## The Milky Way Galaxy

## http://messier.obspm.fr/more/mw.html

[](http://www.hallagulla.com/urdu/photo/data/500/M31_The_Andromeda_Galaxy.jpg)The Milky Way is the [galaxy](http://messier.obspm.fr/galaxy.html) which is the home of our Solar System together with at least 200 billion other stars (more recent estimates have given numbers around 400 billion) and their planets, and thousands of [clusters](http://messier.obspm.fr/cluster.html) and [nebulae](http://messier.obspm.fr/nebula.html).

As a galaxy, the Milky Way is actually a giant, as its mass is probably between 750 billion and one trillion solar masses, and its diameter is about 100,000 light years. Radio astronomical investigations of the distribution of hydrogen clouds have revealed that the Milky Way is a [spiral galaxy](http://messier.obspm.fr/spir.html) of Hubble type Sb or Sc. Therefore, our galaxy has both a pronounced disk component exhibiting a spiral structure, and a prominent nuclear region which is part of a notable bulge/halo component. Decade-long observations have brought up more and more evidence that the Milky Way may also have a bar structure, and thus be of Hubble type SBb or SBc.

The Milky Way Galaxy belongs to the [Local Group](http://messier.obspm.fr/more/local.html), a smaller group of 3 large and over 30 small galaxies, and is the second largest (after the [Andromeda Galaxy M31](http://messier.obspm.fr/m/m031.html)) but perhaps the most massive member of this group. M31, at about 2.9 million light years, is the nearest large galaxy, but a number of faint galaxies are much closer: Many of the dwarf Local Group members are [satellites or companions of the Milky Way](http://messier.obspm.fr/more/mw_sat.html). The two closest neighbors, both already mentioned, have only recently been discovered: The nearest of all, discovered in 2003, is an already almost disrupted dwarf galaxy, the [Canis Major Dwarf](http://messier.obspm.fr/more/cma_dw.html), the nucleus of which is about 25,000 light-years away from us and about 45,000 light-years from the Galactic Center. Second comes [SagDEG](http://messier.obspm.fr/more/sagdeg.html) at about 88,000 light years from us and some 50,000 light years from the Galactic Center. These two dwarfs are currently in close encounters with our Galaxy and in sections of their orbits situated well within the volume occupied by our Milky Way. They are followed in distance by the more conspicuous [Large](http://messier.obspm.fr/xtra/ngc/lmc.html) and [Small Magellanic Cloud](http://messier.obspm.fr/xtra/ngc/smc.html), at 179,000 and 210,000 light years, respectively.

The spiral arms of our Milky Way contain interstellar matter, [diffuse nebulae](http://messier.obspm.fr/diffuse.html), and young stars and [open star clusters](http://messier.obspm.fr/open.html) emerging from this matter. On the other hand, the bulge component consists of old stars and contains the [globular star clusters](http://messier.obspm.fr/glob.html); our galaxy has probably about 200 globular clusters, of which we know about 150. These globular clusters are strongly concentrated toward the Galactic Center.

Our solar system is thus situated within the outer regions of this galaxy, well within the disk and only about 20 light years "above" the equatorial symmetry plane (to the direction of the Galactic North Pole), but about 28,000 light years from the Galactic Center. Therefore, the Milky Way shows up as luminous band spanning all around the sky along this symmetry plane, which is also called the "Galactic Equator". Its center lies in the direction of the constellation [Sagittarius](http://messier.obspm.fr/map/Sgr.html), but very close to the border of both neighbor constellations [Scorpius](http://messier.obspm.fr/map/Sco.html) and [Ophiuchus](http://messier.obspm.fr/map/Oph.html). The distance of 28,000 light years has recently (1997) been confirmed by the data of ESA's astrometric satellite Hipparcos. Other investigations published consequently have disputed this value and propose a smaller value of some 25,000 light years, based on stellar dynamics; a recent investigation yields roughly 26,000 light years. These data, if of significance, would not immediately effect values for distances of particular objects in the Milky Way or beyond.

The solar system is situated within a smaller spiral arm, called the *Local* or *Orion Arm*, which is merely connection between the inner and outer next more massive arms, the *Sagittarius Arm* and the *Perseus Arm*. Similar to other galaxies, there occur [supernovae in the Milky Way](http://messier.obspm.fr/more/mw_sn.html) at irregular intervals of time. If they are not too heavily obscured by interstellar matter, they can be, and have been seen as spectacular events from Earth. Unfortunately, none has yet appeared since the invention of the telescope (the last well observed supernova was studied by Johannes Kepler in 1604).