SCIENCE/PHYSICS

ELECTRONIC STRUCTURE AND THE PROPERTIES OF SOLIDS

Walter A. Harrison

". . . should be widely read by practicing physicists, chemists and materials scientists."
—*Philosophical Magazine*

In this comprehensive and innovative text, Professor Harrison (Stanford University) offers a basic understanding of the electronic structure of covalent and ionic solids, simple metals, transition metals and their compounds. The book illuminates the relationships of the electronic structures of these materials and shows how to calculate dielectric, conducting and bonding properties for each. Also described are various methods of approximating electronic structure, providing insight and even quantitative results from the comparisons. Dr. Harrison has also included an especially helpful "Solid State Table of the Elements" that provides all the parameters needed to estimate almost any property of any solid, with a hand-held calculator, using the techniques developed in the book.

Designed for graduate or advanced undergraduate students who have completed an undergraduate course in quantum mechanics or atomic and modern physics, the text treats the relation between structure and properties comprehensively for all solids rather than for small classes of solids. This makes it an indispensable reference for all who make use of approximative methods for electronic-structure engineering, semiconductor development and materials science.

The problems at the ends of the chapters are an important aspect of the book. They clearly show that the calculations for systems and properties of genuine and current interest are actually quite elementary.

". . . will doubtless exert a lasting influence on the solid-state physics literature."
—*Physics Today*

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