Homework 6 – Due Tuesday May 13

1) What is the observational evidence that supports the "concordance" value o f $\Omega_m = 0.26$?
How much of this is dark matter and how much is baryons?

2 Cosmological constant [10 pts]
Discuss the observational evidence that supports the ideas
(a) that the universe is accelerating and hence the Universe contains "dark energy"[5 points], and
(b) that the curvature of space is k = 0, and that the value of $\Omega_\Lambda = 0.74$.[5 points]

3 Is inflation the solution, Dr. Bernanke? [20 pts.]

Name 3 problems faced by standard cosmology. What is the motivation for cosmic inflation? How can we test this theory? What do you think about it?

4. Dark Matter and galaxies **[10 pts]**

Give a clear and concise explanation for why we believe there is a tremendous amount of dark matter around galaxies and galaxy clusters that is not "normal" baryonic matter. Write this explanation as if you were trying to explain it to a friend who doesn't know much science (even better, try it on a non-scientist friend of yours and see if they are convinced!).

5. Measuring Cosmological quantities **[10 pts]**

Explain how Type 1A Supernovae (SN1a) have been used to derive cosmological quantities. What property of a SNIa makes it useful for this purpose ?

6. FMC Q12.12 **[10 pts]**

7. Galaxy Formation **[10 pts]**
Please describe the processes involved in galaxy formation;
what is different about dark matter and baryons that is important for this process.