

PHYSICAL COSMOLOGY – ASTRONOMY 113 – WINTER 2006

Instructor: George Blumenthal (359 Interdisciplinary Sciences Building, x2005) george@ucolick.org

Time/Place: MWF 2:00-3:10, Interdisciplinary Sciences Bldg 165 (No class on Friday January 13)

Office Hours: Friday 3:15-4:30 + as available

Prerequisite: Math 22 or 23A, Physics 5B or 6B, and Physics 101A

Requirements: Homework, midterm and final exam (March 20 8:00-11:00)

Recommended books:

- **Barbara Ryden** *Introduction to Cosmology* Addison Wesley **RECOMMENDED**
- **Jeremy Bernstein** *An Introduction to Cosmology*
- **Andrew Liddle** *Introduction to Modern Cosmology*
- **Matts Roos** *Introduction to Cosmology*
- **Eric Linder** *First Principles of Cosmology*

PHYSICAL COSMOLOGY

- I. Introduction
- II. Cosmological Principle
- III. Expansion of the Universe
 - A. Observations
 - B. Cosequence of the Cosmological Principle
- IV. Newtonian Cosmology
- V. Relativistic Cosmology
 - A. Spatial Curvature
 - B. Redshift
- VI. Classical Cosmological Tests
- VII. Background Radiation
- VIII. The Early Universe
 - A. Early Epochs
 - 1. Baryosynthesis
 - 2. Inflation
 - B. Nucleosynthesis
 - C. Radiation Dominated Universe
 - D. Recombination
- IX. Galaxy Formation
 - A. Classical Theory
 - B. Effects of Including Dark Matter
 - C. Modern Issues in Structure Formation
- X. Evolution of Galaxies
- XI. Unanswered Questions