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Pavel Tománek
Dagmar Senderáková
Petr Páta
Editors

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Introduction

This volume contains 61 peer-reviewed submissions selected from 97 contributions presented during the seventh Photonics Prague 2011 conference. The conference is dedicated to the development of photonics, particularly in the eastern European countries, with emphasis on systems and devices in photonics.

The conference included 11 topical sessions covering various aspects of photonics:

1. Lasers and Photodetectors in Industry, Imaging, and Sensors
2. Biophotonics
3. Design and Simulation of Photonic Devices
4. Photonic Crystals and Photonic Bandgap Structures
5. Diffractive Photonic Devices
6. Guided Wave Photonics
7. Organic Photonic Materials and Devices
8. Non-Linear Materials, Devices, and Applications
9. Nanophotonics and Nanooptics
10. Solid State Lighting + LED, LD, OLED, Solar Cells
11. Photonics: Education and Multimedia

The conference attracted 102 participants from 24 countries, and the presence of many young first-time participants was greatly appreciated (one third were local from the Czech Republic and Slovakia). The scientific program was comprised of 4 plenary talks, 7 invited talks, 41 oral presentations, and 45 poster presentations.

Also, this volume contains papers written by SPIE Student Best Paper Award winners, Timo Voipio (FIN), Zdeněk Pilát (CZE), Irene Salas-Garcia (ESP), and Dann S. Olesen (DEN), as well as of CSSF Young Scientist Award winners, Oto Brzobohatý (CZE) and Markéta Zezulová (CZE).

We would like to thank the authors for their excellent contributions which made for an outstanding high-level conference, and members of the Program Committee for their fine effort in preparing the conference technical program, as well as for their opinion concerning the submitted papers. Last but not least, we would like to thank the SPIE staff for their support in preparing these Proceedings.

We expect the Photonics Prague series to continue and we look forward to inviting scientists from all countries to attend next Photonics Prague conference in 2014.

Pavel Tománek
Dagmar Senderáková
Petr Páta

Welcome Address

Prague
August 24, 2011

Ladies and gentlemen, dear participants, dear colleagues,

We welcome you who are coming from countries all over the world to the Seventh International Conference Photonics Prague 2011 (Photonics, Devices, and System V) held 24–26 August 2011 at the Artemis Olympik Hotel Congress Centre in Prague, Czech Republic.

The conference traditionally represents the most important event organized by the Czech and Slovak Society for Photonics every three years. This year, it is organized under the auspice of the Lord Mayor of Prague, and is sponsored by the European Optical Society. We thank all of them for their support.

Photonics is driving innovation in Europe and one of the most important key technologies for markets in the 21st century. Photonics is cross-sectoral technology, which comprises ten sectors in Europe and more than 40 major product segments. Its diverse applications play a vital role in the information society.

Today, lighting, measurement and automated vision, production technology, medical technology and life science, defense photonics, and optical components and systems share more than 10% of the total European production volume, while optical communications, solar energy, information technology, and flat panel displays cover share less than 10%.

European photonics production is now comparable to that of microelectronics in Europe and it is expected to exceed it soon. To reach this result, it is necessary to ensure and strengthen a close cooperation between academia, the research community, and industry. The foremost idea of the organizers was to show the variety of photonic approaches to the current development of the high technology in Europe and worldwide in areas such as information and communication, lighting, manufacturing, security or life science, and health. Furthermore, this year the trend is very important in view of the 8th Framework Programme of European Commission and of further international collaboration.

Therefore a principal task of the photonics conference series in Prague is to create an environment for open exchange of topical research information and to stimulate a discussion of novel concepts and fields of application. This

conference series also represents the important regional forum for advances in nature of physical phenomena used in photonics, instruments and devices development, and a wide range of industrial photonics applications.

The conference program committee has suggested four plenary talks showing the emerging trends in photonics, not only from experimental or technical points of view, but also from its theoretical principles. In the first part, Ivan Glesk gives a talk, Toward green high capacity optical network, and Reinhart Poprawe gives a talk, The physics in applications of ultrafast lasers. In the second part, Ole Keller gives a talk, Light: the physics of the photon, and Jürgen Popp gives a talk, Modern biophotonics: a key enabling technology for biomedical diagnostics.

From the numerous abstracts that have been submitted, eight were selected as invited, 47 for oral presentation, and 45 for poster presentation, which will be presented during the three day meeting. The presentations are thematically distributed over 11 topics.

About 110 scientists from 24 countries are attending the conference. A quick glance at the program shows that most participants are local (Czech and Slovak) or from eastern European countries. A more detailed look reveals the current trends in the research field.

We acknowledge all the contributors for submitting the manuscripts in time and for preparing their oral or poster presentations.

We would like to thank the International Program Committee for their help in the selection of papers and the review procedures, and especially the members of the local organizing committee for their efforts in preparing this conference.

We hope that you will profit not only from the conference technical program and its social events, but also from the beauties of the wonderful city of Prague.

We wish you all an inspiring meeting and we hope you will enjoy it.

Dr. Miroslav Jedlička
President of Czech and Slovak
Society for Photonics

Prof. Dr. Pavel Tománek
Conference Chair

Conference Photos



Miroslav Jedlička (*President of Czech and Slovak Society for Photonics*) is presenting a welcome address,



and the auditory is listening his message.



Ivan Glesk (*Strathclyde University, United Kingdom*) presents @ first plenary talk
Towards green high capacity optical network.



Reinhard Poprawe (*Fraunhofer Institute for Laser Technology, Aachen, Germany*) explaining in the second plenary talk
The physics in applications of ultrafast lasers.



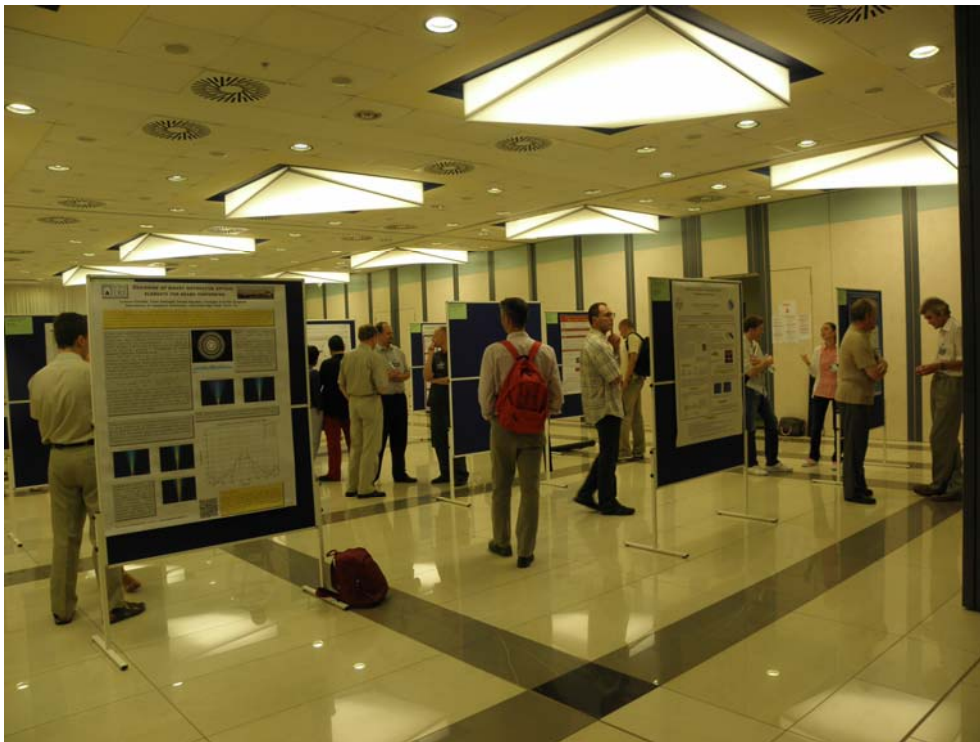
Ole Keller (*Aalborg University, Denmark*) explains what happens if we really want to understand the physics of photons in photonic systems and devices.



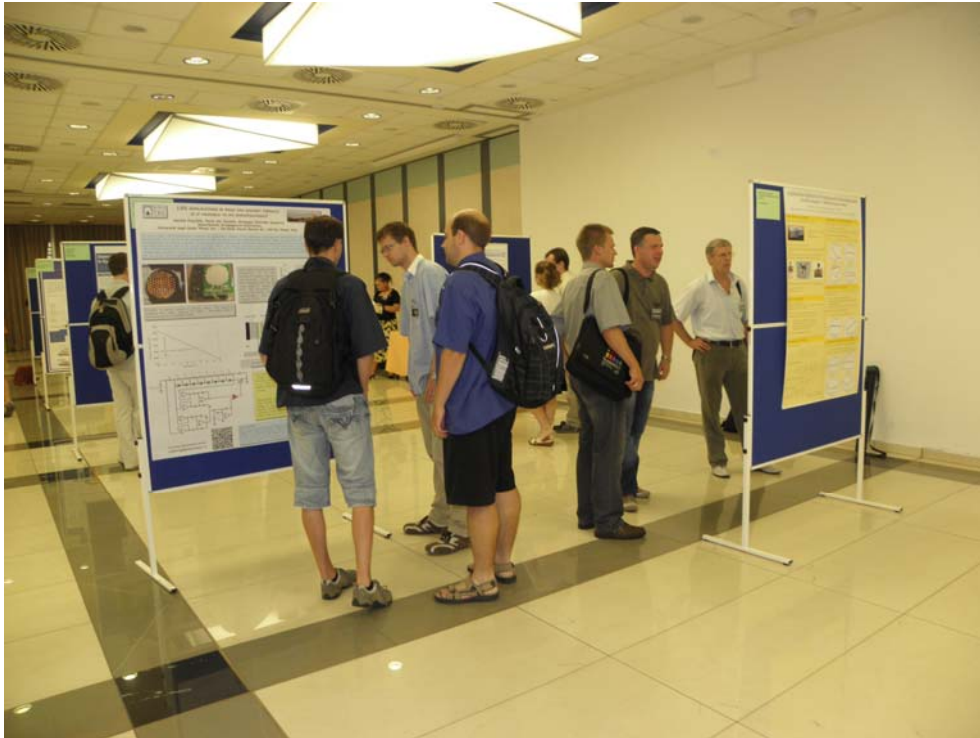
Volker Deckert (*Friedrich Schiller University, Jena, Germany*) shows how interesting “Biophotonics beyond the diffraction limit” ~~is~~.



Timo Voipio (*Aalto University, Finland*) presents his SPIE Best Student paper.



Posters are opened for discussion.



Poster session.



A discussion continues – Zuzana Mrázková (Czech Republic).



Conference , elcome banquet (Wednesday August 24, 2011) in 'esidence of Mayor of Prague.



The participants contemplate the beauty of the Banquet Hall.



Delicious food



and music was here.



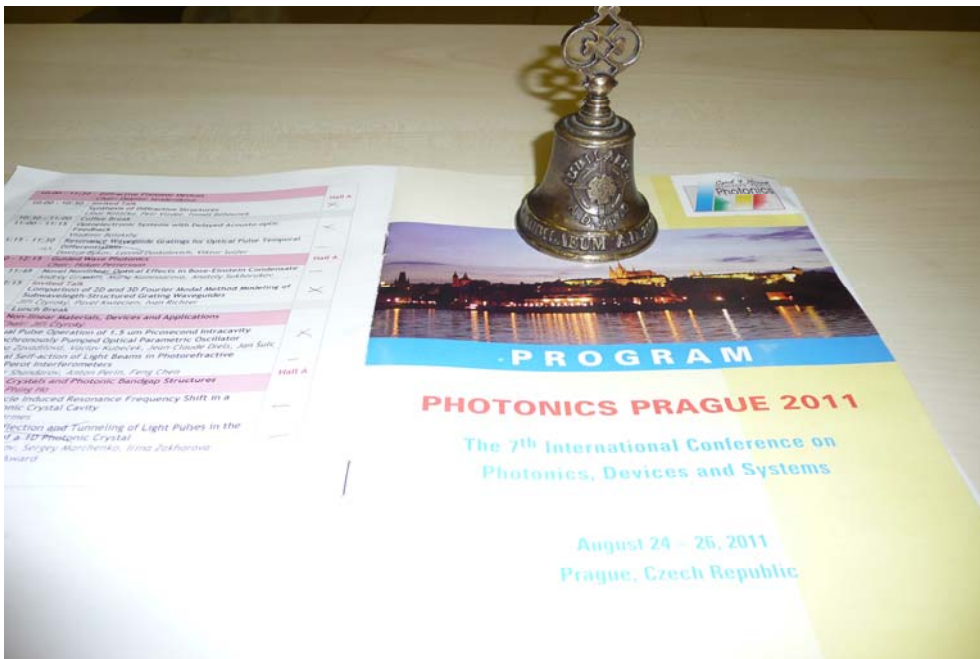
The participants were very satisfied not only with the banquet,



but also with a tour of Prague by night during a hot evening.



Dinara Dallaeva (Russia) looks for the presentation, and session chair Steve Smith (USA) supervises her talk.



The Conference Technical program is almost over, and the conference bell is relaxing before the awards ceremony procedure.

SPIE Best Student Presentation Award Photonics Prague 2011

This year the conference honoured four laureates with SPIE Best Student Presentation Awards.

22 students took part in the competition. The evaluation commission chose four papers, three oral presentations and one poster presentation.



Podium of SPIE Best Student Presentation Award:
Pavel Tománek – conference chair, announcing the results.

From the left to right: **Dann S. Olesen** (Aalborg University, Denmark) – 4th place for his presentation, Theoretical near-field studies of photon emission related to evanescent modes from quantum wells.

Irene Salas-Garcia (University of Cantabria, Santander, Spain) – 3rd place for her presentation, Photosensitizer fluorescence emission during photodynamic therapy applied to dermatological diseases.

Timo Voipio (Aalto University, Finland) – 1st place for his presentation, Partial polarization of pulsed light beams.

Not pictured: **Zdeněk Pilát** (Institute of Scientific Instruments, Czech Academy of Sciences, Brno) – 2nd place for his presentation, Optical micromanipulations and Raman spectroscopy in microfluidic systems for live-cell analysis and sorting.

CSSF Young Scientist Prize 2011

The Czech and Slovak Society for Photonics (CSSF) awarded its prize for best presentation of young Czech and Slovak scientists at the Photonics Prague 2011 conference.

This time there were two coequal prizes:

Oto Brzobohatý, Institute of Scientific Instruments, Academy of Sciences, Brno, for his presentation, Advanced optical manipulation with tailored counter-propagating laser beams, and **Markéta Zezulová**, Faculty of Biomedical Engineering, Czech Technical University in Prague, for her presentation, Study of thin films of LiNbO_3 using FTIR and Raman spectroscopy.



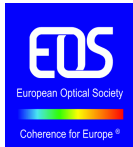
Markéta Zezulová receives her diploma.

Conference Supporters

We wish to thank following organizations for their contribution to the success of the conference.



Photonics Prague 2011 was organized under the auspice of the 1st Deputy Mayor of the City of Prague, Karel Březina.



European Optical Society

Cooperating Organizations:



Local Organizers:

- CSSF—Czech and Slovak Society for Photonics
- Action M Agency

