UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

General Relativity

2223-1-F5802Q012

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, of equal weight in the final evaluation, not necessarily in the same call.

Written exam: ten exercises, two hours and a half. Object of evaluation will be the logic used in the resolution of the problems.

Oral exam: open questions on the course's topics, unrelated to the written exam. Object of evaluation will be the candidate's knowledge of the theoretical part of the program.

Office hours

By appointment

Sustainable Development Goals

QUALITY EDUCATION