

## Table of Contents

<b>Structures and Bio-language to Simulate Transition P Systems on Digital Computers</b> .....	1
<i>Fernando Arroyo, Angel V. Baranda, Juan Castellanos, Carmen Luengo, Luis F. Mingo</i>	
<b>Gamma and the Chemical Reaction Model: Fifteen Years After</b> .....	17
<i>Jean-Pierre Banâtre, Pascal Fradet, Daniel Le Métayer</i>	
<b>Visual Multiset Rewriting: Applications to Diagram Parsing and Reasoning</b> .....	45
<i>Paolo Bottoni, Bernd Meyer, Francesco Parisi Presicce</i>	
<b>Multiset Automata</b> .....	69
<i>Erzsébet Csuhaj-Varjú, Carlos Martín-Vide, Victor Mitrana</i>	
<b>Parikh Mapping and Iteration</b> .....	85
<i>Jürgen Dassow</i>	
<b>Multiset Constraints and P Systems</b> .....	103
<i>Agostino Dovier, Carla Piazza, Gianfranco Rossi</i>	
<b>Toward a Formal Macroset Theory</b> .....	123
<i>Manfred Kudlek, Carlos Martín-Vide, Gheorghe Păun</i>	
<b>Normal Forms of Grammars, Finite Automata, Abstract Families, and Closure Properties of Multiset Languages</b> ....	135
<i>Manfred Kudlek, Victor Mitrana</i>	
<b>On Multisets in Database Systems</b> .....	147
<i>Gianfranco Lamperti, Michele Melchiori, Marina Zanella</i>	
<b>Tolerance Multisets</b> .....	217
<i>Solomon Marcus</i>	
<b>Fuzzy Multisets and Their Generalizations</b> .....	225
<i>Sadaaki Miyamoto</i>	

<b>Universality Results for Some Variants of P Systems .....</b>	<b>237</b>
<i>Madhu Mutyam, Kamala Krithivasan</i>	
<b>Multiset and <math>K</math>-Subset Transforming Systems .....</b>	<b>255</b>
<i>Taishin Yasunobu Nishida</i>	
<b>On P Systems with Active Membranes Solving the Integer Factorization Problem in a Polynomial Time ...</b>	<b>267</b>
<i>Adam Obtułowicz</i>	
<b>The Linear Theory of Multiset Based Dynamic Systems ....</b>	<b>287</b>
<i>Wolfgang Reisig</i>	
<b>Artificial Life Applications of a Class of P Systems: Abstract Rewriting Systems on Multisets .....</b>	<b>299</b>
<i>Yasuhiro Suzuki, Yoshi Fujiwara, Junji Takabayashi, Hiroshi Tanaka</i>	
<b>Mathematics of Multisets .....</b>	<b>347</b>
<i>Apostolos Syropoulos</i>	
<b>Author Index .....</b>	<b>359</b>