

EDITORIAL

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To cite this article: Jovana Petrovi *et al* 2012 *Phys. Scr.* **2012** 010101

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EDITORIAL

Photonica 2011: 3rd International School and Conference on Photonics

Guest Editors

**Jovana Petrović,
Milutin Stepić and
Ljupčo Hadžievski**
*Vinča Institute of Nuclear
Sciences, Belgrade, Serbia*

Photonics is a rapidly growing discipline of physics that investigates properties of light and its interaction with matter and develops devices based on these properties. Due to both the fundamental and applied nature of photonics research, it pervades many branches of modern technology: quantum mechanics, material science, electronics, telecommunications, biology, medicine, material processing, etc. The borders between these subjects are being erased, generating new research areas such as silicon photonics, biophotonics and quantum photonics. Diverse branches of photonics are united in a common effort to further miniaturize photonic devices, integrate them with existing technologies and develop new technologies.

The International School and Conference on Photonics—Photonica—is a biennial forum for the education of young scientists, exchanging new knowledge and ideas, and fostering collaboration between scientists working in photonic science and technology. Conference topics cover a broad range of research activities in optical materials, metamaterials and plasmonics, nonlinear optics, lasers, laser spectroscopy, biophotonics, optoelectronics, optocommunications, photonic crystals, holography, quantum optics and related topics in atomic physics. The aim of the organizers is to provide a platform for discussing new developments, concepts and future trends of various disciplines of photonics by bringing together researchers from academia, government and industrial laboratories.

The educational element of Photonica—a series of tutorials and keynote talks—enables students and young researchers to better understand the fundamentals and their use on a route to applications, and informs both young and experienced scientists of new directions of research. The introductory lectures that are directly related to the state-of-the-art are followed by presentations and discussions on recent results during oral and vibrant poster presentations.

This Topical Issue is dedicated to Photonica 2011 held on 29 August–2 September 2011 in Belgrade, Serbia. The conference was attended by 144 participants from 27 countries who gave 132 oral and poster presentations and 24 lectures. The accompanying papers were peer reviewed and 82 were selected for publication. We take this opportunity to gratefully acknowledge the contribution of the reviewers to the quality of this issue.

The papers are grouped in accordance with the conference topics, each section opening with an invited paper. The issue begins with papers dedicated to ultra-cold atomic systems that display coherent behaviour analogous to that of light. These well-controlled atomic systems are indispensable workhorses for experiments in quantum optics, which is the topic of the next section. Holography as a concept, measurement tool and technique for fabrication of periodic photonic structures is placed accordingly between fundamental and applied photonics. It is followed by reports on various photonic devices, their modelling and nonlinear phenomena. The progress in constructing these devices largely depends on artificial (composites, metamaterials) and natural optical materials and their processing.

This Topical Issue is an original snapshot of the current research in photonics and by no means an extensive survey of the field. While the making of the former

has been a challenging task, the compilation of the latter would be indomitable due to the rapid advances in and diversification of photonics research. In accordance with the aims of the conference itself, we hope that the results reported in this Topical Issue of *Physica Scripta* will serve to inform and to spark the imagination of scientists and engineers exploring or using the principles and products of photonics.