PHYSICS OF THE VERY EARLY UNIVERSE

Readings

Week 1: Review of Standard Cosmology and its Problems


Week 2: Inflationary Universe Scenario


Weeks 3 and 5: Theory of Cosmological Perturbations


Week 4: Cosmic Microwave Background

* W. Hu and S. Dodelson, “Cosmic Microwave Background Anisotropies”, astro-ph/0110414, up to and including subsection 4.2
* Planck Collaboration, “Planck 2013 results: XVI. Cosmological parameters” arXiv:1303.5076. Supplementary reading for recent observational results. Focus on Fig. 1 and Table 2
Week 6: Reheating after Inflation

* M. Amin et al, arXiv:1410.3808, Sections 1 - 3
* R. Allahverdi et al, arXiv:1001.2600; Sections 1 - 3 (with emphasis on 3).

Week 7: Topological Defects and Structure Formation


Week 8: Topological Defects (continued) & Problems of Inflation and Alternatives


Week 9: Bouncing and Emergent Cosmologies


Week 10: Inflation in String Theory


Week 11: Dark Energy


**Week 12: Quantum Field Theory Methods in Cosmology: LAST WEEK**

∗ R. Brandenberger, ”Quantum field theory methods and inflationary universe models”, Rev. Mod. Phys. 57, 1 (1985); Sections II - IV (Effective potential, finite temperature field theory, bubble nucleation).