



Introductory Statistical Thermodynamics

By Nils Dalarsson, Mariana Dalarsson, Leonardo Golubovic

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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
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Bibliography

- Rank: #2966234 in Books
- Published on: 2011-01-03
- Original language: English
- Number of items: 1
- Dimensions: 9.00" h x 1.00" w x 6.10" l, 1.45 pounds
- Binding: Hardcover
- 408 pages

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Editorial Review

Review

"The book is intended as a text for an introductory course in statistical thermodynamics for undergraduate students of physical sciences or engineering. Parts of the material may be useful as well for a graduate course. The book is quite detailed in explicit derivations of all equations and results, followed by a number of fully solved problems/exercises that illustrate theoretical concepts discussed throughout the book. An introductory chapter contains some very basic quantum mechanical background. The second chapter contains derivations of basic notions of classical statistical mechanics, together with a discussion of general laws of macroscopic thermodynamics. The third chapter addresses various applications to physically interesting cases of ideal and non-ideal gases. In the last chapter, a discussion of basic concepts of quantum statistical physics (quantum gases) is followed by a brief discussion of relativistic phenomena."--Zentralblatt Math 1225-1

"This book is an excellent introduction to statistical thermodynamics, which covers the fundamental physical concepts used for the macroscopic description of systems with very large number of particles in thermodynamic equilibrium. Also the macroscopic concepts used in this book, are shown to be connected to the appropriate microscopic theories. However, in the literature, statistical thermodynamics is frequently introduced purely from macroscopic point of view. But in general the macroscopic description is largely independent on the details of the microscopic models describing the interactions of the particle in various physical systems. So learning the connection between microscopic and macroscopic concept will definitely enhance the understanding of the subject to great extent...I recommend this book as one of the most lucidly written introductory texts on Statistical Thermodynamics."--Contemporary Physics

About the Author

Nils Dalarsson has been with the Royal Institute of Technology, Department of Theoretical Physics in Stockholm, Sweden, since 1999. His research and teaching experience spans 32 years. Former academic and private sector affiliations include University of Virginia, Uppsala University, FSB Corporation, France Telecom Corporation, Ericsson Corporation, and ABB Corporation. He holds a PhD in Theoretical Physics, an MSc in Engineering Physics, and an MSc in Education.

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