

SEM-5 / MTC-08 / Unit-② / Physics
By: VVS
Topic: Wave Particle Duality

The matter and energy both have properties of wave and particle characteristics. This behaviour is known as wave particle duality.

Some, wave-particle duality is the concept that both light and matter exhibit wave-like and particle-like properties in different situation.

For example, light behaves as wave during diffraction and as a particle during photoelectric effect.

Particle like-electron can also behave as wave.

These properties was discovered by De-Broglie. According to De-Broglie, the wave length equation

$$\lambda = h/mv$$

where λ = wave length of electron

h = Planck's Constant

m = Mass of electron

v = Velocity of light

De-Broglie proposed that if light (energy) has both the wave nature and particle nature, then particle (matter) must have a wave associated with its motion. He believed that energy and matter must have symmetrical character. This gave rise to the concept of the wave particle duality of matter.