

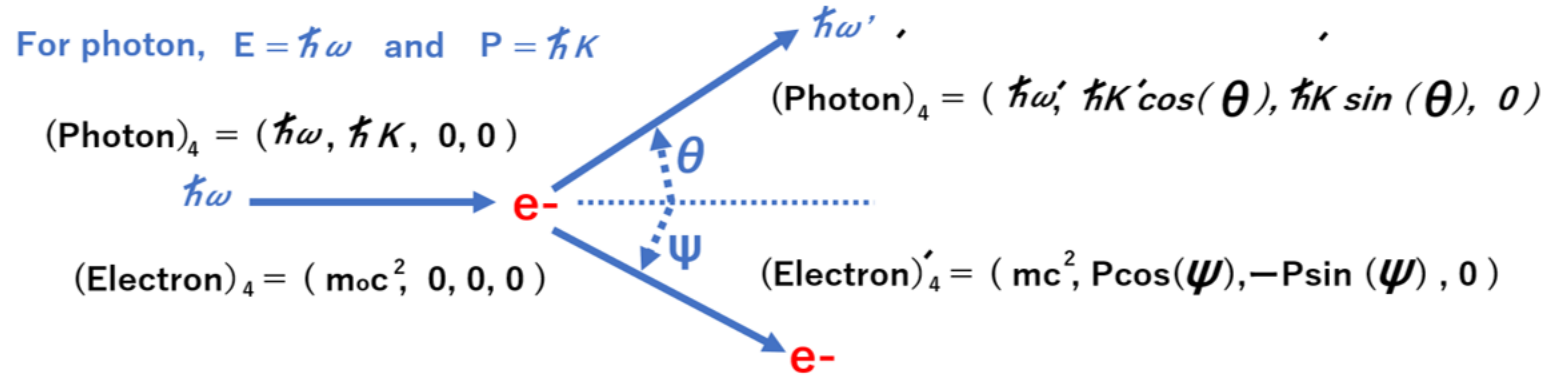
Arthur H. Compton (1892~1962), while at Washington University at St. Louis found that x-rays increase in wave length when scattered, which he explained in 1923 on the basis of the quantum theory of light.

$$(1) E_0 = m_0 c^2$$

For photon,

$$E = \hbar \omega \quad \text{and} \quad P = \hbar K$$

$$E^2 - c^2 P^2 = 0 \quad \omega = c K$$



$$(2) KE = \hbar \omega - \hbar \omega' = E - E_0 = m c^2 - m_0 c^2$$

$$(3) \omega t - K x = K (c t - x) \quad (4) \omega = c K = 2 \pi c / \lambda$$

$$(5) c = f \lambda = (2 \pi f) (\lambda / 2 \pi) = \omega / K$$

$$(6) E^2 - c^2 P^2 = E_0^2$$

$$\lambda' - \lambda = \frac{h}{m_0 c} \{ 1 - \cos(\theta) \}$$