Contents

Part I Introduction

About Self-organization of Information and Synergetics 3
Werner Ebeling and Rainer Feistel

Some Aspects of Synergetics. From Laser Light to Cognition 9
Hermann Haken

Part II Physics

Dynamical Systems with Time-Varying Delay: Dissipative and More Dissipative Systems 27
David Müller, Andreas Otto and Günter Radons

Markov Property of Velocity Increments in Burgers Turbulence 39
Jan Friedrich and Rainer Grauer

Beads in a Rotating Box 51
Frank Rietz and Ralf Stannarius

Power Grids as Synergetic Systems 61
Oliver Kamps and Katrin Schmietendorf

Part III Chemistry

Nonlinear Phenomena in Heterogeneous Catalysis 71
Marina M. Slinko, Alexei G. Makeev and Nikolai V. Peskov

Catalytic Oxidation of CO—A Striking Example of Synergetics 87
Peter J. Plath and Carsten Ballandis

Understanding Earth: The Self-organization Concept and Its Geological Significance; on the Example of Liesegang-Structures and Electric Fields 101
Sabine Dietrich and Karl-Heinz Jacob

Pattern Formation in Microemulsions Affected by Electric Fields 117
Patricia Dähmlow and Stefan C. Müller

Unpinning of Spiral Waves 129
Jiraporn Luengviriya, Malee Sutthiopad, Metinee Phantu, Porramain Porjai, Stefan C. Müller and Chaiya Luengviriya

Battery—Determination and Forecast via Synergetics 139
Ernst-Christoph Haß, Katharina Knicker, Uwe Sydow, Matthias Schulz and Peter J. Plath

Dynamics and Control of Spiral and Scroll Waves 155
Sumana Dutta, Nirmali Prabha Das and Dhriti Mahanta

One-Way Diffusion and Active Motion of Ionic Liquids in a Dissolution Process in Water 167
Noriko Oikawa and Rei Kurita

Part IV Biology

Pattern Formation in Marine Systems 179
Ulrike Feudel

Nonlinear Behavior of a Self-Propelled Droplet Coupled with a Chemical Oscillatory Reaction 197
Nobuhiko J. Suematsu, Yoshihito Mori, Takashi Amemiya and Satoshi Nakata

All About Cells 209
Lisa Kolb and Susanne Krömker

Propagation and Aggregation of Motile Cells of *Escherichia coli* Pattern 227
Tatsunari Sakurai, Tohru Tsujikawa and Daisuke Umeno

From Synchronised to Desynchronised Glycolytic Oscillations in Individual Yeast Cells 239
André Weber, Yury Prokazov, Werner Zuschratter and Marcus J.B. Hauser

Part V Economy

Financial Market Models 257
Lisa Borland

Structural Change in (Economic) Time Series 275
Christian Kleiber

Part VI Brain and Coordination Dynamics

Coarse-Graining to Investigate Cerebral Cortex Dynamics 289
Kentaroh Takagaki and Frank W. Ohl

Coordination Dynamics and Synergetics: From Finger Movements to Brain Patterns and Ballet Dancing 301
Armin Fuchs and J.A. Scott Kelso

The Human Dynamic Clamp: A Probe for Coordination Across Neural, Behavioral, and Social Scales 317
Guillaume Dumas, Aline Lefebvre, Mengsen Zhang, Emmanuelle Tognoli and J.A. Scott Kelso

Design Principle for a Population-Based Model of Epileptic Dynamics 333
Gerold Baier, Richard Rosch, Peter Neal Taylor and Yujiang Wang

Discrete Modeling for a Minimal Circuit in the Hippocampus 349
Anastasia I. Lavrova and Eugene B. Postnikov

Part VII Additional Topics

I See What You Do Not See 361
Kinko Tsuji

Performative Science—Transgressions from Scientific to Artistic Practices and Reverse 373
Hans H. Diebner

Dynamics and Synchronisation in Wind Farms 383
Mehrnaz Anvari, M. Reza Rahimi Tabar, Joachim Peinke and Matthias Wächter

Part VIII Special Lecture

A Primer for Deterministic Thermodynamics and Cryodynamics 391
Otto E. Rossler, Frank Kuske, Dieter Fröhlich, Hans H. Diebner, Thimo Böhl, Demetris T. Christopoulos and Christophe Letellier

Index 415

http://www.springer.com/978-3-319-64333-5

Complexity and Synergetics
Müller, S.C.; Plath, P.J.; Radons, G.; Fuchs, A. (Eds.)
2018, XIX, 421 p. 215 illus., 125 illus. in color.,
Hardcover
ISBN: 978-3-319-64333-5