

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. "

### Evening sky in February 2018

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.

Sirius, the brightest star, appears north of overhead at dusk. Canopus, the second brightest star, is south of the zenith. Orion, containing 'The Pot', is midway up the north sky. Below and left of Orion are Taurus and 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 high in the south sky. Venus might be briefly seen setting soon after the Sun. The other bright planets are in the late night or morning sky. A total lunar eclipse occurs on the morning of February 1st.

## The Evening Sky in February 2018

In February bright stars are nearly overhead. **Sirius**, the brightest star, is north of the zenith. **Canopus**, the second brightest star, is south of the zenith. Below and left of Sirius are Orion's bright stars: bluish **Rigel** and reddish **Betelgeuse**. Between them is the line of three stars making Orion's Belt. The Belt line points left and down to orange **Aldebaran**, one eye of Taurus the Bull. Continuing the same line finds a tight bunch of fainter stars making the **Pleiades/Matariki** star cluster.

**Venus** might be briefly seen from places with a low western skyline. It sets 20 minutes after the Sun at the beginning of the month and 30 minutes after sunset at the end, a lone 'star' fading in the twilight.

**Sirius**, 'the Dog Star', marks the head of **Canis Major** the big dog. A group of stars above and right of it make the dog's hindquarters and tail. **Procyon**, in the northeast below Sirius, marks the smaller of the two dogs that follow Orion the hunter across the sky.

The stars of Orion's belt make the bottom of 'the pot' or 'the saucepan'. The handle of the pot is the faint line of stars above the bright three, Orion's sword. At its centre is the Orion Nebula: a glowing gas cloud many light-years across and 1300 light years away. Here new stars are forming.

The belt stars point to **Aldebaran**. It is at one tip of a V-shaped pattern of stars making the upside-down face of **Taurus**. 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, half the cluster's distance from us.

Low in the northwest is the **Pleiades** or **Matariki** star cluster, also known as the Seven Sisters and Subaru. Six stars are seen by most eyes. Dozens are visible in binoculars. The cluster is 440 light years from us. Its stars formed around 100 million years ago. From northern New Zealand the bright star **Capella** is on the north skyline. It is the sixth brightest star.

**Crux**, the Southern Cross, is 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, like most of the stars in Crux, is a blue-giant star hundreds of light years away. **Canopus** is also a very luminous distant star; 13 000 times brighter than the sun and 300 light years away.

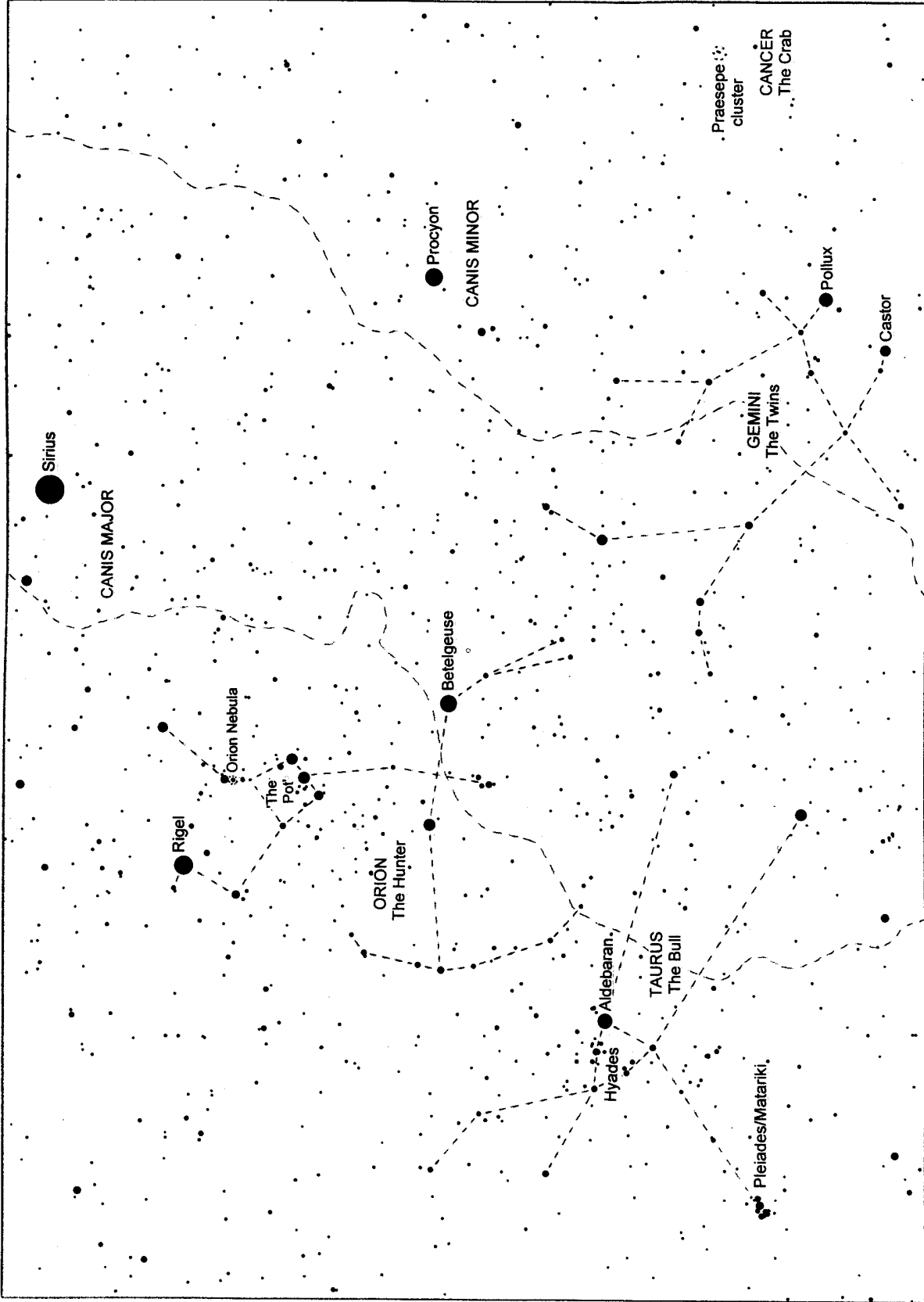
The **Milky Way** is brightest in the southeast toward Crux. It can be traced up the sky, fading where it is nearly overhead. It becomes very faint east or right of Orion. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the Sun is just one.

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, nearby for galaxies. The Large Cloud is about 5% the mass of the Milky Way galaxy; the Small Cloud about 3%.

A **total eclipse of the Moon** occurs the morning of February 1st. The Moon will be moving through the outer part of Earth's shadow till 12:48 a.m. when it begins to move into the darker part. By 1:52 it will be totally in the dark central part of the shadow, the umbra. It should be darkest around 2:30. It begins to exit the umbra at 3:08 and is fully out of it by 4:11. It leaves the outer part of the shadow at 5:08.

**Jupiter** is the brightest 'star' in the late night sky. It rises before 1 a.m. at the beginning of the month and 11 pm by the end. It is followed by **Mars**, much fainter and reddish coloured. At the beginning of the month Mars is level with Antares, to the right of Mars and the same colour and brightness. Mars slowly slips below Antares through the month. Cream-coloured **Saturn** follows Mars, rising around 3:30, at the beginning of the month, on a line with Jupiter and Mars. **Mercury** is the last up, rising an hour before the Sun at the beginning of the month. It fades into the dawn twilight by the second week of February. At dawn Jupiter, Mars and Saturn (and briefly Mercury) make a diagonal line down the eastern sky.

\*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.



### Northern Evening Sky in Summer

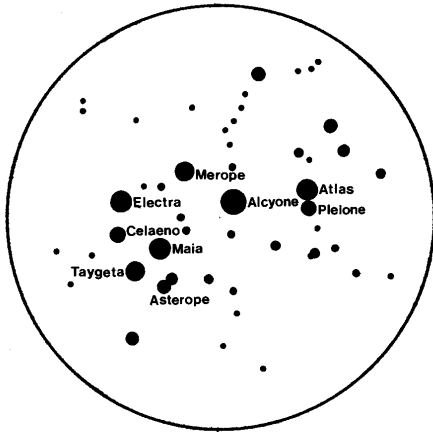
The chart shows our northern sky on summer evenings. It may need to be tilted to the left or right to match the sky, depending on the time of night. Interesting objects are described on the other side of this page.

Chart produced by Guide 8 software; [www.projectpluto.com](http://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](http://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**, making one eye of the bull. 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.

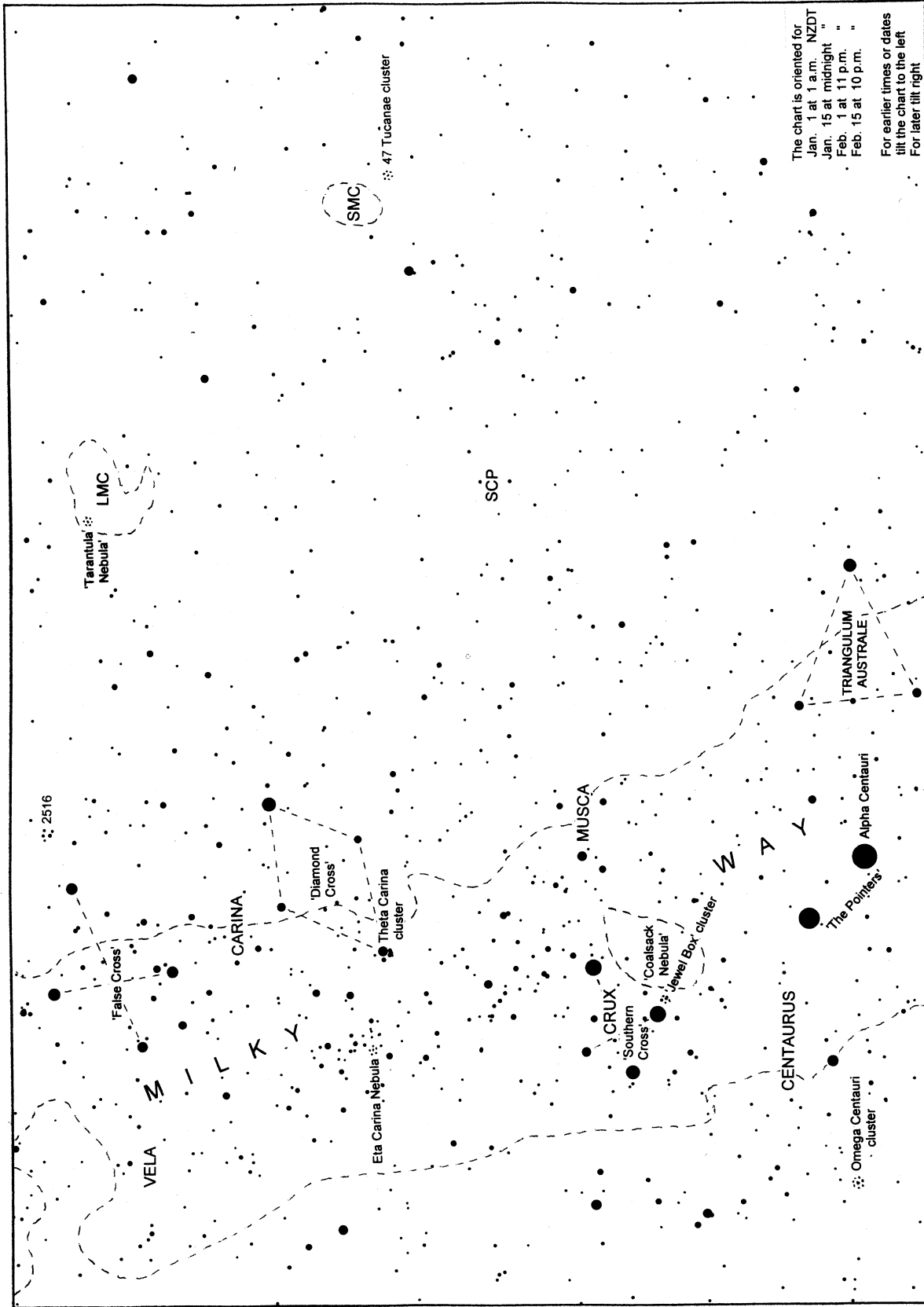


The **Orion Nebula** is visible in binoculars as a misty glow around the middle stars of Orion's Sword or the handle of The Pot. It is a vast cloud of dust and gas about 1300 l.y. away and more than 20 l.y. across. Ultra-violet light from a massive, extremely hot star in the cloud causes it to glow. Some stars in this region are around 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 -- 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.

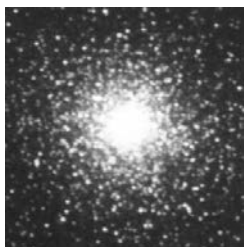


**Southern Evening Sky in February**  
 The chart shows the lower southern. Interesting star clusters and nebulae are indicated with asterisks. They are described on the other side of this page.

Chart produced by Guide 8 software: [www.projectpluto.com](http://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](http://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 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 near the SMC it has no connection, being 15 000 light years away. Globular clusters are mostly very old, 10 billion years or more; at least twice the age of the sun. **Omega Centauri**, in the southeast, is a bigger 'glob'; possibly the core of a small galaxy that had its outer stars stripped off as it merged with the Milky Way.



**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 and look bigger than the whole constellation of Orion.

**Canopus** is the second brightest star. It is 13 000 times brighter than the sun and 300 light years away. Sirius, north of Canopus on autumn 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. They presently appear close together; not easily split in most telescopes. (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 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.

**Theta Carinae cluster** is named after its brightest star. 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 10 million years old.