

## CONTENTS

### LECTURES

**Vladimir Gerdjikov, Georgi Grahovski, Alexander Mikhailov and  
Tihomir Valchev**

ON SOLITON INTERACTIONS FOR THE HIERARCHY OF A GENERALISED HEISENBERG FERROMAGNETIC MODEL ON $SU(3)/S(U(1) \times U(2))$ SYMMETRIC SPACE .....	<b>11</b>
1. Introduction .....	12
2. Preliminaries .....	13
3. Dressing Method and Soliton Solutions .....	19
4. Interactions of Quadruplet Solitons .....	34
5. Integrals of Motion .....	37
6. Conclusions .....	39
Acknowledgements .....	40
References .....	40

**Mauro Spera**

GEOMETRIC METHODS IN QUANTUM MECHANICS .....	<b>43</b>
1. Introduction .....	44
2. Preliminary Tools .....	45
3. Geometric Quantum Mechanics: the Basic Formalism .....	52
4. Some Applications of Geometric Quantum Mechanics .....	63
5. Concluding Remarks .....	76
Acknowledgements .....	76
References .....	76

CONTRIBUTIONS

**Gustavo Arciniega, Francisco Nettel, Leonardo Patino and  
Hernando Quevedo**

TOPOLOGICAL QUANTIZATION OF FREE MASSIVE BOSONIC  
FIELDS ..... 85

**Mayeul Arminjon and Frank Reifler**

CLASSICAL-QUANTUM CORRESPONDENCE AND WAVE PACKET  
SOLUTIONS OF THE DIRAC EQUATION IN A CURVED SPACE-TIME 96

**Peter Djondjorov, Vassil Vassilev, Mariana Hadzhilazova and  
Ivailo Mladenov**

ANALYTIC DESCRIPTION OF THE VISCOUS FINGERING INTERFACE  
IN A ROTATING HELE-SHAW CELL ..... 107

**Bernard Gaffet**

THE SPINNING GAS CLOUDS WITH PRECESSION: THE SYMMETRY  
GENERATORS..... 114

**Anton Galaev**

SOME APPLICATIONS OF THE LORENTZIAN HOLONOMY  
ALGEBRAS ..... 132

**Barbara Gołubowska, Vasyl Kovalchuk, Agnieszka Martens,  
Ewa Eliza Rożko and Jan J. Sławianowski**

SOME STRANGE FEATURES OF THE GALILEI GROUP ..... 150

**Kazuyuki Hasegawa**

A LORENTZIAN SURFACE IN A FOUR-DIMENSIONAL MANIFOLD  
OF NEUTRAL SIGNATURE AND ITS REFLECTOR LIFT ..... 176

**Tomoyo Kanazawa and Akira Yoshioka**

STAR PRODUCT AND ITS APPLICATION TO THE MIC-KEPLER  
PROBLEM ..... 188

<b>Şeyda Kiliçoğlu</b> ON THE INVOLUTIVE B-SCROLLS IN THE EUCLIDEAN THREE-SPACE .....	<b>205</b>
<b>Andrei Ludu</b> VORTEX PATTERNS BEYOND HYPERGEOMETRIC .....	<b>215</b>
<b>Reza Mirzaei</b> COHOMOGENEITY TWO RIEMANNIAN MANIFOLDS OF NON-POSITIVE CURVATURE .....	<b>233</b>
<b>Giovanni Moreno</b> A NATURAL GEOMETRIC FRAMEWORK FOR THE SPACE OF INITIAL DATA OF NONLINEAR PDES .....	<b>245</b>
<b>Vladimir Pulov</b> CONSTRUCTION OF GROUP-INVARIANT SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS .....	<b>258</b>
<b>Andrés Viña</b> QUANTIZATION OPERATORS AND INVARIANTS OF GROUP REPRESENTATIONS .....	<b>265</b>
<b>Alexander B. Yanovski</b> PGEOMETRY OF THE RECURSION OPERATORS FOR CAUDREY- BEALS-COIFMAN SYSTEM IN THE PRESENCE OF MIKHAILOV TYPE $\mathbb{Z}_p$ REDUCTIONS .....	<b>278</b>
<i>Subject Index</i> .....	<b>297</b>
<i>E-mail Addresses</i> .....	<b>299</b>