

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 2026

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.

Jupiter and Venus are the 'evening stars' appearing in the northwest soon after sunset. Jupiter sets early, so isn't on the chart. Venus is a brilliant object in the mid-evening sky, setting around 9 p.m. Sirius, the brightest true star, sets in the southwestern twilight, sparkling colourfully. Low in the north is orange Arcturus, often twinkling red and green. 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. Vega rises on the opposite horizon around 9 p.m.

The Night Sky in July 2026

At the beginning of July **Venus** and **Jupiter** are the 'evening stars', appearing in the northwest soon after sunset. Jupiter has a golden colour and is low in the sky (so not on the chart.) Venus is brilliant white, bright enough to cast shadows in dark locations. Jupiter sets earlier each night as we move to the far side of the Sun from it. By mid-month it is getting lost in the twilight, setting 50 minutes after the Sun.

Venus moves higher night-to-night as it catches up on us from the far side of the Sun. By the end of the month it is setting four hours after the Sun, a brilliant object in the dark sky. Venus is bright enough to see by eye in daylight, if you can focus on infinity. Around 3:30 pm it is due north, one-third to halfway up the sky, depending on your location. On the 17th Venus will be 6.5° to the right of the thin crescent Moon. On the 18th it will be a similar angle below and left of the Moon. 6.5° is 13 full-moon widths.

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 down to the southern skyline before midnight where it also twinkles colourfully. It then moves up into the southeast sky in the morning hours. It is a 'circumpolar star'. Seen from Aotearoa it never sets, except in the most northern places. Canopus is a truly bright star: 13 000 times the sun's brightness and 300 light-years* away.

South of the zenith are 'The Pointers', Beta and **Alpha Centauri**. They point to **Crux**, the Southern Cross, on their right. Alpha Centauri is the third brightest star in the sky. 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 hot blue-giant star hundreds of light-years away. Crux and the Pointers are also circumpolar. They are always somewhere in our southern sky. In summer they are upside down and low in the south.

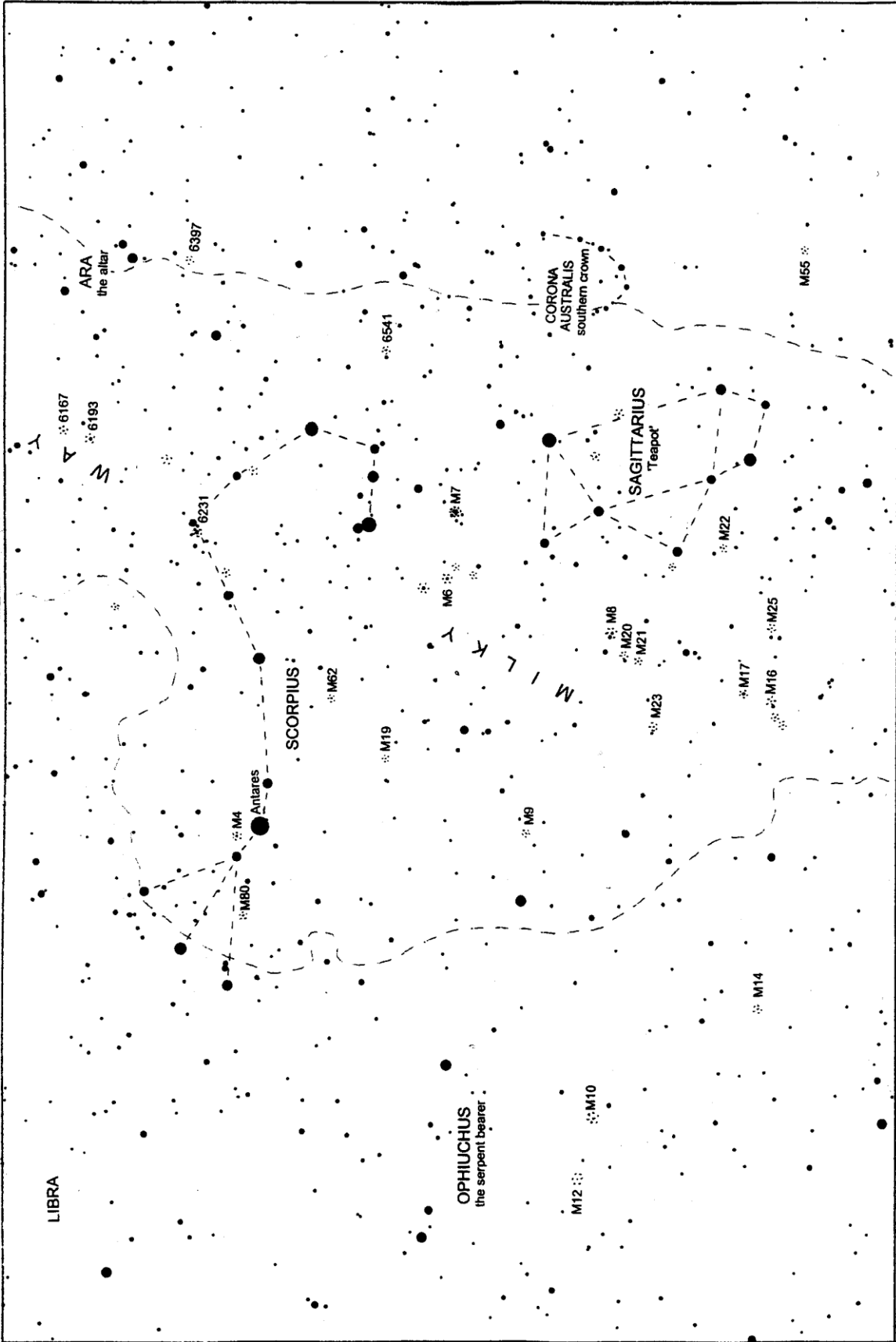
East of overhead is **Scorpius**. The orange-red star **Antares** marks the scorpion's body. Its tail and sting curl off to the right. Later in the night the tail curls around the zenith. The Moon will be near Antares on the 24th and 25th. The name Antares comes from ancient Greek meaning "rival to Mars". Ares was the Greek name for Mars. Mars has a similar colour and brightness to Antares, except when it is close to us.

Midway down the north sky is orange **Arcturus**. It sets in the northwest around midnight, twinkling red and green as it goes. It 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 has an orange colour because it is cooler than the Sun; around 4000°C. Above Arcturus is a lone bright star, **Spica**, the brightest star in Virgo. The Moon will be close to Spica on the 21st. **Vega** rises in the northeast around 9 pm. It is on the opposite side of the sky to Canopus: low in the north when Canopus is low in the south. Vega is the fifth-brightest star in the sky and the second-brightest northern hemisphere star. It is 52 times brighter than the Sun and 25 light-years away.

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.

Saturn rises due east around midnight. It is a lone cream-coloured 'star'. By dawn it is due north, halfway up the sky. Orange-red Mars is in the morning sky, rising before 5 a.m. At the beginning of July, it will be between orange Aldebaran and the Matariki/Pleiades star cluster. They move higher, leaving Mars behind. On the morning of the 4th the planet Uranus will be 21', two-thirds of a full moon's width, below Mars. On the 5th it will be 20' above and left of Mars. In a dark sky Uranus is just visible without a telescope. Unfortunately, moonlight will be bright on the above dates, hiding the faint planet. Both Mars and Uranus show tiny disks in a telescope with Uranus having a blue-green tint.

*A **light-year (l.y.)** is the distance that light travels in one year: nearly 10 million million 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 July

The chart shows the eastern sky at nightfall. The Milky Way is here bright and broad as we look toward the centre of the galaxy. Many star clusters and a few nebulae are seen, some obvious to the naked eye. Those visible in binoculars or small telescopes 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 East of Overhead on Winter Evenings

Antares is the brightest star in the region. It is orange coloured; being a 'red giant' star. (The 'red' of red giants is usually more an orange tint.) It is 600 light years* away, 19 000 times brighter than the sun, and big enough to fill Earth's orbit. Its mass or weight is about 20 times that of the sun, so most of the star is very thin gas spread around a hot dense core. Red giants are the last stage in the evolution of stars. The dense core of the star has shrunk and heated. The outer regions of the star have expanded to a very spread-out gas. The core is wringing the last of the thermo-nuclear energy out of elements like helium, carbon, oxygen and neon. In about two million years the core of Antares will run out of energy and collapse, triggering a spectacular supernova explosion. (The sun will become a red-giant in about seven billion years time but it ends up as a white dwarf star, not a supernova.)

Antares marks the heart of Scorpius. In the evening at this time of year the Scorpion is on its back with its tail on the right, curving upward then turning down and curling clockwise. The sting is the horizontal line of bright stars pointing toward Antares. In Maori star lore the tail's hook is the 'fish hook of Maui'. By midnight the scorpion's tail is directly overhead.

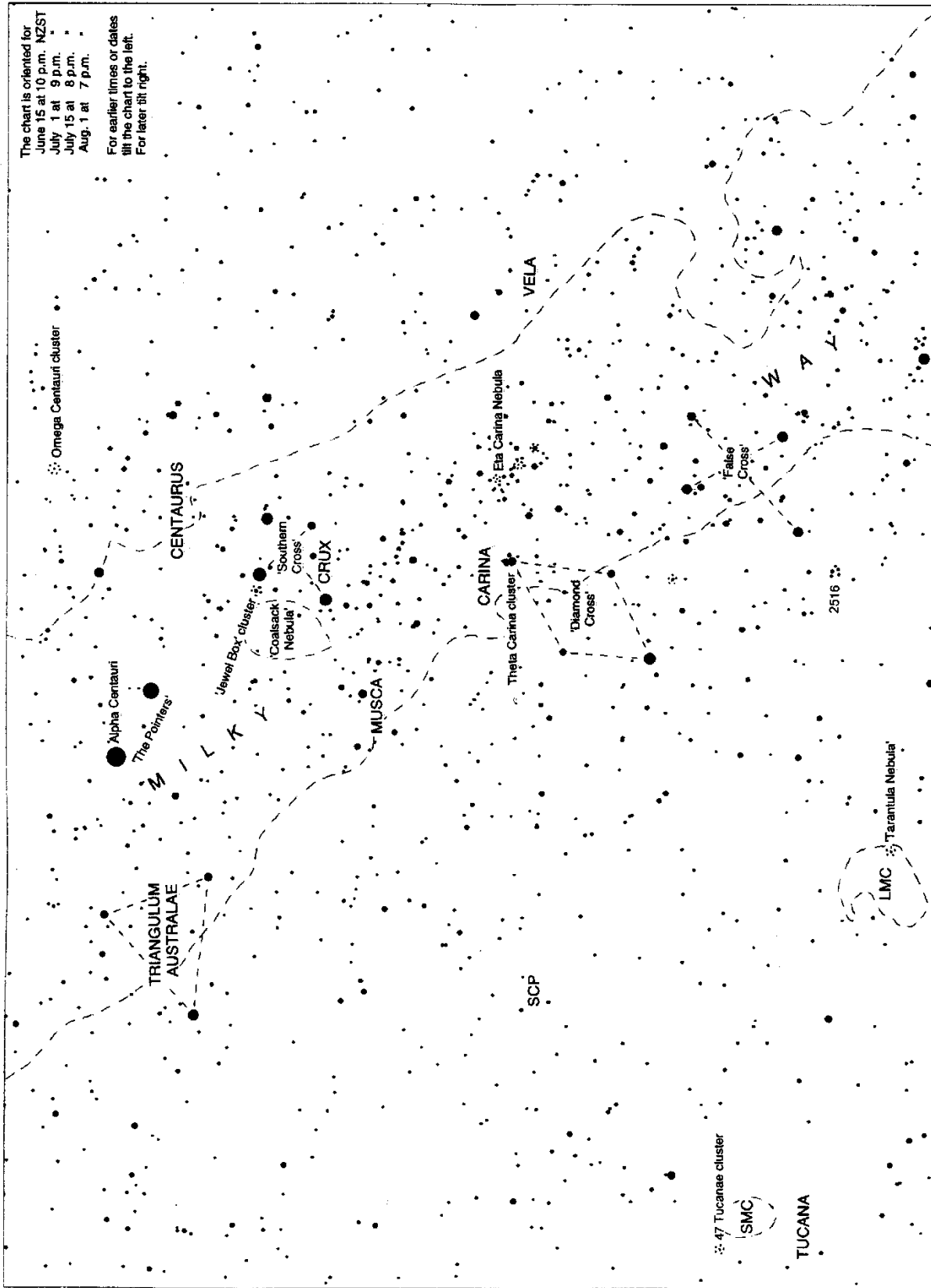
At the right-angle bend in the tail is a large and bright cluster of stars, NGC **6231**, looking like a small comet. It is around 6000 l.y. away. Its brightest stars are 60 000 times brighter than the sun. The cluster is about 8 light years across, similar in size to the Pleiades/Matariki cluster in our summer sky. Were it as close as the Pleiades (400 l.y.) then its brightest stars would be as bright as Sirius. Below the Scorpion's sting is **M7** a cluster obvious to the eye and nicely seen in binoculars. M7 is about 800 l.y. away and around 260 million years old. (The older a star cluster, the fewer bright stars it has.)

Below M7 and fainter is **M6**, the 'butterfly cluster'. M6 is around 1300 l.y. away and is half the age of M7. Other clusters worth a look in binoculars are **M21**, **M23**, NGC **6167**, and NGC **6193**. The 'M' objects were listed by the 18th Century French astronomer Charles Messier. He hunted comets, so made a catalogue of fuzzy objects that could be mistaken for comets. The NGC (New General Catalogue) objects shown are bright enough to have been seen by Messier but are too far south to be seen from Paris.

Left of the Sagittarius 'Teapot' is the glowing gas cloud **M8**, the 'Lagoon Nebula'. It is a star-forming region where gas and dust have recently gathered into new stars. ('Recently' = the past million years or so.) Ultraviolet light from one particularly hot star is lighting up the leftover gas, making it glow. On colour photos it appears pink due to hydrogen atoms fluorescing in the UV light. Below M8 is **M20**, the Trifid Nebula, small glowing patch in binoculars, also a pink hydrogen region in photos. Right alongside it is a blue reflection nebula where starlight is scattered by dust. Other nearby nebulae (gas and dust clouds) are **M16** and **M17**.

Globular clusters, spherical clusters of ancient stars, are found throughout the region. The brightest is **M4** by Antares. It is also one of the closest at 10 000 l.y. away. In binoculars and small telescopes 'globes' appear as round fuzzy spots. Others marked on the chart are **M9**, **M10**, **M12**, **M14**, **M19**, **M22**, **M55**, **M54**, **M62**, **M80** and NGC **6541**. The concentration of globular clusters in this area was an early clue that the centre of the galaxy lay in this direction.

This part of the Milky Way is broad and bright as we are looking to the centre of the galaxy. The actual centre, 27 000 light years away, is hidden from our view by intervening dust clouds. The nearer clouds make gaps and slots along the Milky Way. The hub of the galaxy is a great sphere of stars, called the 'central bulge'. Some of the central bulge is glimpsed in gaps between the dust clouds. At the very centre lies a black hole four million times the sun's mass but only the size of our solar system. Infra-red telescopes, peering through the dust, show stars orbiting the invisible black hole at high speed. By plotting the movements of these stars over the past two decades, astronomers have been able to deduce the mass of the central black hole and its distance. All big galaxies have a massive black hole at their centre.

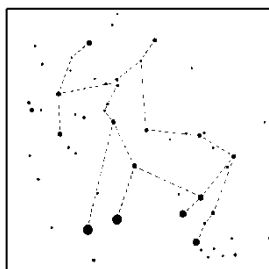


Southern Evening Sky in July

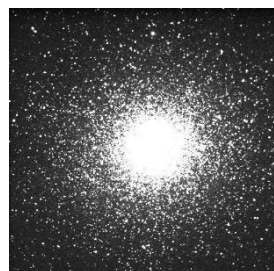
The chart shows the southern and southwest sky. Interesting star clusters and nebulae are indicated with asterisks. They are described on the other side of this page.

Chart produced by Guide 8 software; www.projectpluto.com. Labels 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 Winter Southern Sky



Centaurus, with the bright 'Pointers', and **Crux**, the Southern Cross are south of overhead, the tightest grouping of bright stars in the whole sky. Originally Crux was the hind legs of the Centaur, the horse-man of Greek mythology. The complete Centaur, with bow, is outlined at left. It was only in the 17th Century that Crux was split off as a separate constellation. The slow wobble of Earth's axis allowed this part of the sky to be seen from more northerly places in ancient times. The fainter Pointer and the three bluish-white stars of the Crux are all super-bright stars hundreds of light years away. Alpha Centauri is just 4.3 light years* away and the reddish top star of Crux is 90 light years from us.



Omega Centauri is a globular cluster, a ball-shaped cluster of millions of stars. Its total mass is six million times the sun's mass. It is 17 000 light years away and 200 light years across. Globular clusters are very ancient, around 10 billion years old, twice the age of the sun. Omega Centauri is the biggest of the hundred-odd globulars randomly orbiting our galaxy. It may originally have been the core of a small galaxy that collided with the Milky Way and was stripped of its outer stars. 47 Tucanae, near the SMC, is a similar but smaller cluster about 16 000 light years away.

Coalsack nebula, left of Crux, looks like a hole in the Milky Way. It is a cloud of dust and gas 600 light years away, dimming the distant stars in the Milky Way. Many 'dark nebulae' can be seen along the Milky Way, appearing as slots and holes. These clouds eventually form new stars.

The Jewel Box is a compact cluster of young bright stars about 7000 light years away. The cluster formed about 16 million years ago. To the eye it looks like a faint star close to the second-brightest star in Crux. A telescope is needed to see it well.



Eta Carinae nebula, a luminous spot in the Milky Way to the right of Crux and lower, is a glowing gas cloud about 8000 light years from us. The thin gas glows in the ultra-violet light of nearby hot young stars.

The golden star in the cloud, visible in binoculars, is Eta [Greek 'e'] Carinae. It is estimated to be to be 80 times heavier than the sun. It is four million times brighter than the sun but is dimmed by dust clouds around it. It is expected to explode as a supernova in the next few thousand years. Many star clusters are found in this part of the sky.

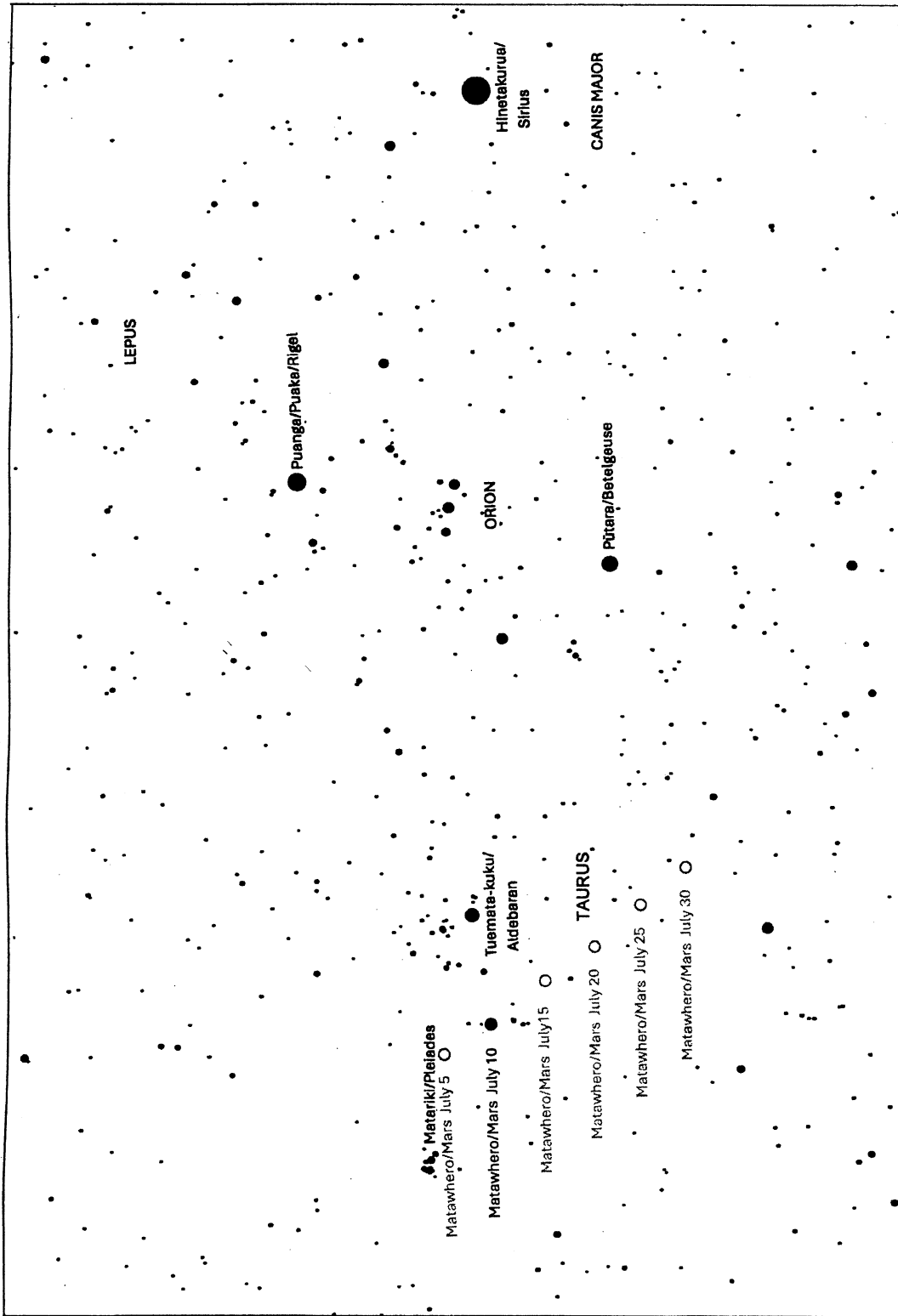
Large & Small Clouds of Magellan (LMC & SMC) appear as two luminous clouds, easily seen by eye in a dark sky. They are galaxies like the Milky Way but much smaller. Each is made of billions of stars. The LMC contains many clusters of young bright stars seen as spots of light in binoculars. The LMC is 160 000 l.y away; the SMC 200 000 l.y. Both are very close by for galaxies.



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 then it would be as bright as the full moon.

*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.



Eastern dawn sky in July 2026

The chart shows the eastern sky at dawn in July. Puanga/Puaka/Rigel is the first star to appear, rising around 4:30 a.m. It is followed by Hinetakurua/Sirius around 5:20, depending on your location. The Matariki/Pleiades star cluster rises before 5 a.m. in July but needs to be several degrees up before it is visible to the eye. Matawhero/Mars crosses the region in June and July. On July 5 it will be between Matariki and the orange star Tuemata-kuku/Aidebaran. Matawhero /Mars has the same orange-red colour as Tuemata-kuku/Aidebaran and is a bit fainter. To the right of them is a brighter orange star, Pūmara/Betelgeuse. Above Pūmara/Betelgeuse is the line of three stars, Tautoru, making Orion's belt or the bottom of The Pot.

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Eastern Dawn Sky in July 2026

This chart is intended for skywatchers who want to find the Matariki/Pleiades star cluster in the dawn sky.

The Matariki/Pleiades/Subaru cluster is quite faint. So even in a dark sky it has to be well above the horizon before it is visible. It is also easily hidden by twilight, bright moonlight and artificial light. The need for some elevation and not too much twilight means the cluster is hard to see till mid-June.

This year the Moon is a thin crescent on Matariki Day, July 10. It is beside the star cluster on the 11th. The orange-red planet Matawhero/Mars crosses the Matariki region in late June and July. On July 5 it will be between Matariki and Tuemata-kuku/Aldebaran. Mars has a similar colour to Tuemata-kuku/Aldebaran and is a bit fainter.

As the Earth moves around the Sun, the Sun appears to move against the background stars. We can't see the stars in the daytime, so the movement isn't obvious. What we see is the stars being a little further west each night. Because of the tilt of Earth's axis to its orbit the Sun's track is tilted on the sky. At this time of year the Sun is near its most northern position, our winter solstice.

The Matariki/Pleiades cluster is near the Sun's track, so it disappears into the western evening twilight in March as the Sun approaches it. It remains hidden through April and May as the Sun passes it by. It reappears in the eastern dawn sky as the Sun moves east of the cluster, or downward and away in our dawn-sky view. This happens everywhere in the world as the Sun's track is near the cluster.

Because the cluster reappears in mid to late June it makes a good marker for the southern winter solstice, our shortest day.

Alan Gilmore

7 June 2026