

General astrophysics



Lecturers: **C. Benoist, B. Carry, A. Crida, M. Faurobert, P. de Laverny**

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Objectives

The aim of this course is to provide a very broad and basic overview of astronomy and astrophysics in terms of objects (planets, stars, galaxies, the universe), of observational methods (photometry, spectroscopy), and general theoretical frameworks (formation and evolution of planets, stars, galaxies and large scale structures). While this overview only gives some flavours of different branches of astrophysics, most topics presented here are covered in details in following fundamental courses or in dedicated Meteors.

Prerequisites

None

Evaluation

Stellar physics : written report based on a homework problem (1/4).
Written exam for the 3 other parts (3/4).

Bibliography & Resources

- Online lectures: <http://jalon.unice.fr/cours/crida/Cours-crida-20160909190232>
- Astrophysics of Planet Formation, *Philip J. Armitage*, CUP, 2013
- An Introduction to Stellar Astrophysics, *Francis Leblanc*, Ed. Wiley, 2011
- The Milky Way Structure, Dynamics, Formation and Evolution, *Françoise Combes & James Lequeux*, EDP Sciences, Savoirs Actuels, 2013
- Extragalactic astronomy & cosmology : an introduction, *Peter Schneider*, Springer, 2010

Contents

Part 1: Planetology

by BENOIT CARRY (EVEN YEARS) & AURÉLIEN CRIDA (ODD YEARS)

1. Definition of planet, from the ancient Greeks to modern astronomy
2. Census and formation of our Solar System
3. Detection & statistics of exoplanets
4. A global picture of planetary formation

Part 2: Stellar Physics

by MARIANNE FAUROBERT

1. How do we measure distances, luminosities, radius and masses of stars?
2. Stellar spectra and classification
3. An overview of stellar evolution

Part 2: The Milky way and its Interstellar Medium

by PATRICK DE LAVERNY

1. The Milky Way: global description of the Galaxy and the Local Group
2. The Solar vicinity: stellar and interstellar content
3. The Galactic stellar components: characteristics of the stellar populations
4. The history of the Milky Way: chemo-dynamical evolution

Part 4: Cosmology

by CHRISTOPHE BENOIST

1. From the static universe to Big-Bang cosmologies
2. The Cosmic Microwave Background
3. Cosmological models
4. The inhomogeneous universe, galaxies, clusters, dark matter