Saratov State University
Research-Educational Institute of Optics & Biophotonics

INTERNATIONAL YEAR OF LIGHT 2015

Saratov Fall Meeting
SFM'15

XIX International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

September 21 - 25, 2015
Saratov, Russia

School Chair
Valery V. Tuchin, Saratov State University, Institute of Precision Mechanics and Control RAS, Russia

School Secretaries
Elena K. Volkova, Saratov State University

Irina Yu. Yanina, Saratov State Medical University

Short Course Program

SPIE SC:
Quantitative phase imaging and wavefront shaping techniques
YongKeun (Paul) Park
Department of Physics, KAIST, South Korea

OSA SC:
Medical Raman Spectroscopy
Juergen Popp
Institute of Photonic Technology, Jena, Germany

Foundation “Dynasty” SC:
Structural and Functional Imaging of Tissues and Cells with Optical Coherence Tomography
Kirill V. Larin
University of Houston, USA

Workshops:

- Modern Optics XIV (V.P. Ryabukho)
- Workshop on Management of High Technologies Commercialization and Regional Innovation Systems XII (J.S. Skibina, V.V. Tuchin)

- English as a Communicative Tool in the Scientific Community XIV (A.B. Pravdin, S.V. Eremina)
- History, Methodology and Philosophy of the Optical Education VIII (B.A. Medvedev)
- Telemedicine X (Elena V. Karchenova, Valery V. Bakutkin)

Co-located with:

International Symposium on Optics and Biophotonics III (Saratov Fall Meeting SFM’15 – Symposium, September 22 - 25, 2015)

The 7th Finnish-Russian Photonics and Laser Symposium PALS’15 (September 22 - 25, 2015)
http://optics.sgu.ru/pals15/

Special events:

Special session on student reports awarded by the Russian Foundation on Innovations U.M.N.I.K. in Optics, Laser Physics, and Biophotonics
Plenary speakers 2015

Polarized Light in Biophotonics
Igor V. Meglinski, University of Oulu, Finland

Wavefront imaging and shaping techniques for biomedicine & nanotechnology
YongKeun (Paul) Park, Department of Physics, KAIST, South Korea

Internet plenary speakers
Quantitative phase imaging for basic and clinical biomedical applications
Gabriel Popescu, University of Illinois, Urbana-Champaign, Illinois, USA

Digital holography of living cells
Juergen Schnekenburger, Biomedical Technology Center of the Medical Faculty Münster, Medical Clinic of Internal Medicine B: Gastroenterology and Metabolic Disorders Münster, Germany (to be confirmed)

Organized by
N.G. Chernyshevsky Saratov State University
Research-Educational Institute of Optics and Biophotonics, Saratov State University

In cooperation with
Academy of Natural Sciences, Saratov Regional Division
Russian Society for Photobiology

Co-sponsored by
RFBR – Russian Foundation for Basic Research
RAS – Russian Academy of Sciences
SPIE – The International Society of Photo-Optical Instrumentation Engineers
OSA – Optical Society of America
IEEE - Institute of Electrical and Electronics Engineers
LLC SPE Nanostructed Glass Technology, Saratov

Russian Technology Platform “The Medicine of the Future”
Russian Technology Platform “Photonics”

Government of the Russian Federation (grant №14.Z50.31.0004 to support scientific research projects implemented under the supervision of leading scientists at Russian institutions and Russian institutions of higher education)
**Program Committee**

Valery V. Bakutkin, Saratov Research Institute of Hygiene  
Alexey N. Bashkatov, Saratov State University  
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Vladimir L. Derbov, Saratov State University  
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Elena V. Karchenova, ISfTeH and Clinic of Doctor Paramonov  
Kirill V. Larin, University of Houston, USA; Saratov State University  
Martin Leahy, National University of Ireland, Galway, Ireland  
Boris A. Medvedev, Saratov State University  
Igor V. Me glinski, University of Oulu, Finland; University of Otago, New Zealand; Saratov State University  
Risto Myllyla, University of Oulu, Finland  
Juergen Popp, Institute of Photonic Technology, Jena, Germany  
Alexander B. Pravdin, Saratov State University  
Vladimir P. Ryabukho, Saratov State University, Institute of Precision Mechanics and Control RAS  
Julia S. Skibina, Saratov State University, SPE “Nanostructured Glass Technology” Ltd.  
Valery V. Tuchin, Saratov State University, Institute of Precision Mechanics and Control RAS, Russia; University of Oulu, Finland  
Martin Wolf, University Hospital Zurich, Switzerland  

**Organizing Committee**

**Chair**  
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Saratov State University  

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**Co-chairs**

Dmitry N. Agafonov, Saratov State University  
Ivan V. Fedosov, Saratov State University  

**Members**

Mikhail M. Stolnitz, Saratov State University  

**The main goal** of the School is to involve junior researchers and students in the field of recent developments and applications of laser and optical technologies in medicine and biology, coherent optics of random and ordered media, material and environmental sciences, nonlinear dynamics of laser systems, laser spectroscopy and molecular modeling, nanophotonics and nanobiophotonics. The main attention will be paid to discussion of fundamentals and general approaches of description of coherent, low-coherent, polarized, spatially and temporally modulated light interactions with inhomogeneous scattering media,
photonic crystals, nanoparticles, tissue phantoms, and various types of tissues in vitro and in vivo. Such effects as static and dynamic light scattering, Doppler effect, Raman scattering, SERS, CARS, optoacoustic and optothermal interactions, mechanical stress, photodynamic effect, etc. will be 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 tissue media will be presented.

SFM-15 will be organized as the Short Courses, morning plenary sessions, afternoon lecture and oral sessions, and evening poster presentations. The original oral reports and posters will be presented by the junior scientists and students. Plenary lectures will be presented by well-recognized experts in the field.

**Last year short courses**

**OSA SC:**
Towards deep tissue luminescence imaging using upconverting nanoparticles
**Stefan Andersson-Engels**, Lund University, Sweden

**SPIE SC:**
Skin spectra and colour calculator: online object oriented GPU accelerated Monte Carlo tool

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**Igor V. Meglinski**, University of Otago, New Zealand, Saratov State University, Russia

Foundation “Dynasty” Short Course:
The spectroscopy, surface modification and bio/medical applications of nanodiamond
**Chia-Liang Cheng**, National Dong Hwa University, Taiwan

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**Last year plenary speakers**

Prospective Studies to Determine the Carotenoid Status in Human Skin
**Jürgen Lademann**, Center of Experimental and Applied Cutaneous Physiology at the Charite Univ. Clinic, Berlin, Germany

Recent Developments on Nanodiamond for Bio/medical applications
**Chia-Liang Cheng**, National Dong Hwa University, Taiwan

Deep tissue imaging using Nd-codoped upconverting nanoparticles and pulsed excitation
**Stefan Andersson-Engels**, Lund University, Sweden

Optical Coherence Elastography — methods and applications
**Kirill V. Larin**, University of Houston, USA, Saratov State University

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Polarized light propagation in turbid media
**Igor V. Meglinski**, University of Otago, New Zealand, Saratov State University

Structural and functional imaging with a microscope-in-a-needle for medicine and biology
**David D. Sampson**, Optical + Biomedical Engineering Laboratory, School of Electrical, Electronic, and Computer Engineering, Centre for Microscopy, Characterization and Analysis, University of Western Australia (IEEE lecturer)

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**Last year internet plenary speakers**

Chromophore based analyses of steady-state diffuse reflectance spectroscopy: current status and perspectives for clinical adoption
**Henricus J. C. M. Sterenborg**, Department of Biomedical Engineering and Physics, Academic Medical Center – Amsterdam, The Netherlands

Multiphoton tomography of human skin
**Karsten König**, JenLab GmbH, Jena, Department of Biophotonics and Laser Technology, Saarland University, Saarbrücken, Germany

ED-e-TEL: Perspectives
**Malina Jordanova**, MD, PhD. Solar-Terrestrial Influences Laboratory,
Bulgaria Academy of Sciences, Bulgaria

Participants from Australia, Bulgaria, Belarus, Belgium, Canada, China, Denmark, Finland, Germany, India, Iran, Ireland, Italy, New Zealand, Latvia, Russia, Slovakia, Portugal, Singapore, Switzerland, Turkey, UK, USA, Uzbekistan have located their papers at the meeting website: http://sfm.eventry.org/symposium2014/ internet

Among invited Internet lecturers were well recognized experts in the fields of biomedical optics and light scattering.

Official languages of the School and the Workshops are English and Russian, translation will be provided.

The Conference fee

For foreign participants the conference fee is $ 200 (includes Program, three short-courses, Welcome Party, Barbecue, Volga-river voyage, and light refreshments), may be paid during the Meeting or transferred to the account number for request.

For Russian participants the Conference fee will depend on financial support from the Russian Foundation of Basic Research and other sponsoring organizations.

Lodging

Hotel “Slovakia” ashore the Volga river
http://slovakia.all-hotels.ru/
Hotel “Volga” in the downtown
Western style mini-hotel Bohemia in the downtown
http://www.bohemiahotel.ru
mail@bohemiahotel.ru
Student hostel “Volna” ashore the Volga river
Student hostel of SSU

Culture program

Visits to Conservatoire, Theaters, and Museums, 4-hour Volga-tour.

Registration


Submission of Abstracts


Proceedings

Conference papers will be published as Conference Proceedings (in Russian and English) under the title “Optical Physics and Biophotonics” and in Russian and International peer-reviewed journals: Journal of Biomedical Photonics & Engineering, J. of Innovative Optical Health Sciences, Quantum Electronics (Russian/English), and Optics and Spectroscopy (Russian/English).

All papers will be subjected to the normal refereeing process for the journals. Manuscripts of papers should be submitted not later than October 15, 2015.

Visa application support

To apply for visa to Russian Consulate you need an official invitation letter. Procedure for letter preparation takes two months; the following information about you and accompany persons is needed:

1. Passport (valid up to six months after September 26, 2015) number:_______ dates of issue:___ and of expiry:______ (copy of passport page with photo)
2. Date of birth:___, place of birth:____
3. Living address:__________________
4. Working position:________________
5. Working address:________________
Please, send this information to general secretary of the SFM-15
Elina A. Genina: eagenina@yandex.ru

Important deadlines

**Visa application support** – information for official invitation letter, before May 31, 2015
**Submission of Abstracts** – before August 15, 2015
**Registration** – before August 15, 2015
**Hotel reservation** – before August 15, 2015
**Conference fee** – before September 21, 2015
**Manuscripts submission** – before October 15, 2015

SFM-15 webpage:
http://sfm.eventry.org/2015/

On behalf of the Organizing Committee of SFM’15- School I have a pleasure in inviting you to attend this Meeting

Valery V. Tuchin

**Organized by**
- N.G. Chernyshevsky Saratov State University
- Research-Educational Institute of Optics and Biophotonics at Saratov State University
- Research-Educational Center of Nonlinear Dynamics & Biophysics (REC-006) of CRDF
- Institute of Precision Mechanics and Control, Russian Academy of Sciences
- Saratov Physics and Technical Lyceum

**Workshop program**

The program of the seminar "Modern Optics" consists of lectures and demonstration parts and seminars on selected topics. One lecture day with thematic sections supposed to hold the afternoon. Section sessions supposed to hold for 3-4 favorites, the most interesting topics for teachers, which posts students and pupils on the results of independent work is supposed to hear and discuss also.
This course aims to help researchers join the exciting and quickly emerging field of QPI. We will explain the basic principles and applications of QPI. In the first part of the course – Methods – we will cover the main approaches to QPI, including phase-shifting, off-axis, common-path, and white-light methods, together with their figures of merit. A practical guide to designing and implementing instrumentations for QPI, along with image processing techniques will be presented. The second part of the course – Applications – will review recent advances in the biomedical applications of QPI. We will cover basic applications published in the recent literature on cell structure, dynamics and light scattering, as well as clinical applications such as blood testing and tissue diagnosis.

LEARNING OBJECTIVES
This course will enable you to:

- Identify and describe the pros and cons of various QPI experimental geometries
- Write down the interference and phase retrieval equations for phase shifting and off-axis methods
- Discriminate between the spatial and temporal phase noise in QPI
- Explain the relationship between QPI and angular light scattering
- Compute tomographic reconstructions under the Born approximation using QPI data
- Summarize the applications of quantitative phase imaging to biomedicine
- Estimate cell dry mass, red blood cell volume, angular scattering map, etc., from QPI data

INTENDED AUDIENCE
Scientists and engineers who wish to broaden their research portfolio by exploring the possibilities in the field of quantitative phase imaging. Undergraduate training in optics or equivalent is assumed.

COURSE LEVEL
Introductory

COURSE LENGTH
Half-day

INSTRUCTOR
YongKeun (Paul) Park is Associate Professor of Physics at Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea. He earned a Ph.D. in Medical Science and Medical Engineering from Harvard-MIT Health Science and Technology. He has been working on QPI techniques and their applications for the study of pathophysiology of cells and tissues. Dr. Park is a Senior Member of SPIE and Editorial Board Member of Scientific Reports (Nature Publishing Group) and Journal of Optical Society of Korean. To learn more about Prof. Park’s research projects, visit his website: http://bmol.kaist.ac.kr
Foundation “Dynasty”
Short Course:
Structural and Functional Imaging of Tissues and Cells with Optical Coherence Tomography

Kirill V. Larin, Ph.D.

Department of Biomedical Engineering, University of Houston
Department of Physiology and Biophysics, Baylor College of Medicine, Houston, TX, USA
klarin@uh.edu

Tutorial Description

This tutorial will overview recent advances in development and application of optical imaging techniques for structural and functional imaging and sensing of various transport, developmental, and disease progression in tissues and cells. This tutorial will start with basic description of light-tissue interaction including structural and optical models of tissues with single and multiple scattering. Intensity- and spatially modulated, coherent and polarized light interactions with random and quasi-organized tissues will be considered. It will be shown that light reflection, transmission, scattering, and state of polarization can be effectively controlled by changes of tissue structure and the refractive index of tissue components. Special emphasis will be devoted to theory and applications of novel imaging/sensing modality – Optical coherence Tomography (OCT). Many examples of OCT noninvasive sensing will be provided such as cardiovascular imaging, ophthalmic applications, monitoring of drug diffusion and optical clearing, sensing and quantifying of microbubbles and nanoparticles in tissues and blood, imaging of early embryonic cardiovascular system development, and, the newest hot topic, assessing biomechanical properties of tissues.

Intended Audience

Engineers, scientists and physicians who are interested in learning optical imaging and spectroscopy, laser methods, OCT instruments design, and application for biomedical science and clinics will find this course useful.

University education on the level of MS in engineering, physics, biophysics or medicine is required. Some basic prior knowledge of optics, statistics, histology and cell biology is desirable but not required.

Speaker:

Kirill V. Larin is an Associate Professor of Biomedical Engineering at the University of Houston. He also holds joint appointments at the Department of Physiology and Biophysics at Baylor College of Medicine and Department of Optics and Biophysics at the Saratov State University (Russia). Larin received his first M.S. in Laser Physics and Mathematics from the Saratov State University (1995), his second M.S. in Cellular Physiology and Molecular Biophysics (2001) and Ph.D. in Cellular Physiology and Molecular Biophysics (2001) and Ph.D. in Biomedical Engineering (2002) from the University of Texas Medical Branch in Galveston. Dr. Larin’s research contributions are in Biomedical Optics and Biophotonics and development and application of various optical methods for noninvasive and nondestructive imaging and diagnostics of tissues and cells (more information could be found on his lab webpage http://bol.egr.uh.edu). He has authored more than 80 peer-reviewed publications and chapters in six books on Biomedical Optics. Dr. Larin has received numerous awards including...
Presidential Award from Russian President Boris Yeltsin, Wallace Coulter Young Investigator Translation Award, Office of Naval Research Young Investigator Award, Outstanding Young Investigator Award from the Houston Society for Engineers in Medicine and Biology, Herbert Allen Award from American Society for Mechanical Engineers, and UH Research Excellence Award. Dr. Larin has delivered more than 50 invited and plenary talks, serves as a chair of Dynamics and Fluctuations in Biomedical Photonics and Optical Elastography conferences and a member of number technical committees at professional conferences. He is SPIE Fellow since 2015. Dr. Larin is also an Instructor for short courses on Tissue Optics and Biophotonics for the SPIE, IEEE, and OSA.
This course aims at introducing the basics of linear and non-linear Raman spectroscopy for medical diagnosis. Raman spectroscopy is an especially efficient analytical method since it probes molecular vibrations distinct for each type of molecule. A Raman spectrum can be seen as a characteristic “molecular fingerprint” of every sample. The ability to obtain specific chemical information label-free makes Raman spectroscopy attractive for many clinical investigations of bodily fluids, pathogens, cells, and tissue biopsies. Within this course we will focus on implementing various Raman approaches for sepsis and cancer, as these types of diseases harbor unmet needs regarding diagnosis and therapy. In the field of sepsis, the fast identification of pathogens, their resistances and the specific host is crucial for choosing the appropriate initial antibiotic therapy to save lives in intensive care units. It will be shown that Raman hold great promise as point-of-care approaches to address these challenging tasks. In the course we will present innovative chip-based bacterial isolation strategies out of complex sample matrices (e.g. blood or urine). The second part of this course focuses on Raman studies on eukaryotic cells for biomedical applications. In this context we will report about the great potential of Raman spectroscopy for a label-free discrimination between normal and (circulating) tumor cells by coupling Raman spectroscopy with microfluidics and micromanipulation approaches. Besides single cells, whole tissue sections like biopsy specimens can be characterized by means of Raman-microspectroscopy enabling an objective evaluation of the tissue samples for an early diagnosis of cancer (= spectral histopathology). Raman spectroscopy as an emerging biomedical tool in recent years is based on steady improvements in instrumentation for excitation and collection, and in particular on the availability of fiber optic probes. The potential to couple the Raman system via optical fibers to the point of measurements has enabled within the last years besides ex-vivo Raman studies on excised tissue also in-vivo Raman studies, i.e. Raman endospectroscopy. Within this course the latest developments and applications of novel Raman fiber probes for in-vivo tissue screening to reliably diagnose and screen cancer and other diseases in internal organs like e.g. colon, stomach or aorta are introduced. The course closes with an introduction into non-linear Raman phenomena like CARS = coherent anti-Stokes Raman scattering or SRS = stimulated Raman scattering. While the advantage of Raman spectroscopy are its unprecedented high specificity it suffers from its poor sensitivity. This disadvantage can be overcome by utilizing non-linear Raman phenomena. However, these methods as standalone techniques are typically highlighting a particular detail of e.g. pathological alterations in tissues and cells. In order to improve the diagnostic result a meaningful combination of different...
contrast mechanism in a multimodal approach in one microscopic setting has been proven to be extremely beneficial for biomedical imaging. Here we demonstrate how the combination of CARS, second harmonic generation (SHG), and two-photon excited auto fluorescence (TPEF) to a multi modal imaging approach allows one to characterize architecture and biochemical composition, i.e., the morpho-chemistry of frozen section biopsy specimens from a broad range of different tissues and pathologies for biomedical diagnosis.

**LEARNING OBJECTIVES**

This course will enable you to:

- understand the basic principle of linear and non-linear Raman spectroscopic techniques for tissue- and cell diagnostics.
- learn how the Raman spectral signatures of cells and tissue can be translated into diagnostic markers by means of statistical data evaluation procedures (chemometrics) or advanced image processing algorithms;
- better grasp some unmet medical needs which can be addressed by Raman-spectroscopic diagnostics. Examples in infectiology, oncology and pathology will be provided
- get a feeling about the advantages and limitations of the various Raman-based approaches for medical diagnosis.
- understand the great potential of medical Raman spectroscopy to complement established clinical diagnostic tools.

**INTENDED AUDIENCE**

Physicists, engineers, biomedical scientists and clinicians who are interested in Raman-spectroscopic techniques will benefit from this course.

**COURSE LEVEL**

Intermediate

**COURSE LENGTH**

Half-day

**INSTRUCTOR**

Juergen Popp studied chemistry at the universities of Erlangen and Wuerzburg, Germany. After his PhD in Physical Chemistry, he joined Yale University for postdoctoral work. He subsequently returned to Wuerzburg University where he finished his habilitation in 2002. Since 2002, he holds a chair for Physical Chemistry at the Friedrich-Schiller University Jena. Furthermore, he is the Scientific Director of the Leibniz Institute of Photonic Technology, Jena, since 2006. His core research focus is biophotonics, i.e. the development and application of frequency-, time- and spatially resolved innovative laser micro spectroscopical methods and techniques for biomedical diagnostics as well as environmental and food analysis. Corner stones are the development and application of linear and non-linear Raman-technologies with particular focus on clinical diagnosis. In this context, Raman methods are utilized and developed according to the needs of pathology, oncology, and infection/ sepsis. He has published more than 540 journal papers and has been named as an inventor on 12 patents in the field of spectroscopic instrumentation. He is founding editor and Editor-in-Chief of the Journal of Biophotonics. In 2012, he received an honorary doctoral degree from Babeş-Bolyai University in Cluj-Napoca, Romania. Professor Jürgen Popp is the recipient of the 2013 Robert Kellner Lecture Award. Prof. Popp has been an Organizer of several international conferences including the world largest Raman conference “The International Conference of Raman Spectroscopy (ICORS)” in 2014.
Workshop: 
Modern Optics XIV
Lectures on Optics for 
University Students, 
Postgraduate Students and 
High School Students

Chair
Vladimir P. Ryabukho, Saratov State University and Institute of Precision Mechanics and Control RAS (Russia)

Secretaries
Ol’ga A. Perepelitsina, Il’ya Smirnov Saratov State University (Russia)

Program Committee:
Vladimir L. Derbov, Saratov State University (Russia)

Boris B. Gorbatenko, Saratov State Technical University (Russia)

Ivan V. Fedosov, Saratov State University (Russia)

Boris A. Medvedev, Saratov State University (Russia)

Leonid A. Melnikov, Saratov State Technical University (Russia)

Alexander B. Pravdin, Saratov State University (Russia)

Lyudmila V. Pravdina, Saratov Physics and Technical Lyceum (Russia)

Alexander V. Priezzhev, Moscow State University (Russia)

Vladimir P. Ryabukho, Saratov State University (Russia)

Mikhail A. Starshov, Saratov State University (Russia)

Valery V. Tuchin, Saratov State University (Russia)

The main goal of the Workshop is promotion of school and high school youth achievements in optics - a thriving direction in physics.

One of the leading scientific schools of optics in Russia, which is a recognized authority in other countries formed in Saratov to date. Conferences, seminars and scientific schools are one of the effective ways to attract talented young people to scientific work, particularly in the area of optical research. Widening the circle of young people, the inclusion of students in high schools and colleges, including the physical, technical and other natural sciences field are one of the main tasks of scientific-methodical workshop on "Modern Optics".

Valery V. Tuchin, Saratov State University (Russia)
Workshop:
Management of High Technologies
Commercialization and Regional Innovation Systems XII

Chairs
Julia S. Skibina,
Saratov State University, LLC SPE
“Nanostructed Glass Technology”

Valery V. Tuchin,
Saratov State University, Institute of Precision Mechanics and Control RAS,
Russia; University of Oulu, Finland

Secretary
Anastasiya A. Zanishevskaya,
Saratov State University, LLC SPE
“Nanostructed Glass Technology”

International Program Committee
Gregory B. Altshuler,
IPG Inc., USA

Robert Breault,
Breault Research Organization, Arizona

Optics Industry Association, USA
Leonid E. Dolotov, Saratov State University
Yury V. Kistenev, Russian Technology Platform “The Medicine of the Future”
Boris Reznik, BioRASI, Inc., USA
Natalya V. Romanova, Saratov State University
Sergey N. Sokolov, OJSC “RME “INJECT”, Saratov, Russia
Stoyan Tanev,
University of Southern Denmark,
Denmark
Andreas Thoss, THOSS Media GmbH, Berlin, Germany

The workshop program will include the following topics:

- High technology commercialization, innovation management, high technologies and business, technologies of opening of the innovative companies, innovative business, transfer of technologies, financing of innovative activity, management of innovation risks, venture financing, education in the field of management in biophotonics and biotechnologies

- Development and monitoring of branch "road maps" as the basis for planning of regional branch clusters and innovation zones

- Actual priorities of the regional innovation policy

- Experience of IP commercialization and actual problems of Academy of Sciences, high schools, chambers of commerce and regional industrial company interaction

- Special sessions on student presentations of new projects to be awarded and reports awarded by the Russian Foundation on Innovations U.M.N.I.K. in Optics, Laser Physics, and Biophotonics
The main goal of the Workshop is to introduce young researchers and students to the international community of scientists dealing with development and application of laser and optical technologies in medicine and biology. Joining this fast-developing field of research is impossible without active English, the language that has become an international communicative tool of modern science. The communicative problem that most of the beginner scientists face is well expressed in the maxim “If you want your voice to be heard in the present-day world, it should sound in English”

Most of the modern publications necessary for the work of a graduate student, postgraduate or young scientists is in English. Therefore, the skill of scanning large amounts of English text with selecting informationally valuable fragments will be one of the leading topics of the sessions and round-table discussions. The level of discussions will be intended for graduate students.

The main attention will be paid to training the active English as an international communicative tool without which it is impossible to present one’s own research results to the scientific community. Traditionally in Russia the language education of specialists in natural sciences was oriented at passive English. We believe that introducing the students and young researchers to the technology of scientific presentations and Internet sites, to the style and grammar peculiarities of a scientific article, etc., will stimulate the progress in their language education and help to overcome the psychological barrier impeding the active use of English.

The Workshop will include lecture sessions with oral presentations. The subjects touched upon during these sessions will be extended and developed in round-table discussions.

We expect active participation of the leading English instructors of Saratov State University, including those working within the framework of REC006 Project, the School professors that have considerable experience in English scientific presentations, the members of Editorial Boards and referees of international journals. At least 3-4 foreign scientists including those from English-speaking countries are supposed to take part in the Workshop.

In the framework of the Workshop an Internet session will be organized in which the participants will be introduced to the facilities of remote language
acquisition and consult with instructors.

**Topics**

The education program will include but is not restricted to the following topic areas:

- The style of a modern scientific publication
- Cursory reading as a means to extract maximal information basing on minimal vocabulary
- Submitting a paper to an International Journal: language requirements
- Russian-English terminology system in biomedical optics
Workshop:
History, methodology and philosophy of the optical education VIII

Chairs:
Boris A. Medvedev, Saratov State University

Secretary:
Alexander A. Skaptsov, Saratov State University

International Program Committee
Vladimir L. Derbov, Saratov State University
Boris A. Medvedev, Saratov State University
Alexander V. Priezzhev, M.V. Lomonosov Moscow State University
Vladimir P. Ryabukho, Saratov State University
Alexander V. Gorokhov, Samara State University
Valery V. Tuchin, Saratov State University
Alex Vitkin, University of Toronto, Canada

The goals of the Workshop are the development of the optical education, the actualization of the interdisciplinary investigation using optical conceptions and tools, the expansion of European educational field of optical physics and biophysics and the increase of creative resources and potential of bachelor, master’s degree, post-graduate training in Optics and Biophotonics.

Topics
There are three main discussing topics.

History of discoveries in optics:
- Founders of optical physics
- History of optical scientific schools
- Optical discoveries on chronicles of the world culture
- Historical aspects of optical investigations for life science

Methodology problems of the optical education:
- Lecture demonstrations of optics
- University optical training
- Methodology of teaching optics in the general course of physics at a natural-science department
- Principles of optical mathematical simulation

Teaching optics in the light of the interdisciplinary education and scientific knowledge integration:
- Problems of teaching optics at medical colleges and universities
- Optical physics in the course “The modern natural scientific conception” at humanitarian departments
- Minimum program of biology, biophysics, biochemistry, and biomedicine for student specialized in optics
Workshop:

Telemedicine:
Opportunities,
Applications, Prospects X

Chairs:

Elena V. Karchenova, ISfTeH and Clinic of Doctor Paramonov, Saratov

Valery V. Bakutkin, Saratov Research Institute of Hygiene

Program Committee

Frank Lievens, ISfTeH, Belgium

Malina Jordanova, MD, PhD. Solar-Terrestrial Influences Laboratory. Bulgarian Academy of Sciences, Bulgaria

Anton V. Vladzimirsky, President of AfUTeHD, Ukraine

Oleg V. Kasimov, Saratov Railway Clinic

Valery V. Tuchin, Saratov State University

Topics

The workshop program will include but is not restricted to the following topics:

- consulting services
- diagnostic/monitoring systems and devices
- electronic health cards
- electronic medical records
- home monitoring services and equipment
- hospital information systems
- imaging/PACS
- internet/intranet services
- satellite communication
- secure data transmission
- surgical systems
- systems integration
- telecommunication services
- telemedicine equipment
- videoconferencing
- vital signs monitoring
- wireless data communication

In a professional and business-minded environment, Telemedicine III brings manufacturers and suppliers together with a qualified and international audience of healthcare service providers and other key contacts such as:

- consultants
- distributors and agents
- educators and researchers
- government representatives
- homecare service

- hospital buyers, administrators and department heads
- insurers
- international organizations and association executives
- physicians and nurses
- for the purpose of establishing new trade contacts and developing existing relationships

The event also features many educational opportunities through its extensive program of presentations, panel discussions and satellite conferences on topics such as:

- bio-informatics
- broadband and wireless networks
- business models
- cost-benefit studies
- current ehealth realizations and projects
- developing countries and ehealth
- distance education
- ehealth integration into routine medical practice
- electronic medical records
- home monitoring and homecare applications
- legal and ethical aspects
- reimbursement issues
- satellites and ehealth
- standardization and interconnectivity
- telemedicine applications and projects