

Key Ideas

Two Principles of Relativity:

- The laws of physics are the **same** for all uniformly moving observers.
- The speed of light is the **same** for all observers.

Consequences:

- Different observers measure **different** times, lengths, and masses.
- Only **spacetime** is observer-independent.

Important Concepts

$$E=mc^2$$

$$t = T[1 - (v/c)^2]^{1/2}$$

$$l=L[1 - (v/c)^2]^{1/2}$$

$$m=m_0/(1-v^2/c^2)^{1/2}$$

$$KE=mc^2-m_0c^2=m_0c^2/(1-v^2/c^2)^{1/2} - m_0c^2$$

Chapter 27

Quantum Physics

Photoelectric Effect

Compton Effect

Photon Theory of Light

Wave Nature of Matter

Wave-Particle Duality

Wave Function

Uncertainty Principle