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Quantum Solid-State Physics

By Vonsovsky, Sergey V. / Katsnelson, Mikhail I.

Book Condition: New. Publisher/Verlag: Springer, Berlin | This book treats the major problems of the quantum physics of solids, ranging from fundamental concepts to topical issues. Rather than use a deductive method of exposition, the authors consider and analyze simple empirically established properties of solids and employ more complicated models only as the need arises. Detailed treatment is given of classical problems such as chemical bonding in crystals, the one-dimensional Schrödinger equation with a periodic potential, the metal-insulator criterion, and the quantum theory of band electron motion in external fields. Consideration is also given to topical problems such as neutron scattering by the crystal lattice, plasma and Fermi liquid effects, the theory of disordered systems, and the polaron. The reader is expected to know only the fundamentals of quantum mechanics and statistical physics. Compared with the Russian edition (Nauka, Moscow 1983), the book has been substantially revised and enlarged, new sections have been written and recent results have been incorporated. | 1. Introduction. General Properties of the Solid State of Matter.- 1.1 General Thermodynamic Description of the Solid State.- 1.2 Crystal Structure of Solids.- 1.3 Reciprocal Lattice.- 1.4 Examples of Simple Crystal Structures.- 1.5 Experimental Techniques for Determining the Periodic...



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