The Solar System

The Solar System is the gravitationally bound system of the Sun and the objects that orbit it. It formed approximately 4.6 billion years ago from the gravitational collapse of a giant interstellar molecular cloud. The vast majority of the system mass is in the Sun, with most of the remaining mass contained in the planet Jupiter.

The four inner planets, Mercury, Venus, Earth, and Mars, are terrestrial planets composed primarily of rock and metal. The four outer planets are giant planets that are substantially more massive than the terrestrials. The two largest, Jupiter and Saturn, are gas giants composed mainly of hydrogen and helium. The two outermost planets, Uranus and Neptune, are ice giants composed largely of volatile substances such as water, ammonia, and methane.

Earth is the third planet from the Sun and the only astronomical object known to harbor life. About 71 percent of its surface is covered with water, mostly by oceans. Earth has a dense atmosphere composed primarily of nitrogen and oxygen. Its magnetic field and ozone layer protect the surface from harmful solar radiation, enabling life to thrive.

Mars, the fourth planet, has a thin atmosphere and surface features that include impact craters, valleys, deserts, and polar ice caps. It has two small moons, Phobos and Deimos. Mars is the site of Olympus Mons, the largest volcano and highest known mountain in the Solar System, and Valles Marineris, one of the largest canyons in the Solar System.

The asteroid belt, which lies between the orbits of Mars and Jupiter, contains objects composed of rock and metal. Beyond Neptune lies the Kuiper belt, a ring of icy bodies including the dwarf planet Pluto. Farther still is the scattered disc and the hypothetical Oort Cloud, a vast spherical shell of icy objects that may extend to a distance of roughly 100,000 astronomical units from the Sun.