

Exercise	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	Total
100%	2	2	1	1	2	3	1	2	3	17
Points										

Name:

Extragalactic Astronomy and Cosmology

Homework 10 - Lecture 23 - measuring Λ

Due date: December 5

To contact me: e-mail to beckmann@milkyway.gsfc.nasa.gov or visit me during office hours (Tuesdays & Thursdays 10 - 12:30 a.m.) in room physics 415

1 Can Λ be determined from nearby Type Ia Supernovae ?

Read the article by Erni & Tammann (2006). Answer the following questions:

1. Why do the authors think it is problematic to use the high redshift Supernovae Type Ia in order to determine Λ ?
2. How do the authors proof that the local Type Ia Supernovae can be used to determine Ω_M and Ω_Λ ?
3. According to Figure 2, what is the allowed range (with 68.3% confidence) of Ω_M for a flat Universe ?
4. According to Figure 2, what is the allowed range (with 95.4% confidence) of Ω_Λ for a flat Universe ?
5. Considering these large uncertainties, why do the authors believe this can put significant constrains on our cosmological models?
6. What is, according to the article, the difference of Sypernovae Type Ia detectable in the local universe compared to those at high redshifts?
7. How many Supernovae Type Ia per year can be expected with a brightness limit of $m_V = 20.0$ mag ?
8. How many Supernovae Type Ia per year can be expected with a brightness limit of $m_V = 19.0$ mag ? [Note that the magnitude scale is logarithmic and inverted, thus an object with $m_V = 19.0$ mag is 2.5 times *brighter* than one with $m_V = 20.0$ mag]
9. What is your overall opinion about the proposed project?