

Physics 174
Homework 3 - Due 13 October

6 October, 2006

1. A wave has a wavelength of 3 m and a frequency of 1.5 Hz. How fast is it propagating?
2. Which carries more energy, an infrared photon or an x-ray photon?
3. Which has a better theoretical resolution, a 1 m telescope operating at a wavelength of 5000 \AA ($0.5 \text{ }\mu\text{m}$), or a 10 m telescope used at a wavelength of $5 \text{ }\mu\text{m}$?
4. A 300 K blackbody (which is you), emits more energy at a wavelength of $10 \text{ }\mu\text{m}$ than any other wavelength. At what wavelength would the emission of a 3000 K blackbody peak?
5. Two spherical blackbodies are heated to the same temperature, but one has twice the radius of the other. How much more luminous is the larger blackbody?