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Chippewa Valley Astronomy Update

Starry, Starry Night

By Bert Moritz

Figure caption: This is the galaxy NGC 3367, an astrophoto taken locally. What appears to be a bright star in the galaxy is a supernova that appeared last month – an exploded star temporarily outshining the rest of the galaxy. **Photo Credit**: Keith Kleinstick, member of the Chippewa Valley Astronomical Society.

So, you want to be an astronomer? Well, one thing is for certain. You will need to measure stars. After all, the word "astronomy" is derived from "astro" which means star and "meter" which means to measure. Astronomy literally means, "to measure the stars." This is a difficult task and astronomers first had to devise a way to organize the stars.

They began by counting. In a perfectly dark sky, well away from all artificial light, unaided vision allows us to see just over 9000 stars. To the ancients this was an immense number. But when Galileo Galilei first turned his small telescope toward the heavens, the true number of stars grew astronomically! Noted astronomer Carl Sagan illustrated this by saying, "The cosmos is rich beyond measure: the total number of stars in the universe is greater than all the grains of sand on all the beaches of the planet Earth." And there are 100,000 grains in each handful!

Faced with the job of organizing so many stars astronomers developed systems to group stars together. One system used gravitational attraction between stars. The smallest of this category is double

stars. 60% of all stars have a companion and these pairs revolve around each other in a nearly timeless dance. But our star, the Sun, is in the minority with no companion.

Next, they learned stars are born in groups. Condensing out of immense clouds of gas and dust, dozens to hundreds of stars can be formed together. These stars are locked together with gravity and they are called "open clusters." The Pleiades is a well-known example of an open cluster.

Another important grouping is called a "globular cluster." These groups of thousands to millions of stars are sometimes held by the gravity of a central black hole. Astronomers have discovered over 150 of such objects in our Milky Way Galaxy. The Hercules Cluster in the constellation of Hercules is a good example of a globular cluster and it is beautiful to view in a telescope.

The final gravitational star grouping is the largest. This is a "galaxy." Massive disc shaped star concentrations slowly rotating around black holes. Our Milky Way galaxy contains an estimated 100 billion stars! And with a diameter of 100,000 light years we live in an average sized galaxy. To confirm Dr. Sagan's illustration, the number of galaxies is estimated to be at least 150 billion!

Now you know there is plenty of work to go around for all of you budding astronomers. Measuring stars is a never-ending task leading to discoveries we can have never expected.

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