
Statistical Physics Second Revised And Enlarged Edition

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Advanced Statistical Mechanics Springer Science & Business Media

Classic text combines thermodynamics, statistical mechanics, and kinetic theory in one unified presentation. Topics include equilibrium statistics of special systems, kinetic theory, transport coefficients, and fluctuations. Problems with solutions. 1966 edition.

Classical and Quantum Statistical Physics World Scientific Publishing Company

Going beyond traditional textbook topics, 'A

Modern Course in Statistical Physics' incorporates contemporary research in a basic course on statistical mechanics. From the universal nature of matter to the latest results in the spectral properties of decay processes, this book emphasizes the theoretical foundations derived from thermodynamics and probability theory underlying all concepts in statistical physics. This completely revised and updated third edition continues the comprehensive coverage of numerous core topics and special applications, allowing professors flexibility in designing individualized courses. The inclusion of advanced topics and extensive references makes this an invaluable resource for researchers as well as students -- a textbook that will be kept on the shelf long after the course is completed.

A Modern Course in Statistical Physics Elsevier

Statistics links microscopic and macroscopic phenomena, and requires for this reason a large number of microscopic elements like atoms. The results are values of maximum probability or of averaging. This introduction to statistical physics concentrates on the basic principles and attempts to explain these in simple terms, supplemented by numerous examples. These basic principles include the difference between classical and quantum statistics, a priori probabilities as

related to degeneracies, the vital aspect of indistinguishability as compared with distinguishability in classical physics, the differences between conserved and non-conserved elements, the different ways of counting arrangements in the three statistics (Maxwell-Boltzmann, Fermi-Dirac, Bose-Einstein), the difference between maximization of the number of arrangements of elements, and averaging in the Darwin-Fowler method. Significant applications to solids, radiation and electrons in metals are treated in separate chapters, as well as Bose-Einstein condensation. In this latest edition, apart from a general revision, the topic of thermal radiation has been expanded with a new section on black bodies and an

additional chapter on black holes. Other additions are more examples with applications of statistical mechanics in solid state physics and superconductivity. Throughout the presentation, the introduction carries almost all details for calculations. States of Matter Princeton University Press
Statistical Mechanics discusses the fundamental concepts involved in understanding the physical properties of matter in bulk on the basis of the dynamical behavior of its microscopic constituents. The book emphasizes the equilibrium states of physical systems. The text first details the statistical basis of thermodynamics, and then proceeds to discussing the elements of ensemble theory. The next two chapters cover the canonical and grand canonical ensemble. Chapter 5 deals with the formulation of quantum statistics, while Chapter 6 talks about the theory of simple gases. Chapters 7 and 8

examine the ideal Bose and Fermi systems. In the next three chapters, the book covers the statistical mechanics of interacting systems, which includes the method of cluster expansions, pseudopotentials, and quantized fields. Chapter 12 discusses the theory of phase transitions, while Chapter 13 discusses fluctuations. The book will be of great use to researchers and practitioners from wide array of disciplines, such as physics, chemistry, and engineering.

Statistical Physics Courier Corporation
Suitable for advanced undergraduates and graduate students of physics, this uniquely comprehensive overview provides a rigorous, integrated treatment of physical principles and techniques related to gases, liquids, solids, and their phase transitions. 1975 edition.

Statistical Physics I Springer Science & Business Media

In each generation, scientists must redefine their fields: abstracting, simplifying and distilling the previous standard topics to make room for new advances and methods. Sethna's book takes this step for statistical mechanics - a field rooted in physics and chemistry whose ideas and methods are now central to information theory, complexity, and modern

biology. Aimed at advanced undergraduates and early graduate students in all of these fields, Sethna limits his main presentation to the topics that future mathematicians and biologists, as well as physicists and chemists, will find fascinating and central to their work. The amazing breadth of the field is reflected in the author's large supply of carefully crafted exercises, each an introduction to a whole field of study: everything from chaos through information theory to life at the end of the universe.

Statistical Physics and Thermodynamics John Wiley & Sons

In this revised and enlarged second edition, Tony Gu é nault provides a clear and refreshingly readable introduction to statistical physics. The treatment itself is self-contained and concentrates on an understanding of the physical ideas, without requiring a high level of mathematical sophistication. The book adopts a straightforward quantum approach to statistical averaging from the outset. The initial part of the book is geared towards explaining the equilibrium properties of a simple isolated assembly of particles. The treatment of gases gives full coverage to Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein statistics.

Statistical Physics Springer Science & Business Media

Well respected and widely used, this volume

presents problems and full solutions related to a wide range of topics in thermodynamics, statistical physics, and statistical mechanics.

The text is intended for instructors, undergraduates, and graduate students of mathematics, physics, chemistry, and engineering. Twenty-eight chapters, each prepared by an expert, proceed from simpler to more difficult subjects. Similarly, the early chapters are easier than the later ones, making the book ideal for independent study. Subjects begin with the laws of thermodynamics and statistical theory of information and of ensembles, advancing to the ideal classical gases of polyatomic molecules, non-electrolyte liquids and solutions, and surfaces. Subsequent chapters explore imperfect classical and quantum gas, phase transitions, cooperative phenomena, Green function methods, the plasma, transport in gases and metals, Nyquist's theorem and its generalizations, stochastic methods, and many other topics.

Statistical Physics Springer Science & Business Media

A book about statistical mechanics for students.

Statistical Physics John Wiley & Sons

This textbook concentrates on modern topics in statistical physics with an emphasis on strongly interacting condensed matter systems. The book is

self-contained and is suitable for beginning graduate students in physics and materials science or undergraduates who have taken an introductory course in statistical mechanics. Phase transitions and critical phenomena are discussed in detail including mean field and Landau theories and the renormalization group approach. The theories are applied to a number of interesting systems such as magnets, liquid crystals, polymers, membranes, interacting Bose and Fermi fluids; disordered systems, percolation and spin of equilibrium concepts are also discussed. Computer simulations of condensed matter systems by Monte Carlo-based and molecular dynamics methods are treated.

Statistical Mechanics OUP Oxford

This volume provides a compact presentation of modern statistical physics at an advanced level, from the foundations of statistical mechanics to the main modern applications of statistical physics. Special attention is given to new approaches, such as quantum field theory methods and non-equilibrium problems. This second, revised edition is expanded with biographical notes contextualizing the main results in statistical physics.

An Introduction to Thermodynamics and Statistical Mechanics Cambridge University Press

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 by users of the first edition, important features have been added in this second, new and revised edition. These additions allow a more coherent picture of thermal physics to emerge. Benefiting from the expertise of the new co-author, the present edition includes a detailed exposition — occupying two separate chapters — of the renormalization group and Monte-Carlo numerical techniques, and of their applications to the study of phase transitions. Additional figures have been included throughout, as have new problems. A new Appendix presents fully worked-out solutions to representative problems; these illustrate various methodologies that are peculiar to physics at finite temperatures, that is, to statistical physics. 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.

Statistical Mechanics CRC Press

While many scientists are familiar with fractals, fewer are familiar with scale-invariance and universality which underlie the ubiquity of their shapes. These properties may emerge from the collective behaviour of simple fundamental constituents, and are studied using statistical field theories. Initial chapters connect the particulate perspective developed in the companion volume, to the coarse grained statistical fields studied here. Based on lectures taught by Professor Kardar at MIT, this textbook demonstrates how such theories are formulated and studied. Perturbation theory, exact solutions, renormalization groups, and other tools are employed to demonstrate the emergence of scale invariance and universality, and the non-equilibrium dynamics of interfaces and directed paths in random media are discussed. Ideal for advanced graduate courses in statistical physics, it contains an integrated set of problems, with solutions to selected problems at the end of the book and a complete set available to lecturers at www.cambridge.org/9780521873413.

Statistical Mechanics, Kinetic theory, and Stochastic Processes Oxford University Press

Statistical physics and thermodynamics

describe the behaviour of systems on the macroscopic scale. Their methods are applicable to a wide range of phenomena, from neutron stars to heat engines, or from chemical reactions to phase transitions. The pertinent laws are among the most universal ones of all laws of physics.

Statistical Physics Walter de Gruyter GmbH & Co KG

A self-contained, mathematical introduction to the driving ideas in equilibrium statistical mechanics, studying important models in detail.

Problems in Thermodynamics and Statistical Physics World Scientific

A completely revised edition that combines a comprehensive coverage of statistical and thermal physics with enhanced computational tools, accessibility, and active learning activities to meet the needs of today's students and educators. This revised and expanded edition of Statistical and Thermal Physics introduces students to the essential ideas and techniques used in many areas of contemporary physics. Ready-to-run programs help make the many abstract concepts concrete. The text requires only a background in introductory mechanics and some basic ideas of quantum theory, discussing material typically found in undergraduate texts as well as topics such as fluids, critical phenomena, and computational techniques, which serve as a natural bridge to

graduate study. Completely revised to be more accessible to students Encourages active reading with guided problems tied to the text Updated open source programs available in Java, Python, and JavaScript Integrates Monte Carlo and molecular dynamics simulations and other numerical techniques Self-contained introductions to thermodynamics and probability, including Bayes' theorem A fuller discussion of magnetism and the Ising model than other undergraduate texts Treats ideal classical and quantum gases within a uniform framework Features a new chapter on transport coefficients and linear response theory Draws on findings from contemporary research Solutions manual (available only to instructors)

Statistical Physics Hodder Education

The essential introduction to modern statistical mechanics—now completely updated and expanded Statistical mechanics is one of the most exciting areas of physics today and has applications to subjects ranging from economics and social behavior to algorithmic theory and evolutionary biology. Statistical Mechanics in a Nutshell provides a self-contained introduction to this rapidly developing field. Starting with the basics of kinetic theory and requiring only a background in elementary calculus and mechanics, this concise book discusses the most important developments of recent decades and guides readers to the very threshold of today's

cutting-edge research. Features a new chapter on stochastic thermodynamics with an introduction to the thermodynamics of information—the first treatment of its kind in an introductory textbook Offers a more detailed account of numerical simulations, including simulated annealing and other accelerated Monte Carlo methods The chapter on complex systems now features an accessible introduction to the replica theory of spin glasses and the Hopfield theory of neural networks, with an emphasis on applications Provides a new discussion of defect-mediated transitions and their implications for two-dimensional melting An invaluable resource for graduate students and advanced undergraduates seeking a compact primer on the core ideas of statistical mechanics Solutions manual (available only to instructors)

Statistical Mechanics of Lattice Systems
Cambridge University Press

Provides a detailed introduction to classical and quantum statistical physics, including modern applications within current research.

Statistical Mechanics in a Nutshell, Second Edition World Scientific

Statistical Physics I discusses the fundamentals of equilibrium statistical mechanics, focussing on basic physical aspects. No previous knowledge of thermodynamics or the

molecular theory of gases is assumed. Illustrative examples based on simple materials and photon systems elucidate the central ideas and methods.

Statistical and Thermal Physics Courier Corporation

This short textbook covers roughly 13 weeks of lectures on advanced statistical mechanics at the graduate level. It starts with an elementary introduction to the theory of ensembles from classical mechanics, and then goes on to quantum statistical mechanics with density matrix. These topics are covered concisely and briefly. The advanced topics cover the mean-field theory for phase transitions, the Ising models and their exact solutions, and critical phenomena and their scaling theory. The mean-field theories are discussed thoroughly with several different perspectives — focusing on a single degree, or using Feynman-Jensen-Bogoliubov inequality, cavity method, or Landau theory. The renormalization group theory is mentioned only briefly. As examples of computational and numerical approach, there is a chapter on Monte Carlo method including the cluster algorithms. The second half of the book studies nonequilibrium statistical mechanics, which includes the Brownian motion, the Langevin and Fokker-Planck equations, Boltzmann equation, linear response theory, and the Jarzynski equality. The book ends with a brief discussion of irreversibility. The topics are supplemented by problem sets (with partial answers) and

supplementary readings up to the current research,
such as heat transport with a Fokker-Planck
approach.