

Introductory Statistical Mechanics

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Thermodynamics And Statistical Mechanics - Richard Fitzpatrick 2020-07-07

This book provides a comprehensive exposition of the theory of equilibrium thermodynamics and statistical mechanics at a level suitable for well-prepared undergraduate students. The fundamental message of the book is that all results in equilibrium thermodynamics and statistical mechanics follow from a single unprovable axiom — namely, the principle of equal a priori probabilities — combined with elementary probability theory, elementary classical mechanics, and elementary quantum mechanics.

Statistical Mechanics in a Nutshell - Luca Peliti 2011-08-28

A concise introduction to statistical mechanics. Statistical mechanics is one of the most exciting areas of physics today, and it also has applications to subjects as diverse as economics, social behavior, algorithmic theory, and evolutionary biology. *Statistical Mechanics in a Nutshell* offers the most concise, self-contained introduction to this rapidly developing field. Requiring only a background in elementary calculus and elementary mechanics, this book starts with the basics, introduces the most important developments in classical statistical mechanics over the last thirty years, and guides readers to the very threshold of today's cutting-edge research. *Statistical Mechanics in a Nutshell* zeroes in on the most relevant and promising advances in the field, including the theory of phase transitions, generalized Brownian motion and stochastic dynamics, the methods underlying Monte Carlo simulations,

complex systems—and much, much more. The essential resource on the subject, this book is the most up-to-date and accessible introduction available for graduate students and advanced undergraduates seeking a succinct primer on the core ideas of statistical mechanics. Provides the most concise, self-contained introduction to statistical mechanics. Focuses on the most promising advances, not complicated calculations. Requires only elementary calculus and elementary mechanics. Guides readers from the basics to the threshold of modern research. Highlights the broad scope of applications of statistical mechanics.

Introductory Statistical Thermodynamics - Nils Dalarsson 2011-01-26

Introductory Statistical Thermodynamics is a text for an introductory one-semester course in statistical thermodynamics for upper-level undergraduate and graduate students in physics and engineering. The book offers a high level of detail in derivations of all equations and results. This information is necessary for students to grasp difficult concepts in physics that are needed to move on to higher level courses. The text is elementary, self contained, and mathematically well-founded, containing a number of problems with detailed solutions to help students to grasp the more difficult theoretical concepts. Beginning chapters place an emphasis on quantum mechanics. Includes problems with detailed solutions and a number of detailed theoretical derivations at the end of each chapter. Provides a high level of detail in derivations of all equations and results.

Elements of Statistical Mechanics - Ivo Sachs

2006-05-11

This 2006 textbook provides a concise introduction to the key concepts and tools of statistical mechanics. It also covers advanced topics such as non-relativistic quantum field theory and numerical methods. After introducing classical analytical techniques, such as cluster expansion and Landau theory, the authors present important numerical methods with applications to magnetic systems, Lennard-Jones fluids and biophysics. Quantum statistical mechanics is discussed in detail and applied to Bose-Einstein condensation and topics in astrophysics and cosmology. In order to describe emergent phenomena in interacting quantum systems, canonical non-relativistic quantum field theory is introduced and then reformulated in terms of Feynman integrals. Combining the authors' many years' experience of teaching courses in this area, this textbook is ideal for advanced undergraduate and graduate students in physics, chemistry and mathematics.

An Introduction to Statistical

Thermodynamics - Terrell L. Hill 2012-06-08

Four-part treatment covers principles of quantum statistical mechanics, systems composed of independent molecules or other independent subsystems, and systems of interacting molecules, concluding with a consideration of quantum statistics.

Statistical Physics of Polymers - Toshihiro Kawakatsu 2013-03-09

From the reviews: "...This book is a very useful addition to polymer literature, and it is a pleasure to recommend it to the polymer community." (J.E. Mark, University of Cincinnati, POLYMER NEWS)

Introduction to Modern Statistical Mechanics - David Chandler 1987

Lectures on elementary statistical mechanics, taught at the University of Illinois and at the University of Pennsylvania.

Statistical Physics - Daniel J. Amit 1999

This invaluable textbook is an introduction to statistical physics that has been written primarily for self-study. It provides a comprehensive approach to the main ideas of statistical physics at the level of an introductory course, starting from the kinetic theory of gases and proceeding all the way to Bose-Einstein and Fermi-Dirac statistics. Each idea is brought out

with ample motivation and clear, step-by-step, deductive exposition. The key points and methods are presented and discussed on the basis of concrete representative systems, such as the paramagnet, Einstein's solid, the diatomic gas, black body radiation, electric conductivity in metals and superfluidity. The book is written in a stimulating style and is accompanied by a large number of exercises appropriately placed within the text and by self-assessment problems at the end of each chapter. Detailed solutions of all the exercises are provided.

An Introduction to Statistical Mechanics and Thermodynamics - Robert H. Swendsen 2012-03

This text presents statistical mechanics and thermodynamics as a theoretically integrated field of study. It stresses deep coverage of fundamentals, providing a natural foundation for advanced topics. The large problem sets (with solutions for teachers) include many computational problems to advance student understanding.

An Introductory Course of Statistical Mechanics - Palash B. Pal 2008

An Introductory Course of Statistical Mechanics introduces the subject to readers without any prior knowledge of the subject. In most textbooks, Statistical Mechanics appears to be a branch of Condensed Matter Physics. This book has a different perspective. It gives great importance to relativistic systems, thus paving the way for various applications of Statistical Mechanics, from nuclear reactions to Astrophysics and Cosmology. Non-relativistic systems and their applications to Condensed Matter Physics are not abandoned either: there are discussions on gases, liquids and magnetic systems. The book ends with one chapter on Phase Transitions and one on Boltzmann equation. Overall, the book presents Statistical Mechanics from a broader perspective encompassing many branches of Physics.

Introduction to Statistical Physics - Silvio Salinas 2010-12-06

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.

The Statistical Mechanics of Financial Markets - Johannes Voit 2013-06-29

A careful examination of the interaction between physics and finance. It takes a look at the 100-year-long history of co-operation between the two fields and goes on to provide new research results on capital markets - taken from the field of statistical physics. The random walk model, well known in physics, is one good example of where the two disciplines meet. In the world of finance it is the basic model upon which the Black-Scholes theory of option pricing and hedging has been built. The underlying assumptions are discussed using empirical financial data and analogies to physical models such as fluid flows, turbulence, or superdiffusion. On this basis, new theories of derivative pricing and risk control can be formulated.

Introductory Statistical Mechanics - Roy Edgar Turner 1974

Statistical Mechanics - A. J. Berlinsky 2019-10-03

In a comprehensive treatment of Statistical Mechanics from thermodynamics through the renormalization group, this book serves as the core text for a full-year graduate course in statistical mechanics at either the Masters or Ph.D. level. Each chapter contains numerous exercises, and several chapters treat special topics which can be used as the basis for student projects. The concept of scaling is introduced early and used extensively throughout the text. At the heart of the book is an extensive treatment of mean field theory, from the simplest decoupling approach, through the density matrix formalism, to self-consistent classical and quantum field theory as well as exact solutions on the Cayley tree. Proceeding beyond mean field theory, the book discusses exact mappings involving Potts models, percolation, self-avoiding walks and quenched randomness, connecting various athermal and

thermal models. Computational methods such as series expansions and Monte Carlo simulations are discussed, along with exact solutions to the 1D quantum and 2D classical Ising models. The renormalization group formalism is developed, starting from real-space RG and proceeding through a detailed treatment of Wilson's epsilon expansion. Finally the subject of Kosterlitz-Thouless systems is introduced from a historical perspective and then treated by methods due to Anderson, Kosterlitz, Thouless and Young. Altogether, this comprehensive, up-to-date, and engaging text offers an ideal package for advanced undergraduate or graduate courses or for use in self study.

Introductory Statistical Mechanics, 2/Ed - Bowley 2007-05-07

Essential Statistical Physics - Malcolm P. Kennett 2020-07-16

Delivers a clear and concise exposition of key topics in statistical physics, accompanied by detailed derivations and practice problems.

Introduction to Statistical Mechanics - S. K. Sinha 2005

Discusses the basic law of statistical physics and their applications to a range of interesting problems. In this title, the basic principles of equilibrium statistical mechanics are clearly formulated and applied to specific examples of ideal gases and interacting systems to bring out their strength and scope.

Statistical Mechanics of Lattice Systems - Sacha Friedli 2017-11-23

A self-contained, mathematical introduction to the driving ideas in equilibrium statistical mechanics, studying important models in detail. *An Introduction to Statistical Thermodynamics* - Terrell L. Hill 1986-01-01

"A large number of exercises of a broad range of difficulty make this book even more useful...a good addition to the literature on thermodynamics at the undergraduate level." — Philosophical Magazine Although written on an introductory level, this wide-ranging text provides extensive coverage of topics of current interest in equilibrium statistical mechanics. Indeed, certain traditional topics are given somewhat condensed treatment to allow room for a survey of more recent advances. The book is divided into four major sections. Part I deals

with the principles of quantum statistical mechanics and includes discussions of energy levels, states and eigenfunctions, degeneracy and other topics. Part II examines systems composed of independent molecules or of other independent subsystems. Topics range from ideal monatomic gas and monatomic crystals to polyatomic gas and configuration of polymer molecules and rubber elasticity. An examination of systems of interacting molecules comprises the nine chapters in Part III, reviewing such subjects as lattice statistics, imperfect gases and dilute liquid solutions. Part IV covers quantum statistics and includes sections on Fermi-Dirac and Bose-Einstein statistics, photon gas and free-volume theories of quantum liquids. Each chapter includes problems varying in difficulty — ranging from simple numerical exercises to small-scale "research" propositions. In addition, supplementary reading lists for each chapter invite students to pursue the subject at a more advanced level. Readers are assumed to have studied thermodynamics, calculus, elementary differential equations and elementary quantum mechanics. Because of the flexibility of the chapter arrangements, this book especially lends itself to use in a one-or two-semester graduate course in chemistry, a one-semester senior or graduate course in physics or an introductory course in statistical mechanics.

Introduction to Statistical Mechanics and Thermodynamics - Keith Stowe 1984

An introductory textbook using the statistical approach for covering classical and quantum statistics and classical thermodynamics, geared for undergraduates majoring in physics. Develops fundamental concepts carefully and deliberately. Frequent use is made of summaries, shaded for ease of identification and placed strategically throughout the text for first-time student involvement in concepts. Includes over 400 homework problems as an aid in student understanding.

Thermodynamics and Statistical Mechanics - Walter Greiner 2012-12-06

From the reviews: "This book excels by its variety of modern examples in solid state physics, magnetism, elementary particle physics [...] I can recommend it strongly as a valuable source, especially to those who are teaching basic statistical physics at our universities."

Physicalia

Statistical Mechanics - Franz Schwabl

2013-03-09

This unique and consistent mathematical treatise contains a deductive description of equilibrium statistics and thermodynamics. The most important elements of non-equilibrium phenomena are also treated. In addition to the fundamentals, the text tries to show how large the area of statistical mechanics is and how many applications can be found here. Modern areas such as renormalization group theory, percolation, stochastic equations of motion and their applications in critical dynamics, as well as fundamental thoughts of irreversibility are discussed. The text will be useful for advanced students in physics and other sciences who have profound knowledge of quantum mechanics.

Statistical Mechanics - James H. Luscombe

2021-01-09

This textbook provides a comprehensive, yet accessible, introduction to statistical mechanics. Crafted and class-tested over many years of teaching, it carefully guides advanced undergraduate and graduate students who are encountering statistical mechanics for the first time through this - sometimes - intimidating subject. The book provides a strong foundation in thermodynamics and the ensemble formalism of statistical mechanics. An introductory chapter on probability theory is included. Applications include degenerate Fermi systems, Bose-Einstein condensation, cavity radiation, phase transitions, and critical phenomena. The book concludes with a treatment of scaling theories and the renormalization group. In addition, it provides clear descriptions of how to understand the foundational mathematics and physics involved and includes exciting case studies of modern applications of the subject in physics and wider interdisciplinary areas. Key Features: Presents the subject in a clear and entertaining style which enables the author to take a sophisticated approach whilst remaining accessible Contains contents that have been carefully reviewed with a substantial panel to ensure that coverage is appropriate for a wide range of courses, worldwide Accompanied by volumes on thermodynamics and non-equilibrium statistical mechanics, which can be used in conjunction with this book, on courses

which cover both thermodynamics and statistical mechanics

Introductory Statistical Mechanics for

Physicists - D. K. C. MacDonald 2006-01-01

This concise introduction is geared toward those concerned with solid state or low temperature physics. It presents the principles with simplicity and clarity, reviewing issues of critical interest. 1963 edition.

Statistical Mechanics - R K Pathria 2017-02-21

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 of Particles - Mehran Kardar 2007-06-07

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.

Introduction to Nonextensive Statistical

Mechanics - Constantino Tsallis 2009-03-11

Metaphors, generalizations and unifications are natural and desirable ingredients of the evolution of scientific theories and concepts. Physics, in particular, obviously walks along these paths since its very beginning. This book focuses on nonextensive statistical mechanics, a current generalization of Boltzmann-Gibbs (BG) statistical mechanics, one of the greatest monuments of contemporary physics. Conceived more than 130 years ago by Maxwell, Boltzmann and Gibbs, the BG theory exhibits uncountable - some of them impressive - successes in physics, chemistry, mathematics, and computational sciences, to name a few. Presently, more than two thousand publications, by over 1800 scientists around the world, have been dedicated to the nonextensive generalization. Remarkable applications have emerged, and its mathematical grounding is by now relatively well established.

A pedagogical introduction to its concepts - nonlinear dynamics, extensivity of the nonadditive entropy, global correlations, generalization of the standard CLT's, among others - is presented in this book as well as a selection of paradigmatic applications in various sciences together with diversified experimental verifications of some of its predictions. This is the first pedagogical book on the subject, written by the proponent of the theory. Presents many applications to interdisciplinary complex phenomena in virtually all sciences, ranging from physics to medicine, from economics to biology, through signal and image processing and others. Offers a detailed derivation of results, illustrations and for the first time detailed presentation of Nonextensive Statistical Mechanics

Thermodynamics and Introductory Statistical Mechanics - Bruno Linder 2004-10-20

In this clear and concise introduction to thermodynamics and statistical mechanics the reader, who will have some previous exposure to

thermodynamics, will be guided through each of the two disciplines separately initially to provide an in-depth understanding of the area and thereafter the connection between the two is presented and discussed. In addition, mathematical techniques are introduced at appropriate times, highlighting such use as: exact and inexact differentials, partial derivatives, Caratheodory's theorem, Legendre transformation, and combinatorial analysis. * Emphasis is placed equally on fundamentals and applications * Several problems are included

Introductory Statistical Mechanics - Roger Bowley 1996

This book aims to explain the ideas and techniques of statistical mechanics - the theory of condensed matter - in a simple and progressive way. The text starts with the laws of thermodynamics and simple ideas of quantum mechanics. The conceptual ideas underlying the subject are explained carefully; the mathematical ideas are developed in parallel to give a coherent overall view. The text is illustrated with examples not just from solid state physics, but also from recent theories of radiation from black holes and recent data on the background radiation from the Cosmic background explorer. The book applies these ideas to successively more complicated systems. At the end of each chapter are exercises, graded so that the easier appear first. They are intended to develop understanding and confidence in tackling problems from all branches of physics.

An Introduction to Thermodynamics and Statistical Mechanics - Keith Stowe 2007-05-10

This introductory textbook for standard undergraduate courses in thermodynamics has been completely rewritten to explore a greater number of topics, more clearly and concisely. Starting with an overview of important quantum behaviours, the book teaches students how to calculate probabilities in order to provide a firm foundation for later chapters. It introduces the ideas of classical thermodynamics and explores them both in general and as they are applied to specific processes and interactions. The remainder of the book deals with statistical mechanics. Each topic ends with a boxed summary of ideas and results, and every chapter contains numerous homework problems,

covering a broad range of difficulties. Answers are given to odd-numbered problems, and solutions to even-numbered problems are available to instructors at www.cambridge.org/9781107694927.

Statistical Physics - Gregory H. Wannier 2012-08-09

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.

Statistical Physics - A.M. Guenault 2007-09-21

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.

Introduction to Statistical Mechanics - John Dirk Walecka 2016-08-25

Statistical mechanics is concerned with defining the thermodynamic properties of a macroscopic sample in terms of the properties of the microscopic systems of which it is composed. The previous book *Introduction to Statistical Mechanics* provided a clear, logical, and self-contained treatment of equilibrium statistical mechanics starting from Boltzmann's two statistical assumptions, and presented a wide variety of applications to diverse physical assemblies. An appendix provided an introduction to non-equilibrium statistical mechanics through the Boltzmann equation and its extensions. The coverage in that book was enhanced and extended through the inclusion of many accessible problems. The current book provides solutions to those problems. These texts assume only introductory courses in classical and quantum mechanics, as well as familiarity with multi-variable calculus and the essentials of complex analysis. Some knowledge

of thermodynamics is also assumed, although the analysis starts with an appropriate review of that topic. The targeted audience is first-year graduate students and advanced undergraduates, in physics, chemistry, and the related physical sciences. The goal of these texts is to help the reader obtain a clear working knowledge of the very useful and powerful methods of equilibrium statistical mechanics and to enhance the understanding and appreciation of the more advanced texts.

Introduction to Relativistic Statistical Mechanics

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Introductory Applied Quantum and Statistical Mechanics - Peter L. Hagelstein 2004-03-25

* An applied focus for electrical engineers and materials scientists. * Theoretical results supported with real-world systems and applications. * Includes worked examples and self-study questions. * Solutions manual available.

Introductory Statistical Mechanics - Roger Bowley 1999

This book explains the ideas and techniques of statistical mechanics--the theory of condensed matter--in a simple and progressive way. The text begins with the laws of thermodynamics and the basic ideas of quantum mechanics. The conceptual ideas are then developed carefully, and the mathematical techniques are developed in parallel to give a coherent overall view. The text is illustrated with examples not just from solid state physics, but also from recent theories of radiation from black holes and recent data on the background radiation from the Cosmic Background Explorer. This second edition includes additional advanced material often found in undergraduate courses. It includes three new chapters on phase transitions at an appropriate level for an undergraduate student, and there are numerous exercises at the end of each chapter, along with brief model answers for the odd-numbered problems. It is a useful and practical textbook for undergraduates in physics and chemistry.

Introductory Statistical Mechanics:

Boseeinsteinkondensat - Ray 2008-01-01

Contents: Mathematical Preliminaries; Some Results Of Combinational Problems; Basic Concepts; Macroscopic And Microscopic States;

Maxwell-Boltzmann (Classical) Statistics; Identical Distinguishable Particles; Quantum Statistics; Need For A New Statistics; Specific Heat And Statistical Mechanics; Principle Of Equipartition Of Energy Again; Brownina Motion; Towards Solution Of Problems; Appendix; Etc.

Introduction to Statistical Physic - Kerson

Huang 2001-09-20

Statistical physics is a core component of most undergraduate (and some post-graduate) physics degree courses. It is primarily concerned with the behavior of matter in bulk--from boiling water to the superconductivity of metals. Ultimately, it seeks to uncover the laws governing random processes, such as the snow on your TV screen. This essential new textbook guides the reader quickly and critically through a statistical view of the physical world, including a wide range of physical applications to illustrate the methodology. It moves from basic examples to more advanced topics, such as broken symmetry and the Bose-Einstein equation. To accompany the text, the author, a renowned expert in the field, has written a Solutions Manual/Instructor's Guide, available free of charge to lecturers who adopt this book for their courses. Introduction to Statistical Physics will appeal to students and researchers in physics, applied mathematics and statistics.

Microstates, Entropy and Quanta - Don Koks

2019-01-25

Statistical mechanics: the bane of many a physics student, and traditionally viewed as a long parade of ensembles, partition functions, and partial derivatives. But the subject needn't be arcane. When pared back to its underlying concepts and built from the ground up, statistical mechanics takes on a charm of its own, and sheds light on all manner of physical phenomena. This book presents a straightforward introduction to the key concepts in statistical mechanics, following the popular style of the author's highly successful textbook "Explorations in Mathematical Physics". Offering a clear, conceptual approach to the subject matter, the book presents a treatment that is mathematically complete, while remaining very accessible to undergraduates. It commences by asking: why does an ink drop spread out in a bathtub of water? This showcases the importance of counting configurations, which

leads naturally to ideas of microstates, energy, entropy, thermodynamics, and physical chemistry. With this foundation, the Boltzmann distribution writes itself in its fullest form, and this opens the door to the Maxwell distribution and related areas of thermal conductivity and viscosity. Quantum ideas then appear: bosons via Einstein's and Debye's theories of heat capacity, and fermions via electrical conduction and low-temperature heat capacity of metals. The text ends with a detailed derivation of blackbody radiation, and uses this to discuss the greenhouse effect, lasers, and cosmology. Suitable for use with core undergraduate courses in statistical mechanics and thermodynamics, this book concentrates on using solid mathematics, while avoiding cumbersome notation. All the necessary mathematical steps are included in the body of the text and in the worked examples. Reviews of *Explorations in Mathematical Physics* by Don Koks, 2006 "With enjoyable and sometimes surprising excursions along the way, the journey provides a fresh look at many familiar topics, as it takes us from basic linear mathematics to general relativity... look forward to having your geometric intuition nourished and expanded by the author's intelligent commentaries." (Eugen Merzbacher, University of North Carolina) "... an interesting supplement to standard texts for teaching mathematical methods in physics, as it will add alternative views that could serve as additional material." (S. Marcelja, Australian Journal of Physics) "... a tour through the main ideas forming the language of modern mathematical physics ...it is a difficult task for

the author to decide what is a good balance between the topics and their presentation, but in this case it has been achieved. ...for those physicists who would like to be exposed to clear motivation and careful explanation of the basics of the present-day apparatus of mathematical physics." (Ivailo Mladenov, Mathematical Reviews).

Introductory Statistical Mechanics - Roger Bowley 1999

This book explains the ideas and techniques of statistical mechanics-the theory of condensed matter-in a simple and progressive way. The text starts with the laws of thermodynamics and simple ideas of quantum mechanics. The conceptual ideas underlying the subject are explained carefully; the mathematical ideas are developed in parallel to give a coherent overall view. The text is illustrated with examples not just from solid state physics, but also from recent theories of radiation from black holes and recent data on the background radiation from the Cosmic background explorer. In this second edition, slightly more advanced material on statistical mechanics is introduced, material which students should meet in an undergraduate course. As a result the new edition contains three more chapters on phase transitions at an appropriate level for an undergraduate student. There are plenty of problems at the end of each chapter, and brief model answers are provided for odd-numbered problems. From reviews of the first edition: '...Introductory Statistical Mechanics is clear and crisp and takes advantage of the best parts of the many approaches to the subject' *Physics Today*