



The chart is orientated for
 Nov. 1 at 1 a.m. NZDT
 Nov. 15 at midnight "
 Dec. 1 at 11 p.m. "
 Dec. 15 at 10 p.m. "

Evening sky in December 2015

To use the chart, hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge. As the earth turns the sky appears to rotate clockwise around the south celestial pole (SCP on the chart). Stars rise in the east and set in the west, just like the sun. The sky also shows a small extra clockwise rotation each night as we orbit the sun.

Mercury is the only naked-eye planet in the evening sky, setting in the southwest twilight. Sirius, the brightest star, is due east, twinkling like a diamond. Left of it is Orion, with 'The Pot' at its centre. Further left is Taurus and the Pleiades/Matariki/Seven Sisters star cluster. The Pointers and Crux, the Southern Cross, are low in the south. Right of Canopus, the second brightest star, are the Clouds of Magellan (LMC and SMC on the chart), two nearby galaxies. The Andromeda Galaxy is faint and low in the north. The bright planets Venus, Jupiter and Mars, and later Saturn, are all in the eastern dawn sky.

The Evening Sky in December 2015

Mercury is the only planet in the evening sky. At the beginning of the month it appears as a bright star setting in the south-west an hour after the sun. It moves slightly higher in the twilight, setting 80 minutes after the sun by the end of the month. In a telescope it looks like a tiny gibbous moon; a moon between first quarter and full.

The brightest true stars are in the east and south. **Sirius**, the brightest of all the stars, is due east at dusk, often twinkling like a diamond. Left of it is the bright constellation of **Orion**. The line of three stars makes Orion's belt in the classical constellation. To southern hemisphere skywatchers they make the bottom of 'The Pot'. The faint line of stars above and right of the three is the Pot's handle. At its centre is the Orion Nebula, a glowing gas cloud nicely seen in binoculars. **Rigel**, directly above the line of three stars, is a hot blue-giant star. Orange **Betelgeuse**, below the line of three, is a cooler red-giant star.

Left of Orion is a triangular group making the upside down face of **Taurus** the bull. Orange **Aldebaran** is the brightest star in the V shape. Aldebaran is Arabic for 'the eye of the bull'. Still further left is the **Pleiades /Matariki/Seven Sisters/Subaru** cluster, impressive in binoculars. It is 440 light years* away.

Canopus, the second brightest star, is high in the southeast. Low in the south are the Pointers, Beta and **Alpha Centauri**, and **Crux** the Southern Cross. In some Maori star lore the bright southern Milky Way makes the canoe of Maui with Crux being the canoe's anchor hanging off the side. In this picture the Scorpion's tail can be the canoe's prow and the Clouds of Magellan are the sails.

The **Milky Way** is wrapped around the horizon. The broadest part is in **Sagittarius** low in the west at dusk. It narrows toward Crux in the south and becomes faint in the east below Orion. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one. The thick hub of the galaxy, 30 000 light years away, is in Sagittarius now low in the west. The nearby outer edge is the faint part of the Milky Way below Orion. A scan along the Milky Way with binoculars will show many clusters of stars and a few glowing gas clouds.

The Clouds of Magellan, **LMC** and **SMC**, high in the southern sky, are two small galaxies about 160 000 and 200 000 light years away, respectively. They are easily seen by eye on a dark moonless night. The larger cloud is about 1/20th the mass of the Milky Way galaxy, the smaller cloud 1/30th.

Very low in the north is the **Andromeda Galaxy** seen in binoculars in a dark sky as a spindle of light. It is a bit bigger than our Milky Way galaxy and nearly three million light years away.

Jupiter, Mars and Venus are all the morning sky, so not shown on the chart. Saturn joins them at the end of the month. At the beginning of December Jupiter rises around 2:30 a.m.; reducing to 12:30 a.m. by the 31st. It is a bright golden-coloured 'star' shining with a steady light. Venus is up around 4 a.m., a brilliant object bright enough to cast shadows in dark locations. Mars is between the two bright planets, looking like a medium-bright reddish star. Jupiter and Mars rise steadily earlier while Venus stays put in the dawn. In the second half of the month Mars is near, then passing below, the bluish-white star Spica the brightest star in Virgo. At the end of the month Saturn emerges from the dawn twilight below and right of Venus, at the bottom end of the diagonal line of planets. The crescent moon will be close to Venus on the morning of December 8th.

A small telescope shows Jupiter's disk with its four big moons like faint stars lined up on each side. They change sides from night to night as they orbit the planet. Jupiter is 794 million km away mid-month.

The Geminid meteor shower peaks on the morning of the 15th. The meteors appear to come from the constellation of Gemini, low in the northeast at midnight, moving to the north by dawn. The meteors are clumps of dust from a comet. Friction with the air heats them up and makes the air around them glow.

A **light year (l.y.)** is the distance that light travels in one year: nearly 10 million million km. Sunlight takes eight minutes to get here; moonlight about one second. Sunlight reaches Neptune, the outermost major planet, in four hours. It takes sunlight four years to reach the nearest star, Alpha Centauri.