

Summary

Photoelectric Effect → light as particles

Measurement shows directly that light (all electromagnetic waves) are quantized with quanta denoted by “Photons”

Energy and momentum of a photon

Key relations of quantum mechanics:

$E=hf$ or $E = \hbar\omega$ and $p=h/\lambda$ where $\hbar = h/2\pi$

Derived here for light – but valid for all matter – more later!