Earth Science

With

Mr. Thomas

Stars cont.

Characteristics:

- Early Observations:
  - Constellations: Groups of stars that depict an object, often used for navigation.
  - Examples include the Big & Small Dippers, Orion, and Pegasus.
  - The positions of the constellations change with the seasons.

Stars cont.

- Apparent Magnitude:
  - A measure of how bright a star appears to an observer on earth. (The lower the magnitude number, the brighter the star!)
- Distance:
  - Since things in space are so far apart, to measure in km's would result in astronomically sized #'s! So we use:

Astronomical Units (AU)

Stars cont.

- One astronomical Unit is equal to the distance from Earth to the Sun:

1 AU = 150 million km

- The nearest star (Proxima Centauri) is about 260,000 AU away (or 40 trillion km), so even with astronomical units, the numbers are getting really big, so we can use:

Light Years

Stars cont.

- One light year is the distance that light travels in one year.
- Since light travels at a speed of

- This distance is

300,000 km/s

9.5 trillion km

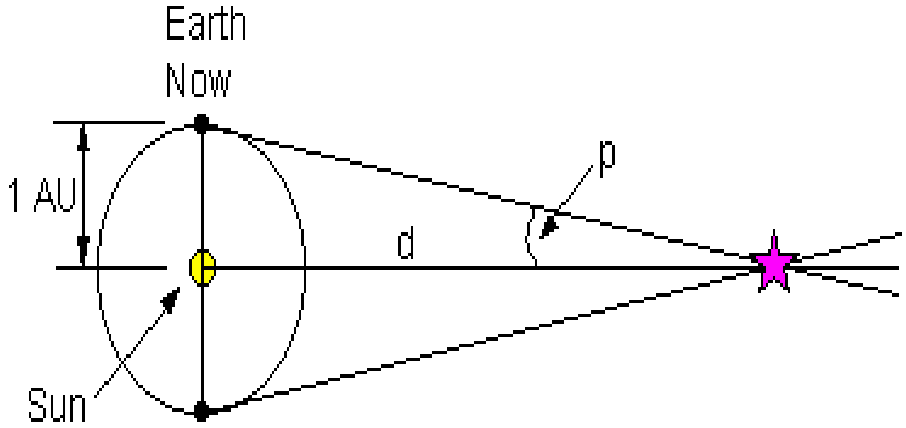
Stars cont.

- Proxima Centauri is about 4.2 light years away, or in other words, light takes 4.2 years to travel from that star to Earth!
- So if a star is 75,000 light years away, it took that light 75,000 years to reach Earth, so the light we see is

75,000 years old!!

Stars cont.

- Parallax:
  - A change in an object's direction or location due to a change in the observer's position.



p = parallax (angle)
d = distance

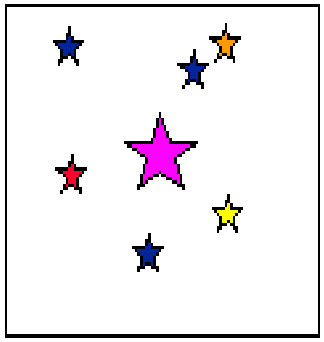


Photo taken now

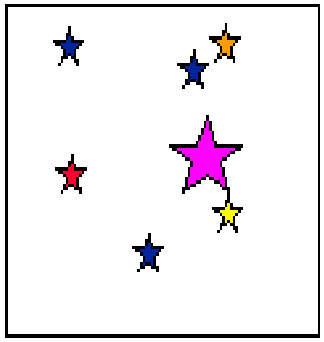


Photo taken 6 months later

Stars cont.

- Star Elements:
- The most abundant elements in stars are hydrogen and helium.
- Temperature, color, and luminosity are given in the ESRT's pg. 15.
- Luminosity is the actual brightness of a star as compared to our sun and is only dependant upon size and temperature.

Stars cont.

- Absolute Magnitude:
  - A measure of how bright a star would be if all stars were the same distance from the Earth.

Life Cycle of Stars:

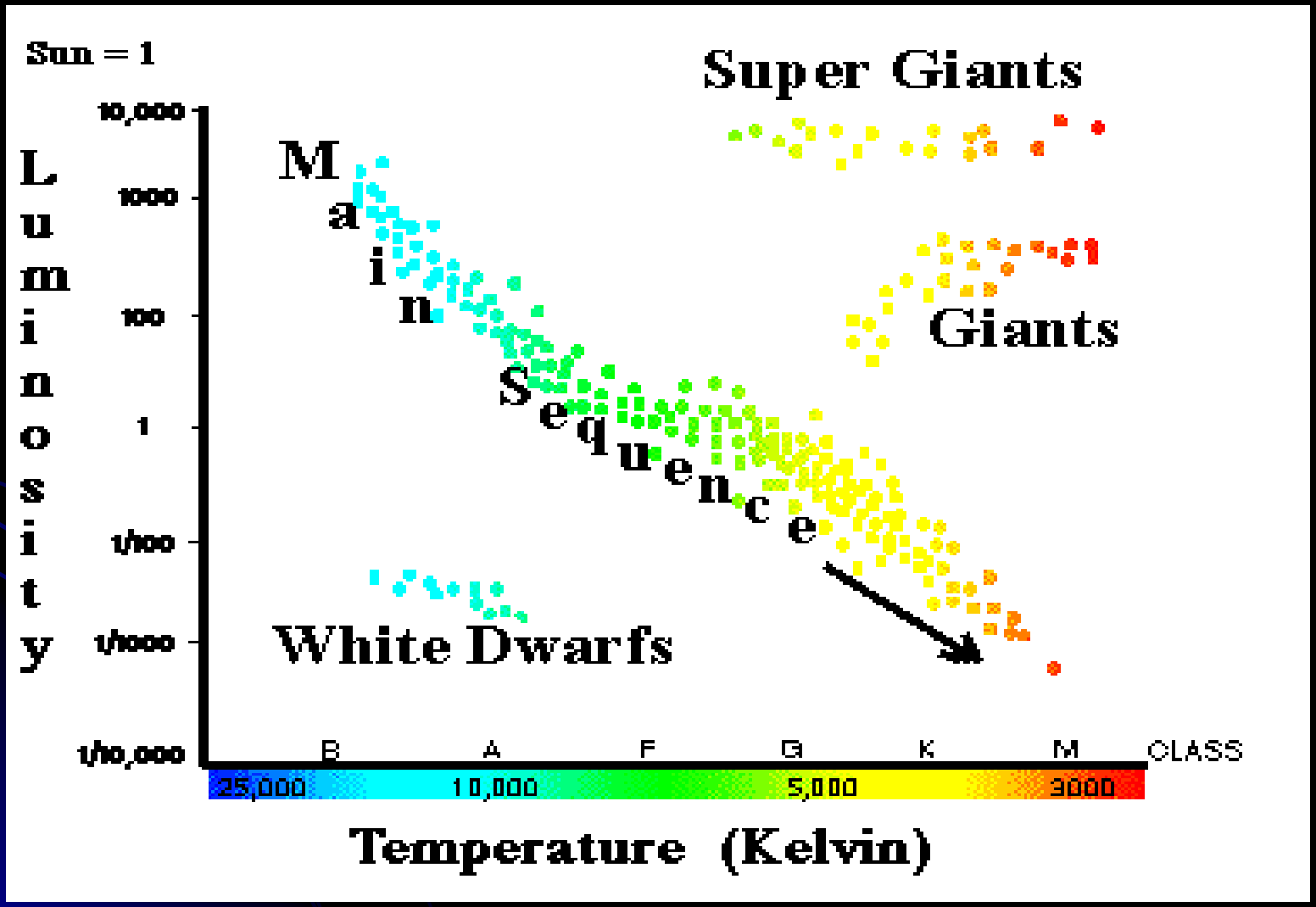
- The stars in our universe are at different stages in their life cycles.
- These stages are outlined with distinct groups in the

Hertzsprung-Russell Diagram

or

H-R Diagram

The H-R Diagram



Life Cycle of Stars:

- Beginning:
- Nebula – Gas cloud
- 2nd Step:
- A) Star like our sun
- B) Red Supergiant

Life Cycle of Stars:

- End Result:
- A) Black Hole
- B) Neutron Star

Galaxies

- Defn.: Systems containing millions or billions of stars and orbiting planets.
- Types of Galaxies:

Spiral **Irregular** **Elliptical**

Origin of the Universe

- Big Bang Theory:

The entire universe was created after a large explosion.

- Evidence:

1) Expanding Universe (Red Shift)
2) Cosmic Background Radiation

That's it