

PHYS 432/750-001, Winter 2008

Cosmology

Prof. David Goldberg (*goldberg@drexel.edu*)

Office: Disque Hall, Room 810

Phone: (215) 895-2715

Lectures: T,Th, 11:00-12:20, Disque 919

Textbooks

Introduction to Cosmology, Barbara Ryden, 2003, Addison-Wesley

An Introduction to Modern Cosmology, 2nd Ed., Andrew Liddle, 2004, Wiley

Course Overview

Cosmology is the study of the universe taken as a whole. In this class, we will explore the range of possible universes – how they are born, how they evolve, distance and time-scale within them, and how they might end. We will also look at our universe in particular. What are the parameters that govern our universe? How do we measure them? How is our universe “fine-tuned” to allow for life as we know it?

Evaluation

The grading scheme for this course is:

- 25% Homework
- 10% Class Participation
- 30% Midterm
- 35% Final Exam

Homework

The problem sets will be nearly identical for the undergraduates and the graduate students, with occasional additional problems required for the graduate students only. They will be assigned every week, and will be due the following week at the beginning of class. The lowest homework grade will be dropped.

Important note on late assignments: Homeworks submitted late will be penalized 10% for each day up to 2 days. No homeworks will be accepted more than 2 days late.

Class Participation

I expect everyone to attend every lecture, and be on time. Habitual lateness *will* result in you not being admitted to class. I'm talking to you, Parejko. You are also expected and encouraged to ask questions, participate in discussion, and, of course, correct the myriad of algebraic errors that I'm likely to make during the course.

Exams

At approximately week 6, we will have an in-class midterm, and at the end of the course, we will have a final exam (during exam period). The format of the problems will be similar to those on the homeworks. You will be given a formula sheet during the exams.

Tentative List of Topics

- What is Cosmology (R1,2.1-2.2; L1,2.1-2.3)
- The Dynamics of Simple Universes/Newtonian Cosmology (R4,5; L2.4,3,5)
- How we see it on earth/ Hubble's law and so forth (R2.3, L5.1,5.2,6)
- Newton to Einstein (R3; L4,Advanced Topic 1)
- Multiple Component Universes (R6)
- Measuring the Cosmological Parameters (R7, L6,8,Advanced Topic 2)
- Dark Matter (R8, L9)
- Dark Energy (L7)
- The CMB (R9, L10)
- Nucleosynthesis (R10, L11,12,Advanced Topic 4)
- Inflation and the Early Universe (R11, L13)
- The growth and evolution of structure (R12, L Advanced Topic 5)

R=Ryden

L=Liddle