Contents

1 Computer Simulation Studies in Condensed Matter Physics: An Introduction <i>D.P. Landau, S.P. Lewis, and H.-B. Schüttler</i>	1
--	---

Part I Materials Properties

2 Accelerated Molecular-Dynamics Simulation of Thin Film Growth <i>K.A. Fichthorn, R.A. Miron</i>	7
3 Simulating the Interaction of High Intensity Optical Pulses with Nanostructured Optical Devices <i>W.M. Dennis, C.M. Liebig</i>	17
4 Crack Motion Revisited <i>F.F. Abraham</i>	23
5 Deconstructing the Structural Convergence of the (110) Surface of Rutile TiO₂ <i>S.J. Thompson, S.P. Lewis</i>	26

Part II New Models, Methods and Perspectives

6 Ensemble Optimization Techniques for the Simulation of Slowly Equilibrating Systems <i>S. Trebst, D.A. Huse, E. Gull, H.G. Katzgraber, U.H.E. Hansmann, M. Troyer</i>	33
7 The Avogadro Challenge <i>N. Ito</i>	48

8 Visualizing Nanodiamond and Nanotubes with AViz	
<i>J. Adler, Y. Gershon, T. Mutat, A. Sorkin, E. Warszawski, R. Kalish, Y. Yaish</i>	56
9 Molecular Dynamics Simulations for Anisotropic Systems	
<i>K.M. Aoki</i>	61
10 Event-by-event Simulation of EPR-Bohm Experiments	
<i>K. De Raedt, K. Keimpema, H. De Raedt, K. Michielsens, S. Miyashita</i> .	66
<hr/>	
Part III Non-Equilibrium and Dynamic Behavior	
<hr/>	
11 Fisher Waves and the Velocity of Front Propagation in a Two-Species Invasion Model with Preemptive Competition	
<i>L. O'Malley, B. Kozma, G. Korniss, Z. Rácz, T. Caraco</i>	73
12 Dynamics and Thermal Structure of Gas-Liquid Phase Interface	
<i>F. Ogushi, S. Yukawa, N. Ito</i>	79
13 Rate Constant in Far-from-Equilibrium Open Systems	
<i>A. Kamimura, S. Yukawa, N. Ito</i>	84
14 First-order Reversal Curve Analysis of Kinetic Monte Carlo Simulations of First- and Second-order Phase Transitions	
<i>I.A. Hamad, D. Robb, P.A. Rikvold</i>	89
<hr/>	
Part IV Magnetic Systems	
<hr/>	
15 Vortex Fluctuation and Magnetic Friction	
<i>B.V. Costa, M. Rapini, R.A. Dias, P.Z. Coura</i>	97
16 Simulation Study on the Linear Response for Huge Hamiltonians: Temperature Dependence of the ESR of a Nanomagnet	
<i>M. Machida, T. Itaka, S. Miyashita</i>	101
17 Attraction-limited Cluster–Cluster Aggregation of Ising Dipolar Particles	
<i>N. Yoshioka, I. Varga, F. Kun, S. Yukawa, N. Ito</i>	106

Part V Biological and Soft Condensed Matter

18 Simulation Study of the Multiple States in Hippocampal Slices	
<i>T. Shimada</i>	115
19 Dissipative Particle Dynamics of Self-Assembled Multi-Component Lipid Membranes	
<i>M. Laradji, P.B. Sunil Kumar</i>	119
20 Solvent-Free Lipid-Bilayer Simulations: From Physics to Biology	
<i>M. Deserno</i>	134
21 Computer Simulation of Models for Confined Two-Dimensional Colloidal Crystals: Evidence for the Lack of Positional Long Range Order	
<i>A. Ricci, P. Nielaba, S. Sengupta, K. Binder</i>	149
List of Contributors	155