

Contents

Introduction	1
Chapter 1: Vladimir Turaev, friend and colleague <i>by Athanase Papadopoulos</i>	15
Chapter 2: Triangles on planar Jordan C^1 -curves and differential topology <i>by Jean-Claude Hausmann</i>	45
Chapter 3: Null-homologous unknottings <i>by Charles Livingston</i>	59
Chapter 4: A question of Turaev about triple higher Milnor linking numbers of divide links <i>by Norbert A'Campo</i>	69
Chapter 5: Fundamental groups in projective knot theory <i>by Julia Viro, Oleg Viro</i>	75
Chapter 6: The Affine Index Polynomial and the Sawollek Polynomial <i>by Louis H. Kauffman</i>	93
Chapter 7: Introduction to quantum representations of mapping class groups <i>by Julien Marché</i>	109
Chapter 8: On symmetric matrices associated with oriented link diagrams <i>by Rinat Kashaev</i>	131
Chapter 9: On Chen–Yang’s volume conjecture for various quantum invariants <i>by Jun Murakami</i>	147
Chapter 10: Non-semisimple invariants and Habiro’s series <i>by Anna Beliakova, Kazuhiro Hikami</i>	161
Chapter 11: Modular categories and TQFTs beyond semisimplicity <i>by Christian Blanchet, Marco De Renzi</i>	175

Chapter 12: State sums for some super quantum link invariants <i>by Louis-Hadrien Robert, Emmanuel Wagner</i>	209
Chapter 13: Brane Topological Field Theory and Hurwitz numbers for CW-complexes <i>by Sergey M. Natanzon</i>	247
Chapter 14: Resurgence of Faddeev’s quantum dilogarithm <i>by Stavros Garoufalidis, Rinat Kashaev</i>	257
Chapter 15: On mapping class group quotients by powers of Dehn twists and their representations <i>by Louis Funar</i>	273
Chapter 16: Higher holonomy and iterated integrals <i>by Toshitake Kohno</i>	309
Chapter 17: Some algebraic aspects of the Turaev cobracket <i>by Nariya Kawazumi</i>	329
Chapter 18: Generalized Dehn twists in low-dimensional topology <i>by Yusuke Kuno, Gwénaél Massuyeau, Shunsuke Tsuji</i>	357
Chapter 19: On geometric group theory <i>by Valentin Poénaru</i>	399
Chapter 20: Geometry of knots and links <i>by Nikolay Abrosimov, Alexander Mednykh</i>	433
Chapter 21: Essential closed surfaces and finite coverings of negatively curved cusped 3-manifolds <i>by Charalampos Charitos</i>	455
Chapter 22: Continuous and discontinuous functions on deformation spaces of Kleinian groups <i>by Ken’ichi Ohshika</i>	477
Chapter 23: A generalization of King’s equation via noncommutative geometry <i>by Gourab Bhattacharya, Maxim Kontsevich</i>	503

Chapter 24: Dessins for modular operads and the Grothendieck–Teichmüller group
by Noémie C. Combe, Yuri I. Manin, Matilde Marcolli 537

Chapter 25: On the involution Jimm
by A. Muhammed Uludağ 561

Chapter 26: What is a black hole? – A geometric introduction
by Sumio Yamada 579

Chapter 27: The paradoxical nature of mathematics
by Vassiliki Farmaki, Stelios Negrepointis 599

Chapter 28: Returns of geometry: From the Pythagoreans to mathematical modernism and beyond
by Arkady Plotnitsky 643

Postface 683

List of contributors 685