



Betelgeuse
M2 Ib, 640 ly

Bellatrix
B2 III, 240 ly

Mintaka
O9 II, 900 ly

Alnilam
B0 Ia, 1350 ly

Alnitak
O9 Ib, 800 ly

Rigel
B8 Ia, 850 ly

Saiph
B0 Ia, 650 ly

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Alkaid
B3 V, 100 ly

Mizar
A2 V, 86 ly

Alioth
A1 III, 81 ly

Megrez
A3 V, 60 ly

Phecda
A0 V, 84 ly

Merak
A1 IV, 80 ly

Dubhe
K0 III, 120 ly

Image taken by Rogelio Bernal Andreo:
http://deepskycolors.com/astro/JPEG/RBA_Orion_HeadToToes.jpg

Orion

Orion is a good example of stars that are very distant from each other but still form a constellation. Look at the belt. Notice that Alnilam (the middle star in the belt) is about 600 light years farther away from Earth than Alnitak, even though Alnitak and Alnilam appear to be right next to each other.

All of Orion's main stars are giants, or supergiants. The smallest star, **Bellatrix**, is still a B2 III (the III means it's a giant), and it's about 8 times the mass of the Sun, and 6 times the radius of the Sun. **Betelgeuse** has the largest diameter of the stars in Orion, and its radius is about 900 times the radius of the Sun. If you took Betelgeuse and placed it where our Sun is, its surface would envelop Mercury, Venus, Earth, Mars, and much of the Asteroid Belt. Accounting for the margin of error with Betelgeuse's size, its surface might even extend past Jupiter's orbit.

M42: The Orion Nebula, M42, is directly below Alnilam. It is a stellar nursery where brand new baby stars are being formed.

The Big Dipper

What's different about this constellation/asterism?

1) Notice that most of the stars in the Big Dipper are about the same distance from Earth. With the exception of Alkaid and Dubhe, these stars lie within about 20 light years of *each other* (from 60-86 light years away from Earth). Mizar, Alioth, Phecda, and Merak are particularly close to each other. These stars are in the Ursa Major Moving Group, or "UMa Group".

2) Notice too that Mizar, Alioth, Megrez, Phecda, and Merak are all A-type stars which means they are about the same temperature, luminosity, and color as each other. What's going on here?

Unlike most other constellations, many of the core stars of the Big Dipper formed with each other and are still near each other. They are truly sister stars, similar to the Pleiades but they've had more time to get away from each other.

Notable stars:

- Mizar is actually a double star system: Mizar and Alcor. Through a telescope, it is easy to see the star system. It turns out that Mizar is actually a quadruple system (4 stars) and Alcor is a double system itself (2 stars) and those systems go around each other, in a 6-star system. While you cannot see all 6 stars in a backyard telescope, they have been discovered using powerful telescopes. No planets have been discovered in this system, but try to get attendees to think about what it would be like to live on a planet with 6 suns. Would there ever be night? Or would the suns all set at roughly the same time, as depicted on Luke Skywalker's fictional home world of Tatooine (which clearly has 2 suns)?

- Merak and Dubhe can be used to find the North Star, Polaris. Just draw a straight line through Merak and Dubhe and follow it up (in the direction of Dubhe) until you hit the North Star.

Constellation: The Big Dipper has been seen as its own constellation in many cultures, sometimes as a plow, a cart, or a spoon.