AST 301
Review questions for Exam #3
Exam date: Friday Nov. 12

1. Area and volume: how do they depend on width?
2. Describe the techniques for finding extrasolar planets:
    Imaging
    Astrometric technique
    Doppler technique
    Transit technique
3. How do we measure the properties of extrasolar planets, and what do we find?
    Masses
    Orbits
    Sizes
4. How do we have to change our theory of the formation of the Solar system to explain the properties of extrasolar planetary systems?
5. Describe the reactions in the proton-proton chain (or at least the first one).
6. How does Einstein's equation, $E = m c^2$, help explain how nuclear reactions generate energy?
7. Describe how neutrinos allow us to observe the interior of the Sun, and say what was found.
8. Describe the ideas of thermal and hydrostatic equilibrium for a star.
9. How are flux (or apparent brightness), luminosity, and distance of a star related?
10. How do we measure flux and distance of a star?
11. How do we measure temperatures and masses of stars?
12. How do we use the Hertzsprung-Russell diagram to make sense of the temperatures and luminosities of stars?
13. Describe the life stages of a low-mass star, like the Sun.
14. Use the HR diagram to show the evolution of a low-mass star graphically.
15. How long can a star remain a main-sequence star? How does main-sequence lifetime depend on the mass of a star?
16. Describe how a star (or protostar) changes if it generates more (or less) energy by nuclear fusion than it radiates from its surface.
17. What happens inside of a star that makes it change from a main-sequence star into a red giant, then a planetary nebula and a white dwarf?
18. How do the life stages of a high-mass star differ, and why?
19. Describe the events that lead up to the two types of supernovae.
20. How does the pressure inside a white dwarf differ from normal gas pressure?
21. Describe neutron stars and pulsars.
22. Why do neutron stars rotate so quickly? Why couldn't other stars rotate as quickly?
23. Describe black holes.