

Chapter 16: Local Group Model

Student Worksheet

Objective:

Get to know your galactic neighborhood, especially in terms of population and distribution. Demonstrate your ability to plot objects when given their right ascension and declination coordinates. Answer the question: What can our Local Group tell us about other groups?

Engage:

Did you know there are about 46 members of our galaxy cluster? To hold an accurate picture of our place in the universe we must know where we fit in. Imagine being alive during the early 1600s when evidence for a heliocentric universe grew and grew, or in the 1920s when the fuzzy clouds seen through telescopes turned out to be island universes of their own, just like our Milky Way. These were huge bounds for our understanding of place. In the study of astronomy, our place is always being both further defined and further questioned.

Introduction:

Our galactic neighborhood, called the Local Group, contains many small elliptical and irregular galaxies. There are also three spiral galaxies in our neighborhood, including the Milky Way. As far as galaxy clusters go, ours is very small. Some clusters have thousands of members. Looking at the population of our cluster we can make inferences about other clusters.

In your activity today you will turn your classroom into a scale size and distance model of the local group.

Your Task:

Work in teams to make scale size models of each galaxy in **Table A.11** in the appendix of your book (Arny, *Explorations: An Introduction to Astronomy*, 7/E). Then use the right ascension and declination values to place the galaxies in the correct location in their clusters.

Your instructor will provide you with guidelines and parameters for this project.

Conclusion:

1. Describe the distribution of the galaxies in our neighborhood.
2. What types of galaxies are most prevalent?
3. Why would it be difficult to get a true sense of our cluster from far outside it? What might this tell us about other galaxy clusters?
4. In 5 billion years Andromeda and the Milky Way are predicted to collide in a galaxy merger. How, if at all, might this affect the smaller galaxies in our group?
5. Based on its position, what seems to be the fate of the Triangulum galaxy?

Extend:

- Compare and contrast the Local Group with another cluster about its size.
- How do galaxy clusters arrange themselves? What larger family is home to the Local Group?