> Date GIRIDHAR KUMAR
Assistant Professor Dept. of Physics Mon Tue Wed Thu Fri Sat Sun

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✱ **De-Broglie concept:-** De Broglie speculate that the nature did not single light out as being the only matter which exhibits a wave-particle duality.

He also proposed that the ordinary 'particles such as electron, protons or etc can as exhibits wave in certain circumstances.

Quantatively he associated a wavelength 'λ' to a particle of mass 'm' moving at speed 'v'

$$\therefore \boxed{\lambda = \frac{h}{mv}}$$

⇒ [redacted]

Proof:- By using Einstein equation

$$E = mc^2 \quad \text{---(1)}$$

Now By Plank's constant

$$E = h\nu \quad \text{---(11)}$$

From Eqn (1) and (11)

$$mc^2 = h\nu$$

Through the Eqn 8, De-broglie substitute v/λ for ν and arrived at the final expression that relates wavelength & particles with speed.

$$mv^2 = \frac{hv}{\lambda}$$

$$\Rightarrow \quad \lambda = \frac{hv}{mv^2}$$

$$\Rightarrow \boxed{\lambda = \frac{h}{mv}} \text{ Proved.}$$

Name:- Giridhar Kumar
Assistant Professor (Guest)
Department of Physics, Maharaja college.
Date:- 07/02/2024.