Modern Physics. Edition No. 2

Description: The second edition of Modern Physics for Scientists and Engineers is intended for a first course in modern physics. Beginning with a brief and focused account of the historical events leading to the formulation of modern quantum theory, later chapters delve into the underlying physics. Streamlined content, chapters on semiconductors, Dirac equation and quantum field theory, as well as a robust pedagogy and ancillary package, including an accompanying website with computer applets, assist students in learning the essential material. The applets provide a realistic description of the energy levels and wave functions of electrons in atoms and crystals. The Hartree-Fock and ABINIT applets are valuable tools for studying the properties of atoms and semiconductors.

- Develops modern quantum mechanical ideas systematically and uses these ideas consistently throughout the book
- Carefully considers fundamental subjects such as transition probabilities, crystal structure, reciprocal lattices, and Bloch theorem which are fundamental to any treatment of lasers and semiconductor devices
- Clarifies each important concept through the use of a simple example and often an illustration
- Features expanded exercises and problems at the end of each chapter
- Offers multiple appendices to provide quick-reference for students

Contents:

1. The Wave-Particle Duality
2. The Schrödinger Wave Equation
3. Operators and Waves
4. Hydrogen Atom
5. Many-Electron Atoms
6. The Emergence of Masers and Lasers
7. Statistical Physics
8. Electronic Structure of Solids
9. Charge Carriers in Semiconductors
10. Semiconductor Lasers
11. Relativity I
12. Relativity II
13. Particles Physics
14. Nuclear Physics

Appendix A: Natural Constants and Conversion Constants
Appendix B: Table of Atomic Masses
Appendix C: Solution of the Oscillator Equation
Appendix D: The Average Value of the Momentum
Appendix E: The Hartree-Fock Applet
Appendix F: Integrals That Arise in Statistical Physics

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