

What's Up – December

Sun and Moon

Full moon occurs on the 2nd, with last quarter (half moon in the morning sky) falling on the 9th. The new moon starts on the 16th and first quarter (half moon in the evening sky) is on the 24th. A second full moon occurs (also referred to as a blue moon) in this month on the 31st, which coincide with a lunar eclipse. A lunar eclipse happens when the moon finds itself inside the Earth's shadow and appears darker than normal. The eclipse is predicted to start at about 19:15 and finishes at about 23:30 local time. The eclipse will be visible from all of South Africa.

The young lunar crescent may be visible with optical aid from a small part of the South Pacific just east of the date line on the 16th. It is visible on the 17th from South America, most of North America except Alaska and northern Canada, southern Spain, Sicily, the SW corner of Turkey, all of Africa, Syria and the Levant, the Arabian Peninsula, southern Iran and Pakistan, India except the northernmost parts, Southeast Asia and the western 2/3 of Australia. It may be visible with optical aid from northern Spain, southern France, Italy, Greece and the Balkans, Turkey, most of the rest of Iran, Pakistan and India, the rest of Australia and New Guinea, the Philippines and South China. First possible sighting from South Africa is predicted on December 17th.

On the 4th at 16:13 the Moon will be at perigee (closest approach to Earth) at a distance of 363478 km. It will be at apogee (furthest from Earth) at a distance of 405730 km on the 20th at 16:55.

Winter solstice (when Sun reaches its most southerly position as viewed from Earth) falls on the 21st at 19:47 local time. This also corresponds to the longest day of year, for those located in the southern hemisphere.

Planetary and other events – morning and evening

Mercury will be setting about an hour after sunset at start of the month, while getting closer to the sun as the month progresses and being closest to the sun by month end. Venus rises shortly before sunrise and remaining close to the sun all month. Mars rises about an hour after midnight at start of the month and an hour before midnight by month end.

Jupiter can be seen early in the evening until 23:30 at start of the month and until 21:30 by month end. Saturn rises at just after 01:00 in the morning at start of the month and just before midnight by month end. Uranus can be seen all night, setting at around midnight all month. Neptune is up during the evenings until about one to two hours before midnight.

On the 15th at around 04:30 in the morning the bright star Antares, near the heart of the Scorpion, can be seen close to a waning crescent Moon.

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 too much empty space. If the sun were a 10cm 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, with the planet Uranus just visible to the naked eye on a dark night for those who know just where to look, 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, where Neptune can be found by those with a telescope.

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 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, was used all over Africa to keep track of the seasons. 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.

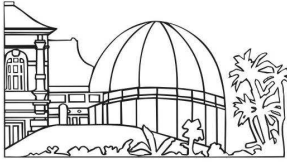
The Morning Sky Stars

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 scan with binoculars, revealing beautiful clumps and clusterings 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 Saturn and 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 supergiants are visible thousands of light years away.

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30 November 009



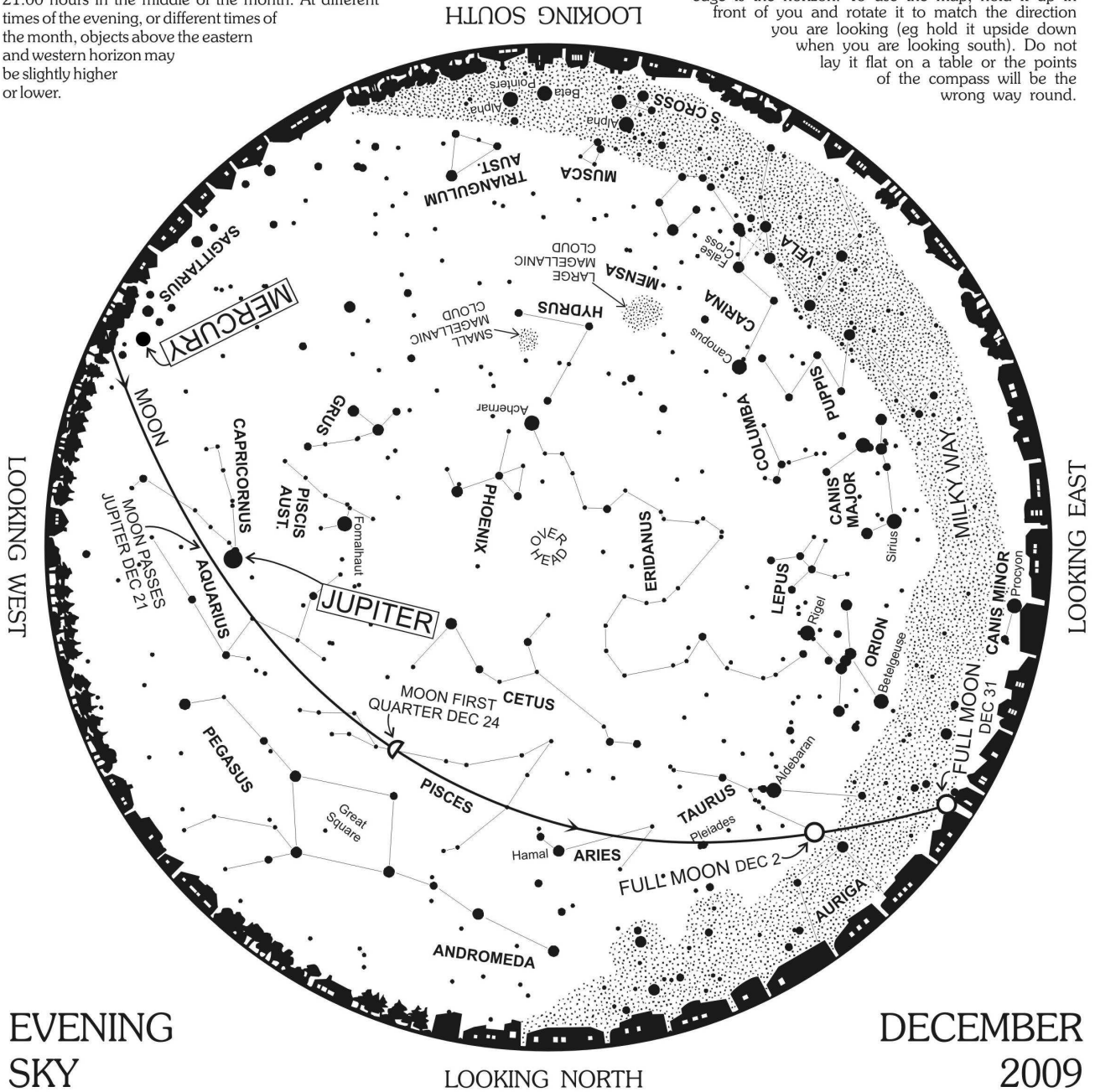
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The map shows the night sky visible above the Cape at 21:00 hours in the middle of the month. At different times of the evening, or different times of the month, objects above the eastern and western horizon may be slightly higher or lower.

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 (eg 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.



EVENING
SKY

DECEMBER
2009