

# Table of Contents

**Preface****Future Trends in Synergetics**

H. Haken 3

**Self-Formation of the Artificial Planar Systems. What is It?**

S. Janušonis 11

**Dynamically Multivalued Self-Organisation and Probabilistic Structure Formation Processes**

A.P. Kirilyuk 21

**From Self-Organization to Evolution of RNA Molecules: The Origin of Biological Information**

P. Schuster 27

**Active Brownian Motion – Self-Formation in Systems of Self-Propelled Particles**

W. Ebeling 37

**Artificial Chemistries – Towards Constructive Dynamical Systems**

W. Banzhaf 43

**Self-Formation Supported by Pattern Recognition**

L. Telksnys 51

**Intelligent Stock Trading Systems Using Fuzzy-Neural Networks and Evolutionary Programming Methods**

R. Simutis and S. Masteika 59

**Evolution of Complex Systems and 1/f Noise: from Physics to Financial Markets**

V. Gontis, B. Kaulakys, M. Alaburda and J. Ruseckas 65

**Nondestructive Testing Method in Artificial Intelligence Real Time Systems**

E. Kazanavicius, A. Mikuckas and I. Mikuckiene 71

**Self-Formation, Development and Reproduction of the Artificial System**

J. Ulbikas, L. Leonas, D. Ulbikiene and S. Janušonis 77

**Self-Formation of the Spatial Planar Object. Topological Approach**

S. Janušonis 85

**A Synergetic Approach of Solar Cells**

L. Fara and V. Bădescu 91

**Self-Organized Corrugated Interface for Barrier Heterostructures to Solar Cells Application**

N.L. Dmitruk, O.Y. Borkovskaya, O.I. Mayeva, I.B. Mamontova and T.V. Malysh 97

**Simulation of Self Formation in Solar Cell Technology**

L. Leonas and S. Janušonis 103

**Iterative Optimization of Spatial Solar Cell: Performance and Technology**

J. Ulbikas, K. Požela and D. Ulbikiene 109

**Solar Power Devices for Providing Power to Handheld Devices: Field of the Invention**

A. Elazari 115

**Technological Graph of Self-Forming Solar Cell**

V. Janušonienė, E. Leonienė and L. Leonas 121

**Pattern Formation in Reaction Diffusion Systems: A Moving Boundary Model**

G. Varghese and J. George 125

**Development of a Course on Photovoltaic Systems**

V. Benda 133

**Diagnostics of Recombination Rate Homogeneity in Structures of Large-Area Solar Cells**

V. Benda 139

**Studies of Porous Layer Formation in p-Si by Spectroscopic Ellipsometry**

J. Sabataitytė, A. Rėza, I. Šimkienė, A. Matulis and G.J. Babonas 145

**Formation and Characteristics of Thin Films of  $ZrO_2$ -8 mol %  $Y_2O_3$  Solid Electrolytes**

D. Milčius, L.L. Pranevičius, V. Širvinskaitė, T. Šalkus, A. Kežionis and A.F. Orliukas 153

**Behavior of Hydrogen in Al, Mg and MgAl Plasma Saturated Films**

D. Milčius, L.L. Pranevičius, J. Nomgaudytė and I. Barnackas 159

<b>Self-Formation Processes in Studies of Surface Topography under Ion Irradiation</b>	165
L.L. Pranavičius, C. Templier and D. Mickevičius	
<b>Quantum Mechanical Design of Molecular Computers Elements Suitable for Self-Assembling to Quantum Computing Living Systems</b>	173
A. Tamulis, V. Tamulis and A. Ziriakoviene	
<b>Self Formation of Porous Silicon Structure: Primary Microscopic Mechanism of Pore Separation</b>	181
M.E. Kompan, A.E. Gorodetski and I.L. Tarasova	
<b>The Role of Processes on the Surface in Organization of Long Range Mass-Transport in the Bulk</b>	185
L.L. Pranavičius, D. Milčius, R. Knizikevičius, J. Nomgaudytė and B. Bobrovaitė	
<b>Self-Assembled TPPS<sub>4</sub> Nanostructures Revealed by Atomic Force Microscopy</b>	191
R. Augulis, V. Snitka and R. Rotomskis	
<b>Atomic Force Microscopy of Self-Assembled Nanostructures of TPPS<sub>4</sub> on SAM Substrates</b>	195
R. Augulis, R. Valiokas, B. Liedberg and R. Rotomskis	
<b>Cylindrical Aggregates of TDBC: Linear and Nonlinear Optical Properties Versus Morphology</b>	201
A. Pugžlys, P.R. Hania, C. Didraga, J. Knoester and K. Duppen	
<b>Reaction Dynamics and Applications in Patterning of Bisthiencylclopentene-Based Photochromic Switches</b>	207
P.R. Hania, A. Pugžlys, L.N. Lucas, J.J.D. de Jong, J. van Esch, B.L. Feringa and K. Duppen	
<b>Modelling Evolution of Nanostructures in Lateral Etching Processes</b>	215
R. Navickas and M. Romanov	
<b>The Polar Sulfonic Groups Influence on Structure of Self-Assembled Tetrapyrrolic Molecules</b>	221
V. Poderys, A. Selskis and R. Rotomskis	
<b>Theoretical Modeling of TPPS<sub>4</sub> J-Aggregates</b>	225
R. Augulis, J. Tamulienė, A. Tamulis and R. Rotomskis	
<b>Basic Self-Formation Processes in the Technologies of the Integrated Circuits</b>	229
R. Navickas and R. Kirvaitis	
<b>Modelling Geometry of Technological Masks in Lateral Etching Processes</b>	235
R. Navickas and R. Ciulada	
<b>Self-Formation of Properties of the Mechanical System in Machining</b>	239
A.J. Marcinkevičius	
<b>Self-Assembly of a Synthetic Opal Infiltrated with Liquid Crystal Like Photonic Crystal</b>	245
L. Rasteniene, S. Pajeda and R. Vaisnoras	
<b>Enhanced Luminescence of Europium in Porous Anodic Alumina Films</b>	251
N.V. Gaponenko, I.S. Molchan, A.A. Lutich and S.V. Gaponenko	
<b>Self-Formation of the Artificial Planar Systems. Theory and Application</b>	259
S. Janušonis and V. Janušonienė	
<b>Self-Formation Phenomenon in the Technological World. Development of Planar Technology</b>	267
S. Janušonis and V. Janušonienė	
<b>Differential Approach to the Plane Contour Evolution</b>	278
S. Janušonis and V. Janušonienė	
<b>Digital Approach to the Plane Figure Evolution</b>	295
S. Janušonis and V. Janušonienė	
<b>Topological Approach to the Object Evolution</b>	312
S. Janušonis and V. Janušonienė	
<b>Topological Approach to the Object Evolution. Topological Approach to the Object Evolution</b>	337
S. Janušonis and V. Janušonienė	
<b>Topological Approach to the Object Evolution. Evolution of Spatial Planar Object</b>	377
S. Janušonis and V. Janušonienė	
<b>Self-Formation, Development and Reproduction of the Artificial Planar Systems</b>	391
S. Janušonis and V. Janušonienė	
<b>Application of Self-Formation</b>	444
S. Janušonis and V. Janušonienė	

