

Statistical Physics

An Entropic Approach

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This undergraduate textbook provides a statistical mechanical foundation to the classical laws of thermodynamics via a comprehensive treatment of the basics of classical thermodynamics, equilibrium statistical mechanics, irreversible thermodynamics, and the statistical mechanics of non-equilibrium phenomena.

This timely book has a unique focus on the concept of entropy, which is studied starting from the well-known ideal gas law, employing various thermodynamic processes, example systems and interpretations to expose its role in the second law of thermodynamics. This modern treatment of statistical physics includes studies of neutron stars, superconductivity and the recently developed fluctuation theorems. It also presents figures and problems in a clear and concise way, aiding the student's understanding.

Statistical Physics: An Entropic Approach

- Provides an excellent introduction to classical thermodynamics
- Covers key topics within the physics undergraduate curriculum that are accessible also to students in chemistry and engineering disciplines
- Dispels confusion over the nature of entropy, offering a coherent and consistent treatment of Boltzmann, Gibbs and Shannon models
- Features clear pictorial representations of statistical systems, illustrating thermodynamic approaches
- Develops statistical thermodynamics for a range of systems and applications
- Features advanced sections on stochastic dynamics and fluctuation relations, including recent ideas concerning the stochastic definition of entropy production, together with suggested further reading on these themes.

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