Contents

Part 1. Introduction: From Deterministic to Stochastic Behavior	
On the Foundations of Kinetic Theory By B. Misra and I. Prigogine (With 1 Figure)	2
Transition Phenomena in Nonlinear Systems. By H. Haken (With 1 Figure)	12
Part II Annual Alama Calada and Burna and	
Part II. Approximation of Stochastic Processes	
Approximation of Discontinuous Processes by Continuous Processes By T.G. Kurtz	22
On the Asymptotic Behavior of Motions in Random Flows By G. Papanicolaou and O. Pironeau	36
Part III. Description of Internal Fluctuations	
Some Aspects of Fluctuation Theory in Nonequilibrium Systems. By G. Nicolis	44
Aspects of Classical and Quantum Theory of Stochastic Bistable Systems By C.W. Gardiner	53
Kinetics of Phase Separation. By K. Binder (With 9 Figures)	62
Chemical Instabilities and Broken Symmetry: The Hard Mode Case By D. Walgraef, G. Dewel, and P. Borckmans	72
Part IV. Long-Term Behavior of Stochastic Systems	
Asymptotic Behavior of Several Dimensional Diffusions. By R.N. Bhattacharya	86
Qualitative Theory of Stochastic Nonlinear Systems By L. Arnold (With 3 Figures)	100
Part V. External Fluctuations and Noise Induced Transitions	
Noise Induced Transitions. By W. Horsthemke (With 2 Figures)	116
Noise Induced Transitions in Biological Systems By R. Lefever (With 7 Figures)	127
Multiplicative Ornstein Uhlenbeck Noise in Nonequilibrium Phenomena By M. San Miguel and J.M. Sancho (With 1 Figure)	137
Part VI. Stochastic Behavior in Model Systems	
Weak Turbulence in Deterministic Systems. By JP. Eckmann	152

Stochastic Problems in Population Genetics: Applications of Itô's Stochastic Integrals. By T. Maruyama (With 4 Figures)	16/
Poisson Processes in Biology. By H.C. Tuckwell	162
Part VII. Space-Time Processes and Stochastic Partial Differential Equations	
Linear Stochastic Evolution Equation Models for Chemical Reactions By L. Arnold, R. Curtain and P. Kotelenez	174
Stochastic Measure Processes. By D.A. Dawson	185
Part VIII. Phase Transitions and Irreversible Thermodynamics	
Stochastic Methods in Non-Equilibrium Thermodynamics By R. Graham (With 2 Figures)	202
Fluctuation Dynamics Near Chemical Instabilities By S. Grossmann (With 10 Figures)	
Transition Phenomena in Nonlinear Optics. By F.T. Arecchi (With 5 Figures)	222
Part IX. Markov Processes and Time Reversibility	
Time-Reversibility in Dynamical Systems. By J.C. Willems	232
List of Participants	235
Index of Contributors	237