Far From Our World

By Mckenzi Ashley-Willie

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Abstract

Our whole galaxy is rotating around a fixed position which is the center. I am curious as to where exactly that is. I chose this project because I am very interested in space and what makes up space more specifically. The purpose of this project is to learn more about our galaxy and its boundaries. The information from this project isn't necessarily useful to the average person, but it could be useful to anyone who is interested in the same things I am. I hypothesize that the center of our galaxy will be wherever there are the most globular star clusters in one spot. This is why when you look at the galaxy, the center is a bright spot filled with stars. I will find where the center of the galaxy is using globular star clusters and where they are placed throughout the galaxy.

Question

Where is the center of our galaxy?

Variables

- Constellations
- Globular star clusters
- The amount of star clusters in a constellation

Hypothesis

If there are more globular star clusters in one area of the galaxy, then that is where the center of the galaxy is.

Globular Star Clusters

Globular star clusters are hundreds, thousands, sometimes millions of ancient stars that are all bunched together. From far away, these clusters of stars just look like a really bright star. These are the “really bright stars” you see in some of the constellations. There are 150 known globular clusters in our galaxy. A majority of them are estimated to be about 10 billion years old. These clusters contain some of the oldest stars in our galaxy and it is estimated that they were formed before the galaxy flattened into a sphere.

Most globular clusters can be seen with the naked eye, but it wasn’t until telescopes were invented that we could closely see into these globular clusters. These stars are fairly small and none are larger than 0.8 solar masses. These clusters are found in every direction of the sky and are very densely packed. None of the clusters contain any gas. Each cluster moves as a whole. Within the clusters, each star moves randomly by itself.

There is gravity inside the clusters that keep the stars from clashing into one another and it also keeps the stars from flying away into space. These clusters also rotate, but not very prominent. You can barely tell they are rotating if you look very closely. Scientists have stated that the bright spot in the middle of our spiral galaxy is just a bunch of globular star clusters bunched together. This is why in my hypothesis, I stated that I think the center of the galaxy will be where there are the most globular clusters because of how bright it is.

Materials List

- Internet access
  - Google earth
  - Globular Clusters List

Experimental Procedure

1. Background research
2. Find out which constellations have the most globular clusters in them
3. Find out where those constellations are in our galaxy
4. Make tables and charts of my findings

Data Analysis

Constellations	Number of globular star clusters
Scorpius	19
Ophiuchus	25
Sagittarius	35

Conclusion

The location of the center of our galaxy is known, but this was a fun experiment to conduct and go through. I conclude that my hypothesis was correct. Based on my data, the center of the galaxy is at or near the constellation Sagittarius. When you look it up and find out where the center actually is, it is near the constellation Sagittarius. My hypothesis was correct and my data is correct. The center of the galaxy is near the constellation Sagittarius.

Works Cited

Google Earth. earth.google.com/web/@0,137.0580466,0a,22251752.77375655d,35y,0h,0t,0r/data=KAE. Accessed 31 Jan. 2022.

Howell, Elizabeth. "Globular Clusters: Dense Groups of Stars." *Space.com*, 22 July 2015, www.space.com/29717-globular-clusters.html. Accessed 7 Feb. 2022.

Milky Way Globular Clusters. www.messier.seds.org/xtra/supp/mw_gc.html. Accessed 31 Jan. 2022.