

Parts of the Solar System

The Sun

The Sun is the closest star to Earth and is the center of our solar system. A giant, spinning ball of very hot gas, the Sun is fueled by nuclear fusion reactions. The light from the Sun heats our planet and makes life possible. The Sun is also an active star that displays sunspots, solar flares, erupting prominences, and coronal mass ejections. These phenomena, which are all related to the Sun's magnetic field, impact our near-Earth space environment and determine our "space weather". In about five billion years, the Sun will evolve into a Red Giant, and eventually, a White Dwarf star. Many cultures have had interesting myths about the Sun, in recognition of its importance to life on Earth.

Planets

By the current count of astronomers, our solar system includes 8 planets and 5 dwarf planets. The planets were formed during the process of solar system formation, when clumps began to form in the disk of gas and dust rotating about our young Sun. Eventually, only the planets and other small bodies in the solar system remained. The four rocky planets at the center of the solar system Mercury, Venus, Earth, Mars, are known as the inner planets. Jupiter, Saturn, Uranus, and Neptune are all composed primarily of gas and are known as the outer planets.

Astronomers agree about two things. To be a planet, an object must orbit a star. If it orbits something else, like another planet, it is a moon instead. The second point is that the object must be big enough that gravity makes it into a sphere. Many asteroids and comets have odd shapes. They are definitely not planets.

Many planets have moons, which are objects that revolve around planets.

Asteroids

Asteroids are small bodies that are believed to be left over from the beginning of the solar system 4.6 billion years ago. They are rocky objects with round or irregular shapes up to several hundred miles across, but most are much smaller.

More than 100,000 asteroids lie in a belt between Mars and Jupiter. These asteroids lie in a location in the solar system where there seems to be a jump in the spacing between the planets. Scientists think that this debris may be the remains of an early planet, which broke up early in the solar system.

Meteors

Meteors are streaks of light, usually lasting just a few seconds, which people occasionally see in the night sky. They are sometimes called "shooting stars" or "falling stars", though they are not stars at all. Meteors are caused by the entry of small pieces of rock, dust, or metal from space into the atmosphere at extremely high speeds. These particles, called "meteoroids" when they are floating around in space, are traveling at incredible speeds of tens of kilometers per second

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(tens of thousands of miles per hour) when they streak into the atmosphere. The incredible pressure meteoroids experience when they collide with Earth's atmosphere shatters them, transferring energy to atoms and molecules in the atmosphere, which then release the energy by glowing. This glow produces the bright trails of light in the sky we see as meteors.

Most meteoroid particles are quite small, ranging in size from a grain of sand to a pea-sized pebble. Almost all of them disintegrate in the atmosphere long before reaching the ground. Very rarely, a larger meteoroid actually survives to strike the ground, creating a meteor crater in a huge explosion. Sometimes, however, pieces of the meteoroid survive and are found in the crater or nearby. These chunks of rock or metal are called meteorites.

Comets

Not long ago, many people thought that comets were a sign that something bad was about to happen to them. People didn't understand how objects in the sky moved, so the sight of a comet must have been very disturbing. There are many historical records and works of art which record the appearance of comets and link them with terrible events such as wars or plagues.

Now we know that comets are lumps of ice and dust that periodically come into the center of the solar system from somewhere in its outer reaches, and that some comets make repeated trips. When comets get close enough to the Sun, heat makes them start to evaporate. Jets of gas and dust form long tails that we can see from Earth. These tails can sometimes be millions of miles long.

Kuiper Belt

The outer edge of our Solar System is not empty. There are many, many huge spheres of ice and rock out near Pluto's orbit. Astronomers call this huge group of planetoids "Kuiper Belt Objects", or "KBOs" for short. The Kuiper Belt is a bit like the asteroid belt, but much farther from the Sun.

Scientists think there are many thousands of KBOs. Astronomers have discovered several hundred so far. KBOs are gigantic balls of ice and rock. Some are small, some are tens of km across, and some are as big as the planet Pluto, and maybe larger! They orbit the Sun on the edge of the Solar System, near Pluto. KBOs take 200 years or longer to orbit the Sun!

The planet Pluto is also a Kuiper Belt Object. There are probably a bunch of other KBOs as big as Pluto or bigger that we haven't found yet. This is why astronomers are having a hard time deciding what a planet is. Is Pluto a planet? Are any of the other KBOs? Astronomers have found one object, called 2003 UB₃₁₃ for now, that looks like it is bigger than Pluto. Some people are calling it the "tenth planet".

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