



Glossary

of Astronomy Terms

Related to Galaxies

Asterism: A pattern formed by stars not recognized as one of the official 88 constellations. Examples include the Summer Triangle, the Big Dipper, and the Winter Circle.

Barred Spiral Galaxy: A type of spiral galaxy having a linear extension, or “bar,” made of stars and interstellar matter, passing through its center.

Blue Star: A very hot star with a short lifetime. Blue stars exist for a few million years. Sirius (Alpha Canis Majoris) is an example of a blue star.

Bulge: A rounded structure in the centers of some galaxies, composed primarily of old stars, and having some gas and dust. The bulge of the Milky Way is about 10,000 light-years across.

Colliding Galaxies: When two or more galaxies are close enough, their gravity begins to attract each one toward the other. The attraction increases as the galaxies travel even closer together. These galaxies can collide and possibly merge to form an elliptical galaxy.

Compare/Contrast Chart or T-chart: A graphic organizer used to compare two objects or ideas. The objects are listed as headings at the top of two columns. The characteristics being compared are then listed under each heading. The chart’s top, horizontal line and its center vertical line trace out the shape of a “T.”

Constellations: “Pictures” in the sky that ancient astronomers perceived by imagining lines or relations between stars that appear grouped. Often, mythological heroes or creatures were the subjects of the pictures. Creating the constellations in the sky not only provided stories for amusement, but also helped people remember the positions of the stars. Knowing the positions of the stars helped farmers keep track of the seasons and travelers keep track of where they were. Modern astronomers define 88 constellations, which are spread across the entire sky.

Disk: A pancake-shaped structure composed primarily of young and middle-aged stars, and having abundant gas and dust. Some old stars are also present. The disk surrounds the bulge in a spiral galaxy. The disk in the

Milky Way is 100,000 light-years across and 2,000 light-years thick.

Edge-on Spiral Galaxy: A spiral galaxy viewed from the side so that the disk containing the spiral arms appears to be a thin line of stars and dust crossing and extending beyond the bulge. Stars in the halo also may be visible. The spiral arm structure is not visible when a spiral galaxy is viewed “edge-on.”

Elliptical Galaxy: A galaxy having an elliptical shape. Some elliptical galaxies are nearly spherical, while others are more oblate, resembling footballs. An elliptical galaxy is essentially a big bulge composed mostly of old stars and containing little interstellar matter (the gas and dust often found in the space between stars).

ESO: These letters, when followed by numbers, refer to the specific entries in an archive of observations made by the European Southern Observatory telescopes. Since the Hubble Space Telescope (HST) is a joint venture between NASA and the European Space Agency, ESO numbers are used to designate HST discoveries. Galaxies with ESO numbers are generally

not included in earlier catalogs, such as those with numbers starting with “NGC” (designating John Dreyer’s *New General Catalogue of Nebulae and Clusters of Stars*) or “M” (designating Charles Messier’s *Catalog of Nebulae and Star Clusters*).

Face-on Spiral Galaxy: A spiral galaxy viewed from above so that the spiral arm structure is visible.

Galaxy: A collection of a million to a trillion stars, along with gas and dust, all held together by gravity.

Halo: A roughly spherical collection of old stars, clusters of old stars (called globular clusters), and a little bit of gas and dust that extends farther than all other components of a galaxy. Halos contain dark matter, which is material that we cannot see but whose gravitational force can be measured. In the Milky Way, the halo measures about 130,000 light-years across.

Hubble Deep Field: A long-exposure, optical-wavelength image. At the time it was taken, it showed the sharpest views of the faintest galaxies ever seen. The image was made by aiming the Hubble Space Telescope at a single

piece of sky for 150 consecutive orbits. The telescope made 342 exposures; 276 of them were fully processed and used for the image. There are two Hubble Deep Field images — the first one studied a location in the northern sky (HDF–N) and the second one studied a location in the southern sky (HDF–S).

Hubble Space Telescope: An automated telescope that orbits Earth at an altitude of 600 km (375 miles). The National Aeronautics and Space Administration and the European Space Agency built the telescope. Its primary mirror is 2.4 meters (94.5 inches) in diameter. The telescope contains an array of instruments capable of carrying out a variety of high-quality astronomical observations at ultraviolet, optical, and infrared wavelengths. Because the telescope is above Earth’s atmosphere, it can obtain extremely clear images.

Irregular Galaxy: A galaxy whose shape is neither elliptical nor spiral. It is often rich in interstellar matter (gas and dust).

Light-year: The distance traveled by light in a full year, equal to some 10 trillion kilometers (or about 6 trillion miles).

Milky Way: The specific galaxy to which the Sun belongs, so named because many of its stars appear as a milky band of light extending across the sky overhead, on a clear, dark night. The Milky Way is a spiral galaxy.

NGC: These letters, when followed by numbers, refer to specific entries in *The New General Catalogue of Nebulae and Clusters of Stars*, which was compiled by John L.E. Dreyer in the nineteenth century. This comprehensive list remains the standard reference guide used by the world’s astronomers.

Red Stars: Stars with low temperatures. Hydrogen-burning red stars are small and use their available fuel slowly. These low-mass stars last for tens to hundreds of billions of years — much longer than hotter-burning stars. Some red stars are very bright, which means they are also very large. These giants, or supergiants, are stars nearing the ends of their lives. Betelgeuse (beta Orionis) is an example of a red supergiant star.

Spiral Arms: Curved, pinwheel-like structures in the disk of a spiral galaxy. The spiral arms contain blue stars and luminous newborn stars that make their spiral pattern visible.

Spiral Galaxy: A galaxy made up of a disk, spiral arms, and a bulge at its center. The size of the disk and the bulge vary. The galaxy is composed of a mixture of old and young stars, as well as loose interstellar matter (the gas and dust found in the space between stars).

Venn Diagram: A diagram consisting of two or more overlapping circles. It is often used in mathematics to show relationships between sets. In other applications, Venn diagrams are useful for examining similarities and differences in the characteristics of objects or ideas.

Yellow Star: Stars that live for a medium length of time (about 10 billion years) and are neither extremely cool nor hot. Earth's Sun is an example of a yellow star.