



The Oxford Solid State Basics

By Steven H. Simon

Oxford University Press. Paperback. Book Condition: New. Paperback. 312 pages. Dimensions: 9.6in. x 7.4in. x 0.6in. The study of solids is one of the richest, most exciting, and most successful branches of physics. While the subject of solid state physics is often viewed as dry and tedious this new book presents the topic instead as an exciting exposition of fundamental principles and great intellectual breakthroughs. Beginning with a discussion of how the study of heat capacity of solids ushered in the quantum revolution, the author presents the key ideas of the field while emphasizing the deep underlying concepts. The book begins with a discussion of the Einstein-Debye model of specific heat, and the Drude-Sommerfeld theories of electrons in solids, which can all be understood without reference to any underlying crystal structure. The failures of these theories force a more serious investigation of microscopics. Many of the key ideas about waves in solids are then introduced using one dimensional models in order to convey concepts without getting bogged down with details. Only then does the book turn to consider real materials. Chemical bonding is introduced and then atoms can be bonded together to crystal structures and reciprocal space results. Diffraction experiments, as...



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