

The Size of the Milky Way

4/05/07

- 1 Logistics
- 2 Where We've Been
- 3 Where We're Going
- 4 Today's Lab
- 5 Globular Clusters
- 6 What You Will Do

- 1 MLO 4/19 7:00 PM Waivers
- 2 Portfolio due by **MAY 10TH 6:00 PM**

Last Labs

- 1 Seasons
- 2 Astrolabe
- 3 The Celestial Sphere
- 4 Sun Spots
- 5 Scale of the Solar System
- 6 Revolution of the Moons of Jupiter
- 7 Planetary Orbits
- 8 Hertzsprung-Russell Diagram
- 9 Cosmic Distances

Course Structure

Start from our perspective here on Earth and move outward, explaining observed phenomena through scientific discovery.

1-3: Geocentric Universe; 4-7: Heliocentric Universe; 8: Doesn't depend on any center; 9: No center of the Universe?

Universal Questions

- We will first (today) find out the size of our Galaxy (historically, this was done not knowing there were other galaxies - so this was a size of the Universe calculation)
- Next week we will learn that there are billions of other Galaxies like ours
- After we get back from MLO, we'll do a lab about modern cosmology to understand astronomers current view of the birth and fate of our Universe.

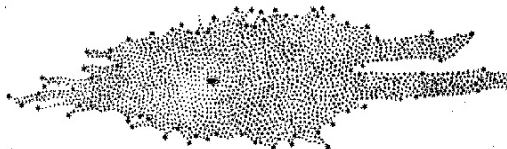
The Milky Way



What is the Milky Way

A short chronology

1610 Galileo discovered that the Milky Way is made of stars.
1700s William and Caroline Herschel (siblings) tried to determine the shape of the Galaxy by counting how many stars are in each direction. 1900s Jacobus Kapteyn used the same basic method and found similar results, the Sun is very close to the center.



The Skeleton of the Milky Way?

Around the same time as Kapteyn, Harlow Shapley was studying Globular Clusters.



- Lots of stars
- High Surface Brightness
- Can see them very far away

We will uncover this method, and also look into where Herschel and Kapteyn went wrong.

What You Will Do

- Use globular clusters and their distribution to find the center of the Galaxy - if in fact it isn't the Sun
- Understand the limitations of this method and what was throwing off people in the past
- Find the size of the Milky Way, and from there (with help from an independent measurement) an estimate of the Galaxy's mass.