

June 2021 Astronomy Update for the Chippewa Valley

Editor's note: *Astronomy Update is provided by the Chippewa Valley Astronomical Society and is compiled by Dr. Lauren Likkell, an emeritus of the University of Wisconsin--Eau Claire department of physics and astronomy.*

Figure caption: The Andromeda Galaxy is the closest large galaxy to our own Milky Way Galaxy, and is visible in the northern sky here in Wisconsin. This image also includes two of the 13 small galaxies that orbit the Andromeda Galaxy (the fat "star" to the top left and the tiny fuzzy disk below). Astrophoto by Mike Brown, a member of the Chippewa Valley Astronomical Society.



“What did we do before Gravity?”

By Kevin Litten

Looking up into the night sky this summer you can see the Andromeda Galaxy. It is the farthest object our unaided eyes can see. It is a spiral galaxy, a beautiful swirl of stars around a central core of more stars. It is thought to be our own galaxy's sister.

In the constellation Hercules is a Globular Cluster known as M 13. Globular Clusters look like angry masses of busy bees. Under ideal conditions both the Andromeda Galaxy and M 13 are visible with eyes alone. In binoculars both objects jump right out at you. It is hard to imagine two more dissimilar looking groups of stars.

Over the past 40 – 50 years scientists believe they know why stars form the distinctive groups they do. Having computers helped. There are at least 3 types each of galaxies and clusters. All of these groups of stars are held together by gravity.

A scientist named William Thomson, who later went by the name of Lord Kelvin, said that if you think you know something but can't quantify it, you know nothing. He might have been talking about Isaac Newton. Everybody knows about gravity but nobody had put the numbers to it till Isaac. The story goes, after having gotten knocked on the noggin by a falling apple.

Isaac did wonderful work. The Moon orbits the Earth. The Earth orbits the Sun. The Sun goes its way through the Milky Way. Your watch could not run smoother. It all made sense except for those big groups of stars. To get those groups to form up and move the way they do, scientists had to take a second hard look at Newton's Laws of Gravity.

We know more about gravity today than we did 50 years ago. Most scientists today support a theory that involves Dark Matter, matter they assume is there, they just can't see it. The presence of this matter would make these massive groups of stars behave correctly. Other scientists propose that on a universal scale Newton's Laws of Gravity need to be modified, hence Modified Newtonian Dynamics. Which is correct? With more observations, better computers, we will probably know in 50 years. Maybe less.

But not to worry. Without human understanding the stars will continue in their courses. Who knows what physical laws we are following without perceiving they are there? Watch out for those apples.

-- Kevin Litten is a recreational astronomer and a member of the Chippewa Valley Astronomical Society