Starring: Jordi Miralda, Part I
Cristiano Germani, Part II (also as coordinator)

A compulsory dual course

Compulsory

The last two decades of cosmological observations gave us a picture of our Universe with an astonishing precision…

A compulsory dual course

Compulsory

… some of the major pressing questions in physics are related to those observations:

. Universe striking homogeneity
. Its current acceleration (aka Dark Energy)
. Dark Matter….

A compulsory dual course

Compulsory

Cosmology became an important basic knowledge for all physicists

A compulsory dual course

Dual

Part I (astrophysics, Miralda) 13/9-31/10:

This module aims to introduce current observations and the way to interpret them. Basics of classical and quantum mechanics will be used.

A compulsory dual course

Dual

Part II (theoretical physics, Germani) 2/11-21/12:
This module aims to introduce the conceptual ideas behind current models of the universe evolution from its early times. Languages and techniques of theoretical/particle physics will be used.

Main topics Part I

1. Spacetime and the expansion of the universe
2. Cosmic microwave background radiation
3. Cosmic budget and cosmological parameters
4. Large scale structure

Main topics Part II

1. Hydrodynamical variables and chemical reactions (the universe elements)
2. Early Universe: thermal history
3. Dark Matter
4. Elements of cosmic inflation
5. The cosmological constant problem

EVALUATION
(will be on modules styles)

Continuous evaluation (exams during the course):

Part I:
25 % assigned exercises
25 % written exam

Part II:
25% Presentation of a chosen written essay of a topic closely related to the course syllabus
25% written exam on the course material

Examination-based assessment: 100% written exam
(to be chosen within terms)

Repeated assessment: June 2024

BACKGROUND

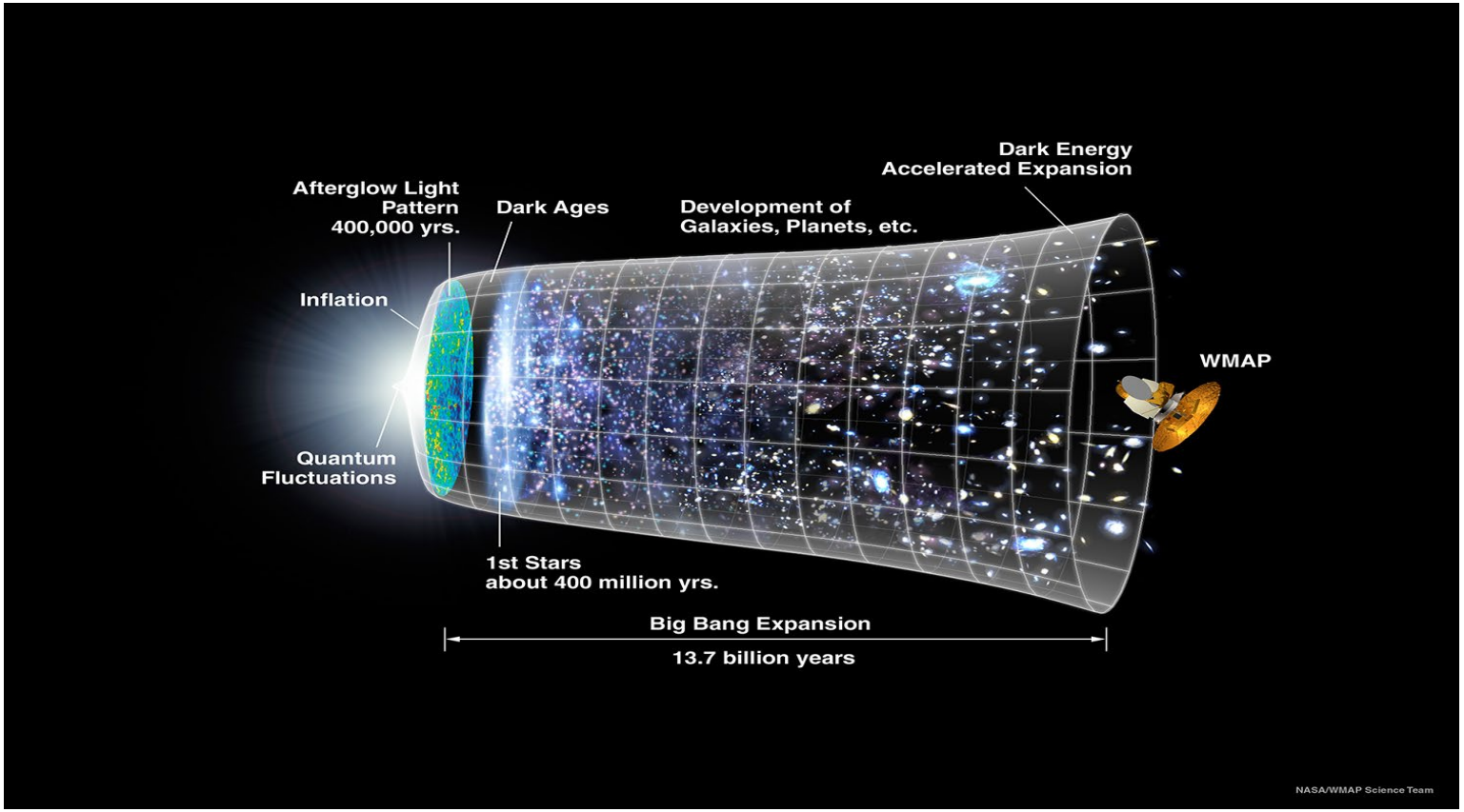
Essential background in basic physics:

1. “Classical mechanics, special relativity”
2. “Electromagnetism”
3. “Thermodynamics, statistical mechanics”

Working knowledge of:

1. “Astrophysics and cosmology”
2. “General relativity”
3. “Quantum mechanics”

BIBLIOGRAPHY



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Thanks!

Questions?