

SECTION OVERVIEW

Unit 4: Modern Physics - Quantum Mechanics, Special Relativity, and Nuclear and Particle Physics

Chapter 12: Quantum Mechanics

- 12.1: Introduction to Quantum Mechanics
- 12.2: Blackbody Radiation
- 12.3: The Photoelectric Effect
- 12.4: The Wave Nature of Matter
- 12.5: Uncertainty Principle
- 12.6: Discovery of the Atomic Nucleus
- 12.7: Bohr's Theory of the Hydrogen Atom
- 12.8: The Wave Nature of Matter Causes Quantization
- 12.E: Quantum Mechanics (Exercise)

Chapter 13: Special Relativity

- 13.1: Prelude to Special Relativity
- 13.2: Einstein's Postulates
- 13.3: Simultaneity and Time Dilation
- 13.4: Length Contraction
- 13.5: Relativistic Addition of Velocities
- 13.6: Relativistic Momentum
- 13.7: Relativistic Energy
- 13.E: Special Relativity (Exercise)

Chapter 14: Nuclear and Particle Physics

- 14.1: Introduction to Nuclear and Particle Physics
- 14.2: Nuclear Radioactivity
- 14.3: Radiation Detection and Detectors
- 14.4: Substructure of the Nucleus
- 14.5: Nuclear Decay and Conservation Laws
- 14.6: Half-Life and Activity
- 14.7: Medical Imaging and Diagnostics
- 14.8: Biological Effects of Ionizing Radiation
- 14.9: Fusion
- 14.10: Fission
- 14.11: Nuclear Weapons
- 14.12: The Four Basic Forces
- 14.13: Particles, Patterns, and Conservation Laws
- 14.14: GUTs- The Unification of Forces
- 14.E: Nuclear and Particle Physics (Exercise)

Thumbnail: Sometimes matter behaves as a particle and sometimes a wave. Quantum physics is the study of this phenomena. Image used with permission (Public domain; Maschen).

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