](http://www.newburyas.org.uk)

#### NEXT NEWBURY BEGINNERS MEETING

17<sup>th</sup> September The Autumn Night Sky  
Website: [www.naasbeginners.co.uk](http://www.naasbeginners.co.uk)

# THE PLANETS DURING THE SUMMER MONTHS



The summer sky chart from Richard Fleet's Graphdark application

Astronomy is somewhat restricted during the summer months due to short nights and a light sky. From mid May to the end of July the night sky does not get truly dark. This is because during these summer months the Sun does not set low enough below the northern horizon to allow the sky to be completely dark. Therefore between May and July the sky, even a midnight, cannot get 'black' and through a telescope looks gray. This means the faint objects are difficult to see because there is not enough contrast with the background sky.

On the chart above the date is shown along the bottom and the time of the day or night is shown vertically on the sides of the graph. The time starts at the bottom at 14:00 (2 o'clock in the afternoon) and finishes at 10:00 (10 o'clock in the morning). On the 28<sup>th</sup> April the new Moon appeared at about 19:30 but disappeared over the western horizon by 20:00. This is indicated by the short white bar above the curved black line between the light blue and dark blue areas. Light blue is daylight and the darker blue is twilight. On 14<sup>th</sup> April there was a Full Moon therefore the white section extends from sunset (the bottom curved thick black line) to sunrise (top curved thick black line).

On the chart above it can be seen that from the beginning of May until about 19<sup>th</sup> May the sky does not completely darken around midnight. This is indicated by the area enclosed by the conical black line and containing the black and white areas. The black area shows the sky can be fully dark and the white area shows that the sky should be dark but the Moon is in the sky making it bright.

From 19<sup>th</sup> May until 22<sup>nd</sup> July the sky does not become completely dark. This is indicated on the chart by there not being any black shown throughout the nights.

The main purpose of the chart above is to show the availability of the planets in the sky for observing. The coloured lines crossing the graph show the times when the planets are in the sky. The colour of the line identifies the planet according to the colour key at the top of the graph. For example Mars is shown as 'Red'.

Each coloured planet line has vertical bars attached above or below the line. If the bars are above the coloured line this means the planet is visible from the time that the line crosses the date in question until dawn. If the bars are below the coloured line the planet is visible from sunset until the coloured line crosses the date in question. For example on 20<sup>th</sup> June Jupiter will be visible from sunset until about 22:00 (bars below the green line). Also Venus will be visible from 02:00 until dawn about 04:00 (bars above the yellow line).

So where are the planets during the summer?

Mercury just observable in the west at sunset at the beginning of June and in the east before sunrise during July and early August.

Venus is clearly on view in the east before sunrise.

Mars is available most of the night through June.

Jupiter is just observable after sunset until mid July.

Saturn is visible most of the night.

Uranus and Neptune are best seen before sunrise.

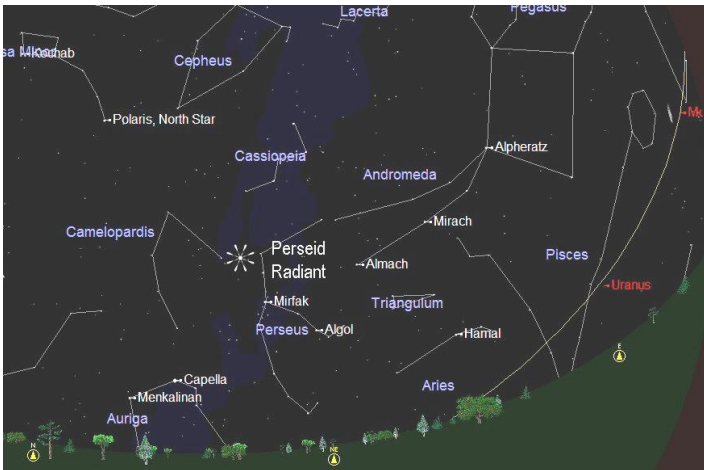


## THE PERSEIDS, THE FIRST METEOR SHOWER OF THE 2014 – 2015 SEASON

Meteor showers are notoriously unpredictable. The exact time of any spectacular increase in numbers or if the meteors will be bright is almost impossible to predict as is the clear weather needed to see them. However every year on the evening of the 12<sup>th</sup> August there is a spectacular display from the Perseid Meteor Shower.

Unfortunately this year there will be a bright near full Moon on the 12<sup>th</sup> August so some of the fainter meteors may be drowned out. The meteors of a shower appear to radiate from a point in the sky that is called the 'Radiant'. The meteors of this particular shower appear to originate from a 'Radiant' point in the constellation of Perseus. If the trail of any meteor that is seen can be tracked back and found to have originated from this radiant point it will be a Perseid. A few meteors might appear to originate from other directions so these are the meteors that might be seen randomly and not part of any named shower. These are known as Sporadic Meteors.

From a clear dark site, the constellation of Perseus can be clearly seen as a line of stars stretching from the very distinctive 'W' shape of Cassiopeia towards the northern eastern horizon. See the chart below.



The 'Radiant' of the Perseid Shower at 23:00

If the sky is clear the Milky Way (our galaxy) can be seen rising up from the northern horizon passing through Perseus, Cassiopeia and right across the sky though Cygnus and the Summer Triangle. The bright star Capella in the constellation Auriga will be twinkling noticeably close to the northern horizon.

No special equipment is required to see meteors but it does pay to make yourself comfortable for a meteor watch. It is essential to dress to keep warm. A warm coat should be worn along with a good thick pair of trousers or perhaps an extra pair of trousers or long legged underwear can be worn for additional comfort. It can get very cold during the night even during the summer. A garden lounger will make the observer much more comfortable and avoid getting a stiff neck from looking up for too long. It will also allow an extra blanket to be used if it is chilly.

Observing can start as soon as it is dark but there is likely to be more meteors after midnight. Position the lounger so that the northern horizon can be seen. Look at about 45° above the horizon and anywhere between west, through north and to the east. Meteors will appear as a fast streak of light flashing across the sky.

One or two meteors every five to ten minutes may be seen. Some might be quite faint and may be difficult to see from a well-lit area in the towns. Some quite bright meteors will be seen even from fairly light polluted skies. These may appear any place anywhere in the sky from close to the radiant in the north to directly overhead. With a clear sky it may be possible to follow the tracks back through the constellations they passed through to the radiant point in Perseus.

Richard Fleet from the Newbury Astronomical Society captured many of the Perseid meteors last year on his DSLR camera from his home in Pusey, Wiltshire. Here are a couple of Richard's pictures:



A Perseid meteor heading towards the Seven Sisters

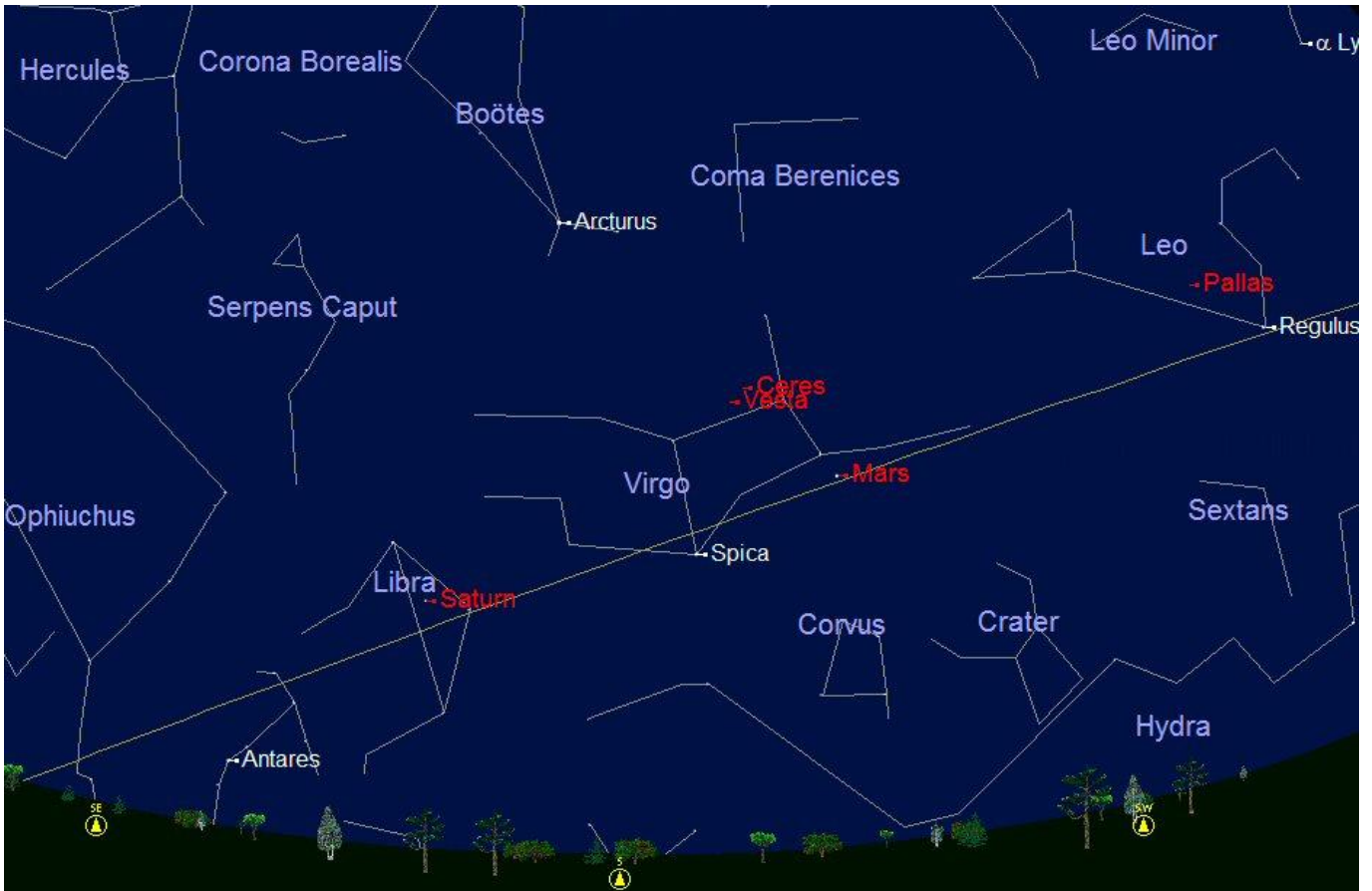


A composite of all Richard's images

Other annual meteor showers are:

PERIOD	SHOWER NAME	MAXIMUM
Jan 1 – Jan 4	Quadrantids	Jan 3
April 10 – April 22	Lyrids	April 2
May 1 – May 8	Eta Aquarids	May 4
June 17 – June 26	Ophiuchids	June 19
July 15 - Aug 15	Delta Aquarids	July 27
July 15 - Aug 20	Piscis Aquarids	July 31
July 15 - Aug 25	Capricornids	Aug 2
<b>July 27 – Aug 17</b>	<b>Perseids</b>	<b>Aug 12</b>
Oct 15 – Oct 25	Orionids	Oct 21
Oct 26 - Nov 16	Taurids	Nov 3
<b>Nov 15 – Nov 19</b>	<b>Leonids</b>	<b>Nov 18</b>
Dec 9 – Dec 14	Geminids	Dec 13
Dec 17 – Dec 24	Ursids	Dec 23

## GUIDE TO THE NIGHT SKY THIS MONTH – JUNE 2014



The southern sky at about 22:30 (half past 10 pm)

The chart above shows the night sky looking south at about 22:30 around mid June. 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'. This month the constellations we can see are: (from west to east [right to left]) Leo, Virgo and Libra. Cancer and Gemini are just off the chart to the west.

### THE CONSTELLATION OF GEMINI AND JUPITER



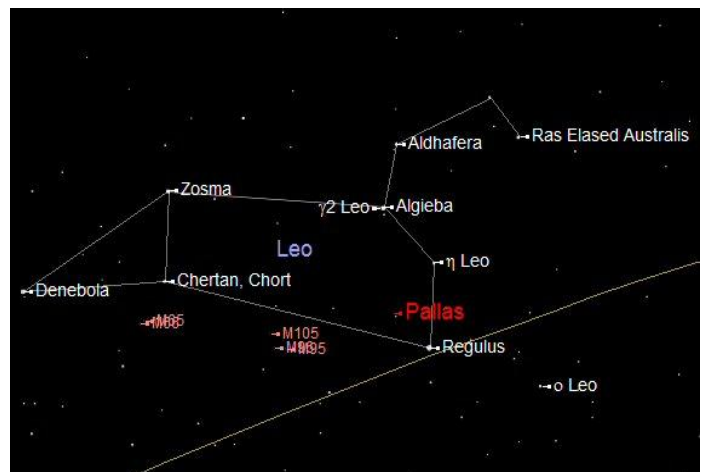
Jupiter in the west at 21:30 on 1<sup>st</sup> June

Jupiter is now past its best but is observable as soon as sky has darkened enough to see it. This will be after about 21:30. It is in the western sky located in the constellation of Gemini. Jupiter is very bright and easy to see even in the fairly bright twilight sky.

Jupiter will be low in the west and will set over the western horizon at 23:45 at the beginning of the month and at 22:40 by the end of the month.

A small telescope or even a good pair of 9 x 50 binoculars will show the four largest and brightest of Jupiter's moons. The moons are named (from the inner most out): Io, Europa, Ganymede and Callisto. A small telescope may show the two main cloud belts and the moons passing in front and behind the planet. With a medium sized telescope it is possible to see the shadow of a moon cross Jupiter in an 'Eclipse'.

### THE CONSTELLATION OF LEO



The constellation of Leo (The Lion)

The constellation of Leo (the Lion) is the most obvious constellation in the southern sky. The Lion's head can be



easily identified by its resemblance to a back-to-front Question Mark '?' It is often referred to as 'the Sickel' because of its resemblance to the curved blade and handle of a sickle. The rest of the brighter stars are to the east (left) of the Sickel and mark out the body of the resting Lion. At the bottom of the 'Sickle' is the brightest star in Leo which is named Regulus. This is one of our brightest stars at magnitude 1.4. It is an intrinsically bright, bluish white star, 160 times brighter than our Sun and has a surface temperature of 13,000°K. It is about 5 times the mass of the Sun and is located at a distance of around 78 light years from us. Binoculars or a small telescope will show that Regulus has a small 8th magnitude companion. The star known as gamma Leonis, real name Algieba (the Lion's Mane), is a beautiful double star. It is shown on the chart above as the second star up the Sickel from Regulus.

The pair are 2<sup>nd</sup> and 3<sup>rd</sup> magnitude yellow giants and can be separated using a small telescope. A good pair of binoculars or a low powered wide field telescope will also show a third unrelated 5th magnitude star close by.

Located below the resting lion shape of Leo are a number of quite bright galaxies. M65 (9th Mag) and M66 (8th Mag) are located below the lion's hind quarters. M95 (10th Mag.) and M96 (9th Mag.) are located below the lion's belly. There is another galaxy M105 located just above this pair. All these galaxies do require a good dark sky and a medium sized telescope (100mm Refractor or a 150mm reflector) to see them.



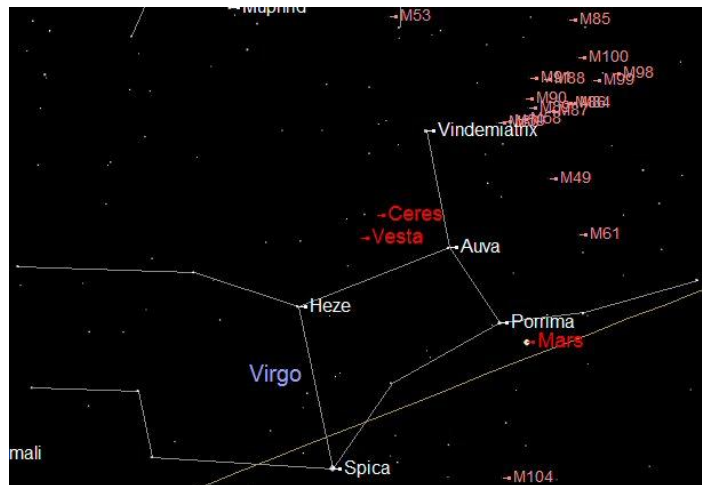
M65 and M66 spiral galaxies in Leo



M95 and M96 spiral galaxies in Leo

## THE CONSTELLATION OF VIRGO AND MARS

The constellation of Virgo is located on the ecliptic to the east (left) of Leo. The stars that make up the accepted shape of Virgo are not particularly bright except for Spica at the very bottom. Spica is a close binary star whose components orbit about each other every four days. They remain sufficiently close together that they cannot be resolved as individual stars through a telescope.

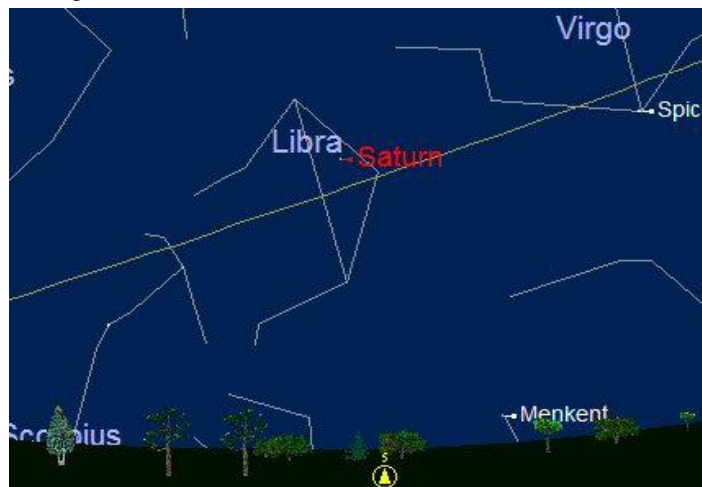


The constellation of Virgo

The primary star has a stellar classification of B1. It is a massive star with more than 10 times the mass of the Sun and seven times the Sun's radius. The total luminosity of this star is about 12,100 times that of the Sun and eight times the luminosity of its companion. The primary is one of the nearest stars to the Sun that has sufficient mass to end its life in a Type II supernova explosion. This year Mars is located in Virgo close to the star Porrima and just above the ecliptic.

## THE CONSTELLATION OF LIBRA AND SATURN

The constellation of Libra is to the east (left) of Virgo and is always positioned low over the horizon. Due to the tilt of Earth's axis (23.4°) the ecliptic is 46.8° higher in the sky in our winter than it is during our summer. Consequently objects close to the ecliptic appear much lower in the sky during the summer months.



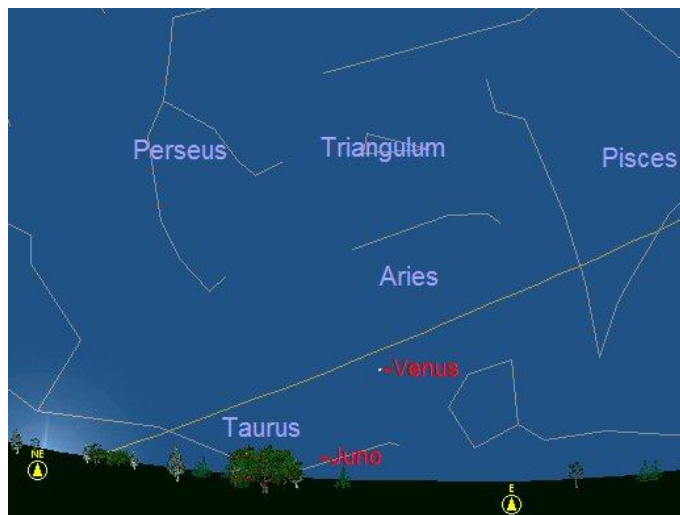
The constellation of Libra and Saturn

Saturn will not be at its best this year due to its position close to the summer ecliptic but the rings are nearly wide open. Saturn is now in a position where it can be observed all night.

## THE SOLAR SYSTEM THIS MONTH

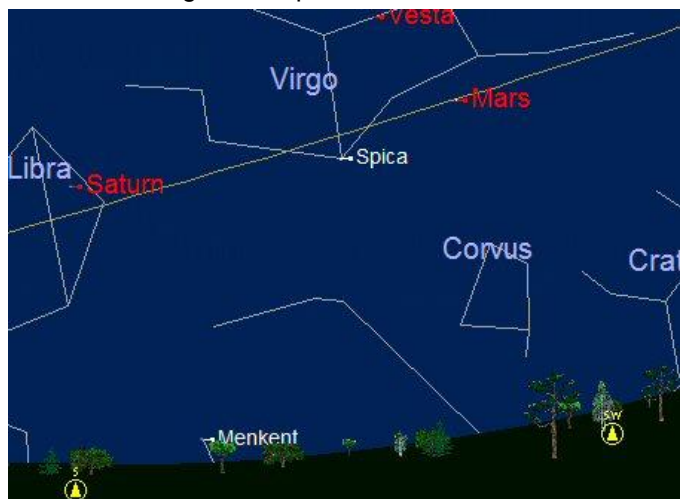
**MERCURY** is moving into inferior conjunction and will not be observable this month.

**VENUS** rises at about 03:25 at the beginning of the month and about 03:00 at the end of the month. This means Venus will appear over the eastern horizon about an hour before sunrise. It will be close to the horizon and will be lost in the brightening sky by about 04:30. Venus is getting smaller as it moves into superior conjunction further away from us and closer to the Sun and now appears 'Gibbous' shaped.



Venus rising in the east just before sunrise

**MARS** rises at about 15:00 at the beginning of the month and at 14:15 by the end of the month. It will be observable in the south, in the constellation of Virgo, close to the bright star Spica.



Mars and Saturn in the south west at 22:30

**JUPITER** rises in the east at around 07:00 at the beginning of the month and 06:30 by the end of the month. This means it will rise over the eastern horizon in daylight and it will be well past its best for observing. It will be positioned in the north west as darkness falls and will set over the north western horizon at 23:15.

**SATURN** is in the constellation of Libra rising at about 18:00 in the east (this is in daylight) and will be at its best for observing in the south at 22:30 and well position for the rest of the night.

**URANUS** rises in the east at about 01:50 and will be observable in the east from about 03:00 until sunrise. Uranus will require a medium sized telescope to see it, a 150mm reflector or a 100mm refractor. It will be difficult to see as it will be close to the horizon in dirty turbulent air. Uranus will be just 3.5 arc-seconds in diameter so will require a high magnification to see its disc.



Uranus and Neptune in the south east at 03:00

**NEPTUNE** rises at about 00:40 and will be just 2.3 arc-seconds in diameter so will be more difficult to see than Uranus and will be close to the south eastern horizon.

### THE SUN

The Sun rises at 04:45 during June and this will be its earliest rising of the year as the summer solstice is on 21<sup>st</sup> June. This month the Sun will set later at 21:10 BST on the 1<sup>st</sup> and also at 21:10 BST at the end of the month.

Solar activity has been relatively low during this cycle with fewer sunspots. However there has been a significant increase in activity over the

Sunspots and other activity on the Sun can be followed live and day by day by visiting the SOHO website at: <http://sohowww.nascom.nasa.gov/>.

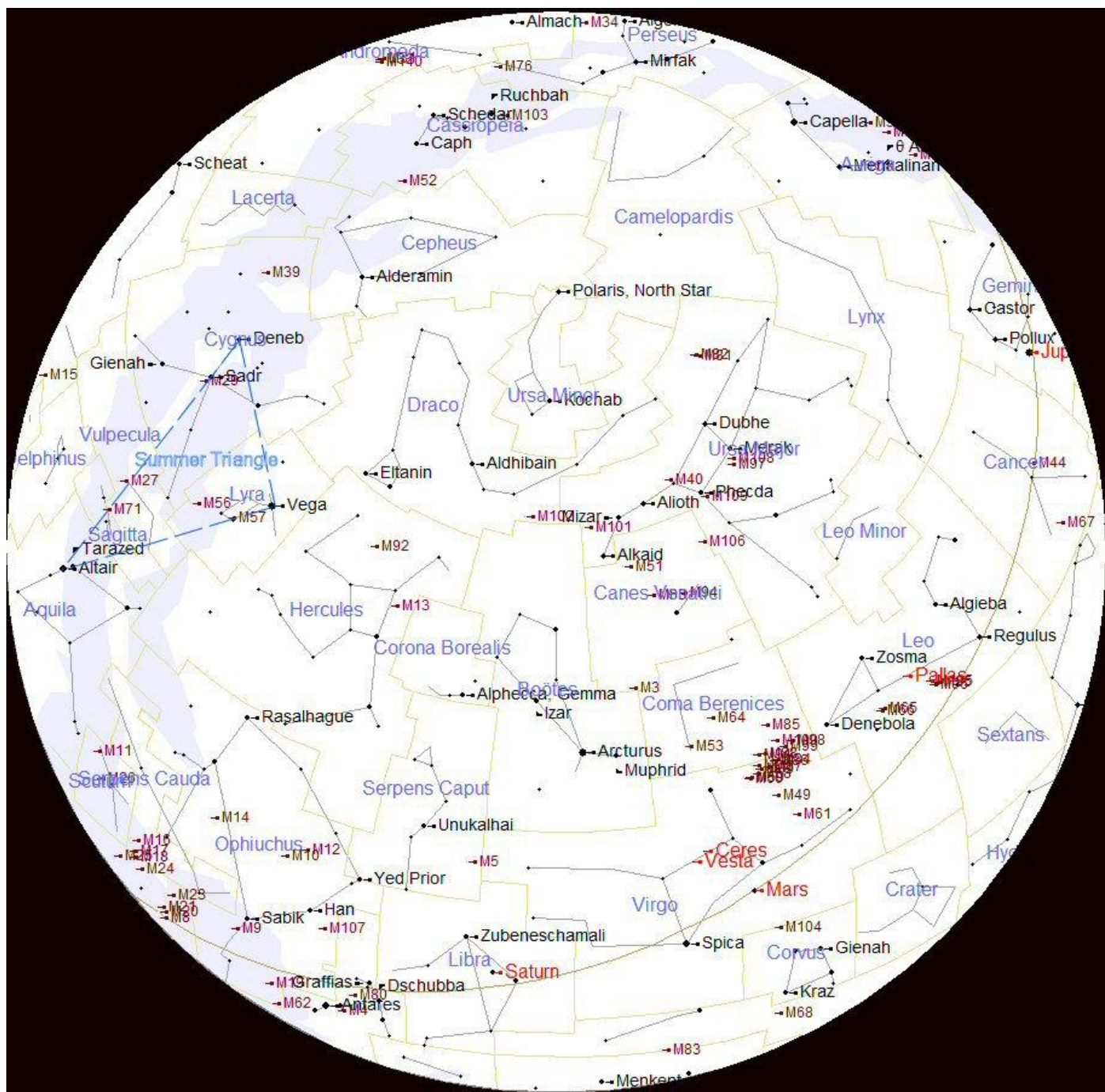
### THE MOON PHASES IN JUNE 2014

2014	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
May-26							
Jun-01							
Jun-02							
Jun-08							
Jun-09							
Jun-15							
Jun-16							
Jun-22							
Jun-23							
Jun-29							
2014	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

First Quarter will be on 5<sup>th</sup> June, Full Moon will be on 13<sup>th</sup> June and Last Quarter will be on 19<sup>th</sup> June. The very thin crescent of the new Moon may be spotted in the west on the evening of the 27<sup>th</sup> June.



## THE NIGHT SKY THIS MONTH



The chart above shows the night sky as it appears on 15<sup>th</sup> June at 10 o'clock in the evening 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 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 to the west of overhead. 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: Jupiter, Mars and Saturn and Venus in the early morning.