

The Backyard Astronomer for Kids

The Rise and Fall of Betelgeuse

Stars seem to stay in the same place in the sky, except for the movement of the Earth spinning around its axis or orbiting around the Sun. Especially when we look deep into space, we see stars, nebulae, and galaxies that don't seem to move at all during our lifetimes. Thousands of years ago, ancient civilizations like the Greeks saw the same stars and constellations that we see today.

One constellation that has been seen by humans for a very long time is Orion. You can see it in the winter sky, just after dark each evening, if you look East above the hills and trees. Two very bright stars in Orion mark his armpit and foot. The foot is Rigel and looks blue-white, while Betelgeuse is his armpit, and looks orange. In between them is three stars in a row, and this is Orion's Belt.



Orion constellation explained. Courtesy Nielander, Wikimedia Commons

Recently, astronomers noticed something odd with Betelgeuse. Usually the 10th brightest star in the night sky, by the end of December it had dimmed to 23rd brightest.

For stars that don't change much over thousands, millions, or billions



Betelgeuse's location is indicated by the arrow. Courtesy Nasa's Jet Propulsion Lab.

of years, this could be a big deal. Or, it could be something normal during this star's life, and we just haven't been around long enough to realize it.

Betelgeuse (usually pronounced like "Beetle-Juice") is a "pulsating semi-regular variable star." A mouthful to say, this designation means that it is always changing, sometimes getting bigger and brighter, and sometimes getting smaller and dimmer. This change usually happens between 1 and 6 years. But right now, Betelgeuse is dimmer than we have ever seen it. But why?

Betelgeuse is a huge star! If you put Betelgeuse where our sun is, it would eat Mercury, Venus, Earth, and Mars. When a star is big like this, it is hungry.

Stars eat Hydrogen and Helium to keep them burning bright. But the weight of all that hydrogen and helium creates lots of gravity, which pushes in on the star. So, the star is always changing as it burps out heat and light while being squeezed by gravity. This makes the star grow and shrink, and also makes it get

brighter and dimmer.

Eventually, when the star runs out of food, it gets squeezed so tightly that it explodes in what is called a supernova. This explosion also leaves clouds of gas and dust in space, which we see in colorful pictures. We call this a nebula.



Nebula image of M8 Lagoon Nebula. Courtesy Joel Cohen, Prescott Valley.

Betelgeuse is very, VERY far away. If you could travel at the speed of light, it would take you 700 years to get there. That also means that the light from Betelgeuse takes 700 years to get back to our eyes here on Earth.

This means it is possible that Betelgeuse already exploded, and we will soon see the supernova and eventually the nebula it creates. But it is also possible that Betelgeuse just ate a big Thanksgiving dinner of helium and is taking a nap, before it wakes up and eats some more.

Even if it does explode, we don't have to worry here on Earth. We're far enough away that it won't affect us. It will just be something pretty to look at in the night time sky.

Adam England sells insurance and does taxes. BORING! So, he also likes to look at the sky with his friends and family. If you want to learn more about astronomy, visit the Prescott Astronomy Club page on Facebook for our next fun and free event.