Statistical mechanics applies probability theory, which contains mathematical tools for dealing with large populations, to the study of the thermodynamic behavior of systems composed of a large number of particles. Statistical mechanics provides a framework for relating the microscopic properties of individual atoms and molecules to the macroscopic bulk properties of materials that can be observed in everyday life, thereby explaining thermodynamics as a result of the classical- and quantum-mechanical descriptions of statistics and mechanics at the microscopic level.

• Fundamentals of Statistical Mechanics

• Boltzmann Average

• Statistical Mechanical Ensembles

• Advanced Statistical Mechanics