



Band Theory and Electronic Properties of Solids (Paperback)

By John Singleton

Oxford University Press, United Kingdom, 2001. Paperback. Book Condition: New. 246 x 186 mm. Language: English . Brand New Book. This book provides an introduction to band theory and the electronic properties of materials at a level suitable for final-year undergraduates or first-year graduate students. It sets out to provide the vocabulary and quantum-mechanical training necessary to understand the electronic, optical and structural properties of the materials met in science and technology and describes some of the experimental techniques which are used to study band structure today. In order to leave space for recent developments, the Drude model and the introduction of quantum statistics are treated synoptically. However, Bloch's theorem and two tractable limits, a very weak periodic potential and the tight-binding model, are developed rigorously and in three dimensions. Having introduced the ideas of bands, effective masses and holes, semiconductor and metals are treated in some detail, along with the newer ideas of artificial structures such as super-lattices and quantum wells, layered organic substances and oxides. Some recent hot topics in research are covered, e.g. the fractional Quantum Hall Effect and nano-devices, which can be understood using the techniques developed in the book. In illustrating examples of e.g....



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