

UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Department of Physics
2014 Winter Quarter

GALAXIES AND COSMOLOGY

Professor Treu

HOMEWORK #5
COSMOLOGICAL PARAMETERS

Problem 1: Four universes. Which one?

Compute and plot for the 4 universes shown in Figure 6.4 of Ryden the following quantities:

-Differential volume as a function of redshift per unit solid angle. -Angular size distance. -Lookback time.

The most distant galaxies known are observed at redshift $z \sim 6.5$. Imagine that you could measure the age of their stars and find it to be 0.7 Gyrs. Which of the four models would this observation allow you to rule out?

Problem 2: Single component and observables:

Ryden 7.3.

Problem 3: Within the horizon:

Ryden 6.8.

Problem 4: Olbers' paradox revisited:

Ryden 7.8.