



# SOUTH AFRICAN ASTRONOMICAL OBSERVATORY

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## What's Up – December 2024

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#### Sun and Moon

The New Moon occurs on the 1<sup>st</sup> of December at 08h21 and the First Quarter Moon falls on the 8<sup>th</sup> of December at 17h27. The Full Moon occurs on the 15<sup>th</sup> of December at 11h02 and the Last Quarter Moon falls on the 23<sup>rd</sup> of December at 00h18. The New Moon occurs again on the 31<sup>st</sup> of December at 00h27.

The Moon will be at apogee (furthest from Earth) at a distance of about 404 486 km on the 24<sup>th</sup> of December at 09h25. The Moon will be at perigee (closest approach to Earth) at a distance of about 365 360 km on the 12<sup>th</sup> of December at 15h18.

The Summer Solstice will occur on the 21<sup>st</sup> of December at 11h20.

#### Planetary and Other Events – Morning and Evening

Venus, Jupiter and Saturn can still be seen in the evening sky. Venus is located near the stars of the constellation Sagittarius. Venus will be near the Moon on the 5<sup>th</sup> of December. Jupiter is located near the stars of the constellation Taurus. Jupiter will be best placed for observation on the 7<sup>th</sup> of December as it reaches opposition. Jupiter will be near the Moon on the 14<sup>th</sup> of December. Saturn can be observed near the stars of the constellation Aquarius. Saturn will be near the Moon on the 8<sup>th</sup> of December. Mars can be observed from late evening near the stars of the constellation Cancer. Mars will be near the Moon on the 18<sup>th</sup> of December. Mars and Jupiter are visible in the morning sky. Mercury will be visible near the stars of the constellation Scorpius before sunrise in the last week of December.

Two meteor showers are active in December, namely the Puppis-Velids (active from 1 December to 15 December, peaking on the 7<sup>th</sup>) and the Geminids. The Geminids are active from the 4<sup>th</sup> to the 20<sup>th</sup> of December, peaking early morning on the 14<sup>th</sup>. Observations of the Geminids, which are one of the strongest meteor showers, can be done from 23h30 to 3h00, and the radiant is located towards the Gemini constellation in a NNE direction. However, there will almost be full Moon at their peak. On the other hand, observing prospects for the Puppis-Velids are good and they are best viewed between 22h30 and 03h30 looking towards the constellations of Puppis and Vela.

#### The Evening Sky Stars

The stars of the Great Square of Pegasus and of Andromeda can still be seen low in the north, with the Andromeda Galaxy visible as a faint fuzzy spot below the star Beta Andromeda. It's believed that in another few billion years, this galaxy will collide with our own Milky Way. Gas and dust clouds will collide, producing large numbers of new stars, but the odds are that not even one star will collide with another. There's just too much empty space. If the Sun were a 10 cm ball, the nearest star system (Alpha Centauri) would be about 3000 km away.

Much of the sky on December evenings is dominated by 'watery constellations' and birds. Above Pegasus and Andromeda are the dim stars of the Fishes tied together at their tails with a knot, and above the Fishes is Cetus, the Whale, representing the sea monster coming to devour Andromeda. The most famous star in Cetus is one that's not usually visible. Named 'Mira', i.e. 'wonderful', it was first recognised as a periodic variable by the Dutchman Jan Holwarda, who found that this star (discovered in 1596 by Fabricius) reached peak brightness roughly every

11 months, when it would typically be visible as a fairly dim star. In between this mysterious object would disappear. We now know of many similar stars, all of them cool 'red giants' hundreds of times the diameter of our own Sun. If Mira were placed at the centre of our solar system, Earth would be inside it!

West of Cetus in the early evening sky is Aquarius the water carrier, while south of Aquarius are the stars of the Southern Fish, headlined by the brightish star Fomalhaut. West of the Southern Fish is the large dim triangle made by the stars of the Sea Goat.

High in the south is the bright star Achernar, with the stars of the Phoenix (the Fire Bird) just above it and the stars of the Toucan and the Crane to the right. The Peacock is moderately low in the SW, below and to the right of the Toucan. Continuing the birds-and-water theme, we find the Water Snake (which looks like a triangle!) directly below Achernar, while the celestial river Eridanus runs its course from Achernar to the knee of Orion, whose stars are rising in the east.

Below Achernar and to the right, among the stars of the Toucan, is the dim glow of the Small Magellanic Cloud. The Large Cloud, below Achernar and to the left, is a bit easier to see, and was imagined by some South African groups to be a hunting plain for the gods. The two brightest stars in the night sky, Canopus and Sirius, are rising in the southeast and east, respectively, with Orion shouldering his way into the summer skies in the northeast, preceded by Taurus the Bull. The small cluster of stars on the Bull's shoulder, the Pleiades, were used all over Africa to keep track of the seasons. In isiXhosa, the Pleiades are called isiLimela. Rising in the east as well is the Milky Way, dimmer than the brilliant Milky Way of winter, but still very impressive on a dark Karoo night.

#### The Morning Sky Stars

The Cross and the Pointers (the two brightest stars in Centaurus) are rising higher in the southeast this month. Just above the Southern Cross and the Housefly are the stars of the great ship Argo as it sails along the Milky Way, accompanied by the dim stars of the Flying Fish. The Milky Way still stretches across the predawn sky from the southeast to the northwest as it did last month, running from Scorpius in the ESE through the Wolf and the Centaur to Argo, then west through the stars of the Unicorn, Orion and the Twins. The southern part is much brighter with obvious dark patches, but all of it will reward a scanner with binoculars, revealing beautiful clumps and clustering of stars. Away from the Milky Way, bright Arcturus glows orange in the NE, with blue-white Spica rising in the E and lonely Alpheratz, heart of the great Water Serpent, above Regulus high in the north.

If you look carefully at where most of the bright stars are, you'll notice that they are concentrated near the Milky Way, but offset a bit. These local bright stars are part of a 'spur' sticking out at a bit of an angle from the local spiral arm in the great pinwheel of stars that is our Milky Way Galaxy. Ironically, although most of the stars visible in the night sky are brighter than our Sun, most of the stars in the Milky Way Galaxy are much dimmer than the Sun. The common red dwarf stars that make up most of the population are too dim to see unless they are extremely close, while the rare super giants are visible thousands of light years away.

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