



The Sun

The Sun is in the constellation of Libra for most of November. On November 23rd it moves into the northern part of Scorpius, where it spends the final week of the month, before moving on into Ophiuchus on November 29th.

At the start of November, the Sun rises around 7:20 am, and sets around 4:30 pm; the sky is reasonably dark between about 6 pm and 6 am. Sunrise gets about 2 minutes later each day, and sunset about 1½ minutes earlier. By the end of the month, the Sun rises around 8:20 am, and sets around 3:40 pm; the sky is reasonably dark between about 5:15 pm and 6:45 am.

The Moon

The Moon was **New** on Tuesday October 28th. During the first week of November, the crescent Moon should be visible in the south-west after sunset; it stays up later each evening.

First Quarter occurs at 04:03 on Thursday November 6th, when the Moon is in the constellation of Capricornus. The Moon is now rising in the early afternoon, and setting just before midnight. As it waxes gibbous over the following week, it continues to rise about the same time, but it stays up further into the early hours of the morning.

The Moon is **Full** on Thursday 13th, in Aries. When it's Full, the Moon is on the opposite side of the sky to the Sun; so it rises in the north-east at sunset, shines throughout the night, and sets in the north-west at sunrise the following morning. As it wanes during the following week, it rises later every evening, but continues to set in the late morning.

The Moon is at **Last Quarter** on Wednesday 19th, when it is in Leo; it rises in the east just before midnight, and doesn't set in the west until after midday the next day. During the following week, it rises later every night, but it continues to set in the middle of the following afternoon.

The Moon is **New** on Thursday 27th. We may see the waning "crescent" just rising in the south-east at dawn, any morning up to Tuesday 25th; but after New Moon, the new crescent won't be visible in the south-west at sunset until Sunday 30th.

First Quarter occurs again on Friday December 5th.

Lunar occultations

As the Moon moves around the Earth each month, it occasionally passes directly in front of one of the stars, and *occults* it. This happens much less often than one might imagine. But on the evening of Thursday November 13th, the Moon occults several of the stars in the Pleiades or “Seven Sisters” star-cluster. When the Sun sets, just after 4 pm, the Moon will be just above the north-eastern horizon. As the sky darkens, it should be possible to see the star-cluster immediately to the left of the Moon, though it won’t be easy, as the Moon is Full; binoculars will help. Gradually, the Moon will draw nearer to the stars. From about 7 pm (the exact time depends on your location), the stars in the cluster will be disappearing behind the Moon’s left-hand edge, and re-appearing at the right-hand edge. Surprisingly, the Moon can only cover a few of the stars at any one time. The last one will re-appear just after 9 pm.

Mercury

Mercury is at “superior conjunction” (behind the Sun) on November 25th. We’re unlikely to see this elusive little planet at all this month.

Venus

Venus is gradually getting into the role of “Evening Star”. Look for it low in the south-west, just after sunset. Even though the sky is still bright, Venus is such a brilliant object that it should show up clearly. At the start of November, it sets about 5:30 pm, but it stays up a minute or two later each evening.

In the telescope, Venus appears as a featureless white disc, about 15 arc-seconds across. However, Venus does show phases, like the Moon. During November it appears about 75% illuminated – rather like the gibbous Moon 11 days after New (e.g. on November 8th).

Relative to the stars, Venus is moving rapidly eastwards, leaving the constellation of Ophiuchus on November 9th and moving into Sagittarius. Unfortunately, this is where the Sun is in mid-winter, so – like the midwinter Sun – Venus is only above the horizon for a few hours. But as Venus continues eastwards, it will soon get higher in the sky, and we will get better views of it from next month onwards.

Don’t confuse Venus with Jupiter: Jupiter is certainly bright, but it’s not as brilliant as Venus. At the start of November, Jupiter is further left and higher up; the two planets are over 30 degrees apart. The gap shrinks quickly; by the end of the month, Venus will be directly below Jupiter, just 2 degrees away. Even though they are low down in the twilight, it will be well worth looking, to see the two brightest planets so close together.

If you can find the crescent Moon at sunset on Saturday November 1st, Venus will be above and to the right of it, about 5 degrees away. The following evening, the two objects will be at the same altitude, but the Moon will be 15 degrees to the left of Venus.

Mars

Mars is almost directly behind the Sun (conjunction is on December 5th). So we won’t be able to see the “Red Planet” at all this month.

Jupiter

The giant planet Jupiter is low in the south-west at dusk, and sets about three hours after sunset. It looks like a very bright, steady star, brighter than any of the genuine stars – though not as brilliant as Venus, which is steadily approaching Jupiter from the lower right. Relative to the stars, Jupiter itself is moving only slowly eastwards, in Sagittarius.

In the telescope, Jupiter shows a disc 35 arc-seconds across, more than twice as large as Venus. But Jupiter is much further from the Sun than Venus is, so it appears much less bright. And being so low down, it won’t be well placed for making detailed observations.

On the evening of Monday November 3rd, the crescent Moon will appear almost directly below Jupiter; the two objects will be about 4 degrees apart.

Saturn

Saturn is rising in the early hours of the morning, and is well up in the south-eastern sky by dawn. It’s moving very slowly south-eastwards in Leo. Saturn is to well to the right of Arcturus, the brightest star in Boötes; it appears a little dimmer than Arcturus, but it shines with a steadier light.

In a telescope, the disc of Saturn appears 17 arc-seconds across, and the famous rings form a very narrow oval, 39 arc-seconds wide and only 1 arc-second high.

Before dawn on Friday November 21st, the waning Moon will be to the right of Saturn, about 7 degrees away; the following morning, the Moon will be directly below Saturn, about 11 degrees away.

Meteors

On any clear night, we may see the occasional meteor or “shooting-star”, as tiny specks of inter-planetary debris burn up in the Earth’s atmosphere. Sometimes the Earth travels through a cloud of this dust, and we get a meteor-*shower*.

The **Leonid** meteor shower is generally active between November 15th and 20th; this year it will probably peak around midday on Monday November 17th, so the best time to look would be shortly before dawn that day. Shower meteors all seem to spread out from a single *radiant point*; for the Leonids, this point is within the “Sickle” of Leo, about midway between the planet Saturn and the waning gibbous Moon on the 17th. Unfortunately, the light from the Moon will drown out all but the brightest meteors.

Meanwhile, *sporadic* (non-shower) meteors can be seen on any night, in any direction.

Aurora Borealis

A display of the Aurora Borealis, or Northern Lights, is impossible to predict in advance; it’s triggered by activity on the Sun, which may or may not interact with the Earth’s magnetic field.

It often begins as a faint greenish glow low on the northern horizon. This may brighten and rise higher in the sky, as an arc of green light; in a good display, the arc will develop vertical rays, which often show different colours, and may eventually converge into a “corona”.

Activity on the Sun follows a cycle of roughly 11 years, which is currently going through a prolonged minimum. However, even at minimum there are occasionally good auroral displays. It’s always worth checking the northern sky, on any clear, dark night.

Algol

The most famous variable star is probably Algol (beta Persei), which is an eclipsing binary system. Every 2.9 days, the fainter secondary star moves in front of the brighter primary, which means the star appears to dim from magnitude 2.1 to 3.4 – the difference is easily detectable by the naked eye.

Many of the minima occur in daylight. But Algol will be at minimum around 04:50 am on Tuesday November 9th, around 01:35 am on Wednesday 12th, and around 10:25 pm on Friday 14th; and again around 06:30 am on Saturday 29th. On each occasion, it takes the star a few hours to dim, and a few more to return to normal.

To use the star chart; print it out and then use it to locate the planets and constellations at night by holding it above your head and pointing the ‘South’ pointer of the chart southwards.

This information has been compiled by Fiona Vincent of the University of St. Andrews It is drawn from the Handbook of the British Astronomical Association, and some has been taken from the magazine Sky & Telescope.

The Swansea Astronomical Society will be holding another public evening at the Marina Towers Observatory this month when the site will be open to the public from **7.00 p.m. to 8.30 pm** on **Friday 7th November**.

During your visit, weather permitting, you can view the Moon’s features through the Society’s Shafer-Maksutov telescope, the largest telescope in Wales and walk through the largest model of the Solar System in Britain. There will be other telescopes set up on the site for you to view through while you wait for your opportunity to use the main telescope. If you have any telescope queries why not consult with the Society members who will be present?

There is no admission charge but all donations are appreciated. Details of this event and future events are viewable on their website www.classroominspace.org.uk