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Nonlinear Optics and Its Applications VIII; and Quantum Optics III

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Editors

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Introduction

This conference on Quantum Optics in the frame of the SPIE Photonics Europe 2014 was arranged for the third time in Brussels, Belgium. It was devoted to the recent scientific advances at the interface between quantum optics and atom optics. During the last decades, the studies of fundamental issues in quantum mechanics exploded from their originally confidential circle of specialists and became a major field of research that covers a large range of sub-disciplines, from nanotechnologies to quantum optics, including Bose-Einstein condensates, single photon sources, squeezed light, technologies for engineering quantum states and manipulating single atoms and ions, as well as quantum dots, etc. Although those researches are clearly foundationally oriented, they fit closely to experiments and already found amazingly successful applications in top-level metrology (spectroscopy, atomic clocks, measure of fundamental constants and so on) and quantum information (quantum cryptography and computing). The conference aimed at bringing a great opportunity to listen to some of the world renowned experts in these interconnected disciplines, as well as to discover new trends that result from the convergence of these fields. It offered an updated review of recent activities both in theoretical and experimental research. The conference programme and all manuscripts included in this volume cover the following topics:

- Nonclassical field states
- Quantum entanglement and EPR states
- Quantum states engineering and reconstruction
- Quantum memory for light, quantum interfaces, slow light, EIT
- Optomechanical devices
- Quantum communication and information processing
- Colour centers in diamond
- Quantum cryptography
- Nonlinear optics in graphene
- Quantum light in cavity
- Quantum key distribution

In conclusion, we thank all the conference participants and the authors of the submitted manuscripts for their contributions. Our special thanks also go the members of the program committee of this conference for their involvement into setting a good program.

Thomas Durt
Alexander V. Sergienko