

# The Universe

## Universe :

The vast surrounding space which includes everything that exists like earth, stars, planets, satellites etc.

## The Stars :

- are giant ball of gases in space that shine through the darkness and are held together by the force of gravitation.
- gases are hydrogen and helium.
- luminous and stationary

## Planets:

- is a large round heavenly body that orbits a star and shines with light reflected from the star.
- revolve around the sun in elliptical orbits and they also rotate about their own axes
- Non luminous and movable

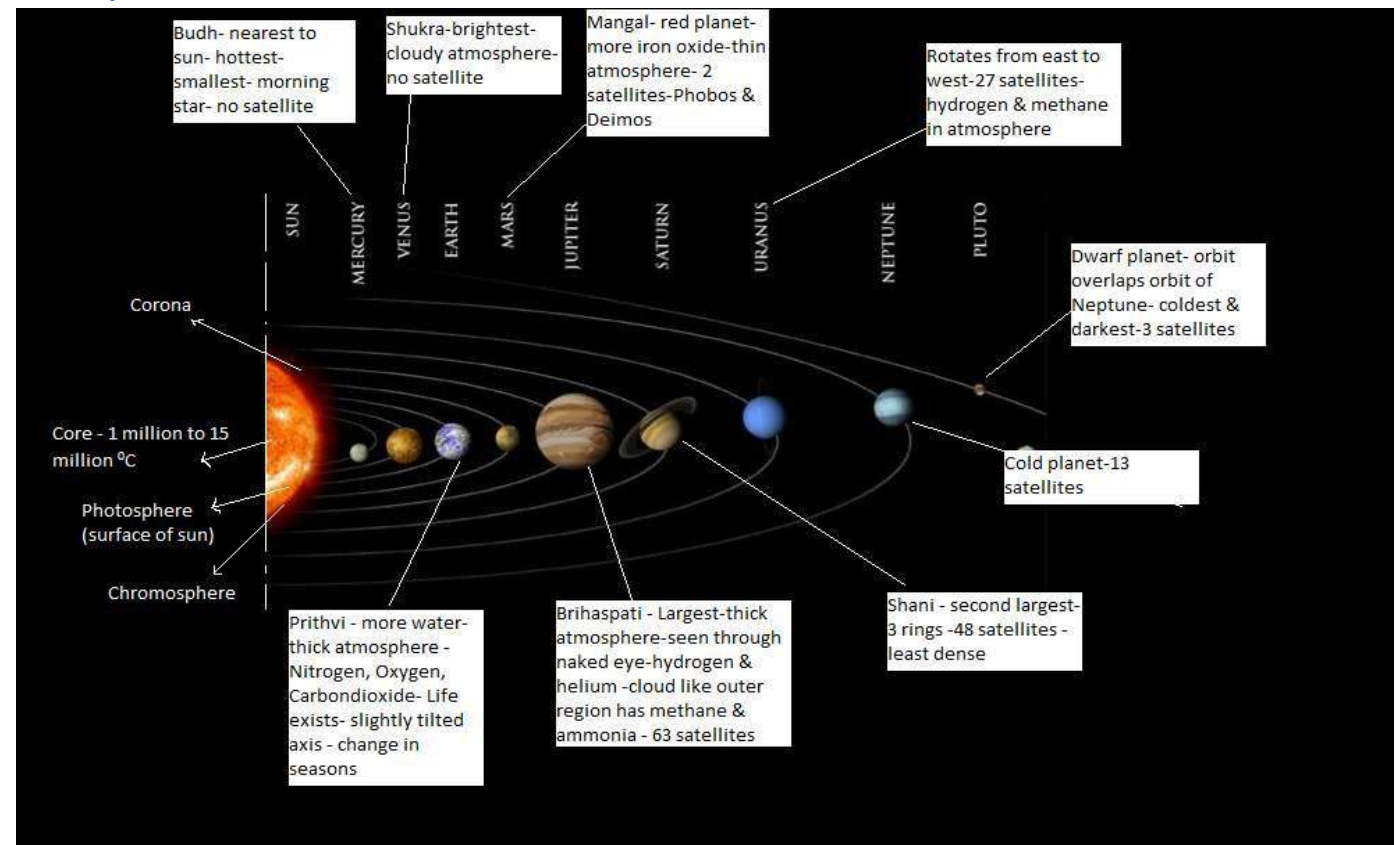
## Galaxy :

- is a collection of billions of stars, gas and dust bound together by gravity
- building blocks of universe
- no fixed pattern or shape
- around 1011 galaxies in the universe
- Milky way- Akashganga- spiral galaxy

## Constellation :

- is a collection of only a very few stars.
- constellation appears to resemble an animal or human being in its shape
- so far 88 known
- Orion – resembles a hunter- seen in winter- Ursa Major – great bear or Saptharishi- 7 major stars
- scorpio – seen in summer in northern hemisphere

## Solar System :



## Asteroids:

There is a large gap in between the orbits of the Mars and Jupiter. This gap is occupied by a large number of minor planets made up of rock which revolve around the sun. These are called asteroids. Ex. Ceres

## Comets:

Comet is small body of ice and dust revolving around the sun in its elongated orbit.

When comet approaches the sun, it heats up and leaves behind a stream of hot glowing gases and dust particles seen as tail. Ex: Halley's comet

## Meteors:

Made of rocks & metals – shooting stars – luminous when enters into earth's atmosphere and burns out on the way due to heat produced by friction

## Meteorites:

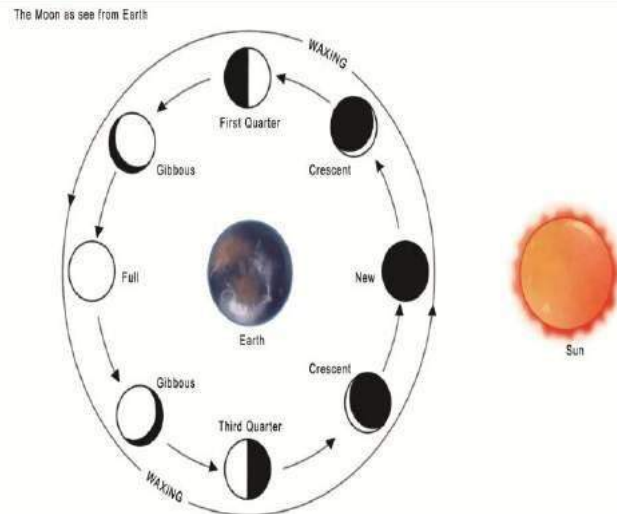
-some of longer meteors which do not burn completely and reaches earth surface are called meteorites – forms craters on earth's surface.

**Moon:** A natural satellite or moon is a non-luminous celestial body that orbits a planet

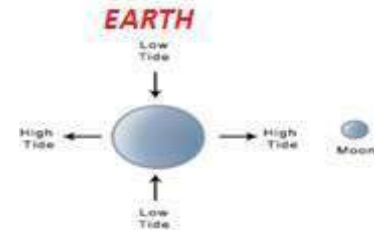
Surface of the moon shows these features:

- dusty and barren
- deep craters
- high mountains
- no water
- no atmosphere

Phases of Moon:



**Tides :**



The regular rise or fall of the water level of sea is called tide. This happens due to the gravitational pull of the moon on the surface of earth.

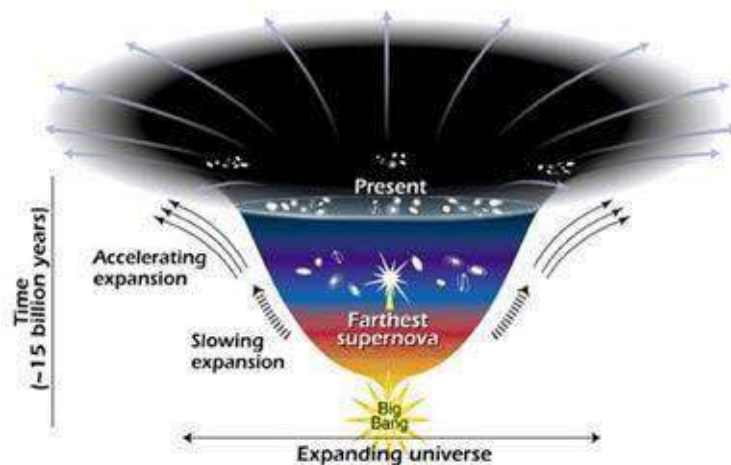
**Artificial satellites**

Manmade satellites that have a smaller orbit than natural satellites and used for weather forecasting, remote sensing, transmission of TV and radio signals and telecommunication e.g. INSAT, IRS, EDUSAT. The first Indian satellite was Aryabhata

**Measurement of distance in universe**

- The distances are measured in light years and parsec
  - 1 light year =  $9.46 \times 10^{12}$  km
  - 1 parsec = 3.26 light year

**Expansion of Universe and Big Bang Theory :**



**Eclipse :**

