

WHAT'S ON IN THE

Autumn Skies

By Professor Jonti Horner



As the days soften and the nights turn crisp, the St George Region comes into its own under a vast autumn sky. From glowing planets to star-filled horizons, this guide invites you to slow down, look up and discover what's shining above our region this season. Let the after dark adventure begin!

HOW LONG DOES EARTH TAKE TO SPIN?

This might seem like a strange question. While it feels natural to say the Earth spins once every 24 hours – but that's not quite true. You see, our planet is a moving platform, orbiting our Sun every year. So each day, we see the Sun in our sky from a slightly different position in space and our star appears to move against the background stars by slightly less than one degree per day.

When measured against the distant background stars, Earth actually completes one full rotation in 23 hours, 56 minutes and four seconds. Choose any star in the night sky and it will return to the same position after exactly that time. The extra three minutes and 56 seconds in our familiar 24-hour day comes from the additional distance Earth must turn - just under one degree - so that we are once again facing the Sun.

Where that is relevant for this guide is that, from month to month, the stars visible at a certain time of night change. Each star returns to the same point in the sky after 23 hours, 56 minutes and four seconds – which means that, tomorrow, the sky will look the same as tonight some three minutes 56 seconds earlier. Let's call that four minutes – just to keep things nice and easy.

After a week has passed, the sky will look the same approximately 28 minutes earlier than it does today; just about half an hour. After two weeks, we're talking 56 minutes; almost an hour.

One month? Two hours. And after twelve months? You're back where you started from – 24 hours (that's two hours per month times twelve months).

What this means for skywatchers is simple. The stars seen at midnight on 1 March will appear at 10pm on 1 April, 8pm on 1 May and 6pm on 1 June, showing how the sky moves steadily with the seasons. The same applies in reverse. A three-month difference corresponds to about a six-hour shift in when stars rise and set, meaning the sky seen at 10pm on 1 June is the same as that seen at 4am on 1 March.

The Moon, planets and occasional visitors like comets don't follow this neat pattern. These objects move against the background stars as they, too, orbit the Sun. That's why their positions change noticeably from month to month; and why spotting them can be especially rewarding.

Each month in this guide includes a night-sky image for the 15th, created using the free planetarium software Stellarium (stellarium-web.org). Each image shows the sky at a specific evening time, with a different focus each month. Keep in mind that the same view appears one hour later at the start of the month and one hour earlier by the end – giving you flexibility to step outside, look up and enjoy the show.

A NOTE ON THE SEASONS

Ask an astronomer when autumn starts and they'll point to the equinoxes and solstices, placing autumn 2026 between 21 March and 21 June. In Australia, however, most of us follow the Bureau of Meteorology's approach, where the seasons change on the first of the month; meaning autumn runs from 1 March to 1 June.

To keep things simple (and avoid a debate!), this guide spans four full months - March, April, May and June - giving you plenty of time to explore the changing night sky.

March

Highlight of the Month: Blood Moon on 3 March

The clear highlight of the month for March is a 'Blood Moon' – a total eclipse of the Moon, when our satellite passes deep into the Earth's shadow, and turns an eerie blood red colour. This Blood Moon is an evening event – those with eagle eyes should notice a dark chunk beginning to be taken out of the Moon, high in the northeastern sky, by about 8pm.

Through the hour that follows, that chunk will get larger and larger, growing to engulf the whole of the Moon. The dark area is the 'umbra' of the Earth's shadow – the darkest part, where the Sun is entirely blocked from view. During this phase of the eclipse, take a look at the curve of Earth's shadow and compare it to the size of the Moon. The shape (clearly curved) is part of the evidence that helped ancient people realise the Earth was not flat – while the diameter of the curve reveals that our planet is about four times the diameter of our satellite.

At 9:04pm, the Moon will fully enter Earth's shadow. In the minutes before this, as the last sliver of the Moon slides into the shadow, the dark area bitten out of the Moon will start to take on a markedly ruddy hue. And as the Moon fully enters our shadow, the whole disk of our satellite will look an eerie bloody red colour. This is the 'total' phase of the eclipse, when the whole of the Moon is deep in the Earth's shadow, and it will last around an hour, coming to an end at 10:03pm. At that point, the whole process will reverse itself – with the Moon gradually sliding out of our planet's shadow, such that, by 11:15pm, the Moon's appearance will almost be back to normal.

Why is the Moon red during a 'Blood Moon'? Imagine for a moment you were stood on the Moon during the eclipse, looking up at the Earth. You would see our planet slide across to block the Sun – and if our planet had no atmosphere, it would block all the light from our star. Instead, when Earth blocks the Sun from view, our planet

would appear to be limned by a red ring of fire. Sunlight hitting the Earth's edge passes through our atmosphere and is bent (refracted) towards the Moon. But our atmosphere does a very good job of filtering out the blue and yellow parts of that light, leaving just the orange and red to make it through. Effectively, during a Blood Moon, you're seeing our satellite illuminated by the light of all of the dawns and all the dusks happening all around the world at the time of the eclipse!

Some eclipses are redder, with the Moon dimmer, and others see the Moon take on a more orange hue, fading less. This is the direct result of the atmospheric conditions around the globe. Storms, fires, dust, and pollution around the globe all act to scatter more of the blue and yellow light from the Sun, whilst clearer air scatters less. The result – every Blood Moon is unique. In fact, astronomers can use the colour and brightness of a Blood Moon to get a feel for the weather on a global scale!

THE CONSTELLATIONS

March sees the night sky start to transition from the wonders of the summer sky to heralding the arrival of the spectacular winter sky. In the evening sky, the Milky Way runs from the northern to the southern horizon. The image above shows the sky above St George at 8pm on 15 March, looking to the north. Sirius, the brightest star in the night sky, shines spectacularly bright overhead, with Orion dominating the northwestern sky. The Moon-free weeks in the middle of the month are a perfect opportunity to learn the constellations around Orion, using the celestial hunter as a signpost to the constellations in the winter sky.

Follow Orion's belt up and to the right to find Sirius, which is the brightest star in Canis Major, the bigger of Orion's two hunting dogs. Follow the belt in the other direction (down and to the left) to find the bright orange star Aldebaran, the eye of Taurus, the Bull. Continue that line down towards the horizon and you will come to the Pleiades star cluster; the Seven Sisters. With binoculars or a small telescope, the Pleiades are a spectacular sight. As is the Orion Nebula, which sits in the centre of Orion's sword, which points upwards in the sky from the Hunter's belt.



THE PLANETS IN March

Jupiter dominates the evening sky in March, in the centre of the constellation Gemini. Jupiter is far brighter than the brightest stars, shining high in the north at dusk, and gradually falling to the western sky as the night progresses. On 1 March, Jupiter sets at about 1:45am, whilst by the end of the month, it sets at around 11:45pm.

Venus is barely visible in the early evening sky during March, setting at 7:15pm at the start of the month, and 7:05pm by the month's end. Looking very much like an aircraft coming in to land with its headlights on full beam, Venus used to be the source of more UFO sightings than any other object, until the advent of the Starlink satellite constellation, which now dominates such reports.

Mercury spends most of the month lost in the Sun's glare. But in the second half of the month can be seen low in the eastern sky before sunrise, with the best views coming right at the end of the month.

Mars, Saturn and Neptune are all lost in the daylight sky this month, rising around dawn, and setting around sunset. None of these planets will be visible in the night sky. Uranus is visible in the evening sky, setting in late evening, but is too faint to see without the use of binoculars or a telescope.

April

Highlight of the Month: Conjunction of Mars, Mercury, the Moon and Saturn in mid-April – a perfect morning photo opportunity!



THE CONSTELLATIONS

April evenings are a good time to look to the southern sky. To the southwest, two glowing clouds of light mark the locations of the Milky Way's two largest satellite galaxies: the Large and Small Magellanic clouds. These galaxies, which are satellites to our own, are so distant that the light we see from them left in the very distant past. The Large cloud lies more than 150,000 light years from Earth, with the small cloud being somewhat more distant, at a distance of around 200,000 light years from our home.

In the southeast, embedded in the bright band of the Milky Way, can be found Crux Australis known as the Southern Cross. This iconic constellation is the smallest of the 88 official constellations recognised by Astronomers and appears on more flags than all other astronomical constellations combined!

Just below the cross can be found the pointers; Alpha and Beta Centauri. Alpha Centauri, the lower of these two stars, is the third brightest star in the night sky, and clearly yellowish in colour.

Where the two Magellanic clouds were incredibly distant, Alpha Centauri is remarkably nearby – the closest star to the Solar system – just 4.35 light years from the Sun. In fact, Alpha Centauri is not a single star, but three. Two stars like the Sun orbiting one another separated by roughly one billion kilometres. Those two stars are accompanied by a much smaller, much dimmer companion, Proxima Centauri, which holds the record for the closest star to the Sun, at a distance of 4.25 light years. Despite being the closest star, Proxima is so dim that it is a factor of a hundred times too faint to see with the naked eye, and it was only discovered by astronomers in 1915!

THE MOON AND PLANETS IN

April

Venus continues to become more visible in the western sky after sunset. Still setting at around 7pm, the earlier sunsets as the year moves into winter will allow Venus to shine in a fully darkened sky. Spectacularly bright, observations through a telescope would show Venus displaying a marked 'gibbous' phase; just like the Moon a few days before or after full Moon. Over the months to come, as Venus climbs higher in the night sky, that phase will gradually change, eventually becoming a thin crescent in September and October.

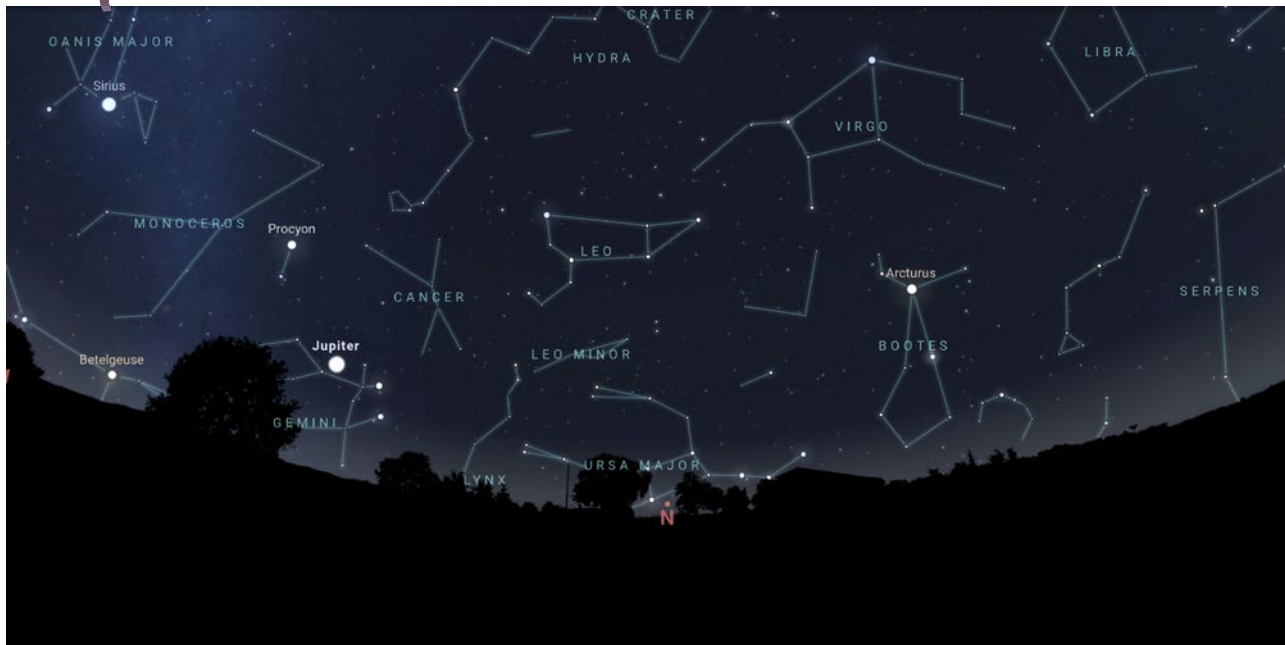
Jupiter is still the brightest star-like object in the evening sky, once Venus sets below the western horizon. At the start of April, Jupiter will set in the west just before midnight, but by the month's end, Jupiter will sink below the horizon by 10pm.

Mercury starts the month easily visible in the morning sky, rising at about 4:15am. During the first two weeks of the month, it gradually falls back towards the eastern horizon in the morning sky, becoming lost in the glare of dawn towards the end of the month. At mid-month, Mercury gets very close to Mars and Saturn in the dawn sky, being joined by a very thin crescent Moon on the morning of 16 April. That would be a perfect opportunity for some early-morning astrophotography. Mercury and Saturn are closest together on the mornings of 20 and 21 April with Mars shining much more faintly just to their left. If observing with a telescope or powerful binoculars, Neptune can be found just above the three planets in the morning sky; but it is always far too faint to find with the unaided eye.

Comets: There is a chance that two comets might become bright enough to see with the unaided eye during April. But it is much more likely that the two will remain too faint to see with the naked eye. A famous astronomer once said 'Comets are like cat – they have tails and they do precisely what they want'. It is still much too early to tell what kind of show those comets will put on – but keep your eye on websites like space.com and theconversation.com/au for the latest news.

May

Highlight of the Month: Blue Moon on 31 May



THE CONSTELLATIONS

May evenings see the northern sky dominated by the constellations Leo, Virgo, and Boötes, with the bright stars Regulus, Spica, and Arcturus. Looking out towards these constellations sees us looking outward from our galaxy – away from the band of the Milky Way. For observers with astronomical telescopes, this makes May the ideal time to go galaxy hunting. The most famous cluster of galaxies in the sky – the Virgo cluster – is found in the bowl-shaped area of the constellation Virgo.

For observers using the naked eye, a fun challenge is to look for the fuzzy blob of Praesepe, the Beehive star cluster. To find the cluster, use the star map to find the bright star Regulus, the heart of Leo (the lion), and draw a line from that star to Jupiter, low in the western sky. Praesepe can be found about halfway along that line – a fuzzy patch to the naked eye, and a spectacular star cluster through binoculars or a telescope.



THE MOON AND PLANETS IN

May

The Moon is full twice this month: first on 2 May, and again on 31 May. Whenever there are two full Moons in a single month, the second one is known as a 'Blue Moon'. Although the saying 'once in a blue Moon' means something that happens very rarely, actual Blue Moons come around relatively often – every two or three years, on average!

Venus dominates the early evening sky, shining bright to the west. By the month's end, it will be getting closer and closer to Jupiter in the sky, approaching a close conjunction in early June.

Jupiter is gradually getting lower and lower in the evening sky. By the end of the month, it will sink below the horizon by about 8pm. But it remains an easy and spectacular sight through the whole month

Mars and Saturn continue to be visible in the morning sky before sunrise, climbing higher in the sky from morning to the next. Early risers, looking to the east at five in the morning, will be able to watch the two planets slowly separating, with Saturn (the brighter of the two) climbing ever higher in the morning sky, leaving Mars much closer to the horizon.

Mercury and Uranus are too close to the Sun to be visible during May, while Neptune can still be seen near Saturn, but requires a telescope or powerful binoculars to identify.

Eta Aquariid Meteor Shower: The Eta Aquariid meteor shower is the second-best meteor shower of the year for observers in Australia. It reaches its peak in the first week of the month, with shooting stars visible in the hours before dawn, streaking up from the eastern horizon. Unfortunately, in 2026, the full Moon will make the sky so bright that most of the meteors will be lost in the glare, so very few meteors are likely to be visible this year. But if you are awake before dawn during the first week of the month, it is worth keeping an eye on the sky, just in case!

June

Highlight of the Month: Jupiter-Venus conjunction around 9 June; the start of Milky Way Season

THE CONSTELLATIONS

June sees the centre of our galaxy, the brightest and widest part of the Milky Way, rising in the early evening to the east. In the middle of the night, the Milky Way is at its most spectacular, spanning the entire night sky from the northeast to the southwest, with the galactic centre directly overhead.

The view is utterly spectacular and enchanting from the dark sites in the St George Region and is a great opportunity to see the 'Emu in the Sky' – a constellation made of the dark patches in the Milky Way that is hugely culturally significant to the traditional owners of the land across Australia. The Emu's head is the dark patch known as the Coalsack Nebula, next to the southern cross, Crux Australis, and its body runs through the centre of our galaxy. The middle of the month is the perfect time to head out and admire the Milky Way – and a great time to practice your astrophotography.



THE MOON AND PLANETS IN *June*

The Moon is just past full at the month's start and returns to a full phase on 30 June. As such, mid-month is the best time to stargaze, when the Moon is new, and therefore out of the way.

Venus and Jupiter pass close together this month and are closest together on the evening of 9 June. The two will be a spectacular sight in the western sky, just above the bright stars Castor and Pollux, at the head of Gemini, the twins.

Saturn is visible in the morning sky; rising at around 3am at the start of the month, and 1am by the month's end. It is joined by the waning crescent Moon on the mornings of 10 and 11 June, marking a nice photo opportunity for early risers.

Mercury is visible in the very early evening sky around mid-month. The evening of the 17 June offers a great photo opportunity, in the early evening after sunset, with Mercury, Jupiter and Venus roughly equally spaced in a line in the western sky, with a thin crescent Moon close to Jupiter in the middle of the line.

