

EDITORIAL

## TaCoNa-Photonics 2008

To cite this article: Dmitry N Chigrin *et al* 2009 *J. Opt. A: Pure Appl. Opt.* **11** 110201

View the [article online](#) for updates and enhancements.

### You may also like

- [Two-dimensional rectangular tantalum carbide halides TaCX \(X = Cl, Br, I\): novel large-gap quantum spin Hall insulators](#)  
Liujiang Zhou, Wujun Shi, Yan Sun et al.
- [A Bilayer Diffusion Barrier of ALD-Ru/ALD-TaCN for Direct Plating of Cu](#)  
Soo-Hyun Kim, Hyun Tae Kim, Sung-Soo Yim et al.
- [Toughness of micro-nano structure of TaC dense ceramic prepared using \*in situ\* technology](#)  
Nana Zhao, Yurong Zhao, Xin wang et al.

## EDITORIAL

# TaCoNa-Photonics 2008

**Dmitry N Chigrin**

*Institute of High-Frequency  
and Communication  
Technology, Faculty of  
Electrical, Information and  
Media Engineering,  
University of Wuppertal,  
Wuppertal, Germany*

**Kurt Busch**

*Institut für Theoretische  
Festkörperphysik, Universität  
Karlsruhe (TH), 76128  
Karlsruhe, Germany*

**Andrei V Lavrinenko**

*DTU Fotonik – Department of  
Photonics Engineering,  
Technical University of  
Denmark, Denmark*

**Guest Editors**

This special section on theoretical and computational nano-photonics features papers presented at the first International Workshop on Theoretical and Computational Nano-Photonics (TaCoNa-Photonics 2008) held in Bad Honnef, Germany, 3–5 December 2008. The workshop covered a broad range of topics related to current developments and achievements in this interdisciplinary area of research.

Since the late 1960s, the word ‘photonics’ has been understood as the science of generating, controlling, and detecting light. Nowadays, a routine fabrication of complex structures with micro- and nano-scale dimensions opens up many new and exciting possibilities in photonics. The science of generating, routing and detecting light in micro- and nano-structured matter, ‘nano-photonics’, is becoming more important both in research and technology and offers many promising applications.

The inherently sub-wavelength character of the structures that nano-photonics deals with challenges modern theoretical and computational physics and engineering with many nontrivial questions: Up to what length-scale can one use a macroscopic phenomenological description of matter? Where is the interface between the classical and quantum description of light in nano-scale structures? How can one combine different physical systems, different time- and length-scales in a single computational model? How can one engineer nano-structured materials in order to achieve the desired optical properties for particular applications? Any attempt at answering these kinds of questions is impossible without the joint efforts of physicists, engineers, applied mathematicians and programmers. This is the reason why the major goal of the TaCoNa-Photonics workshops is to provide a forum where theoreticians and specialists in numerical methods from all branches of physics, engineering sciences and mathematics can compare their results, report on novel results and breakthroughs, and discuss new challenges ahead. In order to intensify theoretical discussions and to put them on ‘solid’ ground it was decided to invite world-leading experts in experimental photonics for plenary talks.

Over three days, the workshop has brought together more than 70 specialists in theoretical and computational nano-photonics. The workshop took place in the historical ‘Physikzentrum Bad Honnef’, whose unique atmosphere supported a multitude of highly interesting debates and discussions that often lasted until midnight and beyond. Different theoretical and numerical aspects of light generation, control and detection in general inhomogeneous media, photonic crystals, plasmonic structures, metamaterials and integrated optical systems were covered in 15 invited talks and 52 contributed oral and posters presentations. The plenary talks were given by Professor M Wegener (metamaterials) and Professor W Barnes (plasmonics).

This special section is a cross-sectional selection of papers which were submitted by the authors of invited and contributed oral presentations. It also includes two papers of the winners of the Best Poster Awards. We hope that these papers will enhance the interest of the scientific community regarding nano-photonics in general and regarding the TaCoNa-Photonics workshop series in particular.

It is our distinct pleasure to acknowledge the generous financial support of our sponsors: Karlsruhe School of Optics & Photonics (KSOP) (Germany), U.S. Army International Technology Center-Atlantic, Research Division (USA), and the Office of Naval Research Global (USA). Without the organizational assistance from the International Department of the Universität Karlsruhe GmbH (Germany) this event would simply have been impossible.