

Review of Part 3

- The Milky Way
 - The ISM: atomic, molecular, and ionized gas and dust
 - Stellar lifetimes, ISM recycling, evolution of metals, star clusters
- Stellar Populations and the Structure of the Milky Way
- Other Galaxies (Hubble types and Stellar Populations)
- Measurements of Dark Matter
- Galaxy Formation, Spiral Galaxies, Galaxy Interactions
- The Distance Ladder
 - Spectroscopic parallax, Pulsating stars (RR Lyrae, Cepheids)
 - Tully-Fisher, Type Ia Supernovae
- Cosmology, Types of Universes, the Big Bang
 - Hubble Law, Age, Shape, Fate of the Universe
 - Microwave background, growth of structure, acceleration

- How to study:
 - Go over homeworks, make sure you understand the answers
 - Read through lecture notes AND the book
 - Try to answer review questions at the end of each chapter
- How to get help:
 - My office hours this week: Tuesday, 2-4 pm, Wednesday 1-3 pm in 417B Davey Lab (or by appointment). Note NEW office!!
 - TA office hours: Tuesday 1 - 5:30 pm, Wednesday 1-3:30 pm
- What to bring:
 - #2 pencil
 - PSU ID Card
 - Please try to arrive a few minutes early on Thursday, spread out in classroom
- Format of Test
 - 50 multiple choice questions
 - Closed book/notes
 - You will not need a calculator

Sample Question 1

- A G main sequence star, an M main-sequence star, an RR Lyrae, star, a white dwarf, and a Cepheid variable star all have the same apparent magnitude. Which is furthest away?
 - (A) the white dwarf
 - (B) the G main sequence star
 - (C) the RR Lyrae
 - (D) the Cepheid
 - (E) the M main sequence star

Sample Question 2

- When galaxies collide
 - (A) the stars inside them collide and go supernova
 - (B) only a few stars will collide; the rest will form a spiral pattern
 - (C) elliptical galaxies may be formed
 - (D) the galaxies will pass through each other and never feel the other's presence.
 - (E) nothing -- galaxies rarely collide

Sample Question 3

- According to what we (think we) know about the acceleration of the universe, the more the universe expands
 - (A) the more matter that will be formed
 - (B) the more galaxy collisions will occur
 - (C) the greater the energy of the microwave background
 - (D) the faster it will expand
 - (E) the greater the influence of gravity