Astr 1020: Test 3 Study Guide

Chapter 18: STELLAR GRAVEYARD

- white dwarfs: properties
- WDs in binaries: nova, supernova Type I
- neutron stars, pulsars, Crab Nebula pulsar
- X-ray binary stars, SS433
- black holes, escape velocity, event horizon, Schwarzschild radius
- Cygnus X-1 binary: O-type supergiant plus black hole
- gamma ray burst sources: merging NS and collapse of massive star
- gravity waves: LIGO discoveries of merging BH+BH and NS+NS
- final outcomes versus initial mass:
 - + M < 0.08 M_{sun} Star cools as brown dwarf
 - $0.08 < M < 10 M_{sun}$ White dwarf remnant
 - $10 < M < 18 M_{sun}$ Neutron star remnant
 - $18 < M < 140 M_{sun}$ Black hole remnant
 - $M > 140 M_{sun}$ No remnant?

Chapter 19: MILKY WAY

- appearance in visible and other wavelengths
- content of the disk, bulge, halo
- Sun's position and motion
- mass of galaxy from Sun's orbit
- recycling and enrichment of galactic gas, mass locked up in old stars
- star formation in spiral arms
- supermassive black hole at galactic center
- steps in the formation of the galaxy

Chapter 20: GALAXIES

- size scale
- Hubble classification scheme: elliptical, spiral, barred spiral, irregular
- distances: Cepheid variables and other standard candles
- discovery of distance to the Andromeda Galaxy from Cepheids
- Tully-Fisher relation
- distance ladder
- Hubble's law for velocity and distance
- Cosmological Principle, expansion of the Universe