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There have been few books devoted to the study of phonons, a major area of condensed matter physics. The Physics of Phonons is a comprehensive theoretical discussion of the most important topics, including some topics not previously presented in book form. Although primarily theoretical in approach, the author refers to experimental results wherever possible, ensuring an ideal book for both experimental and theoretical researchers.

The author begins with an introduction to crystal symmetry and continues with a discussion of lattice dynamics in the harmonic approximation, including the traditional phenomenological approach and the more recent ab initio approach, detailed for the first time in this book. A discussion of anharmonicity is followed by the theory of lattice thermal conductivity, presented at a level far beyond that available in any other book. The chapter on phonon interactions is likewise more comprehensive than any similar discussion elsewhere. The sections on phonons in superlattices, impure and mixed crystals, quasicrystals, phonon spectroscopy, Kapitza resistance, and quantum evaporation also contain material appearing in book form for the first time. The book is complemented by numerous diagrams that aid understanding and is comprehensively referenced for further study. With its unprecedented wide coverage of the field, The Physics of Phonons will be indispensable to all postgraduates, advanced undergraduates, and researchers working on condensed matter physics.