Glossary for Solar System

A

accretion - Accumulation of dust and gas into larger bodies such as stars, planets and moons.

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

B

bolide - A large meteor (fireball) that produces a sonic boom.

C

coma - the dust and gas surrounding an active comet’s nucleus.

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

D

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.

G

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)

geosynchronous orbit – A direct, circular orbit in which the satellite’s orbital velocity is matched to the rotational velocity of the planet; the spacecraft appears to hang motionless above one position of the planet’s surface.

H

heliopause – The boundary where the solar wind meets the interstellar medium. [The heliopause is about 122 AU from the Sun; according to NASA, Voyager 1 crossed the heliopause on August 25, 2012.]

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

I

interstellar medium (ISM) - the matter and radiation that exists in the space between the star systems in a galaxy. This matter includes gas in ionic, atomic, and molecular form, as well as dust and cosmic rays.

M

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
Nebular Hypothesis – Theory about the formation of the Solar System, which states that the SS was formed by the gravitational collapse of a massive cloud called the Solar Nebula. The particles within the flattened disk collided against each other with increased frequency and fused, to form objects known as planetesimals. These further collided and combined through the process of accretion to form protoplanets and the planets, moons, meteors, comets and asteroids that we see today. The solar wind from the newborn sun was so powerful that it swept most of the lighter elements such as helium and hydrogen away from the central solar system. However, the solar wind grew weaker in the outer regions of the SS and thus the outer planets were left with a large amount of hydrogen and helium. This explains the gaseous nature of the outer planets and the contrasting rocky nature of the inner four planets.

P

planet - A celestial body that a) is in orbit around the Sun, b) has sufficient mass for its self-gravity to assume a nearly-round shape and c) has cleared the neighborhood around its orbit.

1. A "dwarf planet" is a celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to assume a spherical shape, (c) has not cleared the neighborhood around its orbit, and (d) is not a satellite.
2. 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.

planetesimal – Formed through a process called accretion, where cosmic dust grains collide and stick through static, to form larger and larger bodies up to a few kilometers across (big enough that gravity is significant in increasing the size)

protoplanet – A large planetary embryo that has undergone internal melting to produce a differentiated layered interior (core, mantel and crust) formed from collisions of planetesimals.

S

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 nebula – “stellar nursery”; When an enormous cloud of gas and dust, possibly several light-years across, begins to contract due to gravity, it may become a 'stellar nursery' - (where multiple disk-shaped 'solar nebulae' may arise from individual clumps of higher density). As the gas and dust condenses around an individual dense clump, the pressure and temperature rises from the friction caused by all of the colliding material. When enough matter has collected at the center of one of the nebular disks, when the pressure is high enough and the temperature reaches 15-million degrees or so, fusion begins and a new star is born.

solar system – the system of planets and other objects originating the star Sol, which happens to be our Sun.

synchronous orbit – An orbit in which a satellite’s orbital period is equal to the rotational period of the planet. A synchronous stays fixed in the sky from the perspective of an observer on the planet’s surface (such orbits are commonly used for communications satellites).