科目ナンバリング	U-LAS12 20017 LE57						
授業科目名<英訳>	Introduction to Cosmology-E2 Introduction to Cosmology-E2			担当者所属職名・氏名	基礎物理学研究所 准教授 Antonio De Felice(アントニオデフェリーチェ)		
群	自然科学科目群			分野(分類)	物理学(発展)	使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2026・前期	曜時限	水2	配当学年	主として1・2回生	対象学生	全学向

[授業の概要・目的]

The aim of this lecture is to introduce the basic concepts of modern cosmology. Our current understanding about the history of the universe is explained so that one can capture how observational data are interpreted with the aid of the law of physics in an elementary way. For this purpose, the development of the basic theories of physics necessary to describe modern cosmology will be reviewed in a less rigorous way. The lecture is supposed to be interactive.

[到達目標]

Students will be able to understand how to approach the study of cosmology in a mathematical and physical way.
They will be introduced to the problems of modern cosmology, and to the methods cosmologist use to try to solve them.
The discussion will tend to link cosmology to other fields in physics, e.g. thermodynamics, (some notions of) particle physics.

[授業計画と内容]

I. Introduction and Historical backgrounds
II. The Role of the Speed of Light in Special Relativity
III. Newtonian Gravity and General Relativity
IV. Homogeneous Universe Model based on General Relativity and Discovery of the Expanding Universe
V. Tips of Thermodynamics
VI. Nucleosynthesis in the Early Universe
VII. Prediction and Discovery of Cosmic Microwave background
VIII Shortcoming of the Big-Bang Cosmology
IX. Inflationary universe
X. Inevitable Quantum fluctuation
XI. Structure Formation of the Universe
XII. Inflation Again in the Present Universe?

In total, at most 14 classes will be offered (one for each week of the semester) plus one feedback meeting with the students.

[履修要件]

特になし

Introduction to Cosmology-E2(2)へ続く↓↓↓

Introduction to Cosmology-E2(2)

[成績評価の方法・観点]

Evaluation method: 25%: mid term exam; 75%: final exam. No homework is given during the whole duration of the course.

[教科書]

Antonio De Felice 『Lecture notes』 （given in the class as a pdf file）

[参考書等]

（参考書）

Michael Rowan-Robinson 『Cosmology』 （Clarendon Press, Oxford, 2011）

[授業外学修（予習・復習）等]

The students will be provided with the lecture notes of the course [as a pdf file in LMS and on kulasis]. They are supposed to study them, not only to review the work done in previous lectures but also to prepare for the upcoming ones.

[その他（オフィスアワー等）]

Office hours: 2hrs per week to be decided with the students [usually taking place on Fridays at noon]. E-mail will be provided, so that the students can contact the teacher at any time.

[主要授業科目（学部・学科名）]

理学部