

Editorial

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Published online: 3 June 2011
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In 2010 the Spring Meeting of the AMOP Section of the German Physical Society, which by now is the largest conference in this field worldwide, took place at the University of Hannover. It was characterized by a very lively exchange of ideas and results between the different areas of modern Atomic, Molecular, and Optical Physics.

The large number of joint sessions shared between the different Sections of the German Physical Society as well as seven interdisciplinary symposia on subjects ranging from fundamental questions of decoherence, quantum control in molecular systems and isolated atoms to the measurement of fundamental constants and diffractive imaging showed the growing interest in research beyond the classical borders of disciplines.

A particular highlight was the symposium dedicated to the 50th anniversary of the invention of the laser. The large number of oral contributions within the Section Quantum Optics and Photonics, which continuously increased since many years, reflects the tendency to broaden the scientific goals and to explore new crossroads between different fields of physics. It was a pleasure to witness the high standards of the presentations, in particular the ones presented by enthusiastic diploma and doctoral students.

This special issue tries to convey a flavor of the wealth of presentations within the Quantum Optics and Photonics Section. The invited contributions, which all underwent the well-established refereeing process of Applied Physics B, were chosen on the basis of recommendations by the session chairs. It was the intention to cover a large variety of subjects in theory and experiment. Therefore the topics of this Special Issue range from fundamental problems to applications. The articles address questions of control of single quantum emitters—atoms or defect centers—for the controlled generation of single-photon pulses, discuss new ideas to study many-body phenomena in optical systems and outline new approaches to high-power and power-stabilized lasers. In the spirit of supporting young researchers, most of the corresponding authors of the articles are at an early stage of their career.

Many thanks to the local organizers of the Hannover meeting, in particular Wolfgang Ertmer and Eberhard Tieermann and their teams, for realizing such an excellent conference. This Special Issue would not have been possible without the professional support of the Editor-in-chief Frank Träger and of Jutta Kaisig from the University of Kassel, who I thank for their help and patience.

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