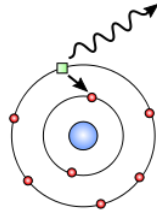


# Photon Energy

## Photons

### Objectives

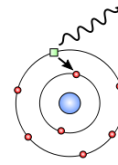
- Define photon.
- Calculate the energy of a photon from frequency and wavelength.
- Observe and analyze the line spectra of several elements.



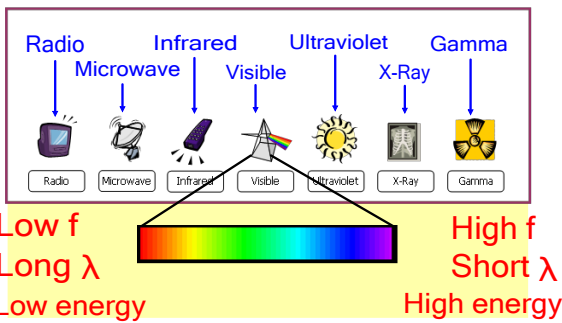
## Light

Atom is the source of all forms of light  
 – electrons absorb energy – move to energy level – falls back releasing energy.

**Photon** – tiny packet, or bundle of energy. Amount of energy in a photon, determines kind of light wave produced.



## Electromagnetic Spectrum



## Photon Energy (Einstein)

photons represent "chunks" of energy within the light wave.

$$E = h \cdot f \quad \text{or} \quad E = \frac{h \cdot c}{\lambda}$$

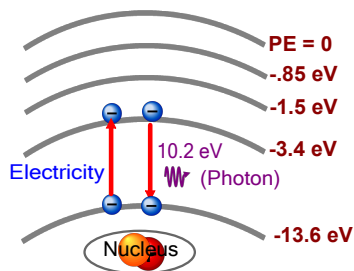
$$h = 6.63 \times 10^{-34} \text{ Js}$$

(Planck's constant)

Photoelectric Effect

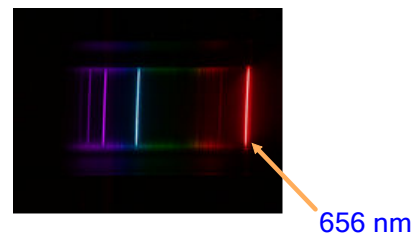
## Energy Level Diagram - Hydrogen

When an element produces light, the energy of light emitted depends on the electron configuration of that element.



## Hydrogen Line Spectrum

A line spectrum is a graph showing the wavelenths of specific photons of light emitted for a particular element.



## Photon Energy

### Assignments . . .



- Lab 21.1: Atomic Line Spectra
- Chapter 21 Homework #7 - 10



## Attachments

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Photoelectric Effect