Lecture 5.1 Milky Way I

From the Inside
Since we are on the inside of the Milky Way it is ________________ to take a picture or see a view of it from the outside.

There are really only ______ objects which do not belong to the Milky Way which can be seen with the naked eye.

Because of these two issues, it was long debated about the nature of “galaxies” and the universe. Some major questions at the turn of the 20th century included:

● What is the ________________ of stars?
● What is the size scale of the ________________?
● What were these ________________ nebula?

About a hundred years before William ________________ had speculated about the shape and size of the Milky Way coming up with a ________________ model. It was, however, based on an erroneous assumption that the stars were more or less uniformly distributed. This placed the earth near the “center”.

Later Harlow ________________ came up with an ________________ theory where the stars were not uniform in distribution but that globular ________________ were distributed spherically. This placed the earth off center.

To answer the second question there was a “Great Debate” between Shapley and Curtis. Shapley argued that the Milky Way was singular and gave estimates of its size. Curtis, on the other hand argued that the so-called spiral nebula were actually very distant and distinct galaxies – that the Milky Way was but one of many, many galaxies. But Curtis also placed the Milky Way at the center, while Shapley had the earth off center. The actual size of the Milky Way is between the estimates offered by both astronomers.

Milky Way Basics

● There are probably a few ___________ billion stars in the Milky Way.
● It is approximately ________________ light years in diameter.
● The sun is about 8.5 ________________ from the center.
● It takes about ________________ million years for the sun to orbit the Milky Way.

Disk

● It is thin.
● The stars in the disk tend to be younger, about ____ billion years old.
● Spiral arms more easily seen because of the hot ____ and ____ stars in it.
● Metallicity consistent with Population ____ stars.
● Lots of gas, dust, and ________________ clusters.
Halo

- It is roughly ________________
- The stars in the halo tend to be older, about ________________ billion years old.
- Little star formation, lots of older, redder stars.
- Orbits are not planar but more elliptical.
- Metallicity consistent with Population ___ stars.
- Little gas and dust, but lots of ____________ clusters.