

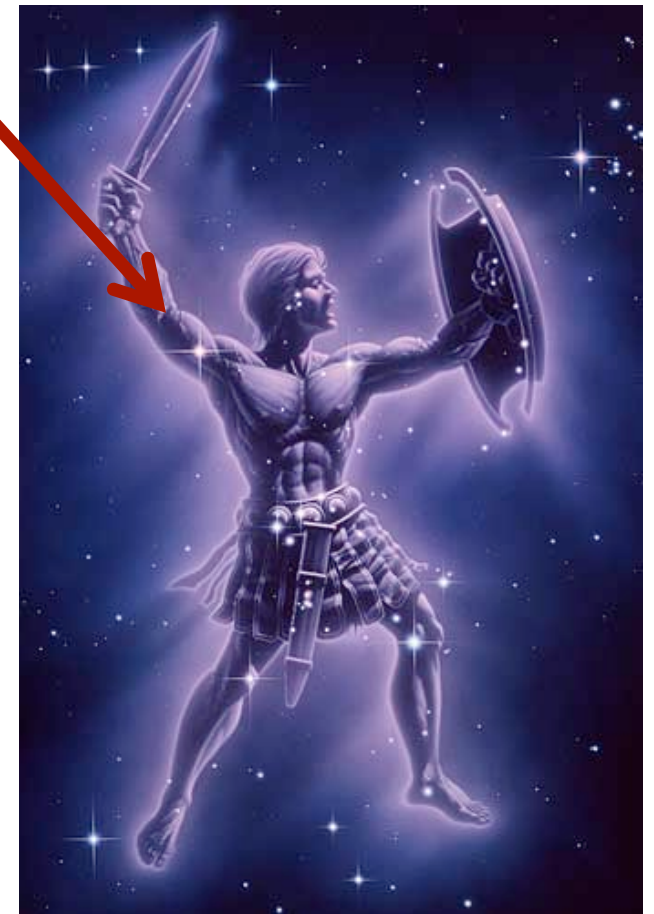
**Right Ascension:** 05 55 10.3  
**Declination:** +07 24 25  
**Apparent Magnitude:** 0.50(var.)  
**Absolute Magnitude:** -7.2  
**Distance:** ~1400 LY  
**Spectral Type:** M1-2Ia-Iab

# Betelgeuse

By: Sera Rives

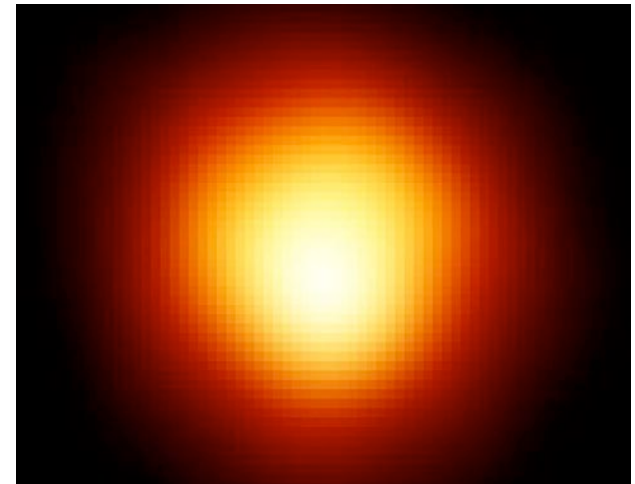
# Basic Facts

- Red supergiant star
- Right shoulder of Orion constellation
- derived from the Arabic word *bat al-dshauzâ*, which means “the giant’s shoulder.” or “armpit”
- 8.5 million yrs old (Sun is 4.6 billion yrs old)
- 600 light years away
- 1000 times bigger than the Sun



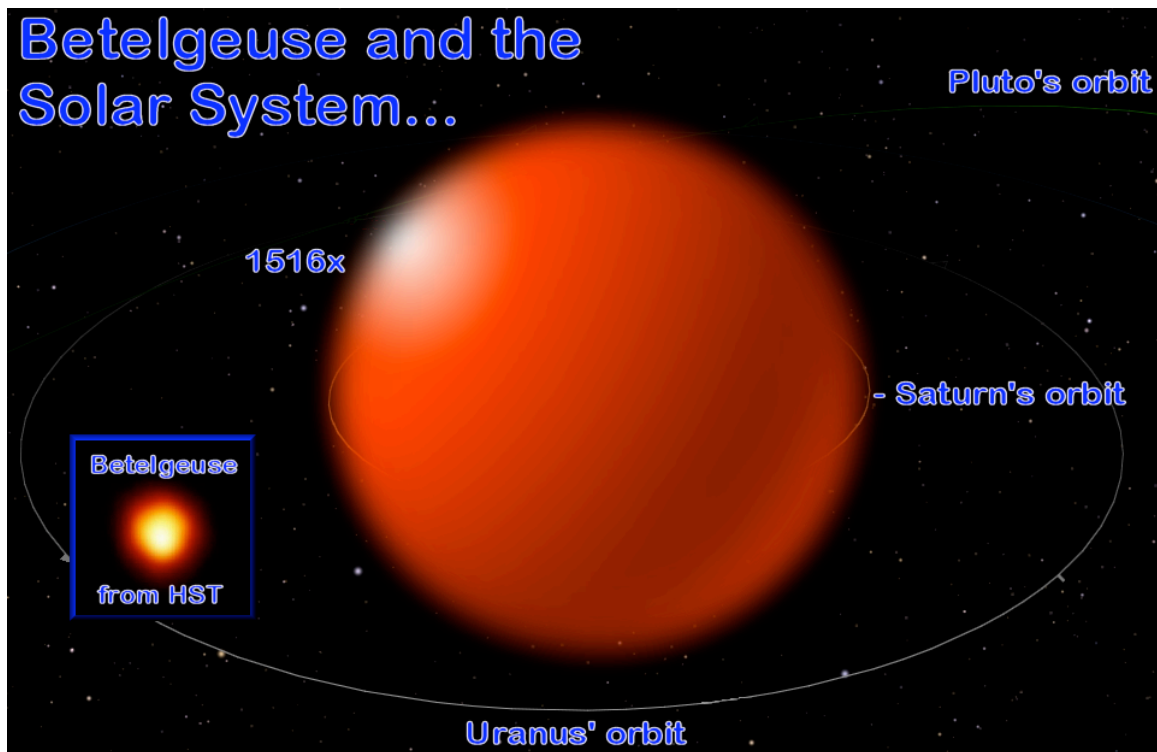
# Basic Facts Continued

- One of 10 brightest stars in the sky
- Only star visible through Hubble that is more than a point of light
- Betelgeuse shines 135,000 brighter than the sun
- Hard to measure its diameter because:
  1. Photosphere has no edge
  2. Gas making up Photosphere gets gradually thinner with distance from star
  3. Strong winds eject dust, making it hard to see its actual surface



# What if?

- If Betelgeuse replaced our Sun in our solar system, it would extend past Jupiter's orbit



# Help Me! I'm shrinking

- Betelgeuse has shrunk 15% in the last 15 years; this would be equal to Venus's orbit.



# How do we know this?

- Charles Townes, a UC Berkeley professor explains it best.

"We observe around 11 microns, the mid-infrared, where this long wavelength penetrates the dust and the narrow bandwidth avoids any spectral lines, and so we see the star relatively undistorted," said Townes. "We have also had the good fortune to have an instrument that has operated in a very similar manner for some 15 years, providing a long and consistent series of measurements that no one else has. The first measurements showed a size quite close to [original 1921 measurements], but over 15 years, it has decreased in size about 15 percent, changing smoothly, but faster as the years progressed."



# Why is this important?

- Scientists are confused about Betelgeuse's apparent shrinking because:
  1. Betelgeuse is a variable star but
  2. Only Mira variables are known to expand and contract significantly every couple yrs.
  3. Betelgeuse's pulses don't match anywhere near Miras
  4. Its brightness has not gotten any dimmer
  5. Scientists do not know what will happen to Betelgeuse in the future

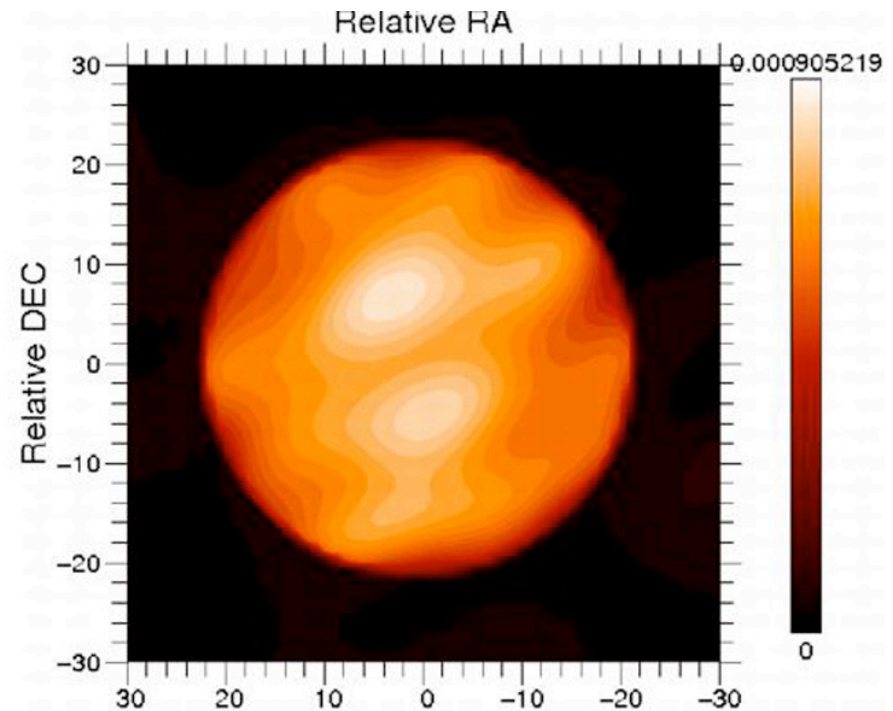


# Two new spots

- Two new spots have been identified on Betelgeuse
- These may be because the star is shrinking and the surface temperatures are rapidly changing

Or

- It may be the star's two poles



The bright spots are equal to  
the Earth-Sun distance

# Getting Old



- Red supergiants live violent, short lives
- Betelgeuse *MIGHT* be collapsing into a white dwarf or neutron star
- Its explosion into a supernova would be so bright; it would be visible even in daylight
- This is expected in the next 1000 years or so, though Betelgeuse's actual fate is still a mystery

# Betelgeuse in the News

- Betelgeuse is very popular. Starring in many stories and movies, including:
- *Planet of the Apes* – the planet revolves around Betelgeuse
- *From a Chageling Star* by Jeffrey Carver, Betelgeuse is alive and calls itself "Bright"; it is on the verge of becoming a supernova in the novel.
- Beetlejuice the movie by Tim Burton – main character is Betelgeuse (spelling on gravestone)



The ghost – ah star – with  
the most



[http://www.youtube.com/watch?v=luhLtH\\_Jg1U](http://www.youtube.com/watch?v=luhLtH_Jg1U)