

ICTP DIPLOMA PROGRAMME IN HIGH ENERGY PHYSICS 2012-13

SYLLABUS

Cosmology - {11 Lectures = 16.5 hours} P. Creminelli

1. Equilibrium thermodynamics

Fermi and Bose statistics. Thermodynamical quantities. Entropy conservation. Neutrino decoupling.

2. Beyond equilibrium

Boltzmann equations. Dark Matter decoupling and WIMP miracle. Nucleosynthesis. Recombination

3. Cosmic microwave background

Boltzmann equations for photons. Temperature anisotropies. Solutions in tight coupling approximation.

4. Cosmological perturbations theory

Perturbed Einstein equations. Choice of gauge. Adiabaticity and conserved quantities.

5. Problems with the standard cosmological model and inflation

Horizon and flatness problem. Definition of inflation. Slow-roll inflation.