

Evening sky in February 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 makes a small extra westward shift each night as we orbit the sun.

Venus and Jupiter are the 'evening stars', appearing soon after sunset. Brilliant Venus is low in the west, setting early. Golden Jupiter is low in the north. Orange Mars, fainter than Jupiter, is toward the northeast. Sirius, the brightest true star, appears north of overhead at dusk. Canopus, the second brightest star, is south of the zenith. Orion, containing 'The Pot', is midway down the north sky. Above Jupiter is the face of Taurus the bull. Left of Jupiter is the Pleiades/Matariki star cluster. The Southern Cross and Pointers are midway up the southeast sky. The Clouds of Magellan, LMC and SMC, two nearby galaxies, are faint luminous patches high in the south sky.

The Evening Sky in February 2025

Venus and **Jupiter** are 'evening stars' in February. Brilliant silver Venus is low in the west. It sets around 10:40 p.m. NZDT at the beginning of the month and around 9 p.m. at the end. The Moon will be near Venus on the 2nd. Golden Jupiter appears in the north soon after sunset. It sets after 2 a.m. at the beginning of the month and around 12:30 at the end. The Moon will be near Jupiter on the 7th. Orange **Mars** is also an 'evening star', low in the northeast, much fainter than Jupiter but the brightest 'star' in that part of the sky. The Moon will be near Mars on the 9th and 10th.

Venus is catching up on Earth on the inside track. It passes between us and the Sun in March. Much of its sunlit side is turned away from us so in a telescope it appears as a tall thin crescent. The disk of Jupiter can be seen in a small telescope with its 'Galilean moons' lined up on each side. They can be seen in binoculars if held steady enough. Mars is a tiny disk in a telescope.

Sirius and **Canopus** are the brightest true stars. Sirius, the brightest of all the stars, is north of overhead. Canopus, the second brightest star, is a bit south of overhead. Both stars are white.

Sirius, 'the Dog Star', marks the head of **Canis Major** the big dog. Sirius is 8.6 light-years* away and 30 times brighter than the Sun. A group of stars above and right of it make the dog's hindquarters and tail, upside down. **Procyon**, in the northeast below Sirius, marks the smaller of the two dogs that follow Orion the hunter across the sky.

Below and left of Sirius are bluish **Rigel** and orange **Betelgeuse**, the brightest stars in **Orion**. Between them is a line of three stars: Orion's belt. To southern hemisphere star watchers, the line of three makes the bottom of 'The Pot'. The handle of The Pot is Orion's sword, a fainter line of stars above the bright three. At its centre is the Orion Nebula; a glowing gas cloud 1300 light-years away, seen in binoculars.

Above Jupiter is the orange star **Aldebaran** making one eye of Taurus the bull. It is on one tip of an upside-down V of stars making the face of **Taurus**. These constellation pictures were thought up by northern hemisphere folk so are upside down to us. Well left of Jupiter, near the northwest skyline, is the Pleiades/Matariki star cluster.

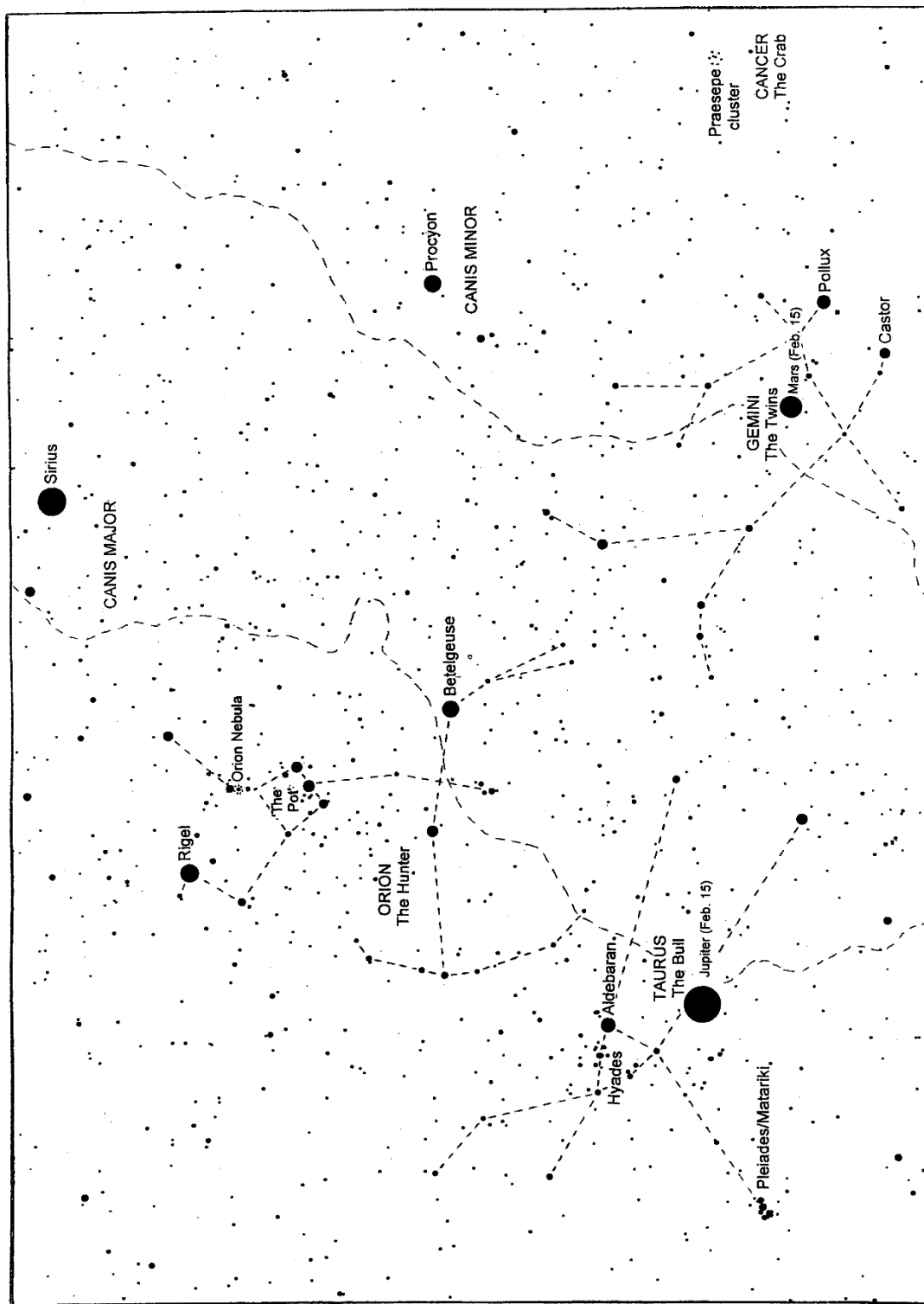
The V-shaped group is called the Hyades cluster. It is 130 light-years away. Aldebaran is not a member of the cluster but merely on the line of sight, 65 light years from us. It is a red-giant star 145 times brighter than the sun. The Pleiades/Matariki star cluster is also known as the Seven Sisters and Subaru among many names. The cluster is 440 light years from us. From northern Aotearoa the bright star **Capella** is on the north skyline. It is 90,000 times brighter than the sun and 3300 light years away.

Crux, the Southern Cross, is on its side in the southeast. Below it are Beta and **Alpha Centauri**, often called 'The Pointers'. Alpha Centauri is the closest naked-eye star, 4.3 light-years away. Beta Centauri is a blue-giant star hundreds of light years away, as are most of the stars in Crux. **Canopus** is also a very luminous distant star; 13,000 times brighter than the sun and 300 light-years away.

The **Milky Way** is brightest in the southeast toward Crux. It can be traced up the sky, fading where it is nearly overhead. It becomes very faint east, or right, of Orion. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one. Star clusters and a glowing gas cloud can be seen in binoculars in the Carina region above Crux.

The Clouds of Magellan, **LMC** and **SMC** are high in the south sky, easily seen by eye on a dark moonless night. They are two small galaxies about 160,000 and 200,000 light years away. Beside the Small Cloud (SMC) is the globular star cluster 47 Tucanae. It looks like a round smudge of light in binoculars. Telescopes show it as a cluster of thousands of faint stars. It is 13,000 light years away. **Omega Centauri**, left of The Pointers is also a globular cluster, 17,000 light-years away.

*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 for sunlight to reach the nearest star, Alpha Centauri.



The Northern Evening Sky in February 2025

Golden Jupiter, low in the north, is a beacon for the region. It is the brightest 'star' in the sky after Venus sets. Above Jupiter is the orange star Aldebaran, making one eye of Taurus the bull. The V-shaped Hyades star cluster makes the face of Taurus, upside-down to us. Left of Jupiter is the Pleiades/Matariki/Subaru/Seven Sisters star cluster. Well to the right of Jupiter, toward the northeast, is orange-red Mars. It is the brightest 'star' in that part of the sky. Below and right of Mars are Castor and Pollux, the heads of Gemini the Twins. Further right is a diffuse spot, the Praesepe star cluster, good in binoculars. Above and right of Jupiter is another orange star, Betelgeuse in Orion. 'The Pot' is above Betelgeuse and blue-white Rigel is higher up again. Sirius, the brightest true star, is high up the north sky.

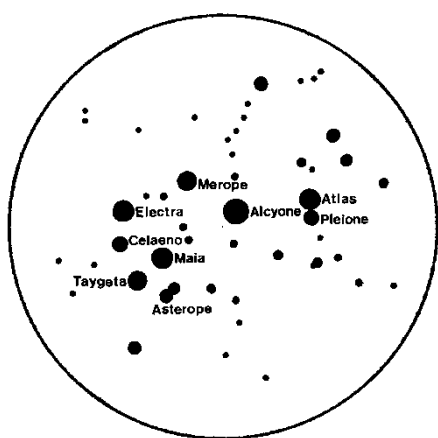
Chart produced by Guide 8 software; www.projectpluto.com. Labels and text added by Alan Gilmore, Mt John Observatory of the University of Canterbury, P.O. Box 56, Lake Tekapo 7945, New Zealand. www.canterbury.ac.nz

Interesting Objects in Orion and Taurus in February 2025

Jupiter, low in the north, is a beacon for the region. It appears soon after sunset and sets in the northwest after midnight. Any telescope will show the disk of Jupiter with its 'Galilean' moons lined up on each side. Not all four are seen every night as they pass in front of and behind Jupiter and into its shadow. Jupiter is 712 million km away mid-month. **Mars** is a bright orange-red 'star' toward the northeast. We passed Mars last month. It is now fading as we leave it behind. It is 114 million km away, mid-month, so tiny in a telescope.

Above Jupiter is the orange star **Aldebaran**. It makes one of the eyes of **Taurus** the Bull. The face of Taurus, upside down in our southern hemisphere view, is made by the V-shaped **Hyades** star cluster. It 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. Its orange colour is due to its temperature, around 3500° C. The sun is 5500° C.

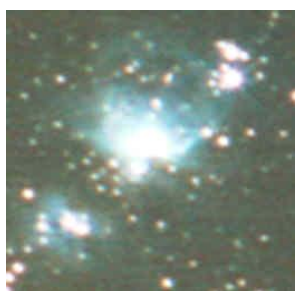
Left of Jupiter is the **Pleiades/Matariki** star cluster.



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.

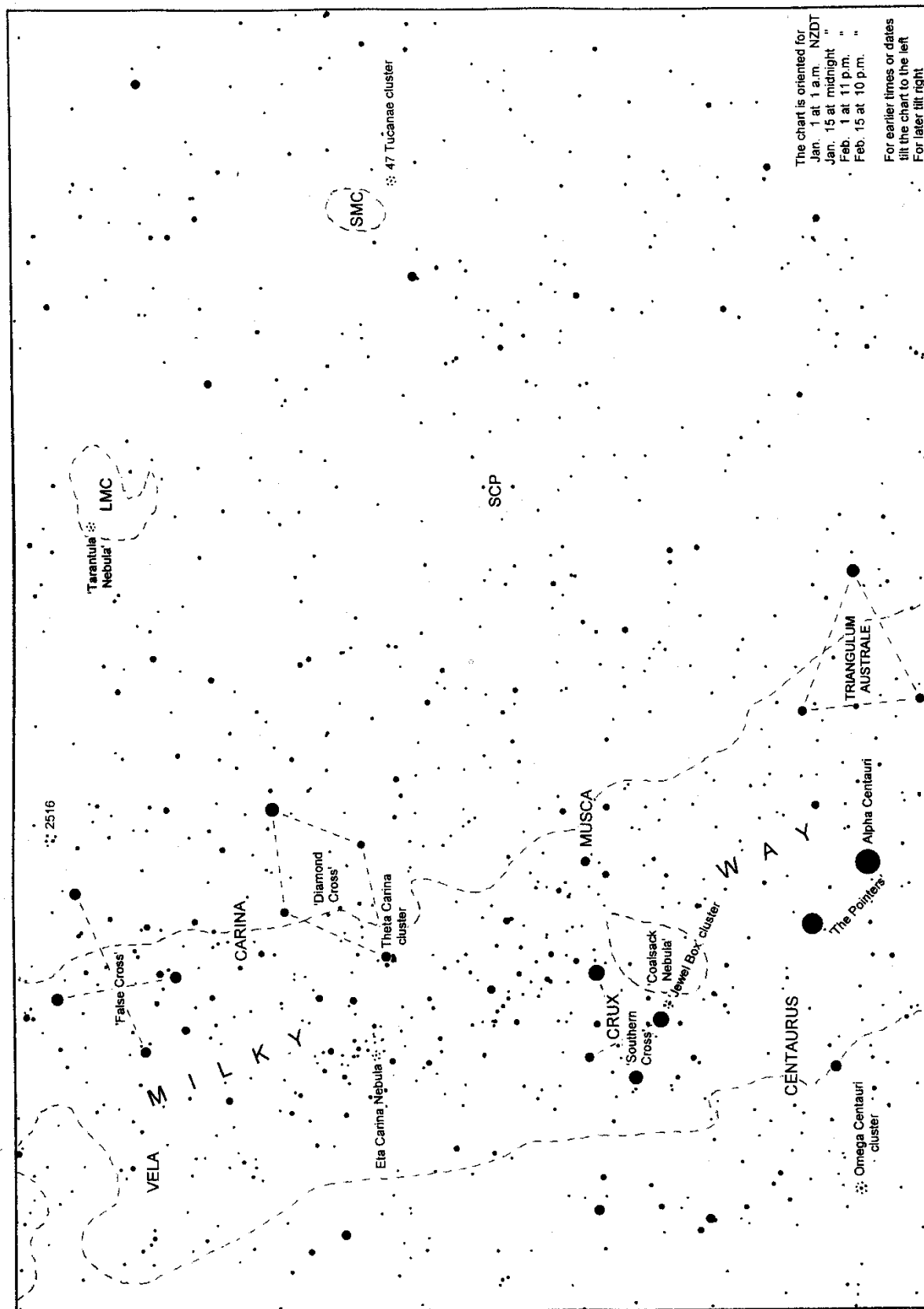
Above and right of Jupiter is another bright orange star, **Betelgeuse**. It marks the shoulder of **Orion** the hunter or warrior. Orion, in the northern hemisphere view, has a shield raised toward Taurus and a club ready for action. The line of three stars above Betelgeuse makes **Orion's Belt**. The 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. Above and left of The Pot is bluish **Rigel**.



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.

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.

North of overhead is **Sirius**, the brightest true star. It is fainter than planets Venus and Jupiter. It appears bright because it is both brighter than the sun, 22 times brighter, and a relatively close 8.6 l.y. away. Sirius was often called 'the dog star' because it is the brightest star in Canis Major, one of the two dogs that follow Orion across the sky. **Procyon** marks the head of the smaller dog.



The chart is oriented for
 Jan. 1 at 1 a.m. NZDT
 Jan. 15 at midnight "
 Feb. 1 at 11 p.m. "
 Feb. 15 at 10 p.m. "
 For earlier times or dates
 tilt the chart to the left
 For later tilt right

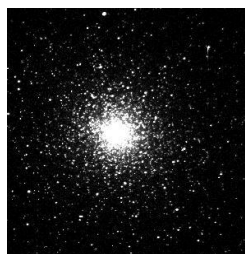
Southern Evening Sky in February

The chart shows the lower southern. 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 added by Alan Gilmore, University of Canterbury's Mt John Observatory
 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 much closer, 13 000 light years away, and is 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 the 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, high in the east, 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 about 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 appears 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.

NGC 2516 to the right of the 'False Cross', looks like a faint comet without a tail. It is a star cluster nicely seen in binoculars. It is 1200 light years away.