PHYS 122: Life in the Universe
Class Session 3, Thursday January 13, 2011

LEARNING OBJECTIVES

1) Put in order of LARGEST to smallest with approximate size (in light years) the following astronomical entities: The Local Group, The Solar System, The Milky Way, and The (observable) Universe. For each describe its contents.

2) Compare and contrast Dark MATTER with Dark ENERGY (how are they similar, how are they different). Describe the scientific evidence (observations for each) that suggests their existence.

3) Describe the Big Bang theory, what is expanding in the Universe and what is not, and list three pieces of scientific evidence supporting it.

Required Textbook readings for class: 51-60, 66-68 (most of 3.2)

Relevant questions to test your understanding of assigned reading (and for pre-class quiz):

1. What is the size (light travel time) and content of our solar system (the book doesn't say, but its about 5 light hours to Pluto from the Sun), the Milky Way, and Local Group?
2. What is the observational evidence for Dark Matter? For Dark Energy?
3. In what way are Dark Matter and Dark Energy similar? How are they different?
4. When was the expansion of the universe discovered? What did this indicate about the age of the universe?
5. What two pieces of evidence indicate the universe was MUCH smaller and hotter in the past?
6. What other bit of evidence supports a smaller, hotter universe in the past?
7. What is the difference between the whole universe and the observable universe?