

<http://en.wikipedia.org/wiki/Star>

Star:

A star is a massive, luminous ball of plasma (= ionized plasma). Stars group together to form galaxies, and they dominate the visible universe. The nearest star to Earth is the Sun, which is the source of most of the energy on Earth, including daylight. Other stars are visible in the night sky, when they are not outshone by the Sun. A star shines because nuclear fusion in its core releases energy which traverses the star's interior and then radiates into outer space. Almost all elements heavier than hydrogen and helium were created inside the cores of stars.

Astronomers can determine the mass, age, chemical composition and many other properties of a star by observing its spectrum, luminosity and motion through space. The total mass of a star is the principal determinant in its evolution and eventual fate. Other characteristics of a star that are determined by its evolutionary history include the diameter, rotation, movement and temperature. A plot of the temperature of many stars against their luminosities, known as a Hertzsprung–Russell diagram (H–R diagram), allows the current age and evolutionary state of a particular star to be determined.

A star begins as a collapsing cloud of material that is composed primarily of hydrogen along with some helium and heavier trace elements. Once the stellar core is sufficiently dense, some of the hydrogen is steadily converted into helium through the process of nuclear fusion. The remainder of the star's interior carries energy away from the core through a combination of radiative and convective processes. These processes keep the star from collapsing upon itself and the energy generates a stellar wind at the surface and radiation into outer space.

Once the hydrogen fuel at the core is exhausted, a star of at least 0.4 times the mass of the Sun[2] expands to become a red giant, fusing heavier

elements at the core, or in shells around the core. It then evolves into a degenerate form, recycling a portion of the matter into the interstellar environment where it will form a new generation of stars with a higher proportion of heavy elements.

Plasma (physics): in physics and chemistry, a plasma is typically an ionized gas. Plasma is considered to be a distinct state of matter, apart from gases, because of its unique properties. "Ionized" refers to presence of one or more free electrons, which are not bound to an atom or molecule. The free electric charges make the plasma electrically conductive so that it responds strongly to electromagnetic fields. Plasma typically takes the form of neutral gas-like clouds (e.g. stars) or charged ion beams, but may also include dust and grains (called dusty plasmas).[1] They are typically formed by heating and ionizing a gas, stripping electrons away from atoms, thereby enabling the positive and negative charges to move more freely. ([http://en.wikipedia.org/wiki/Plasma\\_%28physics%29](http://en.wikipedia.org/wiki/Plasma_%28physics%29))

A dusty plasma is a plasma containing nanometer or micrometer-sized particles suspended in it. Dust particles may be charged and the plasma and particles behave as a plasma [1] [2], following electromagnetic laws for particle up to about 10 nm (or 100 nm if large charges are present). Dust particles may accrete into larger particles resulting in "grain plasmas".

Dusty plasmas are encountered in:

An astrophysical plasma is a plasma (an ionized gas) found in astronomy whose physical properties are studied in the science of astrophysics. Much of the baryonic matter of the universe is thought to consist of plasma, a state of matter in which atoms and molecules are so hot, that they have ionized by breaking up into their constituent parts, negatively charged electrons and positively charged ions. Because the particles are charged, they are strongly influenced by electromagnetic forces, that is, by magnetic and electric fields. ([http://en.wikipedia.org/wiki/Dusty\\_plasma](http://en.wikipedia.org/wiki/Dusty_plasma))

All known astrophysical plasmas are influenced by magnetic fields. Since plasmas contain equal numbers of electrons and ions, they are electrically neutral overall and thus electric fields play a lesser dynamical role. Because plasmas are highly conductive, any charge imbalances are readily neutralised. ([http://en.wikipedia.org/wiki/Astrophysical\\_plasma](http://en.wikipedia.org/wiki/Astrophysical_plasma))

Tema 1: L'Univers, la Via Làctia i el sistema solar

Resum

L'Univers és el conjunt de tota la matèria i energia que existeix. Està format per les nebuloses, les galàxies i les radiacions com la llum que desprenen els astres.

Les galàxies són immenses agrupacions d'estrelles acompanyades de núvols de gas i pòls còsmica (nebuloses) que es mouen junts per l'espai.

Les estrelles són astres lluminosos i gasosos formats principalment d'hidrogen i d'heli. En el seu interior es produeixen reaccions nuclears que desprenen grans quantitats d'energia en forma de radiacions de llum i calor. El Sol és l'estrella més propera al nostre planeta.

El sistema solar és un conjunt d'astres format pel Sol, vuit planetes (Mercuri, Venus, la Terra, Mart, Júpiter, Saturn, Urà i Neptú), tres planetes menors (Ceres, Plutó i UB313), més de seixanta satèl·lits i nombrosos asteroides, cometes i meteorits.

Subject 1: L'Univers, the Lactic Way and the solar system

Summary

L'Univers is the set of all the matter and energy that exists. It is formed by the nebulas, the galaxies and the radiation like the light that they detach the stars.

The galaxies are immense groups of stars accompanied of clouds of gas and cosmic pòls (nebulas) that move around joints for l'espai.

The stars are luminous gas stars formed mainly of hydrogen and helium. In its inland nuclear reactions are produced that great amounts detach of energia in the form of radiation of light and heat. The Sun is l'estrella more next to our planet.

The solar system is a joint of astres formed by the Sun, eight planets (Mercury, Venus, the Earth, Mars, Júpiter, Saturn, Urà and Neptú), three minor planets (Waxes, Plutó and UB313), more of sixty satellite and numerous asteroids, cometes and meteorites.

Univers - Resum - estrelles - espai - hidrogen - Heli

Summary Universe - space stars - helium hydrogen

Planet: (<http://en.wikipedia.org/wiki/Planet>)

A **planet**, as [defined](#) by the [International Astronomical Union](#) (IAU), is a celestial body [orbiting](#) a [star](#) or [stellar remnant](#) that is massive enough to be rounded by its own [gravity](#), not massive enough to cause [thermonuclear fusion](#) in its core, and has [cleared its neighbouring region](#) of [planetesimals](#).<sup>[1][2]</sup>

The term *planet* is an ancient one, with ties to history, science, myth and religion. The planets were originally seen as a divine presence; as emissaries of the gods. Even today, many people continue to believe the [movement of the planets affects their lives](#), although such a causation is [rejected by the scientific community](#). As scientific knowledge improved, the human perception of the planets changed over time, incorporating [a number of disparate objects](#). Even now there is no uncontested definition of what a planet is. In 2006, the IAU officially adopted a resolution [defining planets](#) within the [Solar System](#). This definition has been both praised and criticised, and remains disputed by some scientists.

When astronomers first gazed up at these strange objects that moved through the night sky, they noted that they appeared to [orbit](#) the Earth in circular motions. With the development of the telescope, the planets, which now included Earth, were found to orbit the Sun, and rather than circular motions, their orbits were elliptical. As observational tools improved, astronomers saw that, like Earth, the planets rotated around tilted axes and shared such features as ice-caps and seasons. Since the dawn of the [space age](#), probes have been sent to every planet in the [Solar System](#), and the discoveries they have made have shifted [planetary science](#) from the realm of astronomy to the realms of [geography](#) and [geology](#). The planets have been found to share characteristics such as volcanism, hurricanes, tectonics and even hydrology, previously only known on Earth. Since 1992, and the discovery of hundreds of [extrasolar planets](#), scientists are beginning to observe similar features across the galaxy.

Under IAU definitions, there are eight planets in the Solar System ([Mercury](#), [Venus](#), [Earth](#), [Mars](#), [Jupiter](#), [Saturn](#), [Uranus](#), and [Neptune](#)) and also at least three [dwarf planets](#) ([Ceres](#), [Pluto](#), and [Eris](#)). Many of these planets are orbited by one or more [moons](#), which can be larger than small planets. There have also been more than two hundred planets discovered [orbiting other stars](#).<sup>[3]</sup> Planets are generally divided into two main types: large, low-density [gas giants](#) and smaller, rocky [terrestrials](#). Dwarf planets, a separate category, can either be terrestrials or frozen [ice dwarfs](#).

According to the [IAU's](#) current definitions there are eight planets in the Solar System. In increasing distance from the [Sun](#), they are:

1. [Mercury](#)
2. [Venus](#)
3. [Earth](#)
4. [Mars](#)

5. [Jupiter](#)
6. [Saturn](#)
7. [Uranus](#)
8. [Neptune](#)

The larger bodies of the Solar System can be divided into categories based on their composition:

- o [Terrestrials](#): Planets (and possibly dwarf planets) that are similar to Earth - with bodies largely composed of [rock](#): Mercury, Venus, Earth and Mars. If including dwarf planets, [Ceres](#) would also be counted, with as many as three other [asteroids](#) that might be added.
- o [Gas giants](#): Planets with a composition largely made up of [gaseous](#) material and are significantly more massive than terrestrials: Jupiter, Saturn, Uranus, Neptune. [Ice giants](#) are a subclass of gas giants, distinguished from gas giants by their depletion in hydrogen and helium, and a significant composition of rock and ice: Uranus and Neptune.
- o [Ice dwarfs](#): Objects that are composed mainly of ice, and do not have planetary mass. The dwarf planets [Pluto](#) and [Eris](#) are ice dwarfs, and several dwarf planetary candidates also qualify.