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. 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) | |
| 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) | 154 |
|---|-------|
| Poisson Processes in Biology. By H.C. Tuckwell | 88 10 |
| 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) | 213 |
| Transition Phenomena in Nonlinear Optics. By F.T. Arecchi (With 5 Figures) | 222 |
| Part IX. Markov Processes and Time Reversibility | 85 |
| Time-Reversibility in Dynamical Systems. By J.C. Willems | 232 |
| | |
| List of Participants | 235 |
| Index of Contributors | |