

## **Class #1 (Jan. 11) Reading Questions - Cosmic Onion, Chapt. 1-2**

1. What is the connection between cosmology, which studies the large scale structure of the universe, and particle physics, which is concerned with the small scale structure of nature.
2. What do you think of Feynman's statement about the importance of the atomic theory (pg. 13)?
3. On pg. 14 Close gives the thickness of a monolayer of oil on water (which provides a measure of the size of an oil molecule). What is this thickness in meters and how does this compare with Rutherford's estimate of atomic size of  $10^{-8}\text{cm} = 10^{-10}\text{m}$  seen in his notes (see page 24).
4. Rutherford estimated the size of a gold nucleus to be smaller than  $3.6 \times 10^{-12}\text{ cm}$  (see pg. 24). For this he needed to know the speed of his alpha particles. How do you think he was able to measure this speed?
5. What is the difference between a particle and a wave?

**Your Question:** Please give a well-formulated question that you have regarding the material covered in this reading assignment.