

Contents

H. Haken	
Introduction to Synergetics	9
Mathematical and Physical Concepts for Cooperative Systems	
F. C. Schlögl	
Stability Criteria in Non-Equilibrium Thermodynamics	21
R. Kubo	
Relaxation and Fluctuation of Macrovariables	28
K. Kawasaki	
New Method in Non-Equilibrium Statistical Mechanics of Cooperative Systems	35
H. Mori	
Theory of Linear Non-Markoffian Processes	45
S. Grossmann	
Fluctuations near Phase Transitions in Restricted Geometries	54
Instabilities and Phase-Transition-Like Phenomena in Physical Systems far from Thermal Equilibrium	
R. Graham	
Phase-Transition-Like Phenomena in Lasers and Nonlinear Optics	71
H. Thomas	
Dynamics of Current Instabilities	87
R. Landauer, J. W. F. Woo	
Cooperative Phenomena in Data Processing	97
I. Prigogine and R. Lefever	
Theory of Dissipative Structures	124
Biochemical Kinetics and Population Dynamics	
E. H. Kerner	
A Gibbs Ensemble Approach to Biochemical Kinetics	137
E. W. Montroll, B. J. West	
Models of Population Growth, Diffusion, Competition and Rearrangement	143
H. Kuhn	
Selforganization of Nucleic Acids and the Evolution of the Genetic Apparatus	157
N. Ogita, A. Ueda, T. Matsubara, F. Yonezawa, H. Matsuda	
Computer Simulation of Helix-Coil Transition	177

Biological Structures

W. Reichardt Mechanism of Pattern Recognition by the Visual System of Insects	187
B. Julesz A Cooperative Model of Stereoscopic Depth Perception	194
H. R. Wilson Cooperative Phenomena in a Homogeneous Cortical Tissue Model	207
G. Adam Cooperative Transitions in Biological Membranes	220
K. Tomita A Model for Muscle Contraction	232
H. Fröhlich Organisation and Long Range Selective Interaction in Biological and Other Pumped Systems	241
M. Wagner Nonlinear Transport as a Possible Key to Physical Understanding in Biology	246

General Structures

M. D. Mesarovic Theory of Hierarchical Structures	255
B. Chinitz, G. Crampton, L. P. Kadanoff, S. C. Schwartz, J. R. Tucker, H. Weinblatt Metropolitan Models and Public Policy	263
W. Weidlich Fokker-Planck Equation Treatment of Interacting Social Groups	269