

What's Up – December 2022

Sun and Moon

The Full Moon occurs on 8th of December at 06h08 and the Last Quarter Moon falls on the 16th of December at 10h56. The New Moon occurs on the 23rd of December at 12h16 and the First Quarter Moon falls on the 30th of December at 03h20.

The Moon will be at apogee (furthest from Earth) at a distance of about 405 869 km on the 12th of December at 02h28. The Moon will be at perigee (closest approach to Earth) at a distance of about 358 270 km on the 24th at 10h26.

The Summer Solstice will occur on the 21st of December at 23h48.

Planetary and Other Events – Morning and Evening

The five naked eye planets (Mercury, Venus, Mars, Jupiter and Saturn) can all be observed this month from after sunset. Mars will be at perigee (closest to the Earth) on the 1st of December. Mars is located near the stars of the constellation Taurus. Mars is also visible in the morning sky throughout this month. Mars will be near the Moon on the 8th of December; observers are encouraged to observe it in the early morning sky on that day. Mars reaches opposition on the 8th of December and will be in the best position for observation. Jupiter can be observed near the stars of the constellation Pisces. The Moon will be near Jupiter on the 2nd of December. Saturn, the beautifully ringed planet, is located near the stars of the constellation Capricornus and will be near the Moon on the 26th of December. Venus and Mercury are located in the western skies just after sunset and it may be challenging to observe them at the beginning of the month because of solar glare. The two inner planets are located near the stars of the constellation Sagittarius. Mercury will reach the greatest elongation on the 21st of December and will be best positioned for observation.

Three meteor showers are active in December, the December Phoenicids (active 28 November – 9 December, peaking on the 2nd), the Puppis-Velids (active 1 December – 15 December, peaking on the 7th) and the Geminids (active 4 – 20 December, peaking on the 14th). Observations of the Geminids, which are one of the strongest meteor showers, can be done from 23h30 to 03h00 on the night of the 13th/14th and the radiant is located towards the Gemini constellation in a NNE direction. The December Phoenicids are best viewed between 20h30 and 02h00 looking towards the constellation Phoenix. The Puppis-Velids are best viewed between 22h30 and 03h30 looking towards the constellations of Puppis and Vela. Observing prospects for all the meteor showers are poor.

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 Andromedae. 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 which are cool 'red giants' hundreds of times the diameter of our own Sun. If Mira was 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 Magellanic 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. Orion is 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

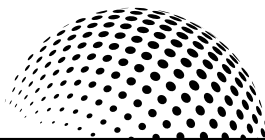
The Cross and the Pointers (the two brightest stars in Centaurus) are rising higher in the southeast this month. Just above the Southern Cross and the Housefly are the stars of the great ship Argo as it sails along the Milky Way, accompanied by the dim stars of the Flying Fish. The Milky Way still stretches across the predawn sky from the southeast to the northwest as it did last month, running from Scorpio 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.

Sivuyile Manxoyi, 01 December 2022

sivuyile@saa.ac.za

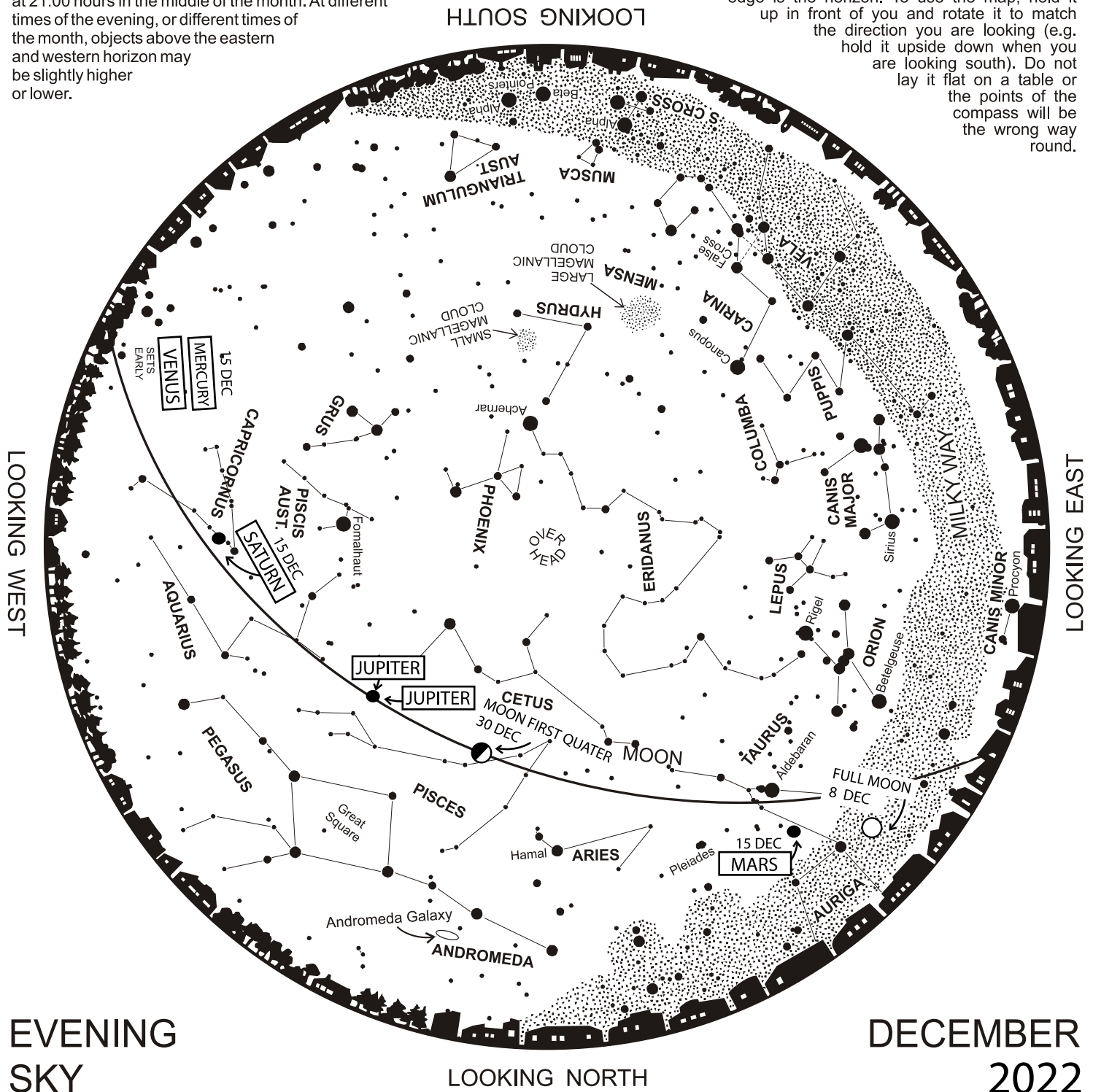
Twitter: @rassivuyile



IZIKO PLANETARIUM AND DIGITAL DOME

The map shows the night sky visible above the Cape at 21:00 hours in the middle of the month. At different times of the evening, or different times of the month, objects above the eastern and western horizon may be slightly higher or lower.

The centre of the map is the overhead point, the edge is the horizon. To use the map, hold it up in front of you and rotate it to match the direction you are looking (e.g. hold it upside down when you are looking south). Do not lay it flat on a table or the points of the compass will be the wrong way round.



As we move towards South Africa's Summer Solstice (longest day) on 22 December, keep an eye out for the impressive 'open cluster' of stars; the Pleiades (isiLimela) in the north-east just below Aries (ram). Although only a few of the cluster's stars are visible to the naked eye, binoculars reveal hundreds more, all formed from the same giant molecular cloud with roughly the same age. The summer constellations Taurus (bull) and Orion (hunter) return to our evening skies, followed closely by the Milky Way as it stretches across our eastern horizon. Sirius, the brightest star in the night sky, lies within Canis Major (big dog) in the east. The second brightest star, Canopus, is in the south-east in Carina (ship's keel).

Since Sirius rises later than Canopus, in Xam Bushman starlore, Sirius was considered the 'grandmother of Canopus', trailing behind the more agile Canopus.

The Moon will be in the evening sky until 12 December with New Moon on 23 December and Full Moon (the 'Springbok Moon') on 8 December. All eight Solar System planets are theoretically visible at dusk around 23 December. However, you will need a telescope to find Neptune and Uranus. Setting just after sunset, Mercury and Venus may also be difficult to spot. Saturn, Jupiter and Mars are bright, and visible for most of the month before midnight.