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Saratov Fall Meeting 2013

Optical Technologies in Biophysics and Medicine XV; and Laser Physics and Photonics XV

Elina A. Genina
Vladimir L. Derbov
Igor Meglinski
Valery V. Tuchin
Editors

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Contents

PHOTODYNAMIC METHODS IN BIOLOGY AND MEDICINE

NANOBIOTECHNOLOGY

NONLINEAR AND COHERENT OPTICS

QUANTUM OPTICS AND ENTANGLED STATES

OPTICAL FIBERS AND PHOTONIC CRYSTALS

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2 Plenary Session II
Martin Wolf, University Hospital Zurich (Switzerland)

3 Plenary Session III
Kirill Larin, University of Houston (United States)

4 Plenary Session Internet Biophotonics
Valery V. Tuchin, N.G. Chernyshevsky Saratov State University (Russian Federation), Institute of Precision Mechanics and Control (Russian Federation), and University of Oulu (Finland)

5 Invited Lecture Session Biophysics I
Alexander V. Priezzhev, Moscow State University (Russian Federation)

6 Oral Session Biophysics II
Sergey N. Vainshtein, University of Oulu (Finland)

7 Oral Session Biophysics III
Igor Meglinski, University of Otago (New Zealand)

8 Oral Session Biophysics IV
Ivan Fedosov, N.G. Chernyshevsky Saratov State University (Russian Federation)

9 Oral Session Laser Physics and Photonics
Vladimir L. Derbov, N.G. Chernyshevsky Saratov State University (Russian Federation)

10 Joint Poster Session and Internet Discussion
Dmitry Agafonov, N.G. Chernyshevsky Saratov State University (Russian Federation)
Ivan V. Fedosov, N.G. Chernyshevsky Saratov State University (Russian Federation)

Introduction

The 1st International Symposium on Optics and Biophotonics (Saratov Fall Meeting (SFM-13)) was held 24–28 September 2013 in Saratov, Russia, with over 500 participants from Russia, USA, Canada, Europe, Africa, Asia, and Pacific Ocean countries. The symposium covered a wide range of modern problems of fundamental and applied optics, laser physics, photonics, and biomedical optics.

In the framework of the Symposium, the following Conferences were organized:

- Optical Technologies in Biophysics and Medicine XV
  Elina A. Genina, Igor Meglinski, and Valery V. Tuchin, Chairs
- Laser Physics and Photonics XV
  Vladimir L. Derbov, Chair
- Spectroscopy and Molecular Modeling XIV
  Valentin I. Berezin, Lev M. Babkov, and Michael D. Elkin, Chairs
- Nanobiophotonics IX
  Nikolai G. Khlebtsov, Chair
- Nonlinear Dynamics and Computational Biophysics IV
  Vadim S. Anishchenko, Chair
- Internet Biophotonics VI
  Alexey N. Bashkatov and Valery V. Tuchin, Chairs
- Microscopic and Low-Coherence Methods in Biomedical and NonBiomedical Applications VI
  Kirill Larin, Chair
- Low-dimensional structures III
  Olga Glukhova, Chair.

The main focus was on the discussion of fundamentals and general approaches of description of coherent, low-coherent, polarized, spatially and temporally modulated light interactions with inhomogeneous absorbing media, photonic crystals, optical biopsy, tissue phantoms, and various types of tissues' properties both in vitro and in vivo. Such effects as static and dynamic light scattering, Doppler, photoacoustic and photothermal interactions, mechanical stress, photodynamic effect, etc. were considered. On this basis, the variety of laser and optical technologies for medical diagnostics, therapy, surgery, and light dosimetry, as well as for spectroscopy of random and ordered media were presented. New fundamental phenomena in quantum optics together with novel laser and fiber optic technologies were presented, as well as photonics of micro- and nanostructures.

SFM-13 was organized as the morning plenary sessions, afternoon lecture and oral sessions, evening poster presentations, and internet discussion. Plenary lectures were presented by leading experts in different fields of science and listened with a great interest and discussed by audience. Original oral reports and posters were

presented by junior scientists under supervising of leaders of well-known scientific groups.

Plenary and Invited lectures, oral and poster presentations covered a wide area of tissue optics, spectroscopy and imaging, controlling of optical properties of tissues, as well as biophysical and photo-chemical aspects of photo and laser therapy.

The traditional specific feature of the Saratov Fall Meetings is the Internet Session and one-day online discussion. In 2013, this session has included two plenary lectures, 10 invited lectures and 27 internet reports.

The abstracts by the participants from USA, Russia, United Kingdom, Germany, Portugal, Finland, Estonia, Israel, New Zealand, etc., located at the meeting website: http://sfm.eventry.org/symposium2013/internet, were available during the meeting and will be available for a whole year until the next meeting.

A great number of the materials presented are the result of collaboration between research groups from different countries supported by international scientific programs such as PHOTONICS4LIFE, TEKES, SCOPUS, Chinese Optical Society, and others.

This volume includes papers presented at the Conferences on Optical Technologies in Biophysics and Medicine XV and Laser Physics and Photonics XV. The editors thank all of the authors for their contributions to SFM-13, especially to internet lecturers for their exciting presentations.

The organizers of SFM-13 are grateful to all the sponsoring organizations and programs that efficiently supported this meeting, especially to: SPIE, The Optical Society (OSA); Russian Foundation for Basic Research; Russian Academy of Sciences; PHOTONICS4LIFE of FP7-ICT-2007-2 (No. 224014, 2008-2013); SPE "Nanostructed Glass Technology" Ltd. (Russia), and Russian Technology Platform “The Medicine of the Future.”

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