

SCIENCE/PHYSICS

MARK S. SWANSON

PATH INTEGRALS AND QUANTUM PROCESSES

This text offers a systematic presentation of the path integral approach to calculating transition elements, partition functions, and source functionals. The treatment contains a set of logical connections and applications which represent the scope of problems that the path integral can solve. Readers receive sufficient background to advance to related books and articles at the frontiers of theoretical physics.

An introductory section covers mathematical preliminaries, progressing to examinations of quantum mechanical path integrals, an evaluation of the path integral, and an exploration of further applications. Subsequent chapters cover Grassmann variables, field theory and gauge field theory, perturbation theory, and nonperturbative results. Suitable for advanced undergraduates and graduate students of physics, the text requires only some familiarity with quantum mechanics. Exercises and lists of references throughout the book make it ideal for supplementary reading and self-study.

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