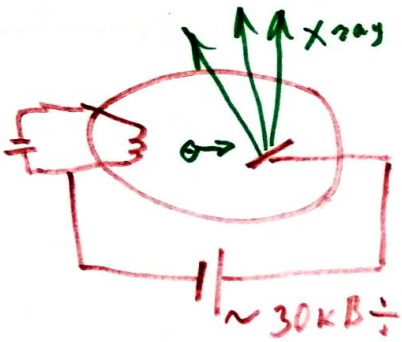
$h\nu = A_в + \frac{m v^2}{2}$

1. $N_э \sim N_ф \sim I_н \sim \Phi$
2. $eU_з = \frac{m v^2}{2} = h\nu - A_в$
3. $h\nu < A_в$ – нет! $\nu_к = \frac{A_в}{h}$.

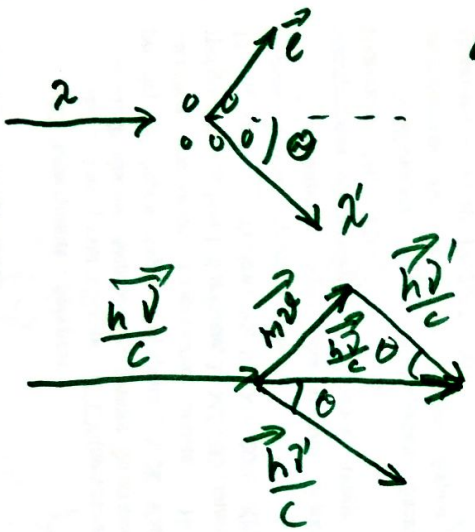
① В. Рентген 1895 г X-ray $\lambda \simeq 1 Å = 10^{-11}$ м



Дж. Дж. Томсон

$\frac{m v^2}{2} = h\nu_{max}$

Комптон 1923



$\Delta\lambda = \lambda' - \lambda = 2K \sin^2\frac{\Theta}{2}$ $\quad K = 0{,}0241 \cdot 10^{-10}\,м$

$P_\phi = \frac{h\nu}{c}$

$$\begin{cases} (mv)^2 = \left(\frac{h\nu}{c}\right)^2 + \left(\frac{h\nu'}{c}\right)^2 - 2\left(\frac{h\nu}{c}\right)\left(\frac{h\nu'}{c}\right)\cos\Theta \\ h\nu + m_0c^2 = h\nu' + mc^2 \end{cases}$$

$$m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}$$

$$\Delta\lambda = \frac{2h}{m_0c}\sin^2\frac{\Theta}{2}.$$

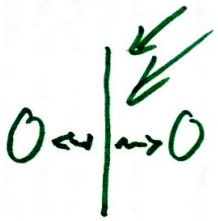
$$K = \frac{h}{m_0c}.$$

Вавилов, Харитон.

Давление света П. Лебедев 1898 г.

$$P = \frac{I}{c}(1+\rho)$$

Боте.

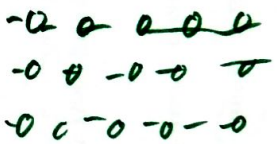


В Луи де Бройль 1924

$\hbar = \frac{h}{2\pi}$

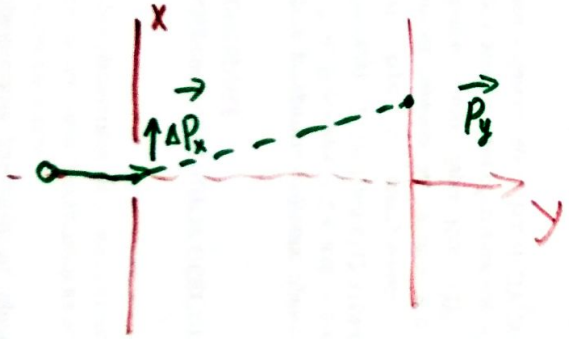
$$E = h\nu = mc^2 = pc \Rightarrow \lambda_Б = \frac{c}{\nu} = \frac{h}{p} = \frac{2\pi\hbar}{p}$$

1927 Дэвисон, Джермер.



1928 Дж. П. Томсон. Тартаковский

1948 Фабрикант 10^{14}



Гейзенберг 1927

неопределённостей

$$\begin{cases} \Delta x \Delta p_x \geq \frac{\hbar}{2} \\ \Delta y \Delta p_y \geq \frac{\hbar}{2} \\ \Delta z \Delta p_z \geq \frac{\hbar}{2} \end{cases}$$

$\hbar, \frac{\hbar}{2}, h$.

$[xp] = \frac{м^2 кг}{с}$

$[Et] =$

$$\Delta E \Delta t \geq \frac{\hbar}{2}$$

канонически