# Saratov Fall Meeting - SFM'11

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

**September 27 – 30, 2011**
**Saratov, Russia**

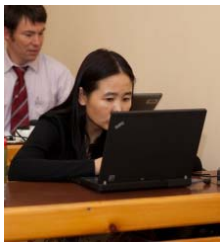
# SCIENTIFIC PROGRAM

## WORKSHOPS:

**Optical Technologies in Biophysics & Medicine XIII**

**Laser Physics and Photonics XIII**

**Spectroscopy and Molecular Modeling XII**



**Modern Optics X**

**English as a Communicative Tool in the Scientific Community X**

**Nanobiophotonics VII**

**Management of High Technologies Commercialization and Regional Innovation Systems VIII**

**History, Methodology and Philosophy of the Optical Education IV**

**Nonlinear Dynamics II**

**Microscopic and Low-Coherence Methods in Biomedical and Non-Biomedical Applications IV**

**Internet Biophotonics IV**

**Low-Dimensional Structures**

Seminar: **Telemedicine: Opportunities, Applications, Prospects VI**

Special events during the Meeting:

**Russian-Chinese Seminar**
**Special session dedicated to memory of Britton Chance**
**Presentation of P4L Saratov Medical Cluster of Photonics4Life Consortium of EC FP7:** Network of Excellence for Biophotonics
**Special Internet Session of European Network of Excellence for Biophotonics, WP 5:** Software for Modeling and Data Analysis in Biophotonics
**U.M.N.I.K.:** Special session on student reports on Optics, Laser Physics and Biophotonics, awarded by the Russian Foundation on Innovations

## SHORT COURSES OSA / SPIE

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

## Organized by

Saratov State University named after N.G. Chernyshevsky

Institute of Precision Mechanics and Control, Russian Academy of Sciences

Research-Educational Institute of Optics and Biophotonics at Saratov State University

Research-Educational Center of Nonlinear Dynamics & Biophysics (REC-006) of CRDF and Ministry of Education and Science of RF

International Research-Educational Center of Optical Technologies for Industry and Medicine “Photonics” at Saratov State University

Volga Region Center of New Information Technologies

Saratov State Medical University

Biomedical Photonics Committee of Chinese Optical Society

## In cooperation with

Academy of Natural Sciences, Saratov Regional Division

Russian Society for Photobiology

Saratov Science Center of the Russian Academy of Sciences

Photonics4Life Consortium of EC FP7: Network of Excellence for Biophotonics

Wiley-VCH Verlag GmbH

## Co-sponsored by

Russian Foundation for Basic Research

Russian Academy of Sciences

U.S. Civilian Research and Development Foundation for the Independent States of the Former Soviet Union (CRDF)

SPIE – The International Society for Optical Engineering

SPIE Student Chapter

OSA Student Chapter

SPE "Nanostructed Glass Technology" Ltd., Saratov

SPE Delta 21 vek, Saratov

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**Kirill V. Larin,** University of Houston (USA), Saratov State University
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**Sergey N. Shtykov,** Saratov State University
**Yulia S. Skibina**, Saratov State University, SPE “Nanostructed Glass Technology” Ltd.
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**Alexey V. Shabunin**, Saratov State University
**Andrey V. Slepnev**, Saratov State University

# Schedule for SFM'11

| September 27, Tuesday | | | | | | |
|---|---|---|---|---|---|---|
| 10.00-13.30 | **SPIE SHORT COURSE**<br>**Nonlinear Morphofunctional Imaging of Tissues**<br>**Francesco Pavone,** European Laboratory for Nonlinear Spectroscopy and Department of Physics Sesto Fiorentino, Italy | | | | | *Building 10, Hall 503* |
| 9.00-14.00 | **Registration** | | | | | *Building 10,* Foyer |
| 14.00-15.00 | **Lunch** | | | | | |
| 15.00-15.10 | **Opening of Saratov Fall Meeting 2011**<br>**Valery V. Tuchin,** Conference Chair, Saratov State University, Russia | | | | | *Building 10 Main Conference Hall* |
| **PLENARY SESSION I**<br>Chair: **Valery V. Tuchin,** Saratov State University, Russia | | | | | | *Building 10 Main Conference Hall* |
| 15.10-15.50 | **Programmable Optics and Programming for Optics: Applications in Biophotonics**<br>**Mark Neil**, Department of Physics, Blackett Laboratory, Imperial College, UK | | | | | |
| 15.50-16.30 | **Blood Perfusion Visualization in Vivo by Synchronous Detection Technique**<br>**Alexei A. Kamshilin**, Department of Applied Physics, University of Eastern Finland, Finland | | | | | |
| 16.30-17.00 | **Coffee break** | | | | | |
| 17.00-19.00 | **LECTURE/ORAL SESSION BIOPHYSICS I**<br>Co-chairs: **Kirill Larin**, Houston University, USA and **Igor Meglinski**, Otago University, New Zealand | *Building 10 Main Conference Hall* | **ROUND-TABLE DISCUSSION EDUCATION I**<br>Co-chairs: **Boris A. Medvedev**, **Vladimir P. Ryabukho,** Saratov State University, Russia | *Scientific Library Conference Hall* | **ORAL SESSION SPECTROSCOPY I**<br>Co-chairs: **Valentin I. Berezin**, and **Lev M. Babkov,** Saratov State University, Russia | *Building 3, Room 34* |
| 19.20-21.30 | **Welcome Party** | | | | | *Building 11, Dining-hall* |

<table>
<tr><th colspan="5">September 28, Wednesday</th></tr>
<tr><td colspan="4">PLENARY SESSION II<br>Chair: Mark Neil, Department of Physics, Blackett Laboratory, Imperial College, UK</td><td>Building 10 Main Conference Hall</td></tr>
<tr><td>9.00-9.30</td><td colspan="4">Fractional Photothermolysis of Tissues as a New Paradigm in Laser Medicine<br>Ilya Yaroslavsky, Palomar Medical Technologies, Inc., USA</td></tr>
<tr><td>9.30-10.00</td><td colspan="4">Optical diagnostics of stress conditions of aquatic organisms in Baikal Lake<br>Igor Meglinski, Otago University, New Zealand</td></tr>
<tr><td>10.00-10.40</td><td colspan="4">Optical Neuroimaging<br>Qingming Luo, Britton Chance Center for Biomedical Photonics, P.R. China</td></tr>
<tr><td>10.40-11.10</td><td colspan="4">Coffee break</td></tr>
<tr><td>11.10-11.30</td><td>SPECIAL SESSION<br>DEDICATED TO MEMORY OF BRITTON CHANCE<br>Co-chairs: Qingming Luo, Britton Chance Center for Biomedical Photonics, HUST, P.R. China; Igor Meglinski, Otago University, New Zealand; and Valery V. Tuchin, Saratov State University</td><td rowspan="3">Building 10 Main Conference Hall</td><td rowspan="3">ORAL SESSION<br>LOW-DIMENSIONAL STRUCTURES I<br>Chair: Olga Glukhova, Saratov State University, Russia</td><td rowspan="3">Building 10, Hall 503</td></tr>
<tr><td>11.30-12.45</td><td>RUSSIAN-CHINESE SEMINAR<br>Co-chairs: Qingming Luo, Britton Chance Center for Biomedical Photonics, HUST, P.R. China, and Valery V. Tuchin, Saratov State University</td></tr>
<tr><td>12.45-13.00</td><td>LECTURE SESSION<br>BIOPHYSICS II<br>Chair: Igor Meglinski, Otago University, New Zealand</td></tr>
<tr><td>13.00-14.00</td><td colspan="4">Lunch</td></tr>
<tr><td>15.00-17.00</td><td colspan="4">Social program (Volga boat trip)</td></tr>
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| September 29, Thursday | | | | | | |
|---|---|---|---|---|---|---|
| 9.30-13.00 | **OSA SHORT COURSE**<br>**Optical Coherence Tomography: Imaging and Sensing of Tissues and Cells**<br>**Kirill V. Larin**, University of Houston, USA | | | | | *Building 10, Hall 503* |
| 9.00-10.30 | **ORAL SESSION**<br>**PHOTONICS I**<br>Chair: **Vladimir L. Derbov**, Saratov State University, Russia | | *Building 10 Main Conference Hall* | **ORAL SESSION**<br>**EDUCATION II**<br>Co-chairs: **Boris A. Medvedev**, and **Vladimir P. Ryabukho,** Saratov State University, Russia | | *Scientific Library Conference Hall* |
| 10.30-11.00 | **Coffee break** | | | | | |
| 11.00-13.00 | **ORAL SESSION**<br>**PHOTONICS II**<br>Chair: **Vladimir L. Derbov**, Saratov State University, Russia | | *Building 10 Main Conference Hall* | **ORAL SESSION**<br>**ENGLISH**<br>Chair: **Svetlana V. Eremina**, Saratov State University, Russia | | *Scientific Library Conference Hall* |
| 13.00-14.00 | **Lunch** | | | | | |
| 14.00-16.00 | **LECTURE SESSION**<br>**MODERN OPTICS**<br>Chair: **Vladimir P. Ryabukho,** Saratov St. University, Russia | *Building 3, Big Physical Hall* | **Joint ORAL SESSION**<br>**NONLINEAR DYNAMICS/MICROSCOPY**<br>Chair: **Kirill V. Larin**, University of Houston, USA | *Building 10 Main Conference Hall* | **ORAL SESSION**<br>**NANOBIOPHOTONICS**<br>Chair: **Nikolai G. Khlebtsov**, IBPPM RAS, Saratov State University, Russia | *Building 10, Hall 503* |
| 16.00-16.30 | **Coffee break** | | | | | |
| **PLENARY SESSION III**<br>Chair: **Ilya Yaroslavsky**, Palomar Medical Technologies, Inc., USA | | | | | | *Building 10, Hall 503* |
| 16.30-17.00 | **From nano- to tera-: applications of the terahertz radiation for studies of artifritial material nanosize structures**<br>**Alexander Shkurinov**[1], Maxim Nazarov[1], Anatoly Khodan[2]; [1]Moscow State University; Institute of Physical Chemistry and Electrochemistry RAS, Russia | | | | | |
| **PLENARY SESSION INTERNET BIOPHOTONICS**<br>Chair: **Valery V. Tuchin**, Saratov State University, Russia | | | | | | *Building 3, Big Physical Hall* |
| 17.00-18.30 | **Photoacoustic Tomography: From Cells to Organs**<br>**Lihong V. Wang,** Washington University in St. Louis, USA | | | | | |
| | **In vivo 3D imaging of kidney microcirculation using Doppler OCT**<br>**Yu Chen**, Fischell Department of Bioengineering, University of Maryland,USA | | | | | |
| | **Clinical application of near-infrared spectroscopy and imaging in neonates**<br>**Martin Wolf**, University Hospital Zurich, Switzerland | | | | | |
| 18.30-21.00 | **JOINT POSTER SESSION AND INTERNET DISCUSSION**<br>Moderator: **Ivan V. Fedosov,** Saratov State University, Russia | | | | | *Building 3, 3d floor Hall* |

| September 30, Friday | | | | | |
|---|---|---|---|---|---|
| 9.00-10.00 | **ORAL SESSION**<br>**BIOPHYSICS III**<br>Chair: **Ivan V. Fedosov,** Saratov State University, Russia | | | | *Building 10, Hall 503* |
| 10.00-10.10 | **Special event:**<br>**Presentation of P4L Saratov Medical Cluster** of Photonics4Life Consortium of EC FP7: Network of Excellence for Biophotonics<br>**Valery V. Tuchin**, Saratov State University | | | | |
| 10.10-10.40 | **Coffee break** | | | | |
| 10.40-13.00 | **ORAL SESSION**<br>**MANAGEMENT**<br>Co-chairs: **Valery V. Tuchin** and **Julia S. Skibina**, Saratov State University, SPE "Nanostructed Glass Technology" Ltd., Russia | *Building 10, Hall 503* | **ORAL SESSION**<br>**TELEMEDICINE**<br>Co-chairs: **Elena V. Karchenova**, ISfTeH and Saratov DNA-centre, and **Valery V. Bakutkin**, Saratov Research Inctitute of Hygigene, Russia | *Saratov DNA-centre* | **Social program (Open-air Museum)** |
| 14.00-17.00 | **Round-table discussions and closing of the Conference** | | | | |

# Special events during the Meeting:

## Wednesday 28 September

**11.10-11.30**

### SPECIAL SESSION DEDICATED TO MEMORY OF BRITTON CHANCE

Co-chairs: **Qingming Luo**, Britton Chance Center for Biomedical Photonics, HUST, P.R. China; **Igor Meglinski**, Otago University, New Zealand; and **Valery V. Tuchin**, Saratov State University

### RUSSIAN-CHINESE SEMINAR

Co-chairs: **Qingming Luo**, Britton Chance Center for Biomedical Photonics, HUST, P.R. China, and **Valery V. Tuchin**, Saratov State University

**11.30-11.45**
**Invited**
**Advances in optical clearing technique and its applications**
Dan Zhu, Britton Chance Center for Biomedical Photonics, HUST, P.R. China

**11.45-12.00**
**Invited**
**New statistics for laser speckle imaging of biological tissue: relative temporal minimum reflectance analysis**
Pengcheng Li, Britton Chance Center for Biomedical Photonics, HUST, P.R. China

**12.00-12.10**
**Microscopic characterization of photothermal effect of laser radiation in gold colloids**
Ivan Fedosov[1], Igor S. Nefedov[2], Boris N. Khlebtsov[3], Valery V. Tuchin[1]; [1]Saratov State University, Russia; [2]Helsinki University of Technology, Finland; [3]Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS, Saratov, Russia

**12.10-12.25**
**Invited**
**Nonlinear optical microscopy for live tissue intrinsic imaging**
Ling Fu, Britton Chance Center for Biomedical Photonics, HUST, P.R. China

**12.25-12.35**
**Nanoparticles and dyes for photodynamic action on microorganisms**
Elena S. Tuchina, Saratov State University, Russia

**12.35-12.45**
**Adjunctive dental therapy with light emitting toothbrush**
Elina A. Genina[1], Vladimir A. Titorenko[2], Valery V. Tuchin[1,3], Georgy V. Simonenko[1], Alexey N. Bashkatov[1], Gennady M. Shub[2], Alexander V. Lepilin[2], Gregory B. Altshuler[4]; [1]Saratov State University; [2]Saratov State Medical University; [3]Institute of Precise Mechanics and Control of RAS, Saratov, Russia; [4]Palomar Medical Products, Burlington, MA, USA

# Workshop on Optical Technologies in Biophysics & Medicine XIII

*Workshop Chair* **Valery V. Tuchin,** Saratov State University, Institute of Precise Mechanics and Control RAS (Russia), University of Oulu (Finland)

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## Tuesday 27 September

### LECTURE/ORAL SESSION I

Co-chairs: **Kirill Larin**, Houston University, USA and **Igor Meglinski**, Otago University, New Zealand

**17.00-17.20**
**Invited**
**Fluorescence spectroscopy of gastrointestinal tumors – advantages and drawbacks**
Ekaterina G. Borisova[1], B. Vladimirov[2], R. Ivanova[3], L. Avramov[1]; [1]Institute of Electronics, Bulgarian Academy of Sciences; [2]Clinic of Gastroenterology, University Hospital Queen Joanna – ISUL; [3]Laboratory of clinical pathology, University Hospital "St. Ivan Rilski", Sofia, Bulgaria

**17.20-17.40**
**Invited**
**On-line object oriented Monte Carlo for the needs of biophotonics and biomedical imaging**
Igor Meglinski, Alexander Doronin, University of Otago, New Zealand

**17.40-18.00**
**Invited**
**Modeling and analytical treatment of FTIR spectra of nucleic acids and proteins in 4 patients with melanocellular nevus**
Natalja Skrebova Eikje, MC Professional Ltd, Estonia

**18.00-18.10**
**Experimental model for fluorescent imaging of tumor growth and regression under therapeutic treatment**
Evgeniya A. Malekhanova[1], N.Y. Lekanova[1], I.V. Krutova[1], I.V. Balalaeva[1], S.M. Deyev[2]; [1]N.I. Lobachevsky State University of Nizhny Novgorod; [2]Institute of Bioorganic Chemistry of Russian Academy of Sciences

**18.10-18.20**
**Analytical study of surface diffuse-reflectance signals from thin biological media**
Nina A. Kalyagina[1], T. Savelieva[1], V. Loschenov[1], W. Blondel[2], C. Daul[2], D. Wolf[2]; [1]General Physics Institute of Russian Academy of Sciences, Moscow, Russia; [2]Centre de Recherche en Automatique, Nancy, France

**18.20-18.30**
**Quantification of structural and biochemical changes in glial tumors with multimodal spectroscopic measurements and multispectral visualization**
Tatiana Savelieva, Nina Kalyagina, Maxim Loschenov, GPI RAS, Moscow, Russia

**18.30-18.40**
**Image artifacts eliminating during lateral scanning in spectral-domain optical coherence tomography**
Pavel A. Shilyagin, Valentin M. Gelikonov, Grigory V. Gelikonov, Dmitry A. Terpelov, Institute of Applied Physics RAS, Nizhny Novgorod, Russia

**18.40-18.50**
**Model of tooth enamel ablation by er-laser radiation**
A.V. Belikov, Kseniya V. Shatilova, A.V. Skrypnik, R.G. Vostryakov St. Petersburg State University of Information Technologies, Mechanics and Optics,Saint-Petersburg, Russia

**18.50-19.00**
**Computer modeling of pathological skin formations control by optical methods**
Ivan A. Bratchenko, Valery P. Zakharov, Samara State Aerospace University, Samara, Russia

## Wednesday 28 September

### LECTURE SESSION II

Chair: **Igor Meglinski**, Otago University, New Zealand

**12.45-13.00**

**Invited**

**An energy-resolving X-ray camera as a novel tool in the full-field X-ray analysis of medical and biological samples**

Oliver Scharf[1], V. Arkadiev[1], R. Wedell[1], A. Bjeoumikhov[2], S. Bjeoumikhova[2], N. Langhoff[2], S. Ihle[3], H. Soltau[3], I. Ordavo[4], G. Buzanich[5], R. Gubzhokov[5], M. Radtke[5], U. Reinholz[5], H. Riesemeier[5]; [1]Institut fuer Angewandte Photonik e.V. (IAP); [2]IfG-Institute for Scientific Instruments GmbH; [3]PNSensor GmbH; [4]PNDetector GmbH; [5]BAM Federal Institute for Materials Research and Testing; Germany

## Thursday 29 September

### POSTER SESSION B

Co-chairs: **Georgy Akchurin, Alexander Kalyanov**
Saratov State University (Russia)

**18.30-21.00**

1B. **NIR tomography to detect of tumor depth by boundary element method** Mohammad Ali Ansari, Saeid Alikhani, Ezzedin Mohajerani, Laser and Plasma Research Institute, Tehran, Iran

2B. **Optical properties of serum albumin in water solutions containing mesoporous silicon nanoparticles** Ksenia A. Anenkova, K.P. Tamarov, Moscow State University, Moscow, Russia

3B. **Modeling thermal distribution in skin tissue during UV and visible laser irradiation for laser induced fluorescence and photodynamic therapy** Ilya V. Krasnikov, A.Yu. Seteikin, E. Drakaki, M. Makropoulou, Amur State University, Russia

4B. **Application for optical controlling methods of plants under external influence** Larisa A. Taskina, E.V. Timchenko, P.E. Timchenko, V.P. Zaharov, SSAU, Samara, Russia

5B. **Correlation of temperature and blood flow oscillations** Andrey A. Sagaidachnyi, D.A. Usanov, A.V. Skripal, A.V. Fomin, Saratov State University, Saratov, Russia

6B. **A comparative effects on intranasal apllicated drugs on intranasal microcirculation** I.S. Bukreev, Gleb O. Mareew, S.I. Lutsevich, Saratov State Medical University, Saratov, Russia

7B. **Tympanic membrain movement measurement results by using autodine laser effect** Gleb O. Mareew, Saratov State Medical University, Saratov, Russia

8B. **Preparation of core-shell structures loaded with photodynamic dyes by layer by layer assembly method** Yulia I. Svenskaya[1], M.V. Lomova[1], A.V. Markin[1], E.A. Lukyanets[2], A. Bartkowiak[3], E.A. Markvicheva[4], D.A. Gorin[1]; [1]Saratov State University, Saratov; [2]State Research Centre of Organic Intermediates and Dyes "NIOPIC", Moscow, Russia; [3]West Pomeranian University, Szczecin, Poland; [4]Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, RAS, Moscow, Russia

9B. **The effect of light polarization on the efficiency of photodynamic therapy** Mahshid JalalKamali[1], Seyed Noureddin Nematollahi-mahani[2], Mohammad Shojaei Baghini[3], [1]Semiconductor Department, Photonic Research Institute, International Center for Science, High Technology & Environmental Sciences (ICST), Mahan, Kerman; [2]Department of Anatomy, Afzalipour Faculty of Medicine, Kerman University of medical Sciences, Kerman; [3]Afzal research institute, Kerman, Iran.

10B. **The involvement of no-mediated signaling in PDT-induced death of neurons and glial cells** Vera D. Kovaleva, E.V. Berezhnaya, M.V. Rudkovskii, A.B. Uzdensky, Department of Biophysics and Biocybernetics, Southern Federal University, Rostov-on-Don, Russia

11B. **Qantum dots as labels in non-instrumental gel-based immunoassay** Irina Yu. Goryacheva, E.S. Speranskaya, N.V. Beloglazova, Chemistry Institute of Saratov State University, Saratov, Russia

12B. **Luminesccent probes in determination of the structural changes in proteins, which contain salts of heavy metals** Andrey Melnikov, Ekaterina Naumova, Saratov State Technical University, Saratov, Russia

13B. **Morphological changes of glial cells in the crayfish nerve cord after photodynamic treatment** Evgeny Duz, Southern Federal University, Rostov-on-Don, Russia

14B. **The phenomenon of cathode luminescence in tooth hard tissues** Nadezda O. Bessudnova, Maxim D. Matasov, Saratov State University, Saratov, Russia

15B. **Determining characteristics of oscillations of elastic spherical shell filled measured using semiconductor laser autodyne** D.A. Usanov, A.V. Skripal', T.B. Usanova, Sergey Yu. Dobdin, Saratov State University, Russia

16B. **Complex analysis of the blood using chirped photonic crystal fiber** A.A. Zanishevskaya[1], Anton V. Malinin[1], Yu. S. Skibina[1,2], I. Yu. Silokhin[1], V.V. Tuchin[1], V.A. Dubrovskiy[3], A.A. Dolmashkin[3]; [1]Saratov State University; [2]SPE "Nanostructed Glass Technology" Ltd.; [3]Saratov State Medical University, Saratov, Russia

17B. **Biocompatible polymeric nanoparticles dopped with ytterbium porphyrazine as potential photosensitizer** Natalia Y. Lekanova[1], M.V. Shirmanova[2], I.V. Balalaeva[1], L.G. Klapshina[3], E.V. Zagaynova[2]; [1]N.I. Lobachevsky State University of Nizhny Novgorod; [2]Nizhny Novgorod State Medical Academy; [3]Nizhny Novgorod Institute of Organometallic Chemistry, Nizhny Novgorod, Russia

18B. **Mathematical model of the biological feed-back used in the modified Nakatani method for the treatment-and-diagnostic complex**, Igor A. Chesnokov[1], Nikolay A. Bushuev[1], Yakov E. Anisimov[1], Elena P. Lyapina[2], Yury Yu. Eliseev[2]; [1]FSUE "SPE "Almaz", [2]Saratov State Medical University; Saratov, Russia

19B. **Combined interaction of various physical factors on an organism - prospect of optimization of physiotherapeutic treatment. hardware maintenance** Igor A. Chesnokov[1], Nikolay A. Bushuev[1], Yakov E. Anisimov[1], Elena P. Lyapina[2]; [1]FSUE "SPE "Almaz"; [2]Saratov State Medical University; Saratov, Russia

20B. **Optical clearing of skin and its influence on microcirculation** Natalia V. Tsapurina, Ekaterina A. Zubkina, Elina A. Genina, Dmitry N. Agafonov, Maxim A. Vilensky, Alexey N. Bashkatov, Valery V. Tuchin, Saratov State University, Saratov, Russia

21B. **Spectral-domain OCT clinical device prototype for endoscopic applications** Dmitry A. Terpelov, Pavel A. Shilyagin, Valentin M. Gelikonov, Grigory V. Gelikonov, Institute of Applied Physics RAS; "BioMedTech" LLC, Nizhny Novgorod, Russia

22B. **Monitoring of experimental tumor's oxygenation after radiation therapy using diffuse optical spectroscopy** Tatiana I. Pryanikova[1], A.G. Orlova[1], A.V. Maslennikova[2], G.Yu. Golubiatnikov[1], V.A. Kamensky[1], T.V. Smirnova[3], I.V. Turchin[1]; [1]Institute of Applied Physics of the RAS; [2]Nizhny Novgorod State Medical Academy; [3]N.I. Lobachevsky Nizhny Novgorod State University, Nizhny Novgorod, Russia

23B. **Spin probe as a possible diagnostic tool** Eugenia Nemova, Institute of Laser Physics SB RAS, Russia

24B. **Laser speckle probe of scatter motion in stratified random media with the improved depth resolution** Anna A. Isaeva, Saratov State Technical University, Saratov, Russia

25B. **The development of automated tools for counting the number of microorganisms on solid nutrient media** Ivan Orlov, Alexander Kovalev, Pavel Petrov, Elena Tuchina, Saratov State University, Saratov, Russia

26B. **Nanoparticles $TiO_2$ and $Fe_2O_3$ in the suppression of the bacterial population by using blue light** Pavel Petrov, Elena Tuchina; Saratov State University, Saratov, Russia

27B. **The digital microscopy technique to monitor creation of pores in fat cell's membrane** Irina Yu. Yanina[1,2], A.V. Gordeev[1], Sh.R. Dahchukov[1], V.A. Doubrovsky[1], V.V. Tuchin[2,3]; [1]Saratov State Medical University; [2]Saratov State University; [3]Institute of Precise Mechanics and Control RAS, Saratov, Russia

28B. **The application of testing light beam spectrally filtered and RGB decomposition of microphotography to register erythrocytes agglutination enhanced by ultrasound on the base of flow method** Valery A. Doubrovski, Yulia A. Ganilova, I.V. Zabenkov; Saratov State Medical University, Saratov, Russia

29B. **Studies of lipid peroxidation of rat blood after *in vivo* photodynamic treatment** Irina Yu. Yanina[1,2], Nikita A. Navolokin[2], Cyan Myau[2], Alla B. Bucharskaya[2], Galina N. Maslyakova[2], Valery V. Tuchin[1,3]; [1]Saratov State University; [2]Saratov State Medical University; [3]Institute of Precise Mechanics and Control RAS, Saratov, Russia

30B. **Effect of bacterial lectin on lipolysis acceleration photodynamic using encapsulated from *in vitro*** Irina Yu. Yanina[1], V.V. Tuchin[1,2], S.A. Portnov[1], Yu.I. Svenskaya[1], D. A. Gorin[1], E.G. Ponomareva[3], V.E. Nikitina[3], [1]Saratov State University; [2]Institute of Precise Mechanics and Control RAS; [3]Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, Saratov, Russia

31B. **Measurement and evaluation of optical parameters of phantoms and pig lung specimens *in vitro* using the integrating sphere** Irina Yu. Yanina[1], Adrian Rühm[2], Michael V. Fedorov[2], Ronald Sroka[2], Valery V. Tuchin[1,3]; [1]Saratov State University, Russia; [2]LIFE-

Center, Hospital of University of Munich, Munich, Germany; [3]Institute of Precise Mechanics and Control RAS, Saratov, Russia

32B. **Comparison of the RGB color space derivatives for human skin imaging** Leonid Dolotov, Saratov State University, Saratov, Russia

33B. **Effect of light source color temperature on the quality of the human skin color analysis** Leonid Dolotov, Saratov State University, Saratov, Russia

34B. **Modeling of temperature fields in the skin and the subcutaneous layers** Sergey Makarov, Rimma Zatrudina; VolSU, Volgograd, Russia

35B. **Numerical simulation of the generation and propagation of acoustic waves in multi-layer tissue under the influence of pulse laser radiation** Sergey Makarov, Rimma Zatrudina; VolSU, Volgograd, Russia

36B. **Two-photon autofluorescence and second-harmonic generation microscopy of $TiO_2$ and ZnO nanoparticles penetration into samples of human tooth tissues** Natalia A. Trunina[1], Alexey Popov[2], Juergen Lademann[3], Valery V. Tuchin[1], Maxim E. Darvin[3]; [1]Research-Educational Institute of Optics and Biophotonics, Saratov State University; [2]Faculty of Technology, Department of Electrical and Information Engineering, University of Oulu, Finland; [3]Center of Experimental and Applied Cutaneous Physiology (CCP), Department of Dermatology, Charité – Universitätsmedizin Berlin, Germany

37B. **Brightness of RGB components of blood samples' photo illuminated by spectrally filtered light beam** Valery A. Doubrovski, Yu. A. Ganilova, I.V. Zabenkov, A.A. Dolmashkin; Saratov State Medical University, Saratov, Russia

38B. **Blood group typing on the basis of elastic light scattering digital monitoring** A.A. Dolmashkin, V.A. Doubrovski Saratov State Medical University, Saratov, Russia

39B. **Ocular drugs influence on the structure of ocular tissues** Anzhelika S. Orlova[1], Tatyana G. Kamenskikh[1], Ivan D. Kamenskikh[1], Igor O. Kolbenev[1], Alexey N. Bashkatov[2], Elina A. Genina[2], Artem Aratov[2], Anastasiya M. Parkheychuk[2], Valery V. Tuchin[2]; [1]Saratov State Medical University; [2]Saratov State University, Saratov, Russia

40B. **Comparison RGB color analysis of human optic nerve disc in different age related groups** I. Bakutkin[1], V. Bakutkin[1], Y. Zaiko[2]; [1]Saratov Research Institute of Hygiene; [2]Stolypin Volga Region Academy of State Service, Saratov, Russia

41B. **Biophysical pattern of the most important physiological constants among the long-livers** Stanislav Shuvalov[1], Lidiya Malinova[2], Tat'yana Denisova[1]; [1]Saratov State Medical University; [2]Saratov Research Institute of Cardiology, Saratov, Russia

42B. **Optical tweezers for studying femtonewton interactions in magnetic particles** Maria Skryabina, Evgeny Lyubin, Maria Khokhlova, Andrey Fedyanin; Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia

43B. **The development of skin immersion clearing method for increasing of laser exposure efficiency on subcutaneous objects** Alexandra Kozina[1], Elina A. Genina[1], Georgy S. Terentyuk[2], Aleksei N. Bashkatov[1], Boris N. Khlebtsov[3], Valery V. Tuchin[1]; [1]Saratov State University; [2]The first Veterinary Hospital; [3]Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov, Russia

44B. **Differences in spectral-luminescent properties of normal and diabetic blood plasma** V.I. Kochubey[1], A.B. Pravdin[1], A.G.Melnikov[2], I.V.Alonova[1]; [1]Saratov State University; [2]Saratov State Technical University, Saratov, Russia

45B. **"Dark" interaction of carbon nanostructures with RBC** N.V. Tkachenko[1], L.A. Grishin[1], A.B. Bucharskaya[2], A.B.Pravdin[1]; [1]Saratov State University; [2]Saratov State Medical University, Saratov, Russia

46B. **Photowhitening of dentin under various chemical conditions** N.I. Kazadaeva, L.E. Dolotov, A.B. Pravdin; Saratov State University, Saratov, Russia

47B. **Signal recording in acoustooptical imaging of scattering media with use multislit aperture** A.P. Solov`ev, M.I. Perchenko, O.V. Zyuryukina; Saratov State University, Saratov, Russia

48B. **Condition of the corneal transplantate after penetrating optical keratoplasty** T.G. Kamenskih, N.M. Khaibulina, I.Y. Goryunova, I.O. Kolbenev; N.R. Lopatinskaya, Saratov State Medical University, Saratov, Russia

49B. **Electrical stimulation with bio-feedback and magnetic simpato-correction in treatment of primary open-angle glaucoma** Ekaterina Veselova, Saratov State Medical University, Saratov, Russia

## Friday 30 September

### ORAL SESSION III

Chair: **Ivan V. Fedosov,** Saratov State University, Russia

**9.00-9.10**

**Label-free conjoined non-invasive imaging of blood and lymphatic vessels**

Igor Meglinski[1], V. Kalchenko[2], Y. Kuznetsov[2], A. Harmelin[2]; [1]University of Otago, New Zealand; [2]Weizmann Institute of Science, Israel

**9.10-9.20**

**Spectral detection of skin tumors - diagnostic feasibilities**

Ekaterina G. Borisova[1], E. Pavlova[2], P. Troyanova[2], P. Pavlova[3], L. Avramov[1]; [1]Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria; [2]University Hospital "Queen Yoanna-ISUL", Sofia, Bulgaria; [3]Technical University – Sofia, branch Plovdiv, Bulgaria

**9.20-9.30**

**Features of the influence of cell oxygen status to delayed fluorescence of xanthene dyes**

Valeriya Maryakhina, Sergey Letuta; Orenburg State University

**9.30-9.40**

**Optical technologies in biology and microbiology**

Daria Korshikova, Olga Nemkova; LOMO PLC, Saint-Petersburg, Russia

**9.40-9.50**

**Investigation of serum proteins aggregation in water solutions containing heavy metal ions with laser fluorescence methods**

Irina A. Sergeeva, G.P. Petrova; Moscow State University, Russia

**9.50-10.00**

**Static and dynamic light scattering in investigation of interaction charge macromolecules enzymes and some metals**

K.V. Fedorova, M.A. Gurova, Zhang Xiaolei, G.P. Petrova; Moscow State University, Russia

# Workshop on
# Laser Physics and Photonics XIII

*Workshop Chair* **Vladimir L. Derbov,** Saratov State University (Russia)

*Secretary* **Andrey I.Konukhov,** Saratov State University (Russia)

*International Program Committee* **Vladimir L.Derbov (Chair),** Saratov State University (Russia), **Alexander P. Kuznetsov**, Saratov Division of Institute of Radio-Engineering of RAS (Russia), **Leonid A. Melnikov**, Saratov State University (Russia), **Marian Marciniak**, National Institute of Telecommunications (Poland), **Alexander P. Nizovtsev**, Institute of Physics of NASB (Belarus), **Aleksey M. Zheltikov**, Lomonosov Moscow State University (Russia), **Vladimir P. Ryabukho**, Saratov State University, IPM&C RAS (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, Dubna, Russia)

## Thursday 29 September

### ORAL SESSION PHOTONICS I

Chair: **Vladimir L. Derbov**, Saratov State University, Russia

**09.00-09.15**
**Low dimensional carbon particles formation under radiation of glass: Yb, Er laser pulses with millisecond duration**
A.V. Belikov, A.V. Skrypnik, Natalia A. Zulina (Saint-Petersburg State University of Information Technologies Mechanics and Optics, Russian Federation)

**09.15-09.30**
**Absorption coefficient for ensemble of spheroidal quantum dots**
Vladimir L. Derbov, Anna S. Klombotskaya (SGU, Saratov), A.A. Gusev, Sergue I. Vinitsky (JINR, Dubna), K.G. Dvoyan, H.A. Sarkisyan (RAU, Erevan)

**09.30-09.45**
**Separable potentials in physics of laser pulses interacting with atoms and molecules**
Yury V. Popov (Nuclear Physics Inst., Moscow State Univ., Head of Laboratory, Moscow, Russia), H.M. Tetchou Nganso, B. Piraux, M.G. Kwato Njock

**09.45-10.00**
**Interference effects in colloidal particle lens arrays**
Alexander Pikulin, A. Afanas'ev, N. Agareva, A. Alexandrov, V. Bredikhin, N. Bityurin (Institute of Applied Physics RAS, Nizhniy Novgorod, Russia)

**10.00-10.15**
**Coherent passive beam combining of fiber lasers operated in the injection locked regime**
Dmitry V. Vysotsky, N. N. Elkin, A. P. Napartovich (SRC RF TRINITI, Russia)

**10.15-10.30**
**The role of Volkov waves in laser-assisted electron momentum spectroscopy**
A.A. Bulychev, Konstantin .A. Kouzakov, and Yu.V. Popov (Faculty of Physics, Moscow State University, Associate Professor, Moscow, Russia)

### ORAL SESSION PHOTONICS II

Chair: **Vladimir L. Derbov**, Saratov State University, Russia

**11.00-11.10**
**The paraxial approximation of the waveguide optics for fast electron scattering on molecules**
Vladislav V. Serov (Saratov State University, Russia)

**11.10-11.20**
**Amplification of laser pulses in a Bose-Einstein condensate**
Yury A. Avetisyan, (Institute of Precise Mechanics and Control, Russian Academy of Sciences, Saratov, Russia)

**11.20-11.30**
**Superradiant backscattering of a light from a Bose-Einstein condensate**
Yury A. Avetisyan, (Institute of Precise Mechanics and Control, Russian Academy of Sciences, Saratov, Russia)

**11.30-11.45**
**Non-markovian relaxation and contour of the radiation line in the system of two two-level atoms**
Alexander V. Gorokhov, V.V. Semin, A.O. Tuchin (Samara State University, Samara, Russia)

**11.45-12.00**
**Quantum chaos in systems of two- and three-level atoms**

I.V. Darma, Alexander V. Gorokhov, E.V. Rogacheva (Samara State University, Samara, Russia)

**12.00-12.15**

**Electromagnetically induced transparency for the case of abrupt leading of a probe pulse edge rising**
Oleg M. Parshkov, (Saratov State Technical University, Russia)

**12.15-12.30**

**Entaglement it nondegenerate two-photon Tavis-Cummings model**
Eugene K. Bashkirov, Darya Zhalnina, Mikhail Mastyugin, (Samara State University, Russia)

**12.30-12.40**

**Investigation of nonlinear properties of chalcogenide glasses by interferometric pump-probe method**
Alexander V. Melnikov, Julia S. Chaikina, Elena A. Romanova (Saratov State University, Russia).

**12.40-12.50**

**Analysis of the generation of terahertz pulses by dual-frequency soliton laser**
Alexander Plastun, Andrey Konukhov (Saratov State Unversity, Russia), Alexey Sysoliatin (Fiber Optics Research Center, Russia).

**12.50-13.00**

**Dynamics of dual wavelength vertical external cavity semiconductor laser**
Leonid Kochkurov, Andrey Konyukhov, (Saratov State Unversity, Russia).

## POSTER SESSION P

Chair: **Alexander S.Plastun,** Saratov State University, Russia

**18.30-21.00**

1 P. **Mechanisms of refractive index variation in he-implanted $LiMo_3$ (M = Ta, Nb) optical waveguides** Victor V. Atuchin, Institute of Semiconductor Physics, Novosibirsk, Russia.

2 P. **Nonlinear-optical solid solutions in binary system $K_2Al_2B_2O_7$ – $Rb_2Al_2B_2O_7$**, Victoria G. Grossman (1),V.V. Atuchin (2), B.G. Bazarov (1), M.S. Molokeev (3), Zh.G Bazarova (1). (1) Laboratory of Oxide Systems, Baikal Institute of Nature Management, SB RAS, Ulan-Ude, Russia, (2) Laboratory of Optical Materials and Structures, Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia, (3) Laboratory of Crystal Physics, Institute of Physics, SB RAS, Krasnoyarsk, Russia

3 P. **Mixed laser weld joints and libs-study of their composition**, Elena L. Surmenko, Tatiana N. Sokolova, Ivan A. Popov (Saratov State Technical University,Russia)

4 P. **The method of determining the level of external optical feedback by means of the analysis of the autodyne signal form**, Evgeniy O. Kaschavtsev, D.A. Usanov, A.V. Skripal, M.Yu. Kalinkin, Saratov State University, Russia

5 P. **Laser-stimulated channeling of positrons in a silicium crystal**, V.V. Serov, Tatiana A. Sergeeva, Saratov State University, Russia

6 P. **Nonlinear properties of chalcogenide glasses near bandgap frequencies**, Yulia S. Chaikina, Alexander V. Melnikov, Elena A. Romanova, Saratov State University, Russia

7 P. **Complex of laser technologies for manufacture of fine-meshed grids and forming of emitting structure of cathodes**, Ivan A. Popov, Saratov State Technical University T.N. Sokolova,Saratov State Technical University E.L. Surmenko, Saratov State Technical University A.V. Konyushin, Saratov State Technical University, Russia

8 P. **Coherent population trapping in frequency- modulated cw laser beams**, Inna L. Plastun, Saratov State Technical University Vladimir L.Derbov, Saratov State University Artem G. Misurin, Saratov State Technical University Alexander A. Orudjev, Saratov State Technical University

9 P. **The numerical correction of phase shifts in the digital holographic interferometry**, Sergey A. Savonin, Saratov State University, Saratov, Russia; Oleg V. Dikov, Saratov State University, Saratov, Russia; Vladimir P. Ryabukho, Saratov State University, Saratov, Russia and Institute of Precision Mechanics and Control of RAS, Saratov, Russia

10 P. **Features of realization of digital laser speckle-photography technique**, B.B. Gorbatenko, Saratov State Technical University, Saratov, Russia; N.Yu. Mysina, Saratov State University, Saratov, Russia; Lyudmila A. Maksimova, Institute of Precision Mechanics and Control Russian Academy of Sciences, Saratov, Russia; V.P. Ryabukho, Saratov State University, Saratov, Russia

11 P. **Technique of improvement of interference pattern quality in digital speckle photography**, N.Yu. Mysina, Saratov State University, Saratov, Russia; Lyudmila A. Maksimova, Institute of Precision Mechanics and Control Russian Academy of Sciences, Saratov, Russia;

V.P. Ryabukho, Saratov State University, Saratov, Russia

12 P. **Technique of interference measurements of scattering object microdisplacement on the basis of correlation processing of digital fourier specklegram**, N.Yu. Mysina, Saratov State University, Saratov, Russia; Lyudmila A. Maksimova, Institute of Precision Mechanics and Control Russian Academy of Sciences, Saratov, Russia; V.P. Ryabukho, Saratov State University, Saratov, Russia

13 P. **Technique of improvement of image reconstructing from intensity of diffraction speckle-field**, B.B. Gorbatenko, Saratov State Technical University, Saratov, Russia; V.P. Ryabukho, Saratov State University, Saratov, Russia; Lyudmila A. Maksimova, Institute of Precision Mechanics and Control Russian Academy of Sciences, Saratov, Russia

14 P. **Formation of vector fields of scattering object displacement on the basis of digital specklegram recording**, Lyudmila A. Maksimova, Institute of Precision Mechanics and Control Russian Academy of Sciences, Russia

15 P. **Features of optical spectral transformation of microstructure fibers made from multicomponent glasses**, Bjeoumikhov Kazbek, Margushev Zaur,Institute of Informatics and problems of regional control, Nalchik, Russia

16 P. **Nonequilibrium degeneration of electron-positron distribution in a strong electric field**, Alexander V. Reichel, A.D. Panferov, A.V. Prozorkevich S.A. Smolyansky, Saratov State University, Russia

17 P. **Effects of near-resonant absorption of laser radiation in dye-doped granular media: absorbance-induced immersion and expressed speckle modulation**, Elena A. Isaeva, Saratov State Technical University, Russia; Anna Isaeva, Saratov State Technical University, Russia; Dmitry A. Zimnyakov, Saratov State Technical University, Russia

18 P. **Wannier functions in 2d photonic crystals structures**, Yulia A. Mazhirina, Saratov State University, Russia; Leonid Melnikov, Saratov State Technical University, Russia

19 P. **The influence of dipole-dipole interaction on the sudden-death of entanglement of two atoms with degenerate two-photon transitions**, Anna Evdokimova, Yulia Nikiforova, Elena Sochkova, Maria Stupatskaya, Samara State University, Russia

20 P. **Crystallinity of a target and the secondary-ionic photoeffect** Alexander Rokakh, Saratov State University, Russia

21 P. **Off-axis digital holography: image reconstruction in case of Nyquist frequency excess** Konstantin A. Grebenyuk, Saratov State Medical University Anton A. Grebenyuk, Saratov State University Vladimir P. Ryabukho, Saratov State University, Institute of Precise Mechanics and Control Russia

22 P. **Study of thermal source light spatial coherence** Maksim A. Kurochkin, Ivan V. Fedosov, Valery V. Tuchin, Saratov State University, Saratov, Russia

23 P. **Impurity photoconductivity and secondary-ionic photoeffect on gaas monocrystals** M.I. Shishkin, Y.N. Perepelitsyn, A.G. Rokakh, Saratov State University, Russia

24 P. **Research of photodynamic activity of carbon nanoparticles on an example RBC digital methods of holographic microscopy** Yana Tarakanchikova, Natalie Tkachenko, Olga A. Perepelitsina, Vladimir P. Ryabukho. Sararov State University, Russia

25 P. **Digital holography interferometry bending deformations with vertical displacement vector** Peter Ryabukho, SGU, Saratov, Russia

26 P. **Digital holography of the reflecting objects** Oleg Dikov, Savonin Sergei, Ryabuho Vladimir, Saratov State University, Russia

## INTERNET INVITED LECTURE

**Controlling individual atoms,** Mikkel Andersen, University of Otago, New Zealand

## INTERNET REPORTS

1. **Plane projector forming the desired light distribution on the base of LED technology.** Alexander A. Belousov, Samara, Russia

2. **Research of propagation of laser radiation in multilayered biological media,** Alexei G. Klechikov, A.Y. Seteykin; Amur State University, Russia

3. **The influence of the stark shift on the entanglement sudden death for two atoms interacting with coherent resonant field,** Eugene K. Bashkirov, Margarita Rusakova, Ekaterina Mangulova, Elena Sochkova; Samara State University, Russia

# Workshop on Spectroscopy and Molecular Modeling XII

*Workshop Chairs* **Valentin I. Berezin, Lev M. Babkov, Michael D. Elkin** *Saratov State University (Russia)*

*Secretaries* **Kirill V. Berezin, Galina N. Ten** *Saratov State University, (Russia)*

*International Program Committee* **Valentin I. Berezin**, *Saratov State University (Russia),* **Lev M. Babkov**, *Saratov State University (Russia),* **Michael D. Elkin**, *Saratov State University (Russia),* **Lev A. Gribov**, *Institute named by V. I. Vernadskyi RAS (Moscow Russia),* **Dmitry S. Umreiko**, *Belarus State University (Minsk, Belorussia),* **Nadezda A. Davydova**, *Institute of Physics, NAS of Ukraine,* **Tatiana G Bourova**, *Saratov State Pedagogical Institute (Russia),* **Nikolai V. Burenin**, *Institute of Applied Physics RAS (Moscow, Russia),* **Victor L. Furer**, *Kazan Civil Engineer Academy (Russia),* **Igor M. Umansky**, *Saratov State Socioeconomic University (Russia),* **Alexander V. Gorohov**, *Samara State University (Russia)*

## Tuesday 27 September

### ORAL SESSION I

Chair **Valentin I. Berezin,** Saratov State University, Saratov, Russia

**17.00-17.15**

**Structural parameters and vibrational spectroscopy of microcrystalline $RBND(MoO_4)_2$**

O.D. Chimitova[1], V.V. Atuchin[2], T.A. Gavrilova[3], M.S. Molokeev[4], Sung-Jin Kim[5], N.V. Surovtsev[6], B.G. Bazarov[1]; [1]Baikal Institute of Nature Management, SB RAS, Ulan-Ude; [2]Institute of Semiconductor Physics, SB RAS, Novosibirsk; [3]Institute of Semiconductor Physics, SB RAS; [4]Institute of Physics, SB RAS, Krasnoyarsk, Russia; [5]Ewha Womans University, Seoul, Republic of Korea; [6]Institute of Automation and Electrometry, SB RAS, Novosibirsk, Russia

**17.15-17.30**

**Rare earth binary molybdates $RBLN(MoO_4)_2$ (LN = ND, SM)**

O.D. Chimitova[1], V.V. Atuchin[2], Zh.G. Bazarova[1], M.S. Molokeev[3], B.G. Bazarov[1]; [1]Baikal Institute of Nature Management, SB RAS, Ulan-Ude; [2]Institute of Semiconductor Physics, SB RAS, Novosibirsk; [3]Institute of Physics, SB RAS, Krasnoyarsk, Russia

**17.30-17.45**

**P 2s and O 1s core levels and P-O chemical bonding in inorganic phorphates**

V.V. Atuchin, Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

**17.45-18.00**

**The study of polymer dielectric properties in terahertz frequency range**

E.V. Fedulova, M.M. Nazarov, A.P. Shkurinov, M.V. Lomonosov Moscow State Univ., Russia; M.S. Kitai, V.I. Sokolov, ILIT RAS, Russia

**18.00-18.15**

**Modelling of PAH/PSS polyelectrolytes layer-by-layer adsorbed films**

Daniil Bratashov, Saratov State University, Saratov, Russia

**18.15-18.55**

**1. Modelling of vibrational spectra of cyanobenzoic acid**

M.D. Elkin, M.V. Kartashov O.N. Grechuhina; Astrahan State University, Saratov State University, Russia

**2. Modelling of vibrational spectra for hydroxysubstituted of benzoic acid**

E.A. Erman, M.D. Elkin, M.V. Kartashov, O.N. Grechuhina; Astrahan State University, Saratov State University, Russia

**3. Vibration spectra glyoxylic acid monomers and dimmers**

P.M. Elkin, M.A. Erman, E.Yu. Stepanovich, O.M. Alikova; Saratov State Technical University; Astrahan State Technical University, Russia

**4. Structural-dynamic models of pyruvic acid**

E.A. Djalmuhambetova, P.M. Elkin, E.A. Stepanovich, T.A. Shalnova; Astrahan State University, Saratov State University, Russia

**5. Structural-dynamic models of fluorobenzoic acid**

P.M. Elkin, V.F. Pulin, M.V. Kartashov, O.N. Grechuhina; Astrahan State University, Saratov State University, Russia

**6. Vibrational spectra and structural-dynamic models of aspirine**

O.M. Alikova, E.A. Erman, P.M. Elkin, O.V.Pulin, Astrahan State University, Saratov State University, Russia

**POSTER SESSION S**

Chairs: **Valentin I. Berezin, Lev M. Babkov, Michael D. Elkin** Saratov State University (Russia)

**18.30-21.00**

1S. **Manifestation of polymorphism and hydrogen bonding in vibrational spectra of cyclohexanol** L. M. Babkov, E.A. Moisejkina, Saratov State Universitet, Saratov, Russia, N.A. Davydova, Institute of Physics NAS of Ukraine, Kiev, Ukraine, J. Baran, Institute of Low Temperature and Srtucture Research, NAS of Poland, Wroclav, Poland

2S. **The modeling of structure and ir spectrum of the methyl-β-d-glucopyranoside by density functional method with tacking into account the hydrogen bonds formation** L.M. Babkov, E.A. Moisejkina, Saratov State University, Saratov, Russia, M.V. Korolevich, Institute of Physics of NAS of Belarus, Minsk, Belarus

3S. **Calculation of Pulay's scale factors for quantum-mechanical molecular force fields in the excited electronic states** M.K. Berezin, G.N. Ten, K.V. Berezin, V.I. Berezin, Saratov State Univ.

4S. **W 4f and O 1s core levels and W-O chemical bonding in tungstates by X-ray photoelectron spectroscopy** V.V. Atuchin, Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

5S. **The structural–dynamic model and IR spectrum of the 2,3-di-O-nytro-methyl-β-d-glucopyranoside** L.M. Babkov, I.V. Ivlieva, Saratov State University, Saratov, Russia, M.V. Korolevich, Institute of Physics NAS of Belarus, Minsk, Belarus

6S. **Interpretation of vibrational spectra for monomers and dimmers of oxalic acid** D.M. Nuralieva, E.A. Erman, M.D. Elkin. Astrahan State Univ., Saratov State Univ.

7S. **Modelling of structure and spectra for hydroxysubstituted of benzenes** M.A. Erman, M.D. Elkin A.R. Gaysina, E.A. Djalmuhambetova, Astrahan State Univ., Saratov State Univ., Astrahan State Technical Univ.

8S. **Structural-dinamic models of pyruvic acid** E.A. Djalmuhambetova, P.M. Elkin, E.A. Stepanovich, T.A. Shalnova, Astrahan State Univ., Saratov State Technical Univ.

9S. **About intepretation of vibrational spectra carbonic acid on base of quantum calculations** M.A.Erman, Astrahan State Technical Univ.

10S. **Interpretation of vibrational spectra for monomers and dimmers of oxalic acid** D.M. Nuralieva, E.A. Erman, M.D. Elkin, Astrahan State Univ., Saratov State Univ.

11S. **Modelling of structure and spectra for hydroxysubstituted of benzenes** M.A. Erman, M.D. Elkin A.R. Gaysina, E.A. Djalmuhambetova, Astrahan State Univ., Saratov State Univ., Astrahan State Technical Univ.

12S. **Modelling of vibrational spectra for hydroxysubstituted of benzoic acid** E.A. Erman, M.D. Elkin, M.V. Kartashov, O.N. Grechuhina, Astrahan State Univ., Saratov State Univ.

13S. **Vibration spectra glyoxylic acid. Monomers and dimmers** P.M. Elkin, M.A. Erman, E.Yu. Stepanovich, O.M. Alikova Saratov State Technical Univ. Astrahan State Technical Univ., Astrahan State Univ.

14S. **Structural-dinamic models of fluorobenzoic acid** P.M. Elkin, V.F.Pulin, M.V. Kartashov, O.N. Grechuhina, Astrahan State Univ., Saratov State Univ., Astrahan State Technical Univ.

15S. **Vibrational spectra and structural-dinamic models of aspirine** O.M. Alikova, E.A. Erman, P.M. Elkin, O.V.Pulin, Astrahan State Univ., Saratov State Univ., Saratov State Technical Univ.

16S. **Modelling of structure and spectra for hydroxysubstituted of benzenes** M.A. Erman, M.D. Elkin A.R. Gaysina, E.A. Djalmuhambetova, Astrahan State Univ., Saratov State Univ., Astrahan State Technical Univ.

17S. **Modelling of structure and spectra for hydroxysubstituted of benzenes** M.A. Erman, M.D. Elkin A.R. Gaysina, E.A. Djalmuhambetova, Astrahan State Univ., Saratov State Univ., Astrahan State Technical Univ.

18S. **Modelling of vibrational spectra for hydroxysubstituted of benzoic acid** E.A. Erman, M.D. Elkin, M.V. Kartashov, O.N. Grechuhina, Astrahan State Univ., Saratov State Univ., Samara State Aerospace University, Samara, Russia

19S. **Analysis of resonance fluorescence spectra with laser excitation for molecules using *ab initio* and DFT methods** M. K. Berezin, G. N. Ten, K. V. Berezin, V. I. Berezin, Saratov State Univ.

20S. **Tunnel effects in vibrations of the aromatic compounds and their identification by the displacement of atoms of the substituents** M.K. Berezin, G. N. Ten, K. V. Berezin, V. I. Berezin, Saratov State Univ.

21S. **Predictive methods of quantum mechanics to evaluate of vibrational frequencies for molecules in excited electronic states. 1. The method of frequency shifts** M. K. Berezin, G. N. Ten, K. V. Berezin, V. I. Berezin, Saratov State Univ.

22S. **Predictive methods of quantum mechanics to evaluate of vibrational frequencies for molecules in excited electronic states. 2. The transfer method of Pulay's scale factors for quantum-mechanical force fields** M.K. Berezin, G.N. Ten, K.V. Berezin, V.I. Berezin, Saratov State Univ.

23S. **Calculation of structure and oscillatory spectra of tsvitter-ionic forms of the glycocoll in the water solution** D.M. Kadrov, G. N. Ten, Saratov State Univ.

24S. **The influence of hydrophobic properties of indole and scatole on hydrogen bond geometric parameters** A.A. Yakovleva, G.N. Ten, Saratov State Univ.

25S. **The calculation of the structure and vibrational spectrum of n-formylmethionine** I.G. Alekseev, G. N. Ten, Saratov State Univ.

26S. **The structure and the spectrum of normal vibrations FADH** R.Sh. Zatrudina, A.V. Surina, Volgograd State Univ., Russia

## INTERNET INVITED LECTURE

**Investigation of the effect of hydrogen bonding in molecular crystals on absorption and Raman spectra** O.P. Cherkasova, I.N. Smirnova, M.M. Nazarov, E.V. Fedulova, A.V. Kargovsky, A.P. Shkurinov, Institute of Laser Physics SB RAS, Novosibirsk, M.V.Lomonosov Moscow State Univ., Moscow, Russia

# Workshop on Modern Optics X

## Popular lectures for postgraduate students, students of universities, and schoolchildren

Workshop Chair: **Vladimir P. Ryabukho,** *Saratov State University and Institute of Precision Mechanics and Control RAS (Russia)*
Secretary: **Ol'ga A. Perepelitsina, Vladislav V. Lychagov, Alexander Kal'yanov, Il'ya Smirnov** *Saratov State University (Russia)*

International Program Committee **Valery V. Tuchin,** *Saratov State University (Russia*), **Vladimir P. Ryabukho,** *Saratov State University (Russia*), **Vladimir L. Derbov,** *Saratov State University (Russia),* **Leonid A. Melnikov,** *Saratov State Technical University (Russia),* **Alexander B. Pravdin,** *Saratov State University (Russia)* **Boris A. Medvedev,** *Saratov State University (Russia*), **Lyudmila V. Pravdina,** *Saratov Physics and Technical Lyceum,* **Alexander V. Priezzhev,** *Moscow State University (Russia),* **Vladimir N. Shevtsov,** *Saratov State University (Russia*), **Mikhail A. Starshov,** *Saratov State University (Russia*), **Boris B. Gorbatenko,** *Saratov State Technical University (Russia)*

### Thursday September 29

**ORAL SESSION**

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

**14.00-15.30**

### Modern Photonics

**Leonid A. Melnikov**

Professor, Head of Department of Instrumentation Engineering,
Saratov State Technical University, Russia

# Workshop English as a Communicative Tool in the Scientific Community X

*Co-chairs:* **Svetlana V. Eremina,** Saratov State University (Russia)
**Alexander B. Pravdin,** Saratov State University (Russia)

*Advising Chair:* **Vladimir L.Derbov,** Saratov State University (Russia)

*Secretary:* **Ol'ga I.Moskalenko,** Saratov State University (Russia)

*Program Committee:* **Vladimir L.Derbov,** Saratov State University (Russia), **Igor V. Meglinski**, University of Otago (New Zealand), **Valery V. Tuchin**, Saratov State University (Russia), **Dmitry A. Zimnyakov,** Saratov State Technical University (Russia)

## Thursday 29 September

### ORAL SESSION

Chair: **Alexander B. Pravdin,** Saratov State University, Russia

**11.00-11.15**
**Homonymy within Terminology**
Svetlana V. Eremina, Department of English Landuage and Intercultural Communication, Saratov State University, Saratov, Russia

**11.15-11.30**
**Typical pronunciation problems among adult English learners**
Yulia A. Martynova, Department of English Language and Intercultural Communication, Saratov State University, Saratov, Russia

**11.30-11.45**
**Self assessment in abstract writing classroom activity**
Alexander B. Pravdin, Department of Optics and Biophotonics, Saratov State University, Saratov, Russia, Svetlana V.Eremina, Department of English Landuage and Intercultural Communication, Saratov State University, Saratov, Russia

**11.45-12.05**
**Studying with exams in mind. Say "yes" to IELTS!**
Natalia Karpova, Saratov State University, English Language Teachers' Support Center "Bookberry"

**12.05-12.15**
**The study of blood plasma proteins with luminescent probe technique**
Andrey G.Melnikov, Saratov State Technical University

**12.15-12.25**
**The dependence of luminescence spectra of CdS nanoparticles on synthesis technique**
Elena K.Volkova, Saratov State University

**12.25-12.35**
**Teeth photowhitening with 405-nm radiation**
Natalia I.Kazadaeva, Saratov State University

**12.35-12.45**
**Photodestructive fat tissue engineering**
Irina Yu.Yanina, Saratov State Medical University

**12.45-13.00**
**Oral presentation skills assessment**
Round table dicussion

# Workshop on Nanobiophotonics VII

*Workshop Chair*: **Nikolai G. Khlebtsov**, Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS, Saratov State University (Russia),

*Secretary:* **Boris N. Khlebtsov**, Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS, Russia

*International Program Committee:* **Dmitry Gorin**, Saratov State University; **Valery Tuchin**, Saratov State University (Russia); **Lev Dykman**, Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS; **Vladimir Bogatyrev**, Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS

## Tuesday 29 September

### LECTURE/ORAL SESSION

Chair: **Nikolai G. Khlebtsov,** Saratov State University, Russia

**14.00 – 14.30**
**Invited**
**Extinction spectroscopy and dynamic light scattering detection of DNA sequences by using cationic gold nanospheres**
Pylaev T.E., Khanadeev V.A.,Khlebtsov B.N., Dykman L.A., Bogatyrev V.A., Khlebtsov N.G, Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov State University, Saratov, Russia

**14.30-14.45**
**Simulations of the optical properties of gold nanorods using a new TEM-based T-matrix solvable model: Calculations and experiment**
Khlebtsov B.N., Khanadeev V.A., Pylaev T.E., Khlebtsov N.G., IBPPM RAS; Saratov State University, Saratov, Russia

**14.45 – 15.00**
**Generation of nanostructures and antiseptic properties of biocompatible plasma sprayed hydroxyapatite coatings by means laser IR-modification**
Papshev V.A., Zakharevich A.M., Surmenko E.L., Lyasnikov V.N. Saratov State Technical Univ., Saratov State Univ., Saratov, Russia

**15.00 – 15.30**
**Invited**
**Nanocomposite coatings, core-shell structures, microcapsules: Preparation, physical properties control, applications**
Gorin D.A., Saratov State Univ., Saratov, Russia

**15.30 – 15.40**
**Silver coated magnetic calcium carbonate core with LBL nanocomposite coating: Preparation and Raman spectroscopy characterization**
Markin A.[1], Apuhtina M.[1], Stestyura I.[1], German S.[1], Malyar I.[1], Ponomarev A.N. [2], Yakimansky A.V.[3], Rusanova T.Yu.[1], Gorin D.A.[1]; [1]Saratov State University; [2]Science & Technical Center of Applied Researches; St-Petersburg; [3]Institute of Macromolecular Compounds RAS, St-Petersburg, Russia

## Tuesday 29 September

### POSTER SESSION N

Chair: **Boris N. Khlebtsov**, IBPPM RAS, Russia

**18.30 – 21.00**

1N. **Laser light heating of nanoshells: numerical modeling of spatial-temporal localization of temperature field** Y.A. Avetisyan, A.N. Yakunin, and V.V. Tuchin, Institute of Precise Mechanics and Control, RAS, Saratov State Univ., Saratov State Technical University, Saratov, Russia

2N. **Physical properties, biocompatibility and toxicity of ZnO-nanocomposite microcapsules** Tatiana A. Kolesnikova[1,2], Dmitry A. Gorin[2], Irina A. Fedorova[3], Alexander A. Gusev[4], Radostina Georgieva[5], Andreas Fery[6], Paolo Fernandes[1], Dmitry G. Shchukin[1], Helmuth Möhwald[1]; [1]Max Planck Institute of Colloids and Interfaces, Potsdam, Germany; [2]Saratov State University; [3]Saratov State Medical University; [4]Tambov State University, Russia; [5]Charité Universitätsmedizin, Berlin; [6]Universität Bayreuth, Germany

3N. **The dependence of luminescence CdS nanoparticles on external shell** Volkova Elena, Vyacheslav I. Kochubey, Saratov State University, Saratov, Russia

4N. **Silver nanowires for transparent conductive coatings** Irina I. Nefedova[1], Ilya Anoshkin[2], Albert G. Nasibulin[2], Igor Nefedov[2], Esko I. Kauppinen[2]; [1]Saratov State Univ., Saratov, Russia; [2]Aalto Univ. School of Science and Technology, Finland

### INVITED INTERNET LECTURE

1. **Generation of radicals by doped $TiO_2$ nanopowders in presence of visible light** A.P. Popov[1,2], A. Sarkar[3], K. Kordas[3,4], M. Meinke[5], J. Lademann[5], A.V. Priezzhev[2,6], R. Myllylä[1], V.V. Tuchin[1,7,8], J.-P. Mikkola[3], M. Darvin[5]; [1]Univ. of Oulu, Oulu, Finland; [2]M.V. Lomonosov Moscow State Univ., Moscow, Russia; [3]Umeå University, Umeå, Sweden; [4]University of Oulu, Oulu, Finland; [5]Universitätsmedizin Charite Berlin, Berlin, Germany; [6]M.V. Lomonosov Moscow State Univ., Moscow, Russia; [7]Saratov State Univ., Saratov, Russia; [8]Institute of Precise Mechanics and Control of RAS, Saratov, Russia

### INTERNET REPORT

2. **Theoretical model of polyelectrolyte deposition on polydisperse oil microdroplets**
Irina Zaporotskova, Volgograd State University, Russia

# Workshop on Management of High Technologies Commercialization and Regional Innovation Systems VIII

*Workshop Co-Chairs*: **Julia S. Skibina** and **Valery V. Tuchin**, Saratov State University (Russia), SPE LLC "Nanostructed Glass Technology" Ltd.

*Secretary*: **Anton V. Malinin**, Saratov State University (Russia), SPE "Nanostructed Glass Technology" Ltd.

*International Program Committee*: **Gregory B. Altshuler**, Palomar Medical Technologies Inc. (USA), **Robert Breault**, Breault Research Organization, Arizona Optics Industry Association (USA), **Viktor I. Fedotov**, Chamber of Commerce of Saratov Region (Russia), **Boris Reznik**, BioRASI, Inc. (USA), **Natalya V. Romanova**, Saratov State University (Russia), **Sergey N. Sokolov**, INJECT Enterprise (Russia), **Stoyan Tanev**, University of Southern Denmark (Denmark)

## September 28, Thursday

**Poster SESSION U.M.N.I.K.**
Co-Chairs: **Georgy Akchurin, Alexander Kalyanov**
Saratov State University (Russia)

**18.30- 21.00**

1U. **Digital holographic microscopy of the phase objects (II)** Sergey A. Savonin, Alexander Y. Abramov, Vladimir P. Ryabukho, Saratov State University, Russia and Institute of Precision Mechanics and Control of RAS, Saratov, Russia

2U. **Development of methods for the synthesis and research of optical properties of anisotropic semiconductor nanoparticles (II)** Elena K.Volkova, Vyacheslav I. Kochubey, Saratov State University, Saratov, Russia;

3U. **20 FPS catheter-based SD-OCT device (II)** Pavel A. Shilyagin, Dmitry A. Terpelov, Valentin M. Gelikonov, Grigory V. Gelikonov, Institute of Applied Physics RAS, Russia, "BioMedTech" LLC, Nizhny Novgorod, Russia

4U. **Features of Fourier transformation of fractal structure (II)** Alexander Ulyanov, Saratov State University, Saratov, Russia

5U. **Laser interferometric vibrometer (II)** Alexander Kalyanov, Saratov State University, Russia.

6U. **Development of a new method of dynamic modeling of tumor growth when exposing the laser hyperthermia (II)** Elena Revzina, Saratov State University, Russia

**INTERNET INVITED LECTURES**

**1. Photonics technology and university-driven business co-creation** John Erland, Ostergaard TEK-Momentum Business Innovation and Technology Department University of Southern Denmark, Denmark; Stoyan Tanev, Integrative Innovation Management Unit, Institute of Technology and Innovation University of Southern Denmark, Denmark

**2. Re-inventing collectivism? Using innovation collectives to create and grow new technology firms** David Hudson Sprott School of Business, Carleton University, Ottawa, ON, Canada; Stoyan Tanev, Institute of Technology, Innovation Integrative Innovation Management Unit University of Southern Denmark, Odense, Denmark

## September 30, Friday

### ORAL SESSION

Co-Chairs: **Valery V. Tuchin** and **Julia S. Skibina,** Saratov State University, SPE "Nanostructed Glass Technology" Ltd. (Russia)

**10.40-11.00**
**Saratov regional laser centre of the laser association. beginning of the work and main goals. Ways of strategic projecting of industrial innovation high technology clusters in photonics**
Sergei N. Sokolov, OJSC "RME "INJECT", Saratov, Russia

**11.00-11.20**
**IP challenge in commercialization of innovative projects**
Natalya Romanova, Saratov State University, Russia, Dmitry Borovskiy, Patentvolgaservice, ltd, Russia

### U.M.N.I.K.
### Special session on student reports on Optics, Laser Physics and Biophotonics

Co-Chairs: **Valery V. Tuchin** and **Julia S. Skibina,** Saratov State University, SPE "Nanostructed Glass Technology" Ltd. (Russia)

**11.20-11.30**
**Modifications and aplications of Langmuir-Blodgett technique for formation of monomolecular layers**
Kim V.P., Glukhovskoy E.G., Gorbachev I.A., Ermakov A.V., Chumakov A.S. Saratov State University, Saratov, Russia

**11.30-11.40**
**Development of fiber-optics sensors for food industry application**
Anna M. Ermakova, Julia S. Skibina, Valery V. Tuchin, Anton V. Malinin, Igor Yu. Silohin, LLS SPE Nanostructed Glass Technology, Saratov State University, Saratov, Russia

**11.40-11.50**
**Encapsulation of photodynamic dyes using polyelectrolyte core-shell structures**
Yulia I. Svenskaya [1], M.V. Lomova[1], A.V. Markin[1], E.A. Lukyanets [2], A. Bartkowiak[3], E.A. Markvicheva [4], D.A. Gorin[1]; [1]Saratov State University, Saratov; [2]State Research Centre of Organic Intermediates and Dyes"NIOPIC", Moscow, Russia; [3]West Pomeranian University, Szczecin, Poland; [4]Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Russian Academy of Sciences, Moscow, Russia

**11.50-12.00**
**The development of multicolour immunochemical test using fluorescent quantum dots as biolabels**
Elena Speranskaya, Irina Goryacheva, Saratov State University, Saratov, Russia

**12.00-12.10**
**Electrophysical properties of Langmuir-Blodgett films containing metal nanoparticles**
V.G. Guryanov, E.G. Glukhovskoy, Saratov State University, Saratov, Russia

**12.10-12.20**
**Nonlinear components for spectroscopic sensors in MID-infrared**
Julia S. Chaikina, Elena A. Romanova, Saratov State University, Russia, Vladimir S. Shiryaev, IHPS RAS, Nizhny Novgorod, Russia, Angela B. Seddon, Trevor M. Benson, University of Nottingham, UK

**12.20-12.30**
**BIOMOD: Cutting-edge modeling software for cross-disciplinary teaching and research in biology and physics of living systems**
Dmitry Postnov, Sararov State University, Russia

**12.30-12.40**
**New express method in emergency surgery for diagnosis of risk of rebleeding in patients presented with acute severe ulcer hemorrhage**
Olga A. Bibikova, Oxana V. Semyachkina-Glushkovskaya, Igor A. Semyachkin-Glushkovsky, Veronika A. Berdnikova, Yana V. Kuznetsova, Sergey S. Sindeev, Saratov State University; Sergey V. Kapralov, Ilya A. Frolov, Saratov State Medical University, Saratov, Russia

**12.40-12.50**
**The development of automated tools for counting the bacterial number**
Pavel Petrov, Ivan Orlov, Saratov State University, Saratov, Russia

**12.50-13.00**
**Development of technique for improvement of efficiency of diagnostic and phototherapeutic approaches with optical clearing method**
Ekaterina Zubkina, Saratov State University, Saratov, Russia

# Workshop on History, Methodology and Philosophy of the Optical Education IV

*Workshop Chairs:* **Boris A. Medvedev**, **Vladimir P. Ryabukho,** Saratov State University (Russia)

*Secretary* **Alexander A. Skaptsov**, Saratov State University

*International Program Committee* **Vladimir L. Derbov**, Saratov State University (Russia); **Alexander V. Priezzhev**, M.V. Lomonosov Moscow State University (Russia); **Alexander V. Gorokhov**, Samara State University (Russia); **Valery V. Tuchin**, Saratov State University (Russia); **Alex Vitkin**, University of Toronto (Canada)

## Tuesday, September 27

### ROUND TABLE
### Man and light in natural and art treatment of the Universe IV

Moderator: **Boris A. Medvedev**, Saratov State University, Russia

**Panel members:**

Valery V. Tuchin[1], Vladimir P. Ryabukho[1], Vladimir L. Derbov[1], Victor V. Rozen[1], Oleg V. Shimelfenig[1], Alexander G. Rokakh[1], Lev M. Babkov[1], Vyacheslav I. Kochubey[1], Svetlana P. Pozdneva[1], Alexander V. Gorokhov[2], Dmitry A. Zimnyakov[3], Leonid A. Melnikov[3], Dmitry V. Mikhel[3], Julia M. Duplinskay[3], Oleg Parshkov[3], Igor V. Meglinski[4], Alexander V. Priezzhev[5]

[1]Saratov State University, Saratov, Russia
[2]Samara State University, Samara, Russia
[3]Saratov State Technical University, Saratov, Russia
[4]University of Otago, New Zealand
[5]M.V. Lomonosov Moscow State University, Moscow, Russia

## Thursday, September 29

### LECTURE/ORAL SESSION

Co-chairs: **Boris A. Medvedev, Vladimir P. Ryabukho**, Saratov State University, Russia

**09.00-09.12**
**Experience in modern optic research with school students in IAP RAS**
Pavel A. Shilyagin, Alexander I. Ermilin, Elena V. Ermilina, Institute of Applied Physics RAS, Nizhny Novgorod, Russia

**09.12-09.25**
**Babinet principal: the use on diffraction by semitransparent screens**
Valery I. Tsoy, Saratov State University, Russia

**09.25-09.37**
**Comparative analysis of the efficiency of photodynamic therapy techniques and magnetic hyperthermia in oncology**
T.V. Bochkareva, A.A. Ignatiev, B.A. Medvedev, Saratov State University, Russia

**09.37-09.50**
**The analysis of books of problems on the mathematician for entrants of physical faculty**
Georgy V. Simonenko, Saratov State University, Russia, Olga G. Simonenko, Gimnaziya 4, Saratov, Russia

**09.50-10.03**
**"The holographic principle" in the digital holography**
Sergey A. Savonin, Vladimir P. Ryabukho, Saratov State University, Russia

**10.03-10.16**
**Statement of the laboratory work on the synthesis and study of semiconductor nanoparticles**
Elena K. Volkova, Saratov State University, Russia

**10.16-10.30**
**Relics of onetime aberrations in modern optics and biophotonics**
Michael M. Stolnitz, Saratov State University, Russia

# Joint Workshop on Nonlinear dynamics II / Microscopy IV

*Co-chairs*: **Vadim S. Anishchenko**, Saratov State University, Russia, **Kirill V. Larin**, University of Houston, USA

*Secretaries:* **Georgy G. Akchurin,** Institute of Precise Mechanics and Control RAS, Saratov State University (Russia), **Galina I. Strelkova**, **Svetlana Yu. Malova**, Saratov State University (Russia)

*International Program Committee:* **Shoude Chang**, National Research Council (Canada); **Mary Dickinson**, Baylor College of Medicine (USA); **Christoph K. Hitzenberger**, University of Vienna (Austria); **Igor V. Meglinski**, University of Otago (New Zealand), Saratov State University (Russia); **Valery V. Tuchin**, Saratov State University (Russia); **Ruikang K. Wang**, Univ. of Washington (USA); **Lutz Schimansky-Geier**, **Jüergen Kurths**, Humboldt University, Berlin (Germany); **Alexander Neiman**, Ohio University (USA); **Igor Khovanov**, Warwick University (UK); **Alexander Balanov**, **Natalia Janson**, Loughborough University (UK); **Olga Sosnovtseva**, University of Copenhagen (Denmark); **Alexander P. Chetverikov**, **Alexey N. Pavlov**, **Tatjana E. Vadivasova**, **Alexey V. Shabunin**, Saratov State University (Russia)

## Thursday September 29

### ORAL SESSION

Chair: **Kirill V. Larin**, University of Houston, USA

**14.00-14.14**
**Pattern formation in bistable-excitable media**
Dmitry Postnov, Saratov State University, Russia

**14.14-14.28**
**Poincaré recurrence time and nonlinear stochastic phenomena**
Sergey Astakhov, Yaroslav Boev, Saratov State University, Russia

**14.28-14.42**
**Soliton-like excitations in 2D nonlinear lattices**
Alexander Chetverikov, Saratov State University, Russia

**14.42-14.56**
**Wavelets in biology and medicine**
Alexey Pavlov, Saratov State University, Russia

**14.56-15.10**
**Digital refocusing for lateral resolution improvement in optical coherence tomography**
A.A. Moiseev, G.V. Gelikonov, P.A. Shilyagin, D.A. Terpelov and V.M. Gelikonov, IAP RAS, Nizhny Novgorod, Russia

**15.10-15.22**
**Application of X-ray nano-particulate markers for the visualization of intermediate layers and interfaces using scanning electron microscopy**
Nadezda Bessudnova, David I. Bilenko, Andrew M.Zakharevich, Viktor V. Galushka, Saratov State University, Russia

**15.22-15.36**
**Theoretical analysis of stratified media imaging in low-coherence interference microscopy**
Anton A. Grebenyuk, Vladimir P. Ryabukho, Saratov State University, Russia

**15.36-15.48**
**Effects of broad angular spectrum of the optical field in the interference experiment**
Dmitry Lyakin, Institute of Precision Mechanics and Control, RAS; Vladislav Lychagov, Ilya Smirnov, Saratov State University, Russia; Vladimir Ryabukho, Saratov State University, Institute of Precision Mechanics and Control, RAS, Saratov, Russia

**15.48-16.00**
**White balance effects in low coherence interference experiment**
Alexander Kalyanov, Ilya Smirnov, Vladislav Lychagov, Vladimir Ryabukho, Saratov State University, Saratov, Russia

## POSTER SESSION D-M

Chairs: **Alexander P. Chetverikov**, Saratov State University (Russia), **Georgy G. Akchurin,** Institute of Precise Mechanics and Control RAS, Saratov State University (Russia)

### 18.30-21.00

1D. **Self-terminating wave patterns and self-organized pacemakers in a phenomenological model for spreading depression** D. E. Postnov, D.D.Postnov, L. Schimansky-Geier, Saratov State University, Russia

2D. **Chaos transition scenarios in a self-sustained oscillatory medium with complex dynamics of the elementary cell** Andrey Slepnev, Saratov State University, Russia

3D. **Mathematical modeling of NO- and CGMP-mediated regulation in smooth muscle cells**. A.Y. Neganova, D.E. Postnov, Saratov State University, Russia

4D. **Complex current oscillations in power rectifier circuits** Alexey Manturov, Nikita Akivkin, Saratov State Technical Univ., Russia

5D. **Spike separation using wavelet neural networks** Alexey Nazimov, Alexey Pavlov, Saratov State University, Russia

1M. **Video capillaroscopy for microcirculation monitoring** Polina Timoshina, Dmitry Agafonov, Saratov State University, Russia

2M. **The development of methodology for determined sensivity microorganisms to antibacterial agents using method of atomic force microscopy by the example *Escherichia coli*** Pavel S. Erohin, Saratov State University, Russia

3M. **Experimental investigation of an effect of a broad angular spectrum of the optical field on its longitudinal coherence length** Dmitry Lyakin, Institute of Precision Mechanics and Control, RAS, Saratov, Russia Sergey Klykov, Saratov State University, Saratov, Russia

4M. **Experimental investigation of an effect of a broad angular spectrum of the optical field on the signal of low-coherence interferometer at layer thickness determination** Dmitry Lyakin, Institute of Precision Mechanics and Control, RAS, Saratov, Russia Anton Sdobnov, Saratov State University, Saratov, Russia

5M. **The resolution estimation of the edge scanning optical microscope** Tatiana Danilova, Yuri Volkov, Alexey Manturov, Saratov State Technical Univ., Mikhail Yudakov, CIT-NANO LLC, Russia

6M. **Interference spectrometry of microinterferometer** Alexander Kalyanov, Ilya Smirnov, Vladislav Lychagov, Vladimir Ryabukho, Saratov State University, Russia

7M. **Linear in-depth scanning in all-fiber fast time domain optical coherence tomography** Dmitry A. Terpelov, Valentin M. Gelikonov, Grigory V. Gelikonov, Pavel A. Shilyagin, Institute of Applied Physics RAS, Nizhny Novgorod,Russia

8M. **Low-coherence digital holographic microscopy** Sergey A. Savonin, Vladislav V. Lychagov, Vladimir P. Ryabukho, Saratov State Univ., Institute of Precise Mechanics and Control of RAS, Saratov, Russia

## INTERNET REPORT

**Influence of spectral characteristics of interferometer on signal and longitudinal resolution** Alexander Kalyanov, Ilya Smirnov, Vladislav Lychagov, Vladimir Ryabukho, Saratov State University, Russia

# Workshop on Internet Biophotonics IV

*Workshop Chair* **Valery V. Tuchin,** Saratov State University, Institute of Precise Mechanics and Control RAS (Russia), University of Oulu (Finland)

*Secretary* **Ivan V. Fedosov,** Saratov State University (Russia)

*International Program Committee* **Victor N. Bagratashvili**, Inst. of Laser & Inform. Technol. RAS (Russia); **Alexey N. Bashkatov**, SSU (Russia); **Wei Chen,** Univ. of Central Oklahoma (USA); **Cornelia Denz,** University of Münster (Germany); **Kishan Dholakia**, Univ. of St. Andrews (UK); **Paul M.W. French,** Imperial College of Sci., Technol. & Med. (UK); **Kirill V. Larin**, University of Houston (USA), Saratov State University; **Martin Leahy**, National Univ. of Ireland, Galway and RCSI (Ireland); **Qingming Luo**, Huazhong Univ. of Sci. & Technol. (China); **Igor V. Meglinsky**, Otago Univ. (New Zealand); **Roberto Pini,** Istituto di Fisica Applicata, Sesto Fiorentino (Italy); **Juergen Popp**, Inst. of Photonic Technol., Jena (Germany); **Alexander V. Priezzhev**, M.V. Lomonosov Moscow State Univ. (Russia); **Katarina Svanberg**, Lund Univ. Medical Laser Centre (Sweden); **Hugo Thienpont**, Vrije Univ. Brussel (Belgium); **Lihong Wang**, Washington Univ. in St. Louis (USA), **Ruikang K. Wang**, Univ. of Washington (USA)

## Thursday September 29

### PLENARY SESSION INTERNET BIOPHOTONICS

Chair: **Valery V. Tuchin**, Saratov State University, Russia

### 17.00-18.30

**Photoacoustic tomography: From cells to organs**
Lihong V. Wang, Washington University in St. Louis, USA

**In vivo 3D imaging of kidney microcirculation using Doppler OCT**
Jeremiah Wierwille[1], Peter Andrews[2], Maristela Onozato[2], Joseph K. Melancon[2], James Jiang[3], Alex Cable[3], Yu Chen[1], [1]Univ. of Maryland, USA, [2]Georgetown Univ. Medical School, USA, [3]Thorlabs, Inc., USA

**Clinical application of near-infrared spectroscopy and imaging in neonates**
Martin Wolf, Univ. Hospital Zurich, Switzerland

### JOINT POSTER SESSION AND INTERNET DISCUSSION

Chair: **Dmitry Agafonov,**
Saratov State University
Moderator: **Ivan V. Fedosov,** Saratov State University, Russia

### 18.30-21.00

### INTERNET INVITED LECTURES

1. ***In-vivo*** **optical coherence microscopy of retinal and skin capillary networks and their characterization**
   Rainer A. Leitgeb, Medical University of Vienna, Austria

2. **Passive fractionation of cells using optofluidics**
   Praveen C. Ashok, Kishan Dholakia, University of St Andrews, St. Andrews, United Kingdom

3. **Kinetics of carotenoid concentration in human skin after topical and systemic administration of antioxidants**
   M.E. Darvin[1], L. Zastrow[2], O. Doucet[2], J. Lademann[1], [1]Charité – Universitätsmedizin Berlin, Germany, [2]Coty Lancaster S.A.M., Monaco

4. **Estimation of axial and surface wave velocity in gelatin phantoms with PHS-SSOCT**
   Ravi Kiran Manapuram, Floredes M. Menodiado, Maleeha Mashiatulla, Shang Wang, Stepan Baranov, and Kirill V. Larin, Univ. of Houston, Houston, USA

5. **Optical transmission properties of red blood cells at high osmolarity**
   M.K. Swami, H.S. Patel, A. Uppal and P.K. Gupta, Raja Ramanna Centre for Advanced Technology, Indore (MP), India

6. **Topical delivery of particulate vaccines into the skin: *in vivo* examination by optical coherence tomography**
T. Kamali, T. Rattanapak, A. Doronin, S. Hook, I. Meglinski, University of Otago, New Zealand

7. **Using speckle variance to detect 3D vasculature in a mouse embryo**
Narendran Sudheendran, University Of Houston, USA Saba H. Syed, University Of Houston, USA Mary E. Dickinson, Baylor College of Medicine, USA Irina V. Larina, Baylor College of Medicine, USA Kirill V. Larin, University Of Houston, USA

8. **Effect of localized mechanical indentation on skin water content evaluated using OCT**
Abhijit A. Gurjarpadhye, Christopher G. Rylander, Virginia Polytechnic Institute and State Univ., USA

9. **Talbot bands in the theory and practice of optical coherence tomography**
Adrian Podoleanu, Univ. of Kent, UK

10. **Evaluating elastic properties of skin by measuring impulse response using phase-sensitive optical coherence tomography**
Chunhui Li, Guangying Guan, Zhihong Huang and Ruikang K Wang, University of Washington, USA, University of Dundee, UK

## INTERNET REPORTS

1. **Planar waveguide device for controlled photoinitiated delivery of nitric oxide to retinal epithelial cells**
Megan C. Frost, Genevieve E. Gierke, Matthew Nielsen, Connor W. McCarthy, Weilue He, Wan Jin Jahng, Michigan Technological Univ.

2. **The study of blood flow dynamics under the action of optical clearing agents in the human nail bed *in vivo***
Ekaterina A. Zubkina, Natalia V. Tsapurina, Dmitry N. Agafonov, Maxim A. Vilensky, Elina A. Genina, Alexey N. Bashkatov, Valery V. Tuchin, Sararov State University, Russia

3. **Theoretical validation of the optimal wavelength sets used for the application of clinical shock detection via vessel density spatial pattern monitoring**
Rajesh Kanawade, Erlangen Graduate School in Advanced Optical Technologies (SAOT), Germany

4. **Size dependent patterns in degree of polarization maps for turbid medium**
M.K. Swami, H.S. Patel, and P.K. Gupta, Raja Ramanna Centre for Advanced Technology, Indore (MP), India-452013

5. **Helicity of the circular polarized light backscattered from fibrous connective tissues influenced by optical clearing**
C. Macdonald, E. Avci, M. Eccles, I. Meglinski, University of Otago, New Zealand

6. **Optical characterization of muscle**
Luis Oliveira, Instituto Superior de Engenharia do Porto, Armindo Lage, Universidade do Porto, Manuel Pais Clemente, Centro de Ciências e Tecnologias Ópticas, Porto, Portugal, Valery V. Tuchin, Saratov State University, Saratov, Russia

7. **Diagnostics of synchronization between the rhythms of cardiovascular system from nonstationary time series**
Anatoly Karavaev, Ekaterina Borovkova, Saratov State Univ., Vladimir Ponomarenko, Mikhail Prokhorov, Saratov Branch of the Kotel'nikov Institute of Radio Engineering and Electronics of RAS, Anton Kiselev, Vladimir Gridnev, Saratov Research Institute of Cardiology, Russia

8. **Experimental study of the possibility of decreasing light scattering in human stomach wall mucosa for endosurgical treatment of bleeding gastroduodenal ulcer**
Alexey N. Bashkatov, Veniamin A. Grishaev, Elina A. Genina, Vyacheslav I. Kochubey, Sergey V. Kapralov, Valery V. Tuchin, Saratov State Univ., Saratov State Medical Univ., Russia

9. **Absorption and scattering properties of human eye sclera**
Alexey N. Bashkatov, Elina A. Genina, Vyacheslav I. Kochubey, Tatyana G. Kamenskikh, Valery V. Tuchin, Saratov State Univ., Saratov State Medical Univ., Russia

10. **Absorption and scattering properties of human skin dermis**
Alexey N. Bashkatov, Elina A. Genina, Vyacheslav I. Kochubey, Valery V. Tuchin, Saratov State Univ., Russia

11. **Optical properties of muscle tissue**
Alexey N. Bashkatov, Elina A. Genina, Vyacheslav I. Kochubey, Marina D. Kozintseva, Valery V. Tuchin, Saratov State Univ., Russia

12. **Estimation of drugs diffusion and permeability coefficients in ocular tissues using optical coherence tomography**
Natalia A. Trunina, Alexey N. Bashkatov, Elina A. Genina, Saratov State Univ., Russia, Kirill V. Larin, Univ. of Houston, USA

13. **Late arriving photons in diffuse optical tomography**
Sergey Proskurin, TSTU, Tambov, Russia

14. **Chiral and achiral symmetry in dynamics of vector-field lasers**
    Larissa Svirina, Belarussian National Technical University, Belarus

15. **Micro-encapsulated sensors for in vivo assessment of the oxidative stress in aquatic organisms**
    Anton Sadovoy, Institute of Materials Research and Engineering, A*STAR, Singapore, Cathleen Teh, Institute of Molecular and Cell Biology, A*STAR, Singapore, Marco Vendrell Escobar, Singapore Bio-imaging Consortium, A*STAR, Singapore, Igor Meglinski, University of Otago, New Zealand, Vladimir Corzh, Institute of Molecular and Cell Biology, A*STAR, Singapore

16. **Raster averaging and image compression in coherence domain imaging**
    A.Yu. Potlov, K. Ghaleb, S.G. Proskurin, TSTU, Russia

17. **Investigation of optical properties of sclera under influence of gele contained deer velvet antlers components**
    Petrov V., Kochubey V., Bakutkin I., Bakutkin V., Panacels, Saratov Research Institute of Hygiene, Russia

18. **Theory and calibration of speckle dynamics of phase object**
    A.P. Vladimirov, A.V. Druzginin, A.S. Malygin, K.N.Mikitas, Institute of Engineering Science, Yeketerinburg, Russia

# Workshop on Low-Dimensional Structures

*Workshop Chair* **Olga E. Glukhova***,* Saratov State University (Russia)

*Secretary* **Anna S. Kolesnikova,** Saratov State University (Russia), **Michael M. Slepchenkov,** Saratov State University (Russia).

*International Program Committee:* **Ming-Fa Lin,** National Cheng Kung University, Tainan (Taiwan), **Irina V. Zaporotskova**, Volgograd State University, Volgograd (Russia), **Gennadiy V. Torgashov,** Institute of Radioengineering and Electronics (IRE) of RAS, Saratov (Russia)

## Wednesday 28 September

### ORAL SESSION

Chair: **Olga E. Glukhova**, Saratov State University Russia

**11.10-11.20**

**The distribution of the tension in the bamboo-like nanotube**

O.E Glukhova., A.S. Kolesnikova, Saratov State University, Saratov, Russia

**11.20-11.30**

**Research of boron nanotube modifided by atoms of alkaline metals**

I.V. Zaporotskova, E.V. Perevalova, Volgograd State University, Volgograd, Russia

**11.30-11.40**

**The synthesis of carbon nanotubes (CNTS) by using various catalysts and substrates**

E.A. Tarasov, Z.I. Buyanova, M.V. Samarsky, Y.P. Volkov, Institute of Radio-engineering and Electronics RAS, Saratov, Russia

**11.40-11.50**

**The formation of Langmuir monolayers under applied electric field**

E.G. Glukhovskoy, I.A Gorbachev., V.P. Kim, V.A. Guryanov, A.V. Ermakov, A.S. Chumakov, Saratov State University, Saratov, Russia

**11.50-12.00**

**Langmuir-Blodgett films and nanotemplates based on them**

E.G. Glukhovskoy, V.A. Guryanov, I.A. Gorbachev, V.P. Kim, A.V. Ermakov, A.S. Chumakov, Saratov State University, Saratov, Russia

**12.00-12.10**

**Formation of monolayers of octylcyanobiphenyl and stearic acid mixture**

E.G. Glukhovskoy, V.A. Guryanov, V.P. Kim, I.A. Gorbachev, A.S. Chumakov, A.V. Ermakov, Saratov State University, Saratov, Russia

**12.10-12.20**

**Morphological changes in the internal organs of laboratory animals under a single administration of Fe nanoparticles**

N.A. Navolokin, O.V. Matveeva, G.N. Maslyakova, A.B. Bucharskya, Saratov State Medical University, Saratov, Russia, X.M. Kong, B.A. Medvedev, A.A. Ignatiev, T.V. Bochkaryeva, Saratov State University, Saratov, Russia

**12.20-12.30**

**Polarizability of fullerene exo- and endohedral derivatives, a theoretical investigation**

D.Sh. Sabirov, E.A. Kamaletdinova, R.R. Garipova, R.G. Bulgakov, Institute of Petrochemistry and Catalysis of RAS, Ufa, Russia

**12.30-12.40**

**Investigation of inelastic deformation of the deflection of a graphene**

O.E. Glukhova, I.V. Kirillova, S.S. Vetsel, V.V. Shunaev, Saratov State University, Saratov, Russia

**12.40-12.50**

**Computer software for analysis of nanostructures**

O.E. Glukhova, R.Y. Zhnichkov, Saratov State University, Saratov, Russia

**12.50-13.00**

**Preparation and functionalization of metal nanofoams on the substrates with different configuration**

D. Voronin, D. Gorin, Saratov State University, Saratov, Russia, D. Borisova, V. Belova, D. Shchukin, Max Planck Institute of Colloids and Interfaces, Potsdam, Germany

## Thursday 29 September

### POSTER SESSION L

Chair: **Olga E. Glukhova**, Saratov State University Russia

### 18.30-21.00

1L. **Strain effect on monolayer and bilayer graphene** J.H. Wong, B.R. Wu, M.F. Lin, National Cheng Kung University, Tainan, Taiwan

2L. **Influence of modulated electric fields on the magneto-optical absorption spectra of graphene** Y.C. Ou, Y.H. Chiu, R.B. Chen, M.F. Lin, National Cheng Kung University, Tainan, Taiwan

3L. **The influence of the surface curvature on the electronic properties of the graphene nanoribbons** O.E. Glukhova, M.M. Slepchenkov, R.Y. Zhnichkov, Saratov State University, Saratov, Russia

4L. **Molybdenum oxide sublimation for α-$MoO_3$ milliplate crystal growth** V.V. Atuchin, T.A. Gavrilova, T.I.Grigorieva, Institute of Semiconductor Physics, Novosibirsk, Russia

5L. **Statistical evaluation of electronic parameters of titanium oxide ($TiO_2$)** V.V. Atuchin, N.V. Atuchin, Institute of Semiconductor Physics, Novosibirsk, Russia

6L. **Optical properties of polymer composites on a basis of nanoparticles $Fe_2O_3$ of the bulk stabilized high pressure in polyethylene** D.M. Kulbatsky, A.N. Ulzutuev, A.V. Makarov, N.M. Ushakov, Saratov State Technical University, Saratov, Russia

7L. **Formation of monolayers of octylcyanobiphenyl and stearic acid mixture** E.G. Glukhovskoy, V.A. Guryanov, V.P. Kim, I.A. Gorbachev, A.S. Chumakov, A.V. Ermakov, Saratov State University, Saratov, Russia

8L. **The formation of Langmuir monolayers under applied electric field** E.G. Glukhovskoy, I.A Gorbachev, V.P. Kim, V.A. Guryanov, A.V. Ermakov, A.S. Chumakov, Saratov State University, Saratov, Russia

### INTERNET REPORTS

1 **Boron nanotubes: Structure and properties** Irina Zaporotskova, Volgograd State University, Volgograd, Russia

2 **Magneto-optical properties of two prototypical bilayer graphenes** Ming-Fa Lin, National Cheng Kung University, Taiwan

# Seminar Telemedicine VI

*Co-Chairs:* **Elena V. Karchenova**, International Society for Telemedicine and eHealth, Saratov DNA center; **Valery Bakutkin**, Saratov Research Institute of Rural Hygiene (Russia)

*Secretary:* **Tatyana L. Travina**, Saratov State University (Russia),

*International Program Committee:* **Frank Lievens**, ISfTeH (Belgium); **Malina Jordanova**, MD, PhD. Solar-Terrestrial Influences Laboratory. Bulgarian Academy of Sciences. (Bulgaria); **Elena V. Karchenova**, Saratov DNA center (Russia), **Valery V. Tuchin** (Russian Federation).

## Friday 30 September

### LECTURE/ORAL SESSION

**10.40-11.00**
**Telemedicine and eHealth: Value for the society, history and reality**
Elena V. Karchenova, International Society for Telemedicine and eHealth, Saratov DNA-centre, Saraov, Russia

**11.00-11.20**
**Telemedicine and image-analysis of age-related changes in optic nerve of human eye**
V.F. Spirin, V.V. Bakutkin, I.V. Bakutkin; Saratov Research Institute of Rural Hygiene, Russia

**11.20-11.40**
**Telemedicine and image analysis of anterior segment of human eye**
L.A. Melnikov, V.V. Bakutkin, I.V. Bakutkin, R.A. Zdragevsky; Research Institute of Rural Hygiene, Saratov State Technical University, Russia

**11.40-12.00**
**Telemedicine and monitoring of temperature of human body.**
V.V. Bakutkin, I.V. Bakutkin, V.V. Lobanov, A.A. Bolshakov, V.A. Pylsky; Saratov Research Institute of Rural Hygiene, Saratov Technical University, Russia

### INTERNET REPORTS

1. **The significance and value of Med-e-Tel for the global telemedicine world**

Malina Jordanova, Space and Solar-Terrestrial Research Institute, Bulgarian Academy of Sciences, Bulgaria Coordinator Educational Program Med-e-Tel, Bulgaria; Frank Lievens, Board Member and Secretary, International Society for Telemedicine & eHealth, Switzerland Director Med-e-Tel, Belgium

2. **The hospital information system "Medic"** Yury V. Mazanov, Olga P. Sosnovtseva, Saratov DNA-centre, Elena V.Karchenova, International Society for Telemedicine and eHealth, Saratov DNA-centre

3. **Telemedicine and assessment of the human intervertebral disc based on image analysis**
Vyacheslav V. Skvortsov, Valerij V. Bakutkin, Natalia E. Komleva, Vladimir F. Spirin, Oleg V. Fadeev, Saratov Research Institute of Rural Hygiene, Russia**,** Alexandr A. Bolshakov, Viktor P. Glazkov, Stanislav K. Daurov, Vladimir V. Lobanov, Saratov State Technical University, Russia

4. **Digital system with nonlinear mixing for secure data transmission**
Anatoly Karavaev, Saratov State University, Russia; Vladimir Ponomarenko, Mikhail Prokhorov, Saratov Branch of the Kotel'nikov Institute of Radio Engineering and Electronics of RAS

5. **Diagnostics of synchronization between the rhythms of cardiovascular system from nonstationary time series**
Anatoly Karavaev, Ekaterina Borovkova, Saratov State University, Russia; Vladimir Ponomarenko, Mikhail Prokhorov, Saratov Branch of the Kotel'nikov Institute of Radio Engineering and Electronics of RAS; Anton Kiselev, Vladimir Gridnev, Saratov Research Institute of Cardiology

# Special Internet Session of European Network of Excellence for Biophotonics
# WP 5: Software for Modeling and Data Analysis in Biophotonics

*Workshop Chairs:* **Valery V. Tuchin,** Saratov State University, Institute of Precise Mechanics and Control RAS (Russia) and **Mark Neil**, Imperial College London (United Kingdom)

*Secretary* **Alexey N. Bashkatov,** Saratov State University (Russia)

*International Program Committee:* **Yurii A. Avetisyan**, Inst. of Precision Mechanics and Control RAS (Russia); **Kishan Dholakia**, Univ. of St. Andrews (UK); **Paul M.W. French**, Imperial College of Sci., Technol. and Medicine (UK); **Olga E. Glukhova**, Saratov State Univ. (Russia); **Irina L. Maksimova**, Saratov State Univ. (Russia); **Juergen Popp**, Institute of Photonic Technology, Jena (Germany); **Hugo Thienpont**, Vrije Univ. Brussel (Belgium); **Alexander N. Yakunin**, Institute of Precision Mechanics and Control RAS (Russia)

**September 29, Thursday**

## INVITED INTERNET LECTURES

1. **Towards modeling of the diffuse reflectance spectra of human skin** Igor Meglinski, Alexander Doronin, University of Otago, New Zealand

2. **Application of Maximum Entropy methods for the lineshape analysis of Stimulated Raman measurements** Thomas Bocklitz[1,2], Babita Mallick[2], Siva Umapathy[2], Jürgen Popp[1,3]. 1 - Institute of Physical Chemistry and Abbe Center of Photonics, Friedrich-Schiller-University Jena, Helmholtzweg 4, Jena, Germany; 2 - Institute of Physical Chemistry, Indian Institute of Science, Bangalore 560012, India; 3 - Institute of Photonic Technology, Albert-Einstein-Strasse 9, Jena, Germany

3. **Chemometric Analysis of Bio-spectroscopic Data in R: hyperSpec** Claudia Beleites, CENMAT and Dept. of Industrial and Information Engineering, University of Trieste, Italy and IPHT Jena, Germany, Christoph Krafft, IPHT Jena, Germany, Jürgen Popp, IPHT Jena and Institute of Physical Chemistry and Abbe Center of Photonics, University Jena, Germany, Valter Sergo, CENMAT and Dept. of Industrial and Information Engineering, University of Trieste, Italy

## INTERNET REPORTS

1. **Monte Carlo simulation of influence of nanoparticles on the skin reflectance spectra** Alexey N. Bashkatov, Elina A. Genina, Valery V. Tuchin, Saratov State University, Russia, Gregory B. Altshuler, Ilya V. Yaroslavsky, Palomar Medical Technology Inc., USA

2. **Development of a technique of 3D reconstruction of temperature fields by using 2D thermal imaging measurements** Tatyana Travina, Saratov State University, Saratov, Russia

3. **Development of instruments for characterization of laser beam intensity profile** Ivan V. Fedosov, Valery V. Tuchin, Saratov State University, Russia

4. **GPU-based parallel computing in application to cortical spreading depression and migraine waves** Dmitry D. Postnov, R.A. Zhirin, L. Schimansky-Geier, Dmitry E. Postnov, Saratov State University, Russia

5. **Mathematical model of UV-induced response of epidermis** Mikhail Stolnitz, Saratov State University, Russia

6. **The parallel algorithms for quantum chemical study of nanoindentors based of the carbon bamboo-like nanotubes for biomedical applications** Olga E. Glukhova, Roman Zhnichkov, Anna Kolesnikova, Michael Slepchenkov, Saratov State University, Russia

7. **Models, methods and software for analysis of thermal optics problems for composite nanoparticles at short laser pulse loading** Alexander N. Yakunin, Yury A. Avetisyan, Institute of Precise Mechanics and Control of RAS, Russia, Valery V. Tuchin, Saratov State University, Institute of Precise Mechanics and Control of the RAS, Saratov, Russia, University of Oulu, Finland

# Post-Deadline Program

## POSTERS

1. **Hyperproduction of nitric oxide in epithelium of stomach as effective indicator of hemorrhagic stress** Veronika Berdnikova[1], Oxana Semyachkina-Glushkovskaya[1], Yana Kuznetsova[1], Igor Semaychkin-Glushkovskij[1], Sergey Kapralov[2], Ilya Frolov[2], Olga Bibikova[1], Sergey Sindeev[1]; [1]Saratov State University; [2]Saratov State Medical University, Saratov, Russia
2. **Study of the influence of gold nanoparticles on morphofunctional state of mesenteric lymph nodes in experiment** Olga V. Zlobina[1], I.O. Bugaeva[1], G.N. Maslyakova[1], S.S. Firsova[1], A.B. Bucharskaya[1], N.G. Khlebtsov[2], B.N. Khlebtsov[2], V.A. Bogatyrev[2]; [1]Saratov State Medical University; [2]Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov, Russia
3. **Assessment of immunological parameters of blood of patients with postoperative radiculopathy in the dynamics of complex treatment with the use of electromagnetic millimeter waves** A.V. Fomina, Irina O. Bugaeva, I.I. Ablaev, I.P. Lyubitsky, I.I. Sholomov, E.A. Salina, E.B. Likhachev; Saratov State Medical University, Saratov, Russia
4. **Device "Mirage"** Olga S. Kachkina, Tatiana G. Kamensky, Saratov State Medical University; OOO "TRIMA" Saratov, Russia,
5. **Investigations of human eye lens by immunohystological and immunocytochemical methods in patients with senile and diabetic cataract** T.G. Kamenskih[1], Antonina S. Tishkova[1], V.A. Galanzha[1], A.B. Bucharskaya[2], G.N. Maslyakova[2], A.A. Shirokov[3], A.M. Burov[3], A.N. Bashkatov[4], E.A. Genina; [1]Clinic of Eye Diseases and Department of Ophthalmology of Saratov State Medical University; [2]Saratov State Medical University; [3]Institute of Biochemistry and Physiology Plants and Microorganisms RAS; Saratov State University, Saratov, Russia
6. **Digital holographic interferometry of bending deformations of real design** Vladimir I. Kachula, Oleg V. Dikov, Sergey A. Savonin, Vladimir P. Ryabukho; Saratov State University, Saratov, Russia
7. **Synthesis of ZnS nanoparticles** Julia Konyukhova, Vyacheslav I. Kochubey, Elena Volkova, Saratov State University, Saratov, Russia
8. **Synthesis of iron oxide nanoparticles and their use for inhibiting bacteria growth** Vyacheslav I. Kochubey, Maria Koulikova; Saratov State University, Saratov, Russia
9. **Electrophoretic fabrication of microstructured coatings based on aluminium hydroxyquinoline particles coated by nanodimensional shell** Dmitry A. Zayarskiy, S. Portnov, D. Gorin; Sararov State University, Saratov, Russia
10. **Dispersion management of the 1D magnonic crystal structure** Alexander V. Sadovnikov, A.G. Rozhnev, Sararov State University, Saratov, Russia
11. **Algorithm automated synthesis of mathematical models for multilayerd magnetodielectrical waveguide with strip lines at the boundaries between layers** Svetlana V. Aleksutova, Sararov State University, Saratov, Russia

## INVITED INTERNET LECTURE

**Visualising gunshot cavity dynamics with high speed video** Peter L. Davidson[1,2], Suzanne J. Wilson[2], Michael C. Taylor[3]; [1]Centre for Bioengineering and Nanomedicine, University of Otago; [2] Injury Prevention Research Unit, University of Otago; [3]Institute of Environmental Science and Research, Otago, New Zealand

## INTERNET REPORTS

1. **Speckle-cappilaroscopic study of microcirculation by the modelling of pancreatonecrosis of rat's pancreas** Maxim A. Vilensky[1], Denis A. Alexandrov[1], Dmitry N. Agafonov[1], Viktor A. Kuleshov[2], Georgii S. Terentuk[1], Andrey A. Skorohodov[2], Polina A. Timoshina[1]; [1]Saratov State University; [2]Saratov State Medical University, Saratov, Russia
2. **Nanoplasmonic field enhancement: Optimization of metal-dielectric coaxial nano-structures** Olga Kozina[1], Leonid Melnikov[2]; [1]Saratov Division of the Institute of Radio-Engineering and Electronics RAS; [2]Saratov State Technical University, Saratov, Russia