

Astro 174 — “Our Milky Way” Homework — 04/21/09

You’ve spent a lot of time in this course learning advanced physical science and practicing problem-solving skills, which will be very useful to you in the years ahead. But there is another aspect of science, and of a good scientist, that is often not emphasized in scientific training but is crucial to master, especially in an academic environment: the ability to communicate—with other astronomers, non-astronomy scientists, and the general public. You will learn how to give science talks in grad school, whether at international conferences or just to your advisor, but training in how to speak about your field to the general public is often neglected.

Astronomy is a beautiful, engaging (some might even say ‘sexy’!), and most importantly, *accessible* scientific discipline; unlike other fields, astronomy can be presented to non-scientists at a decent level without specialized equipment or mathematics, and with some of the most stunning visuals ever taken. Thus we are uniquely well-placed to engage people in science, entertain them and get them thinking about scientific pursuits, and encourage support for scientific endeavors among children and adults alike.

In order to do this, however, the astronomers they encounter must be able to help them understand the topic at hand, whether it be black holes and cosmology, or robotic missions to the Moon or Mars. The ability to effectively explain advanced topics on a more basic level, while retaining the excitement and importance of the work, is extremely valuable to both the individual and the field in general.

So as you may have guessed, this week’s homework assignment involves thinking about astronomy presentations to the public. One of the most dramatic and popular topics of discussion is the simple enormity of most astronomical objects, compared to our day-to-day experience: planets, solar systems, galaxies, galaxy clusters, all the way up to the Universe itself. How do you explain or demonstrate to a non-astronomer just how vast a space we live in, in terms they can understand? This week I talked about the Milky Way Galaxy and our Local Group. Often these size scales are presented using objects and scaled distances that we find in our everyday lives, to which people can relate.

Your assignment is to design (not actually put together) a scale demonstration of our Galaxy and surrounding neighborhood. You may split it up into “our galaxy” and “Local Group sets, or you may portray them together—whichever you think would be most practical and educational with the scales that you choose. The only hard requirements are that the demonstration kit must be reasonably portable (e.g., you cannot use the Earth as an object) and appropriate for the general public, the distance and size scales must be approximately correct (if the Sun were a basketball, the Earth could not be a volleyball 2 inches away), and there must be enough features included to give a good idea of the structure of the Galaxy. Useful features include the Galactic bulge, the bar, the disk’s width-to-thickness ratio, the extent of the halo, the size and distribution of globular clusters, and the size and distances to our dwarf galaxies and to the Andromeda Galaxy, among others. Feel free to be creative, both in the features you include and in the objects you choose to represent them.