Ay 192 — Problem Set 3

Due Nov 22

Problem 1. What is the quantum efficiency of a photomultiplier (with 14 dynodes) that has a sensitivity of 25 mA/Watt at 4500 Åand 65 ma/Watt at 6500 Å?

Problem 2. Plot the modulation transfer function (in frequency defined by line-pairs-per-millimeter) for a system that has a point spread function that is a gaussian with a dispersion (σ) of 100 microns.

What would the image of a 50 micron wide slit look like it it were imaged through this system onto a high resolution detector? (Draw input and output cross sections).

Problem 3. What is the energy resolution of a Xenon proportional counter at 10 Kev? An x-ray CCD at 6 Kev?

Problem 4. If you observe a G2 star (dwarf) at a galactic latitude of 2 degrees and an apparent magnitude of V=17.5 how far away is it and what do you expect its B-V color to be?