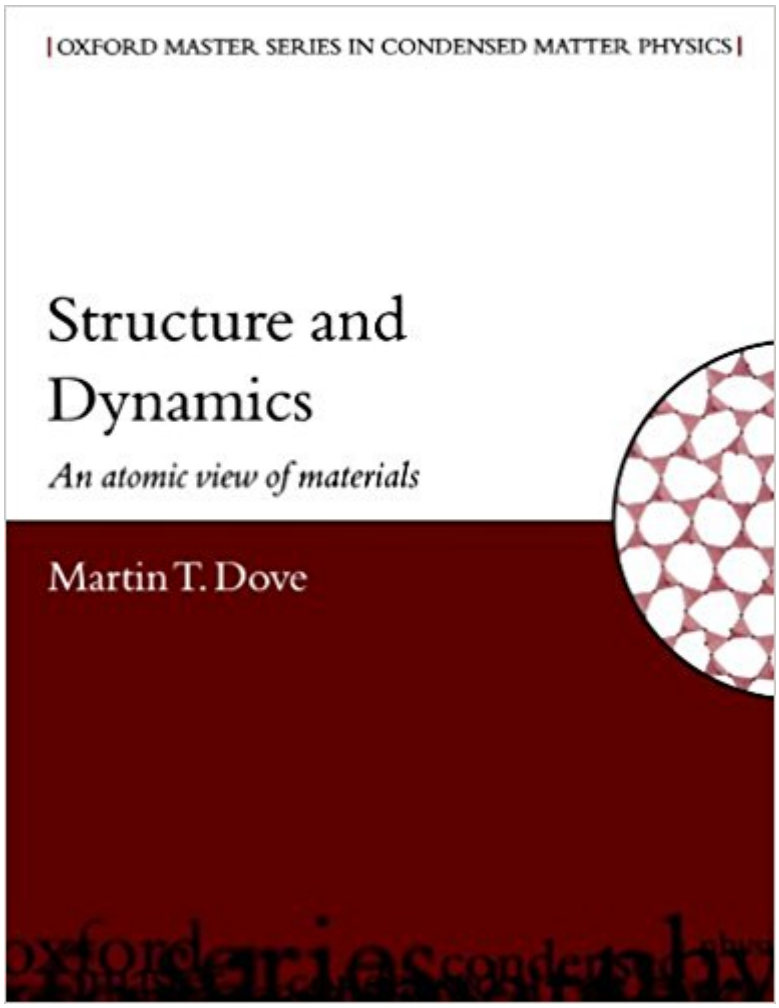
Structure And Dynamics: An Atomic View Of Materials (Oxford Master Series In Physics)



Synopsis

Structure and Dynamics covers the wide range of general principles that govern the behavior of atoms in solids and applies them to the full range of material types known to man. It focuses on the structure of materials at an atomic level and how the atoms vibrate inside solids, bringing these topics together to explore how the atomic principles determine the behavior and properties of materials. Topics discussed include the factors and reciprocal space, the types of atomic bonding, the formalism of atomic vibrations and the theories of phase transitions. The tools of diffraction and spectroscopy in both laboratory and large scale facilities are also covered.

Book Information

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Customer Reviews

`... excellent in many ways. It will be a useful book in the teaching of condensed matter physics, especially as it does achieve a substantial upgrading of the structural aspects of the subject, so long ignored by existing books. [...] I shall definitely be recommending it to my undergraduateswhen it appears.'Prof. Mike Glazer, University of Oxford`... fills a gap in the current literature in treating solids without any reference to the electrons. This leaves enough space for a competent coverage of topics which are often skimmed over in books which attempt to be more comprehensive, and also makes the structural aspects ofcrystallography accessible to students with limited knowledge in physics.'Dr Graeme Ackland, University of Edinburgh`'Structure and Dynamics' is a superbly planned and written book, with carefully selected material and well-chosen examples. [...] Most of the material is given at a remarkable level of simplicity. It is characterised by deep insight, ease of

style, and great pedagogical value. It can beequally useful to students and teachers, and has every reason to become a classical book in its field.'Dr. Artem Oganov, University College London

Dr. Martin T. Dove, Mineral Physics Group, Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ, Tel.: 01223/333482, Email: martin@esc.cam.ac.uk, Homepage: http://www.esc.cam.ac.uk/astaff/dove

This is a nice book to have on your bookshelf if your involved or interested in crystalline materials and thermal properties (more specifically phonons). The text is essential two parts, the first which covers basic crystallography and bonding and then the second discusses, in detail, lattice vibrations theory and measurements. I particularly purchased this book for the second half since the authors advanced text on lattice dynamics is very costly. The only negative comment I have is that occasionally the author allows for some ambiguity in the arrival of equations. The problems at the end of the chapter are very nice and the solutions are also provided. As with the authors advanced text (Introduction to Lattice Dynamics) it would be nice if this text provided some computational problems/exercises since calculating phonon properties of most materials can only be done computationally.

Good overview of symmetry operations, but wish it was slightly more indepth. The book examples need to be more thorough. Otherwise a good read for someone trying to get a fundamental understanding of symmetry operations in crystal structures.

Plasma Physics) Atomic Spectra and Radiative Transitions (Springer Series in Chemical Physics, Vol. 1) Statistical Mechanics: Entropy, Order Parameters and Complexity (Oxford Master Series in Physics) Kinetic Theory and Transport Phenomena (Oxford Master Series in Physics) Band Theory and Electronic Properties of Solids (Oxford Master Series in Physics) Relativity, Gravitation and Cosmology: A Basic Introduction (Oxford Master Series in Physics) Superconductivity, Superfluids, and Condensates (Oxford Master Series in Physics) Quantum Confined Laser Devices: Optical gain and recombination in semiconductors (Oxford Master Series in Physics) Engineering Materials 3: Materials Failure Analysis: Case Studies and Design Implications (International Series on Materials Science and Technology) (v. 3)