



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Introduction To Galaxies

2425-1-F5802Q024

Aims

Provide the background knowledge of current theories and observations of galaxy formation and evolution. Provide the background knowledge and skills for the analysis and interpretation of observational datasets, of the outputs of numerical simulations and of galaxy formation models.

Contents

Theories, observations and numerical simulations of galaxy formation and evolution: elements of galaxy formation; statistical properties of galaxy samples; high-redshift galaxies; the inter- and circum-galactic medium and the galaxy environments; star formation in galaxies and stellar populations

Detailed program

The following topics will be described:

- Growth of dark matter cosmic structures, gas cooling, star formation processes, feedback processes (from supernovae and AGN).
- The inter- and circum-galactic medium, gas accretion theories.
- Stellar Population Synthesis models, estimates of the galaxy physical properties (stellar mass, gas mass, stellar population age, star formation rate, metallicity)
- Galaxy evolution models, equilibrium models, semi-analytic models and numerical simulations.
- Galaxy evolution as a function of mass and environment, quenching of the star formation activity, environmental effects (ram pressure stripping, mergers, gravitational interactions).

Prerequisites

Undergraduate degree in physics.

Teaching form

Lectures on the main theoretical concepts (35 percent, traditional lectures). Each set of lectures will be followed by hands-on sessions on specific datasets or numerical techniques to practice the background concepts, through work done individually or in small groups (65 percent, interactive teaching).

Attendance in presence to the hands-on sessions is highly recommended.

All activities will be in English.

Textbook and teaching resource

Houjun Mo, Frank van den Bosch, Simon White; *Galaxy Formation and Evolution*; 2010 Cambridge University Press.

Handouts provided by the teachers via the e-learning platform.

Relevant papers from the literature will be suggested to deepen the knowledge of the topics.

Semester

First semester.

Assessment method

Written report on the results of two of the hands-on sessions (chosen by the student) and oral exam on the lectures and practical sessions.

Office hours

By appointment (via email).

Sustainable Development Goals

QUALITY EDUCATION
