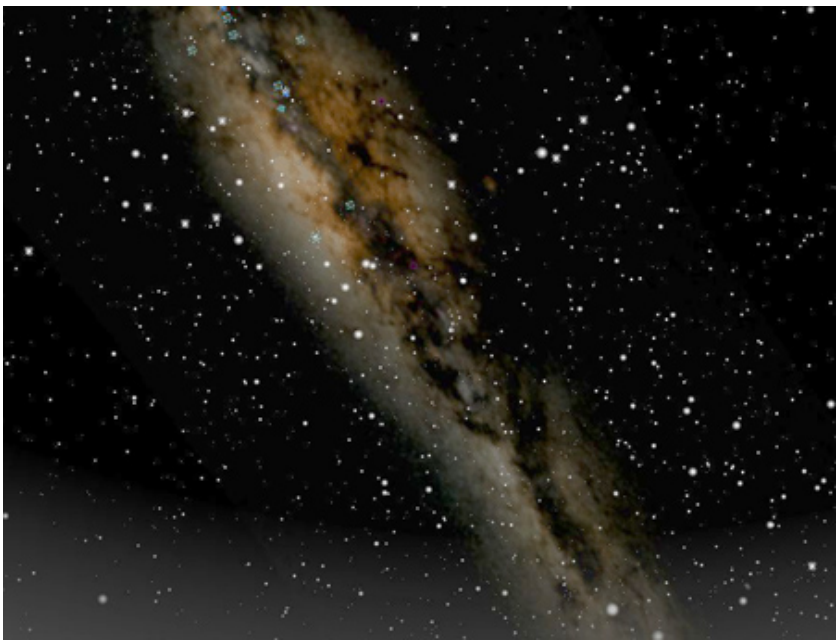
Our Galaxy

Our Galaxy - Introduction

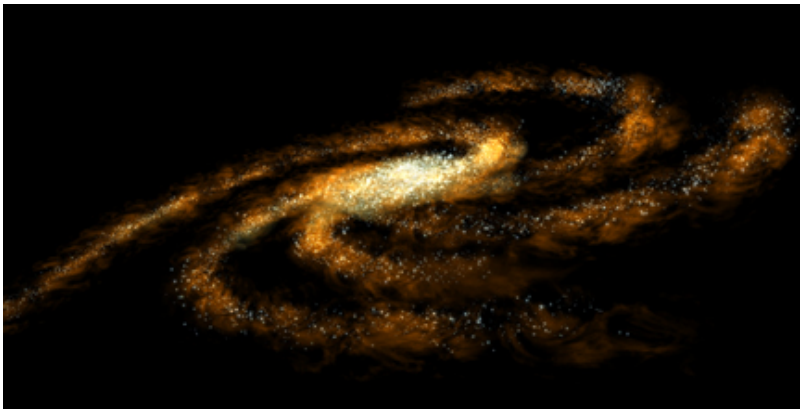
We are but a small star within a vast island of stars called a galaxy- which is also a small object in a vast group of galaxies which is in turn part of the Universe.

If we live in a dark enough area, we can see stretched across the sky a band of clouds:

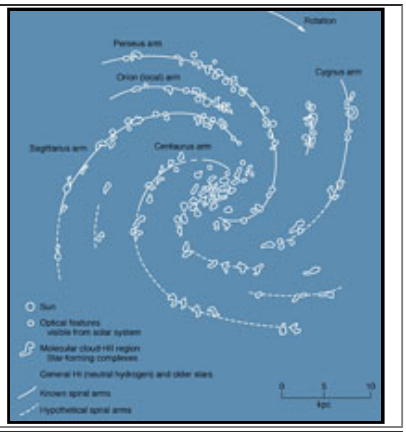


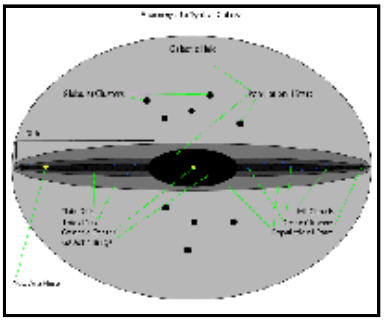
The image above - a screen grab from TheSky version 6 - demonstrates what this might look like. In ancient times, this was called a river of milk, spilled by the gods. The name of this feature would then be called the Milky Way - and the name stuck.

The Milky Way is actually a galaxy - a system of billions of stars gathered by mutual gravitation. Our knowledge of our galaxy (and many others) is still very new but much progress has been made. By using radio observations, we were able to determine the structure of our galaxy (by using Doppler Shift).



Based on these types of observations, we are able to create an artist's impression, like the one above, for what our galaxy might look. These illustrations demonstrate our current understanding of our own Milky Way:



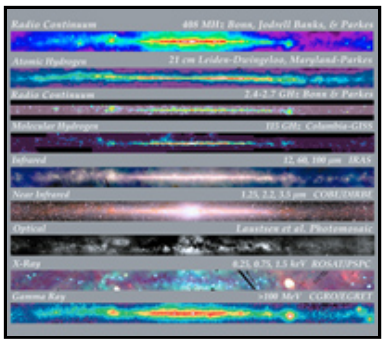


(Image Credit) | Illustration by Astronomy Online

Since the Milky Way is considered an "average" galaxy, much of what we learn can be directly applied to other galaxies. What we know about our galaxy:

- Contains billions of stars, with distinct populations
- Surrounding the galaxy is a large Halo that contains Dark Matter, Globular Clusters and some Population II Stars
- The Disk of the galaxy contains HII Clouds (molecular hydrogen), the Thick Disk, and the Thin Disk
- The Disk of the galaxy contains new, metal rich stars called Population I Stars, and Open Star Clusters
- The Bulge and the Halo contain old, metal poor stars called Population II Stars
- There is a spiral structure to the disk of our galaxy
- The Bulge of the galaxy contains the Galactic Center - believed to be home to a very massive black hole called a Supermassive Black Hole
- Our galaxy is an "average" galaxy
- Our galaxy is probably about 10 billion years old
- Our Sun is 30,000 light-years to the galactic center
- Our galaxy is 120,000 light-years in diameter

- Our galaxy rotates at about 220 km/s - but with an unusual rotation curve that is evidence that Dark Matter is influencing rotation (more on Dark Matter can be found in the Cosmology section)



In the diagram above, you may notice we are located somewhere towards the outer disk. This does pose a problem as our view towards the center of our galaxy is blocked by the HII clouds - or dust. To circumvent this, we use Radio Astronomy and Space-Based probes to peer deep into the center (as well as other parts of our galaxy). This image to the right shows what our galaxy looks like in a variety of wavelengths.

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