

## Weekly assignment for week 6 (27/02/16) AST3220

### BEFORE THE CLASS (AT HOME)

This week we will finish the ‘typical’ exercises in Chapter 1: Before the class, do/try/take-a-look/think-how to solve exercise 1.9, 1.14 and 1.15. We will discuss them in the class but you will probably have no time to do them during the class, because you will be doing 1.8.

If you want extra challenge go for 1.16 and 1.17 as well, but we will not discuss them.

Next week (first of March) we will start with previous exams to warm-up for the midterm (and final) exams so we first need to have all the theory in mind. Owing to that, I would like to ask you to go through Oystein’s lecture notes and make a list-summary of chapter 1.

For example, define and give a very brief explanation: - Principles of Special relativity - Line element (what is it? How it reads? Equation) - Time delay, contraction of distances... - Curved space time (What is it, how GR affects it) - Cosmological pple (homogeneity, isotropy) - Gauss curvatur - FRW line element, equations, how to calculate distances... - Curvature  $k$  - Open, flat, closed universes - Redshift and distances - Friedmann equations - Equations of state: dust, radiation, Lambda, combinations of them... what means? what happens. - Cosmological models - Static universe, EdS, dS... - Horizons - etc.

This summary is for you and it will not be graded. However, if you want feedback you can give it to me and I will write some suggestions and/or recommendations back. You have time until the class on Friday, and you can leave it any time in my post-box (Lluís Mas Ribas, ground floor, next to the printers – main entrance to the right), you can give it to me in my office 106, e-mail it (lluismasribas@gmail.com) or on Friday during the class. You don’t need to put your name (understandable hand-writing is appreciated).

### Look at before class

We will work on exercise 1.8 during the class.

### Bonus problems from universeinproblems.com

Problems 1 to 6, 12 and 13 from the section *Cosmological horizons*.