

PHYSICS 162
COSMOLOGY
SPRING 2016

Instructor: Kim Griest
Time: MW 11-12:20pm
Place: Sequoyah Hall 148

Homework Discussion: Thursday, 3-3:50pm, SERF 383

Griest Office: 337 SERF, 534-8914, k g r i e s t @ u c s d . e d u

Griest Office Hours:
Wed: 2:00pm-3:00pm, or make an appointment by
contacting me.

Text: Introduction to Cosmology, Barbara Ryden
but a lot of material will be only given in class.
THUS YOU NEED TO ATTEND CLASS to do well in this
course.

TA: Nathan Butcher, nbutcher@ucsd.edu
TA Office Hours: BY APPOINTMENT, SERF 383 NOTE CHANGE

Final: Friday June 10, 11:30am-2:30pm, SEQUO 148
[NOTE: YOU MUST ATTEND THE FINAL; CHECK YOUR SCHEDULE NOW!]

Web page: <http://physics.ucsd.edu/students/courses/spring2016/physics162>

SYLLABUS

1. Tour of the Universe
2. Olbers paradox, why the night sky is dark, the expanding Universe
3. Einstein's General Relativity: measuring distances in curved space (metrics)
4. Equations for the expanding Universe (FRW metric and equations)
5. Redshift and distances in an expanding Universe, the Hubble law
6. Pressure in General Relativity; Radiation, Dark Matter, Dark Energy
7. The origin and fate of the Universe
8. Different kinds of distances: angular diameter, luminosity, proper
9. Supernovae as standard candles
10. Observational cosmology, magnitudes, etc.
11. Dark Matter and Dark Energy
12. Horizons: How far can we see now and forever
13. The Early Universe: Temperature and redshift, History of Universe
14. Overview of Particle Physics

15. Entropy and the Creation of Particles
16. The Cosmic Microwave Background: Birth of Atoms
17. Big Bang nucleosynthesis: The Creation of the elements
18. Cosmic Inflation: the Creation of the Space, the Multiverse
19. The Creation of Structure: Galaxy Formation
20. Other topics as time permits: Weak lensing, LISA, etc.