Lecture 3: de Broglie Formula

$$m_0 c^2 = \hbar\omega \quad (1.)$$

$$\hbar = \frac{h}{2\pi} \quad (1.)$$

$$k_x x - \omega t = k_x x' - \omega t' \quad (1.)$$

$$k = \frac{2\pi}{\lambda} \quad (1.)$$

$$k_x x - \omega t = -\omega t' = -\frac{m_0 c^2}{\hbar} \frac{t - \frac{v}{c^2} x}{\sqrt{1 - v^2 / c^2}} \quad (1.)$$

$$m = \frac{m_0}{\sqrt{1 - v^2 / c^2}} \quad (1.)$$

$$\begin{cases} k_x = \frac{1}{\hbar} \frac{m_0 v}{\sqrt{1 - v^2 / c^2}} = \frac{mv}{\hbar} = \frac{p_x}{\hbar} \\ \omega = \frac{1}{\hbar} \frac{m_0 c^2}{\sqrt{1 - v^2 / c^2}} = \frac{mc^2}{\hbar} = \frac{E}{\hbar} \end{cases}$$

$$\begin{cases} \mathbf{p} = \hbar \mathbf{k} \ \textbf{...} \ \textit{quantification of} \ \textbf{substance} \\ E = \hbar\omega \ \textbf{...} \ \textit{quantification of} \ \textbf{waves} \end{cases} \quad (1.)$$