

# CONTENTS

Preface	v
In Memory of Professor Asim Barut (1926–1994) <i>E. C. G. Sudarshan</i>	vii
<b>I. Quantum Systems and Quantum Coherence</b>	
Noether's Theorem, Dynamical Symmetry Groups and Time-Dependent Quantum Invariants <i>O. Castaños and R. Lopez-Peña</i>	3
From Coherent States to Classical-Like Solutions in State-Dependent Potentials <i>F. Illuminati</i>	18
Squeezed Photons and Squeezed Hadrons <i>Y. S. Kim</i>	32
Phase Space as Arena for Atom Optics in a Quantized Light Field <i>D. S. Krähmer, E. Mayr, A. M. Herkommer, V. M. Akulin, W. P. Schleich and I. Sh. Averbukh</i>	46
Photon Statistics for Multimode Squeezed Schrödinger Cat States <i>V. I. Man'ko</i>	71
Quantum Electrodynamical Coherence in Condensed Matter <i>R. Mele</i>	85
Stochastic Quantization and Coherence <i>L. M. Morato</i>	97
Random Path Approach to Quantum Mechanics <i>M. Roncadelli</i>	112
Quantum Dissipation and Coherence <i>G. Vitiello</i>	136

## II. Particles and Fields

Quantum Limits in Interferometric GW Antennas <i>F. Barone, P. Maddalena, A. Porzio, L. Sirigu, S. Solimeno, F. Zaccaria, M. A. Man'ko and V. I. Man'ko</i>	151
Recent Results on the Abraham–Lorentz–Dirac Equation <i>A. Carati, L. Galgani and I. Sassarini</i>	167
Shift Operators and Coherent States in Nonlinear Dynamics <i>E. C. G. Sudarshan</i>	177
A Quantum-Like Description of Combined Traps <i>G. Torelli and R. Poggiani</i>	181
Quantum-Like Manifestation in a Classical Mechanical System <i>R. K. Varma</i>	187

## III. Beam Physics

Paraxial Propagation of Non-classical States in the Thermal Wave Model <i>S. De Nicola, R. Fedele, V. I. Man'ko and G. Miele</i>	203
Quantum-Like Model for Charged Particle Beam Dynamics <i>R. Fedele</i>	219
Applications of the Thermal Wave Model to the Transverse Dynamics in Particle Accelerators <i>G. Miele</i>	233
Coherent Instabilities in Particle Accelerators: Conventional and Novel Approaches <i>M. Migliorati and L. Palumbo</i>	246
Crystalline Beams: Theory, Experiments, and Proposals <i>A. G. Ruggiero</i>	257

**IV. Plasma Physics**

- Generation of Coherent Density Cavities and Fields in Laser-Produced  
Non-uniform Plasmas 283  
*H. C. Pant*
- Periodic Ion Hole Equilibria 305  
*H. Schamel*
- Coherent Structures in Magnetized Plasmas 322  
*P. K. Shukla*
- Dynamics of Interaction of Relativistically Intense Electromagnetic  
Waves with a Relativistically Hot Electron–Positron Plasma 331  
*L. N. Tsintsadze and N. L. Tsintsadze*

**V. Nonlinear Optics**

- Pulse Propagation Determined by the Nonlinear Schrödinger Equation:  
A Variational Approach 345  
*D. Anderson and M. Lisak*
- Stationary and Radiating Solitons in High Order Dispersive Systems 392  
*V. I. Karpman*
- Aberration Classification and Composition 420  
*K. B. Wolf*
- List of Participants 459