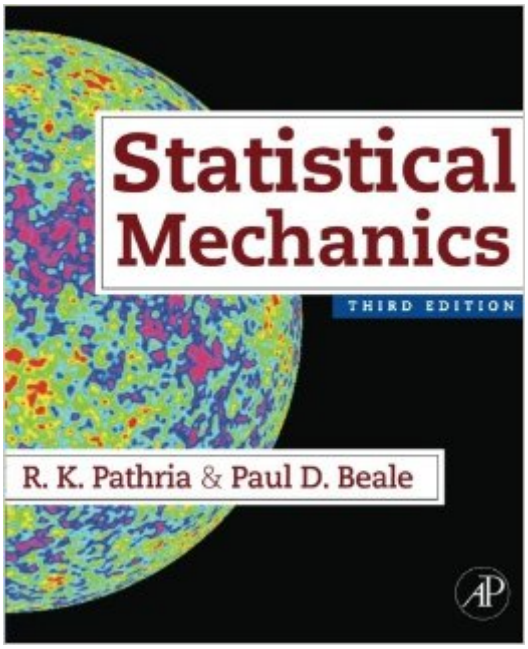
Statistical Mechanics, Third Edition



Synopsis

This classic text, first published in 1972, is designed for graduate physics courses in statistical mechanics. The second edition, published in 1996, incorporated three comprehensive chapters on phase transitions and critical phenomena. This third edition includes new sections on Bose-Einstein condensation and degenerate Fermi behavior of ultracold atomic gases, and two new chapters on computer simulation methods and the thermodynamics of the early universe. We have also added new sections on chemical and phase equilibrium, and expanded our discussions of correlations and scattering, quantized fields, finite-size effects and the fluctuation-dissipation theorem. We hope this new edition will continue to provide new generations of students with a solid training in the methods of statistical physics.-Bose-Einstein condensation in atomic gases -Thermodynamics of the early universe -Computer simulations: Monte Carlo and molecular dynamics -Correlation functions and scattering -Fluctuation-dissipation theorem and the dynamical structure factor -Chemical equilibrium -Exact solution of the two-dimensional Ising model for finite systems -Degenerate atomic Fermi gases -Exact solutions of one-dimensional fluid models -Interactions in ultracold Bose and Fermi gases -Brownian motion of anisotropic particles and harmonic oscillators

Book Information

Paperback: 744 pages
Publisher: Academic Press; 3 edition (March 14, 2011)
Language: English
ISBN-10: 0123821886
ISBN-13: 978-0123821881
Product Dimensions: 7.5 x 1.7 x 9.2 inches
Shipping Weight: 3.4 pounds (View shipping rates and policies)
Average Customer Review: 3.5 out of 5 starsÂ Â See all reviewsÂ (11 customer reviews)
Best Sellers Rank: #258,708 in Books (See Top 100 in Books) #37 inÂ Books > Science & Math > Physics > Applied #159 inÂ Books > Science & Math > Physics > Mathematical Physics #168 inÂ Books > Science & Math > Physics > Mechanics

Customer Reviews

This is a book on statistical mechanics written for physicists. While most books dedicate a chapter or so to the treatment of stat mech. of quantum systems, this book uses the statistics of quantum systems as its foundations. While this means that the reader must possess a very firm grounding in quantum, it does eliminate some ’problems’ of stat mech. such as the Gibbs paradox. It also makes

some of the derivations simpler because once the quantum version of a phenomenon has been derived, the classical limit generally follows immediately. This book is not an easy read. I found that the equations were not always well motivated in the text. Even so, there are usually references to previous equations that will help in the understanding of whatever the current section is covering. One thing that I really like about this book is that the equations are numbered by sections and only the equations that are referenced in the text are given labels so that you don't wind up with numbering that goes into the hundreds (I realize that this is purely a stylistic point but it makes a difference in the readability in my view). I did have a hard time following the chapters on phase transitions and critical phenomena, but after reading parts ofÂ Statistical and Thermal Physics: With Computer Applications, which has a very good treatment of this subject, I was able to come back and understand it a bit better. I also found the chapter on the stat mech. of the early universe quite interesting even if it seemed rather tangential to the rest of the book.

I would not recommend this book for physicists. It felt more written for people with a chemistry background. To me, the topics were out of order and often emphasized the wrong things. They occasionally went into too much detail about something for no apparent reason but then left other topics out. The end-of-chapter problems are numerous (which is good), but often poorly worded or vaguely framed (bad).The redeeming qualities of the book are the couple of pages on the grand canonical ensemble and the appendix that summarizes all the ensembles and equations.I much prefer Kittel's treatment and Landau's conceptual explanations (and the Jacobian formalism).

The way the author writes can be very difficult to understand, and his explanations of the material are opaque. Also, the notation is often counter-intuitive. I am heavily relying on my professor's notes for my graduate stat mech course as well as my undergrad textbook because I do not find this text particularly helpful. I would not recommend buying it unless you absolutely need to.

Very difficult book to learn from. A lot of important details are left out and the prose seems meant to confuse at times. If possible I would suggest pursuing perhaps Landau or Reif.

Not too far through the book yet, but I'm not a fan so far. He rambles on with loose structure and relatively randomly at times, just like the other two authors. He introduces topics that don't follow a logical development. IE Entropy of mixing in chapter 1, after a very minimal discussion of entropy.

arrive on time, binding not very good

I really love this text.It has very deep sense and formalism of the statistical physics.Without doubt this is one of the best, and it would be accessible for undergraduate students

I had Pathria's original book and still bought this updated version. The original was so valuable that I thought the updated version would be worth the money. I wasn't disappointed.

Statistical Mechanics, Third Edition Introduction to Modern Statistical Mechanics The Conceptual Foundations of the Statistical Approach in Mechanics (Dover Books on Physics) Kinetic theory of gases,: With an introduction to statistical mechanics, (International series in physics) Statistical Mechanics, Kinetic Theory and Stochastic Process Statistical Mechanics (Advanced Texts in Physics) Statistical Mechanics of Learning Orbital Mechanics for Engineering Students, Third Edition (Aerospace Engineering) Work The System: The Simple Mechanics of Making More and Working Less (Revised third edition, 4th printing, September 1, 2014) Crazy Horse, Third Edition: The Strange Man of the Oglalas, Third Edition Diagnostic and Statistical Manual of Mental Disorders, 5th Edition: DSM-5 The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition (Springer Series in Statistics) Implementing Six Sigma, Second Edition: Smarter Solutions Using Statistical Methods Statistical Techniques in Business and Economics, 16th Edition Statistical Methods for the Social Sciences (4th Edition) Much Ado About Nothing: Revised Edition: Third Series (The Arden Shakespeare Third Series) What Your Third Grader Needs to Know (Revised Edition): Fundamentals of a Good Third-Grade Education (Core Knowledge Series) I Am Third: The Inspiration for Brian's Song: Third Edition Introduction to Statistical Relational Learning (Adaptive Computation and Machine Learning series) Measuring the Software Process: Statistical Process Control for Software Process Improvement