

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

GALAXIES AND COSMOLOGY

Professor Treu

**HOMEWORK #8**  
CMB and the early universe

Problem 1: **Recombination and baryon to photon ratio**  
Ryden 9.1

Problem 2: **Redshift of Reionization**  
Ryden 9.5

Problem 4: **Gamow's argument**  
Ryden 10.3

Problem 5: **Second inflation**  
Ryden 11.3.