

CONTENTS

Preface	v
Memorial	viii
Part A Introductions	1
The Mathematical Basis for Deterministic Quantum Mechanics <i>G. 't Hooft</i>	3
What Did We Learn from Quantum Gravity? <i>A. Ashtekar</i>	20
Bose–Einstein Condensates and EPR Quantum Non-Localilty <i>F. Lalö</i>	35
The Quantum Measurement Process: Lessons from an Exactly Solvable Model <i>A. E. Allahverdyan, R. Balian and Th. M. Nieuwenhuizen</i>	53
Part B Quantum Mechanics and Quantum Information	67
POVMs: A Small but Important Step Beyond Standard Quantum Mechanics <i>W. M. de Muynck</i>	69
State Reduction by Measurements with a Null Result <i>G. Nienhuis</i>	80
Solving Open Questions in the Bose–Einstein Condensation of an Ideal Gas via a Hybrid Mixture of Laser and Statistical Physics <i>M. Kim, A. Svidzinsky and M. O. Scully</i>	91
Twin–Photon Light Scattering and Causality <i>G. Puentes, A. Aiello and J. P. Woerdman</i>	107

Simultaneous Measurement of Non-Commuting Observables <i>G. Aquino and B. Mehmani</i>	115
Quantum Decoherence and Gravitational Waves <i>M. T. Jaekel, B. Lamine, A. Lambrecht, S. Reynaud and P. Maia Neto</i>	125
Role of Various Entropies in the Black Hole Information Loss Problem <i>Th. M. Nieuwenhuizen and I. V. Volovich</i>	135
Quantum and Super-Quantum Correlations <i>G. S. Jaeger</i>	146
Part C Long Distance Correlations and Bell Inequalities	153
Understanding Long-Distance Quantum Correlations <i>L. Marchildon</i>	155
Connection of Probability Models to EPR Experiments: Probability Spaces and Bell's Theorem <i>K. Hess and W. Philipp</i>	163
Fair Sampling vs No-Signalling Principle in EPR Experiments <i>G. Adenier and A. Yu. Khrennikov</i>	181
Part D Mathematical Foundations	189
Where the Mathematical Structure of Quantum Mechanics Comes From <i>G. M. D'Ariano</i>	191
Phase Space Description of Quantum Mechanics and Non-Commutative Geometry: Wigner-Moyal and Bohm in a Wider Context <i>B. J. Hiley</i>	203
Quantum Mechanics as Simple Algorithm for Approximation of Classical Integrals <i>A. Yu. Khrennikov</i>	212
Noncommutative Quantum Mechanics Viewed from Feynman Formalism <i>J. Lages, A. Berard, H. Mohrbach, Y. Grandati and P. Gosselin</i>	224

Beyond the Quantum in Snyder Space	235
<i>J. F. S. van Huele and M. K. Transtrum</i>	
Part E Stochastic Electrodynamics	245
Some Quantum Experiments from the Point of View of Stochastic Electrodynamics	247
<i>V. Špička, J. J. Mareš, P. Hubík and J. Křištofik</i>	
On the Ergodic Behaviour of Atomic Systems under the Action of the Zero-Point Radiation Field	271
<i>L. De La Peña and A. M. Cetto</i>	
Inertia and the Vacuum-View on the Emergence of the Inertia Reaction Force	284
<i>A. Rueda and H. Sunahata</i>	
Part F Models for the Electron	299
Rotating Hopf-Kinks: Oscillators in the Sense of de Broglie	301
<i>U.ENZ</i>	
Kerr-Newman Particles: Symmetries and Other Properties	308
<i>H. I. Arcos and J. G. Pereira</i>	
Kerr Geometry Beyond the Quantum Theory	319
<i>A. Burinskii</i>	
The Electron and the Neutrino as Solitons in Classical Electromagnetism	332
<i>Th. M. Nieuwenhuizen</i>	
Part G Philosophical Considerations	343
Probability in Non-Collapse Interpretations of Quantum Mechanics	345
<i>D. Dieks</i>	
The Schrödinger-Paradox about the Concept of “State” in Quantum Statistical Mechanics and Quantum Information Theory is Still Open: One More Reason to Go Beyond?	355
<i>G. P. Beretta</i>	

The Conjecture that Local Realism is Possible <i>E. Santos</i>	366
Part H Round Table	375
Round Table Discussion <i>A. M. Cetto, R. Balian, G. 't Hooft, A. Yu. Khrennikov and Th. M. Nieuwenhuizen</i>	377
Author Index	383
Keyword Index	385