



The chart is orientated for
 June 15 at 10 p.m. NZST
 July 1 at 9 p.m. "
 July 15 at 8 p.m. "
 Aug. 1 at 7 p.m. "

Evening sky in July 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 makes a small extra clockwise rotation each night as we orbit the sun.

Brilliant silver Venus and golden Jupiter make a rare close pairing low in the western sky. Sirius, the brightest true star, sets in the southwestern twilight, sparkling colourfully. Saturn is northeast of the zenith with orange Antares, the heart of Scorpio, above it. Low in the north is orange Arcturus, the same brightness as Saturn. The Pointers and Crux, the Southern Cross, are south of the zenith. Canopus, the second brightest star, is low in the southwest. It swings down to the southern horizon later. The Scorpion is on its back high up the eastern sky with Sagittarius below it. Vega rises in the northeast around 9 p.m.

The Evening Sky in July 2015

Brilliant silver **Venus** and golden **Jupiter** are close together in the west at the beginning of July and remain an eye-catching pair through the month. Northeast of the zenith is **Saturn**, cream-coloured. Well left of Saturn, at the same elevation but fainter, is **Spica**. Midway down the north sky is orange **Arcturus**, similar in brightness to Saturn. **Sirius**, the brightest true star, sets in the southwest as twilight ends, twinkling like a diamond. **Canopus**, the second brightest star, is also in the southwest at dusk. It swings south later. South of the zenith are 'The Pointers', Beta and **Alpha Centauri**. They point to **Crux** the Southern Cross on their right. To the right of Saturn is orange **Antares**, the brightest star in Scorpius. **Vega** rises in the northeast around 9 pm.

Venus and **Jupiter** are less than a full-moon's width apart on July 1. This is a rare close pairing of bright planets. They set in the west around 8:30 pm. Through July Jupiter sinks lower in the twilight as we move to the far side of the sun from it. Venus also falls lower, but remains above Jupiter. Venus is catching up on the Earth. It passes between us and the sun in mid-August. The two planets appear similar in size in a telescope. Venus is a tall thin crescent. Jupiter is a disk with its four 'Galilean' moons in a line on either side. The planets' apparent pairing is strictly a line-of-sight effect. On July 15 Venus is 62 million km from us and Jupiter is 930 million km. In mid-July Venus is just left of Regulus, the brightest star in Leo. The moon is near the two planets on the 18th and 19th.

Saturn is always worth a look in any telescope. A small telescope shows the ring system and biggest moon Titan looking like a star about four ring-diameters from the planet. Big telescopes show fainter moons closer in. Saturn is around 1400 million km away in July. It sets in the southeast around 3 a.m.

Alpha Centauri is the third brightest star. It is also the closest of the naked eye stars, 4.3 light years* away. Beta Centauri, like most of the stars in Crux, is a blue-giant star hundreds of light years away. **Canopus** swings down to the southern skyline before midnight then moves into the southeast sky in the morning hours. It is a 'circumpolar star': it never sets. Crux and the Pointers are also circumpolar. Canopus is a truly bright star: 13 000 times the sun's brightness and 300 light years away.

Arcturus, in the north, is the fourth brightest star and the brightest in the northern hemisphere sky. It is 120 times the sun's brightness and 37 light years away. It twinkles red and green when setting in the northwest around midnight. It is an orange colour because it is cooler than the sun; around 4000°C.

East of the zenith, and right of Saturn, is the orange star **Antares**, marking the heart of the Scorpion. The Scorpion's tail, upside down, is stretched out to the right of Antares making the 'fish-hook of Maui' in Maori star lore. Antares is a red giant star: 600 light years away and 19 000 times brighter than the sun. Below Scorpius is 'the teapot' made by the brightest stars of Sagittarius. It is also upside down in our southern hemisphere view.

The **Milky Way** is brightest and broadest in the east toward **Scorpius** and **Sagittarius**. In a dark sky it can be traced up past the Pointers and Crux, fading toward Sirius. 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. The actual centre is hidden by dust clouds in space. A scan along the Milky Way with binoculars shows many clusters of stars and some glowing gas clouds.

The Large and Small Clouds of Magellan, **LMC** and **SMC**, look like two misty patches of light low in the southern sky. They are easily seen by eye on a dark moonless night. They are galaxies like our Milky Way, but much smaller. The Large Cloud is 160 000 light years away and 5% of the mass of the Milky Way. The Small Cloud is 200 000 light years and 3% of the Milky Way's mass.

Mercury ends a morning sky appearance. At the beginning of July it is below orange Aldebaran in the northeast as twilight begins. It sinks lower in the dawn and disappears mid-month.

*A **light year (l.y.)** is the distance that light travels in one year: nearly 10 million million km or 10^{13} km. Sunlight takes eight minutes to get here; moonlight about one second. Sunlight reaches Neptune, the outermost major planet, in four hours. It takes four years to reach the nearest star, Alpha Centauri.