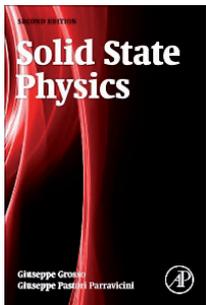


RECENSIONI



G. GROSSO AND G. PASTORI PARRAVICINI

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The second edition of *Solid State Physics* by Giuseppe Grosso and Giuseppe Pastori Parravicini follows by fourteen years the first edition, to signify the evergreen success of this excellent textbook. The book covers with pedagogical clarity the basic notions required by an undergraduate course, as well as the advanced concepts and subjects exposed in graduate condensed-matter courses, whether at the master or PhD levels. This textbook is conceived primarily for students in physics and materials science, but proved to be quite beneficial also to students in materials engineering with a decent background in quantum mechanics. Moreover some chapters of the book may be chosen as the suitable condensed matter complement for the undergraduate course of structure of matter.

The updating of some chapters and a series of new appendices carefully account for the great progress made in condensed matter physics during the last fifteen years, with a thoughtful selection of those advancements which promise to be firm milestones and not just flashes in the pan. For this reasons also young as well as experienced researchers will find quite useful to keep this textbook on hand in their bookshelf. Assuming that the readers are already familiar with the first edition, I simply mention the novelties. The first chapter on electrons in a periodic potential has now an appendix with solved problems and complements. Three new appendices and a new section on methods enrich Chapter 5 on the band theory of crystals. The electronic structure of carbon-based materials, graphene included, is a new entry in Chapter 6 on the electronic properties of different classes of crystals. The following chapter on electronic elementary excitations and screening covers the area where the major progress occurred in recent years, especially when referred to

low-dimensional systems, and has been fully re-organized. Chapter 8, concerning the interaction of electronic and nuclear degrees of freedom, has also a new section on the Berry phase applied to macroscopic polarization, and two new appendices.

Other important additions are a new appendix on the Green's function and the Kubo-Greenwood relation for the theory of the optical properties of semiconductors; a new section on the MOS structure in Chapter 14 on transport in inhomogeneous semiconductors, and a new appendix to the chapter on the magnetic order in crystals. The authors may have long meditated whether to add some appendix to the last chapter on superconductivity, in view of many recent discoveries in the field (new high- T_c , Fe-based and low-dimensional superconductors). Very little is however sufficiently solid nowadays to enter in a textbook. Thus it was a wise decision, I believe, not to obfuscate with questionable additions this masterful chapter.

I think many colleagues have already Grosso and Pastori-Parravicini first edition in their shelf, next to a couple of well-known classics in solid state physics. They certainly appreciate that the former is challenging the latter ones, deserving a distinct place among the classics, for distinctly encompassing both undergraduate and graduate levels, while keeping all over the fourteen chapters the same clarity, rigour and coherence. In this we recognize the legacy of the magnificent school in theoretical condensed matter physics bloomed around Franco Bassani, of which the authors are ideally continuing the best tradition.

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