

## Ch 25.1 Properties of Stars

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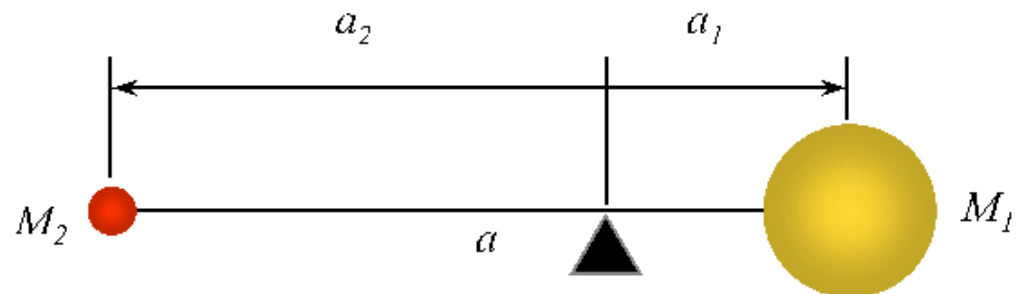
- From our perspective on Earth, we see stars in the night sky that appears to make up a pattern.
- Truth is, these stars are at different distance from the Earth and these patterns are given name of mythological characters.
- These patterns are called **constellations**.

### Characteristics of Stars

- **Star Color and Temperature** – the color of a star is a clue to a star's temperature. Red stars are cooler and emit a longer-wavelength.
- **Binary Stars and Stellar Mass** – Pair of stars pulled toward each other by gravity. Their mass can be calculated if it is attached by gravity to a partner.



**Constellation Orion**



## Measuring Distance to Stars

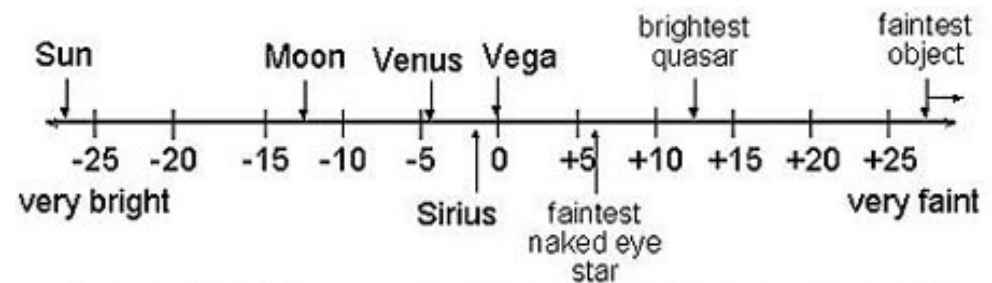
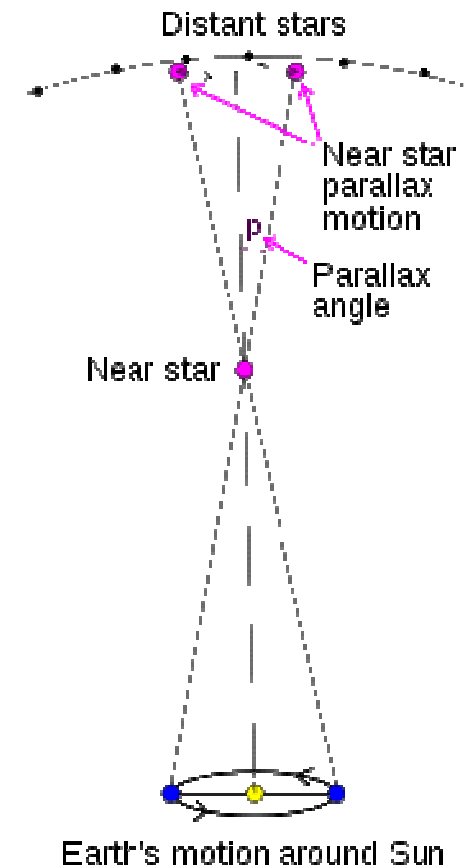
- **Parallax** – a slight shifting in the apparent position of a nearby star due to the orbital motion of Earth.
- The nearest stars have the largest parallax angles, while those of distance stars are too small to measure.

## Light Year

- Distance to stars measured by the distance light travels in one year.

## Stellar Brightness

- **Apparent magnitude** – a star's brightness as it appears from Earth.
- Three factors control apparent brightness:
  1. How big it is.
  2. How hot it is.
  3. How far away it is.



Apparent brightnesses of some objects in the magnitude system.

- **Absolute Magnitude** – is how bright a star actually is based on their distance from Earth.

Name	Distance (light year)	Apparent Magnitude	Absolute Magnitude
Sun	N/A	-26.7	5.0
Alpha Centauri	4.27	0.0	4.4
Sirius	8.70	-1.4	1.5
Arcturus	36	-0.1	-0.3
Betelgeuse	520	0.8	-5.5
Deneb	1600	1.3	-6.9

- The more negative, the brighter; the more positive, the dimmer.
- **Hertzsprung-Russell Diagram** shows the relationship between the absolute magnitude and temperature of stars.
- **H-R diagram** show stars are not uniformly distributed.
- 90% are **main-sequence stars** that fall along a band that runs from the upper-left corner to the lower-right corner.

