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MONTE CARLO
SIMULAITON IN STATISTICAL PYHSICS

An Introduction
Fifth Edition

Monte Carlo Simulation in Statistical Physics deals with the computer simulation of many-body systems in condensed-matter physics and related fields of physics, chemistry and beyond, to traffic flows, stock market fluctuations, etc.). Using random numbers generated by a computer, probability distributions are calculated, allowing the estimation of the thermodynamic properties of various systems. This book describes the theoretical background presentation from which newcomers can learn to perform such simulations and to analyze their results. The fifth edition covers Classical as well as Quantum Monte Carlo methods. Furthermore a new chapter on the sampling of free-energy landscapes has been added. To help students in their work a special web server has been installed to host programs and discussion groups (http://wwwcp.tphys.uni-heidelberg.de) Prof. Binder was awarded the Berni J. Alder CECAM Award for Computational Physics 2001 as well as the Boltzmann Medal 2007.