PROCEEDINGS OF SPIE

Saratov Fall Meeting 2006

Laser Physics and Photonics, Spectroscopy and Molecular Modeling VII

Vladimir L. Derbov
Leonid A. Melnikov
Lev M. Babkov
Editors

26-29 September 2006
Saratov, Russia

Organized by
Saratov State University (Russia) • Research-Educational Institute of Optics and Biophotonics at SSU (Russia) Institute of Precision Mechanics and Control, RAS (Russia) • Research-Educational Center on Nonlinear Dynamics and Biophysics of CRDF and Ministry of Education and Science RF (REC-006) (Russia) • Volga Region Center of New Information Technologies (Russia) • Saratov Railway Clinic Hospital (Russia)

In Cooperation with
Russian Academy of Natural Sciences, Saratov Regional Division • Russian Society for Photobiology • Saratov Science Center of the Russian Academy of Sciences

Sponsored by
Russian Foundation for Basic Research • U.S. Civilian Research and Development Foundation for the Independent States of the Former Soviet Union (CRDF) (Russia) • SPIE Russia Chapter • Saratov State University SPIE Student Chapter (Russia) • Russian Academy of Science • British Degrees in Russia Program, British Council (Russia) • Almus Ltd. (Russia)

Published by
SPIE—The International Society for Optical Engineering

Volume 6537

The International Society for Optical Engineering

Proceedings of SPIE, 0277-786X, v. 6537

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:
Author(s), "Title of Paper," in *Saratov Fall Meeting 2006: Laser Physics and Photonics, Spectroscopy and Molecular Modeling VII*, edited by Vladimir L. Derbov, Leonid A. Melnikov, Lev M. Babkov, Proceedings of SPIE Vol. 6537 (SPIE, Bellingham, WA, 2007) Article CID Number.

ISSN 0277-786X
ISBN 9780819466594

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

Publication of record for individual papers is online in the SPIE Digital Library.

SPIEDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B … 0Z, followed by 10-1Z, 20-2Z, etc.

The CID number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

SPECTROSCOPY AND MOLECULAR MODELING

ADDITIONAL PAPER FROM SESSION 2: MATTER IN STRONG ELECTROMAGNETIC FIELDS

Conference Workshop Committee

Workshop Chairs

Leonid A. Melnikov, Saratov State University (Russia)
Vladimir L. Derbov, Saratov State University (Russia)

Secretary

Andrey I. Konukhov, Saratov State University (Russia)

International Program Committee Chair

Vladimir L. Derbov, Saratov State University (Russia)

International Program Committee

Alexander P. Kuznetsov, Institute of Radio-Engineering (Russia)
Leonid A. Melnikov, Saratov State University (Russia)
Marian Marciniak, National Institute of Telecommunications (Poland)
Alexander P. Nizovtsev, Institute of Physics (Belarus)
William A. Beck, MicroSound Systems (USA)
Aleksey M. Zheltikov, Lomonosov Moscow State University (Russia)
Vladimir P. Ryabukho, Saratov State University (Russia)
Alexander V. Gorokhov, Samara State University (Russia)
Yuri V. Popov, Lomonosov Moscow State University (Russia)
Bogos B. Joulakian, University of Metz (France)
Sergue I. Vinitsky, Joint Institute for Nuclear Research (Russia)

Introduction

This SPIE proceedings volume contains original contributions presented at the Workshops on Laser Physics and Photonics VIII, Spectroscopy and Molecular Modeling VII in the framework of International School for Young Scientists and Students on Optics, Laser Physics, and Biophysics at the Saratov Fall Meeting 2006. The Workshop and School were held in Saratov, Russia, in September 2006. The main topics of the Workshop and School included wide spectrum of the modern problems of fundamental and applied optics and photonics, including frontier research in laser physics, electrodynamics, photonic crystals, nonlinear optics, spectroscopy, and quantum optics.

Many of presented and discussed materials were the result of international collaboration between Russian universities, particularly Saratov State University, in with international programs such as INTAS, and others, as well as direct scientific and educational contacts with U.S., European, and Asian universities. The meeting featured the participation of many young scientists and students from Saratov State University, Saratov State Technical University, Moscow State University, and other Russian universities and institutions of the Russian Academy of Science.

These Proceedings include selected oral and poster presentations, divided into the following subsections:

- Nonlinear Optics
- Matter in Strong Electromagnetic Fields
- Optical Microstructured Fibers and Band-Gap Structures
- Electrodynamics of Laser Optical Systems
- Quantum Optics
- Spectroscopy and Molecular Modeling

Scientific collaboration is not possible without efficient communication. English has now become an international scientific language. That is why a special session devoted to English as a communicative tool in the scientific community was included into the program of the meeting. A selected talk delivered at this session is presented in the last section of this volume.

We hope that this volume will contribute to the development of optical technologies and that it will be useful for scientists, engineers, and students.

We would like to thank all authors for their contributions to this volume. We are grateful to all of the sponsoring organizations and foundations that supported this meeting very effectively, especially to the Nonlinear Dynamics and Biophysics Research and Educational Center of Saratov State University, and SPIE Russia Chapter. We also would like to thank all the organizers of the meeting.

Leonid A. Melnikov
Vladimir L. Derbov
Lev M. Babkov