ASTR/PHYS 3070 Final Exam Study Guide

Comprehensive, but focused on material covered after Midterm 2

Midterms 1 & 2 Material (review exams, study guides)

Stellar Remnants

- What is degeneracy pressure? How does it differ from normal pressure?
- What are white dwarfs, and how are they supported?
- What are neutron stars, and how are they supported?
- What are black holes, and how are they supported?
- What are pulsars?
- Where does the energy come from that causes a star to explode in a supernova?
- What is the Schwarzschild radius?

Milky Way

- Why is it hard to study what's in our own Galaxy?
- What are the individual components of the Milky Way, and what are their physical scales?
- What do you have to measure about a star to figure out its 3D motion in space?
  - How do you measure those quantities?
- How can we use the rotational speed of stars in the MW to infer the MW's mass?
  - What does this measurement tell us about the amount of mass in the MW compared to its expected mass?
- What do we know about the nature of dark matter?

Galaxies

- How do we classify galaxies?
- What properties differentiate elliptical and disk type galaxies?
- What dominates the light from a galaxy at different frequencies?
- What is the distance ladder?
  - How does it allow us to estimate distances to the most far away objects?
  - What distance measures make up its rungs?
- What is Hubble's law, and what does it imply about the universe?
- How are galaxies distributed in the universe?

Cosmology

- What is the universe made up of, and in what proportions?
- What are the different models for how our universe expands?
  - Which universe do we think our is?
  - What observations indicate this?
  - What is dark energy?
- What is the cosmic microwave background (CMB)?
  - What are the tiny temperature fluctuations in the CMB?
- If our current understanding of cosmology is correct, what is the ultimate fate of the universe?