

## 14.8: Andromeda Galaxy

In 1917, **Heber Curtis** (1872-1942) was observing a nova in the Andromeda “nebula.” Researching previous novae, including those in the Milky Way Galaxy, Curtis was convinced that Andromeda was indeed a galaxy much like the Milky Way Galaxy, and that the dust lanes seen in Andromeda were similar to those in the Milky Way Galaxy. **Edwin Hubble** (1889-1953) settled that question a couple of years later when his research and observations determined “nebula” like Andromeda were indeed actually galaxies.

One of the questions at the time was the location of our Solar System within the Milky Way Galaxy. Harlow Shapley (1885-1972) used globular clusters to show where we “live” in our galaxy. Shapley was also able to estimate the size of the Milky Way Galaxy. Yet not all of Shapley’s observations or hypotheses were correct; perhaps the biggest error was his continued argument that spiral ‘nebulae’ were actually galaxies outside the Milky Way Galaxy. Shapley actually referred to Hubble’s work and findings as “junk science.”

Also visible in this image are two companion galaxies of the Andromeda Galaxy. Note the dark lanes within the broad band of stars; these are the dust lanes within the Milky Way Galaxy.

Most modern Milky Way Galaxy research has covered such questions as the type and size of the galaxy, the existence of a supermassive black hole at the Milky Way Galaxy’s center, and satellite galaxies associated with the Milky Way Galaxy.

Recall, **Sagittarius A \***, **SGR A \***, the Milky Way Galaxy’s supermassive black hole, was discovered in 1974. Its characteristics were speculative for a number of years. Continued observations of stars near Sagittarius A\* indicate that the object is indeed a supermassive galactic black hole.

The **Virgo Stellar Stream** was discovered in 2006. This is a collection of stars which rises close to perpendicular to the plane of the spiral arms of the galaxy; most likely this structure is a dwarf galaxy.



The Andromeda Galaxy, *M31* Image courtesy of Mike Reynolds, Ph. D. of Florida State College at Jacksonville.

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