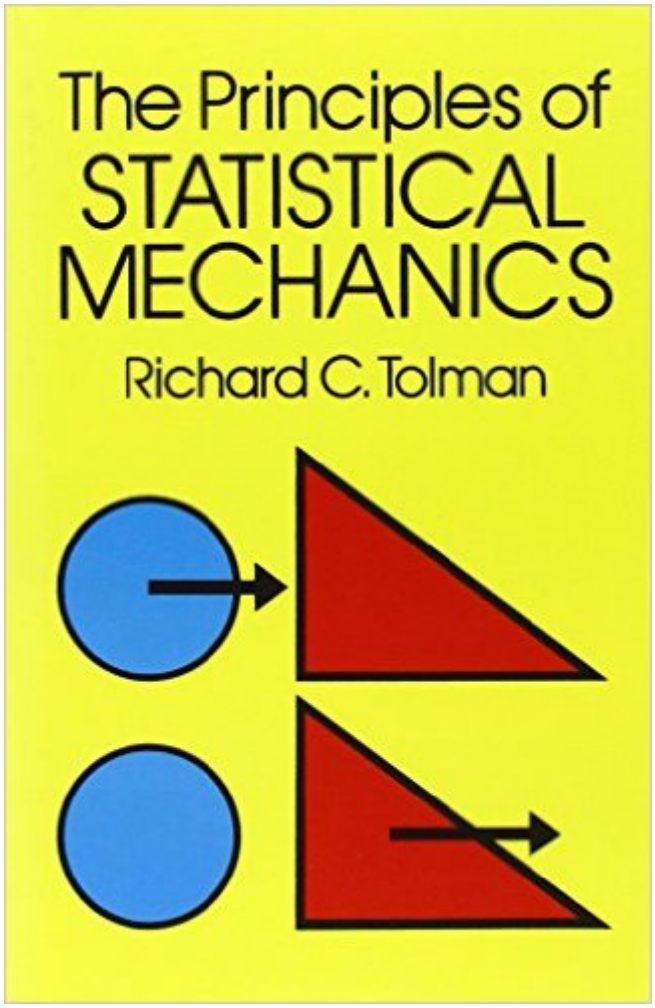
The Principles Of Statistical Mechanics (Dover Books On Physics)



Synopsis

This is the definitive treatise on the fundamentals of statistical mechanics. A concise exposition of classical statistical mechanics is followed by a thorough elucidation of quantum statistical mechanics: postulates, theorems, statistical ensembles, changes in quantum mechanical systems with time, and more. The final two chapters discuss applications of statistical mechanics to thermodynamic behavior. 1930 edition.

Book Information

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Customer Reviews

Most books on statistical mechanics are both heavy on conceptual abstraction and mathematical sophistication. Tolman’s book really helps the reader understand what is going on, including a discussion of why its necessary to consider ergodic or quasi-ergodic systems in the cannonical ensemble. It also contains explicit chapters on the relationship of classical and quantum statistical mechanics, a subject often left unclear or unexplored by other textbooks, or left to the teacher to show how in the proper limit the classical results are recovered from quantum calculations.

Statistical Mechanics is a notoriously difficult subject. This books lays out the foundations of this subject first using Classical Mechanics and then again using Quantum Mechanics. Dr. Tolman then shows how Thermodynamics concepts are related to Statistical Mechanics.This book also includes a self-contained introduction to Quantum Mechanics that is one of the clearest introductions to that subject I have seen.The treatment throughout is excellent. This is truly one of the best physics

books I have ever read. And it was the standard work on the subject for thirty years.If you are trying to understand Statistical Mechanics, you owe it to yourself to read this book. Furthermore, this is somewhat urgent as this marvelous Dover edition is now out of print. If you can get a copy at a reasonable price, buy it. You can always read it later...Prerequisites? Strong calculus background. You should also have a passing familiarity with Fourier Transforms as they play a key role in the development of QM in this book. Also, some exposure to probability and combinatorics is required. Finally, some exposure to advanced classical mechanics will certainly be helpful as that is the launching point of the entire book.Downsides? No exercises. Dated notation for QM. Few pictures. No discussion of Information Theory and its connection to Entropy. Perhaps a bit too much exposition on certain points. Also, this book makes repeated references to another book focused more on the applications of Statistical Mechanics. Sadly, this second book has been out of print for decades. Finally, this book is light on applications, but that is in keeping with the author's intent.Nonetheless, a masterpiece.

This book gives a very detailed treatment of statistical mechanics, both classical and quantum mechanical. Every concept is explained at length, with much verbiage. This makes it a great book to use for self-study. The book was written many years ago, and the treatment is somewhat dated. This shows up, e.g., in the treatment of quantum mechanics which uses the inner product notation while most modern books would use the dual space notation. Another feature of its age is its complete lack of graphs or charts (the only exception being the section on Boltzmann H-Theorem). Nevertheless, the lucid and detailed discussions more than make up for the lack of pictures. As a matter of fact, it may contain yet the most clear introduction to quantum mechanics itself, even though that is not the main purpose of this book. Highly recommended.

Yet another fundamental work made available by Dover. Tolman's book cover all the fundamental concepts on the subject of statistical physics using classical mechanics and quantum mechanics. A handbook to read along modern and concise texts like chandler

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