Quantum Theory (Dover Books on Physics)

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This superb text by David Bohm, formerly Princeton University and Emeritus Professor of Theoretical Physics at Birkbeck College, University of London, provides a formulation of the quantum theory in terms of qualitative and imaginative concepts that have evolved outside and beyond classical theory. Although it presents the main ideas of quantum theory essentially in nonmathematical terms, it follows these with a broad range of specific applications that are worked out in considerable mathematical detail.

Addressed primarily to advanced undergraduate students, the text begins with a study of the physical formulation of the quantum theory, from its origin and early development through an analysis of wave vs. particle properties of matter. In Part II, Professor Bohm addresses the mathematical formulation of the quantum theory, examining wave functions, operators, Schr dinger's equation, fluctuations, correlations, and eigenfunctions. Part III takes up applications to simple systems and further extensions of quantum theory formulation, including matrix formulation and spin and angular momentum. Parts IV and V explore the methods of approximate solution of Schr dinger's equation and the theory of scattering. In Part VI, the process of measurement is examined along with the relationship between quantum and classical concepts.

Throughout the text, Professor Bohm places strong emphasis on showing how the quantum theory can be developed in a natural way, starting from the previously existing classical theory and going step by step through the experimental facts and theoretical lines of reasoning which led to replacement of the classical theory by the quantum theory.

Other Books

Quantum Field Theory, This comprehensive text begins with the standard quantization of electrodynamics and perturbative renormalization, advancing to functional methods, relativistic bound states, broken symmetries, nonabelian gauge fields, and asymptotic behavior. 1980 edition.

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