

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

Evening sky in November 2024

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.

Venus is the brilliant 'evening star', appearing in the west soon after sunset and setting late. Mercury is below and left of Venus. Saturn is north of the zenith. Jupiter rises around 11 pm at the beginning of the month and 9 pm at the end. It is the brightest 'star' after Venus sets. Sirius, the brightest true star, appears in the east twinkling colourfully. Left of Sirius is Orion containing 'The Pot'. Further left are Taurus and the Pleiades/Matariki star cluster. Canopus, the second brightest true star, is midway up the southeast sky. The Pointers and Crux, the Southern Cross, are low in the south. The Clouds of Magellan, small nearby galaxies, are two misty patches high in the south. The Milky Way is wrapped around the horizon. Low in the north is the Great Square of Pegasus with the Andromeda galaxy below and right of it.

The Evening Sky in November 2024

Venus is the brilliant 'evening star', appearing soon after sunset (or before, if you know where to look.) It sets in the southwest around 11:20 pm NZDT at the beginning of the month and near midnight at the end. A brilliant object in the dark night sky. The crescent Moon will be near Venus on the 4th and 5th. Below and left of Venus is **Mercury**, the brightest 'star' in that area. It sets around 10 pm at the beginning of the month and 10:20 at mid-month. A thin Moon will be near Mercury on the 3rd. Mercury fades and slips lower in the twilight at the end of November. Antares, the heart of the scorpion, will be left of Mercury on the 11th.

Saturn is northwest of the zenith at dusk looking like a medium-bright star with a cream tint. In a telescope it looks like a ball with a spike through it as the ring is nearly edge-on to our view. The Moon will be near Saturn on the 10th and 11th.

At the beginning of the month **Jupiter** rises in the northeast around 11:20 as Venus is setting in the southwest. It is the brightest 'star' in the late-night sky and shines with a steady golden light. Any telescope will show its disk and its four 'Galilean' moons lined up on each side. By the end of the month it will be in the sky at dusk. At dawn Jupiter is low in the northwest sky. The Moon is near Jupiter on the 17th.

Sirius, the brightest true star, is low in the east twinkling colourfully. By the end of the month it is up at sunset. **Canopus**, the second-brightest star, is in the southeast. Both stars twinkle like diamonds as the air disperses their white light.

Sirius is the brightest star both because it is relatively close, nine light-years away, and bright as stars go. Seen up close it would be 23 times brighter than the sun. By contrast, Canopus is 300 light-years* away and 13 000 times brighter than the sun.

Left of Sirius is the constellation of **Orion**, with 'The Pot' at its centre. **Rigel**, a bluish supergiant star, is directly above the line of three stars; orange **Betelgeuse**, a red-giant star, is straight below. Left again is orange **Aldebaran**. It is at one tip of a triangular group called the Hyades cluster. The Hyades and Aldebaran make the upside-down face of **Taurus** the bull. Still further left is the **Pleiades** or **Matariki** star cluster, also called the Seven Sisters, Subaru and many other names. Six stars are visible to most eyes. Dozens are seen in binoculars. The cluster is 440 light-years away and around 100 million years old.

The **Milky Way** is low in the sky, visible around the horizon from the northwest, through south into the eastern sky. The broadest, brightest part is in **Sagittarius**, to the right of the Scorpion's sting. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the Sun is just one.

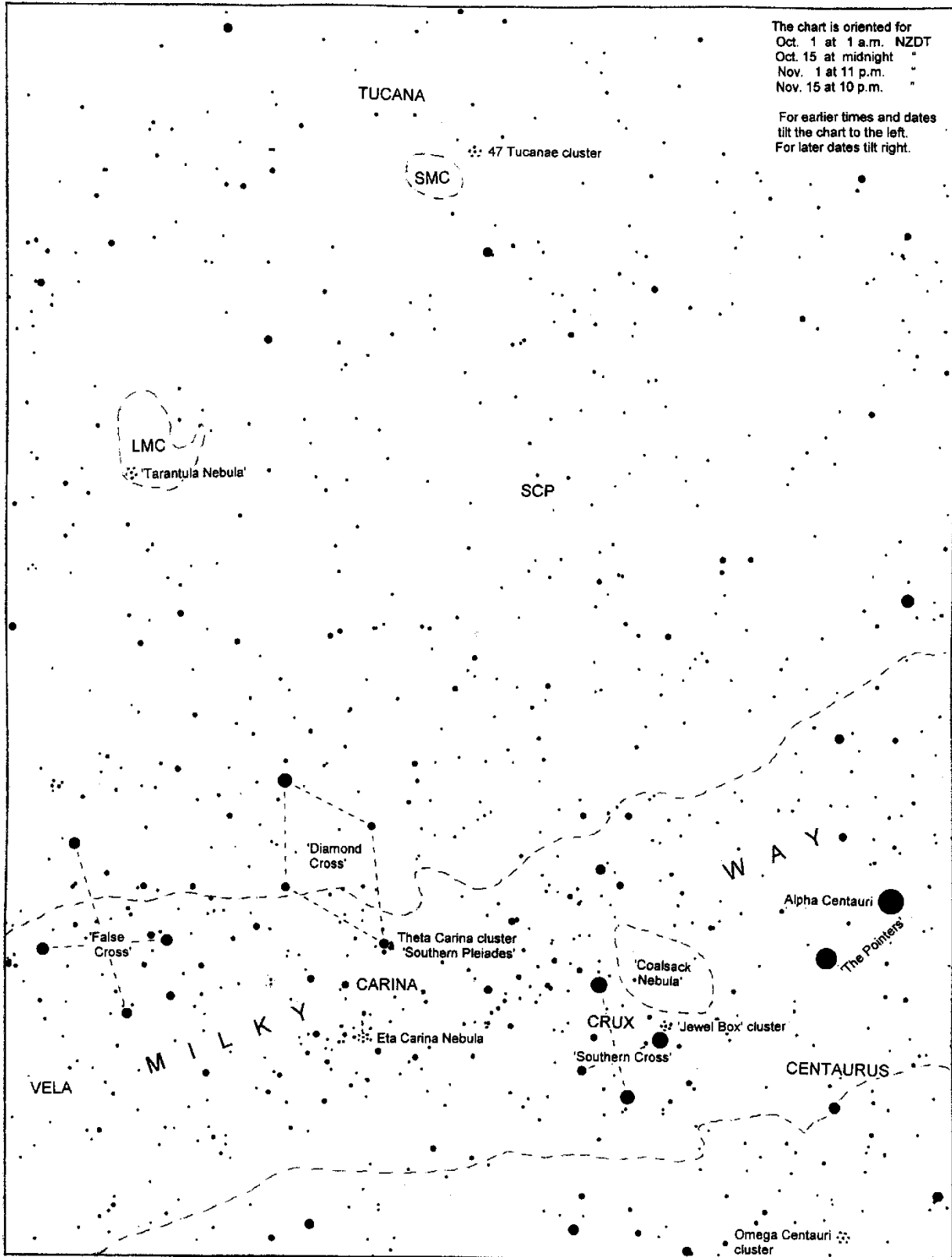
Low in the south are the Pointers, Beta and **Alpha Centauri**, and **Crux** the Southern Cross, now upside down. In some Māori star lore the bright southern Milky Way makes the canoe of Maui with Crux being the canoe's anchor hanging off the side. In this picture the Scorpion's tail can be the canoe's prow and the Clouds of Magellan are the sails. Alpha Centauri is the closest naked-eye star; 4.3 light-years away.

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 globular star cluster **47 Tucanae** looks like a slightly fuzzy star near the top-right edge of the SMC. It is 13 000 light-years away and on the line of sight to the SMC. Globular clusters are spherical clouds of ancient stars.

Very low in the north is the **Andromeda Galaxy**, easily seen in binoculars in a dark sky, and faintly visible to the eye. It is like our Milky Way Galaxy and nearly three million light years away.

Mars is in the morning sky rising in the northeast around 2 a.m. at the beginning of the month and 12:30 at the end. It is the brightest 'star' in that part of the sky and is reddish orange in colour.

*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 sunlight four years to reach the nearest star, Alpha Centauri.



Southern Evening Sky in November

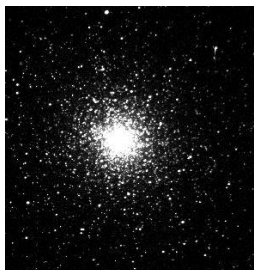
The chart shows the sky south of overhead. Interesting star clusters and nebulae are indicated with asterisks. They are described on the other side of this page.

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 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 Large Cloud is about 160 000 light years away, the Small Cloud 200 000 l.y.; away very close by for galaxies. (1 light year is about 10 000 billion km, or 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, 15 000 light years away, and it 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.

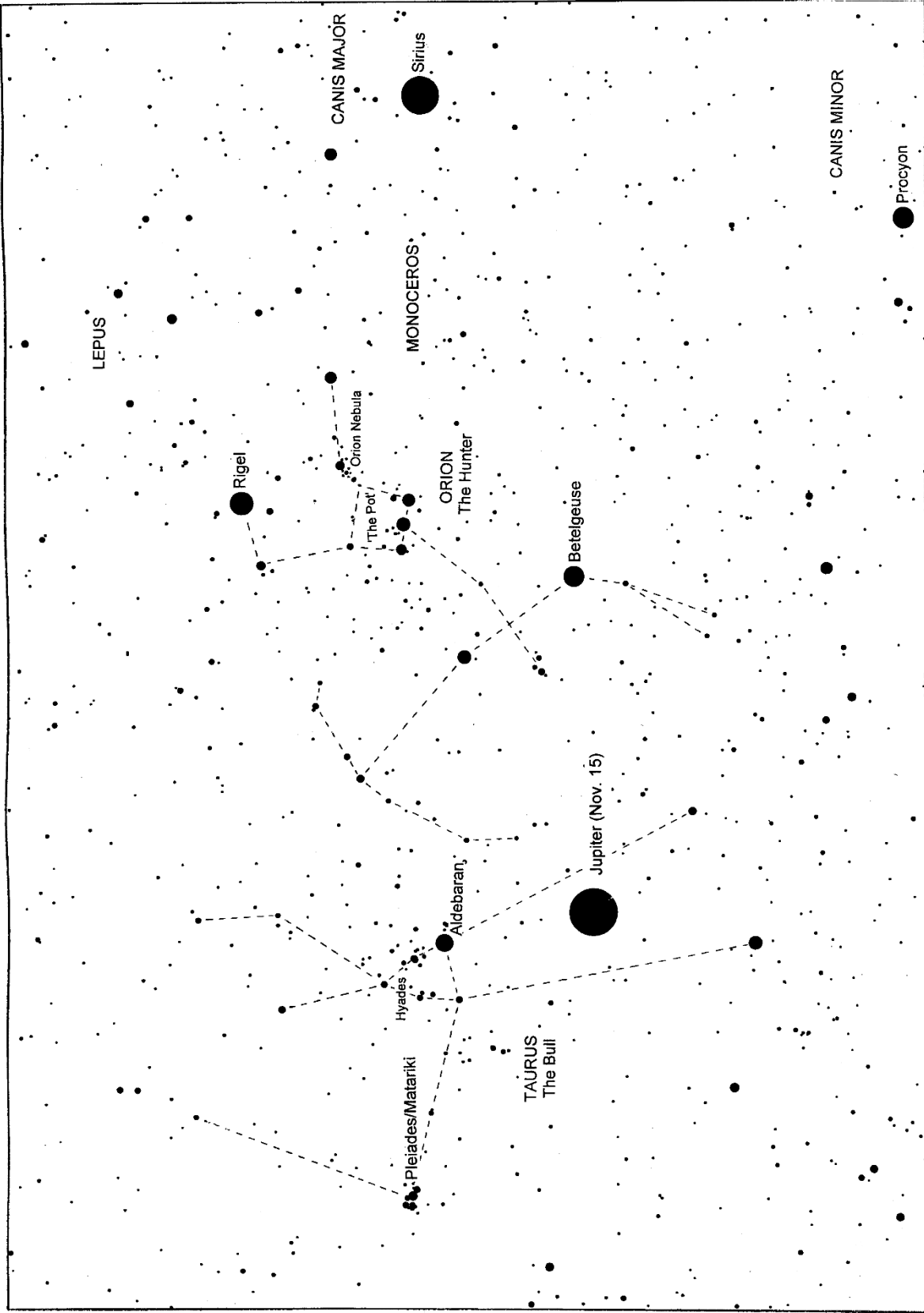
The Jewel Box is a compact cluster of young luminous stars about 7000 light years away. The cluster formed around 25 million years ago. To the eye it looks like a faint star.



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 estimated to be to be 60 times heavier than the sun and a million times brighter but is dimmed by dust clouds around it. It 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 Southern Pleiades is a newish name for a cluster of stars at one point of the 'Diamond Cross'. It is formally the **Theta Carinae cluster**, after its brightest star but is also known as the 'Five of Diamonds' cluster, the reason obvious when it is seen in a telescope. It is much fainter and smaller than the real Pleiades in Taurus but a nice sight in binoculars. The cluster is about 500 light years away and is around 10 million years old.



Eastern Evening Sky in November 2024

The chart shows the east to northeast sky at dusk. Jupiter is a beacon for the region. It rises around 11:40 at the beginning of the month and around 9:30 at the end. It is the brightest 'star' in the night sky after Venus sets.

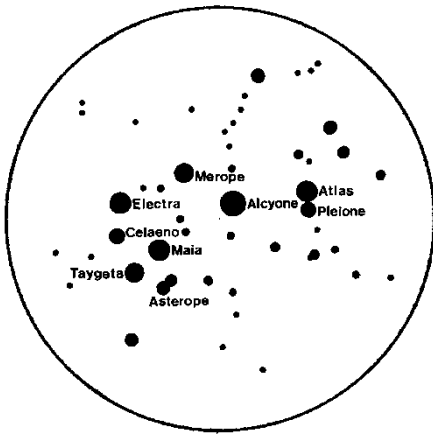
Chart produced by Guide8 software: www.projectpluto.com. Labels added by Alan Gilmore, University of Canterbury's Mt John Observatory, Lake Tekapo.

The Eastern Evening Sky in November 2024

Sirius appears low in the east at dusk twinkling all colours. It is the brightest true star in the sky but much fainter than Venus, on the opposite side of the sky. Left of Sirius is **Orion** with its bright stars bluish **Rigel** and orange **Betelgeuse**. Between them is the line of three fainter stars making Orion's belt or, in the southern hemisphere view, the bottom of **The Pot** or Saucepan. Left of Orion is orange **Aldebaran**, one eye of Taurus the Bull. The bull's face is made by the V-shaped cluster of stars called the **Hyades**, upside down in our view. Left again is the **Pleiades/Matariki** cluster.

Jupiter rises around 11:15 NZDT, an hour after Sirius, at the beginning of the month. It is much brighter than Sirius and doesn't twinkle. Jupiter, and the stars, rise four minutes earlier each day. By the end of November Jupiter is rising at dusk. So there are bright planets on opposite sides of the sky.

Orion, in the northern hemisphere view, has a shield raised toward Taurus and a club ready for action. The line of faint stars above and left of the belt then form Orion's sword dangling from his belt. In the southern hemisphere it makes the handle of The Pot. A modern variation on this is 'the shopping trolley'. The Pot is the trolley's basket. Betelgeuse and Bellatrix, the star above and left of Betelgeuse, make the wheels. Like most constellation pictures, it requires imagination.



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 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. The cluster is 630 million years old. **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. 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 are only two 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 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 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 30 times brighter than the sun and relatively close at 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.