Exam 2 Review Questions

Questions on the new topics (previous physics still applies!):

1. Explain the process of how energy from the Sun's core reaches the surface, including energy transport in each region. Approximately how long does this take? Compare this with the time it would take if the photons could come straight out.

2. Explain how to use color index to find the distance of a star on the main sequence.

3. How does the H-R Diagram of an old cluster compare to a young cluster? Sketch two diagrams, and explain the differences.

4. If I observe several different knots (or parts) of a supernova remnant, will they have the same amounts of various elements in them? Why or why not?

5. Cas A is a supernova remnant. The Sun has the same abundance of iron in it as Cas A. What does that imply about the circumstances of the Sun's formation?

6. Draw a diagram and explain why we see pulses from pulsars.

7. Why can we use a white dwarf supernova to find the distance to another galaxy?

8. How might we measure the mass of two stars orbiting each other? How is this different from, say, measuring the mass of our own Sun?

9. Draw a diagram of the blackbody spectrum for two objects, one at a temperature around 152,000K and one around 6,000K (the sun). Put both on the same diagram. What are the two main differences between the two spectra?

10. Explain why Chandra X-ray observatory must be in space.

11. Suppose the speed of light were slower than we actually think it is. How does this affect our distance measurements? *(Hint: which measurements rely directly on the <u>speed</u> of light?)*

12. After the Big Bang and the universe cooled enough to form elements, what was the matter in the universe mostly composed of? What are most things today composed of?

13. Explain how luminosity is related to temperature and radius.

14. What is absolute magnitude? Apparent magnitude?

15. Draw a diagram showing the Sun's layers (currently). Explain what each layer is, and what (if anything) the solar spectrum shows of this layer.

16. Explain the processes involved in the core of a star and the outer layers of a star as it evolves off the main sequence. How does a high mass star compare to a low mass star?

17. Why does the sun shine?

18. Explain the difference between a reflection nebula and an emission nebula.

19. What are some of the things that happened in the first second after the Big Bang? Within three minutes?

20. How do we think galaxies formed?