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Título: Interactions Of Photons And Neutrons With Matter

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Sinopsis

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This invaluable book is based on lecture notes developed for a one-semester graduate course entitled "Interaction of Radiation with Matter", taught in the Department of Nuclear Science and Engineering at the Massachusetts Institute of Technology. The main objective of the course is to teach enough quantum and classical radiation theory to allow students in engineering and the applied sciences to understand and have access to the vast literature on applications of ionizing and non-ionizing radiation in materials research.

Besides presenting the fundamental physics of radiation interactions, the book devotes individual chapters to some of the important modern-day experimental tools, such as nuclear magnetic resonance, photon correlation spectroscopy, and the various types of neutron, x-ray, and light-scattering techniques. End-of-chapter problems have been added for the new edition, making the book more appropriate as a course textbook.

Contents:

An Overview of Classical Mechanics

The Transition to Quantum Mechanics

Classical Treatment of Electromagnetic Fields and Radiation

Quantum Properties of the Field

Time-Dependent Perturbation Theory, Transition Probabilities, and Scattering

The Density Operator and Its Role in Quantum Statistics

First-Order Radiation Processes

Second-Order Processes and the Scattering of Photons

Principles of Nuclear Magnetic Resonance

Theory of Photon Counting Statistics

Dynamic Structure Factors

Linear Response Theory