A Survey of Celestial Bodies

Introduction

This document provides a concise overview of different types of objects found within our solar system. It categorizes them by their physical composition and orbital characteristics to aid in the testing of scientific data retrieval.

Terrestrial Planets

Terrestrial planets are Earth-like planets made up of rocks or metals with a hard surface. They also have a molten heavy-metal core, few moons, and topological features such as valleys, volcanoes, and craters.

Mars

Mars is the fourth planet from the Sun and the second-smallest planet in the Solar System. It is often referred to as the "Red Planet" due to the reddish iron oxide prevalent on its surface. Mars is a terrestrial planet with a thin atmosphere, having surface features reminiscent both of the impact craters of the Moon and the valleys, deserts, and polar ice caps of Earth.

It is home to Olympus Mons, the largest volcano and highest known mountain on any planet in the Solar System, and Valles Marineris, one of the largest canyons. Several rovers have been sent to Mars to search for evidence of past life.

Key Characteristics:

- **Type:** Terrestrial Planet
- **Atmosphere:** Thin, mostly Carbon Dioxide
- **Notable Feature:** Olympus Mons (Largest volcano)

Gas Giants

Gas giants are large planets composed mostly of gases, such as hydrogen and helium, with a relatively small rocky core. They lack a well-defined solid surface and typically have ring systems and numerous moons.

Jupiter

Jupiter is the fifth planet from the Sun and the largest in the Solar System. It is a gas giant with a mass one-thousandth that of the Sun, but two-and-a-half times that of all the other planets in the Solar System combined. It is known for its Great Red Spot, a giant storm that is bigger than Earth and has raged for at least 340 years.

Jupiter has a faint ring system and a powerful magnetosphere. It has 95 known moons, including the four large Galilean moons: Io, Europa, Ganymede, and Callisto, which are of significant scientific interest.

Key Characteristics:

- **Type:** Gas Giant
- **Composition:** Hydrogen and Helium
- **Notable Feature:** Great Red Spot storm

Stars

A star is an astronomical object consisting of a luminous spheroid of plasma held together by its own gravity. The nearest star to Earth is the Sun.

The Sun

The Sun is the star at the center of the Solar System. It is a nearly perfect sphere of hot plasma, heated to incandescence by nuclear fusion reactions in its core, radiating the energy mainly as light and infrared radiation. It is by far the most important source of energy for life on Earth.

Its diameter is about 109 times that of Earth, and its mass is about 330,000 times that of Earth, accounting for about 99.86% of the total mass of the Solar System. Roughly three-quarters of the Sun's mass consists of hydrogen; the rest is mostly helium.

Key Characteristics:

- **Type:** G-type Main-Sequence Star (Yellow Dwarf)
- **Surface Temperature:** Approx. 5,500°C
- **Significance:** Primary energy source for Earth