INTRODUCTION

- The whole sky is filled with tiny shining objects – some are bright, others dim. Some twinkling and some does not.
- Along with these bright objects, you may also see the moon on most of the days at different times, in different shapes and at different positions.
- You can see the full moon only once in about a month’s time and the day called Full moon night or Poornima.
- A fortnight later, you cannot see it at all. It is a New moon night or Amavasya.
- The very bright light of the sun does not allow us to see all these bright objects of the night sky.
- The sun, the moon and all those objects shining in the night sky are called celestial bodies.
Some celestial bodies are
  • very big and hot.
  • are made up of gases.
  • have their own heat and light, which they emit in large amounts.
  • These celestial bodies are called stars.
  • The sun is a star.

Stars in the night sky are similar to the sun. But we do not feel their heat or light, and they look so tiny because they are very very far from us.

Figure 1.1: Saptarishi and the North Star
While watching the night sky, you may notice various patterns formed by different groups of stars. These are called **constellations**.

- **Ursa Major or Big Bear** is one such constellation.
- One of the most easily recognisable constellation is the **Saptarishi** (*Saptaseven, rishi-sages*). It is a group of seven stars (Figure 1.1)that forms a part of Ursa Major.
In ancient times, people used to determine directions during the night with the help of stars. The North star indicates the north direction, also called the Pole Star. It always remains in the same position in the sky. We can locate the position of the Pole Star with the help of the Saptarishi.

Some celestial bodies do not have their own heat and light. They are lit by the light of the stars. Such bodies are called planets.

The word ‘planet’ comes from the Greek word “Planetai” which means ‘wanderers’. The earth is a planet. It gets all its heat and light from the sun, which is our nearest star.

The moon that we see in the sky is a satellite. It is a companion of our earth and moves around it.

THE SOLAR SYSTEM

The sun, eight planets, satellites and some other celestial bodies known as asteroids and meteoroids form the solar system.
The Sun

- The sun is in the centre of the solar system.
- It is huge and made up of extremely hot gases.
- It provides the pulling force that binds the solar system.
- The sun is the ultimate source of heat and light for the solar system.
- But that tremendous heat is not felt so much by us because despite being our nearest star, it is far away from us.
- The sun is about 150 million km away from the earth.

Planets

- There are eight planets in our solar system.
- In order of their distance from the sun, they are:
- Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- All the eight planets of the solar system move around the sun in fixed paths.
- These paths are elongated. They are called **orbits**.
- **Mercury** is nearest to the sun. It takes only about 88 days to complete one round along its orbit.
- **Venus** is considered as ‘Earth’s-twin’ because its size and shape are very much similar to that of the earth.
- Till recently (August 2006), Pluto was also considered a planet. However, in a meeting of the International Astronomical Union, a decision was taken that Pluto like other celestial objects (Ceres, 2003 UB313) discovered in recent past may be called ‘dwarf planets.”

**The Earth**

The earth is the **third nearest** planet to the sun.

- In size, it is the **fifth largest**
  - It is slightly flattened at the poles. That is why, its shape is described as a **Geoid**. Geoid means an earth-like shape.
  - Conditions favourable to support life are probably found only on the earth
  - neither too hot nor too cold
  - has water and air, which are very essential for our survival.
  - The air has life-supporting gases like oxygen.

From the outer space, the earth appears blue because its **two-thirds** surface is covered by water. It is, therefore, called a **blue planet**.

**The Moon**

- Our earth has only one satellite, that is, the moon.
- Its diameter is only **one-quarter** that of the earth.
- It appears so big because it is nearer to our planet than other celestial bodies.
- It is about 3,84,400 km away from us.
The moon moves around the earth in about 27 days. It takes exactly the same time to complete one spin. As a result, only one side of the moon is visible to us on the earth.

The moon does not have conditions favourable for life. It has neither water nor air. It has mountains, plains and depressions on its surface. These cast shadows on the moon’s surface.

**Asteroids**

- Apart from the stars, planets and satellites, there are numerous tiny bodies which also move around the sun. These bodies are called **asteroids**.
- They are found between the orbits of Mars and Jupiter (Figure 1.2).
- It is viewed as parts of a planet which exploded many years back.

**Meteoroids**

- The small pieces of rocks which move around the sun are called **meteoroids**.
- Sometimes these meteoroids come near the earth and tend to drop upon it. During this process due to friction with the air they get heated up and burn. It causes a flash of light.
- Sometimes, a meteor without being completely burnt, falls on the earth and creates a hollow.
- Do you see a whitish broad band, like a white glowing path across the sky on a clear starry night? It is a cluster of millions of stars. This band is the **Milky Way galaxy** (Figure 1.6).
- Our solar system is a part of this galaxy. In ancient India, it was named **Akash Ganga**.
- A galaxy is a huge system of billions of stars, and clouds of dust and gases
- There are millions of such galaxies that make the
Universe.

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