



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Gravitational Wave Astrophysics

2021-1-F5801Q051

Aims

Acquire basic knowledge in the field of gravitational waves, which have recently been confirmed as an extraordinary tool for understanding the universe and the objects that populate it.

.....
.....
.....

Contents

.....
.....
.....
.....

Detailed program

1- Theory of gravitational wave emission

.....
.....

2- Gravitational wave signals from binary systems

.....
.....
.....
.....

3- Astrophysics of gravitational wave sources

- stellar mass binaries (white dwarfs, neutron stars, black holes)

5- Bayesian data analysis of gravitational wave signals

- signal to noise ratio

Prerequisites

None, besides the basic classes of the bachelor.

It is advised to take this class after Relativistic Astrophysics. Some of the concepts developed during the course will be easier to understand if the students have attended the General Relativity course. I stress, however, that this is not a needed prerequisite, as the course will be largely self-contained.

Teaching form

42 hours of frontal lectures, mostly at the blackboard, occasionally with the support of slides

If the COVID emergency persists in the second semester, lectures will be recorded and distributed in remote via the e-learning platform.

Textbook and teaching resource

Supporting material will be uploaded on e-learning during the course of the semester, in any case here

follows an (incomplete) list of useful references.

2-gravitational wave signals from binaries

Michele Maggiore: "Gravitational Waves". Book 2, 2018

Semester

Second semester

Assessment method

Oral examination. The student will first be asked to elaborate on a topic of his choice for about 15-20 minutes. In the rest of the exam, the lecturer will ask other questions covering any of the topics treated during class.

There will be no intermediate examinations nor marked homework.

If the COVID situation persists in the second semester, exams will be held remotely using the teleconference platform Zoom.

Office hours

Any day is possible, so long as an appointment is requested via email.

If the COVID situation persists in the second semester, meetings will be held remotely using the teleconference platform Zoom.
