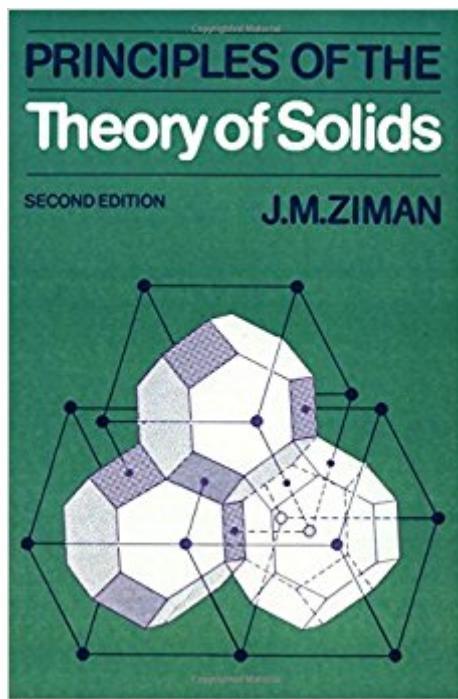


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Principles Of The Theory Of Solids



Synopsis

Professor Ziman's classic textbook on the theory of solids was first published in 1964. This paperback edition is a reprint of the second edition, which was substantially revised and enlarged in 1972. The value and popularity of this textbook is well attested by reviewers' opinions and by the existence of several foreign language editions, including German, Italian, Spanish, Japanese, Polish and Russian. The book gives a clear exposition of the elements of the physics of perfect crystalline solids. In discussing the principles, the author aims to give students an appreciation of the conditions which are necessary for the appearance of the various phenomena. A self-contained mathematical account is given of the simplest model that will demonstrate each principle. A grounding in quantum mechanics and knowledge of elementary facts about solids is assumed. This is therefore a textbook for advanced undergraduates and is also appropriate for graduate courses.

Book Information

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Customer Reviews

This book deserves to be much more widely used. Ziman's prose is simply wonderful, where Kittel is unreadable, and Ashcroft & Mermin often dense. It's a bit quirky (how on earth did he find the epigrams for each chapter?) but that is what makes it lovable. Anyone who doubts his scientific soundness should check out his massive "Electrons & Phonons." The main advantage of this book is that it emphasizes conceptual understanding over mathematical manipulation. That's also its weakness: Ziman often glosses over or just sketches what in other texts would be occasions for massive algebra. Perhaps if you are a true theorist type, you can fill in the blanks on your own. As

an experimentalist, I feel like I need some other intro texts to make me feel like I can do *some* math in the field. On the other hand, I don't know of any textbook that makes me feel I could do the truly heavy lifting.

For students who have Kittel or Ashcroft/Mermin under their belt, this book provides a somewhat more mathematical presentation of fundamental concepts in solid state theory, as is clear from the contents shown on this site. I might add, that Ziman is a highly respected physicist, well known for his work on superconductivity. This was the first book I got into my hands that said something like "as the group of lattice translations is abelian, Bloch functions that are translated change only by a phase factor", which made me hungry for more.

I used heavily the first edition of this book, and have not seen the second, but it is no doubt as good as the first, which was packed full of insights into the many rich phenomena that exists in solids. It has served, and will serve, future generations of students in the 21st century in their development of new ideas and technologies based on condensed matter physics. Writers of physics texts should follow the strategy that this author does, in his statement that "a treatise expounds; a textbook explains". The emphasis of any book in physics should be in developing the reader's intuition; the mathematics sometimes takes hold and moves the reader away from the essential ideas. The author is one of the few who has not done this, and that is no doubt the reason for this book's popularity.

The book is surely an advanced treatment of solid state physics and as such, the uninitiated reader may not necessarily appreciate the beauty of the treatment at first. Indubitably, however, Ziman presents a coherent and clear exposition in which the principles of the solid state are explained in a unified manner --a merit many books are missing. It is a joy to read if you have the basics covered in an earlier course and/or self-study. Ziman's Shakespearian flair is virtually impossible to not realize and in turn, further enhances the quality of the exposition. For those who would like to kick their theoretical background up a notch, this book is the right answer.

There are few physics books that I can say I enjoy reading for fun (and I'm a student of physics) but I must admit that this book is excellent. It holds true not only to its reputation but to what the author's original intent was. It is thorough, enlightening, to the point and fun to read, the author's sense of humor not only aids in ease of reading but makes retention and elucidation all the more easy! This

is an excellent graduate text on basic solid state physics, even though it was published in 1975. It covers all the basic areas, from periodicity to lattice waves, phonons, semiconductors etc at an accessible level to the beginning graduate student. A must read.

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