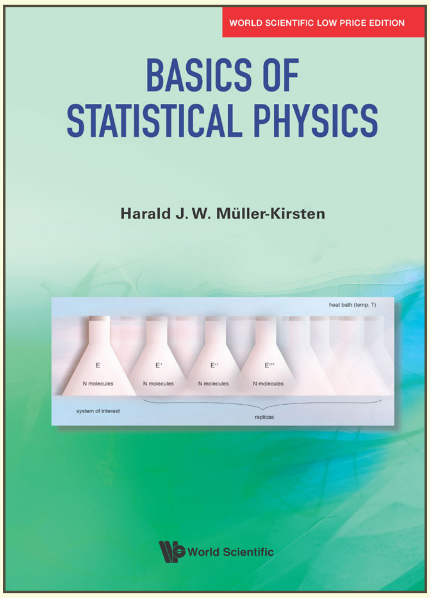
Basics of Statistical Physics
3rd Edition



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ABOUT THE BOOK

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. In this latest edition, apart from a general revision, the topic of thermal radiation has been expanded with a new section on black bodies and an additional chapter on black holes. Other additions are more examples with applications of statistical mechanics in solid state physics and superconductivity. Throughout the presentation, the introduction carries almost all details for calculations.

READERSHIP

Advanced undergraduates, graduate students and academics interested in statistical physics.

CONTENTS

- Entropy
- Quantum Statistics
- Exact Form of Distribution Functions
- Application to Radiation (Light Quanta)
- Debye Theory of Specific Heat of Solids
- Electrons in Metals
- Limitations of the Preceding Theory — Improvement with Ensemble Method
- Averaging instead of Maximization, and Bose–Einstein Condensation
- The Boltzmann Transport Equation
- Thermal Radiation of Black Holes

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