Problem Set #8

Due Wednesday, May 13 by 5pm to Dickinson 104

Unless otherwise indicated, all problems come from "The Cosmic Perspective," 8e

1. Problem 21.46 *A Nearby Starburst*
2. Problem 19.48 *Mass of the Milky Way's Halo*
3. Problem 5.56 *Doppler Calculations*
4. Problem 23.48 *Alternative Gravity*
5. Problem 23.52 *Mass from Orbital Velocities*
6. *How Many MACHOs?*
   Imagine a galaxy whose stars are all identical to the Sun but that has an overall mass-to-light ratio of 30 $M_\odot/L_\odot$
   a. What is the ratio of dark matter to luminous matter in this galaxy?
   b. Suppose all Dark matter consists of MACHOs similar to Jupiter, each with mass $0.001M_\odot$. How many of these MACHOs must the galaxy contain for each ordinary star. Explain.