

Saratov Fall Meeting - SFM'16



SCIENTIFIC PROGRAM

International Symposium

Optics and Biophotonics-IV

September 27 – 30, 2016, Saratov, Russia

CONFERENCES and WORKSHOPS:

Optical Technologies in Biophysics & Medicine XVIII

Laser Physics and Photonics XVIII

Spectroscopy and Molecular Modeling XVII

Nanobiophotonics XII

Microscopic and Low-Coherence Methods in Biomedical and Non-Biomedical Applications IX

Internet Biophotonics IX

Low-Dimensional Structures VI

Biomedical Spectroscopy III

Computational Biophysics and Analysis of Biomedical Data III

Nonlinear Dynamics VII

Advanced Polarization and Correlation Technologies in Biomedicine and Material Science III

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XVI

20th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

September 26 – 30, 2016, Saratov, Russia

WORKSHOPS:

Modern Optics XV

English as a Communicative Tool in the Scientific Community XV

Management of High Technologies Commercialization and Regional Innovation Systems XIII

History, Methodology and Philosophy of the Optical Education IX

Telemedicine: Opportunities, Applications, Prospects XI

SHORT OSA/SPIE COURSES

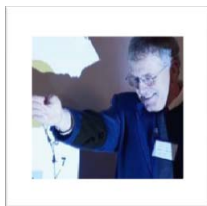
SPECIAL EVENTS:

SPIE Focus events

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

Exhibition of Optical Medical Instrumentation

Student Concert



SPONSORS



Dynasty



Russian Technology Platform
"Photonics"



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SFM'16

International Symposium Optics and Biophotonics-IV

20th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Organized by

Saratov National Research State University n.a. N.G. Chernyshevsky (SSU)

Research-Education Institute of Optics and Biophotonics, SSU

International Research-Education Center of Optical Technologies for Industry and Medicine "Photonics", SSU

Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS

Institute of Precision Mechanics and Control, RAS (IPMC RAS)

Saratov State Medical University n.a. V.I. Razumovsky

Volga Region Center of New Information Technologies, SSU

National Research Tomsk State University (TSU), Russia

Biomedical Photonics Committee of Chinese Optical Society, China

University of Oulu, Finland

SPIE Student Chapter, SSU

OSA Student Chapter, SSU

Saratov/Penza IEEE Chapter

In cooperation with

Academy of Natural Sciences, Saratov Regional Division

Russian Society for Photobiology

Saratov Science Center, RAS

Photonics4Life Consortium (**P4L**) of EC FP7: Network of Excellence for Biophotonics

Biophotonics4Life Worldwide Consortium (**BP4L**) and BiophotonicsWorld.org

EPIC – European Photonics Industry Consortium

Co-sponsored by

RFBR – Russian Foundation for Basic Research

RAS – Russian Academy of Sciences

SPIE – The International Society of Photo-Optical Instrumentation Engineers

OSA – Optical Society of America

IEEE - Institute of Electrical and Electronics Engineers

LLC SPE Nanostructured Glass Technology, Saratov

Russian Technology Platform “The Medicine of the Future”

Russian Technology Platform “Photonics”

European Technology Platform “Photonics21”

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

OJSC “RME “INJECT”, Saratov, Russia

COST Action, BM1205 (European Cooperation in Science and Technology)

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Internet group

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Ivan V. Fedosov, Saratov State University

Members

Andrey V. Slepnev, Saratov State University

Maxim A. Kurochkin, Saratov State University

Schedule of SFM-16
International Symposium “Optics and Biophotonics-IV”
20th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

September 26, Monday

September 26, Monday				
12.00-14.00	Registration			<i>Building 10, Foyer</i>
14.00-14.10	Opening of 20th International School on Optics, Laser Physics & Biophotonics Valery V. Tuchin, Saratov State University, Russia			<i>Building 10, Hall 503</i>
14.10-15.10	OSA SHORT COURSE Remote Photonic Bio-Sensing and Super Resolved Imaging Zeev Zalevsky, Bar Ilan University, Israel			<i>Building 10 Hall 503</i>
15.10-15.40	Coffee break			
15.40-16.40	OSA SHORT COURSE Remote Photonic Bio-Sensing and Super Resolved Imaging Zeev Zalevsky, Bar Ilan University, Israel			<i>Building 10 Hall 503</i>
16.40-19.00	ORAL SESSION ENGLISH Co-chairs: Alexander B. Pravdin, Svetlana V. Eremina , Saratov State University, Russia	<i>Building 10 Hall 503</i>	LECTURE/ORAL SESSION EDUCATION I Co-chairs: Boris A. Medvedev and Vladimir P. Ryabukho , Saratov State University, Russia	<i>Building 3, Room 34</i>

September 27, Tuesday

9.00-14.00	Registration							<i>Building 3, Foyer</i>
10.00-11.00	SPIE SHORT COURSE In Vivo Flow Cytometry: Fundamentals and Biomedical Applications Ekaterina I. Galanzha, University of Arkansas for Medical Sciences, USA							<i>Building 10, Hall 503</i>
11.00-11.30	Coffee break							
11.30-12.30	SPIE SHORT COURSE In Vivo Flow Cytometry: Fundamentals and Biomedical Applications Ekaterina I. Galanzha, University of Arkansas for Medical Sciences, USA							<i>Building 10, Hall 503</i>
12.30-13.50	Lunch							
13.50-14.00	Opening of International Symposium "Optics and Biophotonics-IV" Valery V. Tuchin, Saratov State University, Russia							<i>Building 3, Big Physical Hall</i>
14.00-16.00	PLENARY SESSION I Chair: Valery V. Tuchin, Saratov State University, Russia OCT in Live Embryonic Imaging, Kirill Larin , University of Houston, USA Optical Techniques for Assessing the Risk Factors of Socially Important Diseases in Blood of Human Individuals and Laboratory Animals, Alexander V. Priezzhev , Moscow State University, Russia Hyperspectral Holography - Novel Application of the FT-Spectroscopy, Sergey Kalenkov , Moscow State University of Mechanical Engineering, Research and Development Centre "Opto-Electronics", Russia							<i>Building 3, Big Physical Hall</i>
16.00-16.30	Coffee break							
16.30-18.30	INVITED/ORAL SESSION BIOPHYSICS I Chair: Alexander V. Priezzhev, Moscow State University, Russia	<i>Building 10 Main Conference Hall</i>	ORAL SESSION BIOCOMPUTING I Chair: Dmitry E. Postnov, Saratov State University, Russia	<i>Building 10, Hall 503</i>	ORAL SESSION SPECTROSCOPY I Chair: Lev M. Babkov, Saratov State University, Russia	<i>Building 3, Room 34</i>	LECTURE/ORAL SESSION EDUCATION II Co-chairs: B. Medvedev and V. Ryabukho, SSU, Russia	<i>Scientific Library Conference Hall</i>
	Special Event: Optical Metamaterials and Maxwell's Equations, Arkadi Chipouline , Institute for Microwave Engineering and Photonics, Technical University of Darmstadt, Germany							<i>Building 3, Big Physical Hall</i>
18.30-19.00	Student Concert							<i>Building 10 Main Conference Hall</i>
19.00-21.00	Welcome Party							<i>University campus</i>

September 28, Wednesday

9.00-10.00	<p>OSA SHORT COURSE</p> <p>Structural and Functional Imaging with Optical Coherence Tomography and Optical Coherence Elastography Kirill Larin, University of Houston, USA</p>	<i>Building 10, Hall 503</i>
10.00-10.30	Coffee break	
10.30-11.00	<p>OSA SHORT COURSE</p> <p>Structural and Functional Imaging with Optical Coherence Tomography and Optical Coherence Elastography Kirill Larin, University of Houston, USA</p>	<i>Building 10, Hall 503</i>
11.00-11.30	Coffee break	
11.30-13.00	<p>PLENARY SESSION II</p> <p>Chair: Alexander V. Priezhev, Moscow State University, Russia</p> <p>Optical Monitoring of Lymphatics, Ekaterina I. Galanzha, University of Arkansas for Medical Sciences, USA</p> <p>Nanoaggregates, Bubbles, Droplets, and Thin Films: The Influence of Interfacial Energies in Confined Systems, Hans Riegler, Max Planck Institute of Colloids and Interfaces, Potsdam, Germany</p> <p>Electrically Pumped Er-Si Nanoparticle Core Shell Probes for Near Infrared Bio-Imaging, Munir Nayfeh, University of Illinois at Urbana-Champaign, USA</p>	<i>Building 10 Main Conference Hall</i>
13.00-14.00	Lunch	
15.00-17.00	Social program (Volga boat tour)	

September 29, Thursday

September 29, Thursday								
9.30-10.50	PLENARY SESSION III Chair: Ekaterina I. Galanzha , University of Arkansas for Medical Sciences, USA Application Driven Polymeric Multilayer Encapsulating Envelopes: Tuning the Size and Composition , Maria Antipina , Institute of Materials Research & Engineering, A*STAR, Singapore Functional Optoacoustic Neuro-Tomography for Large-Scale Observation of Neural Activity , Daniel Razansky , Technical University of Munich, Institute for Biological and Medical Imaging, Helmholtz Center Munich, Germany							<i>Building 10 Main Conference Hall</i>
10.50-11.00	Special Event I: How to Prepare a Paper Manuscript for Publication in the Journal of Biomedical Photonics & Engineering , Valery P. Zakharov , Samara State University, Russia							
Coffee break								
11.30-13.00	INVITED/ORAL SESSION BIOPHYSICS II Chair: Daniel Razansky , Technical University of Munich, Germany	<i>Building 10 Main Conference Hall</i>	ORAL SESSION PHOTONICS I Chair: Vladimir L. Derbov , Saratov State University, Russia	<i>Building 10, Hall 503</i>	ORAL SESSION NANOBIPHOTONICS I Chair: Nikolai G. Khlebtsov , IBPPM RAS, Saratov State University, Russia	<i>Building 9, Conference Hall</i>	ROUND-TABLE DISCUSSION EDUCATION I Co-chairs: B.A. Medvedev, V.P. Ryabukho , Saratov State University, Russia	<i>Scientific Library Conference Hall</i>
Lunch								
14.00-15.30	INVITED/ORAL SESSION BIOPHYSICS III Chair: Valery P. Zakharov , Samara State University, Russia	<i>Building 10 Main Conference Hall</i>	ORAL SESSION PHOTONICS II Chair: Vladimir L. Derbov , Saratov State University, Russia	<i>Building 10, Hall 503</i>	LECTURE SESSION MODERN OPTICS Chair: Georgy V. Simonenko , Saratov State University, Russia	<i>Building 3, Big Physical Hall</i>	ROUND-TABLE DISCUSSION EDUCATION II Co-chairs: Boris A. Medvedev and Vladimir P. Ryabukho , Saratov State University, Russia	<i>Scientific Library Conference Hall</i>
	ORAL SESSION NONLINEAR DYNAMICS I Chair: Vadim S. Anishchenko , SSU Russia	<i>Building 3, Room 38</i>	LOW-DIMENSIONAL STRUCTURES Chair: Olga Glukhova , SSU, Russia	<i>Building 3, Room 34</i>	ORAL SESSION NANOBIPHOTONICS II Chair: Nikolai G. Khlebtsov , IBPPM RAS, SSU, Russia	<i>Building 9, Conference Hall</i>		
Coffee break								
PLENARY SESSION IV INTERNET BIOPHOTONICS								
16.00-17.30	Chair: Valery V. Tuchin , Saratov State University, Russia Fundamentals and Advances of Biomedical Spectroscopy , Yukihiro Ozaki , Kwansai Gakuin University, Japan Quantitative Cytopathology of Cancer , Anna N. Yaroslavsky , University of Massachusetts at Lowell, USA Nanoscale Imaging and Sensing of Live Cell , Adam Wax , Duke University, USA Label free Imaging of Cells and Tissues from Nanometer to Millimeter Scales , Gabriel Popescu , University of Illinois, Urbana-Champaign, USA In vivo optical clearing for blood flow imaging , Dan Zhu , Britton Chance Center for Biomedical Photonics, HUST, Wuhan, P.R. China							<i>Building 3, Big Physical Hall</i>
17.30-19.30	JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION. COMPETITION FOR THE BEST STUDENT POSTER AWARD Moderators: Dmitry Agafonov , Ivan V. Fedosov , Saratov State University, Russia Special event: Exhibition of Optical Medical Instrumentation							<i>Building 3, 3rd floor Hall</i>

September 30, Friday

9.00-10.40	<p>PLENARY SESSION V Chair: Kirill V. Larin, University of Houston</p> <p>Benchmarking of Devices Currently Used for Teledermatology Consultations: Optical Specifications and Limits, Marine Amouroux, Université de Lorraine – CRAN, France</p> <p>On-the-Fly Processing of Imaging Data Using the Localization of Wavelet Spectral Components via the Spline - smoothing approach, Eugene Postnikov, Kursk State University, Russia</p> <p>Optical Non-Invasive Diagnostics of Microcirculatory-Tissue Systems of the Human Body: Questions of Metrological and Instrumentation Provision, Methods and Results, Andrey Dunaev, Orel State University, Russia</p>							<i>Building 10 Main Conference Hall</i>
10.40-11.00	<p>Special Event II: How to prepare a manuscript for publication in the Journal of Biomedical Optics and make a revision following reviewers' comments, Valery V. Tuchin (JBO Topical Editor), Saratov State University, Russia</p>							
11.00-11.30	<p>Coffee break</p>							
11.30-13.00	<p>JOINT ORAL SESSION BIOCOMPUTING II/ MICROSCOPY AND LOW-COHERENCE METHODS Chair: Eugeny B. Postnikov, Kursk State University, Russia</p>	<p><i>Building 10 Main Conference Hall</i></p>	<p>ORAL SESSION MANAGEMENT U.M.N.I.K. Co-chairs: Sergey N. Sokolov, RME "INJECT" LLC, Saratov, Russia; Julia S. Skibina, Saratov State University, SPE LLC "Nanostructured Glass Technology"</p>	<p><i>Building 8, Hall 3</i></p>	<p>ORAL SESSION SPECTROSCOPY II Chair: Lev M. Babkov, Saratov State University, Russia</p>	<p><i>Building 3, Room 34</i></p>	<p>INVITED/ORAL SESSION BIOMEDICAL SPECTROSCOPY Co-chairs: Vyacheslav I. Kochubey and Alexander B. Pravdin, Saratov State</p>	<p><i>Scientific Library Conference Hall</i></p>
	<p>ORAL SESSION POLARIZATION Chair: Dmitry A. Zimnyakov, Saratov State University, Russia</p>	<p><i>Building 1, Room 459, SSTU, 77 Politechnicheskaya Str.</i></p>	<p>ORAL SESSION ELECTROMAGNETICS Chair: Michael V. Davidovich, Saratov State University, Russia</p>	<p><i>Building 8, Room 82</i></p>	<p>ORAL SESSION NONLINEAR DYNAMICS II Chair: Vadim S. Anishchenko, Saratov State University, Russia</p>	<p><i>Building 3, Room 38</i></p>	<p>ORAL SESSION TELEMEDICINE Co-chairs: V. Bakutkin, Saratov Research Institute of Rural Hygiene and Sergey Utz, Clinics of Skin and Venereal Diseases, SSMU, Russia</p>	<p><i>Clinics of Skin and Venereal Diseases, SSMU, 22 Proviantskaya Str.</i></p>
14.00-17.00	<p>Round-table discussions and closing of the School and The Symposium. The Best Student Poster Award Ceremony.</p>							

PLENARY LECTURES

September 27, Tuesday

PLENARY SESSION I

(Building 3, Big Physical Hall)

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

14.00-14.40

OCT in Live Embryonic Imaging

Kirill Larin, University of Houston, USA

14.40-15.20

Optical Techniques for Assessing the Risk Factors of Socially Important Diseases in Blood of Human Individuals and Laboratory Animals

Alexander V. Priezzhev, Moscow State University, Russia

15.20-16.00

Hyperspectral Holography - Novel Application of the FT-Spectroscopy

Sergey Kalenkov, Moscow State University of Mechanical Engineering, Research and Development Centre "Opto-Electronics", Russia

September 28, Wednesday

PLENARY SESSION II

(Building 10, Main Conference Hall)

Chair: **Alexander V. Priezzhev**, Moscow State University, Russia

11.30-12.00

Optical Monitoring of Lymphatics

Ekaterina I. Galanzha, University of Arkansas for Medical Sciences, USA

12.30-13.00

Electrically Pumped Er-Si Nanoparticle Core Shell Probes for Near Infrared Bio-Imaging

Munir Nayfeh, University of Illinois at Urbana-Champaign, USA

12.00-12.30

Nanoaggregates, Bubbles, Droplets, and Thin Films: The Influence of Interfacial Energies in Confined Systems

Hans Riegler, Max Planck Institute of Colloids and Interfaces, Potsdam, Germany

September 29, Thursday

PLENARY SESSION III

(Building 10, Main Conference Hall)

Chair: **Ekaterina I. Galanzha**, University of Arkansas for Medical Sciences, USA

9.30-10.10

Application Driven Polymeric Multilayer Encapsulating Envelopes: Tuning the Size and Composition

Maria Antipina, Institute of Materials Research & Engineering, A*STAR, Singapore

10.10-10.50

Functional Optoacoustic Neuro-Tomography for Large-Scale Observation of Neural Activity

Daniel Razansky, Technical University of Munich, Institute for Biological and Medical Imaging, Helmholtz Center Munich, Germany

**PLENARY SESSION IV
INTERNET BIOPHOTONICS**

(Building 3, Big Physical Hall)

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

16.00-17.30

Fundamentals and Advances of Biomedical Spectroscopy

Yukihiro Ozaki, Kwansei Gakuin University, Japan

Quantitative Cytopathology of Cancer

Anna N. Yaroslavsky, University of Massachusetts at Lowell, USA

Nanoscale Imaging and Sensing of Live Cell

Adam Wax, Duke University, USA

Label Free Imaging of Cells and Tissues from Nanometer to Millimeter Scales

Gabriel Popescu, University of Illinois, Urbana-Champaign, USA

***In vivo* optical clearing for blood flow imaging**

Dan Zhu, Britton Chance Center for Biomedical Photonics, Huazhong University of Science and Technology, Wuhan, P.R. China

September 30, Friday

PLENARY SESSION V

(Building 10, Main Conference Hall)

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

9.00-9.40

Benchmarking of Devices Currently Used for Teledermatology Consultations: Optical Specifications and Limits

Marine Amouroux, Université de Lorraine – CRAN, France

9.40-10.10

On-the-Fly Processing of Imaging Data Using the Localization of Wavelet Spectral Components via the Spline - Smoothing Approach

Eugene Postnikov, Kursk State University, Russia

10.10-10.40

Optical Non-Invasive Diagnostics of Microcirculatory-Tissue Systems of the Human Body: Questions of Metrological and Instrumentation Provision, Methods and Results

Andrey Dunaev, Orel State University, Russia

SPIE FOCUS EVENTS

September 29, Thursday

SPECIAL EVENT I
(Building 10, Main Conference Hall)

10.50-11.00

How to prepare a paper manuscript for publication in the Journal of Biomedical Photonics & Engineering

Valery P. Zakharov, Samara State University, Russia

THE BEST STUDENT POSTER AWARD
(Building 3, 3rd floor Hall)

17.30-19.30

Competition for the Best Student Poster Award

Jury of experts appointed by the Organizing Committee

September 30, Friday

SPECIAL EVENT II
(Building 10, Main Conference Hall)

10.40-11.00

How to prepare a manuscript for publication in the Journal of Biomedical Optics and make a revision following reviewers' comments

Valery V. Tuchin, Saratov State University, Russia

THE BEST STUDENT POSTER AWARD
In frames of Round-table discussions and closing of the School and The Symposium

15.00-15.30

Competition for the Best Student Poster Award.

Winners award

Valery V. Tuchin, Natalia A. Talaikova, Saratov State University, Russia,

International Symposium Optics and Biophotonics - IV

Conference on Optical Technologies in Biophysics & Medicine XVIII

Co-chairs: **Elina A. Genina**, Saratov National Research State University; National Research Tomsk State University (Russia) and **Valery V. Tuchin**, Saratov National Research State University; Institute of Precision Mechanics and Control RAS; National Research Tomsk State University (Russia)

Secretary: **Polina A. Timoshina**, Saratov National Research State University (Russia)

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September 27, Tuesday

INVITED LECTURE/ORAL SESSION BIOPHYSICS I

(Building 10, Main Conference Hall)

Chair: **Alexander V. Priezzhev**, Moscow State University, Russia

16.30-16.50

Invited

A novel handheld 1050 nm optical coherence tomography system for diagnostic imaging of pediatric retinoblastoma patients: technology transfer and clinical study, Oleg Nadiarnykh¹, Annette Moll², Johannes De Boer¹, ¹Department of Physics and Astronomy, Vrije University; ²Department of Ophthalmology, VU, University Medical Center, Amsterdam, Netherlands

16.50-17.10

Invited

Selection of fiber spectroscopy methods for cancer diagnostics V. Artyushenko¹, Olga Bibikova^{1,2,3,4}, U. Zabarylo⁵, I. Usenov¹, A. Bogomolov^{1,6}, T. Sakharova¹, H.-J. Eichler⁷, O. Minet⁵, ¹Art photonics GmbH, Berlin, Germany; ²Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Finland; ³Institute of Analytical and Bioanalytical Chemistry, Ulm University, Ulm, Germany; ⁴Saratov National Research State University, Saratov, Russia; ⁵Center for Radiology, Medical Physics and Optical Diagnostics, Charité-Universitätsmedizin, Berlin

Germany; ⁶Samara State Technical University, Samara, Russia; ⁷Technical University of Berlin, Institute for Optics & Atomic Physics, Berlin, Germany

17.10-17.30

Invited

New perspective of terahertz medicine development, Vyacheslav I. Fedorov, Institute of Laser Physics SB RAS, Novosibirsk, Russia

17.30-17.45

Influence of terahertz radiation on drosophila life span, Vyacheslav I. Fedorov¹, N. Weisman², ¹Institute of Laser Physics SB RAS; ²Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia

17.45-18.00

Optical study of the effect of Fe₂O₃ nanoparticles in vitro incubated with human red blood cells on their microrheological properties Andrei Lugovtsov¹, V. Kochubey², A. Priezzhev¹, Valery Tuchin^{2,3,5}, ¹Lomonosov Moscow State University; ²Research-Education Institute of Optics and Biophotonics, Saratov National Research State University; ³Tomsk State University; ⁵Institute of Precision Mechanics and Control, RAS, Saratov, Russia

18.00-18.15**Complex study of dextran mediated alteration of red blood cells mechanical properties *in vitro***

Natalia Rovnyagina¹, K. Lee², D. Flormann³, E. Shirshin¹, C. Wagner³, T. Tikhonova¹, A. Popov², I. Meglinski², A. Priezzhev¹, ¹Lomonosov Moscow State University, Russia; ²University of Oulu, Finland; ³Experimental Physics, Saarland University, Saarbrücken, Germany

18.15-18.30**Red blood cells interaction strength in norm and pathology measured *in vitro* by laser tweezers**

Alexey Semenov¹, K. Lee², A. Lugovtsov¹, A. Priezzhev¹, ¹Lomonosov Moscow State University, Russia; ²University of Oulu, Finland

September 29, Thursday

**INVITED LECTURE/ORAL SESSION
BIOPHYSICS II**

(Building 10, Main Conference Hall)

Chair: **Daniel Razansky**, Technical University of Munich, Germany

11.30-11.50

Invited

Skin cancer diagnostics

Valery P. Zakharov, Samara National Research University, Russia

11.50-12.05

Serum albumin molecular mobility in water solutions containing iron (III) chloride, Victoria Gibizova, V. Sapozhnikov, K. Fedorova, G. Petrova, Moscow State University, Russia

12.05-12.20

Diagnostics of anoxygenic phototrophic microorganisms using spectral methods: depth distribution of differently pigmented bacteria in natural lakes and estimation of the amount of bacteriochlorophylls per cell, Anna Zhiltsova¹, A.V. Kharcheva¹, P.M. Norin¹, E.D. Krasnova¹, , Nikolai Pertsov², O.N. Lunina³, A. Savvichev³, S. Patsaeva, ¹Lomonosov Moscow State University, Faculty of Physics; ²White Sea Biological Station, Republic Karelia; ³Winogradsky Institute of Microbiology, RAS, Moscow, Russia

**INVITED LECTURE/ORAL SESSION
BIOPHYSICS III**

(Building 10, Main Conference Hall)

Chair: **Valery P. Zakharov**, Samara National Research University, Russia

14.00-14.20

Invited

Optical digital capillaroscopy provides important information for heart failure diagnosis and treatment Yury I. Gurfinkel, Maria Sasonkova, Galina Lasarenko, Research Clinical Center of Russian Railways, Moscow, Russia

14.20-14.35

The role of stress in disruption of blood-brain barrier in hypertensive rats assessed by optical and physiological methods Oxana Semyachkina-Glushkovskaya, A. Abdurashitov, A. Gekalyuk, M. Ulanova, V. Fedorova, E. Saranceva, T. Iskra, A. Sharif Esmat Sharif, V. Tuchin, Saratov National Research State University, Russia

12.20-12.35

Visualization of dynamic strains and cumulative deformations in laser reshaping of collagenous tissues using optical coherence elastography Vladimir Zaitsev¹, A. Matveyev¹, L. Matveev¹, G.Gelikonov¹, A. Omelchenko², O. Baum², E. Sobol², ¹Institute of Applied Physics, Nizhny Novgorod, RAS; ²Institute of Photonic Technologies, Centre "Crystallography and Photonics", RAS, Russia

12.35-12.50

Indirect laser surgery employing colloidal dielectric particles: field calculations and parameter optimization Nikolai Mitin, A. Pikulin, V. Kamensky, N. Bityurin, Institute of Applied Physics, RAS, Nizhny Novgorod, Russia

12.50-13.00

Porphyrazine photosensitizer with high viscosity sensitivity for application in photodynamic therapy Nina Peskova¹, N. Shilyagina¹, S. Lermontova^{1,2}, A. Brilkina¹, L. Klapshina^{1,2}, I. Balalaeva¹, ¹Lobachevsky University, Nizhny Novgorod, Russia; ²Institute of Organometallic Chemistry, RAS, Nizhny Novgorod, Russia

14.35-14.50

In vitro destruction of anterior human lens capsule by submicrosecond pulses of Yb,Er:Glass laser A.V. Belikov, S.V. Gagarsky, A.N. Sergeev, Sergey N. Smirnov, ITMO University, Saint Petersburg, Russia

14.50-15.05

Laser radiation parameters influence on geometrical dimensions of laser welding of biological tissues seam Dmitry Ryabkin, A. Gerasimenko, National Research University of Electronic Technology, Zelenograd, Russia

15.05-15.20

Melanoma and basal cell carcinoma detection with raman and fluorescence spectroscopy Ivan Bratchenko¹, D. Artemyev¹, J. Kristophorova¹, O. Myakinin¹, A. Moryatov², S. Kozlov², V. Zakharov¹, ¹Samara University; ²Samara State Medical University, Russia

15.20-15.30

Real-time Raman spectroscopy and autofluorescence analysis for *in-vivo* diagnosis of the skin neoplasms Yulia Khristoforova, I. Bratchenko, D. Artemyev, V. Zakharov, Samara University, Russia

POSTER SESSION BIOPHYSICS

(Building 3, 3rd floor Hall)

Chair (B): **Anton Sdobnov**, Saratov State University (Russia)

17.30-19.30

1B. **Temperature compensation in optical ndir methane gas detection with virtual reference channel** Andrey Konyukhov, A. Plastun, Saratov National Research State University, Russia

2B. **Model propagation of a femtosecond laser radiation in the vitreous of the human eye: experiment** Pavel Rogov, S. S. Nalegaev, V. G. Bepalov, ITMO University, Saint Petersburg, Russia

3B. **Temperature dynamics of soft tissues during diode laser cutting by different types of fiber opto-thermal converters** A. Belikov, A. Skrypnik, Sergey Smirnov, Y. Semyashkina, ITMO University, Saint Petersburg, Russia

4B. **Calibration of laser doppler anemometer** Maria Borozdova, Saratov National Research State University, Russia

5B. **Receiving and application in medicine of nanocomposites of a glaukonite** Ekaterina Selifonova, N. Scherbakova, A. Selifonov, O. Shapoval, O. Nechayeva, G. Naumova, V. Splyukhin, V. Serzhantov, R. Chernova, S. Venig, Saratov National Research State University, Russia

6B. **Investigation of corneal permeability for cement dust: prognosis for occupational safety** Darya Popova, R. Kalmykov, E. Genina, T. Kamenskikh, V. Tuchin, A. Bashkatov, Saratov National Research State University, Russia

7B. **Interaction of protoporphyrin ix-carbon nanoparticles complex with red blood cell membranes by optical microscopy method** Natalie Tkachenko, A. Doronkina, A. Pravdin, V. Tuchin, Saratov National Research State University, Russia

8B. **Study the inhibition of red blood cell haemolysis by plant antioxidants by**

optical microscopy method

Natalie Tkachenko¹, D. Klychkova¹, A. Pravdin¹, N. Navolokin², A. Bucharskaya², ¹Saratov National Research State University, Russia; ²Saratov State Medical University, Russia

9B. **Does optical clearing affect uv-riboflavin sclera crosslinking?** Marina Shvachkina, A. Pravdin, Saratov National Research State University, Russia

10B. **Transformation of polarization-optical parameters of sclera during immersion clearing** Marina Shvachkina, D. Yakovlev, A. Pravdin, D. Yakovlev, Saratov National Research State University, Russia

11B. **Characterization of dentine colour by different methods** Natalia I. Kazadaeva, Matvei Vodolagin, Alexander B. Pravdin, Leonid E. Dolotov, Valery V. Tuchin, Saratov State University, Russia

12B. **Complex analysis of metabolic and hemodynamic processes in patients with diabetes mellitus using optical non-invasive diagnostic methods** Elena Zharkikh¹, M. Filina¹, V. Dremin¹, E. Potapova¹, I. Makovik¹, E. Zherebtsov¹, A. Zherebtsova¹, A. Dunaev¹, V. Sidorov², Krupatkin A.I., Priorov ¹Orel State University; ²SPE "Lazma" Ltd.; ³Priorov Central Research Institute of Traumatology and Orthopaedics, Russia

13B. **Photothrombotic preconditioning changes the expression of MAPK family proteins in the rat brain cortex** Svetlana Demyanenko, A. Uzdensky, Southern Federal University, Rostov-on-Don, Russia

14B. **Histone H4 acetylation in the cortex and hippocampus of mice after photothrombotic infarction** Svetlana Demyanenko, V. Dzreyan, Southern Federal University, Rostov-on-Don, Russia

15B. **Localization of ubiquitin-c-terminal hydrolase L1 in brain cells at different time points after photothrombotic infarction** Svetlana Demyanenko, A. Uzdensky, Southern Federal University, Rostov-on-Don, Russia

16B. **PDT induces changes in no synthase distribution in the crayfish mechanoreceptor** Vera Kovaleva, A. Uzdensky, Southern Federal University, Rostov-on-Don, Russia

17B. **The role of autophagy in the photodynamic damage of neurons and glial cells** Elena Berezhnaya, M.

- Neginskaya, V. Nikul, A. Uzdensky, Southern Federal University, Russia
- 18B. **Photodynamic effect of radachlorin triggers phospholipase C activity in primary neurons** Maria Neginskaya, E. Berezhnaya, A. Uzdensky, Academy Of Biology And Biotechnology, Southern Federal University, Russia
- 19B. **The influence of glutamate, ATP and GABA on photo-induced death of nerve cells** Maria Neginskaya, E. Berezhnaya, A. Uzdensky, Academy Of Biology And Biotechnology, Southern Federal University, Russia
- 20B. **Optoacoustic technique for controlling laser impact during photocoagulation** Anton Lytkin¹, A. Larichev¹, S. Shmeleva¹, V. Simonova¹, A. Ardamakova², V. Sipliviy², A. Bolshunov², ¹Moscow State University; ²State Research Institute of Eye Diseases, RAS, Moscow, Russia
- 21B. **Venous occlusion monitoring by using imaging photoplethysmography** Valery Zaytsev¹, M. Volynsky¹, A. Kamshilin¹, O. Mamontov^{1,2}, ¹ITMO University; ²Federal Almazov North-West Medical Research Centre, Saint Petersburg, Russia
- 22B. **Synthesis of environmentally benign luminescent carbon dots** Alina Gvozdyuk, I. Goryacheva, Saratov National Research State University, Russia
- 23B. **Optical manipulation of non-spherical microparticles in vacuum** Alexey Porfirev¹, S. Fomchenkov¹, R. Skidanov², ¹Samara University; ²Image Processing Systems Institute—Branch of the Federal Scientific Research Centre “Crystallography and Photonics”, RAS, Samara, Russia
- 24B. **Evaluation of blood microcirculation parameters by combined use of the laser doppler flowmetry and the video capillaroscopy methods** Igor Gurov¹, M. Volkov¹, D. Kostrova¹, N. Margaryants¹, N. Erofeev², V. Dreminev³, A. Dunaev³, E. Zharkikh³, E. Zherebtsov³, I. Kozlov³, ¹ITMO University, Saint Petersburg; ²St. Petersburg State University; ³Orel State University, Russia
- 25B. **Double-frequency sub-THz source for biomedical application based on the beam piercing photonic crystal** Nikita Frolov¹, S. Kurkin¹, A. Koronovskii¹, A. Hramov², ¹Saratov National Research State University; ²Saratov State Technical University, Russia
- 26B. **Analysis of cuvette forms for Raman signal registration of albumin with different concentration** Anastasya Lykina¹, D. Artemyev¹, T. Kuzmina², I. Davydkin², V. Zakharov¹, ¹Samara National Research University, Russia; ²Samara State Medical University, Russia
- 27B. **Raman spectroscopy of human body fluids for cancers detection** Lyudmila Shamina, I. Bratchenko, D. Artemyev, O. Myakinin¹, A. Moryatov², S. Kozlov², V. Zakharov¹, ¹Samara University; ²Samara State Medical University, Russia
- 28B. **Raman spectroscopy and autofluorescence of skin data analysis using PLS and PCA** Dmitry Artemyev¹, I. Bratchenko¹, O. Myakinin¹, Y. Khristoforova¹, S. Kozlov², A. Moryatov², V. Zakharov¹, ¹Samara National Research University; ²Samara State Medical University, Russia
- 29B. **Experimental studies of hydroxyapatite using Raman spectroscopy method** P. Timchenko¹, E. Timchenko¹, E. Pisareva¹, M. Vlasov², L. Volova², Oleg Frolov¹, ¹Samara National Research University, Samara; ²Experimental Medicine And Biotechnologies Institute Of The Samara State Medical University, Samara, Russia
- 30B. **Spectral assessment of influence of lyophilization process in manufacture of implants based on bacterial cellulose** E. Timchenko, P. Timchenko, E. Pisareva, M. Vlasov., N. Klenova, V. Revin, Anna Asadova, Samara National Research University, Russia
- 31B. **Experimental studies of influence of oil hydrocarbons on the plants' optical characteristics** Ekaterina Selezneva, E. Timchenko, P. Timchenko, N. Tregyb, Samara National Research University, Russia
- 32B. **Evaluation of the potential of the Raman spectroscopy for minimally invasive diagnosis of hyaline articular cartilage** P. Timchenko¹, E. Timchenko¹, L. Volova², D. Dolgyshkin², Maria Markova¹, ¹Samara National Research University, Russia; ²Samara State Medical University, Russia
- 33B. **Using of raman spectroscopy method in assessment of extracellular matrix based on heart valves** E. Timchenko¹; P. Timchenko¹, L. Volova², S. Pershutin¹, Polina Shalkovskaya¹, ¹Samara National Research University; ²Experimental Medicine and Biotechnologies Institute of the Samara Medicine University, Russia

- 34B. **Studies of bone condition after oophorectomy using Raman spectroscopy method** E. Timchenko¹; P. Timchenko¹, L. Volova², Yana Fedorova¹, A. Asadova¹,¹Samara National Research University, Russia; ²Samara State Medical University, Russia
- 35B. **Homogeneous FRET-based system for rapid detection of food and feed contaminants** Olga Goryacheva¹, S. Saeger², I. Goryacheva¹, N. Beloglazova²¹Saratov State University, Russia; ²Ghent University, Belgium
- 36B. **Biodegradable polymeric submicron capsules for triggering cell activity** Yana Tarakanchikova^{1,2}, I. Skovorodkin, G. Sukhorukov³, I. Meglinski², A. Popov²,¹University of Oulu, Finland; ²Sararov State University, Russia; ³Queen Mary University of London, UK
- 37B. **Visualization of hyperspectral holograms of biosamples by means of virtual reality systems** S.Kalenkov¹, G. Kalenkov², Vasily Kiselev², S. Klimenko³, N. Zaalishvili¹,¹University Of Mechanical Engineering, Russia; ²Moscow Institute Of Physics and Technology (State University); ³Institute of Computing for Physics and Technology, Russia
- 38B. **Laser-induced breakdown detection of metal colloid particles in aqueous environment** Evgeny Shirshin, V. Fadeev, Moscow State University, Russia
- 39B. **Raman microscopy of porcine skin by optical clearing treatment** Anton Sdobnov^{1,2}, M. Darwin³, J. Lademann³, Valery Tuchin^{1,2},¹National Research Saratov State University, Russia, ²University of Oulu, Finland; ³Charite-Universitaetsmedizin Berlin, Germany
- 40B. **Hyperspectral imaging technique for skin chromophores and blood oxygenation assessment** Evgeny Zherebtsov^{1,2}, Lucas Surazynski¹, A. Popov¹, I. Meglinski¹,¹University Of Oulu, Oulu, Finland; ²Orel State University, Russia
- 41B. **The influence of local pressure on evaluation parameters of skin blood perfusion and fluorescence** Evgeny Zherebtsov, K. Kandurova², Evgenia Seryogina², I. Kozlov², V. Dremine², A. Zherebtsova², A. Dunaev², I. Meglinski¹,¹University of Oulu, Finland; ²Orel State University, Russia
- 42B. **Spatial and temporal coherence effects in diffraction phase microscopy** Natalia Talaiikova, V. Ryabukho, Saratov National Research State University, Russia
- 43B. **Prototype of a tensoristor based on nanomaterials layers with single-walled carbon nanotubes** Levan Ichkitidze, V. Petuhov, A. Gerasimenko, V. Podgaetski, S. Selishchev, E. Blagov, A. Dudin, A. Pavlov, E. Kitsuk, Y. Shaman, National Research University of Electronic Technology, MIET, Zelenograd, Moscow, Russia
- 44B. **Investigation of optical clearing of rat skin ex vivo by Omnipaque 300 in the spectral range 400-2100 nm** Elizaveta Basko¹, N. Teslina¹, D. Tuchina¹, A. Bashkatov^{1,2}, E. Genina^{1,2}, V. Tuchin¹⁻³,¹Saratov National Research State University, Russia; ²Tomsk National Research State University, Russia; ³Institute of Precise Mechanics and Control, RAS, Saratov, Russia
- 45B. **Laser-triggered vasodilation as a new technique for microcirculation studies** Elena Stiukhina, M. Kurochkin, I. Fedosov, D. Postnov, Saratov National Research University, Russia
- 46B. **The effect of white blood cells' "highlighting" as a method to identify them by digital microscopy** Stanislav Torbin, V. Doubrovsky, Saratov State Medical University, Russia
- 47B. **Identification and cell counting for the sample of blood in its native state on the basis of digital microscopy** V. Doubrovski, I. Zabenkov, Stanislav Torbin, O. Tsareva, Saratov State Medical University, Russia
- 48B. **Acousto-optical method of blood typing - the comparison of application of anti-a and anti-b monoclonal antibodies with standard hemagglutinating sera** V. Doubrovski, Maria Medvedeva, Saratov State Medical University, Russia
- 49B. **Observation of collective sedimentation of spherical solids in viscous liquid by the means of digital videorecording** V. Doubrovski, K. Dvoretzki, Maria Medvedeva, L. Levanova, Saratov State Medical University, Russia
- 50B. **The temperature dependences of hemoglobin refractive index for several wavelengths** Ekaterina Lazareva^{1,2}, V. Tuchin^{1,2,3},¹Saratov National Research State University; ²Tomsk National Research State University; ³Institute of Precision Mechanics and Control, RAS, Saratov, Russia

- 51B. **Monitoring of temperature-mediated fat phase transitions by refractive-index measurements for several wavelengths** Ekaterina Lazareva^{1,2}, V. Tuchin^{1,2,3}, ¹Saratov National Research State University; ²Tomsk State University; ³Institute of Precision Mechanics and Control, RAS, Saratov, Russia
- 52B. **The study of luminescence spectra of polycyclic aromatic hydrocarbons adsorbed at the diacetate cellulose membranes** Elena Volkova, Grachia Khurshudyan, Milena Otradnova, Svetlana Rogacheva, Saratov State Technical University, Russia
- 53B. **The morphological changes in the internal organs of laboratory animals after intramuscular administration of microcapsules contained magnetite nanoparticles** Nikita A. Navolokin¹, O.S. Godage¹, A.B. Bucharskaya¹, S.V. German², V.V. Zuev¹, G.N. Maslyakova¹, G.S. Terentyuk^{1,2}, D.A.Gorin², ¹Saratov State Medical University ²National Research Saratov State University
- 54B. **Investigation of kinetics of *ex vivo* skin geometrical parameters at the skin optical clearing by glycerol solutions with different concentrations** Vadim D. Genin, Darya K. Tuchina, Elina A. Genina, Valery V. Tuchin, Alexey N. Bashkatov, Saratov State University, Russia
- 55B. **The effect of field compression on optical and physiological characteristics of biological tissue in the condition of *in vivo* and *in vitro*** Inara Nakhaeva, O. Zyuryukina, M. Mohammad, Y. Sinichkin, Saratov National Research State University, Russia
- 56B. **Evolution of water content change in biotissue under external mechanical compression (*in vivo* and *in vitro* experiments)** Mohammed R. Mohammed, Saratov State University, Russia Inara A. Nakhaeva, Saratov State University, Russia Olga A Zyuryukina, Saratov State University, Russia Yury P. Sinichkin, Saratov State University, Russia
- 57B. **Transfollicular delivery of microparticles into skin *in vivo* and *ex vivo*** Sergey M. Zaitsev¹, Yulia Svenskaya¹, Olga I. Guslyakova¹, Elina A. Genina^{1,2}, Georgy S. Terentyuk³, Alla B. Bucharskaya³, Alexey N. Bashkatov^{1,2}, Nikita A. Navolokin¹, Valery V. Tuchin^{1,2,4}, ¹Saratov National Research State University; ²Tomsk State University; ³Saratov State Medical University; ⁴Institute of Precision Mechanics and Control, RAS, Saratov, Russia
- 58B. **Impact of microablation of epidermis on skin optical clearing *in vivo*** Natalia Ksenofontova¹, Georgy S. Terentyuk², Alexey N. Bashkatov^{1,3}, Alla B. Bucharskaya², Valery V. Tuchin^{1,3,4}, Elina A. Genina^{1,2}, ¹Saratov National Research State University; ²Saratov State Medical University; ³Tomsk State University; ⁴Institute of Precision Mechanics and Control, RAS, Saratov, Russia
- 59B. **Magnetohydrodynamic blood flow in a narrow tube** Samia Salem, The Faculty of Science, Benha University, Egypt

Workshop on Laser Physics and Photonics XVIII

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

Secretary: **Andrey I. Konyukhov**, 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 Technical 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)

September 29, Thursday

ORAL SESSION PHOTONICS I (Building 10, Hall 503)

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

11.30-11.40

Electromagnetically induced disintegration and polarization plane rotation of laser pulses

Oleg Parshkov, Anastasia Kochetkova, Victoria Budyak, Yuri Gagarin State Technical University of Saratov, Russia

11.40-11.50

Geometrization of Maxwell's equations in the construction of optical devices

D.S. Kulyabov, A.V. Korolkova, L.A. Sevastianov, M.N. Gevorkyan, A.V. Demidova, RUDN University & LIT JINR, Russia

11.50-12.00

The anisotropy-induced lateral casimir effect – a driving force from nothing

Igor Nefedov¹, Miguel Rubi², ¹ITMO University, Russia, ²University of Barcelona, Spain

12.00-12.10

Dynamics of two superconducting qubits interacting with two different quantum resonator

Eugene Bashkirov, Samara University, Russia

12.10-12.20

Sustainable entangled state of two qubits under laser field irradiation

Mark Shleenkov, Alexander Biryukov, Samara University, Russia

12.20-12.30

Spin and orbital angular momentum of twisted light

Alexander V. Gorokhov, Samara National Research University, Russia

12.30-12.40

Dynamical symmetry, squeezing and many-photon correlations in spontaneous parametric down-conversion

Alexander V. Gorokhov, Samara National Research University, Russia

12.40-12.50

Three-body scattering model: diatomic homonuclear molecule and atom

Sergue Vinitsky¹, A.A. Gusev¹, O. Chuluunbaatar¹, V.L. Derbov², P.M. Krassovitskiy³, ¹Joint Institute for Nuclear Research, Dubna, Russia, ²Saratov State University, Saratov, Russia, ³Institute of Nuclear Physics, Almaty, Kazakhstan

ORAL SESSION PHOTONICS II (Building 10, Hall 503)

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

14.00-14.10

Raman scattering by clusters of silver nanoparticles

Elizaveta I. Konstantinova¹, A.Yu. Zyubin², V.A. Slezhkin¹, V.V. Bryukhanov^{2,3}, ¹Kaliningrad State Technical University, Russia; ²Immanuel Kant Baltic Federal University, Russia; ³Centre for Laser Nanotechnologies and Information Biophysics

14.10-14.20

Vortex lenses for optical micromanipulation

Sofia Ganchevskaya, Samara University, Russia

14.20-14.30

Relaxation of two- and three-level atoms via master equations averaged over stochastic field realizations

Victor Mikhailov, Nikolay Troshkin, Samara National Research University, Russia

14.30-14.40

Unusual dynamics of the electronic spin polarization in EPR comagnetometer

Evgenij Popov, K. Barantsev, A. Litvinov, Peter the Great Saint-Petersburg polytechnic university, Russia

14.40-14.50

Arrays of photonic jets generated by close-packed monolayers of spherical and spheroidal dielectric particles deposited on a substrate

Nikolai Mitin, A. Pikulin, N. Bityurin, Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia

14.50-15.00

Numerical modelling of quantum transitions within the functional integration formalism

Yana Degtyareva, Alexander Biryukov, Samara University, Russia

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION (Building 3, 3rd floor Hall)

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

17.30-19.30

1P. Influence of red laser irradiation and photosensitizers Photoditazine and Dimegin on the growth of methicillin-resistant strain of Staphylococcus aureus

G.E. Brill, A.V. Egorova, I.O. Bugaeva, E.S. Tuchina, O.V. Ushakova, G.V. Ponomaryov, Saratov State Medical University, Saratov State University, Saratov State Technical University, Russia

2P. Reflection spectra of 1D dielectric photonic crystals with defect layer of active heterogeneous metal-dielectric medium

Darya A. Maksina, Vasily F. Nazvanov, Saratov State University, Russia

3P. Spectra of absorption and scattering cross-sections of double-layer metal nanoparticles with the shell of amplifying heterogeneous metal-dielectric medium

Niyaz Sh. Gimadeev, Vasily F. Nazvanov, Saratov State University, Russia

4P. Lagrangian representation of Maxwell's equations in the formalism of fiber bundles for the needs of optoelectronics

D.S. Kulyabov, A.V. Korolkova, L.A. Sevastianov, G. Eferina, T.R. Velieva, RUDN University, Russia

5P. Slicing of photonic band-gap of low-contrast solid-core bandgap fibre

Andrey Konyukhov, Alexander Plastun, Sergey Zarkov, Petr Mavrin, Saratov State University, Russia

15.00-15.10

Density of states in complex cavity with hyperbolic medium and super-planckian thermal emission

Olga Kozina¹, Leonid Melnikov², Igor Nefedov³, ¹Saratov Branch of the Kotel'nikov Institute of Radio-Engineering and Electronics Electronics of RAS Russia, ²Saratov State Technical University Russia, ³Aalto University, School of Electrical Engineering, Finland

15.10-15.20

The use of the expanding coordinate system for a numerical simulation of a rabbit experiment

Vladislav Serov, Saratov State University, Russia

6P. Coherence properties of optical solitons generated in dispersion oscillating fibers

Andrey Konyukhov, Leonid Melnikov, Vladislav Baranovsky, Petr Mavrin, Saratov State University, Saratov State Technical University, Russia

7P. Optical reflection spectra of the structures with surface plasmons, excited at the metal - amplifying heterogeneous medium boundary

Andrey Andreev, Saratov National Research State University, Russia

8P. Mathematical synthesis of the thickness profile of the waveguide luneburg lens by adiabatic waveguide modes method

Edik Ayrjan, Joint Institute for Nuclear Research, Genin Dashitsyrenov, Konstantin Lovetskiy, Anton Sevastianov, Leonid Sevastianov, Peoples' Friendship University of Russia, Russia

9P. The numerical-analytical implementation of the cross-sections method to the open waveguide transition of the "horn" type

Dmitry Divakov, Dmitry Malykh, Leonid Sevastianov, Anastasia Tyutyunnik, Peoples' Friendship University of Russia, Russia

10P. Mathematical model of image sensor in digital holography

Konstantin Grebenyuk, Saratov State University, Russia

11P. Fields calculation in the "horn" type waveguide transition in the single-mode approximation of the cross-sections method

Migran Gevorkyan, Dmitry Kulyabov, Konstantin Lovetskiy, Anton Sevastianov, Leonid

- Sevastianov, Peoples' Friendship University of Russia, Russia
- 12P. **Entanglement in two-atom tavis-cummings model with raman transitions** Michail Evseev, Eugene Bashkurov, Samara State University, Russia
- 13P. **Dynamics of two N-level atoms (N=2,3) in nonideal cavities** S.N. Agapov, A.V. Gorokhov, Samara National Research University, Russia
- 14P. **Hamiltonian representation of Maxwell's equations in the formalism of fiber bundles for the needs of optoelectronics** D.S. Kulyabov, RUDN University & LIT JINR, A.V. Korolkova, RUDN University, L.A. Sevastianov, RUDN University & BLTP JINR, E.G. Eferina, RUDN University, T.R. Velieva, RUDN University, Russia
- 15P. **Emergence of multistability and quasi-periodicity in an optoelectronic oscillator** Maksim Balakin, Sergey Astakhov, Anton Dvorak, Alexander Kochanov, Vladimir Astakhov, Yuri Gagarin State Technical University of Saratov, Russia
- 16P. **Simulation of resonance focusing of light by dielectric cylinder with a square section** Elena S. Kozlova, Victor V. Kotlyar, IPSI RAS, Russia
- 17P. **3D-simulation of silicon micro-ring resonator with COMSOL** Sergey Degtyaryov, Samara State Aerospace University, Russia
- 18P. **The effect of the "fast" light in the large-sized carbon nanostructures in the nanosecond time range** Vladislav Ju. Gribkov, Rimma Sh. Zatrudina, Volgograd State University, Russia
- 19P. **Research the formation of thin-walled glass sphere during the laser ablation of ceramic** Daria Dobrina, Dmitry Sinev, Anastasia Strusevich, Vadim Veiko, ITMO University, Russia
- 20P. **Optical discharge on the surface of transparent dielectric induced and maintained by laser irradiation** Valery V. Romanov, Andrei A. Samokhvalov, Department Laser Technologies and Systems, ITMO University, Russia
- 21P. **Study of laser radiation detection by matrix sensor based on array carbon nanotubes** Aleksandr Polokhin, A.Yu. Gerasimenko, National Research University of Electronic Technology, Russia; E.P. Kitsyuk, Institute of Nanotechnology of Microelectronics, Scientific-Manufacturing Complex "Technological Centre"; A.P. Orlov, Institute of Nanotechnology of Microelectronics of the RAS, Kotel'nikov Institute of Radio-engineering and Electronics, RAS; Yu.P. Shaman, Scientific-Manufacturing Complex "Technological Centre"; A.A. Pavlov, Institute of Nanotechnology of Microelectronics, RAS, Scientific-Manufacturing Complex "Technological Centre, Russia
- 22P. **Development of protection methods against product falsification by creating special marks on its surface by laser oxidation and structuring** Valery V. Romanov, Roman Yatsuk, Michael Moskvin, Galina Odintsova, Julia Karlagina, Yaroslava Andreeva, ITMO University, Russia
- 23P. **Inelastic soliton collisions under effect of stimulated Raman scattering** Andrey Konyukhov, Sergey Zarkov, Petr Mavrin, Saratov State University, Russia
- 24P. **Transmitting subwavelength azimuthal micropolarizer** Sergey S. Stafeev, Image Processing Systems Institute, Russia, Anton G. Nalimov, Image Processing Systems Institute, Russia, Liam O'Faolain, School of Physics and Astronomy of the University of St. Andrews, Scotland, Maria V. Kotlyar, Samara National Research University, Russia, Victor V. Kotlyar, Image Processing Systems Institute, Russia
- 25P. **Spectral kinetic features of electron excitation energy transfer between the clusters of silver nanoparticles and rhodamine 6G molecules at the silica surface** N.S. Tikhomirova, Kaliningrad State Technical University, I.G. Samusev, Immanuel Kant Baltic Federal University, V.A. Slezhkin, Kaliningrad State Technical University, A.Yu. Zyubin, V.V. Bryukhanov, Immanuel Kant Baltic Federal University, J.A. Evtushenkov, Immanuel Kant Baltic Federal University, Russia
- 26P. **The regenerative and superregenerative amplifications of the ultrashort laser pulses** M.S. Baranov, V.N. Khramov, Volgograd State University, Russia
- 27P. **Entanglement of three superconducting qubits interacting with quantum electromagnetic field in a coplanar cavity** Ekaterina Averchenko, Eugene Bashkurov, Samara University, Russia
- 28P. **Entanglement between two atoms successively passing a thermal cavity taking into account detuning and atomic coherence** Eugene Bashkurov, Michail Evseev, Tatyana Mastyugina, Samara University, Russia
- 29P. **Application of libs-analysis in checking of electronic devices** Elena Surmenko, Ivan Popov, Dmitry Bessonov, Tatiana Sokolova, Saratov State Technical University, Russia

- 30P. **The effect of «fast» light in the carbon nanostructures in the nanosecond range of pulsewidth** Rimma Sh. Zatrudina, Vladislav Yu. Gribkov, Volgograd State University, Russia
- 31P. **Transmission of evanescent waves in a multimode chalcogenide fiber immersed into a crude oil** Svetlana Korsakova, Elena Romanova, Saratov State University; Vladimir Shiryaev, Alexander Pushkin, Alexander Velmuzhov, Institute of Chemistry of High Purity Substances, RAS, Nizhny Novgorod, Russia
- 32P. **Photo-induced refractive index change in a chalcogenide glass sample studied with the femtosecond resolution in time** Georgy Vasilyev, Semen Evseiko, Elena Romanova, Saratov State University, Russia
- 33P. **Decorrelation effects in digital holographic interferometry of scattering objects** Petr Ryabukho, Saratov State University; Lyudmila Maximova, Institute of Precision Mechanics and Control, RAS; Sergey Savonin, Vladimir Ryabukho, Saratov State University, Russia
- 34P. **The method of phase-shifting of spatial spectrum field in digital speckle-photography for determining the sub-pixel microdisplacements of speckle-structure** Ludmila A. Maksimova, Institute of Precision Mechanics and Control, RAS; Petr V. Ryabukho, Saratov State University; Natalia Y. Mysina, Institute of Precision Mechanics and Control, RAS; Vladimir P. Ryabukho, Saratov State University, Institute of Precision Mechanics and Control, RAS, Saratov, Russia
- 35P. **Effects of mutual spatial-temporal coherence of wave fields in optical interferometer with amplitude division** Dmitry Lyakin, Institute of Precision Mechanics and Control, RAS, Petr Ryabukho, Saratov State University, Russia, Vladimir Ryabukho, Saratov State University and Institute of Precision Mechanics and Control, RAS, Saratov, Russia
- 36P. **Digital holographic interferometry to study the effect of thermal cycles and mechanical impacts on functional elements of electronic board** Bogdan Grizbil, Petr Ryabukho, Institute of Precision Mechanics and Control, RAS, Saratov State University; Alexander Yakunin, Institute of Precision Mechanics and Control, RAS; Vladimir Ryabukho, Institute of Precision Mechanics and Control, RAS, Saratov State University, Russia
- 37P. **Numerical modeling of spatio-temporal dynamics in fiber lasers** Vadim Razukov, Leonid Melnikov, Yulia Mazhirina, Sergey Sukhanov, Saratov State Technical University, Russia
- 38P. **Tunable excitons in gated graphene systems** Anahit Djotyan, Artak Avetisyan, Department of Physics, Yerevan State University, Armenia; Konstantinos Mouloupoulos, Department of Physics, University of Cyprus, Cyprus
- 39P. **Stabilization of enhanced field emission of the DLC film structure in conditions of field localization** N.P. Aban'shin, Volga-Svet Co. Ltd.; G.G. Akchurin, Saratov State University; Yu.A. Avetisyan, Institute of Precision Mechanics and Control, RAS; A.P. Loginov, D.S. Mosiyash, Volga-Svet Co. Ltd.; A.N. Yakunin, Institute of Precision Mechanics and Control, RAS, Saratov, Russia

INTERNET REPORTS

1. **Scattering of light on photo-induced micro-scale susceptibility gratings** Vitaly Smirnov, Liubov Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS, Faculty of Informational Technologies of NSUEM, Russia
2. **Influence of He-Ne laser illumination on lifetime of photo-induced micro-scale susceptibility gratings in oxide glass** Liubov Vostrikova, Vitaly Smirnov, Rzhanov Institute of Semiconductor Physics SB RAS, Faculty of Informational Technologies of NSUEM, Russia
3. **Flat tape anisotropic micro-structures in oxide glass** Liubov Vostrikova, Vitaly Smirnov, Rzhanov Institute of Semiconductor Physics SB RAS, Faculty of Informational Technologies of NSUEM, Russia
4. **Analysis of the structures of photonics and nanoplasmonics by method of integral equations** Michael Davidovich, Saratov State University, Russia
5. **About the role of field localization and features of electron transport in the DLC film structure for application in electronic and photonic devices** N.P. Aban'shin¹, G.G. Akchurin², Yu.A. Avetisyan³, A.P. Loginov¹, D.S. Mosiyash¹, A.N. Yakunin⁴, ¹Volga-Svet Co. Ltd., ²Saratov State University, ³Institute of Precision Mechanics and Control, RAS, ⁴Institute of Precision Mechanics and Control, RAS, Russia

Conference on Spectroscopy and Molecular Modeling XVII

Workshop Chairs **Lev M. Babkov, Kirill V. Berezin** Saratov State University (Russia)

Secretaries **Galina N. Ten** Saratov State University (Russia)

International Program Committee **Lev M. Babkov**, Saratov State University (Russia), **Michael D. Elkin**, Saratov State Technical University Saratov (Russia), **Lev A. Gribov**, Institute named by V. I. Vernadskiy 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), **Alexander V. Gorohov**, Samara State University (Russia)

September 27, Tuesday

ORAL SESSION SPECTROSCOPY I

Chair **Lev M. Babkov**, Saratov State University,
Saratov (Russia)

16.30–16.40

Retardation effect in the recoil corrections to the fine shift of S energy levels of hydrogen-like atoms
Svetlana Churochkina, Anastasiya Udalova, Saratov State University, Russia

16.40 – 16.50

Imaging spectrometer without lens
V. Blank, Samara University, Russia

16.50–17.00

The dependence of the mechanical properties on micropore sizes of sorbents
Anna Kolesnikova, Saratov State University, Russia

17.00–17.10

Manipulation of mechanical properties of carbon composite
Marguerita Mazepa, Anna Kolesnikova, Saratov State University, Russia

17.10 – 17.20

Investigation of intermolecular interaction and conformational mobility in biological compounds
Lev Babkov, Saratov State University, Russia, Nadezhda Davydova, Institute of Physics, NAS Ukraine, Ukraine, Irina Ivlieva, Saratov State University, Russia, Maya Korolevich, Belarusian State Agrarian Technical University, Belarus

17.20 – 17.30

Experimental FTIR spectra and polymolecular quantum model of plant cell walls
K.V. Berezin (Saratov State University, Russia), A.M. Lihter (Astrahan State University, Russia), I.T. Shagautdinova (Astrahan State University, Russia), M.L. Chernavina (Saratov State University, Russia)

17.30 – 17.40

Grapeseed oil composition studied by FTIR spectroscopy and theoretical modeling

Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, Astrahan State University, V.V. Nechaev, Saratov State Technical University, M.L. Chernavina, Saratov State University, Russia

17.40 – 17.50

Interaction of collagene and some molecular cleaning agents for optical processing human tissue. Study by molecular dynamics and quantum chemistry

Kirill Berezin, Saratov State University, K.N. Dvoretzkiy, Saratov State Medical University, V.V. Nechaev, Saratov State Technical University, M.L. Chernavina, Saratov State University, Russia

17.50 – 18.00

Conformational analysis and vibrational spectra modeling of flavonoids by the DFT method: apigenine

Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, Astrahan State University, Russia

18.00 – 18.10

Experimental investigation natural and artificial dehydration of citrus peel by the FTIR spectroscopy

Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, Astrahan State University, Russia

18.10 – 18.20

Structural parameters and thermodynamics of molecular water clusters

Kirill Berezin, O.V. Kozlov, Saratov State University, Russia

September 29, Thursday

POSTER SESSION SPECTROSCOPY

(Building 3, 3rd floor Hall)

Chair(S): **Kirill V. Berezin** Saratov State University,
Russia

17.30-19.30

1S. Research of the stoichiometric heterogeneity of lithium niobate crystals by IR spectroscopy, Ekaterina Pantelej, V.D. Parinin, Samara National Research University, Samara, Russia

2S. Experimental vibrational IR and Raman spectra quercetin and its theoretical interpretation, Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, Astrahan State University, A.V. Novoselova, Saratov State University, Russia

3S. Normal modes analysis of Raman spectra and hydroxyl group conformational mobility of flavonoids: Luteolin and chrysin, Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, Astrahan State University, Russia, A.V. Novoselova, Saratov State University, Russia

4S. Comparative analysis structure and vibrational spectra hesperitine and its glycoside, Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, Astrahan State University, Russia

5S. Application of FTIR spectroscopy for study of newsprint sheets: molecular model and theoretical interpretation, Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, Astrahan State University, M.L. Chernavina, Saratov State University, Russia

6S. Barriers to internal rotation, structure and molecular modeling of vibrational spectra of propanediol and ethylene glycol, Kirill Berezin, Saratov State University, K.N. Dvoretzkiy, Saratov State Medical University, V.V. Nechaev, Saratov State Technical University, Russia

7S. Molecular models of cellulose, pectine, lignine. DFT study of structure and spectral properties, Kirill Berezin, M.L. Chernavina, Saratov State University, A.M. Lihter, I.T. Shagautdinova, O.N. Grechukhina, Astrahan State University, Russia

8S. Taking into account of bond water at modeling of polymer dietary fibers: Thermodynamics and spectral properties, Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, O.N. Grechukhina, Astrahan State University, Russia

9S. Experimental investigation and molecular simulation of FTIR spectra of carota, Kirill Berezin, Saratov State University, A.M. Lihter, I.T. Shagautdinova, Astrahan State University, Russia

10S. DFT study of the effect of metall cation to the spectral characteristics of hydroxy anthraquinones, Kirill Berezin, Saratov State University, A.M. Lihter, E. M. Antonova, Astrahan State University, Russia

11S. Theoretical study of hydroxy-aza-anthraquinones by DFT method, Kirill Berezin, Saratov State University, A.M. Lihter, E. M. Antonova, Astrahan State University, Russia

12S. Density functional theory study of structural characterization and spectral properties of violoxanthine, Kirill Berezin, Saratov State University, A.M. Lihter, E.A. Dzhalmuhambetova, Astrahan State University, Russia

13S. Computational study of structure and vibrational spectra of alpha-, beta-carotenes, Kirill Berezin, Saratov State University, A.M. Lihter, E.A. Dzhalmuhambetova, Astrahan State University, Russia

14S. Influence of methoxy-group conformations on structure and vibrational states of isoflavones, Kirill Berezin, Saratov State University, A.M. Lihter, T.A. Egorenkova, E.U. Stepanovich, Astrahan State University, Russia

15S. Santal monohydrate. DFT study of structure and thermodynamics, Kirill Berezin, O.V. Kozlov, Saratov State University, A.M. Lihter, T.A. Egorenkova, Astrahan State University, Russia

16S. Influence of hydrogen bond on IR spectra and structure of nanodiaminds and DNA nucleobases molecular complex, Inna L. Plastun, Andrey N. Bokarev, Ksenya E. Agandeeva, Saratov State Technical University, Russia

17S. H-bond, structure and IR spectrum of substituted glucose, Lev Babkov, Irina Ivlieva, Saratov State University, Russia, Maya Korolevich, Belarusian State Agrarian Technical University, Belarus

18S. Vibration spectra and H-bond in the triphenylphosphite, Lev Babkov, Saratov State University, Russia, Nadegda Davydova, Institute of Physical, NAS Ukraine, Irina Ivlieva, Saratov State University, Russia

19S. Distribution of different types of green sulfur bacteria in separating from the White Sea waters: comparison of winter and summer periods, Anastasia Kharcheva, Anna Zhiltsova, Olesya Kalmatskaya, Nikita Shchelkunov, Faculty of

Physics, Lomonosov Moscow State University, Russia, Elena Krasnova, Nikolai Pertsov, White Sea Biological Station, Faculty of Biology, Lomonosov Moscow State University, Svetlana Patsaeva, Faculty of Physics, Lomonosov Moscow State University, Russia

20S. **Protein-vaterite system: loading efficiency versus loading capacity**, Albina Alebastrova, SSU, Russia

21S. **Modeling of vibrational spectra of halogenated benzophenone by density functional theory method**, Lev Babkov, Vitaly Boykov, Saratov State University, Nadezda Davydova, Inst. of Phys., NAS Ukraine, Kyiv, Ukraine

22S. **Numerical solution of inverse problem of chemical kinetics of hydrocarbons**, Roman Safonov, Anna Kolesnikova, Anton Pilipenko, Sergey Ignatiev, Raisa Kuzmina, Saratov State University, Russia

23S. **RNA world. From the first synthesis of prebiotic molecules to self-replication RNA**, Anatoly Abalymov, Irina Vidyasheva, Institute of Nanostructured and Biosystems, Alexey Kletsov, Dmitry Ovsyannikov, Saratov State University, Russia

24S. **Spectral characteristics and intermolecular interactions of flavonoids from stonecrop extracts**, Valentina Plastun, SSMU, K.E. Agandeeva, SSTU, N.A.Durnova, SSMU, I.L. Plastun, SSTU, G.A. Afanaseva, SSMU, Russia

25S. **Muonic hydrogen in the quasipotential approach**, N. Boykova, I. Svyatkin, SSU, Russia

September 30, Friday

**ORAL SESSION
SPECTROSCOPY II
(Building 3, Room 34)**

Chair: **Lev M. Babkov**, Saratov State University,
Russia

11.30 – 11.40

The quality of modern spectroscopic information in models of radiation transfer in simulation of climate processes

K.M. Firsov, Volgograd State University, T.Yu. Chesnokova, V.E. Zuev Institute of Atmospheric Optics, Siberian Branch, Russian Academy of Sciences, Russia

11.40 – 11.50

Conformational Changes of Serum Albumins Monitored by Photophysical Parameters of Tyrosine Residues

Nadezda Zhdanova, Evgeny Shirshin Victor Fadeev (Moscow State University, Faculty of Physics, Russia)

11.50 -12.00

Artificial Neural Networks as an Instrument to Solve Inverse Problems in Spectroscopy: Determination of Ionic Composition of an Aqueous Solution

Alexander Efitorov, Sergey Burikov, Kirill Laptinskiy, Tatiana Dolenko, Sergey A. Dolenko, D.V.Skobel'tsyn Institute of Nuclear Physics, M.V.Lomonosov Moscow State University, Russia

12.00 – 12.10

Laser spectroscopy diagnostics of mineral waters with Artificial Neural Networks

Olga Sarmanova, Alexey M. Vervald, Sergey A. Burikov M.V. Lomonosov Moscow State University, Sergey A. Dolenko, Alexander O. Efitorov, D.V. Skobel'tsyn Institute of Nuclear Physics, Kirill A. Laptinskiy, Ivan V. Plastinin, Ekaterina N. Khusainova, Tatiana A. Dolenko, M.V. Lomonosov Moscow State University, Russia

12.10 – 12.20

Interpretation of vibrational spectra of zwitter-ionic form of tryptophan

G. N. Ten, Saratov State University, N. E. Scherbakova, Russian Scientific Research Institute for Plague Control "Microbe", Saratov, V. I. Baranov, Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

12.20 – 12.30

Absorption spectra and fluorescence of tryptophan in aqueous solution

G. N. Ten, Saratov State University, N. E. Scherbakova, Russian Scientific Research Institute for Plague Control "Microbe", Saratov, V. I. Baranov, Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

12.30 – 12.40

Electronic spectra of nanotubes with different conductivity

G. N. Ten, E. M. Slepchenkova, Saratov State University, V. I. Baranov, Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

12.40 – 12.50

Algorithm for study of albumin-fullerenol interactions by laser correlation spectroscopy

Elina Nepomnyashchaya, Ekaterina Savchenko Elena Velichko, Evgenii Aksenov, Peter the Great Saint-Petersburg Polytechnic University, Russia

12.50 – 13.00

The influence of the nature of the ligand and the counterion on the spectral-luminescence properties of europium complexes

Anastasia V. Kharcheva, Faculty of Physics, Lomonosov Moscow State University, Sergey E. Bakaev, Marina D. Reshetova, Leonid A. Korotkov, Nataliya E. Borisova Faculty of Chemistry, Lomonosov Moscow State University, Svetlana V. Patsaeva, Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

Conference on Nanobiophotonics XII

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

Secretary: **Vitaly A. Khanadeev**, Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS, Russia;

International Program Committee: **Boris N. Khlebtsov**, Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS; **Dmitry Gorin**, Saratov State University; **Valery Tuchin**, Saratov State University; **Lev Dykman**, Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS; **Vladimir Bogatyrev**, Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS

September 29, Thursday

ORAL SESSION NANOBIPHOTONICS I (Building 9, Conference Hall)

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

11.30 – 11.45

Results of interaction between plasmon energy of silver nanoparticles of different origin and Bovine Serum Albumin molecules Anna Tcibulnikova¹, Natalia Myslitskaya¹, Slezhkin Vasily¹, Bryukhanov Valery², Evgeniya Zemlyakova¹, ¹Kaliningrad Technical State University; ²Baltic Federal University, Russia

11.45 – 12.00

Nonlinear optical threshold effects at interaction composite biosolders with high power laser radiation M.S. Savelyev, A.Y. Gerasimenko, L.P. Ickitidze, V.M. Podgaetsky, S.A. Tereshchenko National Research University of Electronic Technology, Russia

12.00 – 12.15

Immobilized gold nanostars on the cell culture plastic as a novel platform for enhanced laser-induced cell transfection Ekaterina Vanzha¹, Timofey Pylaev¹, Artur Prilepski¹, Boris Khlebtsov¹, Nikolai Khlebtsov^{1,2}, ¹Institute of Biochemistry and Physiology of Plants and Microorganisms (IBPPM RAS); ²Saratov State University, Saratov, Russia

12.15 – 12.30

The effect of nanoparticles Fe₂O₃ on the rate of the enzymatic reaction in the fibrinogen-thrombin model solution (according light scattering data) Marina Kirichenko, Leonid Chaikov, Lebedev Physical Institute of the RAS, Moscow, Russia

12.30 – 12.45

Investigation of biodegradation rate and hemocompatibility of composite bioconstructions Ulyana Kurilova¹, Natalia

Zhurbina¹, Irina Suetina², Marina Mezentseva², Leonid Russu², Alexander Gerasimenko¹, ¹National Research University of Electronic Technology; ²Ivanovsky Institute of Virology, Russia

12.45 – 13.00

Polyelectrolytes deposition as instrument to control division and to modify surface of bacterial cells Rybkin Iaroslav¹, Daniil Bratashov¹, Dmitry Gorin¹, Gleb Sukhorukov^{1,2}, Aleš Lapanje¹, ¹Saratov State University, Russia; ²Queen Mary University of London, UK

13.00-14.00

Lunch

ORAL SESSION NANOBIPHOTONICS II (Building 9, Conference Hall)

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

14.00 – 14.15

What use is to understand electrostatic properties of bacterial cells? Ales Lapanje¹, Iaroslav Rybkin¹, Dmitry Gorin¹, Gleb Sukhorukov^{1,2}, ¹Saratov State University, Russia; ²Queen Mary University of London, United Kingdom

14.15-14.30

Quantum dots luminesce in microstructured optical fibers modified by polyaniline Pavel Pidenko, Saratov State University, Russia

14.30 – 14.45

Plasmonic nanostars as signal enhancers for surface-enhanced vibrational spectroscopy and optical imaging Olga Bibikova^{1,2,3,4}, Julian Haas³, A. I. López-Lorente³, A. Popov^{2,5,6}, A. Bykov^{2,5,6}, M. Kinnunen², V. Tuchin^{4,6,7}, B. Mizaikoff³, I. Meglinski^{2,5,6}, ¹Art Photonics GmbH, Berlin, Germany; ²Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Finland; ³Institute of Analytical and

Bioanalytical Chemistry, Ulm University, Germany;
⁴Research-Educational Institute of Optics and Biophotonics, Saratov National Research State University, Russia; ⁵ITMO University, St. Petersburg, Russia; ⁶Interdisciplinary Laboratory of Biophotonics, Tomsk National Research State University, Russia; ⁷Institute of Precision Mechanics and Control of Russian Academy of Sciences, Saratov, Russia

14.45 – 15.00

Particle segmentation in Gwyddion: machine learning approach Daniil Bratashov, Saratov State University, Russia

15.00 – 15.15

Influence of polyelectrolyte layer coating on enhancement of SERS signal from small molecules E. S. Prikhozhenko¹, D. N. Bratashov¹, B. N. Khlebtsov², D. A. Gorin¹, G. B. Sukhorukov³, A. M. Yashchenok¹, ¹Saratov State University, Saratov, Russia; ²IBPPM RAS, Saratov, Russia; ³Queen Mary University, London, United Kingdom

15.15 – 15.30

Luminescent quantum dots: design of properties Irina Goryacheva, SSU, Russia

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION (Building 3, 3rd floor Hall)

Chair (N): **Vitaly Khanadeev**, IBPPM RAS, Russia

17.30 – 19.30

1N. Cell conductivity study of the nanocarbon coatings for artificial ligament implants Natalia Zhurbina, U.E. Kurilova, A.Yu. Gerasimenko, National Research University of Electronic Technology, Russia

2N. Transdermal route of Amygdalin delivery Alexandra Danchuk, Alexey Selifonov, Ekaterina Selifonova, Rimma Chernova, Sergey Doronin, Saratov State University, Russia

3N. Synthesis of the nonwoven material and its composite with copper nanoparticles by electrospinning methodology Alexandra Danchuk, Tatyana Mahova, Semen Mahov, Sergey Doronin, Yuriy Salkovskiy, Saratov State University, Russia

4N. The assessment of effectiveness of plasmonic resonance photothermal therapy in tumor-bearing rats after multiple intravenous administration of gold nanorods Alla Bucharskaya¹, Galina N. Maslyakova¹, Nikita A. Navolokin¹, Georgy S. Terentyuk^{1,2}, Boris N. Khlebtsov³, Nikolai G. Khlebtsov^{2,3}, Alexey N.

Bashkatov², Elina A. Genina², Valery V. Tuchin², ¹Saratov State Medical University; ²National Research Saratov State University; ³Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov, Russia

5N. Fabrication of colloidal solutions of silver nanoparticles by laser ablation under different parameters of the laser radiation and the liquid and researching of the spectra M.S. Baranov¹, V.N. Khramov¹, E.V. Khaydukov², ¹Volgograd State University, Volgograd; ²Institute on Laser and Information Technologies of the Russian Academy of Sciences, Troitsk, Russia

6N. The source of THz-radiation based on system of coupled superlattices for biomedical applications Vladimir Makarov¹, V.A. Maksimenko¹, A.G. Balanov², A.E. Hramov¹, ¹SSTU, Russia; ²Loughborough University, UK

7N. Optimization of the source of THz radiation based on the semiconductor sandwich heterostructures for medical applications Vladimir Maksimenko, Vladimir Makarov, SSTU, Russia

8N. Impact of PEG-modification on the characteristics of the silica-coated luminescent quantum dots Daniil Drozd, Valentina Gofman, Irina Goryacheva, Saratov State University, Russia

9N. Synthesis and Luminescent Properties of Carbon Dots produced from Starch and Carboxymethylcellulose Anastasiya R. Khokhlova, Mikhail Pozharov, Irina Yu. Goryacheva, Tamara V. Zakharova, Saratov State University, Russia

10N. Multicolour nanoparticles incorporated into polyelectrolyte microcontainers Anna Vostrikova, Artem Bakal, Irina Yu. Goryacheva, National Research Saratov State University, Russia

11N. Sorption of horseradish peroxidase on the inner surface of the fiber waveguides Irina Zharkova¹, Gul'sara Balkaeva¹, Andrej Shuvalov², Yuliya Skibina², Irina Goryacheva¹, ¹Saratov State University; ²Nanostructured Glass Technology, Russia

12N. The influence of physical-chemical properties of bacterial polysaccharides on the SERS spectra Tatyana Ponomaryova¹, Vitaly Khanadeev², Svetlana Minaeva³, Mikhail Tsvetkov³, Gennady Burygin², ¹Saratov State University; ²Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov; ³Institute on Laser and Information Technologies RAS, Moscow, Troitsk, Russia

- 13N. **Obtaining and characterization of antibodies to *Mycobacterium lipoarabinomannan* oligosaccharides conjugated to gold nanospheres** Elena Titanova¹, Tatyana Ponomaryova¹, Leonid Kononov², Gennady Burygin³, ¹Saratov State University; ²Zelinsky Institute of Organic Chemistry RAS; ³Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Russia
- 14N. **Non-invasive control of transport function of fluorescent colored liposomal nanoparticles** O. Stelmashchuk¹, E. Zherebtsov^{2,3}, A. Zherebtsova², E. Kuznetsova¹, A. Vinokurov¹, A. Dunaev², I. Snimshchikova⁴, A. Mamoshin^{4,5}, A. Borsukov⁵, A. Bykov³, I. Meglinski³, ¹Orel State University, Scientific-Educational Center "Biotechnology and Chemical Technologies"; ²Orel State University, Biomedical Photonics Instrumentation Group, Scientific-Educational Centre of "Biomedical Engineering", Russia; ³University of Oulu, Faculty of Information Technology and Electrical Engineering, Opto-Electronics and Measurement Techniques, Finland; ⁴Orel State University, Medical Institute, Russia; ⁵Smolensk State Medical University, Problem Scientific-Research Laboratory "Diagnostic Researches and Miniinvasive Technologies", Russia
- 15N. **Theranostic system based on hollow silver alginate containers: synthesis, encapsulation, remote release and intracellular sensor application** Ekaterina Lengert¹, Alexey Yashchenok², Anatoly Abalymov¹, Dmitry Gorin¹, Gleb Sukhorukov³, Bogdan Parakhonskiy⁴, ¹Saratov State University, Russia; ²Max Plank Institute of Colloids and Interfaces, Potsdam, Germany; ³Queen Mary University of London, London, UK; University of Ghent, Belgium
- 16N. **Biomedical potential of composite materials based on polymeric fibers coated with porous calcium carbonate** Maria Savelyeva¹, Anatoly A. Abalymov¹, German P. Lyubun¹, Ekaterina Prikhozhdenko¹, Dmitry A. Gorin¹, Bogdan V. Parakhonskiy², ¹Saratov State University, Russia; ²Ghent University, Belgium
- 17N. **Targeted smart cell delivery by using nanocomposite microcapsules containing magnetite nanoparticles** I.V. Vidyasheva, A.A. Abalymov, O.A. Mayorova, D.A. Gorin, Saratov State University, Russia
- 18N. **Study of immunogenic properties of transmissible gastroenteritis virus antigen conjugated with gold and selenium nanoparticles** Mezhenny P.V.^{1,2}, S.A. Staroverov^{2,3}, A.S. Fomin^{2,3}, A.A. Volkov^{1,2}, S.V. Kozlov¹, I.Y. Domnitsky¹, V.N. Laskavy², L.A. Dykman³, ¹Saratov State Agrarian University; ²Saratov Scientific and Research Veterinary Institute; ³IBPPM RAS, Saratov, Russia
- 19N. **The study of the therapeutic activity of the colloidal gold with silymarin in experimental hepatitis** S.A. Staroverov¹, A.S. Fomin^{1,2}, A.O. Rybin¹, A.A. Kurilova³, S.V. Kozlov³, A.A. Volkov¹, L.A. Dykman², ¹Saratov Scientific and Research Veterinary Institute; ²IBPPM RAS; ³Saratov State Agrarian University, Russia

INTERNET REPORTS

1. **Phase synchronization for light interacting on photo-induced susceptibility gratings** Liubov I. Vostrikova, Vitaly A. Smirnov, Rzhanov Institute of Semiconductor Physics SB RAS and Faculty of Informational Technologies of NSUEM, Russia
2. **Analysis of Ge concentration on harmonics generation in silicate materials** G.F. Ischenko¹, V.A. Fedotov¹, V.L. Revutsky¹, V.A. Smirnov¹, V.V. Smirnov², A.R. Sorokin¹, L.I. Vostrikova^{1,3}, ¹Rzhanov Institute of Semiconductor Physics SB RAS, Russia; ²Novosibirsk State Technical University, Russia; ³Faculty of Informational Technologies of NSUEM, Russia
3. **About peculiarities of the second harmonic generation in oxide glass** V.A. Smirnov, L.I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculty of Informational Technologies of NSUEM, Russia

Conference on Microscopy and Low-Coherence Methods in Biomedical and Non-Biomedical Applications IX

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

Secretary: **Georgy G. Akchurin**, Saratov State University, Institute of Precise Mechanics and Control RAS, Russia

International Program Committee: **Shoude Chang**, National Research Council (Canada); **Mary Dickinson**, Baylor College of Medicine (USA); **Christoph K. Hitzengerger**, University of Vienna (Austria); **Igor V. Meglinski**, University of Otago (New Zealand), Saratov State University (Russia); **Valery V. Tuchin**, Saratov State University (Russia).

September 29, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

Chair (M): **Georgy G. Akchurin**; Saratov State University (Russia), Institute of Precise Mechanics and Control RAS

17.30-19.30

- 1M. **Combined optical coherence and fluorescence microscopy based on acousto-optic spectral image filtration** Lyudmila Burmak, Alexander Machikhin Scientific and Technological Center of Unique Instrumentation of the RAS, Russia
- 2M. **Tunable spectral full-field quantitative phase measurement based on acousto-optic filtration of light** Olga Polschikova, Alexander Machikhin, Alina Ramazanova, Scientific and Technological Center of Unique Instrumentation of the RAS, Russia
- 3M. **Multimodal diagnostics of skin tumors on OCT images** Dmitry Raupov, Oleg Myakinin, Dmitry Artemyev, Ivan Bratchenko, Dmitry Kornilin, Valery Zakharov, Alexander Khramov, Samara National Research University, Russia
- 4M. **An active sphere method for volume evaluation in 3D OCT images** Kirill Ryabov¹, Oleg Myakinin¹, Arslan Guseynov², Valery Zakharov¹, Alexander Khramov¹, ¹Samara University; ²Branchevsky Eye Clinic, Samara, Russia
- 5M. **Phase contrast interference microscopy for visualization of RBC** Olga Izotova¹, Vladimir Ryabukho^{1,2}, ¹Saratov State University; ²Institute of Precision Mechanics and Control of RAS, Russia

6M. **Characterizing single red blood cells properties by optical tweezers in combination with diffraction phase microscopy** Natalia Talaikova^{1,2}, Kisung Lee^{1,3}, Francois Yaya^{1,4}, A.V. Priezzhev³, Igor Meglinski¹, Alexey Popov¹, ¹University of Oulu, Finland; ²Saratov State University, Russia; ³Lomonosov Moscow State University, Russia; ⁴Jean Monnet University, Saint Etienne, France

7M. **Effect of numerical aperture of objective on the period of interference fringe and polychromatic interference pattern in interference microscopy** Anton Dyachenko^{1,2}, Vladimir Ryabukho^{1,2}, ¹Saratov State University; ²Institute of Precision Mechanics and Control of RAS, Saratov, Russia

8M. **Dye injection based microangiography of chicken embryo vasculature** Anton Namykin, E. Stiukhina, Dmitriy Postnov, Ivan Fedosov, Valery Tuchin Saratov State University, Russia

9M. **Measurement of trap stiffness during optical clearing of a RBC** Oleg Grishin, Ivan Fedosov, Valery Tuchin Saratov State University, Russia

10M. **Numerical focusing in interference microscopy with broadband illumination** Anton Grebenyuk^{1,2}, Vladimir Ryabukho^{1,2}, ¹Saratov State University; ²Institute of Precision Mechanics and Control of RAS, Russia

INTERNET REPORTS

1. **Evaluation of Dermal Fillers by Optical Coherence Tomography and Optical Coherence Elastography** Manmohan Singh¹, Shang Wang², Richard W. Yee³, Kirill Larin¹, ¹University of Houston, USA; ²Baylor College of Medicine, USA; ³SeeFit Inc., USA

2. **Detection of muscle anisotropy using non-contact single shot line-field optical coherence elastography** Chih-Hao Liu,

Alexander Schill, Chen Wu, Manmohan Singh, Raksha Raghunathan, Jiasong Li, Zhaolong Han, Kirill Larin, University of Houston, USA

3. Lorentz force optical coherence elastography Chen Wu, Zhaolong Han, Manmohan Singh, Raksha Raghunathan, Jiasong Li, Chih-Hao Liu, Alexander Schill, Kirill Larin, University of Houston, USA

4. Fluid-structure interface effect on elastic wave velocity in cornea-like structures

Zhaolong Han¹, Jiasong Li¹, Manmohan Singh¹, Srilatha Vantipalli¹, Salavat R. Aglyamov², Chen Wu¹, Chih-hao Liu¹, Michael Twa³, Kirill Larin¹,
¹University of Houston; ²University of Texas at Austin, USA; ³University of Alabama, Birmingham, USA

September 30, Thursday

**JOINT COMPUTATIONAL
BIOPHYSICS/MICROSCOPY AND LOW-
COHERENCE METHODS
ORAL SESSION II**

(Building 10, Main Conference Hall)

Chair: **Eugeny B. Postnikov**, Kursk State
University, Russia

11:30-11:42

**Binary generalized synchronization in
unidirectionally coupled time-delayed systems**

Olga I. Moskalenko¹, A.A. Koronovskii¹, A.E.
Hramov², V.I. Ponomarenko³, M.D. Prokhorov³,
¹Saratov State University; ²Saratov State Technical
University; ³Saratov Branch of the Institute of
RadioEngineering and Electronics of RAS, Russia

11:42-11:54

**Patterns recognition of electric brain activity
using artificial neural networks**

Vyacheslav Y.
Muratov, A.E. Runnova, S.V. Pchelintseva, V.Dykin,
A.E. Hramov, Saratov State Technical University,
Russia

11:54-12:06

**Multifractal spectrum of physiological signals: a
mechanisms-related approach**

Alexey N.
Pavlov^{1,2}, O.N. Pavlova², A.S. Abdurashitov², A.E.
Runnova¹, O.V. Semyachkina-Glushkovskaya²,
¹Saratov State Technical University; ²Saratov State
University, Russia

12:06-12:18

**Oscillating and average components of laser
doppler flowmetry signal under the contralateral
cold pressor test** Irina A. Mizeva, P. Frik, S.
Podtaev, Institute of Continuous Media Mechanics
of the Ural Branch of RAS, Russia

12:18-12:30

**Modeling spike and wave discharges using
complex network of FitzHugh-Nagumo
equations**

Ilya V. Sysoev¹, T.M. Medvedeva¹, M.V.
Sysoeva², ¹Saratov State University; ²Saratov State
Technical University, Russia

12:30-12:36

**Modeling of kidney vascular network: does cell
patterns matter?** Dmitry E. Postnov, Saratov State
University, Russia

12.36-12.48

**Digital OCT data mining. Methods and medical
applications**

Oleg Myakinin, Valery Zakharov Samara National
Research University, Russia

12.48-13.00

**Spatio-spectral analyses of biosamples by
means of hyperspectral image plane holography**

Georgy Kalenkov¹, Sergey Kalenkov², Alexander
Shtanko³, ¹Moscow Institute of Physics and
Technology (State University); ²University of
Mechanical Engineering; ³Moscow State University
of Technology Stankin, Russia

Conference on Internet Biophotonics IX

Chairs: **Alexey N. Bashkatov**, Saratov State University, Tomsk State University, Tomsk, Russia **Ivan V. Fedosov**, Saratov State University, **Valery V. Tuchin**, Saratov State University, Institute of Precise Mechanics and Control RAS, Russia, Tomsk State University, Tomsk, Russia

Secretary: **Daria K. Tuchina**, Saratov State University, Russia

International Program Committee: **Gert von Bally**, University of Münster (Germany); **Wei Chen**, University of Central Oklahoma (USA); **Cornelia Denz**, University of Münster (Germany); **Kishan Dholakia**, University of St. Andrews (UK); **Paul M.W. French**, Imperial College of Science, Technology and Medicine (UK); **Kirill V. Larin**, University of Houston (USA), Saratov State University (Russia); **Martin Leahy**, National University of Ireland, Galway; **Qingming Luo**, Huazhong University of Science and Technology (China); **Roberto Pini**, Inst. di Fisica Applicata, Sesto Fiorentino (Italy); **Juergen Popp**, Inst. of Photonic Technology, Jena (Germany); **Alexander V. Priezzhev**, Moscow State University (Russia); **Katarina Svanberg**, Lund University Medical Laser Centre (Sweden); **Hugo Thienpont**, Vrije University Brussel (Belgium); **Lihong Wang**, Washington University in St. Louis (USA); **Ruikang K. Wang**, University of Washington (USA); **Mikhail Yu. Kirillin**, Institute of Applied Physics RAS, Nizhny Novgorod (Russia), **Igor Minin**, Siberian State University of Geosystem and Technologies, Novosibirsk, Novosibirsk, Russia

September 29, Thursday

**JOINT POSTER/INTERNET SESSION AND
INTERNET DISCUSSION
(Building 3, 3rd floor Hall)**

**PLENARY SESSION INTERNET BIOPHOTONICS
(Building 3, Big Physical Hall)**

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

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

17.30-19.30

16.30-17.30

INVITED INTERNET LECTURES

- Fundamentals and advances of biomedical spectroscopy** Yukihiro Ozaki, Kwansai Gakuin University, Japan
- Quantitative cytopathology of cancer** Anna Yaroslavsky, University of Massachusetts at Lowell, USA
- Nanoscale imaging and sensing of live cell** Adam Wax, Duke University, USA
- Label free imaging of cells and tissues from nanometer to millimeter scales** Label free imaging of cells and tissues from nanometer to millimeter scales Gabriel Popescu, University of Illinois, Urbana-Champaign, Illinois, USA
- In vivo optical clearing for blood flow imaging** Dan Zhu, Britton Chance Center for Biomedical Photonics, Huazhong University of Science and Technology, Wuhan, P.R. China
- Wavelength dependence of refractive index of human colon tissues: comparison between healthy mucosa and tumor polyps** S. Carvalho¹, N. Gueiral², E. Nogueira², R. Henrique¹, L. Oliveira², V.V. Tuchin³, ¹Instituto Português de Oncologia do Porto, Portugal; ²Instituto Superior de Engenharia do Porto, Portugal; ³Saratov State University, Russia
- Photodynamic properties of newly synthesized polymer-phthalocyanine conjugates** E. Borisova¹, A. Yakimansky², I. Angelov³, V. Mantareva³, ¹Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria; ²Institute of Macromolecular Compounds, Russian Academy of Sciences, St. Petersburg, Russia; ³Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences, Sofia, Bulgaria
- In vivo monitoring of oxygen state and hemoglobin concentration in course of tumor model development by optical diffuse spectroscopy** A. Orlova¹, M. Kirillin¹, A. Volovetsky², N. Shilyagina², E. Sergeeva¹, G. Golubiatnikov¹, I. Turchin¹, ¹Institute of Applied Physics RAS, Russia; ²N.I.Lobachevsky State University of Nizhny Novgorod, Russia
- Surface-enhanced infrared absorption by steroids on arrays of Au nanoantennas** O.P. Cherkasova^{1,2}, A. Milekhin^{1,3}, I. Milekhin¹, S. Kuznetsov¹, E. Rodyakina^{1,2}, A. Latyshev³, ¹Novosibirsk State University, Russia; ²Institute of Laser Physics SB RAS, Novosibirsk, Russia;

³A.V. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia

5. **Lipid ordering profile of the stratum corneum measured *in vivo* using confocal raman microscopy** M.E. Darwin¹, C. Choe^{1,2}, J. Lademann¹, ¹Charité-Universitätsmedizin Berlin, Germany; ²Kim Il Sung University, Ryongnam-Dong, Taesong District, Pyongyang, DPR Korea
6. **Thermographic imaging of a localized heat source hidden in biological tissue. I. Direct problem on image characteristics** V.V. Barun, A.P. Ivanov, Institute of Physics, Belarus
7. **Thermographic imaging of a localized heat source hidden in biological tissue. II. Retrieval of the source parameters** A.P. Ivanov; V. Barun, Institute of Physics, Belarus
8. **An equivalent inverse source method of evaluating the weight functions for parallel-plate time-domain diffuse optical tomography** A.B. Konovalov, V. Vlasov, Russian Federal Nuclear Center - Zababakhin Institute of Applied Physics, Russia
9. **Cloud-based online Monte Carlo simulation platform of light propagation in turbid tissue-like scattering medium for biophotonic applications** A. Doronin¹, I. Meglinski², ¹Yale University, USA; ²University of Oulu, Finland
10. **Subwavelength localized electromagnetic fields by mesoscale dielectric particles in millimeter and terahertz waves** I. Minin, O. Minin, Siberian State University of Geosystem and Technologies, Novosibirsk, Russia
11. **Optical and thermal properties of skin tissue phantoms** Maciej S. Wróbel¹, Maciej Marchwiński¹, Dorota Truchanowicz¹, Anna Sękowska¹, Stanisław Galla¹, Adam Cenian², Małgorzata Jędrzejewska-Szczerska¹, ¹Gdańsk University of Technology; ²The Szewalski Institute of Fluid-flow Machinery, Polish Academy of Sciences, Gdańsk, Poland
4. **Tissue sensing by structured illumination in optical diffuse reflectometry** D.A. Loginova^{1,2}, V.I. Plekhanov¹, I.I. Fiks¹, A.V. Gorshkov^{1,2}, E.A. Sergeeva¹, M.Yu. Kirillin¹, ¹Institute of Applied Physics RAS, Nizhny Novgorod, Russia; ²Lobachevsky State University of Nizhny Novgorod, Russia
5. **Optical phantoms mimicking spectral properties of laboratory mouse biotissues** D.A. Loginova^{1,2}, E.A. Sergeeva¹, P.D. Agrba¹, M.Yu. Kirillin¹, ¹Institute of Applied Physics RAS, Nizhny Novgorod, Russia; ²Lobachevsky State University of Nizhny Novgorod, Russia
6. **Spectroscopic analysis of the powdery complex chitosan-iodine** O. Belyakova, A. Shipovskaya, Saratov State University, Russia
7. **Glycerol: terms, properties, constants and formulas** M. Stolnitz, Saratov State University, Russia
8. **Universal low-cost method and device for probe protein preparation and protein concentration assay in biological fluids, nutritional liquids, vegetables, fruits and foods** A. Kuznetsov^{1,2}, A. Frorip², A. Sünter², ¹Tartu University, Estonia; ²AS Ldiamon, Tartu, Estonia
9. **Measurement of glycerol diffusion coefficient in skin by optical method** D.K. Tuchina¹, Yu.P. Razdelkina¹, A.N. Bashkatov^{1,2}, E.A. Genina^{1,2}, V.V. Tuchin^{1,2,3}, ¹Research-Education Institute of Optics and Biophotonics, Saratov National Research State University, Russia; ²National Research Tomsk State University, Russia; ³Institute of Precision Mechanics and Control RAS, Saratov, Russia
10. **A comparative study of impact of X-ray contrast OmnipaqueTM used as an optical clearing agent on blood microcirculation in rats with alloxan diabetes by laser speckle contrast imaging** P.A. Timoshina¹, A.B. Bucharskaya², V.V. Tuchin^{1,3,4}, ¹Research-Education Institute of Optics and Biophotonics, Saratov National Research State University, Russia; ²Saratov State Medical University, Russia; ³Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia; ⁴National Research Tomsk State University, Russia
11. **Comparison of non-photochemical quenching of phycobilisomes fluorescence *in vivo* and *in vitro*** E. Nikonova, E. Shirshin, E. Maksimov, Moscow State University, Russia
12. **Assessment of autofluorescence and depth stratification influence on the reflectance spectra of cyanobacteria** E. Nikonova, E.

INTERNET REPORTS

1. **SEM examination of structural changes in chitosan microtubes during their *in vitro* biodegradation** N. Gegele, T. Babicheva, A. Shipovskaya, Saratov State University, Russia
2. **Photosensitizing properties of supramolecular systems based on chlorine e6** I. Klimenko¹, A. Lobanov², ¹Institute of Biochemical Physics of RAS, Russia, ²Institute of Chemical Physics of RAS, Russia
3. **Analysis of organic-inorganic xerogels structure based on chitosan and silicon tetraglycerolates by scanning electron**

Shirshin, V. Fadeev, Moscow State University, Russia

13. **'Point' contact in the red blood cells interaction** K. Lee^{1,2}, N. Rovniagina², C. Wagner³, E. Shirshin², A. Priezzhev², A. Popov¹, I. Meglinski¹, ¹University of Oulu, Finland; ²M.V. Lomonosov Moscow State University, Russia; ³Saarland University, Saarbrücken, Germany
14. **Light distribution in fat cell layers at physiological temperatures** I. Yanina^{1,2}, P.A. Timoshina¹, A. Shalin³, I. Minin⁴, O. Minin⁴, V.V. Tuchin^{1,2,5}, ¹Saratov National Research State University, Russia; ²National Research Tomsk State University, Russia; ³National Research University of Information Technologies, Mechanics and Optics, St. Petersburg, Russia; ⁴Siberian State University of Geosystem and Technologies, Russia; ⁵Institute of Precision Mechanics and Control RAS, Russia
15. **Continuous-wave circular polarization terahertz imaging of nonmelanoma skin cancers** J. Martin, University of Massachusetts Lowell, United States
16. **The assessment of lipid peroxidation in tumor-bearing rats after plasmonic photothermal treatment** A.B. Bucharskaya¹, G.A. Afanasyeva¹, A.V. Ivlichev¹, D.A. Mudrak¹, N.A. Navolokin¹, G.S. Terentyuk^{1,2}, G.N. Maslyakova¹, B.N. Khlebtsov³, N.G. Khlebtsov^{2,3}, A.N. Bashkatov³, E.A. Genina², V.V. Tuchin², ¹Saratov State Medical University, Russia; ²National Research Saratov State University, Russia; ³Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Russia
17. **Quantitative methods in laser plasmonic hyperthermia of tissues and cells** A.N. Yakunin¹, Yu.A. Avetisyan¹, V.V. Tuchin^{1,2,3}, ¹Institute of Precision Mechanics and Control of the Russian Academy of Science, Russia; ²Research-Education Institute of Optics and Biophotonics, National Research State University, Saratov, Russia; ³Interdisciplinary Laboratory of Biophotonics, National Research Tomsk State University, Russia
18. **Opportunity of using pulsed low-intensive terahertz sources for medical practice** O.A. Smolyanskaya¹, E.L. Odlyanitskiy¹, I.A. Geyko², A.G. Zabolotniy², M.K. Khodzitskiy¹, E.A. Sedykh¹, A.V. Semenova³, ¹ITMO University, St-Petersburg, Russia; ²FSBI "The Academician S.N. Fyodorov IRTC "Eye Microsurgery", Krasnodar, Russia; ³Institute for Physics of Microstructures, Nizhny Novgorod, Russia
19. **Image processing for vascular pulsation measurements in response to laser light irradiation using micro-piv approach** M.A. Kurochkin, E.S. Stiukhina, I.V. Fedosov, D.E. Postnov, National Research State University, Saratov, Russia
20. **Hypertension and stress: optical imaging of injuries of blood-brain barrier and cerebral blood flow** O. Semyachkina-Glushkovskaya¹, S. Sindeev¹, A. Abdurashitov¹, A. Shirokov², N. Navolokin³, A. Gelaluyk¹, M. Ulanova¹, V. Razubaeva¹, V. Fedorova¹, E. Saranceva¹, A. Esmat Sharif¹, V. Tuchin^{1,4}, ¹Saratov State University, Russia; ²Institute of Bioorganic Chemistry, Russian Academy of Sciences; ³Saratov Medical University, Russia; ⁴Laboratory of Biophotonics, Tomsk State University
21. **The optical visualization of scenarios of stress-induced intracranial hemorrhages in newborn rats** E. Zinchenko¹, O. Semyachkina-Glushkovskaya¹, A. Abdurashitov¹, N. Navolokin¹, M. Abakumov¹, I. Fedosov¹, A. Namikin¹, A. Serov¹, V. Tuchin^{1,2}, ¹Saratov State University, Saratov, Russia; ²Laboratory of Biophotonics, Tomsk State University
22. **Optical coherence tomography to evaluate changes in vasculature of the murine fetal brain *in utero* due to prenatal alcohol exposure** R. Raghunathan¹, C. Wu¹, M. Singh¹, C.-H. Liu¹, R.C. Miranda², K.V. Larin¹, ¹University of Houston, USA; ²Texas A&M Health Science Center, USA
23. **Detailed spectral analysis of decellularized skin implants** E.V. Timchenko¹, P.E. Timchenko¹, L.T. Volova², D.A. Dolgushkin², P.Y. Shalkovsky¹, S.V. Pershutin¹, ¹Samara National Research University, Russia; ²Experimental Medicine And Biotechnologies Institute of the Samara State Medical University, Russia
24. **Assessment of spectral characteristics of rodents in conditions of effect of heavy metals** E.V. Timchenko¹, P.E. Timchenko¹, S.V. Simak², E.A. Selezneva¹, A.D. Kadayb¹, ¹Samara National Research University, Russia; ²Samara Municipal Nayanova University
25. **The influence of flavonoid-containing extract on intensity of peroxidation processes in blood of tumor-bearing rats** N. Navolokin, D.A. Mudrak, A.V. Ivlichev, S.A. Tychina, A.B. Bucharskaya, G.A. Afanasyeva, N.V. Polukonova, G.N. Maslyakova, Saratov State Medical University, Russia
26. **Wavelet analysis of shuttle motility in *P. Polycephalum plasmodium*** T. Avsievich, S. Proskurin, Tambov State Technical University, Russia
27. **Measurements of refractive index of hemoglobin in the visible and NIR spectral ranges** E.N. Lazareva, V.V. Tuchin, Saratov State University, Russia

28. **Monte-Carlo simulation of OCT structural images of subcutaneous blood vessels** D. Petrov, A.Yu. Potlov, S.G. Proskurin, Tambov State Technical University, Russia

29. **Specific features of motion of the photon density normalized maximum in highly**

scattering media with tissue-like optical properties A.Yu. Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University, Russia

Conference on Low-Dimensional Structures VI

Workshop Chair: **Olga E. Glukhova**, SaratovStateUniversity (Russia)

Secretaries: **Vladislav V. Shunaev**, SaratovStateUniversity (Russia), **Michael M. Slepchenkov**, SaratovStateUniversity (Russia)

International Program Committee: **Ming-Fa Lin**, National Cheng Kung University, Tainan (Taiwan), **Irina V. Zaporotzkova**, Volgograd State University, Volgograd (Russia), **Galina N. Maslyakova**, Saratov State Medical University named after V.I. Razumovsky, Saratov (Russia), **Igor S. Nefedov**, Aalto University, Espoo (Finland), **Nikolay I. Sinitsyn**, Institute of Radioengineering and Electronics (IRE) of RAS, Saratov (Russia), **Gennadiy V. Torgashov**, Institute of Radioengineering and Electronics (IRE) of RAS, Saratov (Russia)

September 29, Thursday

ORAL SESSION

(Building 3, Room 34)

Chair: **Olga E. Glukhova**, SaratovStateUniversity
Russia

14.00-14.20

Theoretical investigation of the effect of oxidation on the electrical conductivity of graphene nanoribbons

O.E. Glukhova, G.V. Savostyanov, Saratov State University, Russia

14.20-14.40

The new scheme for an effective modification of graphene by oxygen

V.V. Shunaev, O.E. Glukhova, Saratov State University, Russia

14.40-15.20

Graphene as a hydrogen storage media

J. Baimova, Institute for Metals Superplasticity Problems of RAS, Россия

15.20-15.30

Electronic and optical properties of hybrid carbon nanotube-graphene monolayer films

O.E. Glukhova, V.V. Mitrofanov, M.M. Slepchenkov, Saratov State University, Russia

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3d floor Hall)

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

17.30-19.30

- 1L. **Electronic properties of fullerene onions** R. Pincak, J. Smotlacha, Slovak Academy of Science Slovakia, V.V. Shunaev, M.M. Slepchenkov, O.E. Glukhova, Saratov State University, Russia
- 2L. **Creating of microdimensional structures on the surface of glassy carbon by laser cutting** Dmitriy Bessonov, T.N. Sokolova, E.L. Surmenko, I. Popov, Gagarin Saratov State Technical University, Russia
- 3L. **Research LDL penetration mechanism into the intima of vessels** A.A. Zyktin, O.E. Glukhova, Saratov State University, Russia, G.N. Maslyakova, Saratov State Medical University, Russia
- 4L. **Dimerization of miniature carbon nanotori: predictive modeling** O.E. Glukhova, I.A. Kupriyanov, M.M. Slepchenkov, Saratov State University, Russia
- 5L. **Regularities in atomic structure of new hybrid carbon films of nanotubes-graphene type** O.E. Glukhova, M.M. Slepchenkov, A. Kuryleva, Saratov State University, Russia
- 6L. **The modeling of composite systems which consist of carbon nanostructures and biological molecules** O.E. Glukhova, G.V. Savostianov, D.S. Shmygin, Saratov State University, Russia
- 7L. **Graphene nanoribbons as the element base of optical nanodevices** K. Asanov, O.E. Glukhova, Saratov State University, Russia

- 8L. **The new theoretical model of terahertz nanodetector on the base of hybrid carbon nanostructure** O.E. Glukhova, M.M. Slepchenkov, V.V. Shunaev, Saratov State University, Saratov, Russia
- 9L. **Atomic structure and thermodynamic stability of graphene nanoblisters: predictive modeling** P. Barkov, O.E. Glukhova, M.M. Slepchenkov, Saratov State University, Russia
- 10L. **The efficiency of encapsulation flavonoid containing extracts, for example, the influence of tumor cells in vitro** N. Navolokin, N. Polukonova, A. Bucharskaya, G. Maslyakova, Saratov State Medical University, Russia, M. Lomova, D. Gorin, Saratov State University, Russia, D. Khochenkov, M. Baryshnikov, Russian Cancer Research Center n/a of NN Blokhin, Russia, G. Sukhorukov, Queen Mary University, London, UK
- 11L. **Atomistic simulation of layered graphene/graphane nanostructures** N. Panova, O.E. Glukhova, M.M. Slepchenkov, Saratov State University, Russia
- 12L. **Technology of structuring and marking of soda-lime glass by nanosecond laser with a wavelength 1060 nm** I. Popov, T.N. Sokolova, E.L. Surmenko, D.A. Bessonov, Gagarin Saratov State Technical University, RPF "Pribor-T", Russia
- 13L. **Photosensitivity of quantum dots and graphene sheets structures** A.J.K. Al-Alwani, Saratov State University, Russia, Babylon University, Babylon, Iraq, A.S. Chumakov, I.A. Gorbachev, S.B. Wenig, E.G. Glukhovskoy, Saratov State University, Russia
- 14L. **The langmuir films of quantum dots mixed with liquid crystal formation** A.S. Chumakov, A.J.K. Al-Alwani, I.A. Gorbachev, A.V. Ermakov, E.G. Glukhovskoy, Saratov State University, Russia
- 15L. **Investigation of quantum dots langmuir monolayer formation process at different temperature** I.A. Gorbachev, S.N. Shtykov, E.G. Glukhovskoy, Saratov State University, Russia
- 16L. **Polyelectrolyte nanocapsules: design and application as anticancer drug carriers** D. Trushina, T. Bukreeva, National Research Centre "Kurchatov Institute", Russia, M. Antipina, Institute of Materials Research and Engineering, Singapore
- 17L. **Electronic and optical properties of graphene/graphene layered structures** O.E. Glukhova, D.A. Melnikov, M.M. Slepchenkov, Saratov State University, Saratov, Russia

INTERNET REPORTS

1. **About the impedance conditions in metal nanowires** M. Davidovich, Saratov State University, Russia
2. **Synthesis of sers nanotags and their investigation inside photonic-crystal fibers** N.E. Markina, Victor V. Galushka, Andrey M. Zakharevich, Alexey V. Markin, Irina Yu. Goryacheva, Saratov State University, Russia

Conference on Biomedical Spectroscopy III

Conference Chairs: **Vyacheslav I. Kochubey, Alexander B. Pravdin**, Saratov State University (Russia)

Secretary: **Elena K. Volkova**, Saratov State University (Russia)

International Program Committee: **Ekaterina G. Borisova**, Institute of Electronics, BAS (Bulgaria), **Dmitry A. Gorin**, Saratov State University (Russia), **Gennady V. Melnikov**, Yuri Gagarin State Technical University of Saratov (Russia), **Alexander M. Saletsky**, Lomonosov Moscow State University (Russia), **Dzmitry Shcharbin**, Institute of Biophysics and Cell Engineering of NASB (Belarus), **Andre Skirtach**, Ghent University (Belgium)

September 29, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION (Building 3, 3rd floor Hall)

Chair (BS): **Elena K. Volkova**, Saratov State University Russia

17.30-19.30

- 1BS. **Monitoring of changes in the ascorbic acid's structure by absorption spectroscopy** Svetlana Kutsenko, Julia Danyaeva, Volgograd State University, Russia
- 2BS. **Capillary Electrophoresis of Blood Plasma with OD- and LIF-Channels as a Tool for Prostate Pathology Diagnostics** Nadezda Zhdanova¹, Anton Maydykovskiy¹, Evgeny Shirshin¹, Elena Prilepskaya², Pavel Rasner², Victor Fadeev¹, ¹M.V. Lomonosov Moscow State University, Faculty of Physics; ²A.I. Evdokimov Moscow State University of Medicine and Dentistry, Russia
- 3BS. **Effect of detonation nanodiamonds on flavonoids transport: molecular modelling** Inna L. Plastun, Ksenya E. Agandeeva, Andrey N. Bokarev, Viktor Koshel'kov, Saratov State Technical University, Russia
- 4BS. **Optical properties of human nails in THz frequency range** Victoria Guseva, Sviatoslav Gusev, Petr Demchenko, Egor Sedykh, Mikhail Khodzitsky, ITMO University, Russia
- 5BS. **Detection of internal temperature of rat tissue in vitro during laser thermolysis** E.A. Kozlova, S.O. Ustalkov, O.A. Savenko, V.I. Kochubey, V.V. Galushka, A.A. Skaptsov, Saratov National Research State University, Russia
- 6BS. **Environment-friendly fluorescent nanoparticles for biolabeling** A. Sobolev^{1,2}, M. Tessier³, S. De Saeger¹, Z. Hens³, I. Goryacheva², N. Beloglazova^{1,2}; ¹Faculty of Pharmaceutical Sciences, Department of Bioanalysis, Laboratory of Food Analysis,

Ghent University, Ghent, Belgium; ²Saratov State University, Chemistry Faculty, Department of General and Inorganic Chemistry, Russia; ³Faculty of Sciences, Department of Inorganic and Physical Chemistry, Ghent University, Ghent, Belgium

- 7BS. **SERS-based approaches to study heme proteins in situ** E.I. Nikelshparg¹, N.A. Brazhe¹, A.A. Bayzhumanov¹, A.S. Sarycheva¹, E.A. Goodilin^{1,2}, A.A. Semenova¹, L.I. Deev¹, O. Sosnovtseva³, G.V. Maksimov¹, ¹Lomonosov Moscow State University; ²Kurnakov Institute of General and Inorganic Chemistry of Russian Academy of Sciences, Russia; ³Copenhagen University, Denmark
- 8BS. **Measurement of Water Concentration in Biological Samples by Terahertz Time Domain Spectroscopy** Mariia Borovkova, ITMO University, Russia
- 9BS. **Nanoparticles-free biotissue-mimicking phantoms** T. Avsievich¹, A. Bykov², A. Popov², I. Meglinski², ¹Biomedical Engineering Department, Tambov State Technical University, Russia; ²Opto-Electronics and Measurement Techniques Research Unit, Faculty of Information Technology and Electrical Engineering, University of Oulu, Finland
- 10BS. **Influence of excitation power density on temperature dependencies of NaYF₄: Yb, Er nanoparticles luminescence spectra** S.O. Ustalkov, E.A. Kozlova, O.A. Savenko, Mohammed A.H.M, V.I. Kochubey, A.A. Skaptsov, Saratov National Research State University, Russia
- 11BS. **Changes of rat peritoneum luminescence spectra in peritonitis** E.A. Kozlova¹, K.S. Lysakova¹, V.I. Kochubey¹, A.A. Kondrakov², S.Yu. Gorodkov², ¹Saratov National Research State University; ²Saratov State Medical University, Russia
- 12BS. **Investigation of photodynamic activity of Fe₂O₃ nanoparticles coated with Zn-TPP** Elena Sagaidachnaia, Vyacheslav I. Kochubey, Saratov National Research State University, Russia

- 13BS. **Synthesis, characterization, and stabilization of abietic nanoparticles** E.A. Kozlova, A.V. Markin, A.M. Zakharevich, A.A. Skaptsov, Saratov State University, Russia
- 14BS. **Influence of laser power density on the temperature sensitivity of upconversion nanoparticles green luminescence** E.K. Volkova^{1,2,3}, I.Yu. Yanina^{1,2,3}, A.A. Skaptsov¹, Ju.G. Konyukhova¹, V.V. Tuchin^{1,2,4}, V.I. Kochubey^{1,2}; ¹Research-Educational Institute of Optics and Biophotonics, Saratov State University; ²Biophotonics Laboratory, Tomsk State University, Russia; ³Opto-Electronics and Measurement Techniques Research Unit, Faculty of Information Technology and Electrical Engineering, University of Oulu, Finland; ⁴Laboratory of Laser Diagnostics of Technical and Living Systems, Precise Mechanics and Control Institute, Russian Academy of Sciences, Saratov, Russia
- 15BS. **Fabrication of tissue phantoms containing nanoparticles** A.A. Skaptsov, S.O. Ustalkov, V.I. Kochubey, Saratov State University, Russia
- 16BS. **Luminescence of rat blood in norm and pathology** E.A. Kozlova¹, K.S. Lysakova¹, A.B. Pravdin¹, V.I. Kochubey¹, A.A. Kondrakov²; ¹Saratov State University; ²Saratov State Medical University, Russia
- 17BS. **A method to monitor over the kinetics of gold nanorods growth** A.A. Skaptsov, O.A. Savenko, Saratov State University, Russia
- 18BS. **Scattering-related distortions of fluorescent images produced by upconversion nanoparticles** V.O. Ogorodnik¹, N.D. Savchenko¹, I.V. Zabenkov², Vyacheslav Kochubey¹, ¹Saratov State University; ²Saratov State Medical University, Russia
- 19BS. **Analysis of the degree of antimicrobial and antioxidant activity of flavonoid-containing stonecrop extracts, based on a comparison of the spectra and experiments in vivo** Valentina Plastun, N.A. Durnova, S.A. Raikova, G.A. Afanaseva, E.A. Komarova, Saratov State Medical University, Russia
- 20BS. **Luminescence method to investigate the growth of CuInS₂ quantum dots in real time** A.A. Skaptsov, A.S. Novikova, Mohammed A.H.M., V.V. Galushka, I.Yu. Goryacheva, V.I. Kochubey, Saratov State University, Russia

INTERNET REPORTS

Use of annular excitation generated from a multi-mode fiber for depth sensitive fluorescence spectroscopy Mahesh Kumar Swami, P K Kushwaha, H S Patel, P K Gupta, Raja Ramanna Centre for Advanced Technology, India

Detection of Rhodamine 6G in blood and urine using combination of surface-enhanced Raman spectroscopy and liquid-liquid extraction Victoria V. Shalabay, Natalia E. Markina, Andrey M. Zakharevich, Alexey V. Markin, Irina Yu. Goryacheva, Saratov State University, Russia

September 30, Friday

**INVITED LECTURE/ORAL SESSION
(Scientific Library Conference Hall)**

Co-chairs: **Vyacheslav I. Kochubey, Alexander B. Pravdin**, Saratov State University, Russia

11.30-11.45

Influence of tissue optical parameters on the accuracy of temperature determination from luminescence measurements Vyacheslav Kochubey¹, N.D. Savchenko¹, V.O. Ogorodnik¹, I.V. Zabenkov², ¹Saratov State University; ²Saratov State Medical University, Russia

11.45-12.05

Invited

Synchronous fluorescence spectroscopy of colon neoplasia Ekaterina Borisova¹, Tsanislava Genova¹, Latchezar Avramov¹, Nikolay Penkov², Ivan Terziev², Borislav Vladimirov², Oxana Semyachkina-Glushkovskaya³; ¹Institute of Electronics, Bulgarian Academy of Sciences; ²University Hospital "Tsaritsa Yoanna - ISUL", Sofia, Bulgaria; ³Biology Department, Saratov State University, Physiology of Human and Animals Lab., Saratov, Russia

12.05-12.20

Spectroscopic studies of interactions of nanodiamonds with DNA-molecules Ekaterina Vervald, Sergey Burikov, Kirill Laptinskiy, Tatiana Dolenko, Faculty of Physics, MSU, Russia

12.20-12.35

The possibilities of laser spectroscopy for screening diagnosis of major socially significant diseases Yu.V. Kistenev¹, K.V. Lisovodskaya¹, A.G. Levashkin¹, D. A. Kuzmin², A. G. Syrkina³, A.V. Borisov¹; ¹National Research Tomsk State University; ²Siberian State Medical University; ³Federal State Budgetary Scientific Institution «Research Institute for Cardiology», Russia

12.35-12.50

Luminescent determination of PAHs in proteins Olga Plotnikova, Andrei Melnikov, Gennady Melnikov, Saratov State Technical University, Russia

Conference on Computational Biophysics and Analysis of Biomedical Data III

Workshop Chair: **Dmitry E. Postnov**, Saratov State University (Russia)

Secretary: **Elena S. Stiukhina**, Saratov State University (Russia)

International Program Committee: **Alexander B. Neiman**, Ohio University, USA, **Olga V. Sosnovtseva**, University of Copenhagen, Denmark, **Oxana V. Semyachkina-Glushkovskaya**, Saratov State University, Russia, **Anatoly V. Skripal**, Saratov State University, Russia, **Boris P. Bezruchko**, Saratov State University, Russia

September 27, Tuesday

ORAL SESSION BIOCOMPUTING I (Building 10, Hall 503)

Chair: **Dmitry E. Postnov**, Saratov State University, Russia.

16:30-16:45

Intermittent phase synchronization in epileptic brain: influence of medical drugs on epileptic seizure duration and degree of synchronization
Olga I. Moskalenko¹, M.O. Zhuravlev¹, A.A. Koronovskii¹, A.E. Hramov², ¹Saratov State University; ²Saratov State Technical University, Russia

16:45-17:00

Intermittency in electric brain activity in the perception of ambiguous images Alexander E. Hramov¹, A.A. Koronovskii², A.E. Runnova¹, M.K. Kurovskaya², M.O. Zhuravlev¹, A.N. Pysarchik³, ¹Saratov State Technical University; ²Saratov State University, Russia; ³Madrid Technical University, Spain

17:00-17:15

Quantifying dynamical features of complex oscillations from noisy interspike intervals
Alexey N. Pavlov^{1,2}, O.N. Pavlova², ¹Saratov State Technical University; ²Saratov State University, Russia

17:15-17:30

Phase synchronization of oscillations in cardiovascular and respiratory systems in human Arina V. Tankanag¹, A.A. Grinevich¹, I.V. Tikhonova¹, A.V. Chaplygina², N.K. Chemeris¹, ¹Institute of Cell Biophysics RAS; ²Lobachevsky State University of Nizhni Novgorod, Russia

17:30-17:45

Modeling of 6-mercaptopurine effects detected by confocal fluorescence microscopy in the individual treatment of childhood leukemia
Anastasia I. Lavrova, A. Zyubin, S. Babak, Baltic Federal University, Russia

17:45-18:00

Skin surface temperature as a tracer of blood microcirculation Y. Tang¹, Irina A. Mizeva², Y. He¹, ¹Dalian university of technology, China; ²Institute of continuous media mechanics of the Ural Branch of RAS, Russia

18:00-18:15

Stationary blood flow dissipative structures in cortical spreading depression and bold contrast imaging Andrey Yu. Verisokin¹, D.V. Verveiko¹, D.E. Postnov², ¹Kursk State University; ²Saratov State University, Russia

18:15-18:30

1. **The Batch of 1-minute poster advertisements by** Aleksey A. Doroshenko, Anastasiya E. Runnova, Petr A. Ermolaev, Andrey A. Grinevich, Ilya N. Rodionov, Kirill A. Laptinskiy, Anna S. Kolesnikova, Dmitrii V. Ivanov, Kristina Rogatina, Yuri N. Avtomonov

September 29, Thursday

**JOINT POSTER/INTERNET SESSION AND
INTERNET DISCUSSION**

(Building 3, 3rd floor Hall)

Chair (BC): **Dmitry E. Postnov**, Saratov State
University, Russia

17.30-19.30

- 1BC. **Modeling of eye movements trajectory in some types oculomotor pathology** Aleksey A. Doroshenko, D.A. Usanov, A.E. Postelga, Saratov State University, Russia
- 2BC. **The study of evolution and depression of the alpha-rhythm in the human brain eeg based on wavelet-based methods** Anastasiya E. Runnova^{1,2}, M.O. Zhuravlev^{1,2}, M.V. Khramova¹, A.N. Pysarchik^{1,3}, ¹Saratov State Technical University; ²Saratov State University, Russia; ³Center for Biomedical Technology, Technical University of Madrid, Spain
- 3BC. **Mathematical approach to recover eeg brain signals with artefacts by means of gram-schmidt transform** Anastasiya E. Runnova^{1,2}, M.O. Zhuravlev^{1,2}, A.A. Koronovskiy^{2,1}, ¹Saratov State Technical University; ²Saratov State University, Russia
- 4BC. **Dealing with noise and physiological artefacts in human eeg recordings: empirical mode methods** Anastasiya E. Runnova^{1,2}, V. Grubov^{1,2}, ¹Saratov State Technical University; ²Saratov State University, Russia
- 5BC. **Automatic model selection based on symbolic regression for dynamic interference fringe processing algorithms** Petr A. Ermolaev, Maxim A. Volynsky, ITMO University, Russia
- 6BC. **Formation of the peak amplitude of blood flow oscillations at a frequency of 0.1 hz in the human cardiovascular system by the noise effect on the heart** Andrey A. Grinevich, A.V. Tankanag, N.K. Chemeris, Institute of Cell Biophysics RAS, Russia
- 7BC. **Development and implementation of architecture of the software allowing to visualize medical data from different devices** Ilya N. Rodionov, OJSC "ESDIAR", Russia
- 8BC. **Monitoring of DNA duplex melting by Raman spectroscopy for molecular DNA computations** Kirill A. Laptinsky, S.A. Burikov, O. Sarmanova, T.A. Dolenko, Lomonosov Moscow State University, Russia
- 9BC. **Problems and prospects of surgical planning software** Anna S. Kolesnikova, R. Safonov, A. Kalinin, A. Donnik, Saratov State University, Russia
- 10BC. **Technology for creating accurate solid geometric models of spine segments based on CT images** Dmitrii V. Ivanov, A.V. Dol', Saratov State University, Russia
- 11BC. **The assessment of sympathetic activity using i-PPG based inter-limb coherence measurements** Kristina Rogatina, M.O. Tsoy, D.E. Postnov, Saratov State University, Russia
- 12BC. **DIY: positioning equipment for optical imaging** Yuri N. Avtomonov, Ekaterina A. Kurishova, M.A. Kurochkin, D.E. Postnov, Saratov State University, Russia

INTERNET REPORTS

Physics of the Korotkoff sounds Yuriy N. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia

September 30, Thursday

**JOINT COMPUTATIONAL
BIOPHYSICS/MICROSCOPY AND LOW-
COHERENCE METHODS
ORAL SESSION II**

(Building 10, Main Conference Hall)

Chair: **Eugeny B. Postnikov**, Kursk State
University, Russia.

11:30-11:42

Binary generalized synchronization in unidirectionally coupled time-delayed systems
Olga I. Moskalenko¹, A.A. Koronovskii¹, A.E. Hramov², V.I. Ponomarenko³, M.D. Prokhorov³,
¹Saratov State University; ²Saratov State Technical University; ³Saratov Branch of the Institute of RadioEngineering and Electronics, RAS, Russia

11:42-11:54

Patterns recognition of electric brain activity using artificial neural networks
Vyacheslav Y. Muratov, A.E. Runnova, S.V. Pchelintseva, V.Dykin, A.E. Hramov, Saratov State Technical University, Russia

11:54-12:06

Multifractal spectrum of physiological signals: a mechanisms-related approach
Alexey N. Pavlov^{1,2}, O.N. Pavlova², A.S. Abdurashitov², A.E. Runnova¹, O.V. Semyachkina-Glushkovskaya²,
¹Saratov State Technical University; ²Saratov State University, Russia

12:06-12:18

Oscillating and average components of laser doppler flowmetry signal under the contralateral cold pressor test
Irina A. Mizeva, P. Frik, S. Podtaev, Institute of Continuous Media Mechanics of the Ural Branch of RAS, Russia

12:18-12:30

Modeling spike and wave discharges using complex network of FitzHugh-Nagumo equations
Ilya V. Sysoev¹, T.M. Medvedeva¹, M.V. Sysoeva², ¹Saratov State University; ²Saratov State Technical University, Russia

12:30-12:36

Modeling of kidney vascular network: does cell patterns matter?
Dmitry E. Postnov, Saratov State University, Russia

12.36-12.48

Digital OCT Data Mining. Methods and Medical Applications
Oleg Myakinin, Valery Zakharov Samara National Research University, Russia

12.48-13.00

Spatio-spectral analyses of biosamples by means of hyperspectral image plane holography
Georgy Kalenkov¹, Sergey Kalenkov², Alexander Shtanko^{3,1}, Moscow Institute of Physics and Technology (State University); ²University of Mechanical Engineering, Russia; ³Moscow State University of Technology Stankin, Russia

Workshop on Nonlinear Dynamics VII

Workshop Chair: **Vadim S. Anishchenko**, Saratov State University (Russia)

Secretary: **Andrei V. Slepnev**, Saratov State University (Russia)

September 29, Thursday

ORAL SESSION NONLINEAR DYNAMICS I (Building 3, Room 38)

Chair: **Vadim S. Anishchenko**, Saratov State University, Russia

14.00-14.15

Numerical modeling of discrete breathers and nonlinear modes in graphene using molecular dynamics in classical and quantum approximations

I.P. Lobzenko, Institute of Molecule and Crystal Physics URC RAS, Russia; A.P. Chetverikov, Saratov State University, Russia

14.15-14.30

Evaluation of neuronal ensemble population sizes responsible for the generation of different rhythms during a sleep

A. Hramov, Yuri Gagarin State Technical University of Saratov; A.A. Koronovskii, Saratov State University; V.V. Grubov, Yuri Gagarin State Technical University of Saratov; A.E. Kharchenko, Saratov State University; A.N. Pavlov, Yuri Gagarin State Technical University, Saratov, Russia

14.30-14.45

Metastable modes in Morse-Rayleigh chain

K.S. Sergeev, A.P. Chetverikov, Saratov State University, Russia

14.45-15.00

Hard and soft self-oscillation excitation in the memristor-based systems with a line of equilibria

I. Korneev, V. Semenov, Russia; T. Vadivasova, Saratov State University, Russia

15.00-15.15

Effect of delayed nonlinear response on the soliton collisions in model of nonlinear Schroedinger equation with variable coefficients

A. Konyukhov, S. Zarkov, Saratov State University, Russia

15.15-15.30

Coherence-resonance chimeras in a network of excitable elements

N. Semenova, Saratov State University, Russia; A. Zakharova, Berlin Technical University, Germany; V. Anishchenko, Saratov State University, Russia; E. Schöll, Berlin Technical University, Germany

POSTER SESSION

(Building 3, 3rd floor Hall)

Chair (ND): **Andrey Slepnev**, Saratov State University, Russia

- 1ND. **Study of pattern formation in multilayer adaptive network of phase oscillators in application to brain dynamics analysis**
D. Kirsanov, V. Nedajvazov, V. Makarov, Yuri Gagarin State Technical University of Saratov, Russia; A. Koronovskii, Saratov State University, Russia; A. Hramov, Yuri Gagarin State Technical University of Saratov, Russia
- 2ND. **The nonlinear dynamics in the semiconductor superlattices with the fluctuations of the doping density**
A. Hramov, Yuri Gagarin State Technical University of Saratov, Russia; A. Koronovskii, O. Moskalenko, A. Selskii, Saratov State University, Russia
- 3ND. **Transition from spatial synchronization to desynchronization in the ring of nonlocally coupled chaotic oscillators**
E. Rybalova, N. Semenova, Saratov State University, Russia
- 4ND. **Lyapunov analysis of the chaotic dynamics in the spatially discrete-continuous model of the neural network**
V. Maksimenko, Yuri Gagarin State Technical University of Saratov, Russia; D. Postnov, Saratov State University, Russia; V. Makarov, Yuri Gagarin State Technical University of Saratov, Russia; A. Koronovskii, Saratov State University, Russia

September 30, Friday

**ORAL SESSION
NONLINEAR DYNAMICS II
(Building 3, Room 38)**

Chair: **Vadim S. Anishchenko**, Saratov State University, Russia

11.30-11.45

Synchronization of far ends of extended starlike networks of Van der Pol oscillators as an example of long-range remote synchronization

P. Kuptsov, A. Kuptsova, Yuri Gagarin State Technical University of Saratov, Russia

11.45-12.00

Spatio-temporal coherence-incoherence transition in a single time-delay feedback system

V. Semenov, Saratov State University, Russia; A. Zakharova, Berlin Technical University, Germany; Yu. Maistrenko, National Centre for Medical and Biotechnical Research, Ukraine; E. Schöll, Berlin Technical University, Germany

12.00-12.15

Complex dynamics in a ring of unidirectionally coupled Toda oscillators

A. Dvorak, S.V. Astakhov, V.V. Astakhov, Yuri Gagarin State Technical University of Saratov, Russia

12.15-12.30

Bifurcation analysis of Van der Pol oscillator loaded by one and two additional oscillatory circuits

A. Gulaj, S. Astakhov, O. Astakhov, V. Astakhov, Yuri Gagarin State Technical University, Saratov, Russia

12.30-12.45

Peculiarities of chimera states formation in an ensemble of non-locally coupled Anishchenko–Astakhov self-sustained oscillators

A. Slepnev, A. Bukh, T. Vadivasova, Saratov State University, Russia

12.45-13.00

Chimera regimes in a two-dimensional network of cubic maps with nonlocal coupling

I. Shepelev, Saratov State University, Russia

Workshop on Advanced Polarization and Correlation Technologies in Biomedicine and Material Science III

Workshop Co-chairs: **Dmitry A. Zimnyakov**, Yuri Gagarin Saratov State Technical University, Russia, Institute of Precise Mechanics and Control RAS, Russia; **Igor V. Meglinski**, University of Otago, New Zealand, Saratov State University, Russia

Secretaries: **Anna A. Isaeva**, Yuri Gagarin Saratov State Technical University, Russia

International Program Committee:

Robert R. Alfano, CCNY, USA; **Stefan Andersson-Engels**, Tyndall National Institute, Cork, Ireland; **Oleg V. Angelsky**, Chernivtsi National University, Ukraine; **Victor N. Bagratashvili**, Inst. of Laser and Information Technologies RAS, Russia); **Claude Boccara**, ESPCI, France; **Alexander V. Bykov**, Univ. of Oulu, Finland; **Alexander V. Doronin**, Yale University, New Haven, CT, USA; **Steven L. Jacques**, Oregon Health Sciences Univ., USA ;**Alexey P. Popov**, Univ. of Oulu, Finland; **Alexander P. Sviridov**, Inst. of Laser and Information Technologies RAS, Russia; **Valery V. Tuchin**, Saratov National Research State University, Institute of Precision Mechanics and Control RAS, National Research Tomsk State University, Russia; **Olga V. Ushakova** Yuri Gagarin Saratov State Technical University of Saratov, Russia; **Alexander G. Ushenko** Chernivtsi National University, Ukraine; **Lihong Wang**, California Institute of Technology, CA, USA

Thursday September 29

POSTER SESSION

(Building 3, 3rd floor Hall)

Chair (AP): **Dmitry A. Zimnyakov**, Yuri Gagarin Saratov State Technical, Russia

17.30-19.30

1AP Peculiarities of variation of the rats tissues electrical resistance during the development of precancerous lesions of the gastrointestinal tract Matvey V. Kanevskiy, Irina K. Mironova, Vladimir A. Velikov, Oksana V. Semyachkina-Glushkovskaya, Svetlana A. Konnova Svetlana A. Konnova, Saratov State University, Russia

2AP Polarization enhanced multispectral reflectance imaging for evaluating dermal collagen changes Xin Feng, Anna Yaroslavsky, University of Massachusetts Lowell, USA, Victor Neel, Massachusetts General Hospital, USA

3AP Characterization of thick samples of collagenous tissues using transmission polarization mapping Marina E. Shvachkina, Dmitry D. Yakovlev, Alexander B. Pravdin, Dmitry A. Yakovlev, Saratov State University, Russia

4AP Full field speckle correlometry with improved depth resolution of complex media Elena A. Isaeva, Anna A. Isaeva, Michael A. Machejev, Yuri Gagarin State Technical University of Saratov, Russia

5AP Tissue structure characterization of biotissue phantom by speckle-polarization analysis Elena A. Isaeva, Anna A. Isaeva, Yuliya V. Agapova, Yuri Gagarin State Technical University of Saratov, Russia,

6AP Spatially resolved speckle-correlometry of random inhomogeneous media: mathematical simulation Anna A. Isaeva, Elena A. Isaeva, Aleksej V. Pantyukov, Yuri Gagarin State Technical University of Saratov, Russia

Friday September 30

**ORAL SESSION
POLARIZATION**

(Building 1, Room 459, SSTU)

Chair: **Dmitry A. Zimnyakov**, Yuri Gagarin
Saratov State Technical University, Russia

11.30-11.45

A novel approach for express measurement of nanorods aspect ratio based on the depolarized light scattering

Pavel Shalaev, Sergey Tereshchenko, Sergey Dolgushin, Igor Burnaevskiy, National Research University of Electronic Technology, Russia, Igor Yudin, Viktor Dshabo, Oil and Gas Research Institute of Russian Academy of Sciences, Russia

11.45-12.00

Transmission microscopic polarization mapping of biotissues and liquid crystals: potentialities and limitations

Dmitry D. Yakovlev, Marina E. Shvachkina, Alexander B. Pravdin, Dmitry A. Yakovlev, Saratov State University, Russia

12.00-12.15

A non-linear dielectric function of titania nanoparticles: the role of generation of photoinduced charge carriers

Sergey A. Yuvchenko, Leonid V. Samoilov, Dmitry A. Zimnyakov, Yuri Gagarin Saratov State Technical University, Russia

12.15-12.30

Diffusing light diagnostics of heterogeneous supercritical fluidic systems

Olga V. Ushakova, Dmitry A. Zimnyakov, Yuri Gagarin Saratov State Technical University, Russia

12.30-12.45

Modeling of polarization state evolution in random sequences of scattering events

Marina V. Alonova, Dmitry A. Zimnyakov, Yuri Gagarin Saratov State Technical University, Russia

12.45-13.00

Coherence effects in spectrally selected fluorescence from dye-doped random media

Dmitry A. Zimnyakov, Yuri Gagarin Saratov State Technical University, Ilya M. Asharchuk, Alexander P. Sviridov, FSRC "Crystallography and Photonics" RAS

13.00-13.15

Speckle correlation analysis of non-stationary systems with temperature-dependent scatter dynamics

Elena A. Isaeva, Anna A. Isaeva, Leonid V. Samoilov, Yuri Gagarin State Technical University of Saratov, Russia

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XVI

Workshop Chair: **Michael V. Davidovich**, Saratov State University (Russia)

Secretaries: **Vadim V. Korniyakov**, Saratov State University (Russia), **Alexander N. Savin**, Saratov State University (Russia), **Pavel A. Shilovski**, Acronis, Moscow (Russia)

International Program Committee: **Alexander I. Nosich**, Kharkov Institute of Radio-Engineering and Electronics, NAS Ukraine (Ukraine), **Nikita M. Ryskin**, Saratov State University (Russia), **Igor S. Nefedov**, Aalto University, Espoo (Finland), **Georgi N. Georgiev**, "Sts. Cyril and Methodius", VelikoTirnov, (Bulgaria), **Andrei D. Grigoriev**, St. Petersburg Electrotechnical University LETI (Russia), **Josef Modelsky**, Warsaw University of Technology (Poland), **Dmitry I. Trubetskov**, Saratov State University (Russia)

September 30, Friday

ORAL SESSION (Building 8, Room 82)

Chair: **Michael V. Davidovich**, Saratov State University, Russia

11.30-11.40

Amplification of Cross-Polarization Conversion of Terahertz Radiation by an Optically Pumped Graphene Metasurface at Room Temperature O.V. Polischuk¹, V.S. Melnikova², D.V. Fateev¹, K.V. Mashinski², V.V. Popov^{1,2}, ¹Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch), Russian Academy of Sciences, Saratov, ²National Research Saratov State University, Saratov, Russia

11.40-11.50

Digital Signal Processing of Heteromagnetic Sensors A. Maslow¹, A. Ignatiev¹, ¹National research Saratov state university, Saratov, Russia

11.50-12.00

Analysis of Plasmons and Homogenization in a Flat-Layered Hyperbolic Metamaterials M.V. Davidovich, Saratov State University, Saratov, Russia

12.00-12.10

Design and Modeling of Powerful Vacuum-Tube Sources of THz Radiation with Sheet Electron Beams A.I. Benedik¹, T.A. Karetnikova¹, A.G. Rozhnev¹, N.M. Ryskin¹, A.G. Terentyuk¹, ¹Saratov State University, Russia

12.10-12.20

Improving Frequency Stability and Tunability of THz Gyrotrons by Frequency/Phase Locking A.B. Adilova¹, S.A. Gerasimova¹, M.M. Melnikova¹, A.V. Tyshkun¹, A.G. Rozhnev¹, N.M. Ryskin¹, ¹Saratov State University, Russia

12.20-12.30

Whispering Gallery Modes of an Infinite Dielectric Cylinder Made of a Glassy Semiconductor D.S. Zhivotkov¹, E.A. Romanova¹, ¹National Research Saratov State University, Saratov, Russia

12.30-12.40

Propagation of Evanescent Waves in Multimode Chalcogenide Fibers Immersed in an Aqueous Acetone Solution: Theory and Experiment S. Korsakova¹, E. Romanova¹, M.J. Komaneč², T. Nemeček², V. Shiryayev³, A. Velmuzhov³, ¹Saratov State University, Russia, ²Czech Technical University in Prague, Czech Republic, ³Institute of Chemistry of High Purity Substances of RAS, Nizhny Novgorod, Russia

12.40-12.50

Use of Generalized Functions for Description of Digital Hologram Recordion K.A. Grebenyuk, Saratov State University, Saratov, Russia

12.50-13.00

Tensor Green's Function Method for the Dispersion of Surface Plasmons on Metasurfaces M.V. Davidovich, Saratov State University, Saratov, Russia

September 29, Thursday

**JOINT POSTER/INTERNET SESSION AND
INTERNET DISCUSSION**

(Building 3, 3rd floor Hall)

Chair (EI): **Michael V. Davidovich**, Saratov State
University, Russia

17.30-19.30

- 1EI. **Plasmon Terahertz Detection Due to Electron-Hole Ratchet Effect in a Spatially Periodic Graphene Structure** K.V. Mashinskii¹, D.V. Fateev², K.V. Popov^{1,2,x} ¹National Research Saratov State University, Saratov, Russia, ²Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch), Russian Academy of Sciences, Saratov
- 2EI. **Creating of Population Inversion in Graphene Using the Pumping by Optical Plasmon** I.M. Moiseenko¹, M.Yu. Morozov², V.V. Popov^{1,2}, ¹National Research Saratov State University, Saratov, Russia, ²Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch) of RAS, Saratov, Russia
- 3EI. **Investigation of Influence of Dielectric Spacer Thickness on Absorption of Metasurface Based on Electric Ring Resonator** D. Gomon¹, E. Sedykh¹, M. Khodzitsky¹, K. Zaitsev², ¹ITMO University, Russia, ²Bauman University, Russia
- 4EI. **Research of Interaction of Continuous Wave Infrared Radiation of Wavelength 980 nm with Mouse Tissues** Yu. Nazarov¹, M. Khodzitsky¹, ¹ITMO University, Russian Federation
- 5EI. **Development of Tunable Filter with Cross-Shaped Resonators for Terahertz Frequency Range** V.Y. Soboleva¹, V.K. Balya¹, E.A. Sedykh, M.K. Khodzitsky¹, ¹ITMO University, Russia
- 6EI. **Hyperbolic Medium from Finite Length Nanowires** M.V. Davidovich, Saratov State University, Russia

INTERNET REPORTS

1. **Subwavelength Localized Electromagnetic Fields by Mesoscale Dielectric Particles in Millimeter and Terahertz Waves** I. Minin¹, O. Minin¹, ¹SGUGiT, Novosibirsk, Russia
2. **The Influence of Pulsed and Continuous Modes of Low Power Electromagnetic Millimeter Waves to Human Epithelial Cell Lines** A.N. Velikanov¹, M.I. Murashova¹, A.N. Semenov¹, A.H. Tambiev¹, V.A. Golichenkov¹, ¹Lomonosov Moscow State University Russia
3. **Landauer-Datta-Lundstrom Based on Graphene Model for Terahertz Transistor** M.V. Davidovich, Saratov State University, Saratov, Russia

20th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Workshop on Modern Optics XV

Lectures on Optics for University Students, Postgraduate Students and High School Students

Workshop Chair **Georgy V. Simonenko**, Saratov State University

Secretary: **Irina Yu. Yanina**, 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), **Alexander V. Priezzhev**, Moscow State University (Russia)

September 29, Thursday

LECTURE SESSION:
(Building 3, Big Physical Hall)

Chair: **Georgy V. Simonenko**, Saratov State University, Russia

14.00-14.45

Public lecture: OCT in Live Embryonic Imaging
Prof. Kirill Larin, University of Houston, Professor

14.45-15.15

Quantum computers and quantum algorithms
Prof. Vladimir Soloviev, Saratov State University

15.15-15.45

Show "Exciting Light"
Assoc. Prof. Ivan V. Fedosov, Saratov State University, Russia

Workshop English as a Communicative Tool in the Scientific Community XV

Workshop Chairs: **Svetlana V. Eremina, Alexander B. Pravdin**, Saratov State University (Russia)

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

Secretary: **Natalia I. Kazadaeva**, Saratov State University (Russia)

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

September 26, Monday

ORAL SESSION I (Building 10, Hall 503)

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

16.40-16.55

ESP of Science: Nomenclature versus Terminology
Svetlana V. Eremina, Alexander B. Pravdin, Saratov State University, Russia

16.55-17.10

Classification of Chinese characters for effective learning and recognizing
Konstantin Grebenyuk, Saratov State University, Russia

17.10-17.25

Terminology as a source of metaphors
Dina Alexeeva, Saratov State University, Russia

17.25-17.40

Shifts in Russian-Chinese written English business communication standards caused by the interplay of specific cultural factors
Denis Sher, Saratov State University, Russia

17.40-17.55

Teaching ESP students: optimization of grammar course
Arina Shelyugina, Saratov State University, Russia

17.55-18.10

Poster session at the international conference: experience of organizing and holding
Anna Smirnova, Anna Sosnovskaya, Saratov State University, Russia

September 29, Thursday

POSTER SESSION (Building 3, 3rd floor Hall)

Chair (E): **Natalia I. Kazadaeva**, Saratov State University Russia

17.30-19.30

1E. The structure of scientific conference name in Chinese
Igor Demin, Saratov State University, Russia; Konstantin Grebenyuk, Saratov State University, Russia

Workshop on Management of High Technologies Commercialization and Regional Innovation Systems XIII

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

Workshop Co-Chairs: **Sergey N. Sokolov**, RME "INJECT" LLC, Saratov, Russia; **Julia S. Skibina**, Saratov State University, SPE LLC "Nanostructured Glass Technology", Saratov, Russia

Secretary: **Anastasiya A. Zanishevskaya**, Saratov State University, SPE LLC "Nanostructured Glass Technology", Saratov, Russia

International Program Committee: **Gregory B. Altshuler**, IPG Inc., USA, **Robert Breault**, Breault Research Organization, Arizona Optics Industry Association, USA, **Leonid E. Dolotov**, Saratov State University, **Yury V. Kistenev**, Russian Technology Platform "The Medicine of the Future", **Boris Reznik**, BioRASI, Inc., USA, **Natalya V. Romanova**, Saratov State University, **Sergey N. Sokolov**, RME "INJECT" LLC, Saratov, Russia, **Stoyan Tanev**, University of Southern Denmark, Denmark, **Andreas Thoss**, THOSS Media GmbH, Berlin, Germany

September 30, Friday

ORAL SESSION

(Building 8, Room 3)

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

Chairs: **Sergey N. Sokolov**, RME "INJECT" LLC, Saratov, Russia; **Julia S. Skibina**, Saratov State University, SPE "Nanostructured Glass Technology", LLC, Saratov, Russia

11.30-11.45

Colorimetric evaluation of the biological activity of the new azoloquinazolines and azolociklanopyrimidines

M.A. Ivonin, N.O. Vasilkova, D.C. Dymolazova, N.V. Safarova, A.A. Matikenova, A.P. Krivenko, V.V. Sorokin, Saratov State University, Russia, G.L. Burygin, A.Y. Prilepskii, A.A. Golubev, IBPPM RAS, Russia

11.45-12.00

The optical reflection spectra of structures with surface plasmons excited on the metal reinforcing border with heterogeneous environments

A. Andreev, V.F. Nazvznov, Saratov State University, Russia

12.00-12.15

Modeling of vibrational spectra of halogenated benzophenone by density functional theory method

V. Boykov, Saratov State University, Russia

12.15-12.30

Contact arrays of spheroidal particles: generation of photonic jets and optimized focusing for laser nanostructuring and biomedicine applications

Nikolai N. Mitin, Alexander V. Pikulin, Vladislav A. Kamensky, Nikita M. Bityurin, Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia

Workshop on History, Methodology and Philosophy of the Optical Education IX

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

Secretary: **A. A. Skaptsov**, Saratov State University, Russia

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

September 26, Monday

LECTURE/ORAL SESSION I

(Building 3, Room 34)

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

16.40-17.10

Invited

Nonlocality, contingency, physics and philosophy

O. Parshkov, Yuri Gagarin State Technical University of Saratov, Russia

17.10-17.20

Problems of the description of electromagnetic momentum in metamaterials

V. Tsoy, Saratov State University, Russia

17.20-17.30

Einstein vs Bohr: parallels and intersections in life and science

M. Stolnitz, Saratov State University, Russia

17.30-17.40

Why chemists need NMR? How to understand, what is it?

A. Shkel, O. Fedotova, Saratov State University, Russia

17.40-17.50

Application of NMR spectroscopy for studying chromenothiopyrylium salts

N. Bunina, A. Shkel, O. Fedotova, Saratov State University, Russia

17.50-17.55

Galileo's telescope and eye

M. Starshov, M. Grigorieva, Saratov State University, Russia

17.55-18.00

Physical laboratory for nonphysicists

M. Starshov, Saratov State University, Russia

18.00-18.05

The oldest optics problem

M. Starshov, Ju. Usol'tseva, Saratov State University, Russia

18.05-18.10

Physics in experiences

M. Starshov, Ju. Leshko, Saratov State University, Russia

18.10-18.20

Temperature dependence of luminescence spectra of quantum dots and upconversion nanoparticles

A.H.M. Mohammed, Saratov State University, Russia

18.20-18.30

Application of the method of two-particle density matrix to describe complexes of magnetic nanoparticles and biomolecules

B. Medvedev, A. Dronkin, E. Listratova, T. Bochkareva, Saratov State University, Russia

18.30-18.40

Intangible world of microscopic mechanics of life

A. Namykin, I. Fedosov, V. Tuchin, Saratov State University, Russia

18.40-18.50**Simple lens-free technique of fourier-transform holographic microscope with compensation of phase aberration**

O. Grishin, I. Fedosov, V. Tuchin, Saratov State University, Russia

18.50-19.00**The history and the physical meaning of image sensor model in digital holography**

K. Grebenyuk, Saratov State University, Russia

19.00-19.07**Determination of the angular position of the object rotating in the earth's magnetic field**

A. Ignatiev, N. Reshetnikov, Saratov State University, Russia

19.07-19.14**Distributed magnetically system**

A. Ignatiev, A. Lekarev, Saratov State University, Russia

19.14-19.21**Digital signal processing of heteromagnetic sensors**

A. Maslow, A. Ignatiev, Saratov State University, Russia

19.21-19.30**The features of nonlinear processes in ferromagnetic materials**

A. Vasiliev, A. Ignatiev, Saratov State University, Russia

September 27, Tuesday

LECTURE/ORAL SESSION II
(Scientific Library, Conference Hall)

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

16.30-17.00

Invited

Angular momentum of photon, twisted light and some applications

A. Gorokhov, Samara University, Russia

17.00-17.20

Invited

The complex of laser equipment and processing techniques in the preparation of specialists in laser technologies

T. Sokolova, Y. Gagarin State Technical University of Saratov, Russia

17.20-17.27

Scientific and applied importance of fundamental constants

N. Boikova, Saratov State University

17.27-17.35

Muonic hydrogen and universal physical constants

I. Svyatkin, N. Boikova, Saratov State University, Russia

17.35-17.40

Spectrum of luminescence and multiphase character of CdS-PbS films

M. Shishkin¹, Vladimir Dyakonov², A. Rokakh¹
¹Saratov State University, Russia; ²Wuerzburg University, Germany

17.40-17.45

Analogy ionic-electronic photoeffect and plasma resonance: mathematical simulation

M. Shishkin, A. Rokakh, David Bilenko, Saratov State University, Russia

17.45-17.50

The influence of the character of the grounding in the secondary-ion photoeffect in multiphase semiconductor structure

M. Shishkin, A. Serdobintsev, A. Rokakh, Saratov State University, Russia

17.50-18.00

Internet and studying of mathematics and physics

O. Simonenko¹, G. Simonenko²

¹Local autonomous educational institution

"Gymnasium 4", Saratov,

²Saratov State University, Saratov

18.00-18.08

History of gold nanoparticles at the beginning of the 21st century

O. Savenko, Saratov State University, Russia

18.08-18.16

1h NMR spectroscopy structural study of arylmethylen-bis-4-hydroxy-6-methyl-2h-pyran-2-ones

A. Kostritskiy, I. Strashilina, A. Aniscov, O. Fedotova, Saratov State University, Russia

18.16-18.23

Use of the combined methods of optimization of a configuration of a magnetic field at synthesis of heteromagnetic structures

V. Malyarchuk, Saratov State University, Russia

18.23-18.30

Doppler effect in optics and relativity

M. Borozdova, Saratov State University, Russia

September 29, Thursday

ROUND TABLE I

Man and light in natural and art treatment of the Universe

(Scientific Library, Conference Hall)

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

Panel members:

Valery V. Tuchin^a, Vladimir P. Ryabukho^a, Vladimir L. Derbov^a, Victor V. Rozen^a, Oleg V. Shimelfenig^a, A. G. Rokakh^a, Lev M. Babkov^a, Vyacheslav I. Kochubey^a, Svetlana P. Pozdneva^a, A. V. Gorokhov^b, Dmitry A. Zimnyakov^c, Leonid A. Melnikov^c, Dmitry V. Mikhel^c, Julia M. Duplinskay^c, Oleg M. Parshkov^c, A. V. Priezzhev^d,

^aSaratov State University, Saratov, Russia

^bSamara University, Samara, Russia

^c Yuri Gagarin State Technical University of Saratov, Saratov, Russia

^dM.V. Lomonosov Moscow State University, Moscow, Russia

11.30-11.45

On the 80th anniversary of the theoretical physics chair of Saratov State University. History of creation

Prof. L. Babkov, Saratov State University, Russia

11.45-12.00

XXI century: the problem of two cultures of Charles Snow in the context of the ethical paradigm of enlightenment

Associate Prof. B. Medvedev, Saratov State University, Russia

12.00-12.15

Cosmological models of the universe

Prof. V. Rozen, Saratov State University, Russia

12.15-12.30

The "hot" universe through a viewpoint of "cold" semiotic systems

Prof. Yu. Duplinskaya, Yuri Gagarin State Technical University of Saratov, Russia

12.30-12.45

Revival and new life of Zeno's paradoxes

Prof. O. Parshkov, A. Kochetkova, Yuri Gagarin State Technical University of Saratov, Russia

12.45-13.00

The logic of ancient texts: the treatment of the problem

Prof. A. Rokakh, Saratov State University, Russia

13.00-14.00

Lunch

ROUND TABLE II

Man and light in natural and art treatment of the Universe

(Scientific Library, Conference Hall)

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

14.00-14.15

Light and darkness: the physical and the philosophical-religious aspects

Associate Prof. O. Shimelfenig, Associate Prof. L. Solodovnichenko, Saratov State University, Russia

14.15-14.30

The theme of light in works by S.L. Frank

Associate Prof. L. Solodovnichenko, Associate Prof. O. Shimelfenig, Saratov State University, Russia

14.30-14.45

Nikolai N. Semenov: from "luminous" phosphorus to the Nobel prize. On the 60th anniversary of the awarding of the Nobel prize

Prof. V.M. Anikin, Saratov State University, Russia

14.45-15.00

Problem of future through ontological prism of light

Associate Prof. N. Dovgalenko, Yuri Gagarin State Technical University of Saratov, Russia

15.00-15.15

Genesis of modern human in the light of new molecular-genetic data

Prof. V.V. Anikin, Saratov State University, Russia

15.15-15.30

Light as the elementary substance and the problem of error-free way of science

Prof. V. Sorokin, Saratov State University, Russia

15.30-15.45

Rene dekart about light refraction

Prof. S. Pozdneva, Prof. R. Maslov, Saratov State University, Russia

15.45-15.52

Physics of light and philosophy of the world

Associate Prof. I. Fedosov, Saratov State University, Russia

15.52-16.00

Jan Vermeer: a ray of northern light

Prof. D. Mikhel, Associate Prof. I. Mikhel: Yuri Gagarin State Technical University of Saratov, Russia

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION (Building 3, 3d floor Hall)

Chair (H): **A. Skaptsov**, Saratov State University, Russia

17.30-19.30

- 1H. **Colorimetric evaluation of the biological activity of the new azoloquinazolines and azolociklanopyrimidines** M. Ivonin¹, N. Vasilkova¹, D. Dymolazova¹, N. Safarova¹, A. Matikenova¹, A. Krivenko¹, V. Sorokin¹, G. Burygi², A. Prilepskii², A. Golubev², ¹Saratov State University; ²Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Russia
- 2H. **Experimental determination of parameters of rlc elements of magnetically sensitive chips** A. Gunstvin, L. Strakhova, A. Ignatyev, Saratov State University, Russia
- 3H. **Bijjective map of lehmer codes to benes-type multistage interconnection network** L. Sotov, V. Chesakov, Saratov State University, Russia
- 4H. **Parametric optimization of RF and microwave power dividers** A. Khvalin, A. Arkhipov, D. Krasnov, Saratov State University, Russia
- 5H. **Influence on outputing signal of magnetic head uncontact** S. Kudryavceva, S. Zghusubaliev, Saratov State University
- 6H. **Use of non-magnetic shields of different materials to magnetic field sensor** L. Romanchenko, E. Zaiceva, Saratov State University
- 7H. **A study of the dynamic magnetization in the non-magnetic centrifuge** A. Ignatiev, D. Spiridonov, Saratov State University, Russia
- 8H. **High-sensitivity tri-axial magnetometer** A. Ignatiev, D. Spiridonov, Saratov State University, Russia
- 9H. **The use of peltier modules for the thermostabilization geomagnetic field sensors** S. Ovchinnikov, D. Gridnev, Saratov State University, Russia

16.00-16.15

Space and time in poetic perception of the world

Associate Prof. B. Medvedev, Saratov State University, Russia

- 10H. **Light as an ideal gas: how to derive formula for radiation pressure?** L. Zhestkova, K. Grebenyuk, Saratov State University, Russia
- 11H. **A study of increase frequency stability ways of primary converter of heteromagnetic magnetic field sensos in temperature range** S. Ovchinnikov, A. Pshenichniy, Saratov State University, Russia

INTERNET REPORTS

1. **The propagation of light in curved spacetime** Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia
2. **Physics of the korotkoff sounds** Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia
3. **On the perturbation theory in quantum electrodynamics** Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia
4. **The ponderomotive force acting from the electromagnetic wave onto the probe particle** Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia
5. **Light scattering for investigation of nanoparticles colloids: demonstration experiments for secondary school education** A. Markin¹, I. Eilks², ¹Saratov State University, Russia; ²University of Bremen, Germany

Workshop on Telemedicine: Opportunities, Applications, Prospects XI

Chairs: **Valery V. Bakutkin**, Saratov Research Institute of Hygiene, Russia, and **Sergey R. Utz**, Clinic of Skin and Venereal Diseases of Saratov Medical State University, Russia

International Program Committee: **Marine Amouroux**, Université de Lorraine – CRAN (France); **Frank Lievens**, ISfTeH (Belgium); **Malina Jordanova**, MD, PhD. Solar-Terrestrial Influences Laboratory. Bulgarian Academy of Sciences (Bulgaria); **Anton V. Vladzimirsky**, Prezident of AfUTEHD (Ukrania); **Oleg V. Kasimov**, Saratov Railway Clinic (Russia), **Valery V. Tuchin** Saratov National Research State University (Russia)

September 30, Friday

ORAL SESSION TELEMEDICINE

(Clinic of Skin and Venereal Diseases, SSMU)

Co-chairs: **V. Bakutkin**, Saratov Research
Institute of Rural Hygiene, Russia

11.30-11.40

Aspects of telemedicine pupillometry in psychophysical evaluation of the human condition

Valery Bakutkin, Alex Danilov, Saratov Research Institute of Hygiene, Russia

11.40-11.50

Telemedicine monitoring of the state of contact lenses

Anastasia Bakutkina, Saratov State University, Russia; Nugaeva Nailia Saratov Medical University

11.50-12.00

Telemedicine ophthalmoscopy training system in infants

Oleg Chichev, Valery Bakutkin, Saratov Research Institute of Hygiene, Russia

12.00-12.10

Telemedicine system for biomicroscopy study of human skin

Anton Kurenkov, Alexei Kurenkov, "NPP-Tehnoavtomat" LLC, Russia, Saratov region, Engels; Valery Bakutkin, Saratov Research Institute of Hygiene; Dmitry Aristov, Oleg Kachanov, "NPP-Tehnoavtomat" LLC, Russia, Saratov region, Engels

12.10-12.20

On line computer analysis system for laser microsurgery of eye

Nailya Nugaeva, Saratov Medical University, Russia

12.20-12.30

Development of device for measuring skin color index based smartphone with android operating system for a telemedicine

Mariya Kuznetsova, Saratov State Technical University, Russia

INTERNET REPORT

Finding out the needed information in a video

Oscar Chabrera Villarreal, ViLynx Co-Founder & EU Manager **Elisenda Bou Balust**, ViLynx Co-Founder & CTO, IEEE member, Universitat Politècnica de Catalunya (UPC, Barcelona)