PHYS-UA 800 Special Topics in Cosmology

Course Description

This course is a technical but elementary introduction to the modern understanding of cosmology, intended for non-science students. We will cover advances in cosmology over the last 100 years, with special emphasis on more recent developments in the field. We will cover topics ranging from the early universe to galaxy formation in the present day universe, through the lens of the theory of relativity and the expanding universe. We will cover the Big Bang, the Cosmic Microwave Background, dark matter, dark energy and the associated evidence for these phenomena. Assumes a high-school level mathematics and physics background. This course counts to the astronomy minor.

Course Text

Foundations of Modern Cosmology, Hawley and Holcomb, 2nd Edition.

Course Grades

Midterm Exam - 30%
Final Exam - 40%
Homework - 30%

Syllabus

- Cosmology becomes a field
- Space and Time
- Special Theory of Relativity
- General Theory of Relativity
- Black Holes
- The Expanding Universe and the Friedmann Equation
- The Expanding Universe and Dark Energy
- The Early Universe and the Big Bang
- The Early Universe and the Theory of Inflation
- Dark Matter
- Large Scale Structure and the Cosmic Web
- Galaxy Formation and Evolution