

AST 598 – Astronomical Instrumentation and Data Analysis Homework Set #2

Due 5pm, Fri Oct 6th, 2006

Please leave in the Instructor's mailbox on the F-wing 6th floor

Questions should be addressed to the Instructor via email to paul.scowen@asu.edu or during Office Hours (see website for these)

[HCA, pp 6-7, 33-35, 64-65]

- (1) 1.3.4
- (2) 2.5.2 – slightly reworded version: Calculate the energy in eV, in Joules and in ergs of photons with wavelengths of 10, 100, 1000, and 10000 nm. How do these energies compare with each other? If you assume that an incandescent light bulb emits only 5% of the energy it consumes in the form of light, and furthermore that all that light is emitted as 500 nm photons, then how many photons does a 100 Watt lightbulb produce every second?
- (3) 2.5.4 – remember to use the correct form of the equation from class, and not the one from the textbook! An acceptable loss would be 1%.
- (4) 2.5.6
- (5) 2.5.8
- (6) 2.5.10
- (7) 3.10.3
- (8) 3.10.7
- (9) 3.10.12
- (10) 3.10.15 – answer the second half of the question assuming a read noise of $5 e^-$.
- (11) 3.10.16
- (12) Use the data included below, decide for each observation whether the observation yields a detection or not. Depending on your decision give the net number of source counts (integrated over the PSF, including 1-sigma uncertainties), or the 95.5-% upper limits. If a detection is claimed, give the detection likelihood (in percent).

