**HomeWork 15**

**Due Friday 11/13/15**

**Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_/5**

1) Imagine that the atomic nucleus is represented by a ping pong

 ball which has a radius of 20 mm.

a) What is the ~ radius of the electronic cloud given the above in

 miles ?

 100,000\*20 mm=2,000,000 mm=200,0000 cm

 200,000 cm \* 1 in/2.54 cm \*1 ft/12 inches \* 1 mile/5280 ft=1.24 miles

 \_\_\_\_1.24\_\_\_\_\_\_\_\_\_ miles

b) Suggest a sensible metaphor for the distance you calculated for

 the electronic cloud radius given that the nucleus is the ping

 pong ball.

 Distance from here to Alfred Station

 2) Given that c= 3\*108 m/s:

a) what is the wavelength of light λ in meters associated with 6

 Hz ? λ\*f=3\*108 m/s = λ\*6=3\*108 => λ=5\*107 m

 λ= \_\_\_5\*107\_\_\_\_\_\_ m

b) what is the frequency of light, f, in Hz associated with a

 wavelength of 10-5 m.

λ\*f=3\*108 m/s= 10-5\*f => f= 3\*108/10‑5 = 3\*1013 Hz

 f= \_\_\_3\*1013\_\_\_\_\_\_\_\_\_ Hz

3) According to the photoelectric effect, which part of the light `wave’ below

 determines the real energy of the light ?? Amplitude or wavelength (=c/f)

 **Wavelength determines energy**



Which light wave to the left is most likely to cause electrons to `jump’ in the Photoelectric effect ?

**High Medium Low**

