

## The visibility of Puaka/Rigel and the Matariki/Pleiades star cluster

— Alan Gilmore

The Earth circles the Sun through the year. This causes the Sun to appear to move a little east against the background stars each day. We take our time from the Sun, not from the stars, so we see the stars shifting a little west each day. This causes the stars to rise and set four minutes earlier each day. That is why we see different stars at different times of the year.

Most people know the pattern of the 'The Pot' or 'The Saucepan', Orion's belt and sword in European and Middle Eastern astronomy. The Pot is first seen in the evening sky in spring when it is rising in the east. By summer it is midway up our northern sky at dusk. (Puaka/Rigel, a bright bluish star, is then straight above The Pot.) In the autumn The Pot falls lower in the western sky. Around the beginning of June it can be seen both setting in the dusk and rising in the dawn. So it never completely disappears from our sky. The three bright stars of The Pot are on the equator of the sky.

Stars in the south stay in our sky all the time. The Southern Cross is nearly overhead on May and June evenings. In August and September it is on its side in the southwest. In November it is upside down low on the south skyline. In February–March it is on its other side in the southeast sky.

The Earth's axis is tilted to its orbit. That is why we have seasons. In our summer the southern hemisphere is tilted toward the Sun. In our winter, when the Earth is around the other side of the Sun, the southern hemisphere is tilted away from the Sun. Between the summer and winter the Earth's equator is pointed at the Sun. That's when we have the equinoxes: equal day and night.

The Earth's tilt causes the Sun's annual track through the stars to be tilted to the equator of the sky. In our summer the Sun hides star patterns of the southern sky around the Scorpion and Sagittarius. As the Sun moves on these constellations appear in the dawn sky. They are overhead in mid-winter.

The Matariki/Pleiades star cluster is in the north sky close to the Sun's track. So Matariki is hidden by the Sun from late April to mid-June as the Sun moves past that part of the sky.

The Sun's track is well north of, or below, Orion. So Puaka is never hidden by the Sun from our southern hemisphere viewpoint. At the end of May and for most of June Puaka can be seen both setting in the western sky at dusk and rising in the eastern sky at dawn.

Matariki, being a cluster of stars much fainter than Puaka, is not seen in bright twilight nor when it is near the horizon. It has to be higher in a darker sky to be seen. There are no reliable naked-eye sightings of Matariki before June 14.

### Approximate rise times for Puaka/Rigel, the Sun and Matariki at Dunedin (a.m. NZST)

Date	Puaka	Sun	Matariki
May 20	7:20	7:50	
May 25	7:00	7:55	
May 30	6:40	8:00	
June 4	6:21	8:05	7:14
June 9	6:01	8:08	6:55
June 14	5:41	8:11	6:35
June 19	5:22	8:13	6:15