

EDITORIAL

This issue of the Journal of Russian Laser Research is a collection of papers presented at the Workshop “Nonlinearity and Coherence in Classical and Quantum Systems” held at the University “Federico II” in Naples, Italy on December 4, 2009 in honor of Prof. Margarita A. Man’ko in connection with her 70th birthday. The other collaborators from different scientific centers also contributed

to this issue. The topics of the workshop, related to the scientific activity of M. A. Man’ko, were laser physics, signal analysis, optical communication, and quantum computing.

Contributions contained in this issue are devoted to several problems of theoretical and experimental physics. Some other contributions will be published in issue 3. The order of the papers corresponds to the alphabetical order of the first author of the paper.

The paper by P. Aniello deals with an important concept of quantum mechanics – the Weyl system, which is used to quantize classical systems, including electromagnetic fields of lasers. The theoretical aspects of gravitation and cosmology are presented in the contribution from S. Capozziello. The experimental and theoretical problems of the polarized-light interference behind a diffracting grating are studied in the paper by M. Božić, M. Davidović, T. L. Dimitrova, S. Miret-Artés, A. S. Sanz, and A. Weis. The paper by S. De Nicola, R. Fedele, M. A. Man’ko, V. I. Man’ko, R. Meucci, and G. Zito is devoted to Fresnel tomography of Laguerre–Gauss modes of electromagnetic beams propagating in optical fibers; here the theoretical and experimental studies of vortex beams based on the new tomographic approach, providing an invertible map of the complex beam-field amplitude on the fair probability distribution, yield the phase of the electromagnetic radiation in terms of the light intensity. Prospects for new experiments for detecting photons created in resonators with moving walls due to the non-stationary (dynamic) Casimir effect are discussed in the paper by V. V. Dodonov. Abstract structures like deformed algebras and their relations to Feynman-like diagrams used as instruments in field theoretical research are analyzed in the paper by G. H. E. Duchamp, P. Blasiak, A. Horzela, K. A. Penson, and A. I. Solomon. Quantum correlations in open systems with continuous variables like photon-quadrature components are considered in the paper by A. Isar. A. Yu. Khrennikov presents in his paper a new approach to foundations of quantum mechanics and quantum optics based on the pre-quantum random field concept. The quantum behavior of matter waves in laser fields and the cold-atom patterns in the form of quantum carpets are studied in the paper by S. V. Prants and V. O. Vitkovsky.



Margarita A. Man’ko was born in Moscow on December 4, 1939. She was graduated from the Faculty of Physics of the M. V. Lomonosov Moscow State University in 1963. After defending her Master’s thesis at the P. N. Lebedev Physical Institute at the Laboratory of Prof. A. M. Prokhorov, Nobel Prize winner, she was accepted as a researcher at the Laboratory of Prof. N. G. Basov, Nobel Prize winner, where in 1970 she got her PhD. All her scientific life is connected with the Lebedev Institute where she is now a Leading Senior Researcher. Since 1989, Margarita A. Man’ko has been the Scientific Editor of the Journal of Soviet (now Russian) Laser Research.