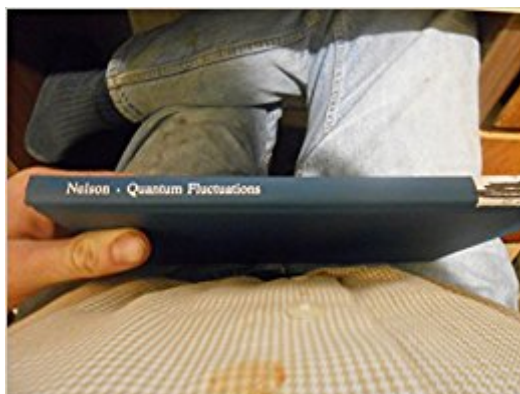# Quantum Fluctuations (Princeton Series In Physics)

Synopsis

Stochastic mechanics is a description of quantum phenomena in classical probabilistic terms. This work contains a detailed account of the kinematics of diffusion processes, including diffusions on curved manifolds which are necessary for the treatment of spin in stochastic mechanics. The dynamical equations of the theory are derived from a variational principle, and interference, the asymptotics of free motion, bound states, statistics, and spin are described in classical terms. In addition to developing the formal mathematical aspects of the theory, the book contains discussion of possible physical causes of quantum fluctuations in terms of an interaction with a background field. The author gives a critical analysis of stochastic mechanics as a candidate for a realistic theory of physical processes, discussing measurement, local causality in the sense of Bell, and the failure of the theory in its present form to satisfy locality.

Book Information

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Customer Reviews

This book is clearly written for mathematicians with an excellent background in the modern theories of measure, probability and stochastic processes. I wonder if the notions of differentiable manifolds, of affine connections, of martingales, ... are mathematical tools absolutely necessary to understand the theory of stochastic mechanics. It seems that the author does not know what to do with the stochastic process attached to any solution of the Schrödinger equation and that he sometimes tries to solve artificial problems.

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