



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Esperimentazioni di Astrofisica

1920-3-E3001Q058

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#### Aims

*Introduce instrumentation and techniques for Astrophysics; allow students to have the first experience in sources observation and signal calibration.*

#### Contents

Astronomical sources, techniques and instrumentation used in astrophysics are described for the several spectral bands, with particular attention to the microwave band used during the laboratory activity. Students are guided to perform some measurement including: detector characterisation; calibration of observed signals; observation of sky sources.

#### Detailed program

In the first part astronomical sources and observables are described, among them: Sun, Moon, Galaxy, Cosmic microwave background, Cosmic rays. Techniques and instrumentation used in astrophysics are also described for the several spectral bands, with particular attention to the microwave band used during the laboratory activity. The following items are presented: antennas, telescopes, optics; detectors; photometric and spectroscopic techniques; noise reduction techniques and data analysis.

Students will work in groups of 3-4 people. Each group will carry on observations of sky sources like: Sun, Moon, Galaxy, Cosmic microwave background, Cosmic rays. Groups are then involved in measurements including: detector characterisation; calibration of observed signals. Each group will analyse data and subtract spurious signals like rf interferences or atmospheric emission. Finally groups will describe their activity and discuss results in a short report.

## **Prerequisites**

Students are requested to know contents of courses of Physics and Laboratory followed in the previous years and semesters.

## **Teaching form**

Introductory front teaching: 20-24 hours; Laboratory experimental training: 72-76 hours.

## **Textbook and teaching resource**

- 1) Slides and notes of the introductory lectures, provided by the lecturer.
- 2) Software codes and packages for driving instruments and data analysis.

## **Semester**

Second semester.

## **Assessment method**

Final assessment with the usual score up to 30; evaluation by written report on the activities carried on in laboratory, including experimental measurements and data analysis, plus an interview related to the same topics.

## **Office hours**

Every working Monday during the course, from 12:30 pm to 1:30 pm. Otherwise on request.

