

# Introduction To Statistical Physics By Anthony John Pointon

Statistical Physics  
Problems in Thermodynamics and Statistical Physics  
Statistical Physics  
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Statistical Physics  
Basics Of Statistical Physics (Second Edition)  
Statistical Physics  
Equilibrium Statistical Physics (3rd Edition)  
Equilibrium Statistical Physics (2nd Edition)  
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Fundamentals of Statistical and Thermal Physics  
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Introduction to Statistical Physics  
Elementary Statistical Physics  
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Leo P. Kadanoff Michael Plischke Michael Plischke Ian Ford Mehran Kardar L D Landau Kip S. Thorne F. Reif Hung-the Diep Daijiro Yoshioka Michael Plischke Silvio Salinas Charles Kittel  
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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

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

in this revised and enlarged second edition tony guénault 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 is not a difficult subject and i trust that this will not be found a difficult book it contains much that a number of generations of lancaster students have studied with me as part of their physics honours degree work the lecture course was of twenty hours duration and i have added comparatively little to the lecture syllabus a pre requisite is that the reader should have a working knowledge of basic thermal physics i e the laws of thermodynamics and their application to simple substances the book thermal physics by colin finn in this series forms an ideal introduction statistical physics has a thousand and one different ways of approaching the same basic results i have chosen a rather down to earth and unsophisticated approach without i hope totally obscuring the considerable interest of the fundamentals this enables applications to be introduced at an early stage in the book as a low temperature physicist i have always found a particular interest in statistical physics and especially in how the absolute zero is approached i should not therefore apologize for the low temperature bias in the topics which i have selected from the many possibilities

the manchester physics series general editors d j sandiford f mandl a c phillips department of physics and astronomy university of manchester properties of matter b h flowers and e mendoza optics second edition f g smith and j h thomson statistical physics second edition e mandl electromagnetism second edition i s grant and w r phillips statistics r j barlow solid state physics second edition j r hook and h e hall quantum mechanics f mandl particle physics second edition b r martin and g shaw the physics of stars second edition a c phillips computing for scientists r j barlow and a r barnett statistical physics second edition develops a unified treatment of statistical mechanics and thermodynamics which emphasises the statistical nature of the laws of thermodynamics and the atomic nature of matter prominence is given to the gibbs distribution leading to a simple treatment of quantum statistics and of chemical reactions undergraduate students of physics and related sciences will find this a stimulating account of the basic physics and its applications only an

elementary knowledge of kinetic theory and atomic physics as well as the rudiments of quantum theory are presupposed for an understanding of this book statistical physics second edition features a fully integrated treatment of thermodynamics and statistical mechanics a flow diagram allowing topics to be studied in different orders or omitted altogether optional starred and highlighted sections containing more advanced and specialised material for the more ambitious reader sets of problems at the end of each chapter to help student understanding hints for solving the problems are given in an appendix

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 this revised second edition contains an additional chapter on the boltzmann transport equation along with appropriate applications also more examples have been added throughout as well as further references to literature

the material presented in this invaluable textbook has been tested in two courses one of these is a graduate level survey of statistical physics the other a rather personal perspective on critical behavior thus this book defines a progression starting at the book learning part of graduate education and ending in the midst of topics at the research level to supplement the research level side the book includes some research papers several of these are classics in the field including a suite of six works on self organized criticality and complexity a pair on diffusion limited aggregation some papers on correlations near critical points a few of the basic sources on the development of the real space renormalization group and several papers on magnetic behavior in a plain geometry in addition the author has included a few of his own papers

this third edition of one of the most important and best selling textbooks in statistical physics is a graduate level text suitable for students in physics chemistry and materials science the discussion of strongly interacting condensed matter systems has been expanded a chapter on stochastic processes has also been added with emphasis on applications of the fokker planck equation the modern theory of phase transitions occupies a central place the chapter devoted to the renormalization group approach is largely rewritten and includes a detailed discussion of the basic concepts and

examples of both exact and approximate calculations the development of the basic tools includes a chapter on computer simulations in which both monte carlo method and molecular dynamics are introduced and a section on brownian dynamics added the theories are applied to a number of important systems such as liquids liquid crystals polymers membranes bose condensation superfluidity and superconductivity there is also an extensive treatment of interacting fermi and bose systems percolation theory and disordered systems in general

this revised and expanded edition of one of the important textbook in statistical physics is a graduate level text suitable for students in physics chemistry and materials science after a short review of basic concepts the authors begin the discussion on strongly interacting condensed matter systems with a thorough treatment of mean field and landau theories of phase transitions many examples are worked out in considerable detail classical liquids are treated next along with traditional approaches to the subject such as the virial expansion and integral equations newer theories such as perturbation theory and density functional theories are introduced the modern theory of phase transitions occupies a central place in this book the development is along historical lines beginning with the onsager solution of the two dimensional ising model series expansions scaling theory finite size scaling and the universality hypothesis a separate chapter is devoted to the renormalization group approach to critical phenomena the development of the basic tools is completed in a new chapter on computer simulations in which both monte carlo and molecular dynamics techniques are introduced the remainder of the book is concerned with a discussion of some of the more important modern problems in condensed matter theory a chapter on quantum fluids deals with bose condensation superfluidity and the bcs and landau ginzburg theories of superconductivity a new chapter on polymers and membranes contains a discussion of the gaussian and flory models of dilute polymer mixtures the connection of polymer theory to critical phenomena a discussion of dense polymer mixtures and an introduction to the physical properties of solid and fluid membranes a chapter on linear response includes the kubo formalism the fluctuation dissipation theorem onsager relations and the boltzmann equation the last chapter is devoted to disordered materials each chapter contains a substantial number of exercises a manual with a complete set of solutions to these problems is available under separate cover

this undergraduate textbook provides a statistical mechanical foundation to the classical laws of thermodynamics via a comprehensive treatment of the basics of classical thermodynamics equilibrium statistical mechanics irreversible thermodynamics and the statistical mechanics of non equilibrium phenomena this timely book has a unique focus on the concept of entropy which is studied starting from the well known ideal gas law employing various thermodynamic processes example systems and interpretations to expose its role in the second law of thermodynamics this modern treatment of statistical

physics includes studies of neutron stars superconductivity and the recently developed fluctuation theorems it also presents figures and problems in a clear and concise way aiding the student's understanding

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 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

a lucid presentation of statistical physics and thermodynamics which develops from the general principles to give a large number of applications of the theory

a groundbreaking textbook on twenty first century statistical physics and its applications kip thorne and roger blandford's monumental modern classical physics is now available in five stand alone volumes that make ideal textbooks for individual graduate or advanced undergraduate courses on statistical physics optics elasticity and fluid dynamics plasma physics and relativity and cosmology each volume teaches the fundamental concepts emphasizes modern real world applications and gives students a physical and intuitive understanding of the subject statistical physics is an essential introduction that is different from others on the subject because of its unique approach which is coordinate independent and geometric embraces and elucidates the close quantum classical connection and the relativistic and newtonian domains and demonstrates the power of statistical techniques particularly statistical mechanics by presenting applications not only to the usual kinds of things such as gases liquids solids and magnetic materials but also to a much wider range of phenomena including black holes the universe information and communication and signal processing amid noise includes many exercise problems features color figures suggestions for further reading extensive cross references and a detailed index optional track 2 sections make this an ideal book for a one quarter half semester or full semester course an online illustration package is available to professors the five volumes which are available individually as paperbacks and ebooks are statistical physics optics elasticity and fluid dynamics plasma physics and relativity and cosmology

all macroscopic systems consist ultimately of atoms obeying the laws of quantum mechanics that premise forms the basis for this comprehensive text intended for a first upper level course in statistical and thermal physics reif

emphasizes that the combination of microscopic concepts with some statistical postulates leads readily to conclusions on a purely macroscopic level the authors writing style and penchant for description energize interest in condensed matter physics as well as provide a conceptual grounding with information that is crystal clear and memorable reif first introduces basic probability concepts and statistical methods used throughout all of physics statistical ideas are then applied to systems of particles in equilibrium to enhance an understanding of the basic notions of statistical mechanics from which derive the purely macroscopic general statements of thermodynamics next he turns to the more complicated equilibrium situations such as phase transformations and quantum gases before discussing nonequilibrium situations in which he treats transport theory and dilute gases at varying levels of sophistication in the last chapter he addresses some general questions involving irreversible processes and fluctuations a large amount of material is presented to facilitate students later access to more advanced works to allow those with higher levels of curiosity to read beyond the minimum given on a topic and to enhance understanding by presenting several ways of looking at a particular question formatting within the text either signals material that instructors can assign at their own discretion or highlights important results for easy reference to them additionally by solving many of the 230 problems contained in the text students activate and embed their knowledge of the subject matter

the aim of this book is to provide the fundamentals of statistical physics and its application to condensed matter the combination of statistical mechanics and quantum mechanics has provided an understanding of properties of matter leading to spectacular technological innovations and discoveries in condensed matter which have radically changed our daily life the book gives the steps to follow to understand fundamental theories and to apply these to real materials

this book provides a comprehensive presentation of the basics of statistical physics the first part explains the essence of statistical physics and how it provides a bridge between microscopic and macroscopic phenomena allowing one to derive quantities such as entropy here the author avoids going into details such as liouville s theorem or the ergodic theorem which are difficult for beginners and unnecessary for the actual application of the statistical mechanics in the second part statistical mechanics is applied to various systems which although they look different share the same mathematical structure in this way readers can deepen their understanding of statistical physics the book also features applications to quantum dynamics thermodynamics the ising model and the statistical dynamics of free spins

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planck equation the modern theory of phase transitions occupies a central place the chapter devoted to the renormalization group approach is largely rewritten and includes a detailed discussion of the basic concepts and examples of both exact and approximate calculations the development of the basic tools includes a chapter on computer simulations in which both monte carlo method and molecular dynamics are introduced and a section on brownian dynamics added the theories are applied to a number of important systems such as liquids liquid crystals polymers membranes bose condensation superfluidity and superconductivity there is also an extensive treatment of interacting fermi and bose systems percolation theory and disordered systems in general

this textbook covers the basic principles of statistical physics and thermodynamics the text is pitched at the level equivalent to first year graduate studies or advanced undergraduate studies it presents the subject in a straightforward and lively manner after reviewing the basic probability theory of classical thermodynamics the author addresses the standard topics of statistical physics the text demonstrates their relevance in other scientific fields using clear and explicit examples later chapters introduce phase transitions critical phenomena and non equilibrium phenomena

geared toward graduate students in physics this text covers such important topics as the properties of the fermi dirac and bose einstein distributions the interrelated subjects of fluctuations thermal noise and brownian movement and the thermodynamics of irreversible processes most sections include illustrative problems 1958 edition

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