

## THE ORION CONSTELLATION

### the Great Hunter

Orion constellation lies in the northern sky, on the celestial equator. It is one of the brightest and best known constellations in the night sky. Orion is also known as the Hunter: it is associated with one in mythology. **The constellation represents the mythical hunter Orion, who is often depicted in star maps as either facing the charge of Taurus, the bull, or chasing after the hare (constellation Lepus) with his two hunting dogs, represented by the nearby constellations Canis Major and Canis Minor.**

The constellation contains two of the ten brightest stars in the sky – Rigel (*Beta Orionis*) and Betelgeuse (*Alpha Orionis*) – a number of famous nebulae – the Orion Nebula, De Mairan's Nebula and the Horsehead Nebula, among others, and one of the most prominent asterisms in the night sky – Orion's Belt.

### FACTS

- Orion is the 26th constellation in size, occupying an area of 594 square degrees.
- It is located in the first quadrant of the northern hemisphere (NQ1) and can be seen at latitudes between  $+85^\circ$  and  $-75^\circ$ .
- The neighboring constellations are Eridanus, Gemini, Lepus, Monoceros and Taurus.
- Orion contains three Messier objects – M42, (NGC 1976) The Orion Nebula, M43, (NGC 1982) De Mairan's Nebula, and M78, (NGC 2068)
- It has seven stars with known planets.
- There are two meteor showers associated with Orion, the Orionids and the Chi Orionids. The Orionid meteor shower reaches its peak around October 21 every year
- Orion belongs to the Orion family of constellations, along with Canis Major, Canis Minor, Lepus and Monoceros

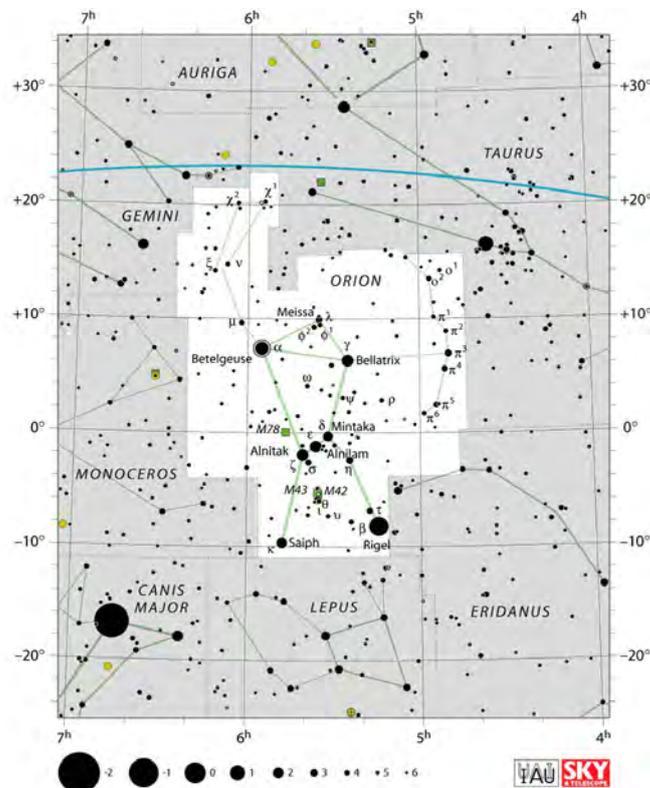
### MYTH

The constellation Orion has its origins in Sumerian mythology, specifically in the myth of Gilgamesh. Sumerians associated it with the story of their hero fighting the bull of heaven, represented by Taurus. Babylonians knew Orion as The Heavenly Shepherd.

In Greek mythology, the hunter Orion was the most handsome of men.

**He was the son of the sea god Poseidon and Euryale, the daughter of King Minos of Crete.** In Homer's *Odyssey*, Orion is described as exceptionally tall and armed with an unbreakable bronze club. Orion is often shown as facing the attack of a bull, yet there are no myths in Greek mythology telling any such tale. When describing the constellation, the Greek astronomer Ptolemy describes the hero with a club and lion's pelt, both of which are usually associated with Heracles, but there is no evidence in mythology books of a direct relation between the constellation and Heracles. However, since Heracles, the most famous of Greek heros, is represented by the much less conspicuous constellation Hercules, and since one of his tasks was to catch the Cretan bull, there are at least hints of a possible connection between the two.

In one myth, Orion fell in love with the Pleiades, the seven sisters, daughters of Atlas and Pleione. He started pursuing them and Zeus scooped them up and placed them in the sky in the constellation Taurus. **Orion can still be seen chasing the sisters across the sky at night.** Most myths about Orion's death involve a scorpion, but the stories differ from one mythographer to another. In one tale, Orion boasted to the goddess Artemis and her mother Leto that he could kill any beast on earth. The Earth Goddess heard him and



sent a scorpion, which stung the giant to death. In another story, he tried to force himself on Artemis and she was the one who sent the scorpion. In yet another account of his death, Orion was stung while trying to save Leto from the scorpion. All myths of Orion's death share the same outcome: Orion and the scorpion were placed on opposite sides of the sky, so that when the constellation Scorpius rises in the sky, Orion sets below the horizon in the west, fleeing from the scorpion.

Orion is a well-known constellation in many cultures. **In Australia, the stars forming Orion's Belt and sword are sometimes called the Pot or the Saucepan.** In South Africa, the three stars of Orion's Belt are known as Drie Konings (the three kings). In Spain and Latin America, the stars are called Las Tres Marías, or The Three Marys. Because pharaohs were believed to be transformed into Osiris after death, some of the greatest pyramids were built to mirror the pattern of the stars in the constellation. To make the transformation easier, the air shaft in the King's Chamber in the Great Pyramid was aligned with the star Alnitak, Zeta Orionis, the easternmost star in Orion's Belt.

#### MAJOR STARS IN ORION

1. Rigel (*Beta Orionis*) is the brightest star in the constellation. With an apparent visual magnitude of 0.18, it is also the sixth brightest star in the sky. Rigel is really a star system composed of three stars. It has been a known visual binary since 1831, possibly even earlier, when **F. G. Struve** first measured it. Rigel is surrounded by a shell of expelled gas. The name Rigel comes from an Arabic phrase meaning "the left foot" Rigel marks Orion's left foot. Rigel is a blue supergiant. It belongs to the spectral type B8Iab and is 772.51 light years distant. **It has 85,000 times the luminosity of the Sun and 17 solar masses.** It is classified as a slightly irregular variable star, with its luminosity varying from 0.03 to 0.3 magnitudes over 22 – 25 days. Rigel is only about 10 million years old. Eventually, it will grow into a red supergiant, one very similar to Betelgeuse.
2. Betelgeuse (*Alpha Orionis*) is the second brightest star in Orion and the eighth brightest star in the sky. It is a red supergiant, belonging to the spectral class M2Iab. The star has an apparent visual magnitude of 0.42 and is approximately 643 light years distant. Betelgeuse is one of the most luminous stars known. It has an absolute magnitude of -6.05. Recent findings suggest that the star emits more light than 100,000 Suns. Alpha Orionis is classified as a semi-regular variable star, which means that Betelgeuse occasionally outshines its bright neighbour Rigel. . The star's variation in brightness was first noted by **Sir John Herschel** in his *Outlines of Astronomy* in 1836. Betelgeuse is believed to be about 10 million years old. It will likely explode as a supernova in the next million years. When it does, the supernova will shine brighter than the full Moon.
  - a. The name Betelgeuse is derived from the Arabic name for the hand of Orion, which through a mistransliteration into medieval Latin became "the house of Orion" during the Renaissance.
3. Bellatrix (*Gamma Orionis*), sometimes also known as the Amazon Star, is the third brightest star in Orion and the 27th brightest star in the sky, only slightly dimmer than Castor in Gemini. Its name comes from the Latin word for "the female warrior." It has a mean apparent visual magnitude of 1.64 and is approximately 240 light years distant.
  - a. Bellatrix is a hot, luminous blue-white giant star, classified as an eruptive variable. Its magnitude varies between 1.59 and 1.64. The star belongs to the spectral class B2 III. It is one of the hotter stars visible to the naked eye. It emits about 6,400 times more light than the Sun and has eight or nine solar masses. Within a few million years, Bellatrix will become an orange giant and eventually a massive white dwarf.
4. Orion's Belt is one of the best known asterisms in the night sky. It is formed by three bright stars in the constellation Orion: Mintaka (*Delta Orionis*), Alnilam (*Epsilon Orionis*), and Alnitak (*Zeta Orionis*).



Orion's Belt stars and Flame Nebula,

**The Orion Nebula** (also known as Messier 42, or NGC 1976) is a diffuse nebula situated in the Milky Way south of Orion's Belt near the tip of the sword in the constellation of Orion. It is one of the brightest nebulae, and is visible to the naked eye in the night sky. M42 is located at a distance of 1,344 light years and is the closest region of massive star formation to Earth.

**The Orion Nebula is one of the most scrutinized and photographed objects in the night sky, and is among the most intensely studied celestial features.** The nebula has revealed much about the process of how stars and planetary systems are formed from collapsing clouds of gas and dust. Astronomers have directly observed protoplanetary disks, brown dwarfs, intense and turbulent motions of the gas, and the photo-ionizing effects of massive nearby stars in the nebula.

**The Horsehead Nebula** (also known as Barnard 33 ) is a dark nebula in the constellation Orion. The nebula is located just to the south of the star Alnitak, which is farthest east on Orion's Belt, and is part of the much larger Orion Molecular Cloud Complex. It is also part of nebula IC 434, a bright emission nebula in the constellation Orion. IC434 was discovered on February 1, 1786 by **William Herschel**. The Horsehead Nebula is a dark nebula silhouetted against it. It was first recorded in 1888 by Scottish astronomer **Williamina Fleming** on photographic plate B2312 taken at the Harvard College Observatory. The Horsehead Nebula is approximately 1500 light years from Earth. It is one of the most identifiable nebulae because of the shape of its swirling cloud of dark dust and gases, which bears some resemblance to a horse's head when viewed from Earth. Today the Horsehead Nebula is one of the most photographed stellar nurseries in the night sky. The nebula formed from a collapse of an interstellar cloud of material and appears dark mainly because of the thick dust in the neighbouring area, with the bright spots at the base marking hidden protostars, newly formed or forming young stars. It can contain more than a hundred known gases, both organic and inorganic, and also complex, large organic molecules of dust.

The swirling clouds of gas and dark dust are lit by a pinkish glow of hydrogen gas located behind the nebula and ionized by the nearby bright star *Sigma Orionis*, a five-star system illuminating the entire region.

The brighter star visible in this area of the sky in images is *Zeta Orionis*, but it is located in the foreground and not related to the Horsehead Nebula. The jutting pillar that forms the Horsehead has a high density of helium and hydrogen, which makes it hard to erode. While the gas clouds that surrounded the nebula have already dissipated, it will be another five million years before the pillar dissipates too.

AK from Wikipedia



M42 is estimated to be 24 light years across. It has a mass of about 2000 times the mass of the Sun. Older texts frequently refer to the Orion Nebula as the Great Orion Nebula.



This spectacular visible light wide-field view of part of the famous belt of the great celestial hunter Orion shows the region of the sky around Alnitak and the Flame Nebula. The whole image is filled with glowing gas clouds illuminated by hot blue young stars

