

Phys 2053: Homework I

due January 20, 2016

1. *2 pts*

- (a) Calculate the energy of photons for light having a wavelength $\lambda = 500$ nm.
- (b) Suppose that a beam of light consists of photons having an energy of 5.4 eV. What is the wavelength of the light?

2. *2 pts*

A double-slit experiment is performed with sodium light ($\lambda = 589.0$ nm). The slits are separated by 1.05 mm, and the screen is 2.357 m from the slits. Find the separation between adjacent maxima on the screen.

3. *2 pts*

Radio waves have a frequency of the order of 1 to 100 MHz. What is the range of energies of these photons? Our bodies are continuously bombarded by these photons. Why are they not dangerous to us?

4. *2 pts*

- (a) What is the wavelength of an X-ray photon of energy 10 keV?
- (b) What is the wavelength of a gamma-ray photon of energy 1 MeV?
- (c) What is the energy of photons of visible light with wavelength of 350 to 700 nm?