

Statistical Mechanics Made Simple



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This second edition extends and improves on the first, already an acclaimed and original treatment of statistical concepts insofar as they impact theoretical physics and form the basis of modern thermodynamics. This book illustrates through myriad examples the principles and logic used in extending the simple laws of idealized Newtonian physics and quantum physics into the real world of noise and thermal fluctuations. In response to the many helpful comments on the first edition, important features to this edition include additional figures, new problems, and worked-out solutions to some representative problems. Armed with the wit and knowledge of a new coauthor, the topics of renormalization group and Monte Carlo numerical techniques are now treated on a par with more conventional elements of statistical thermodynamics. The addition of these important subjects thus allows a coherent picture of thermal physics to emerge. This new edition incorporates important aspects of many-body theory and of phase transitions. It should better serve the contemporary student, while offering to the instructor a wider selection of topics from which to craft lectures on topics ranging from thermodynamics and random matrices to thermodynamic Green functions and critical exponents, from the propagation of sound in solids and fluids to the nature of quasiparticles in quantum liquids and in transfer matrices.

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