

AST 250 Spring 2010 HOMEWORK #5

Due Friday March 26

- (1) Develop your own mnemonic for the modern stellar spectral sequence: O B A F G K M L T Y. Be creative! I'll read a few in class.
- (2) Look up the spectral types of the following stars (the primary stars if it is a binary) and order them by (a) effective temperature and (b) luminosity: Sun, Sirius, Betelgeuse, Aldebaran, and Barnard's Star. (N.B. don't just look up T_{eff} and L . Understand the ordering based on spectral type. There could be a similar question on the exam).
- (3) Estimate the mass of main sequence stars with twice the luminosity of the Sun and with half the luminosity of the Sun. What is the dominant nucleosynthesis process in the cores of these stars?
- (4) Calculate the Schwarzschild radius for a star the mass of the Sun.
- (5) (a) The Hertzsprung-Russell diagram is usually plotted in logarithmic coordinates ($\log L$ vs. $\log T_{\text{eff}}$ with temperature increasing to the left). Mathematically derive the slope of a line of constant radius in the logarithmic H-R diagram. (b) Order the stars in problem 2 by stellar radii.

