Astronomy 82
Midterm 2 Review Sheet
For Midterm 2 on 2008/05/23

**Midterm Review Wednesday, May 21 at 5:30 PM**
**in PAB 3rd floor conference room**

Here's a list of topics we've covered in class so far, as generated by you all. If you can cogently address all these issues, you should be A-OK for the midterm.

1. First midterm material:
    a. Basic introductory material
    b. Solar systems, near and far
    c. Our sun
    d. Fusion and stellar properties
    e. Stellar Evolution
2. Variable Stars
    a. How are radius, luminosity, intensity, and wavelength related in Cepheid variables?
    b. What is the period-luminosity relationship, and what implications does it have?
    c. Explain why Cepheids are so important in Astronomy.
    d. How did researchers use Cepheids to make significant astronomical discoveries in the early twentieth century?
3. Compact Stars
    a. What is the meaning of the equation of hydrostatic equilibrium? What is its use?
    b. What types of main sequence stars will eventually form the various kinds of compact objects (white dwarfs, neutron stars, black holes)?
    c. What sort of pressure supports White Dwarfs? Which pressure supports Neutron Stars? How are they similar and different?
    d. What are the typical sizes and mass limits of NS's and WD's?
    e. Some neutron stars are called pulsars; how did they get this name? Why do pulsars rotate so much more quickly than main-sequence or giant stars? What generates the pulses?
    f. What is the anatomy of a black hole? What are its observable effects?
4. Eruptive Variable Stars
    a. What is the Roche Lobe? How is it related to some eruptive variables?
    b. Why do novae repeat over and over?
    c. What are the differences between Type 1 and Type II Supernovae?
    d. Why are Type I SNe useful as "standard candles", but Type II SNe are not?

    e. How are Type I Supernovae historically significant?
    f. What are the different progenitor stars for each of the type of Supernovae?
5. Interstellar Medium
    a. What generates the interstellar medium?
    b. What causes extinction in the interstellar medium?
    c. How does interstellar extinction change the “distance modulus” in the magnitude-distance relation? What else does it change?
    d. How do we overcome the difficulties imposed by dust in visible-light astronomy?
6. Star Clusters and Associations
    a. What are the differences and similarities between associations, open clusters, and globular clusters in age, gravitational binding, number of stars, and formational history?
    b. Describe/draw the expected color-magnitude (HR) diagram for an open cluster and for a globular cluster.
    c. Explain the techniques of kinematic and statistical parallax.
7. The Milky Way
    a. How has our view of the Earth's position in the universe changed over time?
    b. How can we determine distances within the Milky Way? What are the limitations of some of these methods?
    c. How do stars' orbit around the Galactic Center differ from Earth’s orbit around the sun?
    d. What is the Local Standard of Rest (LSR)?
    e. The Milky Way has three main components—the disk, the halo, and the bulge w/bar. How do the stellar populations of each of these differ?
    f. What are Population I and Population II stars? Where are each typically found?
8. Galaxies
    a. What are the different types of galaxies, and how do they differ in shape, brightness, age, etc?
    b. Why doesn’t distance matter when calculating the surface brightness of a galaxy?
    c. Sketch a SBb (or E3, etc...) galaxy
    d. Describe the Tully-Fisher relationship, and its uses.
    e. What is a rotation curve? How is it measured?
    f. How do observed galactic rotation curves differ from initial expectations? What is the suggested explanation for this?
    g. Given a particular mass distribution, calculate a rotation curve.