The book was found

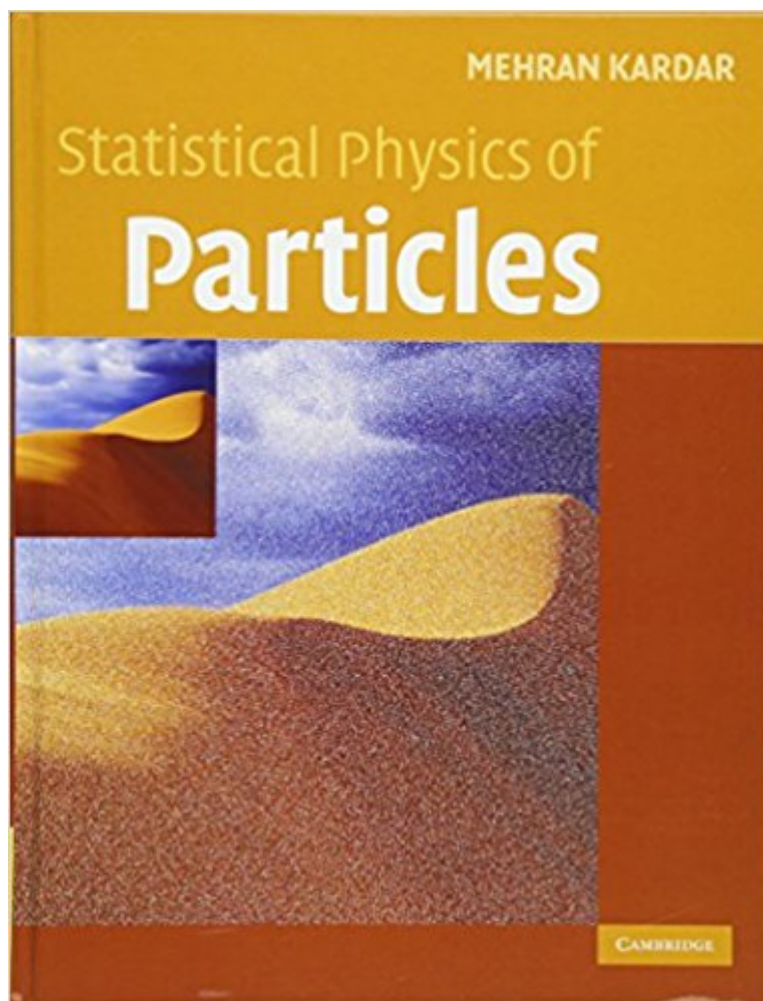# Statistical Physics Of Particles

MEHRAN KARDAR

Statistical Physics of
Particles

CAMBRIDGE

Synopsis

Statistical physics has its origins in attempts to describe the thermal properties of matter in terms of its constituent particles, and has played a fundamental role in the development of quantum mechanics. Based on lectures taught by Professor Kardar at MIT, this textbook introduces the central concepts and tools of statistical physics. It contains a chapter on probability and related issues such as the central limit theorem and information theory, and covers interacting particles, with an extensive description of the van der Waals equation and its derivation by mean field approximation. It also contains an integrated set of problems, with solutions to selected problems at the end of the book and a complete set of solutions is available to lecturers on a password protected website at www.cambridge.org/9780521873420. A companion volume, Statistical Physics of Fields, discusses non-mean field aspects of scaling and critical phenomena, through the perspective of renormalization group.

Book Information

Hardcover: 330 pages

Publisher: Cambridge University Press; 1 edition (June 25, 2007)

Language: English

ISBN-10: 0521873428

ISBN-13: 978-0521873420

Product Dimensions: 7.4 x 0.9 x 9.7 inches

Shipping Weight: 1.9 pounds (View shipping rates and policies)

Average Customer Review: 3.1 out of 5 stars   16 customer reviews

Best Sellers Rank: #120,231 in Books (See Top 100 in Books)   #52 in Books > Science & Math > Physics > Mathematical Physics   #475 in Books > Textbooks > Science & Mathematics > Physics

Customer Reviews

"In this much-needed modern text, Kardar presents a remarkably clear view of statistical mechanics as a whole, revealing the relationships between different parts of this diverse subject. In two volumes, the classical beginnings of thermodynamics are connected smoothly to a thoroughly modern view of fluctuation effects, stochastic dynamics, and renormalization and scaling theory. Students will appreciate the precision and clarity in which difficult concepts are presented in generality and by example. I particularly like the wealth of interesting and instructive problems inspired by diverse phenomena throughout physics (and beyond!), which illustrate the power and broad applicability of statistical mechanics." Leon Balents, Department of Physics, University of

California, Santa Barbara"... Statistical Physics of Fields is the welcome result of an innovative and popular graduate course Kardar has been teaching at MIT for almost twenty years. It is a masterful account of the essentials of a subject which played a vital role in the development of twentieth century physics ... Statistical Physics of Fields builds on the foundation laid by the Statistical Physics of Particles, with an account of the revolutionary developments of the past 35 years, many of which were facilitated by renormalization group ideas. Much of the subject matter is inspired by problems in condensed matter physics, with a number of pioneering contributions originally due to Kardar himself." David R Nelson, Arthur K Solomon Professor of Biophysics, Harvard University"If Landau and Lifshitz were to prepare a new edition of their classic Statistical Physics text they might produce a book not unlike this gem by Mehran Kardar. Indeed, Kardar is an extremely rare scientist, being both brilliant in formalism and an astoundingly careful and thorough teacher. He demonstrates both aspects of his range of talents in this pair of books, which belong on the bookshelf of every serious student of theoretical statistical physics." H Eugene Stanley, Director, Center for Polymer Studies, Boston University"This is one of the most valuable textbook I have seen in a long time. Written by a leader in the field, it provides a crystal clear, elegant and comprehensive coverage of the field of statistical physics. I am sure this book will become the reference for the next generation of researchers, students and practitioners in statistical physics. I wish I had this book when I was a student but I will have the privilege to rely on it for my teaching." Alessandro Vespignani, Center for Biocomplexity, Indiana University"Over the past two decades, I have admired Kardar's contributions to theoretical physics, and now I admire his contribution to teaching physics. The first volume, Statistical Physics of Particles, is distinguished by its useful feature of teaching physics by example... the first eight chapters of Statistical Physics of Fields are stunning. With that volume Kardar has produced an excellent and unique textbook that will serve our community well for many years." David Chandler, Physics Today

Based on lectures for a statistical mechanics course, this textbook introduces the central concepts and tools of statistical physics including solutions that are available to lecturers at www.cambridge.org/9780521873420. A companion volume, discusses non-mean field aspects of scaling and critical phenomena, through the perspective of renormalization group.

This book is so beautiful. I think it's one of the clearest exposition on statistical mechanics. The derivations follow a bit of the Landau Lifshitz style, being very systematic and rigorous at the same time, and very economical on word count. It's also very concise, I would say if you like the Landau

series, you'll like this. I also like the emphasis on probability. I find a lot of statistical mechanics can just be derived from information theory, which unifies the whole subject, and Kardar uses that fact to make the whole treatment very unified.Beware, however, the problems are very hard, and require complete mastery of the material to solve (some require an ingenious trick).

I'm really enjoying the book so far. The quality of the content is 4 to 5 stars. However, I feel really ripped off as to the price and length. This book is 200 something pages. And the author released another 200 page book along side it. Both 80 dollars. Together, these two books would make a legitimate 80 dollar book. But 160 dollars is a rip off to be honest.The book should be "Statistical Physics" and part one should be "Statistical Physics of Particles" and part two should be "Statistical Physics of Fields."

good and short explanation about concepts

Perhaps I am a bit biased as I took Mehran Kardar's statistical mechanics class, but this is the best graduate-level statistical mechanics textbook I have looked at (including Pathria, Huang, and Landau). In the tradition of Landau's excellent mechanics textbook, Kardar is a master of statistical physics who starts with only basic assumptions about the nature of the physical laws in each chapter, and derives wonderful results elucidating the nature of statistical physics. The meat of the textbook is less than 200 pages and includes all of the basic results of thermodynamics, a section on probability, an introduction to kinetic theory, and the bulk of classical and quantum statistical mechanics; brevity is the soul of wit, as they say. A few areas could have used a little more elaboration (the derivation of the Boltzmann equation seemed to skip a few important steps in implementing the streaming collision terms, and a better explanation for the basics of diagrammatical techniques would have been nice), but none of the other books I have looked at even broached these topics in any depth. Unlike Landau's excellent statistical physics book, very little assumed knowledge is required to follow this textbook; obviously, skill in elementary algebra, calculus, differential equations, and a bit of Hamiltonian mechanics and a few very basic results of quantum mechanics are prerequisites. Recommended!

This book is trash. The first chapter is concise and helpful but quickly becomes a conduit for Kardar to show you how exceptional he is at math and also a challenge to himself in terms of how many obscure notations he can introduce.There is little explanation and the problems further detach the

reader from the essence of the material. Be prepared to read this book alongside a well-written undergraduate textbook if you hope to understand anything.

This is a great book for my graduate level Stat. Mech. It starts off simple and basic and builds. It's well written and the problems at the end of the chapters make you think (and sometimes google how to solve them). The writer was great too and responded when I asked him questions. The solutions in the back are nice and Dr. Kardar was willing to send me additional solutions to the ones that weren't in the back. A great book, a great author. Excellent learning tool.

I used both this text and Pathria for a graduate level class in statistical mechanics. Kardar's treatment is very modern and has a wonderful perspective. However, it is very mathematical while managing to not be very thorough. The problems were very good and the worked solutions in the back were quite helpful. For the material covered in this book, I preferred Pathria, which was in general far more thorough.

This book often explains things in the most confusing way possible. It rarely does examples after it introduces a new concept. It's often very hard to connect the problems for each chapter to the material of the chapter.

Download to continue reading...

Statistical Physics of Particles Six Ideas That Shaped Physics: Unit Q - Particles Behave Like Waves (WCB Physics) Elementary Particles : The Building Blocks of the Universe - Physics and the Universe | Children's Physics Books Statistical Physics (Student Physics Series) Modern Classical Physics: Optics, Fluids, Plasmas, Elasticity, Relativity, and Statistical Physics Statistical Methods for Data Analysis in Particle Physics (Lecture Notes in Physics) Statistical Physics: Theory of the Condensed State (Course of Theoretical Physics Vol. 9) Fundamentals of Statistical and Thermal Physics (Fundamentals of Physics) Methods of Quantum Field Theory in Statistical Physics (Dover Books on Physics) Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles Particles and Nuclei: An Introduction to the Physical Concepts (Graduate Texts in Physics) An Introduction to the Physics of Nuclei and Particles Elementary Particles and the Laws of Physics: The 1986 Dirac Memorial Lectures Geometry, Particles, and Fields (Graduate Texts in Contemporary Physics) Analytics: Business Intelligence, Algorithms and Statistical Analysis (Predictive Analytics, Data Visualization, Data Analytics, Business Analytics, Decision Analysis, Big Data, Statistical Analysis) The Solid State: An Introduction to the Physics of Crystals for Students of Physics, Materials

Science, and Engineering (Oxford Physics Series) Head First Physics: A learner's companion to mechanics and practical physics (AP Physics B - Advanced Placement) Physics for Scientists and Engineers with Modern Physics: Volume II (3rd Edition) (Physics for Scientists & Engineers) Physics for Kids : Electricity and Magnetism - Physics 7th Grade | Children's Physics Books Six Ideas that Shaped Physics: Unit N - Laws of Physics are Universal (WCB Physics)