

CHAPTER OVERVIEW

2: Principles of Physical Statistics

This chapter is the keystone of this course. It starts with a brief discussion of such basic notions of statistical physics as statistical ensembles, probability, and ergodicity. Then the so-called microcanonical distribution postulate is formulated, simultaneously with the statistical definition of the entropy. This allows a derivation of the famous Gibbs (“canonical”) distribution – the most frequently used tool of statistical physics. Then we will discuss one more, “grand canonical” distribution, which is more convenient for some tasks. In particular, it is immediately used for the derivation of the most important Boltzmann, Fermi-Dirac, and Bose-Einstein statistics of independent particles, which will be repeatedly utilized in the following chapters.

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