UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

General Relativity

2122-1-F1701Q084

Aims

General relativity and applications.

Contents

1) Principles and equations of general relativity.
2) Elements of differential geometry.
3) Black hole physics.
4) Elements of cosmology.

Detailed program

1) Summary of special relativity. Minkowski spacetime.

2) Equivalence principle. Accelerated observers.

3) Elements of differential geometry. Curvature. Geodesics.

4) Physics on curved spaces. Curvature and gravity. Einstein's equations. Rudiments of Hamiltonian treatment.

Vielbein formalism.

5) Gravitational waves. Black holes: Schwarzschild, charged, rotating solutions. Definition of mass in general relativity. Causality.

6) Elements of cosmology. De Sitter and anti-de Sitter spaces.

Prerequisites

Undergraduate degree in physics.

Teaching form

Lessons, 6 credits.

Textbook and teaching resource

Lecture notes available at https://www.dropbox.com/s/t84lftb2llgb87w/GR.pdf?dl=0P

Semester

First semester

Assessment method

Written and oral exam. Exercises and problems on the course's topics.

Office hours

By appointment