19. Life Cycle of Stars

- The Earth is located in milky way galaxy which is composed of many stars grouped in spiral form.
- Stars are gigantic spheres of hot gases.
- The Sun appears large to us because it is very near to the Earth.
- Mass of the Sun, say M_{sun}, is used as unit of mass for other stars.
- Masses of other stars lie in the range:
  Msun10≤Mass of a star≤100Msun
- The time elapsed after the formation of a star defines its age.
- The properties of the Sun is said to change after 4.5 billion years.
- The spaces between the stars present in a galaxy are occupied by huge clouds of gas and dust, known as interstellar clouds.
- Diatance travelled by the light in one year is known is known as light year.

1 light year = 9.5×10^{12} km

- Speed of light = 3×108 m/s
- Stars are stable when the gas pressures exerted by the particles present in it are able to balance the gravitational force between the particles.
- Gas pressure is directly proportional to its temperature and density.
- Evolution of a star refers to a process in which a star passing through its different stages goes through various changes in its properties.
- The burning and therefore the decrease in the amount of fuel is the reason for the evolution in the stars.
- **Factors dependent on mass of a star**
  - Number of fuel consumed by a star is directly proportional to its mass
  - Rate of evolution of star depends on the its mass
  - Path of evolution depends on the its mass
- Stars are divided into 3 groups based on their initial mass.
  - End stages of stars having initial mass less than 8 times the mass of the Sun ($M_{star} < M_{Sun}$)
  - End stages of stars having initial mass between 8 and 25 times the mass of the Sun ($8M_{Sun} < M_{star} < 25M_{Sun}$)
  - End stages of stars having initial mass larger than 25 times the mass of the Sun ($M_{star} > 25M_{Sun}$)