Problem Set 6

November 5, 2003

Problem 1.

- (1) The Sun's surface temperature is approximately 6000 K. The Sun's spectrum peaks near 0.6 μm. (1 μm = 10^{-6}m). Estimate the peak wavelength of radiation emitted by (a) Earth ($T = 300$K), (b) a molecular cloud ($T = 20$K) and (c) the microwave background ($T = 2.7$K)
- (2) Compute the resolution (in arcseconds) of a 2 meter telescope operating at (a) 0.6 μm and (b) - (d) the peak wavelengths estimated in part 1.
- (3) Use google (or your favorite search engine) to find the websites for the following telescopes: Hubble Space Telescope, SIRTF, OVRO, and WMAP. Match each observatory with the characteristic wavelength discussed in part 1.

Problem 2. Radial velocity searches find planets around roughly 10% of all stars surveyed. This suggests that 90% of all stars may not have Jupiter sized planets. Is this the only conclusion that can be drawn? Briefly describe two possible explanations of this result. (Hint: observational constraints; planet formation; planet migration).