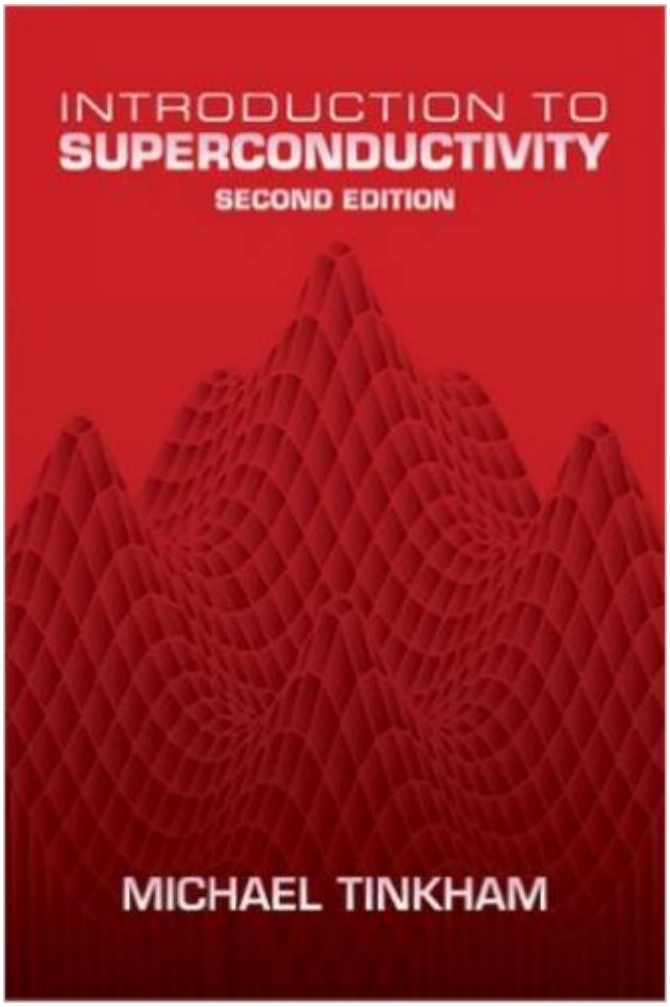
Introduction To Superconductivity: Second Edition (Dover Books On Physics) (Vol I)



Synopsis

Well known for its accessibility to graduate students and experimental physicists, this volume emphasizes physical arguments and minimizes theoretical formalism. The second edition of this classic text features revisions by the author that improve its user-friendly qualities, and an introductory survey of latter-day developments in classic superconductivity enhances the volumeâ ™s value as a reference for researchers. Starting with a historical overview, the text proceeds with an introduction to the electrodynamics of superconductors and presents expositions of the Bardeen-Cooper-Schrieffer theory and the Ginzburg-Landau theory. Additional subjects include magnetic properties of classic type II superconductors; the Josephson effect (both in terms of basic phenomena and applications and of the phenomena unique to small junctions); fluctuation effects in classic superconductors; the high-temperature superconductors; special topics (such as the Bogoliubov method, magnetic perturbations and gapless superconductivity, and time-dependent Ginzburg-Landau theory); and nonequilibrium superconductivity. 1996 edition.

Book Information

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Customer Reviews

This classic book on superconductivity is excellent for an experienced reader who has already some background in superconductivity. However, for a student trying to learn superconductivity, it says too many things in too brief which may be difficult to follow. While teaching a course I would prefer to follow a book like Superconductivity by Ketterson and Song and refer to this book for selected

(special) topics.

I am a grad student researching superconducting circuits for quantum information. Everyone in my lab uses this book as a reference so I bought it to use as my introduction to superconductivity theory. I like the book very much and would recommend it to anyone who has taken a graduate course in quantum mechanics.Tinkham’s basic theoretical development is clear and comprehensive, and the accompanying discussion is actually helpful. You can learn how to really extract information from a theory if you pay attention to how Tinkham works the BCS theory in chapter 3. There’s a good reason this book is a classic. After just reading chapter 3 I was able to understand essentially everything I need to have an intelligent conversation with others in my research group.I recommend this book along with Van Duzer’s "Superconducting Devices and Circuit." While Tinkham is presumably a book on basic theory, and Van Duzer is presumably a book for applications, both books provide brilliant gems of insight in each other’s domain. They make a great pair.Prerequisits: Second quantization, basic solid state, and basic E&M. In short, a first year grad student’s education is more than enough.

The theory of superconductors is an amazingly complicated and rich field, and it can be very daunting to begin studying without a large background in physics. This book does an excellent job telling you the details enough to understand what is going on without giving you so much that it becomes a daunting task to read the book.Having only read through the first three chapters so far, I give that caveat before continuing.The first chapter, the author says upfront, is difficult to follow, as it gives a quick outline of every future chapter in the book. I would recommend skimming the first chapter, and then after reading each chapter go back and see if you got the key points illustrated in the first chapter.The second chapter, a treatment of the London equations, does an excellent job deriving the London equations in the first section, then providing a great deal of application of the equations, as well as outlining the limits of that model of superconductors.Chapter 3 is where the book gets down to business, as Tinkham gives an introduction to BCS theory. This treatment uses plausibility arguements to justify many of the conclusions or assumptions, but also provides some guidance to the mathematical rigor you might use to really prove the assertions you make. The chapter does not leave you feeling very confused at all, and the section can be read almost straight through.Although I have not read any further into the book, I can only imagine that it is more of the same. I would strongly recommend this book to anybody interested in learning something about superconductors before trying something more rigorous, such as Schrieffer’s classic text on the

work.

This book provides an excellent comprehensive review of most of the aspects relevant to superconductivity. A strong basis in physics is required to follow it all the way. Otherwise, it is possible to read most of the chapters separately without loosing continuity, so the more complex ones can be put aside if the reader is not interested in deep physics. Many references to relevant authors are given all along the text. It should be a reference available to all the people seriously involved in superconductivity. The only bad point is that it uses CGS unit rather than SI units.

A bit denser than other intros, but the best intro I've read. Tinkham does a great job guiding the reader (i.e. suggesting skipping the BCS chapter), giving examples, and not oversimplifying. Its clear the writer had a broad base of knowledge and a good historical account of a lot of the research. Comments on some complex superconductive phenomena which most other intros skip out on (non-equilibrium and other odd effects)

I was introduced to this book (1st edition) while in grad school (research in SC) and, in my collection of books related to this field, Tinkham's is all the way to the top.If you are really serious about understanding SC theory, this one is a must have.

Great book to learn basic superconductivity. Every thing basically you should know is compacted in the book. Sure you should know some basics on solid state physics and mathematics. That is obvious since superconductivity is no basic subject.

Michael Tinkham was a great developer of the field and made a fine book for students to have (in my opinion)a second approach to the subject.

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