ASTRONOMY 252

Assignment 8  
Spring 2010

INTERACTING BINARY STARS

GOALS:
- To learn about how close binaries interact and the effects that this can have upon the evolution of the stars.
- To learn about the results of interacting binaries with white dwarfs - accretion disks, novae, supernovae (Type I).
- To learn about black holes in binaries and how this provides a means to detect them.

DUE:  
Friday, April 16, 2010 (by 3pm)

READ:  
Chapter 12 [12.5-skim (SS433- subject of research by Prof. Hillwig)]

HOMEWORK:  
(Sign the honor code at the end)

1. Determine the luminosity derived from the infall of material toward a white dwarf of mass 0.6 M\textsubscript{Sun}. Assume that it starts at a distance away from the white dwarf of 1 R\textsubscript{Sun} and falls to a 1.5 R\textsubscript{Earth} of the center of the white dwarf at a rate of 3.0 \times 10^{-8} M\textsubscript{Sun}/yr.  
(5 pts)

2. Q 12.4  
(4 pts)  
[neutron star in binary]

3. Q 12.5  
(4 pts)  
[millisecond pulsar]

4. 12.9  
(5 pts)  
[Mass of black hole]

Review session/office hours: Friday, April 14, 1:00-2:00 pm, in my office.

Video viewing? – I have an interesting video on the death of stars (supernovae) and the birth of stars. Is there interest in viewing this together some afternoon or evening? I will bring the popcorn!

Special talk: Friday, April 23, 7:30-8:30 pm in NSC 224 – “Life After Death: White Dwarfs, Neutron Stars, and Black Holes” by Prof. Todd Hillwig