

Homework 6 – Due Thursday May 7; It will be graded but may not be handed back due to end of the semester

1) What is the observational evidence that supports the “concordance” value of $\Omega_m = 0.26$? [5pts]

How much of this is dark matter and how much is baryons? [5pts]

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 [15pts]

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. FMC Q12.12 [15pts]

6. Galaxy Formation [15pts]

Please describe the processes involved in galaxy formation; what is different about dark matter and baryons that is important for this process.