



Condensed Matter in a Nutshell

By Gerald D. Mahan

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Condensed Matter in a Nutshell is the most concise, accessible, and self-contained introduction to this exciting and cutting-edge area of modern physics. This premier textbook covers all the standard topics, including crystal structures, energy bands, phonons, optical properties, ferroelectricity, superconductivity, and magnetism. It includes in-depth discussions of transport theory, nanoscience, and semiconductors, and also features the latest experimental advances in this fast-developing field, such as high-temperature superconductivity, the quantum Hall effect, graphene, nanotubes, localization, Hubbard models, density functional theory, phonon focusing, and Kapitza resistance. Rich in detail and full of examples and problems, this textbook is the complete resource for a two-semester graduate course in condensed matter and material physics.

- Covers standard topics like crystal structures, energy bands, and phonons
- Features the latest advances like high-temperature superconductivity and more
- Full of instructive examples and challenging problems
- Solutions manual (available only to teachers)

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Condensed Matter in a Nutshell By Gerald D. Mahan Bibliography

- Sales Rank: #1952724 in eBooks
- Published on: 2010-10-04
- Released on: 2010-10-04
- Format: Kindle eBook

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Editorial Review

Review

"Don't skip the introduction. It will not only re-energize those synapses which remember the history of chemistry, geology, and crystal growth, but it also poses some apparently simple questions which reveal the thrust of modern material research--all in eight pages."--**Bruce L. Dietrich, *Planetarian***

From the Inside Flap

"Mahan's book does an admirable job of covering the broad subject of condensed matter physics in a balanced way. Virtually every important modern topic is explained. The informal narrative style gives the reader the sense of sitting in on a lecture by the master. The long search for a suitable text for a one-year graduate course on condensed matter physics may finally be over."--**Patrick A. Lee, Massachusetts Institute of Technology**

"This book is a great place to start learning about the vast array of phenomena that nature is able to produce around us in the form of materials. It hardly fits in a nutshell--it covers a great many topics, both traditional and current, in condensed matter physics. It is more akin to Hamlet's assertion that he could be bounded in a nutshell, and count himself a king of infinite space. The prodigious knowledge of the author shines through in the choice of topics."--**Sidney R. Nagel, University of Chicago**

"This is an excellent book that shows the author's wide grasp of the material. I particularly appreciate the many problems at the end of each chapter. Another welcome feature is the inclusion of many hot, still-developing topics in contemporary solid state physics."--**Torgny Gustafsson, Rutgers University**

"Mahan is a nuts-and-bolts theorist. *Condensed Matter in a Nutshell* includes many current hot topics, and the problem sets are well chosen. The book will help those trained in chemistry and materials science, both professionals and students, to come to grips with the current thinking in condensed matter physics, and it directs readers where to go for deeper immersion."--**Zachary Fisk, University of California, Irvine**

From the Back Cover

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