

## Glossary for Solar System

**asteroid** - a medium-sized rocky object orbiting the Sun; smaller than a planet, larger than a meteoroid

**astronomical unit (AU)** = 149,597,870.691 km; the average distance from the Earth to the Sun. 1 AU is a long way - at 100 miles per hour (160 kph) it would take over 100 years to go 1 AU.

**atmosphere** – the gaseous area surrounding a planet or other body.

**aurora** - (Latin for "dawn") a glow in a planet's ionosphere caused by the interaction between the planet's magnetic field and charged particles from the Sun

**aurora borealis** - "Northern Lights"; caused by the interaction between the solar wind, the Earth's magnetic field and the upper atmosphere. A similar effect happens in the southern hemisphere where it is known as the aurora australis.

**chromosphere** - the lower level of the solar atmosphere between the photosphere and the corona

**coma** - the dust and gas surrounding an active comet's nucleus

**comet** - a medium-sized icy object orbiting the Sun; smaller than a planet

**corona** - the uppermost level of the solar atmosphere, characterized by low densities and high temperatures (> 1.0E+06 K).

**dwarf planet** - A celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, (c) has not cleared the neighborhood around its orbit, and (d) is not a satellite. Currently there are five objects, Pluto, Ceres, Eris, Haumea, and Makemake, officially designated as dwarf planets.

**flare** - a sudden eruption of energy on the solar disk lasting minutes to hours, from which radiation and particles are emitted.

**Galilean Moons** - Jupiter's four largest moons: Io, Europa, Ganymede and Callisto; discovered independently by Galileo and Marius. (Galileo proposed that they be named the **Medicean stars**, in honor of his patron Cosimo II de Medici; the present names are due to Marius)

**Galileo Galilei** 1564-1642 - Italian astronomer and physicist. The first to use a telescope to study the stars. Discoverer of the first moons of an extraterrestrial body (see above). Galileo was an outspoken supporter of Copernicus's heliocentric theory. In reaction to Galileo, the Church declared it heresy to teach that the Earth moved and silenced him. The Church clung to this position for 350 years; Galileo was not formally exonerated until 1992.

**greenhouse effect** - increase in temperature caused when incoming solar radiation is passed but outgoing thermal radiation is blocked by the atmosphere (carbon dioxide and water vapor are the major factors). Very important on Venus and Earth but very weak on Mars.

**heliopause** - the point at which the solar wind meets the interstellar medium or solar wind from other stars.

**heliosphere** - the space within the boundary of the heliopause containing the Sun and solar system.

**inferior planets** - the planets Mercury and Venus are called inferior planets because their orbits are closer to the Sun than is Earth's orbit. (The other planets are called "superior" planets.)

**lunar month** - The average time between successive new or full moons, equal to 29 days 12 hours 44 minutes. Also called synodic month.

**meteor** - a bright streak of light in the sky caused by the entry into Earth's atmosphere of a meteoroid or a small icy particle.

**meteorite** - a rock of extra-terrestrial origin found on Earth

**meteoroid** - a small rocky object orbiting the Sun; smaller than an asteroid

**old surface** - a planetary surface that has been modified little since its formation typically featuring large numbers of impact craters.

**photosphere** - the visible surface of the Sun; sunspots are observed in the photosphere.

**planet** - The recently adopted IAU resolution states that "planets" and other bodies in our Solar System be defined into three distinct categories in the following way:

1. A "planet" is a celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, and (c) has cleared the neighbourhood around its orbit.
2. A "dwarf planet" is a celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, (c) has not cleared the neighbourhood around its orbit, and (d) is not a satellite.
3. All other objects except satellites orbiting the Sun shall be referred to collectively as "Small Solar-System Bodies".

So by this official definition there are exactly eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Pluto, Ceres, Eris, Haumea, and Makemake are "dwarf planets" with a potentially large number of additional objects falling into this category in the near future.

**prominence** - a strand of relatively cool gas in the solar corona which appears bright when seen at the edge of the Sun against the blackness of space.

**shepherd satellite** - (or 'shepherd moon') a satellite which constrains the extent of a planetary ring through gravitational forces. (See Pandora for a nice image.)

**solar system** - the system of planets and other objects orbiting the star Sol, which happens to be our Sun.

**solar wind** - a steady flow of gas and energetic charged particles, mostly protons and electrons -- plasma -- which stream from the Sun; typical solar wind velocities are near 350 kilometers per second.

**sunspot** - an area seen as a dark spot on the photosphere of the Sun; they appear dark because they are cooler than the surrounding photosphere.

**superior planets** - the planets Mars, Jupiter, Saturn, Uranus, Neptune and Pluto are called superior planets because their orbits are farther from the Sun than Earth's orbit. (Mercury and Venus are called "inferior" planets.)

**young surface** - When used to describe a planetary **surface** "young" means that the visible features are of relatively recent origin, i.e. that older features have been destroyed (e.g. by erosion or lava flows). Young surfaces exhibit few impact craters and are typically varied and complex. In contrast an "old" surface is one that has changed relatively little over geologic time. The surfaces of Earth, Titan and Io are young; the surfaces of Mercury, Callisto and most other solid bodies in our solar system are old.