

Astronomy 4100, Homework # 08, 30 January 2015 (due 4 February 2015).

1. On a particular night Mars has an angular diameter of 15 arcsec and apparent brightness of  $1.0 \times 10^{-7} \text{ W/m}^2$ . Two astronomers observe the planet with identical CCD cameras which have pixels that are  $25\mu\text{m}$  apart. Albert has a telescope with a 0.3 m aperture and  $f/8$ . Bertha has a telescope with a 30 m aperture and  $f/4$ . How much energy accumulates in 100 ms on the pixels viewing Mars for Albert and Bertha?