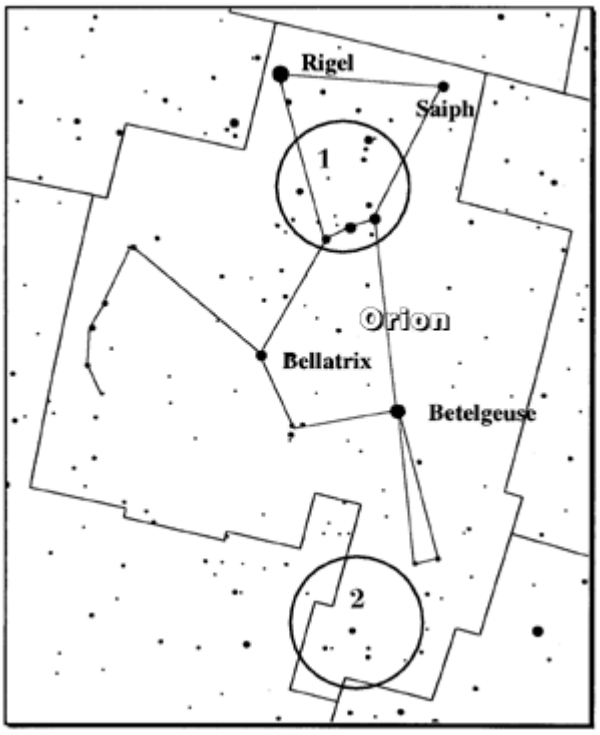
Sky Tour for Binoculars: Orion



Orion star map

Highlights of the tour:

- **a host of bright stars**
- **the *Great Nebula in Orion***
- **a Mira variable star**

The constellation of *Orion* is one of the most impressive sights in the night sky. From Melbourne it is best seen in the summer, when it dominates our northern skies. In ancient Greek mythology, Orion was a legendary hunter. To us in the southern hemisphere, he appears upside-down and is quite easy to recognise. The three bright stars in a line in the centre of the constellation represent his belt. Below these are two bright stars, **Betelgeuse** and **Bellatrix**, which mark his shoulders. Above the stars of the belt are two more bright stars, **Rigel** and **Saiph**, which are in his legs.

Rigel is the brightest star in this constellation, and shines with a brilliant white light. The next brightest is Betelgeuse, which has a reddish colour. Binoculars bring out the difference in colour very well. Betelgeuse is 310 light-years away. It is a red supergiant, large enough to swallow the Earth's orbit around the Sun. The brightness of this star varies a little, as the star itself swells and shrinks over a period of more than 5 years. At its brightest it is almost as bright as Rigel. Rigel is much further away, at over 900 light-years, but it is the brighter of the two because it gives off more light.

Stop 1

This group of stars within Orion is commonly known in Australia as the *Saucepan*. This should fit within your field of view, with the three stars in the belt of Orion at the bottom. Their names are (from left to right) **Mintika**, **Alnilam** and **Alnitak**, and they form the base of the saucepan. Above these are the stars of the sword of Orion, which marks the handle of the saucepan. In the middle of this group is an object which appears to be a fuzzy star to the unaided eye. It is actually the spectacular **Great Nebula in Orion**, or **M42**, and through binoculars it can be seen as a large glowing cloud, shaped like a fan. Stars can be seen in the nebula and at the centre is **Theta Orionis**, a group of four stars commonly called the *Trapezium*, though this can be difficult to see. M42 is over 1 000 light-years away and is relatively young, at around 30 000 years old. Stars are being formed in this nebula, and their heat cause the cloud to glow. M42 is actually just the brightest part of a much larger nebula which covers most of the constellation, but much of which we cannot see.

Stop 2

In the middle of this field is the variable star U Orionis. It is a Mira variable, a special type of variable star named after the star Mira in the constellation of Cetus. Mira variables are unstable, pulsating stars, either red giants or red supergiants, whose brightness varies considerably over time. The periods of these stars range from 80 to over 600 days. U Orionis has a period of 373 days, or just over a year. At its brightest it is an easy object to find in binoculars and has a strong reddish colour but at its faintest, it cannot be seen at all in binoculars.