BOOK REVIEWS

Statistical Mechanics

R. P. Feynman ; W. A. Benjamin, Inc. ; 1972, Pp xiii+354,

Professor Feynman knows how to create the interest in the subjects concerned to every teacher and student. *Statistical Mechanics : A set of lectures* proves it.

The book contains eleven chapters covered within 354 pages. The concepts of statistical physics with many original and profound contributions are summed up in introduction. *Density matrices* and *path integrals* are masterly discussed in chapters 2 and 3 respectively. Chapter 4 contains *Classical system of N particles*. In chapter 5 *order-disorder theory* is discussed and it has been shown how to handle *the Onsager problem*. Chapter 6 covers most mathematical tools including *field quantization* and *Feynman diagrams*.

Chapter 7 contains *Spin algebra* which shows how the interactions give rise to a coupling between the spins of two objects and what happens when such a coupling appears in a lattice full of spins. *The Polaron problem* is reported in chapter 8. Chapter 9 reserves for *electron gas in a metal*. *The superconductivity and superfluidity* are throughly discussed in chapters 10 and 11 respectively.

Each chapter contains a concise introduction and many original problems are discussed. It makes clear the lot of unanswered questions of the students. Finally, we can praise W. A. Benjamin, Inc. for adding this book in Frontiers in Physics Series.

P. G.

Wave Mechanics and its applications

By P. Gombas and D. Kisde; Pergamon press pp xii+238..

In modern times quantum Mechanics has got its enormous importance in every branch of science. To understand various phenomena in different branches of science such as nuclear physics, solid state physics, quantum biology a strong background of quantum mechanics is required.

The main aim of the book by P. Gombas and D. Kisdi, which deals with one of the two representations of quantum mechanics, namely, wave mechanics is to assist the readers to acquire such a background.

To give an idea about the advent of quantum mechanics the authors have included in the first part of the book Planck's law, some preliminary discussion

on atom models of Ratherford and Bohr etc. It seems better, had there been some room for experiments of Davisson-Germar and of G. P. Thomson, which established de Broglie's idea of matter waves. It is noteworthy, however, that the famous uncertainty principle is well explained with suitable examples.

In the other part, the authors have shown the detailed computation for solving some important problems in wave mechanics. But one characteristic feature which this text is lacking is that each chapter is not supplemented with exercises at the end.

Apart from these minor shortcomings, the book with clear exposition of many worked out problems will serve as a good text for students at the undergraduate and post-graduate level and also be beneficial to persons engaged in theoretical research work in atomic and nuclear physics.

T. G.

Photon-Hadron Interactions

R. P. Feynman ; W. A. Benjamin, Inc., 1972 ; Pp xvi+277

Photon-Hadron Interactions in Frontiers in Physics Series edited by David Pines is prepared from the lecture notes delivered by Professor R. P. Feynman at Caltech in 1971-72. It can be considered an intermediate step between lecture notes and formal monograph, though it is produced from the lecture notes.

The contents of this book are discussed on advanced topics with the theoretical knowledge of the theory of hadron-hadron interactions assumed. There are nineteen subsections and two appendices which are covered by fifty seven lectures mainly on the VMD, Deep Inelastic Scattering and Parton Model. Most of the lectures with the following headings are based on the articles published in different journals :

Low Energy Photon Reactions, Quark Model of Resonances, Pseudoscalar Meson Photoproduction, t-Channel Exchange Phenomena, Vector Mesons and Vector Meson Dominance Hypothesis, Electromagnetic Form Factors, Parton Model, Light Cone Algebra, Parton as Quarks, etc., etc.

First five lectures on general theoretical background are most useful to all who are interested in modern topics of Strong Interactions. Finally, this book itself claims its position in the domain of the workers of the fields of Strong Interactions.

P. K. R.

Reviews of modern physics, volume 74, january 2002. Statistical mechanics of complex networks. ReÂ´ ka Albert* and Albert-LaÂ´ szloÂ´ BarabaÂ´ si. Department of Physics, University of Notre Dame, Notre Dame, Indiana 46556.Â This article reviews the recent advances in the eld of complex networks, focusing on the statistical mechanics of network topology and dynamics. After reviewing the empirical data that motivated the recent interest in networks, the authors discuss the main models and analytical tools, covering random graphs, small-world and scale-free networks, the emerging theory of evolving networks, and the interplay between topology and the networkâ€™s robustness against failures and attacks. I recommend the book "A Modern Course in Statistical Physics" by Reichl. It starts with phenomenological thermodynamics, covers both equilibrium and nonequilibrium statistical mechanics, and discusses a wide range of applications, not only ideal and real gases. Its level of rigor is that of typical books on theoretical physics. You may also be interested in my book http://lanl.arxiv.org/pdf/0810.1019v2.pdf ; the part on statistical mechanics is nearly independent of the remainder. share | cite | improve this answer |. follow.