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Nota di contenuto	Computer Simulations of Supercooled Liquids -- Numerical Simulations of Spin Glasses: Methods and Some Recent Results -- Dipolar Fluctuations in the Bulk and at Interfaces -- Theory and Simulation of Friction and Lubrication -- Simulation of Nanodroplets on Solid Surfaces: Wetting, Spreading and Bridging -- Monte Carlo Simulations of Compressible Ising Models: Do We Understand Them? -- Computer Simulation of Colloidal Suspensions -- Phase Transitions of Model Colloids in External Fields -- Computer Simulation of Liquid Crystals -- Coarse-Grained Models of Complex Fluids at Equilibrium and Under Shear -- Mesoscopic Simulations of Biological Membranes -- Microscopic Elasticity of Complex Systems -- Mesoscopic Simulations for Problems with Hydrodynamics, with Emphasis on Polymer Dynamics -- Polymer Dynamics: Long Time Simulations and Topological Constraints -- Reaction Kinetics of Coarse-Grained Equilibrium Polymers: A Brownian Dynamics Study -- Equilibration and Coarse-Graining Methods for Polymers -- Drug-Target Binding Investigated by Quantum Mechanical/Molecular Mechanical (QM/MM) Methods -- Redox Free Energies from Vertical Energy Gaps: Ab Initio Molecular

Dynamics Implementation -- Advanced Car-Parrinello Techniques: Path Integrals and Nonadiabaticity in Condensed Matter Simulations -- Evolutionary Design in Biological Physics and Materials Science -- Monte-Carlo Methods in Studies of Protein Folding and Evolution.

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Sommario/riassunto

This extensive and comprehensive collection of lectures by world-leading experts in the field introduces and reviews all relevant computer simulation methods and their applications in condensed matter systems. Volume 1, published as LNP 703 (ISBN 3-540-35270-8) is an in-depth introduction to a vast spectrum of computational techniques for statistical mechanical systems of condensed matter. It will enable the graduate student and both the specialist and nonspecialist researcher to get acquainted with the tools necessary to carry out numerical simulations at an advanced level. The present volume is a state-of-the-art survey on numerical experiments carried out for a great number of systems, ranging from materials sciences to chemical biology, such as supercooled liquids, spin glasses, colloids, polymers, liquid crystals, biological membranes and folding proteins.

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