

Contents

Preface	viii
Randolph R. Aldinger	
Berry's Connection in a Quantum Relativistic Description of the Curved Space Analogue of Development	1
Ivan Avramidi and Giampiero Esposito	
Heat-Kernel Asymptotics of the Gilkey-Smith Boundary-Value Problem	15
Ivan Avramidi and Giampiero Esposito	
On Ellipticity and Gauge Invariance in Euclidean Quantum Gravity	33
Andrea L. Bertozzi , Andreas Münch, and Michael Shearer	
Undercompressive Waves in Driven Thin Film Flow: Theory, Computation, and Experiment	41
A.V. Bogdanov, A.S. Gevorkyan, and A.G. Grigoryan	
Internal Time Peculiarities as a Cause of Bifurcations Arising in Classical Trajectory Problem and Quantum Chaos Creation in Three-Body System	67
A.V. Bogdanov, A.S. Gevorkyan, and A.G. Grigoryan	
Random Motion of Quantum Harmonic Oscillator - Thermodynamics of Nonrelativistic Vacuum	79
Andrew Bordner	
A New Formulation of Lax Pairs for Generalized Calogero-Moser Models	109
Gordon Chalmers and Koenraad Schalm	
Four-Point Correlation Functions in the ADS/CFT Correspondence	117
Sergey Cherkis	
Gravitational Instantons and Moduli Spaces	131
E. Cremmer, B. Julia, H. Lü, and C.N. Pope	
Superdualities and Twisted Self-Duality	137
Indranil Dasgupta	
Boomerons in Field Theory	183

CONTENTS

Michael J. Duff	
A Layman's Guide to M-Theory	193
John K. Elwood	
Family Symmetry, the Anomalous $U(1)$, and Neutrino Mixing	213
D. Ennyu, H. Kawabe, and N. Nakazawa	
Stochastic Quantization Approach to $c \leq 1$ Open-Closed String Field Theories	215
Cesar D. Fosco	
Gauge Invariance and Effective Actions at Finite Temperature	223
Ioannis Giannakis	
Superconformal Deformations and Space-Time Symmetries .	247
Martin E. Glicksman	
Nonlinear Patterns in Microstructures	253
C. R. Hagen	
Non-Thermalizability of a Quantum Field Theory	255
Ray Hefferlin	
Field Theory for Chemical Spaces	263
Jens Hoppe	
From Functions to Matrices	267
Emil Horozov and Alex Kasman	
Duality and Construction of Quantum Integrable Systems .	271
Gerhard Huisken	
Geometric Concepts for the Mass in General Relativity . . .	281
Carroll K. Johnson	
Crystallographic Topology 2: Overview and Work in Progress	289
Ian I. Kogan and Oleg A. Soloviev	
Gravitationally Dressed RG Flows, Zigzag Symmetry and Zero-Tension Strings	321
Claude LeBrun	
Einstein Metrics and the Yamabe Problem	327
Ramon López-Alemán	
Numerical Evolution in Time of Curvature Perturbations in Kerr Black Holes	351
Andrei (Andy) Ludu and J.P. Draayer	
Nonlinearity and Self-Similarity: Wavelets and Compactons on A Physical Background	359
Badri Magradze	
On Analytic Approach to Perturbative Quantum Chromodynamics	371

CONTENTS

Chris Michael	
Lattice Gauge Theory	379
Rafael Nepomechie	
Integrable Models With Boundary	381
Herbert Neuberger	
Mathematical Aspects of Chiral Gauge Theories on the Lattice	391
Leopoldo Pando-Zayas	
The Statistical Entropy of Black Holes and the AdS_3 Geometry	401
Eqab M. Rabei	
Canonical Treatment of Regular Lagrangians with Holonomic Constraints as Singular Systems	413
C. Rasinariu, U.P. Sukhatme, and A. Gangopadhyaya	
Algebraic Shape Invariant Models	421
Wilson Rivera-Gallego	
Molecular Configurations and Euclidean Distance Matrices . .	429
Igor Shovkovy	
Derivative Expansion of the One-Loop Effective Action in QED	437
Clifford Taubes	
Nonlinear Generalizations of a 3-Manifold's Dirac Operator .	445
Cheng-Li Wu	
Dynamical Symmetry Approach to Quantum Many-Body Problems	457
Contributors
	493