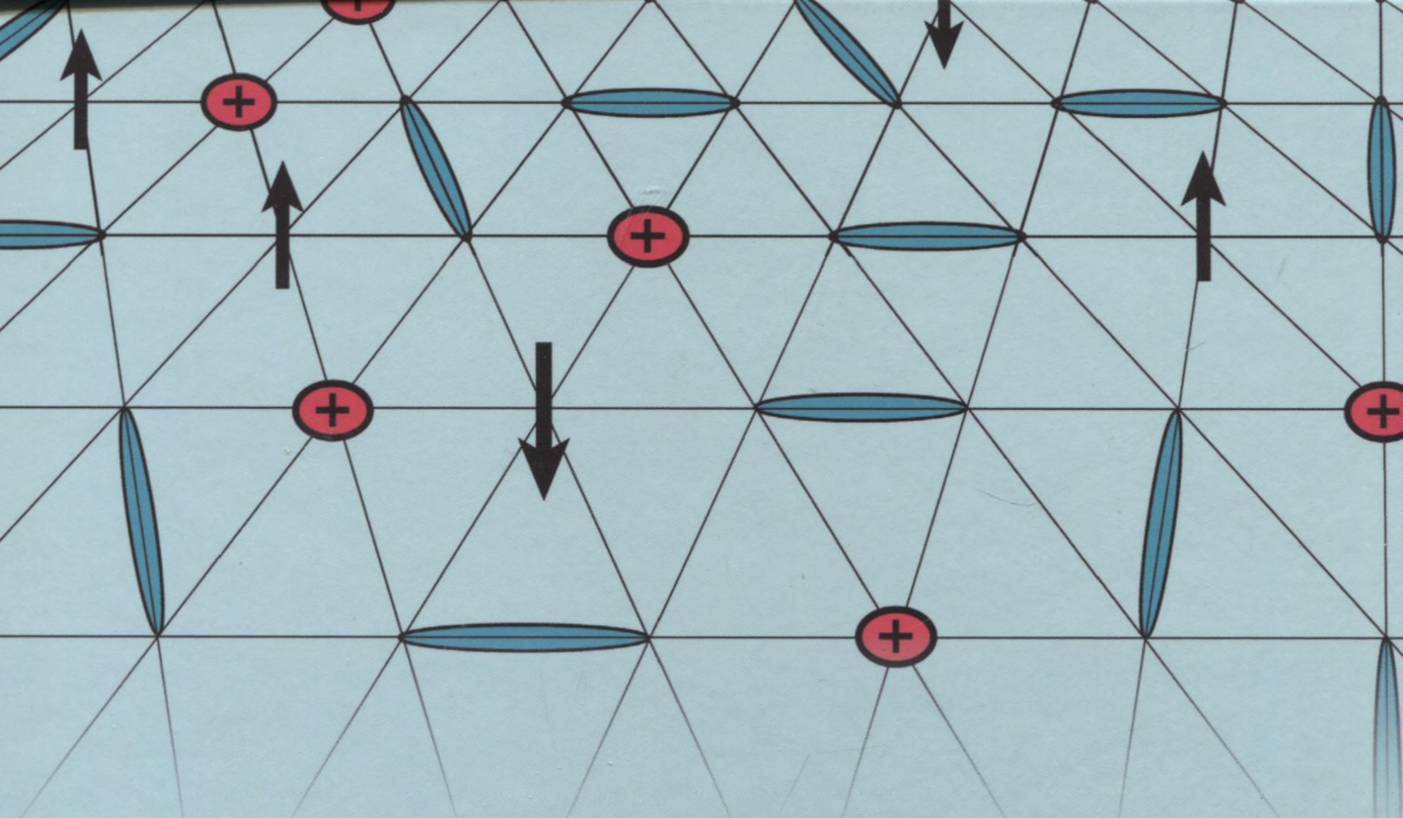

Aimed at graduate students and researchers, this book covers the key aspects of the modern quantum theory of solids, including up-to-date ideas such as quantum fluctuations and strong electron correlations. It presents the main concepts of the modern quantum theory of solids, as well as a general description of the essential theoretical methods required when working with these systems.

Using unifying concepts of order and elementary excitations, the book treats diverse topics such as the general theory of phase transitions; harmonic and anharmonic lattices; Bose condensation and superfluidity; modern aspects of magnetism including resonating valence bonds; electrons in metals and strong electron correlations. The main theoretical tools used to treat these problems are introduced and explained in a simple way, and their applications are demonstrated through concrete examples.

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