

12.007 Problem Set #1

Out: Thurs. 2/20/03

Due: Thurs. 2/27/03

1. **Time & space scales and the origin of the Universe & Solar Sytem.**

Provide (a) five examples of astronomical objects and (b) five examples of astronomical phenomena spanning spatial and temporal scales covering at least 5 orders of magnitude each. Where meaningful, provide the approximate age and/or duration of the phenomenon.

Example:

Spatial Scales

Universe, $\sim 10^{10}$ lt-y.

Time Scales

Big Bang, $\sim 10^3$ yr for H & He nuclei to become stable. Occurred 13.8 Ga.

2. **Nucleosynthesis.** Briefly describe the distribution of elements and how they evolved in (a) the Solar nebula, (b) Earth, and (c) Earth's crust.

3. **Origin of Life.** Briefly discuss why it is so difficult to determine (a) 'when life began' and (b) 'how life began.'