

37 Lecture - PHY101

Important Subjective

What is the particle nature of light?

Answer: The particle nature of light refers to the idea that light consists of tiny packets of energy called photons.

Who first proposed the idea of the particle nature of light?

Answer: Albert Einstein first proposed the idea of the particle nature of light in 1905.

What is the photoelectric effect?

Answer: The photoelectric effect is a phenomenon in which electrons are emitted from a material when light of a certain frequency is shone on it.

How does the photon theory explain the photoelectric effect?

Answer: The photon theory explains the photoelectric effect by suggesting that photons transfer their energy to electrons in the material, allowing them to escape.

What is the Compton effect?

Answer: The Compton effect is an experiment that showed that X-rays scattered off a material have a longer wavelength than the incident radiation, which can be explained by the X-rays interacting with the electrons in the material as if they were particles.

What is the wave-particle duality?

Answer: The wave-particle duality refers to the idea that particles, such as photons, can exhibit both wave-like and particle-like behavior depending on the experiment.

How does the wave-particle duality of light challenge our understanding of the nature of reality?

Answer: The wave-particle duality challenges our understanding of the nature of reality by suggesting that particles can exist in multiple states simultaneously.

What is the practical application of the particle nature of light in photovoltaic cells?

Answer: The particle nature of light is used in photovoltaic cells to convert light energy into electrical energy.

How do lasers work?

Answer: Lasers work by creating a population inversion in a material, where more atoms are in an excited state than in the ground state. When these atoms decay to the ground state, they emit photons with the same frequency and phase, resulting in a coherent beam of light.

Why is the discovery of the particle nature of light important?

Answer: The discovery of the particle nature of light revolutionized our understanding of the fundamental nature of light and has practical applications in modern technology.