



# The Universe and Solar System

- The **Universe** is commonly defined as the totality of everything that exists including all physical matter and energy, the planets, stars, galaxies and the contents of intergalactic space.
- The Study of universe is known as 'cosmology'.
- A **Galaxy** is a vast system of billions of stars, dust and light gases bound by their own gravity. There are 100 billion galaxies in the universe and each galaxy has, on average, 100 billion stars.
- Our galaxy is **Milky Way Galaxy** (or the Akash Ganga) formed after the Big Bang. **Andromeda** is the nearest galaxy to the Milky Way.
- **Stars** are heavenly bodies made up of hot burning gases and they shine by emitting their own light.
- **Comets** are made up of frozen gases. They move around the sun in elongated elliptical orbit with the tail always pointing away from the Sun.
- **Constellations** The sky is divided into units to enable the astronomers to identify the position of the stars. These units are called 'constellations'. There are 88 known constellations.
- **The Solar System** consists of the Sun, eight planets and their satellites (or moons), and thousands of other smaller heavenly bodies such as asteroids, comets and meteors.

- The **Sun** is the centre of the solar system and all these bodies revolve around it. It is the nearest star to the Earth. Time taken by sunlight to reach the Earth is 8 minutes and 16.6 seconds.
- **Moon** is the only satellite of the Earth. It completes its rotation in 27 days, 7hr. 43 min and 11.47 sec and same is the time taken by moon in one revolution around Earth.

## Classification of Planets

- **Inner Planets** include Mercury, Venus, Earth and Mars. They are called as 'Terrestrial' or 'Rocky planets'. They are nearer to the Sun.
- **Outer Planets** include Jupiter, Saturn, Uranus and Neptune. They are called as 'Jovian' or 'Gaseous planets'. They are far away from the Sun.
- **Dwarf Planet** According to International Astronomical Union (IAU), it is a celestial body in direct orbit of the Sun, that is massive enough that its shape is controlled by gravitational forces, but has not cleared its neighbourhood. e.g., Pluto, Ceres, Eris, Makemake and Haumea.
- A **light year** is the distance light travels in one year at the speed of  $3 \times 10^8$  m/s.
- Astronomical unit is the mean distance between Earth and Sun.

Biggest Planet	Jupiter
Biggest Satellite	Ganymede (Jupiter )
Blue Planet	Earth
Green Planet	Uranus
Brightest Planet	Venus
Brightest Planet outside Solar System	Sirius (Dog Star)
Closest Star of Solar System	Proxima Centauri
Coldest Planet	Neptune
Evening Star	Venus
Farthest Planet from Sun	Neptune
Planet with maximum number of satellites	Saturn (82)
Fastest revolution in Solar System	Mercury

Hottest Planet	Venus
Densest Planet	Earth
Fastest Rotation in Solar System	Jupiter
Morning Star	Venus
Nearest Planet to Earth	Venus
Nearest Planet to Sun	Mercury
Red Planet	Mars
Slowest Revolution in Solar System	Neptune
Slowest Rotation in Solar System	Venus
Smallest Planet	Mercury
Smallest Satellite	Deimos (Mars)
Earth's Twin	Venus
Only Satellite with an atmosphere like Earth	Titan

## Practice Exercise

- The Study of universe is known as
  - Cosmography
  - Cosmology
  - Astronomy
  - Climatology
- Milky Way Galaxy is commonly known by which name in India?
  - Aakash Ganga
  - Agni
  - Trishul
  - Vayumandal
- Nearest planet to the Earth is known by the name of
  - Jupiter
  - Venus
  - Mercury
  - Uranus
- Coldest planet of the Universe is called
  - Neptune
  - Venus
  - Jupiter
  - Earth
- How much time sunlight takes to reach the Earth?
  - 8 Minutes 16.6 Seconds
  - 10 Minutes
  - 4 Minutes
  - 8 Minutes
- Which Planet possess fastest 'Rotational Speed' in solar system family?
  - Jupiter
  - Neptune
  - Venus
  - Mercury
- Which is the nearest Galaxy to the Milky way Galaxy?
  - Black Eye
  - Whirlpool
  - Andromeda
  - Tadpole
- Which planet is known as 'Evening star'?
  - Jupiter
  - Mercury
  - Venus
  - Earth
- Which one of the following is the 'Brightest planet', outside the solar system family?
  - Dog star (Sirius)
  - Jupiter
  - Uranus
  - Deimos/Mars
- According to International Astronomical Union, which planet lost the prestige of planet and become dwarf?
  - Pluto
  - Mercury
  - Mars
  - Venus
- Which group of planets is known as 'Inner planets'?
  - Mercury, Venus, Earth and Mars
  - Mercury, Venus, Jupiter and Neptune
  - Neptune, Venus, Mercury and Mars
  - Mercury, Venus, Jupiter and Earth

