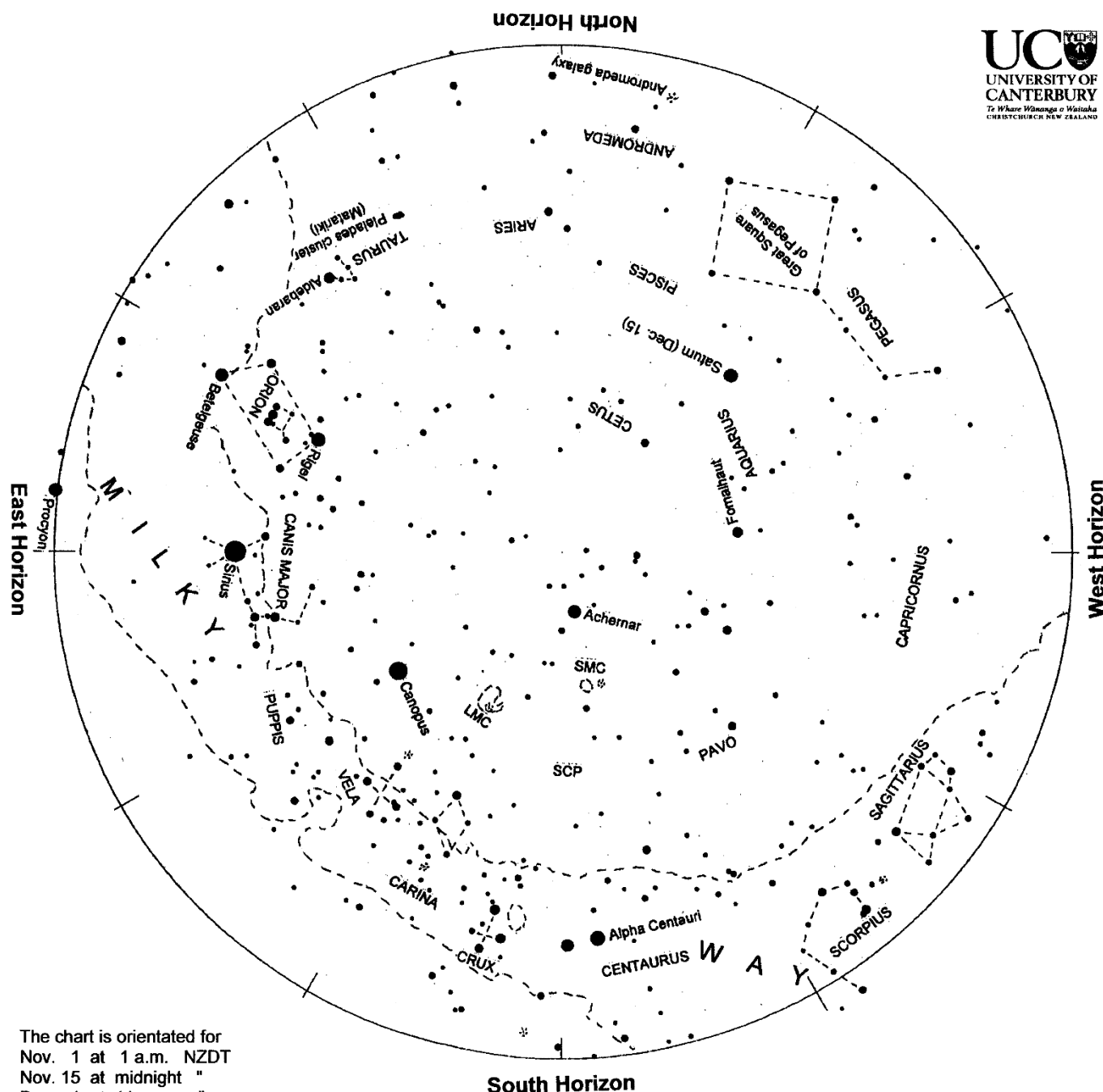




The chart is orientated for
Nov. 1 at 1 a.m. NZDT
Nov. 15 at midnight "
Dec. 1 at 11 p.m. "
Dec. 15 at 10 p.m. "

Evening sky in December 2025

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 does a small extra clockwise rotation each night as we orbit the sun.

Saturn is midway down the northwestern sky. Due east is Sirius, the brightest true star, twinkling like a diamond. Left of it is Orion, with 'The Pot' at its centre. Bright bluish Rigel is above the Pot and reddish Betelgeuse below. Left of Orion is orange Aldebaran with a V-shaped cluster making the face of Taurus the Bull. Further left is the Pleiades/Matariki/Seven Sisters star cluster. The Pointers and Crux, the Southern Cross, are low in the south. Above and right of Sirius is Canopus, the second brightest star. Above it are two misty patches, the Clouds of Magellan, LMC and SMC on the chart, small nearby galaxies. The Great Square of Pegasus spans the lower northwest sky with the Andromeda Galaxy below and right of it. Jupiter rises in the northeast in the late evening (so isn't on the chart). It is the brightest 'star' in the late-night sky.

The Evening Sky in December 2025

Saturn is northwest of the zenith at dusk. It looks like a medium-bright cream-coloured star and sets due west around 1 a.m. The Moon will be below Saturn on the 27th. A small telescope will show the disk of Saturn. The ring is nearly edge-on, so it looks like a spike through the planet. Saturn's biggest moon, Titan, looks like a star in line with the ring.

Jupiter (not on the chart) rises in the northeast around 11:40 pm at the beginning of the month and around 9:30 at the end. It is the brightest 'star' in the late-night sky and shines with a steady golden light. There is an unreliable rule that stars twinkle and planets don't. It works for Jupiter. Though it isn't obvious to the eye, Jupiter appears as a disk. This blurs the twinkling effect of the air, giving the steady glow that we see. Jupiter crosses the sky during the night so is in the north to northwest at dawn. Any telescope will show Jupiter's 'Galilean' moons, but not all four every night as they cross in front of and behind Jupiter. Two of the brightest moons can be seen in binoculars, if you can hold them steady enough. The near-full Moon will be near Jupiter on the night of the 7th-8th.

Sirius is the brightest true star, low in the east at dusk, twinkling colourfully. **Canopus**, the second brightest, is a bit higher in the southeast. Left of Sirius is the constellation of **Orion**. Bluish **Rigel** and orange **Betelgeuse** are Orion's brightest stars. Between them is the line of three stars making the bottom of 'The Pot' in our southern hemisphere view. A faint line of stars above the bright three is the Pot's handle. At its centre is the Orion Nebula, a glowing gas cloud nicely seen in binoculars.

Left of Orion is a triangular group making the upside-down face of **Taurus** the bull. Orange **Aldebaran**, at one tip of the V shape, is one eye of Taurus. The stars on and around the V, except for Aldebaran, are the Hyades cluster. Aldebaran is not a member of the cluster but closer and on the line-of-sight. Further left is the **Pleiades/Matariki/Subaru** cluster, a tight grouping of six naked-eye stars. Many more stars are seen in binoculars.

Almost overhead is **Achernar**. It marks the end of Eridanus, the river. The scattered river of faintish stars meanders down the sky to Orion.

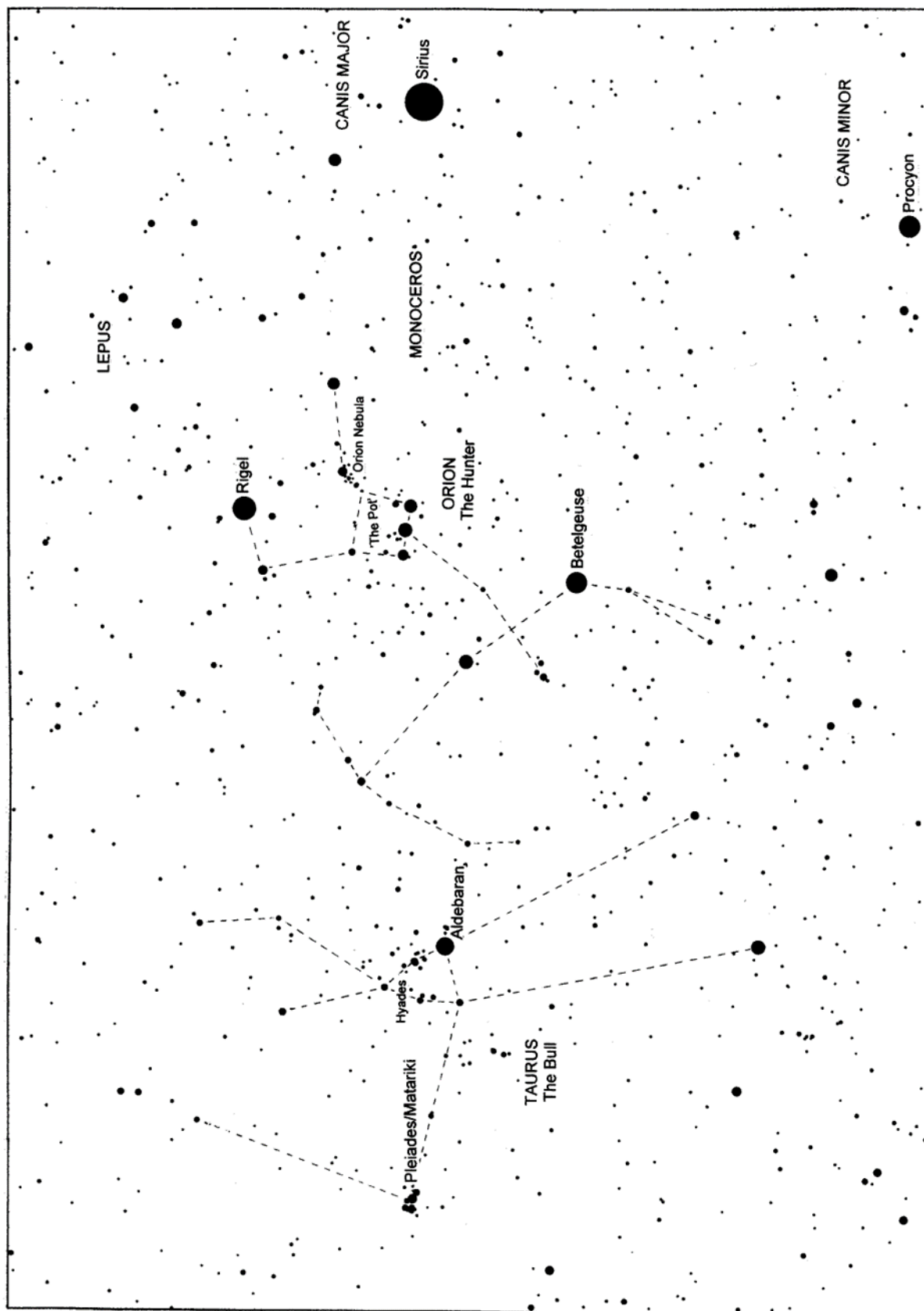
Low in the south are the Pointers, Beta and **Alpha Centauri**, and **Crux** the Southern Cross, upside down at this time of the year. The **Milky Way** is wrapped around the horizon. The broadest part is in Sagittarius, low in the southwest at dusk. It narrows toward Crux in the south and becomes faint in the east below Orion. Several star clusters and a glowing gas cloud can be seen in the Milky Way above and left of Crux.

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 as misty patches of light. Just right of the SMC, the Small Cloud, is a faint fuzzy 'star'. It is the globular cluster 47 Tucanae, a globe-shaped cluster of millions of stars.

Very low in the north is the **Andromeda Galaxy**. In binoculars in a dark sky it looks like a spindle of light. It is a bit bigger than our Milky Way Galaxy and nearly three million light-years away.

Mercury rises in the southeast an hour before the Sun mid-month. The thin crescent Moon will be near it on the mornings of the 18th and 19th.

*A **light-year (l.y.)** is the distance that light travels in one year: nearly 10 million million km, 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 sunlight four years to reach the nearest star, Alpha Centauri.



Eastern Evening Sky in Early Summer

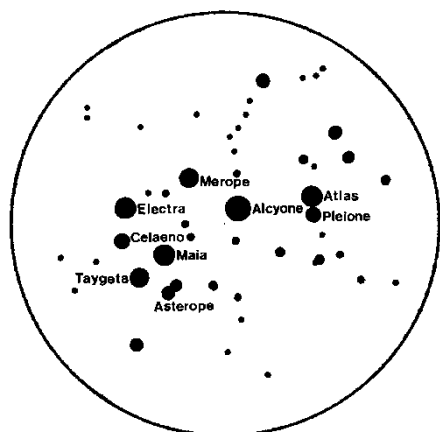
Tilt the chart to the left as the region rises in the sky. Orion and Taurus are seen upside down from the southern hemisphere. Interesting objects are described on the other side of this page.

Chart produced by Guide 8 software; www.projectpluto.com. Labels and text added by Alan Gilmore, Mt John Observatory of the University of Canterbury, P.O. Box 56, Lake Tekapo 8770, New Zealand. www.canterbury.ac.nz

Interesting Objects in Orion and Taurus

Taurus the Bull and **Orion** the Hunter are constellations recognised by most northern hemisphere cultures. To see the northern hemisphere pictures turn the chart upside down. The face of Taurus is outlined by the V-shaped **Hyades** cluster. The brightest star in this group is orange **Aldebaran**. It makes one of the eyes of Taurus. Taurus's long horns extend down our sky. The **Pleiades** cluster rides on the Bull's back.

Orion, in the northern hemisphere view, has a shield raised toward Taurus and a club ready for action. The line of three stars makes **Orion's Belt**. The line of faint stars above and left of the belt form **Orion's Sword** in the northern view, dangling from his belt. To most southern hemisphere sky watchers the belt and sword form **The Pot, The Iron Pot, or The Saucepan**.



The **Pleiades / Seven Sisters / Matariki / Subaru**, and many other names, is a cluster of stars well known in both hemispheres. Though often called the Seven Sisters, most modern eyes see only six stars. Dozens are visible in binoculars. The cluster is about 440 light years away. Its brightest stars are around 200 times brighter than the sun.

One **light year (l.y.)** is the distance light travels in one year: about 10 million million km or 6 million million miles. Light from the sun reaches us in 8 minutes; from the moon in 1 second. Sunlight takes 4 hours to reach Neptune, the outermost significant planet, and 4 years to reach Alpha Centauri, the nearest star.

The **Hyades** cluster is 160 light years away. Its brightest stars (not Aldebaran!) are about 70 times brighter than the sun. **Aldebaran** is not a member of the cluster but simply on the line of sight. It is 65 l.y. away and 150 times brighter than the sun. Aldebaran is a giant star about 25 times bigger than the sun though only five times heavier. Its orange colour is due to its temperature, around 3500° C. The sun is 5500° C.

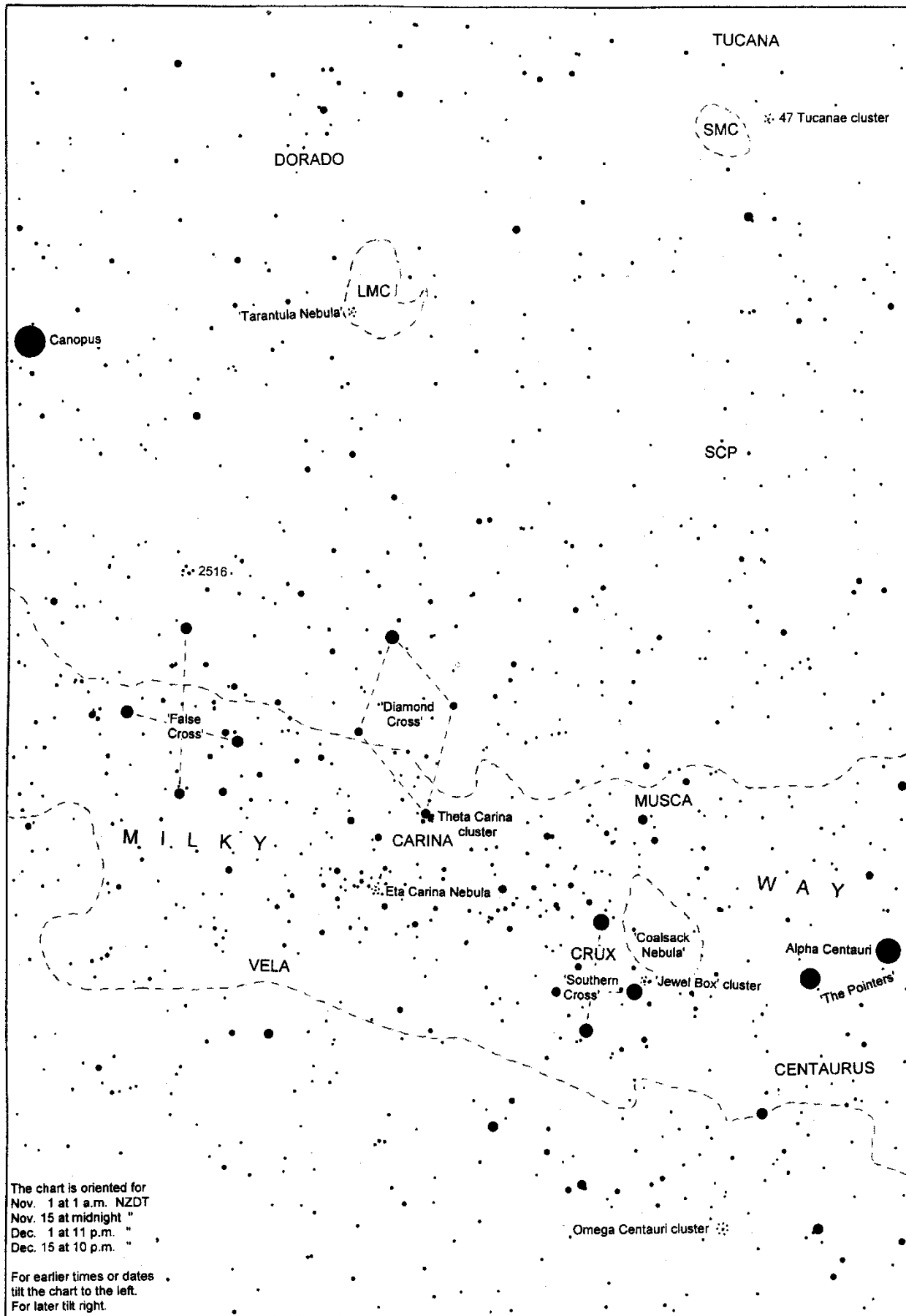


The **Orion Nebula** is visible in binoculars as a misty glow around the middle stars of Orion's Sword or the handle of The Pot. It is a vast cloud of dust and gas about 1300 l.y. away and more than 20 l.y. across. Ultra-violet light from a massive, extremely hot star in the cloud causes it to glow. Some stars in this region may be less than a million years old. The sun, by contrast, is 4.6 billion years old. Stars continue to form in a giant cloud behind the glowing nebula. There are many bright and dark nebulae in this region. The Horsehead nebula, a favourite of astronomy books, is beside the right-hand star of Orion's Belt, but too faint to be seen in small telescopes.

Rigel is a blue 'supergiant' star around 40 000 times brighter than the sun and 800 l.y. away. Its surface temperature is around 20 000°C, giving it a bluish colour.

Betelgeuse is a red giant star 250 times bigger than the sun -- wider than earth's orbit! -- but only around 20 times heavier, so it is mostly very thin gas. It is around 10 000 times brighter than the sun, about 400 l.y. away, and has a surface temperature around 3000°C.

Sirius is the brightest star, though the planets Venus and Jupiter, and sometimes Mars, are brighter. Sirius appears bright because it is both brighter than the sun and relatively a close 8.6 l.y. away. Sirius was often called 'the dog star' being the brightest star in Canis Major, one of the two dogs that follow Orion across the sky.



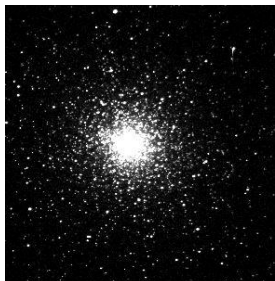
Southern Evening Sky in December

The chart shows the lower southern sky. Interesting star clusters and nebulae are indicated with asterisks. They are described on the other side of this page.

Chart produced by Guide 8 software; www.projectpluto.com. Labels and text added by Alan Gilmore,
 Mt John Observatory of the University of Canterbury, P.O. Box 56, Lake Tekapo, 7945, New Zealand.
www.canterbury.ac.nz

Interesting Objects in the Southern Sky

Large & Small Clouds of Magellan (LMC & SMC) appear as two luminous patches, easily seen by eye in a dark sky. They are two galaxies like the Milky Way but much smaller. Each is made of billions of stars. The Large Cloud contains many clusters of young luminous stars seen as patches of light in binoculars and telescopes. The LMC is about 160 000 light years away and the SMC 200 000 l.y away, both very close by for galaxies. (1 light year is about 10 000 billion km, 10^{13} km.)



47 Tucanae, looks like a faint fuzzy star on the edge of the SMC. It is a globular cluster, a ball of millions of stars. A telescope is needed to see a peppering of stars around the edge of the cluster. Though it appears on the edge of the SMC it is one-tenth the distance, 13 000 light years away, and has no connection to the Small Cloud. Globular clusters are mostly very old, 10 billion years or more; at least twice the age of the sun. **Omega Centauri**, very low in the south, is a similar cluster.



Tarantula nebula is a glowing gas cloud in the LMC. The gas glows in the ultra-violet light from a cluster of very hot stars at centre of the nebula. The cloud is about 800 light years across. It is easily seen in binoculars and can be seen by eye on moonless nights.

This nebula is one of the brightest known. If it was as close as the Orion nebula (in The Pot's handle) then it would be as bright as the full moon.

Canopus is the second brightest star. It is 14 000 times brighter than the sun and 300 light years away. Sirius, low in the east on spring evenings, is the brightest star in the sky.

Alpha Centauri, the brighter Pointer, is the closest naked-eye star, 4.3 light-years away. Alpha Centauri is a binary star: two stars about the same size as the sun orbiting around each other in 80 years. A telescope that magnifies 50x splits the pair. (A very faint and slightly closer star, Proxima Centauri, orbits a quarter of a light-year, or 15 000 Sun-earth distances, from the Alpha pair.)

Coalsack nebula is a cloud of dust and gas about 600 light years away, dimming the more distant stars in the Milky Way. Many similar 'dark nebulae' can be seen, appearing as slots and holes in the Milky Way. These clouds of dust and gas eventually coalesce into clusters of stars.

The Jewel Box is a compact cluster of young luminous stars about 7000 light years away. The cluster formed less than 16 million years ago. To the eye it looks like a faint star.



Eta Carinae nebula is a glowing gas cloud about 8000 light years away. The golden star in the cloud, visible in binoculars, is Eta Carinae. (Eta is the Greek 'e'.) It is a binary star: two massive stars orbiting each other in 5.5 years. The bigger star is 80 times heavier than the Sun; the smaller is 60 times the Sun's mass. Together they are about five million times brighter than the Sun but are dimmed by dust clouds around them. The bigger star is expected to explode as a supernova any time in the next few thousand years.

Many star clusters are found in this part of the sky.

The **Theta Carina Cluster** at one point of the 'Diamond Cross'. It is also known as the 'Five of Diamonds' cluster, the reason obvious when it is seen in a telescope. A newish name is 'Southern Pleiades', though this cluster is much fainter and smaller than the real Pleiades in Taurus. The cluster is about 500 light years away and is around 30 million years old.