

ASTR 121 – Spring 2016

**Lab 6 – Hubble’s Law: Prelab Questions**

Due Monday, [Date TBA]

Answer the following questions on a separate sheet of paper.

1. For this lab you will be accessing an online database to find information about the galaxies you will use to measure the expansion of the universe. Go to: <https://ned.ipac.caltech.edu/>. Look up the following galaxies and list their apparent visual magnitude: NGC 4725; NGC 3982; NGC 5896
2. There are three lines that we are looking at in galactic spectra in this lab. List the three lines, their wavelengths, and whether they’re absorption or emission. How will an absorption line appear different than an emission line in the spectra?
3. As explained in the lab handout, Hubble’s constant can be used to estimate the age of the universe with the relationship  $t = 1/H$ . Though the relationship is simple, the units are not. For a value of  $H = 70 \text{ km/s/Mpc}$ , calculate the age of the universe  $t$  and report your answer in units of years.
4. Look up the article “A Brand New Way to Determine Hubble’s Constant” on Astrobit.es. What are the major differences between how they determine Hubble’s constant versus how we will find it in the lab?