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SFM'18

6th International Symposium “Optics and Biophotonics”

22nd International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Organized by

Saratov State University (SSU)

Research-Educational Institute of Optics and Biophotonics of SSU

International Research-Educational Center of Optical Technologies for Industry and Medicine “Photonics” of SSU

Institute of Biochemistry & Physiology of Plants & Microorganisms of the RAS

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

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

Volga Region Center of New Information Technologies of SSU

Tomsk State University

ITMO University

Bauman Moscow State Technical University (BMSTU)

Institute of Solid State Physics of the RAS

Prokhorov Institute of General Physics of the RAS

Research Center of Biotechnology of the RAS

Biomedical Photonics Committee of Chinese Optical Society, China

SPIE Student Chapter of SSU

SPIE Student Chapter of Bauman Moscow State Technical University

SPIE Student Chapter of Institute of Solid State Physics of the RAS

SPIE Student Chapter of Samara University

OSA Student Chapter of SSU

OSA Student Chapter of (BMSTU)

In cooperation with

Academy of Natural Sciences, Saratov Regional Division

Russian Society for Photobiology

Saratov Science Center of the RAS

Biophotonics4Life Worldwide Consortium (**BP4L**)

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



Russian Technology Platform “The Medicine of the Future”

Russian Technology Platform “**Photonics**”

Russian Technology Platform “Photonics”



European Technology Platform “Photonics21”



Government of the Russian Federation



LLC SPE Nanostructured Glass Technology



INJECT RME LLC



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Sergey A. Kozlov, ITMO University

Vyacheslav I. Kochubey, Saratov State University

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Kirill V. Larin, University of Houston, USA, Saratov State University, Tomsk State University

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Juergen Popp, Institute of Photonic Technology, Jena, Germany

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Alexander B. Pravdin, Saratov State University

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Oxana V. Semyachkina-Glushkovskaya, Saratov State University, Russia

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Alexander M. Sergeev, Institute of Applied Physics RAS

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Schedule of ADFLIM / SFM-18
3rd School on Advanced Fluorescence Imaging Methods
6th International Symposium “Optics and Biophotonics”
22nd International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

September 24, Monday

9.00-14.00	Registration	<i>Building 10, Foyer</i>
10.20-10.30	Introduction to ADFLIM/SFM Educational Program Alexander Savitsky, Research Center of Biotechnology of the RAS, Valery V. Tuchin, Saratov State University, Russia	<i>Building 10 Main Conference Hall</i>
10.30-11.50	ADFLIM/SFM PLENARY SESSION I Chairs: Valery V. Tuchin, Saratov State University Alexander P. Savitsky, Research Center of Biotechnology of the RAS, Russia Quantifying Stability in Deterministic and Stochastic Complex Systems, Jürgen Kurths, Humboldt University, Physics Department and Potsdam Institute for Climate Impact Research, Potsdam, Germany Optical Study of Molecular and Microrheologic Mechanisms of Interaction and Alteration of Blood Components in the Microcirculatory System Alexander V. Priezzhev, M.V. Lomonosov Moscow State University	<i>Building 10 Main Conference Hall</i>
11.50-12.20	Coffee break	<i>Building 10</i>
12.20-13.00	ADFLIM/SFM PLENARY SESSION II Chair: Alexander P. Savitsky, Research Center of Biotechnology of the RAS, Russia Biological Tissue Optics and Optical Clearing, Valery Tuchin, Saratov State University, Russia	<i>Building 10 Main Conference Hall</i>
13.00-14.00	Lunch	

14.00-15.00	SPIE SHORT COURSE Fluorescence Guided Procedures and Photodynamic Therapy in Neurosurgery Ronald Sroka , LIFE-Center at Department of Urology at Hospital of University of Munich, Munich, Germany	<i>Building 10 Hall 503</i>
15.00-15.30	Coffee break	<i>Building 10</i>
15.30-16.30	SPIE SHORT COURSE Fluorescence Guided Procedures and Photodynamic Therapy in Neurosurgery Ronald Sroka , LIFE-Center at Department of Urology at Hospital of University of Munich, Munich, Germany	<i>Building 10 Hall 503</i>
16.40-17.20	ADFLIM/SFM PLENARY SESSION III Chairs: Alexander P.Savitsky , Research Center of Biotechnology of the RAS Valery V. Tuchin , Saratov State University, Russia Plasmonic SERS Tags with Embedded Raman Molecules for Bioimaging and Sensing Applications, Nikolai G. Khlebtsov , Institute of Biochemistry and Physiology of Plants and Microorganisms of the RAS, Saratov State University, Russia	<i>Building 10 Main Conference Hall</i>
17.20-17.40	Coffee break	<i>Building 10</i>
17.40-19.00	ADFLIM/SFM PLENARY SESSION IV Chairs: Valery V. Tuchin , Saratov State University Alexander P.Savitsky , Research Center of Biotechnology of the RAS, Russia Optical Dosimetry of Extraoral Photobiomodulation Therapy of Oropharyngeal Mucositis in Pediatric Patients Undergoing Hematopoietic Cell Transplantation, Anna N. Yaroslavsky , Advanced Biophotonics Laboratory at the Department of Physics, University of Massachusetts, Lowell, USA Approaches of the molecular imaging and machine learning for medical applications Yury V. Kistenev et al. , Tomsk State University, Siberian State Medical University, Russia	<i>Building 10 Main Conference Hall</i>

September 25, Tuesday

9.00-14.00	Registration	<i>Building 10, Foyer</i>
10.00-11.00	OSA SHORT COURSE Diffuse Laser Speckles and their Statistics for Non-Invasive, Deep Tissue Blood Flow Measurements Turgut Durduran , ICREA Professor at ICFO -The Institute of Photonic Sciences, Barcelona, Spain	<i>Building 10, Hall 503</i>
11.00-11.30	Coffee break, Exhibition	<i>Building 10</i>
11.30-12.30	OSA SHORT COURSE Diffuse Laser Speckles and their Statistics for Non-Invasive, Deep Tissue Blood Flow Measurements Turgut Durduran , ICREA Professor at ICFO -The Institute of Photonic Sciences, Barcelona, Spain	<i>Building 10, Hall 503</i>
12.30-14.00	Lunch	
14.00-14.20	Opening of SFM and ADFLIM Valery V. Tuchin , Saratov State University, Alexander P. Savitsky , Research Center of Biotechnology of the RAS, and Wolfgang Becker , Becker&Hickl GmbH, Berlin, Germany	<i>Building 10 Main Conference Hall</i>
14.20-15.40	ADFLIM/SFM PLENARY SESSION V Chair: Wolfgang Becker , Becker&Hickl GmbH, Berlin, Germany How to Measure Tissue Blood Flow Non-Invasively with Light And What are The Current Trends? Turgut Durduran , ICFO-The Institute of Photonic Sciences, Barcelona, Spain Advanced Technologies for Brain Metin Akay , University of Houston, USA	<i>Building 10 Main Conference Hall</i>
15.40-16.10	Coffee break, Exhibition	<i>Building 10</i>

16.10-18.10	<p>ADFLIM/SFM PLENARY SESSION VI</p> <p>Chair: Turgut Durduran, ICFO-The Institute of Photonic Sciences, Barcelona, Spain</p> <p>Microscopy of the Brain on the Basis of Generation of Optical Harmonics: in Search of Optimum, Ilya V. Fedotov, M.V. Lomonosov Moscow State University, Russia</p> <p>Photonic and Magnetic Nanoparticles for Health, Energy, and Biosensing T. Randall Lee, University of Houston, USA</p> <p>Superconducting Thin Film Nanostructures as Terahertz and Infrared Heterodyne and Direct Detectors Grigory N. Goltsman, Moscow State Pedagogical University, Russia</p>	<i>Building 10 Main Conference Hall</i>
18.10-18.40	<p>SFM SPECIAL EVENT</p> <p>Chair: Valery V. Tuchin, Saratov State University</p> <p>Time-Resolved Single Photon Detection for Ultrafast Lifetime Imaging and Enhanced Superresolution STED Imaging Mathias Bayer, Sales and Application Specialist for Microscopy, Picoquant (Technoinfo), Germany</p>	
19.00-22.00	Welcome Party	<i>Univ.camp.</i>

September 26, Wednesday

9.00-10.00	SPIE SHORT COURSE Optical Dosimetry of Clinical Light Treatments Anna N. Yaroslavsky, Advanced Biophotonics Laboratory at the Department of Physics, University of Massachusetts, Lowell, USA						Building 10, Hall 503	
10.00-10.30	Coffee break, Exhibition						Building 10	
10.30-11.30	SPIE SHORT COURSE Optical Dosimetry of Clinical Light Treatments Anna N. Yaroslavsky, Advanced Biophotonics Laboratory at the Department of Physics, University of Massachusetts, Lowell, USA						Building 10, Hall 503	
11.40-13.00	SFM PLENARY SESSION VII Chair: Kirill Larin , University of Houston, USA Stone Fragmentation in Urology Ronald Sroka, LIFE-Center at Department of Urology at Hospital of University of Munich, Munich, Germany Imaging Below the Diffraction Limit by Spectroscopic Signal Separation Using Quantum Dots Andrei Sapelkin, Queen Mary University of London, UK	Building 10 Main Conference Hall	ADFLIM LECTURE SESSION I Chair: Francesco S. Pavone , European Lab. for Non-linear Spectroscopy, Florence, Italy				Building 10, Hall 503	
13.00-14.00	Lunch							
14.00-16.30	JOINT INVITED LECTURE/ORAL SESSION BIOPHYSICS I/MICROSCOPY AND LOW-COHERENCE METHODS Chair: Metin Akay , University of Houston, USA	Building 10 Main Conference Hall	ORAL SESSION PHOTONICS I Chair: Vladimir L. Derbov , Saratov State University, Russia	Building 3, Hall 34	LECTURE/ORAL SESSION EDUCATION I Chairs: Boris A. Medvedev and Vladimir P. Ryabukho , Saratov State University, Russia	Scientific Library Conference Hall	ADFLIM LECTURE SESSION II Chair: Vladislav Shcheslavskiy , Becker&Hickl GmbH, Berlin, Germany	Building 10, Hall 503

	ORAL SESSION BIOCOMPUTING I Chairs: Dmitry E. Postnov, Eugene B. Postnikov, Saratov State University, Kursk State University, Russia	<i>Building 8, Conference Hall</i>	ORAL SESSION BIOMEDICAL SPECTROSCOPY I Chair: Alexander B. Pravdin, Saratov State University, Russia	<i>Building 10, Hall 108</i>				
16.30-17.00	Coffee break, Exhibition							<i>Building 10</i>
17.00-19.15	INVITED LECTURE/ORAL SESSION BIOPHYSICS II Chair: Valery P. Zakharov, Samara University, Russia	<i>Building 10 Main Conference Hall</i>	ORAL SESSION LASER PHYSICS & PHOTONICS I Chair: Vladimir L. Derbov, Saratov State University, Russia	<i>Building 3, Hall 34</i>	ORAL SESSION BIOMEDICAL SPECTROSCOPY II Chair: Alexander Pravdin, State University, Russia	<i>Building 10, Hall 108</i>	ADFLIM LECTURE SESSION III Chair: Alexey Feofanov, Faculty of Biology, Moscow State Universtiy, Russia	<i>Building 10, Hall 503</i>
	ORAL SESSION BIOCOMPUTING II Chair: Dmitry E. Postnov, Saratov State University, Russia	<i>Building 8, Conference Hall</i>	ORAL SESSION EDUCATION II Chairs: B. Medvedev and V. Ryabukho, Saratov State University, Russia	<i>Scientific Library Conference Hall</i>	ORAL SESSION SPECTROSCOPY I Chair: Lev M. Babkov, Saratov State University, Russia	<i>Building 8, Hall 85</i>		
20.00-22.00	Social program (Volga boat tour)							

September 27, Thursday

9.00-11.00	<p>SFM PLENARY SESSION VIII</p> <p>Chair: Alexander V. Priezzhev, M.V. Lomonosov Moscow State University, Russia</p> <p>Prospects for Malignancy Diagnosis by Using Terahertz Spectroscopy and Imaging Kirill I. Zaytsev et al., Bauman Moscow State Technical University, Prokhorov General Physics Institute of the RAS, Russia</p> <p>Optical Detection of Clinical Pathologies by Image and Spectroscopic Analysis Francesco S. Pavone, European Lab. for Non-linear Spectroscopy, Florence, Italy</p> <p>In Vivo Flow Cytometry for Detection of Silent Circulating Tumor Cells in Melanoma Ekaterina I. Galanzha, University of Arkansas Medical Science, USA; Saratov State University, Russia</p>		Building 10, Main Conference Hall	<p>ADFLIM SESSION IV</p> <p>Chair: Wolfgang Becker, Becker&Hickl GmbH, Berlin, Germany</p>		Building 10, Hall 503
11.00-11.30	Coffee break, Exhibition					Building 10
11.30-13.30	<p>INVITED LECTURE/ORAL SESSION BIOPHYSICS III</p> <p>Chair: Walter Blondel, University of Lorraine, CNRS, CRAN, France</p>	Building 10, Main Conference Hall	<p>ORAL SESSION LASER PHYSICS & PHOTONICS II</p> <p>Chair: Vladimir L. Derbov, Saratov State University, Russia</p>	Building 8, Conference Hall	<p>ADFLIM SESSION V</p> <p>Chair: Vladislav Shcheslavskiy, Becker&Hickl GmbH, Berlin, Germany</p>	Building 10, Hall 503
13.30-14.30	Lunch					
14.00-15.30	<p>PUBLIC LECTURE SESSION MODERN OPTICS</p> <p>Chairs: Georgy V. Simonenko, Alexander B. Pravdin, Saratov State University, Russia</p> <p>How Does the Brain Works? The Worldwide Initiatives Francesco S. Pavone, European Lab. for Non-linear Spectroscopy, Florence, Italy</p> <p>Shining Light on Biology with Optogenetics, Andrew L. Lopez III, Department of Molecular Physiology and Biophysics, Baylor College of Medicine, Houston, Texas, USA</p> <p>Show "Exciting Light", Ivan V. Fedosov, Saratov State University, Russia</p>					Building 3, Big Physical Hall

14.30-16.30	ORAL SESSION TERAHERTZ OPTICS AND BIOTECHNOLOGY Chair: Valeriy E. Karasik , Bauman Moscow State Technical University, Russia	<i>Building 10, Main Conference Hall</i>	ORAL SESSION NONLINEAR DYNAMICS Chair: Vadim S. Anishchenko , Saratov State University, Russia	<i>Building 3, Room 38</i>
	ORAL SESSION NANOBIPHOTONICS I Chair: Nikolai G. Khlebtsov , IBPPM RAS, Saratov State University, Russia	<i>Building 9, Conference Hall</i>	LOW-DIMENSIONAL STRUCTURES Chair: Olga Glukhova , Saratov State University, Russia	<i>Building 8, Room 82</i>
	ORAL SESSION LASER PHYSICS & PHOTONICS III Chair: Vladimir L. Derbov , Saratov State University, Russia	<i>Building 8, Conference Hall 3</i>	ROUND-TABLE DISCUSSION EDUCATION Chairs: Boris A. Medvedev and Vladimir P. Ryabukho , Saratov State University, Russia	<i>Scientific Library Conference Hall</i>
16.30-17.00	Coffee break, Exhibition			<i>Building 3</i>
17.00-18.30	SFM INTERNET PLENARY SESSION IX Chair: Valery V. Tuchin , Saratov State University Ubiquitous THz Photonics From Ultra-High Bit-Rate Communications To Super-Resolution Non-Destructive Imaging Maksim Skorobogatiy , Polytechnique Montreal, Canada Non-Invasive Optical Imaging of Tissue Microstructure and Microcirculations in Vivo Ruikang K. Wang , University of Washington, USA Biomedical Applications of Terahertz - Applications, Opportunities and Challenges Vincent P. Wallace , University of Western Australia, Australia			<i>Building 3, Big Physical Hall</i>
18.30-19.30	JOINT POSTER/INTERNET SESSION. COMPETITION FOR THE BEST STUDENT POSTER AWARD Chairs: Ivan V. Fedosov and Anton Dyachenko , Saratov State University, Russia			<i>Building 3, 1-3rd floor, BPH</i>

September 28, Friday

9.00-11.00	<p>SFM PLENARY SESSION X Chair: Kirill I. Zaytsev, Prokhorov Institute of General Physics of the RAS, Bauman Moscow State Technical University, Russia</p> <p>Recent advances in Embryonic Imaging and Tissue Elastography Kirill Larin, University of Houston, USA</p> <p>Photodiagnostics of Stress-Induced Gastrointestinal Neoplasia Ekaterina Borisova et al., Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria, Saratov State University, Russia</p> <p>Nanosatellite Biomedical Experiments in Space Valery P. Zakharov, Samara University, Russia, Russia</p>	Building 10 Main Conference Hall	<p>ADFLIM/ SESSION VI</p> <p>Vladislav Shcheslavskiy, Becker&Hickl GmbH, Berlin, Germany</p>	Building 10 Hall 503
11.00-11.30	Coffee break, Exhibition			Building 10
11.30-13.00	<p>ADVANCED MATERIALS FOR OPTICS AND BIOPHOTONICS I Chair: Vladimir N. Kurlov, Bauman Moscow State Technical University, Russia</p>	Building 10 Main Conference Hall	<p>ADFLIM SESSION VII ADFLIM CLOSING// WINNERS AWARD</p> <p>Chair: Alexander P. Savitsky, Research Center of Biotechnology of the RAS, Russia</p>	Building 10, Hall 503
	<p>ORAL SESSION NANOBIPHOTONICS II Chair: Nikolai G. Khlebtsov, IBPPM RAS, SSU, Russia</p>	Building 9, Conference Hall		
	<p>ORAL SESSION ELECTROMAGNETICS Chair: Michael V. Davidovich, Saratov State University, Russia</p>	Building 8, Room 82	<p>ORAL SESSION ENGLISH Chair: Alexander Pravdin, Saratov State University, Russia</p>	Scientific Library Conference Hall
	<p>ORAL SESSION POLARIZATION Chair: Dmitry A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia</p>	Building 1, Room 459, SSTU	<p>ORAL SESSION SPECTROSCOPY II Chair: Kirill V. Berezin, Saratov State University, Russia</p>	Building 3, Room 34
	<p>ORAL SESSION TELEMEDICINE Chairs: Valery V. Bakutkin, Saratov Research Institute of Rural Hygiene and Sergey R. Utz, Clinics of Skin and Venereal Diseases, SSMU, Russia</p>		Clinics of Skin and Venereal Diseases, SSMU	
14.00-18.00	Round-table discussions and closing of the School. The Best Student Poster Award Ceremony			Open Air Meeting

PLENARY LECTURES

September 24, Monday

ADFLIM/PLENARY SESSION I

(Building 10, Main Conference Hall)

Chairs: **Valery V. Tuchin**, Saratov State University
Alexander P.Savitsky, Research Center of Biotechnology of the RAS

10.30-11.10

Quantifying stability in deterministic and stochastic complex systems

Jürgen Kurths, Humboldt University, Physics Department and Potsdam Institute for Climate Impact Research, Potsdam, Germany

11.10-11.50

Optical study of molecular and microrheologic mechanisms of interaction and alteration of blood components in the microcirculatory system

Alexander V. Priezzhev, M.V. Lomonosov Moscow State University, Russia

ADFLIM/PLENARY SESSION II

(Building 10, Main Conference Hall)

Chair: **Alexander P.Savitsky**, Research Center of Biotechnology of the RAS

12.20- 13.00

Biological tissue optics and optical clearing

Valery Tuchin, Saratov State University, Russia

ADFLIM/PLENARY SESSION III

(Building 10, Main Conference Hall)

Chairs: **Valery V. Tuchin**, Saratov State University
Alexander P.Savitsky, Research Center of Biotechnology of the RAS

16.40-17.20

Plasmonic SERS tags with embedded Raman molecules for bioimaging and sensing applications

Nikolai G. Khlebtsov, Institute of Biochemistry and Physiology of Plants and Microorganisms of the RAS, Saratov State University, Russia

ADFLIM/PLENARY SESSION IV

(Building 10, Main Conference Hall)

Chairs: **Valery V. Tuchin**, Saratov State University
Alexander P.Savitsky, Research Center of Biotechnology of the RAS

17.40-18.20

Optical dosimetry of extraoral photobiomodulation therapy of oropharyngeal mucositis in pediatric patients undergoing hematopoietic cell transplantation

Anna N. Yaroslavsky, Advanced Biophotonics Laboratory at the Department of Physics, University of Massachusetts, Lowell, US

18.20-19.00

Approaches of the molecular imaging and machine learning for medical applications

Yury V. Kistenev,^{1,2} Alexey V. Borisov^{1,2}, Viktor V. Nikolaev,¹ Denis A.Vrazhnov¹, Anastasya I.Knyazkova¹, ¹Tomsk State University; ²Siberian State Medical University, Russia

September 25, Tuesday

ADFLIM/SFM PLENARY SESSION V

(Building 10, Main Conference Hall)

Chair: **Wolfgang Becker**, Becker&Hickl GmbH, Berlin, Germany

14.20-15.00

How to measure tissue blood flow non-invasively with light and what are the current trends?

Turgut Durduran, ICFO-The Institute of Photonic Sciences, Barcelona, Spain

15.00-15.40

Advanced technologies for brain

Metin Akay, University of Houston, USA

ADFLIM/SFM PLENARY SESSION VI

(Building 10, Main Conference Hall)

Chair: **Turgut Durduran**, ICFO-The Institute of Photonic Sciences, Barcelona, Spain

16.10-16.50

Microscopy of the brain on the basis of generation of optical harmonics: in search of optimum

Ilya V. Fedotov, M.V. Lomonosov Moscow State University, Russia

16.50-17.30

Photonic and magnetic nanoparticles for health, energy, and biosensing

T. Randall Lee, University of Houston, USA

17.30-18.10

Superconducting thin film nanostructures as terahertz and infrared heterodyne and direct detectors

Grigory N. Goltsman, Moscow State Pedagogical University, Russia

September 26, Wednesday

SFM PLENARY SESSION VII

(Building 10, Main Conference Hall)

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

11.40-12.20

Stone fragmentation in urology

Ronald Sroka, LIFE-Center at Department of Urology at Hospital of University of Munich, Munich, Germany

12.20-13.00

Imaging below the diffraction limit by spectroscopic signal separation using quantum dots

Andrei Sapelkin, Queen Mary University of London, UK

September 27, Thursday

PLENARY SESSION VIII
(Building 10, Main Conference Hall)

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

9.00-9.40

Prospects for Malignancy Diagnosis by Using Terahertz Spectroscopy and Imaging

Kirill I. Zaytsev,^{1,2} Valery E. Karasik,¹ Vladimir N. Kurlov,³ Valery V. Tuchin,⁴ Igor V. Reshetov⁵,
¹Bauman Moscow State Technical University, ²Prokhorov General Physics Institute of the RAS, ³Institute of Solid State Physics of the RAS, ⁴Saratov State University, ⁵Sechenov University, Russia

9.40-10.20

Optical detection of clinical pathologies by image and spectroscopic analysis

Francesco S. Pavone, European Lab. for Non-linear Spectroscopy, Florence, Italy

10.20-11.00

In vivo flow cytometry for detection of silent circulating tumor cells in melanoma

Ekaterina I. Galanzha, University of Arkansas Medical Science, USA; Saratov State University, Russia

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

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

17.00-17.30

Ubiquitous THz photonics from ultra-high bit-rate communications to super-resolution non-destructive imaging

Maksim Skorobogatiy, Polytechnique Montreal, Canada

17.30-18.00

Non-invasive optical imaging of tissue microstructure and microcirculations in vivo

Ruikang K. Wang, University of Washington, USA

September 28, Friday

PLENARY SESSION X

(Building 10, Main Conference Hall)

Chair: **Kirill I. Zaytsev**, Prokhorov Institute of General Physics of the RAS,
Bauman Moscow State Technical University, Russia

9.00-9.40

**Recent advances in embryonic imaging and
tissue elastography**

Kirill Larin, University of Houston, USA

9.40-10.20

**Photodiagnosics of stress-induced
gastrointestinal neoplasia**

Ekaterina Borisova et al., Institute of Electronics,
Bulgarian Academy of Sciences, Sofia, Bulgaria;
Saratov State University, Russia

10.20-11.00

Nanosatellite Biomedical Experiments in Space

Valery P. Zakharov, Samara University, Russia

SPIE FOCUS EVENTS THE BEST STUDENT POSTER AWARD

September 27, Thursday

SPECIAL EVENT I
(Building 3, 3rd floor Hall)

18.30-19.30

Competition for the Best Student Poster Award

Jury of experts appointed by the Organizing Committee

September 28, Friday

SPECIAL EVENT II

In frames of Round-table discussions and closing of the School and Symposium

15.00-15.30

Competition for the Best Student Poster Award. Awarding of Winners

Valery V. Tuchin, Anton A. Dyachenko, Saratov State University, Russia

6th International Symposium Optics and Biophotonics

Conference on Optical Technologies in Biophysics & Medicine XX

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

Secretary: **Polina A. Timoshina**, Saratov State University, Tomsk State University

International Program Committee: **Alexey N. Bashkatov**, Saratov State Univ., **Walter Blondel**, Univ. of Lorraine (France), **Wei Chen**, Univ. of Central Oklahoma (USA); **Kishan Dholakia**, Univ. of St. Andrews (UK); **Maria Farsari**, FORTH-IESL (Greece), **Paul M.W. French**, Imperial College of Sci., Technol. & Med. (UK); **James G. Fujimoto**, MIT (USA); **Steven L. Jacques**, Tufts School of Engineering (USA); **Vyacheslav Kalchenko**, Weizmann Institute of Science (Israel), **Sean J. Kirkpatrick**, Michigan Technological Univ. (USA); **Kirill V. Larin**, Univ. of Houston (USA), Saratov State Univ.; **Jürgen M. Lademann**, Charité Universitätsmedizin Berlin (Germany); **Martin Leahy**, National Univ. of Ireland, Galway and RCSI (Ireland); **Qingming Luo**, Huazhong Univ. of Sci. & Technol. (China); **Francesco S. Pavone**, University of Florence (Italy); **Juergen Popp**, LeibnizInst. of Photonic Technol., Jena (Germany); **Alexey P. Popov**, Univ. of Oulu (Finland), **Alexander V. Priezzhev**, M.V. Lomonosov Moscow State Univ. (Russia); **Lihong Wang**, Caltech (USA); **Ruikang K. Wang**, Univ. of Washington (USA); **Dan Zhu**, Huazhong Univ. of Sci. and Technol. (China)

September 26, Wednesday

INVITED LECTURE/ORAL SESSION BIOPHYSICS I

(Building 10, Main Conference Hall)

Chair: **Metin Akay**, University of Houston, USA

14.20-14.40

Invited

Laser speckle dynamics in flow imaging - beyond the contrast,

Dmitry Postnov^{1,2}, Evren Erdener¹, Jianbo Tang¹, David Boas¹, ¹Neurophotonics Center, Boston University, Boston, USA; ²Faculty of Health and Medical Sciences, Copenhagen University, Copenhagen, Denmark

14.40-15.00

Invited

Optical properties of skin as predictors of chronic diseases

Ivan Bratchenko¹, Lyudmila Shamina¹, Dmitry Artemyev¹, Oleg Myakinin¹, Yulia Khristoforova¹, Dmitriy Kornilin¹, Vladimir Grishanov¹, Valery Zakharov¹, Peter Lebedev¹, Larisa Rogozina², Daria Pimenova², Alexander Moryatov², Sergey Kozlov, ¹Samara University; ²Samara State Medical University, Russia

15.00-15.20

Invited

OCT in ENT: Otitis media with effusion diagnosing

Pavel Shilyagin, Dmitry Terpelov, Valery Gelikonova, Alexey Novozhilov, Timur Abubakirov,

Grigory Gelikonov, Andrey Shakhov, Valentin Gelikonov, Institute of Applied Physics RAS, N.-Novgorod, Russia

15.20-15.35

Erbium laser perforation and active delivery of photodynamic agent in PDT therapy of onychomycosis

Anastasia Tavalinskaya, A.V. Belikov, S.N. Smirnov, ITMO University, Saint Petersburg, Russia

15.35-15.50

Conventional Raman and SERS of body fluids for cancer detection

Lyudmila Shamina¹, Ivan Bratchenko¹, Dmitry Artemyev¹, Oleg Myakinin¹, Julia Starikova¹, Elena Tupicova¹, Igor Platonov¹, Alexander Moryatov², Sergey Kozlov², Valery Zakharov¹, ¹Samara University; ²Samara State Medical University, Russia

15.50-16.05

Spatial speckle-correlometry and polarimetry technique for nondestructive investigation of biological objects

Ekaterina Korneeva, Maria Putintseva, Peter the Great St. Petersburg Polytechnic University, Russia

16.05-16.20

Study of microvascular reaction on the application of capsicum plaster by imaging photoplethysmography

Maxim Volynsky¹, Oleg Mamontov^{1,2,3}, Rashid Giniatullin^{1,4,5}, and Alexei Kamshilin¹, ¹ITMO University; ²Pavlov First Saint Petersburg State Medical University; ³Almazov National Medical Research Centre, Saint Petersburg; ⁴Kazan Federal

University, Russia; ⁵University of Eastern Finland, Kuopio, Finland

INVITED LECTURE/ORAL SESSION BIOPHYSICS II

(*Building 10, Main Conference Hall*)

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

17.00-17.20

Invited

Estimation of skin optical properties modified by an optical clearing agent and measured using bimodal tissue spectroscopy

P. Rakotomanga¹, C. Soussen¹, G. Khairallah^{1,3}, M. Amouroux¹, F. Marchal^{1,4}, A. Delconte¹, H. Chen¹, W. Feng^{5,6}, D. Zhu^{5,6} and Walter Blondel¹, ¹University of Lorraine, CNRS, CRAN, Vandœuvre-lès-Nancy; ²L2S, CentraleSupélec, CNRS, Université Paris-Sud; ³Regional Hospital CHR Metz-Thionville; ⁴Cancer Institute of Lorraine, Nancy, France; ⁵Wuhan National Laboratory for Optoelectronics-Huazhong University of Science and Technology (HUST), Wuhan; ⁶Britton Chance Center and MOE Key Laboratory for Biomedical Photonics, School of Engineering Sciences, HUST, Wuhan, China

17.20-17.40

Invited

Impact of standardization of autofluorescence and diffuse reflectance spectra on diagnosis accuracy of optical spectroscopy used for skin carcinomas diagnosis

G. Khairallah^{1,2}, W. Blondel¹, P. Rakotomanga¹, C. Soussen³, A. Delconte¹, F. Plénat¹, F. Marchal^{1,4}, Marine Amouroux¹, ¹Université de Lorraine, CNRS, CRAN Vandœuvre-lès-Nancy; ²CHR Metz-Thionville, Service de Chirurgie plastique, Metz; ³L2S, CentraleSupélec, CNRS, Université Paris Sud; ⁴Institut de Cancérologie de Lorraine, Vandœuvre-lès-Nancy, France

17.40-18.00

Invited

OCT-lymphangiography based on speckle statistics evaluation

Lev Matveev¹, Valentin Demidov², Marina Sirotkina³, Dmitry Karashtin¹, Alexander Moiseev¹, Alexander Sovetsky¹, Alexander Matveyev¹, Grigory Gelikonov¹, Elena Zagaynova³, Natalia Gladkova³, Vladimir Zaitsev¹, Alex Vitkin², ¹Institute of Applied Physics RAS, Russia, ²University of Toronto, Canada, ³Privolzhsky Research Medical University, Russia

18.00-18.20

Invited

Manually-operated compressional optical coherence elastography using robust strain mapping in phase-sensitive OCT

Vladimir Y. Zaitsev¹, A.L. Matveyev¹, A.A. Sovetsky¹, L.A. Matveev¹, D.V. Shabanov¹, S.Y. Ksenofontov, G.V. Gelikonov¹ ¹Institute of Applied Physics RAS, Nizhny Novgorod, Russia

18.20-18.30

In vitro Yb,Er:Glass laser hydroacoustic processing of human cataract eye lens: influence of pulse structure on removal efficiency

Andrey Belikov¹, Sergey Gagarsky¹, Andrey Sergeev¹, Sergey Smirnov¹, Alexey Zagorulko², ¹ITMO University, Russia, ²St. Petersburg Branch of the S. Fyodorov Eye Microsurgery Federal State Institution, Russia

18.30-18.40

Assessment of meat freshness with visible and near-infrared spectroscopy utilizing two conventionally used experimental approaches

Motahareh Peyvasteh, A. Popov, A. Bykov, I.V. Meglinski, University of Oulu, Finland

18.40 -18.50

Blood coagulation estimation using the method of laser-speckle correlation,

Lin Li¹, Iuliia D. Sytnik¹, Yakov S, Pekker^{1,2}, Fedor A. Gubarev¹, ¹National Research Tomsk Polytechnic University, Tomsk, ²Siberian State Medical University, Tomsk, Russia

18.50-19.00

Optical and morphological investigation of oral cavity mucous regeneration, after the fractional treatment by radiation of 980 nm diode laser

Elena Sergeeva¹, Andrey Belikov², Luidmila Ermolaeva¹, Dmitrii Korzhevskiy³, Yulia Semyashkina², Maria Antropova², Denis Fedotov¹, ¹St. Petersburg State University, Russia, ²ITMO University, St. Petersburg, Russia, ³FSBSI "IEM"

September 27, Thursday

**INVITED LECTURE/ORAL SESSION
BIOPHYSICS II**

(Building 10, Main Conference Hall)

Chair: **Walter Blondel**, University of Lorraine, CNRS, CRAN, France

11.30-11.50

Invited

Optical coherence tomography of malignant brain tumors ex vivo

Irina Dolganova^{1,2,3}, P. Aleksandrova³, K. Zaytsev^{2,3,4}, A. Kosyrkova⁵, S.-I. Beshplav⁵, I. Reshetov², A. Potapov⁵, V. Tuchin⁶, ¹Institute of Solid State Physics of RAS, Chernogolovka; ²Sechenov First Moscow State Medical University, Moscow; ³Bauman Moscow State Technical University; ⁴Prokhorov General Physics Institute of RAS, ⁵Burdenko Neurosurgery Institute, Moscow; ⁶Saratov State University, Saratov, Russia

11.50-12.10

Invited

Fiber optics probes as optical bridges between spectroscopy and medicine

Olga Bibikova^{1,2}, Urszula Zabarylo³, Anastasya Melenteva⁴, Valeria Belikova⁴, Iskander Usenov¹, Tatiana Sakharova¹, Olaf Minet³, Viacheslav Artyushenko¹, ¹art photonics GmbH, Germany, ²Research-Educational Institute of Optics and Biophotonics, Saratov State University, Russia, ³Center for Radiology C6, Medical Physics and Optical Diagnostics, CBF, Charité-Universitätsmedizin, Germany, ⁴Samara University, Russia

12.10-12.30

Invited

Towards the monitoring of cardiovascular and neurohydrodynamics to assess lymphatic function,

Teemu Myllylä, University of Oulu, Finland

12.30-12.45

Low-coherence optical fiber sensors using diamond structures

Daria Majchrowicz, M. Jędrzejewska-Szczerska, Gdańsk University of Technology, Gdańsk, 11/12 Gabriela Narutowicza Street, Poland

12.45-13.00

Fluorescent indices of Tradescantia leaves under various lighting conditions, Olesya Kalmatskaya, V.A. Karavaev, A.N. Tikhonov, Lomonosov Moscow State University, Faculty of Physics, Russia

13.00-13.15

Reaction of the cardiovascular system on the cold-stress test assessed by camera-based photoplethysmography

Valery Zaytsev¹, Oleg Mamontov², Alexei Kamshilin¹, ITMO University, Saint Petersburg, Russia, ²Almazov National Medical Research Centre, Saint Petersburg, Russia

**POSTERSESSION BIOPHYSICS
(Building 3, 3rd floor Hall)**

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

18.30-19.30

- 1B. **Investigation of blood microcirculation parameters in patients with rheumatic diseases by videocapillaroscopy and laser Doppler flowmetry during cold pressor test** Dmitry Stavtsev¹, Mikhail Volkov², Nikita Margaryants², Andrey Potemkin², Viktor Dreminev¹, Igor Kozlov¹, Irina Makovik¹, Evgeny Zhrebtsov³, Andrey Dunaev¹, ¹Research and Development Center of Biomedical Photonics, Orel State University named after I.S. Turgenev, Orel, Russia, ²Computer Photonics and Videomatics Department, Saint Petersburg National Research University of Information Technologies, Mechanics and Optics, Saint Petersburg, Russia, ³Aston Institute of Photonic Technologies, Aston University, Birmingham, UK
- 2B. **Influence of local pressure on the oscillations of cutaneous blood flow** Mikhail Mezentsev¹, Elena Potapova¹, Valerii Shupletsov¹, Irina Mizeva², ¹Orel State University named after I.S. Turgenev, Orel, Russia, ²Institute of continuous media mechanics, Ural Branch of RAS, Perm
- 3B. **Refractive index sensor based on double hybrid plasmonic waveguide** Muhammad Ali Butt, Samara National Research University, Russia
- 4B. **Vasodilatation rate under local heating test in controls and patients with diabetes mellitus** Elena Zharkikh, Orel State University, Russia
- 5B. **Optical needle system for blood vessels detection during stereotactic biopsy of brain tumors,** Elena Kiseleva, Privolzhskiy Research Medical University, Research Institute of Biomedical Technologies, Russia
- 6B. **New technique for determination of electrophoretic mobility of colloidal system** Ekaterina Savchenko, Peter the Great Saint-Petersburg Polytechnic University, Russia
- 7B. **Pilot studies of the synchronization in skin blood flow oscillations in contralateral limbs** Yulia I. Loktionova¹, S.A. Bryanskaya¹, I.O. Kozlov¹, E.V. Zharkikh¹, E.A. Zhrebtsov², A.I. Zhrebtsova¹, V.V. Sidorov³,

S.S. Sokolovski², A.V. Dunaev¹, E.U. Rafailov², ²Aston Institute of Photonic Technologies, Aston University, Aston Triangle, Birmingham, UK, ³SPE "LAZMA" Ltd, Moscow, Russia

- 8B. **Laser speckle contrast imaging of abdominal organs in rat model** Evgenia Seryogina¹, Viktor Dremine¹, Anton Sdobnov², Igor Kozlov¹, Mikhail Mezentsev¹, Andrian Mamoshin¹, Alexander Alyanov¹, Andrey Dunaev¹, ¹Orel State University named after I.S. Turgenev, Russia, ²Faculty of Information Technology and Electrical Engineering, University of Oulu, Oulu, Finland
- 9B. **Influence of local pressure on the oscillations of cutaneous blood flow** Mikhail Mezentseva¹, Elena Potapova¹, Valerii Shupletsov¹, Irina Mizeva^{2,1}, ¹Orel State University named after I.S. Turgenev, Orel, Russia, ²Institute of continuous media mechanics, Ural Branch of RAS, Perm, Russia
- 10B. **Spectral analysis of dural implants using chemometric analysis** Timchenko P.E.¹, Timchenko E.V.¹, Volova L.V.², Kiyko Nikita¹, ¹Samara University, ² Samara State Medical University, Russia
- 11B. **Chemometric analysis of raman spectra to assess the suitability of bone tissue in the production of bioimplants** Timchenko P.E.¹, Timchenko E.V.¹, Oleg Frolov¹, M.D. Markova¹, ¹Samara University, Russia
- 12B. **OCT based three-dimensional strain mapping for elastography and relaxography** Alexander Sovetsky¹, Alexander Matveyev¹, Ekaterina Gubarkova², Lev Matveev¹, Anton Plekhanov², Grigory Gelikonov¹, Dmitry Shabanov¹, Elena Zagaynova², Natalia Gladkova², Vladimir Zaitsev¹, ¹Institute of Applied Physics RAS, Russia, ²Privolzhsky Research Medical University, Russia
- 13B. **Seminal works on mitogenetic radiation from experiments with onion to "cancer quencher"** I.V. Volodyaev¹, E.V. Naumova², D.A. Isaev³, A.E. Naumova⁴, ¹Biological faculty of M.V. Lomonosov Moscow State University, Moscow, Russia, ²Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia, ³All-Russia Research and Development Institute of Irrigation Fishery, Moscow, Russia, ⁴Saratov State University, Saratov, Russia
- 14B. **The mirror artifact elimination in SD-OCT** Pavel Shilyagin, Dmitry Terpelov, Valentin Gelikonov, Grigory Gelikonov, Institute of Applied Physics RAS, Russia
- 15B. **Improvement of photodiagnosis using 5-ALA/PpIX, ZnPc and GalZnPc photosensitizers in combination with vaso-dilatation drugs** Alexandr Khorovodov¹, Ekaterina Borisova², Ilana Agranovich¹, Anastasia Shintenkova¹, Veronika Shimanova¹, Matvey Kanevsky¹, Nikita Navolokin³, Tsaniislava Genova – Hristova², Ivan Angelov⁴, Vanya Mantareva⁴, Oxana Semyachkina-Glushkovskaya¹, ¹Saratov State University, Russia, ²Institute of Electronics-Bulgarian Academy of Sciences, Sofia, Bulgaria, ³Saratov State Medical University, Russia, ⁴Institute of Organic Chemistry with Centre of Phytochemistry - Bulgarian Academy of Sciences, Sofia, Bulgaria
- 16B. **Estimation of color characteristics by spectral data under photobleaching of glycated dentine** Natalia Kazadaeva, Tatiana Kashina, Alexandr Pravdin, Leonid E. Dolotov, Saratov State University, Russia
- 17B. **Myocardium laser welding with infrared radiation** L. Frolov¹, A.E. Moskalensky¹, S.G. Sokolovski², ¹Laboratory of Optics and Dynamics of Biological Systems Department of Physics NSU, Russia, ²AIPT, School of Engineering and Applied Sciences, Aston University, Birmingham, UK
- 18B. **Automatic malignant melanoma recognition using a dermatoscopy imaging tool** Semyon Konovalov¹, Oleg A. Melsitov¹, Oleg O. Myakinin¹, Ivan A. Bratchenko¹, Alexander Moryatov², Sergey Kozlov², Valery Zakharov¹, ¹Samara University, Russia, ²Samara State Medical University, Russia
- 19B. **Modeling of a local temperature field photoinduced in a medium with plasmon nanoparticles** Sergey Zarkov¹, Avetisyan Yuriy¹, Yakunin Alexander¹, Akchurin Georgy^{1,2}, Akchurin Garif^{1,2}, Tuchin Valery^{1,2,3}, ¹Institute of Precision Mechanics and Control, Russian Academy of Sciences, Russia; ²Saratov State University, Russia; ³Tomsk State University, Russia
- 20B. **Thermooptics of structures based on ordered arrays of plasmon nanoparticles and their applications** Yakunin Alexander¹, Avetisyan Yuriy¹, Sergey Zarkov¹, Akchurin Georgy^{1,2}, Akchurin Garif^{1,2}, Tuchin Valery^{1,2,3}, ¹Institute of Precision Mechanics and Control, Russian Academy of Sciences, Russia; ²Saratov State University, Russia; ³Tomsk State University, Russia
- 21B. **Regularities of local heating in laser irradiation of biotissues doped by gold nanostars** Akchurin Garif^{1,2}, Avetisyan Yuriy¹, Sergey Zarkov¹, Akchurin Georgy^{1,2}, Yakunin Alexander¹, Tuchin Valery^{1,2,3}, ¹Institute of Precision Mechanics and Control, Russian Academy of Sciences, Russia; ²Saratov State University, Russia; ³Tomsk State University, Russia
- 22B. **Orientational invariance of the integral absorption of laser radiation by plasmon-**

- resonant nanostars** Avetisyan Yuriy¹, Sergey Zarkov¹, Yakunin Alexander¹, Akchurin Garif^{1,2}, Akchurin Georgy^{1,2}, Tuchin Valery^{1,2,3}, ¹Institute of Precision Mechanics and Control, Russian Academy of Sciences, Russia; ²Saratov State University, Russia; ³Tomsk State University, Russia
- 23B. **Single molecule detection and manipulation by optical trapping and fluorescence microscopy** Olga Kuznetsova, Tashtimirova Dilara, Peter the Great St. Petersburg Polytechnic University, Russia
- 24B. **Application of the method of combination scattering spectroscopy for estimation of quality of honoplastic in experiment on rabbits** P.E.Timchenko, E.V. Timchenko, M.D.Markova, L.T. Volova², D.A. Dolgyskin², Anna Tyumchinkova¹, Maria Markova¹, Galina Tikhomirova¹, ¹Samara University, Samara, Russia, ²Samara State Medical University, Samara, Russia
- 25B. **Colour characteristics definition from spectral data of glycated dentin during photobleaching**, Natalia Kasadaeva, Saratov State University, Russia
- 26B. **Optical properties of water solutions of glycerol and hyaluronic acid in the visible and near-IR regions** Ekaterina N. Lazareva^{1,2}, E.A. Genina^{1,2}, A.N. Bashkatov^{1,2}, V.I. Kochubey^{1,2}, V.V. Tuchin^{1,2,3}, ¹Saratov State University, Saratov, ²Tomsk State University, ³Institute of Precision Mechanics and Control RAS, Saratov, Russia
- 27B. **Study of the optical and structural properties of glycated and non-glycated hemoglobin by refractometric, fluorescent and Raman spectroscopy** Ekaterina Lazareva^{1,2,3}, Andrey. Y. Zyubin^{1,4}, Ilya G. Samusev^{1,4}, Vasily A. Slezhkin^{4,5}, Vyacheslav I. Kochubey^{2,3}, Valery V. Tuchin^{2,3,6}, ¹Center for Functionalized Magnetic Materials (FunMagMa), Immanuel Kant Baltic Federal University, Russia, ²Saratov State University, Saratov, Russia, ³Tomsk State University, Russia, ⁴Immanuel Kant Baltic Federal University, Kaliningrad, ⁵Kaliningrad State Technical University, ⁶Institute of Precision Mechanics and Control of RAS, Saratov, Russia
- 28B. **Role of different plasma constitutes in human erythrocytes interaction** Alexey Semenov, Andrey Lugovtsov, Alexander Hlutkin², Victor Zinchuk², Sehyun Shin³, Alexander Priezhev¹, ¹Moscow State University, Russia, ²Grodno State Medical University, Belarus ³Korea University, Republic of Korea
- 29B. **Non-invasive blood microcirculation sensor** Olga Golovan, Peter the Great St. Petersburg Polytechnic University, Russia
- 30B. **Optical and thermophysical modelling of the processes occurring in the mucous membrane of oral cavity as a result of fractional exposure of diode laser radiation with the wavelength of 980 nm** Maria Antropova, Andrey Belikov, ITMO University, Russia.
- 31B. **Photodynamic therapy of onychomycosis by high-intensive LED light of wavelength 660 ± 10 nm** Yulia Semyashkina¹, Andrey Belikov¹, Mark Gelfond², Elena Sergeeva¹, Mikhail A. Modin¹, ¹ITMO University, ²Scientific Research Institute of Oncology named after Petrov, Russia
- 32B. **Intravital molecular tagging velocimetry of lymph flow using Evans Blue** Anton Namykin, Saratov State University, Saratov, Russia
- 33B. **Multispectral and autofluorescence RGB imaging for skin cancer diagnostics** Vanesa Lukinsone¹, R.Veilande¹, E.V.Plorina¹, I.Kuzmina¹, D.Bliznuk², K.Bolochko², A.Derjabo³, I.Lihacova¹, J.Spigulis¹, ¹Institute of Atomic Physics and Spectroscopy, University of Latvia, Riga, Latvia, ²Faculty of Computer Science and Information Technology, Riga Technical University, Riga, Latvia, ³Oncology Centre of Latvia, Riga Eastern University Hospital, Riga, Latvia
- 34B. **Application of light scattering methods for measuring the red blood cells microrheologic properties in vitro** Anastasia Maslyanitsina, Lomonosov Moscow State University, Department of Physics, Russia
- 35B. **Characterization of carbon nanoparticles influence on red blood cell membrane tension by AFM method**, Doronkina Anna, Saratov State University, Russia
- 36B. **In vivo study of skin cancers by using hyperspectral imaging** Violetta Sherendak, Samara University, Russia
- 37B. **Fluorescent properties of fluoroquinolone in the presence of silver nanoparticles** Tatyana Danilina, Natalya Levina, Anastasia Bryshkina, Tatyana Smirnova, Saratov State University, Russia
- 38B. **Optical coherent elastography as a new method for estimation of chemotherapy efficacy on triple-negative breast cancer in the experiment** Anton Plekhanov¹, A. Sovetsky², E.B. Kiseleva¹, E.V. Gubarkova¹, M.A. Sirotkina¹, V.Yu. Zaitsev², L.A. Matveev², A.L. Matveev², S.S. Kuznetsov¹, N.D. Gladkova¹, ¹Institute of Biomedical Technologies, Privolzhsky Research Medical University, Nizhny Novgorod, ² Institute of Applied Physics RAS, Nizhny Novgorod, Russia

- 39B. **Study of regional differences in blood microcirculation in normal and pathological conditions** Svetlana Bryanskaya, Orel State University, Russia
- 40B. **Determination of salt solutions in Microstructured Optical Fiber** Pavel Pidenko¹, Andrey Shuvalov², Alexey Horev³, Natalia Burmistrova¹, ¹Saratov State University, Russia, ²SPC Nanostructured Glass Technology Ltd, Russia, ³Saratov State Medical University, Russia
- 41B. **Registration and modeling of the sedimentation process for erythrocytes and their aggregates in vitro** V.A. Doubrovski¹, K.N. Dvoretzki¹, Sergey V. Markov², E.P. Karpocheva³, V.V. Tuchin², ¹Saratov State Medical University, ²Saratov State University, ³Saratov Regional Blood Transfusion Station, Russia
- 42B. **Raman spectra analysis of venous and capillary blood using the projection on latent structure method** Anastasya Lykina¹, D. Artemyev¹, ¹Samara University, Russia
- 43B. **Study of early stages of lymphedema using multiphoton and THz microscopy** Ekaterina Sandykova¹, Daria Tuchina², Polina Timoshina², Anastasya Knyazkova³, ¹SSMU, Russia ²SSU, ³TSU, Russia
- 44B. **Computational recognition technique for histological micro-photo analysis of rat bone tissue in the scaffold implantation region** I.A. Norkin¹, Igor V. Zabenkov², I.O. Bugaeva², D.A. Gorin³, A.N. Ivanov¹, M.O. Kurtukova², P.V. Ryabukho⁴, M.S. Saveleva⁴, V.Y. Ulyanov¹, ¹Scientific Research Institute of Traumatology, Orthopedics and Neurosurgery of Razumovsky Saratov State Medical University, ²Razumovsky Saratov State Medical University, ³SKOLKOVO Institute of Science and Technology, ⁴Saratov State University, Russia
- 45B. **Ultrasonic standing wave action upon the sedimentation process of human erythrocytes** V.A. Doubrovski¹, Sergey V. Markov², S.O. Torbin¹, E.P. Karpocheva³, ¹Saratov State Medical University, ²Saratov State University, ³Saratov Regional Blood Transfusion Station, Russia
- 46B. **Infrared imaging of sweat glands activity of fingers during the post-occlusive reactive hyperemia test** Andrey A. Sagaidachnyi, A.V. Fomin, D.I. Mayskov, D.A. Usanov, A.V. Skripal, Saratov State University, Russia
- 47B. **Antibacterial composites based on a glauconite** Ekaterina I. Selifonova, S. B. Venig, R. K. Chernova, V. G. Serzhantov, A. N. Mikerov, O. G. Shapoval, V. P. Splyukhin, A. A. Selifonov, G. N. Naumova, N. N. Scherbakova, Saratov State University, Russia
- 48B. **Effect of different macromolecules on viscous and microrheologic properties of blood at various temperatures** Petr Ermolinkiy¹, Alexei Semenov¹, Andrei Lugovtsov^{1,2}, Maria Fehringer³, Ursula Windberger³, Alexander V. Priezzhev^{1,2}, ¹Department of Physics of M.V. Lomonosov Moscow State University, Moscow, ²International Laser Center of M.V. Lomonosov Moscow State University, Moscow, ³Medical University of Vienna, Center for Biomedical Research, Vienna, Austria
- 49B. **Application of light scattering methods for measuring the red blood cells microrheologic properties in vitro** Anastasia I. Maslyanitsina¹, P.B. Ermolinskiy¹, A.E. Lugovtsov^{1,2}, L.I. Dyachuk³, A.V. Priezzhev^{1,2}, ¹Department of Physics of M.V. Lomonosov Moscow State University, Moscow, ²International Laser Center of M.V. Lomonosov Moscow State University, Moscow, ³Medical Research and Education Center of M.V. Lomonosov Moscow State University, Moscow, Russia
- 50B. **Monitoring changes in sclera during UV/riboflavin crosslinking process by fluorescence lifetime measurements** Marina Shvachkina¹, Anastasya Knyazkova², Yury Kistenev², Alexander Pravdin¹, Dmitry Yakovlev¹, Saratov State University, ²Tomsk State University, Russia
- 51B. **The role of meningeal lymphatics in brain clearing after opening of blood-brain barrier** Oxana Semyachkina-Glushkovskaya¹, Alexander Khorovodov¹, Alexander Shirokov², Nikita Navolokin³, Andrey Terskov¹, Maria Klimova¹, Aysel Mamedova¹, Juergen Kurths^{1,4}, ¹Saratov State University, Russia ²Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, ³Saratov State Medical University, Russia, ⁴Potsdam Institute for Climate Impact Research, Humboldt University, Germany
- 52B. **Photodiagnostics of stress-induced stomach neoplasia using direct and indirect photosensitization**, Aleksandr Khorovodov¹, Ilana Agranovich¹, Anastasia Shintenkova¹, Veronika Shimanova¹, Matvei Kanevsky¹, Oxana Semyachkina-Glushkovskaya¹, Tسانislava Genova², Alexander Gisbrecht², Ivan Angelov³, Vanya Mantareva³, Ekaterina Borisova², ¹Saratov State University, Russia; ²Institute of Electronics-Bulgarian Academy of Science; ³Institute of Organic Chemistry with Centre of Phytochemistry - Bulgarian Academy of Sciences, Sofia, Bulgaria
- 53B. **How the brain cleans from the blood after stroke?** Alexander Khorovodov², Alexander Shirokov⁴, Nikita Navolokin¹, Andrey Terskov²,

Maria Klimova², Olga Sineeveva², Aysel Mamedova², Sergey Sokolovsky³, Edik Rafailov³, Oxana Semyachkina-Glushkovskaya,¹ Saratov State Medical University,² Saratov State University, Russia,³ Optoelectronics and Biomedical Photonics Group, Aston University, Birmingham, UK,⁴ Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Russia

54B. **The changes of the blood-brain barrier during formation of glioma** Olga Pavlova¹, Alexander Khorovodov¹, Alexander Shirokov², Nikita Navolokin³, Andrey Terskov¹, Maria Klimova¹, Aysel Mamedova¹,¹ Saratov State University,² Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences,³ Saratov State Medical University, Russia

55B. **Optical monitoring of brain clearing after opening of blood-brain barrier** Nikita Navolokin¹, Maria Klimova², Arkady Abdurashitov^{2,3}, Oxana Semyachkina-Glushkovskaya,¹ Valery Tuchin^{2,3},¹ Saratov State Medical University, Russia² Saratov State University,³ Tomsk State University, Russia

56B. **Investigation of the possibilities of locating fluorescent layers in biotissues using immersion optical clearing** Marina Shvachkina, Dmitry Yakovlev, Alexander Pravdin, Saratov State University, Russia

57B. **A refractometric OCT-technique for monitoring the collagen fiber composition during immersion clearing process** Marina Shvachkina, Ekaterina Lazareva, Dmitry Yakovlev, Alexander Pravdin, Dmitry Yakovlev, Saratov State University, Saratov, Russia

58B. **Application of multi-wavelength laser speckle contrast imaging for skin perfusion assessment**, Anton Sdobnov¹, A. Bykov¹, A. Popov¹, A. Grabovski², J. Spigulis², I. Meglinski^{1,3},¹ Opto-Electronics and Measurement Techniques Research Unit, University of Oulu, Finland,² Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy University of Latvia, Riga, Latvia,³ Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk, Russia

59B. **Study of skin permeability for glycerol in alloxan diabetes** Daria K. Tuchina^{1,2,3}, Alexey N. Bashkatov^{1,2}, Alla B. Bucharskaya⁴, Valery V. Tuchin^{1,2,5}¹ Saratov State University, Saratov, Russia,² Tomsk State University, Tomsk, Russia,³ Prokhorov General Physics Institute of RAS, Moscow, Russia⁴ Saratov State Medical University, Saratov, Russia,⁵ Institute of Precision Mechanics and Control RAS, Saratov, Russia

60B. **Utilization of VIS-NIR diffuse reflectance spectroscopy in differentiation of biosamples** Lucas Surazynski¹, Aleksandra Zienkiewicz², Anton Sdobnov,¹ Teemu Myllyla,¹ Motahareh Peyvaste¹,¹ University of Oulu, Oulu, Finland;² Orel State University, Orel, Russia

61B. **Comparative evaluation of the elastic properties of the biological tissues in various pathological states using optical coherence elastography**, Gubarkova Ekaterina, Privolzhsky Research Medical University, Nizhny Novgorod, Russia

62B. **The influence of local pressure on evaluation parameters of skin blood perfusion and fluorescence** Ksenia Kandurova¹, V. Dremine¹, E. Zherebtsov^{1,2}, E. Potapova¹, A. Dunaev², A. Mamoshin¹, A. Alyanov¹, Muradyan⁴,¹ Orel State University, Orel, Russia,² Aston Institute of Photonic Technologies, Aston University, Birmingham, UK,⁴ Orel Regional Clinical Hospital, Orel, Russia

63B. **Optical coherence microscopy combined with optical tweezers for cellular mechanics research**, Maxim Sirotin, Faculty of Physics, Lomonosov Moscow State University, Russia

64B. **Skin optical clearing in vivo in humans using oleic acid** Elina Genina,^{1,2} Albina Kazina¹, Yury Surkov,¹ Isabella Serebryakova,¹ Alexey Bashkatov,^{1,2} Valery Tuchin,^{1,2,3} Vladimir Zharov,^{1,4}¹ Saratov State University;² Tomsk State University;³ Institute of Precise Mechanics and Control of RAS, Russia;⁴ University of Arkansas Medical Science, USA

65B. **Fiber-optic sensor with nitrogen-doped diamond film**, Monika Kosowska, Daria Majchrowicz, Małgorzata Jędrzejewska-Szczerska, Gdańsk University of Technology, Gdańsk, 11/12 Gabriela Narutowicza Street, Poland

66B. **Investigation of the effect of immersion agents on the optical depth of OCT probing of skin ex vivo** Sergey Zaytsev^{1,2}, Alexey Bashkatov^{1,3}, Valery Tuchin^{1,3,4}, Yulia Svenskaya¹, Ekaterina Lengert¹, Elina Genina^{1,3},¹ Saratov State University,² Université de Lorraine,³ Tomsk State University,⁴ Institute of Precision Mechanics and Control, RAS, Saratov, Russia

67B. **Optical coherence tomography of ex vivo brain gliomas of different grades**, Polina Aleksandrova¹, I.N. Dolganova^{1,2,3}, K.I. Zaytsev^{2,3,4}, P.V. Nikitin⁵, S.-I.T. Beshplav⁵, I.V. Reshetov², A.A. Potapov⁵, and V.V. Tuchin⁶,¹ Bauman Moscow State Technical University,² Sechenov First Moscow State Medical University, Moscow,³ Institute of Solid State Physics of RAS, Chernogolovka,

⁴Prokhorov General Physics Institute of RAS, Moscow, ⁵Burdenko Neurosurgery Institute, Moscow, ⁶Saratov State University, Saratov, Russia

- 68B. **Borderline's reconstruction of absorbing and scattering inhomogeneity in biological tissue using time-resolved diffuse optical tomography** Anton Yu. Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University
- 69B. **Investigation of ex vivo skin geometrical parameters kinetics at the skin optical clearing by glycerol solutions with different concentrations** Vadim Genin, Alexey Bashkatov, Elina Genina, Valery Tuchin, Saratov State University, Russia
- 70B. **Models of optical parameters dynamics of collagenous tissues placed in glycerol** Mikhail Stolnitz, Saratov State University, Russia
- 71B. **The biotissue dehydration under external mechanical compressio**, Olga Zyuryukina, Yuriy P. Sinichkin, Saratov state University, Russia
- 72B. **Stroke induces nuclear shuttling of histone deacetylase 4 in the early post-stroke recovery period** Svetlana Demyanenko, Elena Berezhnaya, Maria Neginskaya, Viktor Nikul, SFedU, Russia
- 73B. **Expression of HDAC1, HDAC2 and HDAC4 in acute phase after photothrombotic stroke in the rat brain**, Svetlana Demyanenko, Valentina Dzreyan, Valeria Guzenko, SFedU, Russia
- 74B. **Towards screening of brain malformations with circularly polarized light?** Mariia Borovkova^{1,2}, Alexey Popov², Alexander Bykov², Jens Pahnke³, Mikhail Khodzitsky¹, Igor Meglinski¹, ¹ITMO University, Russia; ²University of Oulu, Finland; ³University of Oslo, Norway
- 75B. **Laser Doppler anemometer with liquid crystal modulator for blood flow velocity measurements**, Maria Borozdova, Fedosov Ivan, Tuchin Valery, Saratov State University, Russia
- 76B. **Comparison of elastic properties of tissue samples in various pathological states using optical coherence elastography**, Ekaterina Gubarkova¹, A.A. Sovetsky², V.Yu. Zaitsev², L.A. Matveev², A.L. Matveev², D.A. Vorontsov³, L.B. Timofeeva¹, E.B. Kiseleva¹, A.Yu. Vorontsov³, I.A. Kuznetsova⁴, N.D. Gladkova¹, ¹Privolzhsky Research Medical University; ²Institute of Applied Physics RAS; ³Nizhny Novgorod Regional Oncologic Hospital; ⁴N.A. Semashko Nizhny Novgorod Regional Clinical Hospital, Russia
- 77B. **Optical coherence elastography as a new method for estimation of chemotherapy efficacy on triple-negative breast cancer in the experiment**, Anton A. Plekhanov¹, A.A. Sovetsky², E.B. Kiseleva¹, E.V. Gubarkova¹, M.A. Sirotkina¹, V.Yu. Zaitsev², L.A. Matveev², A.L. Matveev², S.S. Kuznetsov¹, N.D. Gladkova¹, ¹Institute of Biomedical Technologies, Privolzhsky Research Medical University, Nizhny Novgorod; ²Institute of Applied Physics RAS, Nizhny Novgorod, Russia
- 78B. **Biophotonics for advanced diagnosis of thrombosis in human diseases** Galina Afanasieva¹, E.I. Galanzha^{2,3} and V.P. Zharov^{2,3} ¹V.I. Razumovsky Saratov State Medical University, Russia; ²University of Arkansas for Medical Sciences, Little Rock, AR, USA; ³Saratov State University, Russia
- 79B. **Transmission mode THz time-domain spectroscopy (THz-TDS) for blood plasma investigation** N.Yu. Ekimova¹, Yu.K. Aksenova¹, Ya.V. Grachev¹, M.L. Gelfond², E.N. Slugin², L.V. Plotnikova³, V.V. Tuchin^{1,4}, O.A. Smolyanskaya² ¹ITMO University; ²N.N. Petrov National Medical Research Center of Oncology; ³Saint Petersburg State University; ⁴Saratov State University, Russia
- 80B. **Application of the digital holographic microscopy for visualization of optopored cell membranes by a femtosecond laser irradiation** A.O. Georgieva^{1,2}, N.V. Petrov¹, B.V. Popov², S.E. Putilin¹, A.N. Tsyppin¹, O.A. Smolyanskaya¹ and V.V. Tuchin^{3,4} ¹ITMO University; ²Institute of Cytology of the RAS, Saint-Petersburg; ³Saratov State University, ⁴Institute of Precision Mechanics and Control of the RAS, Saratov, Russia
- 81B. **The changes of the blood-brain barrier during formation of glioma** Olga Pavlova¹, Alexander Khorovodov¹, Alexander Shirokov², Nikita Navolokin¹, Andrey Terskov¹, Maria Klimova¹, Aysel Mamedova¹, ¹Saratov State University; ²Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Russia
- 82B. **Quantitative laser speckle contrast imaging for blood flow imaging and it's application in microfluidics**, Amir Asadollahifanabonab, Shahid Beheshti University, Tehran, Iran
- 83B. **Optical diagnostics of bile duct tissues state with tumor compression**, Ksenia Kandurova¹, Victor Dremin¹, Evgeny Zhrebtsov^{1,2}, Elena Potapova¹, Andrey Dunaev¹, Andrian Mamoshin^{1,3}, Alexander Alyanov^{1,3}, Vadim Muradyan³, ¹Research and Development Center of Biomedical Photonics, Orel State University named after I.S. Turgenev, Orel, Russia; ²Aston Institute of Photonic Technologies, Aston University, Birmingham, UK; ³Orel Regional Clinical Hospital, Orel, Russia

84B. **Effect of low frequency fluctuations of arterial blood pressure on NIRS signals**
Aleksandra Zienkiewicz¹, Hany Ferdinando²,
Erkki Vihriälä¹, Vesa Korhonen^{2,3}, Teemu
Myllylä², ¹Optoelectronics and Measurement
Techniques Unit, University of Oulu;
²Research Unit of Medical Imaging, Physics
and Technology, University of Oulu;
³Department of Diagnostic Radiology, Oulu
University Hospital, Oulu, Finland

85B. **Optical and thermal modeling of Ti-doped
optothermal fiber converter for laser
surgery** Andrey Belikov, Alexei Skrypnik,
Irina Salogubova, ITMO University, Russia

86B. **Photodynamic influence of red (662 nm)
radiation on Staphylococcus Aureus
processed by photosensitizer** Aleksey A.
Selifonov¹, Olga G. Shapoval², Sergey A.
Yuvchenko³, Dmitry A. Zimnyakov³, Anatoly
N. Mikerov², Valery V. Tuchin¹, ¹Saratov State
University; ²Saratov Medical University;
³Saratov State Technical University, Russia

Workshop on Laser Physics and Photonics XX

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**, Yuri Gagarin State Technical University of Saratov (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 26, Wednesday

ORAL SESSION PHOTONICS I (Building 3, Conference Hall 34)

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

15.30-15.45

On rotational-vibrational spectrum of a diatomic beryllium molecule

Sergue I. Vinitsky, JINR, Dubna, Russia; A.A. Gusev, JINR, Dubna, Russia; O. Chuluunbaatar, JINR, Dubna, Russia; V.L. Derbov, Saratov State University, Saratov, Russia; P.M. Krassovitskiy, Institute of Nuclear Physics, Almaty, Kazakhstan

15.45-16.00

New numerical model of ultrashort optical pulse dynamics in bidirectional ring fibre cavity

Vadim Razukov, Yuri Gagarin State Technical University of Saratov, Russia

16.00-16.15

Nonlinear dynamics of intracavity difference-frequency generator pumped by a dual-wavelength semiconductor disk laser: Model of single-mode optical fields with strong time-delay feedback.

Yury A. Morozov, Kotelnikov Institute of Radio-Engineering and Electronics of RAS, Saratov, Russia

16.15-16.30

Numerical analysis of eikonal equation

T.R. Velieva, Dmitry S. Kulyabov, A.V. Korolkova, M.N. Gevorkyan, Peoples' Friendship University of Russia (RUDN University) & Laboratory of Information Technologies, Moscow, Russia

ORAL SESSION PHOTONICS I (Building 3, Conference Hall 34)

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

17.00-17.15

Nonmonotonic entropy growth at the field induced phase transitions in graphene

Konstantin Kravtsov, S. Smolyansky, V. Dmitriev, A. Panfyorov, Saratov State University, Russia

17.15-17.30

Quasiresonant elliptic polarized normal modes of electromagnetically induced transparency

Oleg M. Parshkov, Yuri Gagarin State Technical University of Saratov, Russia

17.30-17.45

Quantum fluctuations in short-pulse fiber lasers

Leonid A. Melnikov, Yuri Gagarin State Technical University of Saratov, Russia

17.45-18.00

Numerical simulation of the THz lasing in the cavity with graphene-based hyperbolic medium

Olga N. Kozina, Kotelnikov Institute of Radio-Engineering and Electronics of RAS, Saratov, Russia

September 27, Thursday

ORAL SESSION PHOTONICS II (Building 8, Conference Hall 3)

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

11.30-11.45

Suppression of transverse spatio-temporal instabilities in broad-area lasers emission by external optical injection

Anton A. Krents, Samara State University, Russia

12.00-12.15

Optical rogue waves in the laser with positive optoelectronic feedback

Anton A. Krents, Samara State University, Russia

12.15-12.30**Symmetry, coherent states and control of quantum dynamics**

Alexander V. Gorokhov, Samara National Research University, Russia

12.30-12.45**Influence of detuning and dipole-dipole interaction on the entanglement of a Jaynes-Cummings atom and an isolated atom**

Eugene K. Bashkirov, Samara National Research University, Russia

12.45-13.00**Entanglement in double Jaynes-Cummings model induced by thermal noise**

Eugene K. Bashkirov, Samara National Research University, Russia

**ORAL SESSION PHOTONICS III
(Building 8, Conference Hall 3)**

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

14.30-14.45**Autodyne interferometry of distance by injected current modulation of semiconductor laser**

Anatoly V. Skripal, Dmitry Usanov, Sergey Dobdin, Aleksey Dzhafarov, Saratov State University, Russia

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

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

17.30-19.30

1P. **Advantages and limitations of the matrix record of the Wentzel-Kramers-Brillouin solution in the problem of the distribution of electromagnetic waves in planar structures** Natalya M. Moiseeva, Anton V. Moiseev, Volgograd State University, Russia

2P. **Numerical simulation of modes of planar open waveguides** D.V. Divakov, RUDN University, Moscow, Russia

3P. **Numerical simulation of the propagation of waveguide modes in a thin film waveguide Luneberg lens**, D.V. Divakov, RUDN University, Moscow, Russia

4P. **Laser recording resolution increasing of binary photomasks in thin chromium films by magnetron sputtering modes optimization** Sergey A. Fomchenkov, Samara University, Russia

14.45-15.00**Waveguide diffraction at the joint of planar waveguides**

Dmitry V. Divakov, RUDN University, Moscow, Russia

15.00-15.15**Exact dynamics of two-level quantum systems**

Vitalii Semin, Samara National Research University, Russia

15.15-15.30**Plasmonic terahertz photoconductive antennas for spectroscopy and imaging systems**

Dmitry S. Ponomarev, Institute of ultra high frequency semiconductor electronics of RAS, Russia

15.30-15.45**THz quantum cascade lasers with gold- and silver based double metal waveguide**

Rustam A. Khabibullin, Institute of ultra high frequency semiconductor electronics of RAS, Russia

15.45-16.00**Femtosecond thulium-doped ring fiber laser as a perspective source in mid-IR region for breath analysis**

Alexander Donodin, BMSTU, Russia

5P. **Calculation of the shape of optical pulses when reflected by a planar cholesteric cell** Anton V. Moiseev, Volgograd State University, Russia

6P. **Analysis of steady-state stability and quasi-periodic oscillations in intracavity optical parametric oscillator pumped by semiconductor disk laser**, Leonid Kochkurov, M. I. Balakin, Yu. A. Morozov, M. Yu. Morozov, A. I. Konukhov, V. V. Dedova, Yuri Gagarin State Technical University of Saratov, Russia, Kotel'nikov Institute of Radio-Engineering and Electronics of RAS, Saratov, Russia, Saratov State University, Russia.

7P. **Complex dynamics of coupled VCSELs with optical phase-locking**, Leonid Kochkurov, M. I. Balakin, Yu. A. Morozov, M. Yu. Morozov, A. I. Konukhov, V. V. Dedova, Yuri Gagarin State Technical University of Saratov, Russia, Kotel'nikov Institute of Radio-Engineering and Electronics of RAS, Saratov, Russia, Saratov State University, Russia.

8P. **Amplitude zone plate with aluminium rings**, Elena S. Kozlova, Image Processing Systems Institute of RAS, Samara, Russia

- 9P. **Formation of an optical vortex in the near field of a spiral microaxicon** Sergey S. Stafeev, Image Processing Systems Institute of RAS – Branch of the FSRC “Crystallography and Photonics” RAS, Samara, Russia
- 10P. **Finslerian representation of the geometrized Maxwell equations** Dmitry S. Kulyabov, A.V. Korolkova, T.R. Velieva, A.V. Demidova Peoples' Friendship University of Russia (RUDN University) & Laboratory of Information Technologies, Moscow, Russia
- 11P. **Hamiltonian approach to the geometrized Maxwell theory** A.V. Korolkova, Dmitry S. Kulyabov, L.A. Sevastianov, M.N. Gevorkyan, Peoples' Friendship University of Russia (RUDN University) & Laboratory of Information Technologies, Moscow, Russia
- 12P. **Modeling of the laser pulse in a waveguide with a Bragg grating** Stanislav. Krasnov, Samara University, Russia
- 13P. **The propagation of ultrashort laser pulses in phototropic media** Vladislav Yu. Gribkov, Rimma S. Zatrudina, Volgograd State University, Russia
- 14P. **The propagation of ultrashort laser pulses in phototropic media** Vladislav Yu. Gribkov, Rimma S. Zatrudina, Volgograd State University, Russia
- 15P. **Modelling of distribution of circular beams of Airy in parabolic fiber** Evgeny O. Monin, Samara National Research University, Russia
- 16P. **Dispersion and evanescent properties of multimode chalcogenide fiber modes** Elena Vinogradova, E.A. Romanova, Saratov State University, Russia
- 17P. **Modern polarization technologies in biomedicine and materials science**, Natalya Moiseeva, Volgograd State University, Russia
- 18P. **Investigation of the optophysical properties of self-organized thin films of biomacro molecules** Alexandra P. Alexeenko, Peter the Great St.Petersburg Polytechnic University, Russia
- 19P. **Subwavelength grating polarizer for cylindrical vector beams creation** Sergey A. Degtyarev, Samara National Research University, Russia
- 20P. **Soliton dynamics in ring bidirectional fibre microcavity** Vadim Razukov, Yuri Gagarin State Technical University of Saratov, Russia
- 21P. **Dynamics of quantum discord and entanglement in double Jaynes-Cummings model with dipole-dipole interaction** Mikhail Evseev, Eugene Bashkurov, Samara National Research University, Russia
- 22P. **Dynamics of atom-field entanglement in nonlinear Tavis-Cummings models** Marya O. Guslyannikova, Samara National Research University, Russia
- 23P. **Atom-field entanglement for multi-photon Tavis-Cummings model** Eugene Bashkurov, Marya O. Guslyannikova, Samara National Research University, Russia
- 24P. **Dynamics of atomic entanglement for artificial atoms non-resonantly interacting with quantum field of lossless cavity**, Anatoly M. Vorobiev, Eugene Bashkurov, Samara National Research University, Russia
- 25P. **Entanglement in Tavis-Cummings models induced by a thermal noise** Eugene K. Bashkurov, Mikhail Evseev, Samara National Research University, Russia
- 26P. **Diffraction misaligned vortex beams on a binary axicon in the near field** Dmitry Savelyev, Samara National Research University, Russia
- 27P. **Numerical and experimental selection of optimal parameters in the interferometric method of measuring the thickness of the cornea** Anton A. Adamov, M.S. Baranov, V.N. Khramov, Volgograd State University, Russia
- 28P. **Optical and morphological properties of Al₂O₃ layer deposited by E-beam evaporation for optical waveguide applications** Andra Naresh Kumar Reddy, M.A. Butt, S.N. Khonina, Samara University, Russia
- 29P. **Parametric generation in optical fibers with variable dispersion**. A. Konyukhov, Alexander I. Rap, Saratov State University, Russia
- 30P. **Dispersive wave generation in variable-diameter optical fibers**. A. Konyukhov, E. Schurkin, Saratov State University, Russia
- 31P. **Transient dynamics of Kerr-lens mode locking in vertical external cavity semiconductor laser**. A. Konyukhov, Yu A. Morozov, Saratov State University, Russia, Kotelnikov Institute of Radio-Engineering and Electronics of RAS, Saratov, Russia
- 32P. **Soliton fission due to stepwise change of dispersion coefficient in model of nonlinear Schrödinger equation** Andrey I. Konyukhov, P. Mavrin, Saratov State University, Russia
- 33P. **Collision of Airy pulses in nonlinear optical fibers** Andrey I. Konyukhov, V. Baranovsky, Saratov State University, Russia
- 34P. **Research of the configuration of optical fibers and filter systems based on optical fibers for effective registration of Raman scattering** Yuliya Litvinova, D.N. Artemyev, I.A. Bratchenko Samara University, Russia
- 35P. **Research of the configuration of a resonant dielectric grating used as the basis of a sensor for changing the refractive index of a medium** S.A. Syomik, L.L. Doskolovich, Samara University, Russia
- 36P. **Modeling of speckle structures in partially coherent optical wave field with wide frequency and angular spectra** Vladimir Ryabukho, Ludmila Maksimova, Natalia Mysina, Dmitry Lyakin, Petr Ryabukho, Saratov State

University, Institute of Precision Mechanics and Control Russian Academy of Sciences, Russia

- 37P. **Digital speckle photography based on correlation analysis of spatial spectra of speckle patterns**, Ludmila Maksimova, Natalia Mysina, Petr Ryabukho, Dmitry Lyakin, Vladimir Ryabukho, Saratov State University, Institute of Precision Mechanics and Control Russian Academy of Sciences, Russia
- 38P. **Formation of interference fringes in thin layer in the light of a quasi-monochromatic extended source and a source with wide frequency and angular spectra** Ludmila Maksimova, Natalia Mysina, Petr Ryabukho, Anton Dyachenko, Dmitry Lyakin, Vladimir Ryabukho, Saratov State University, Institute of Precision Mechanics and Control Russian Academy of Sciences, Russia
- 39P. **Optimization of parameters in a modified laser triangulation method**. A. A. Adamov, M. S. Baranov, V. N. Khramov, Volgograd State University, Russia
- 40P. **The conditions for the propagation of soliton-like pulses in nonlinear media with reverse saturable absorption** Rimma Zatrudina, Vladislav Gribkov, VolSU, Russia
- 41P. **Development of laser-induced holographic images on the stainless steel AISI 304** M.K. Moskvin, G.V. Odintsova, V.V. Romanov, R.M. Yatsuk, ITMO University, Russia
- 42P. **Modeling of reflectors and microfluidic systems for efficient collection of raman scattering** Taisiya Slivkova, D.N. Artemyev, I.A. Bratchenko Samara National Research University n.a. academician S.P. Korolev, Russia
- 43P. **Entangled solitons via soliton fission in dispersion variable fibers** Yulia Mazhirina, Yuri Gagarin State Technical University of Saratov, Russia
- 44P. **Coherent states of qubits and photons and their superpositions** Alexander Gorokhov, Samara National Research University, Russia
- 45P. **Development of a technology for manufacturing radio antennas and retarding structures based on the laser ablation method** Peter V. Ryabukho, Victor V. Galushka, Alexey A. Serdobintsev, Andrey V. Starodubov, Anton M. Pavlov, Educational-Scientific Institute of Nanostructures and Biosystems, Saratov State University, Russia
- 46P. **The lifetime of the entangled states of interacting qubits in external fields and the thermostat calculated by path integral approach** A. Biryukov, M. Shleenkov, Samara National Research University, Russia
- 47P. **Description of multiphoton ionization of an atom by path integral approach** A. Biryukov, Ya. Degtyareva, Samara University, Russia
- 48P. **Laser optical systems for manipulating microobjects**, M.L. Galkin, M.A. Vinogradov, M.S. Kovalev, and P.A. Nosov, Bauman Moscow State Technical University, Moscow, Russia
- 49P. **Laser optical systems for the formation of Bessel beams**, Vinogradov M.A., Galkin M.L., Krasin G.K., Kovalev M.S., Nosov P.A., Bauman

Moscow State Technical University, Moscow, Russia

- 50P. **High efficiency infrared reflector based on a multilayer structure** Sergey A. Fomchenkov, Samara University, Russia

INTERNET REPORTS

1. **Light squeezing in two- and three atom Jaynes-Cummings models**. Alexander Korotchenko, Anatoly Vorobiev, Anna Gorchakova, Eugene Bashkirov, Samara University, Russia
2. **Rare-earth elements action upon small-periodical microstructures**. L.I. Vostrikova, V.A. Smirnov, Rzhanov Institute of Semiconductor Physics SB of RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia
3. **Long-lived micro- and nanostructures of nonlinear polarizability in amorphous media**. L.I. Vostrikova, V.A. Smirnov, Rzhanov Institute of Semiconductor Physics SB of RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia
4. **Reversibility of temperature influence on all-optical poling**. L.I. Vostrikova, V.A. Smirnov, Rzhanov Institute of Semiconductor Physics SB of RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia
5. **Analysis of harmonic's generation in susceptibility gratings**. Vitaly Smirnov, Liubov Vostrikova, Rzhanov Institute of Semiconductor Physics SB of RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia
6. **Phase-matched conditions for waves interactions on photo-induced susceptibility gratings**. Vitaly Smirnov, Liubov Vostrikova, Rzhanov Institute of Semiconductor Physics SB of RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia
7. **Impact of heating on photo-induced susceptibility gratings**. Vitaly Smirnov, Liubov Vostrikova, Rzhanov Institute of Semiconductor Physics SB of RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia
8. **Reflection of light by a planar inhomogeneous gyrotropic layer with torsion**. Natalya Moiseeva, VolSU, Russia, Anton Moiseev, VolSU, Russia

Conference on Spectroscopy and Molecular Modeling XIX

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), **Lev A. Gribov**, Institute named by V. I. Vernadskyi RAS (Moscow, Russia), **Dmitry S. Umreiko**, Belarus State University (Minsk, Belorussia), **Nadezda A. Davydova**, Institute of Physics, NAS of Ukraine, **Tatiana G. Bourova**, Saratov State Pedagogical Institute (Russia), **Nikolai V. Burenin**, Institute of Applied Physics RAS (Moscow, Russia), **Victor L. Furer**, Kazan Civil Engineer Academy (Russia), **Alexander V. Gorohov**, Samara State University (Russia)

September 26, Wednesday

ORAL SESSION SPECTROSCOPY I (Building 8, Hall85)

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

17.00–17.15

Luminescence of europium complexes: the influence of the ligand structure, substituent and counterion type on photophysical properties

Anastasiia V. Kharcheva¹, Svetlana V. Patsaeva¹, Nataliya E. Borisova², Alexey V. Ivanov², ¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia, ²Faculty of Chemistry, Lomonosov Moscow State University, Moscow, Russia

17.15 – 17.30

Molecular modeling of the process of optical clearing of human skin under the action of aqueous solutions of some mono saccharides

Konstantin Dvoretzkiy, Saratov State Medical University, Russia

17.30–17.45

IR spectrum and molecular model of honey

Ekaterina Antonova, Astrakhan State University, Russia

17.45–18.00

Application of raman spectroscopy and quantum chemistry to determine the relative content of tri-glycerides of oleic and linoleic acids in olive and sunflower oil mixture

Kirill Berezin. Saratov State University, Russia

18.00 – 18.15

Manifestation of vibronic interactions in chlorophyll absorption spectra (a)

Vladimir Nechaev, Yuri Gagarin State Technical University of Saratov, Russia

18.15 – 18.30

FT-IR spectrum and molecular model of quercetin

Ilmira Shagautdinova, Astrakhan State University, Russia

18.30 – 18.45

Interpretation of vibrational spectra of fullerene derivatives with glycine

G.N. Ten¹, N.E. Scherbakova², V.I. Baranov³, ¹Saratov State University, Russia, ²Russian Scientific Research Institute for Plague Control "Microbe", Saratov, Russia, ³Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

18.45 – 19.00

Vibrational spectra of arginine and lysine in aqueous solution at different pH

G.N. Ten¹, N.E. Scherbakova², V.I. Baranov³, ¹Saratov State University, Russia, ²Russian Scientific Research Institute for Plague Control "Microbe", Saratov, Russia, ³Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

19.00–19.50

Intermolecular interaction and energy of hydrogen bonds in aqueous suspensions of nanodiamonds with different surface functionalization: molecular modeling and experiment

Inna Plastun¹, Andrey Bokarev¹, Kirill Laptinskiy², Tatiana Dolenko², ¹Yuri Gagarin State Technical University of Saratov, Russia, ²Lomonosov Moscow State University, Russia

September 27, Thursday

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

Co-chairs: **Kirill V. Berezin, Lev M. Babkov**,
Saratov State University, Russia

18.30-19.30

- 1S. **Possibility of targeted drug delivery due to hydrogen bonds formation in nanodiamonds and anticancer drugs: molecular modeling** Andrey Bokarev, Inna Plastun, Yuri Gagarin State Technical University of Saratov, Russia
- 2S. **IR spectrum of arginine: experimental investigation and molecular modeling** Maria Kornaukhova, Kutsenko Svetlana Anatolievna, Volgograd State University, Russia
- 3S. **Molecular modeling of electron spectra of ascorbic acid in polar solvents** Yuliya Danyaeva, Kutsenko Svetlana Anatolievna, Sitnikova Svetlana Vladimirovna, Volgograd State University, Russia
- 4S. **Spectroscopic analysis supported by chemometric tools for qualification of plant-based and animal-based matrixes** Olga Krivets, Saratov State University, Russia
- 5S. **Luminescent characteristics of water-soluble Europium(III) complexes** Anastasiia Kharcheva, Nataliya Borisova, Oleg Farat, Mikhail Freidkin, Mariya Kapitonova, Svetlana Patsaeva, Aleksandra Son, Roman Zorin, Lomonosov Moscow State University, Moscow, Russia
- 6S. **Monte Carlo modeling of Raman scattering in a multi-layered tissue** Irine A. Matveeva, Oleg O. Myakinin, Ivan A. Bratchenko, Valeriy P. Zakharov, Samara University, Samara, Russia
- 7S. **Determination of the structure of components of isomeric mixtures heterocyclic compounds by spectral methods** Maxim Ivonin, N.O. Vasilkova, A.S. Kalugina, V.V. Sorokin, A.P. Kriven'ko, Saratov State University, Russia
- 8S. **Optical study of associates of rhodamine 6g molecules adsorbed on the surface silver island films with silver nanoparticles** Konstantinova E.I. et al. Immanuel Kant Baltic Federal University, Russia

INTERNET REPORTS

1. **SEM of the cutting edge of oxide cutters** Ivan Egorov, Aleksandr Fomin, Yuri Gagarin State Technical University of Saratov, Russia, Andrey Zakharevich, Saratov State University, Russia, Igor Rodionov, Yuri Gagarin State Technical University of Saratov, Russia

September 28, Friday

**ORAL SESSION
SPECTROSCOPY II
(Building 3, Room 34)
Chair: Kirill V. Berezin,
Saratov State University, Russia**

11.30 – 11.45

The influence of hydration on the vibrational spectra d-ribose 5-phosphate
Anna Novoselova, Saratov State University, Russia

11.45 – 12.00

Conformational analysis of ethylene glycol in aqueous solution
Maria Chernavina, Saratov State University, Russia

12.00–12.15

Intermolecular interaction in halogen-substituted benzophenone
V.A. Boykov¹, L.M. Babkov¹, N.A. Davydova²
¹Saratov National Research State University, Russia, ²Institute of Physics of the National Academy of Sciences of Ukraine, Kiev

12.15-12.30

IR spectra and structure of some compounds with h-bonds
I.V. Ivlieva-Peretokina¹, L.M. Babkov¹, N.A. Davydova², ¹Saratov National Research State University, Russia, ²Institute of Physics of the National Academy of Sciences of Ukraine, Kiev

12.30-12.45

Molecular modeling, structure and IR spectra of some organic polyconjugated semiconductors
M.V. Kinder¹, L.M. Babkov¹, T.V. Bezrodna², T.A. Gavrilko²
¹Saratov National Research State University, Russia, ²Institute of Physics of the National Academy of Sciences of Ukraine, Kiev

12.45-13.00

Influence of intermolecular interaction on the structure and IR spectrum of behenic acid
S.N. Firsunin¹, L.M. Babkov¹, T.V. Bezrodna², T.A. Gavrilko²
¹Saratov State University, Russia, ²Institute of Physics of the National Academy of Sciences of Ukraine, Kiev

Conference on Nanobiophotonics XIV

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

Secretary: **Timofey E. Pylaev**, Institute of Biochemistry and Physiology of Plants and Microorganisms of the RAS

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

September 24, Monday

ADFLIM/SFM PLENARY SESSION III

(Building 10, Hall 503)

Chairs: **Alexander P. Savitsky**, Research Center of Biotechnology of the RAS
Valery V. Tuchin, Saratov State University

16.40 – 17.20

Plasmonic SERS tags with embedded Raman molecules for bioimaging and sensing applications **Nikolai G. Khlebtsov** IBPPM RAS, Saratov State University

September 27, Thursday

ORAL SESSION NANOBIPHOTONICS I

(Building 9, Conference Hall)

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

14.30 – 14.45

Integration of plasmonic particles into multifunctional devices **Fulvio Ratto**, Inst. Applied Physics, Nat'l Research Council, Florence, Italy

14.45 – 15.00

Gold nanorods for photoacoustic theranostics **Lucia Cavigli**, Inst. Applied Physics, Nat'l Research Council, Florence, Italy

15.00 – 15.15

Background-suppressed laser-scanning microscopy of upconversion nanoparticles in cell culture **Alexey B. Kostyuk**, Lobachevsky

State University of Nizhny Novgorod, Nizhny Novgorod, Russia

15.15 – 15.30

Conductive coatings on nonwoven electrospun mats by vacuum magnetron sputtering for nerve stimulation *in vivo* **Peter Ryabukho**, Saratov State University

15.30 – 15.45

Optical properties of polydopamine coated Au nanoparticles **Boris N. Khlebtsov**, IBPPM RAS, Saratov, Russia

15.45 – 16.05

Red infrared quantum dots for rapid test imaging and bioanalysis **Olga Goryacheva**, Saratov State University, Russia

16.05 – 16.20

Study of ultra-small gold nanoparticles toxicity towards microalga *Dunaliella salina* and animal cells **Daniil S. Chumakov**, IBPPM RAS, Saratov, Russia

16.20 – 16.35

Synthesis of high luminescent fluorophore from citric acid and ethylenediamine **Alina Kokorina**, Saratov State University, Russia

16.35 – 16.50

Formation and study of the properties of copper nanoparticles monolayers at the gas-liquid and «gas-solid state» phase interfaces **Nadejda Begletsova**, Saratov State University, Russia

September 28, Friday

ORAL SESSION NANOBIPHOTONICS II

(Building 9, Conference Hall)

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

11.00 – 11.15

Nanoscale luminescent labels of organic and inorganic nature Irina Yu. Goryacheva, Saratov State University

11.15-11.30

Microcontainers on the basis of nano-titania and polyelectrolyte layers Polina A. Demina, Saratov State University

11.30 – 11.45

Cytotoxic effect of copper particles on the human dermal fibroblasts cells culture Roman A. Verkhovskii, Saratov State University

11.45 – 12.00

Polyelectrolyte submicrocapsules, functionalized by magnetite nanoparticles for MR contrast control Anastasia A. Kozlova

September 27, Thursday

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

(Building 3, 3rd floor Hall)

Chair (N): **Timofey E. Pylaev**, IBPPM RAS,
Saratov, Russia

18.30 – 19.30

- 1N. **Synthesis and SERS properties of gold@gold and gold@silver nanomatryoshkas with embedded reporters** Vitaly A. Khanadeev, IBPPM RAS, Saratov, Russia, **Boris N. Khlebtsov** and **Nikolai G. Khlebtsov** IBPPM RAS, Saratov, Russia, Saratov State University
- 2N. **A novel highly-tunable universal approach for plasmonic nanoparticles layering on 2-D surfaces** **Timofey E. Pylaev**, Elena S. Avdeeva and **Boris N. Khlebtsov**, IBPPM RAS, Saratov, Russia
- 3N. **Synthesis of monodisperse and uniform gold nanospheres by seed-mediated growth** Andrey M. Burov, IBPPM RAS, Saratov, Russia, **Boris N. Khlebtsov** and **Nikolai G. Khlebtsov**, IBPPM RAS, Saratov, Russia, Saratov State University
- 4N. **Cytotoxicity of NaYF₄:Er:Yb/SiO₂ nanoparticles in vivo** Nikita A. Navolokin,

12.00 – 12.15

Development of system for Raman spectra analysis and recognition Daniil N. Bratashov, Saratov State University

12.15 – 12.30

Porous biodegradable submicron particles for non-invasive transdermal drug delivery Yulia I. Svenskaya, Saratov State University

12.30 – 12.45

Functional hybrid materials based on mineralized polymeric scaffolds for bone tissue regeneration Maria Saveleva, Saratov State University

12.30 – 12.45

Study of protein corona formation on the surface of upconversion nanoparticles in situ by fluorescence correlation spectroscopy Artem Vorotnov, Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia

Saratov State University, Saratov State Medical University, Irina Yu. Yanina, Saratov State University, Tomsk State University, Elena K. Volkova, Saratov State University, Tomsk State University, Elena A. Sagaydachnaya, Saratov State University, Dmitry A. Mudrak, Saratov State Medical University, Andrey M. Zakharevich, Saratov State University, Vyacheslav I. Kochubey Saratov State University, Tomsk State University, and Valery V. Tuchin, Saratov State University, Tomsk State University, Institute of Precision Mechanics and Control of the RAS

5N. **Optical properties of biomolecular complexes** Elina Nepomnyashchaya, Elmira Valiulina, Peter the Great Saint-Petersburg Polytechnic University, Saint-Petersburg, Russia

6N. **Submicron Mesoporous Vaterite Particles for Transdermal Delivery of Antimycotic Drug Griseofulvin** Ekaterina Lengert, Mariia Saveleva, R.A. Verkhovskiy, Yu. I. Svenskaya Saratov State University

7N. **Immobilization of antifungal agent "Naftifine" in porous calcium carbonate particles** Olga I. Gusliakova, Saratov State University

8N. **Surface modification of carbon nanoparticles** Alina Kokorina, Saratov State University

- 9N. **The study of the effect of acids and alkalis on the optical characteristics of carbon nanoparticles on the base of biopolymers** Anastasiya Mitrofanova, Saratov State University
- 10N. **Synthesis of CdSe/ZnS/ZnS quantum dots with blue fluorescence** Aleksandr Sobolev, Saratov State University
- 11N. **Comparative study of hydrothermal treatment effect on the optical properties of polyelectrolyte microcapsules** Daria Shpuntova, Saratov State University
- 12N. **Factors influencing the fluorescent properties of structures based on citric acid and ethylenediamine** Ekaterina Mordovina
- 13N. **Optical properties citric acid and ethylenediamine based carbon nanoparticles** Artem Bakal, Saratov State University
- 14N. **Water-soluble in-based quantum dots for application as biolabels** Anastasiya Novikova, Saratov State University
- 15N. **Comparison between ligand exchange methods for quantum dots hydrophilization** Daniil Drozd, Saratov State University
- 16N. **Photodynamic aspects of antimicrobial action of nanoparticles of silver on Staphylococcus aureus strains** Tatiana A. Shulgina^{1,3}, Olga V. Nechaeva², Natalya V. Bespalova², Anna S. Torgashova³, ¹Institute of Traumatology and Orthopedics, ²Yuri Gagarin State Technical University of Saratov, ³V.I. Razumovsky Saratov State Medical University, Russia
- 17N. **Luminescence properties of upconversion nanoparticles with rare-earth elements for biomedicine** Sergey Burikov Moscow M.V. Lomonosov State University, Department of Physics, Moscow, Russia
- 18N. **Fluorescence quenching of bioactive molecules by nanodiamonds** Alexey Vervald Faculty of Physics, MSU, Moscow, Russia
- 19N. **Determination of some cephalosporins with SERS platforms based on gold and silver nanoparticles** Snezhana Kushneruk Saratov State University
- 20N. **Antioxidants loaded nanocarriers for potential application in COPD therapy** Vinay Kumar, Indian Institute of Technology Roorkee, India, Mehak Passi, Indian Institute of Technology Roorkee, India, P. Gopinath, Indian Institute of Technology Roorkee, India
- 21N. **Synthesis and characterization of graphene quantum dots from citric acid for biosensing applications** Ashish, Indian Institute of Technology Roorkee, India, Rangadhar Pradhan, Indian Institute of Technology Roorkee, India, P. Gopinath, Indian Institute of Technology Roorkee, India
- 22N. **Intermolecular interaction and energy of hydrogen bonds in aqueous suspensions of nanodiamonds with different surface functionalization: molecular modeling and experiment** Inna Plastun, Yuri Gagarin State Technical University of Saratov, Andrey Bokarev, Yuri Gagarin State Technical University of Saratov, Kirill Laptinskiy, Tatiana Dolenko, Lomonosov Moscow State University, Russia
- 23N. **SERS-platforms based on electrospun nanofibers with embedded silver nanoparticles** Nadezhda Komova, Saratov State University, Russia

INTERNET REPORTS

1. **Strategies to enhance the sensitivity of NAGDF4:YB-TM based nanothermometers** Daria Pominova Prokhorov General Physics Institute of the Russian Academy of Sciences

Workshop on Microscopy and Low-Coherence Methods XI

Co-chairs: **Kirill Larin** and **Metin Akay**, University of Houston, USA

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

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 Oulu (Finland); **Valery V. Tuchin**, Saratov State University

September 26, Wednesday

ORAL SESSION MICROSCOPY AND LOW-COHERENCE METHODS XI

Chair: **Metin Akay**, University of Houston, USA

14.00-14.20

High-Speed Visualization of Aluminum Nanopowder Combustion in Air

Fedor A. Gubarev, Andrei V. Mostovshchikov, Alexander P. Il'in, Lin Li, Tomsk Polytechnic University, Tomsk, Russia

Olga Izotova, Saratov State University, Russia, Vladimir P. Ryabukho, Saratov State University, Institute of Precision Mechanics and Control, Russian Academy of Sciences, Russia

September 27, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

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

18.30-19.30

1M. **Line field swept source optical coherence tomography system with compensation of chromatic aberrations**

Igor P. Gurov, Aleksei Yu. Pimenov, Pavel S. Skakov, ITMO University, Russia

2M. **High resolving low-coherence microscopy method for 3D analysis of biological tissues internal micro structure**

Maxim A. Volynsky, Igor P. Gurov, Nikita B. Margaryants ITMO University, Russia

3M. **Partially coherent illumination in digital holographic microscopy**

Daria M. Klychkova, Vladimir P. Ryabukho Saratov State University; Institute of Precision Mechanics and Control, Russian Academy of Sciences, Russia

4M. **Hyperspectral interference microscopy with spatial filtration in reference field**

5M. **Influence of the color model of image representation on the accuracy of measurement the optical thickness of thin-layered objects in interference microscopy**

Anton Dyachenko Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov State University, Russia, Vladimir P. Ryabukho Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov State University, Russia

6M. **Electrochemical introduction of the porous coating of medico-technical products**

Elena Poshivalova, Yuri Gagarin State Technical University of Saratov, Russia

7M. **Multi-spectral amplitude and phase distribution measurement using acousto-optic image filtration in near-common-path interferometer**

Ludmila I. Burmak, A.S. Machikhin, L.A. Zykova, Scientific and Technological Center of Unique Instrumentation of the RAS (STC UI RAS), Russia

INTERNET REPORTS

1.SEM of the cutting edge of oxide cutters

Aleksandr Fomin, Ivan Egorov, Andrey Zakharevich, Igor Rodionov, Yuri Gagarin State Technical University of Saratov, Russia

2.Morphology and hardness of zirconium coatings obtained on tool steel by the electrospark alloying

Aleksandr Fomin, Maksim Fedoseev, Yuri Gagarin State Technical University of Saratov, Russia

Conference on Internet Biophotonics XI

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

Secretary: **Daria K. Tuchina**, Saratov State University, Tomsk State University, Bauman Moscow State Technical University

International Program Committee: **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); **Elina A. Genina**, Saratov State University (Russia); **Kirill V. Larin**, University of Houston (USA), Saratov State University; **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); **Lihong Wang**, Caltech, Pasadena (USA); **Ruikang K. Wang**, University of Washington (USA); **Mikhail Yu. Kirillin**, Institute of Applied Physics RAS, Nizhny Novgorod (Russia), **Valery P. Zakharov**, Samara University (Russia), **Edik Rafailov**, Aston University (UK).

September 27, Thursday

PLENARY SESSION

(Building 3, Big Physical Hall)

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

17.00-18.30

1. Ubiquitous THz photonics from ultra-high bit-rate communications to super-resolution non-destructive imaging, Maksim Skorobogatiy, Polytechnique Montreal, Canada

2. Non-invasive optical imaging of tissue microstructure and microcirculations *in vivo*, Ruikang K. Wang, University of Washington, USA

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, Big Physical Hall, Room 43)

Moderators: **Maxim Malovetsky**, **Ivan V. Fedosov**, Saratov State University

17.00-19.30

INVITED INTERNET LECTURES

1. Optical properties of human liver from 400 to 1000 nm Isa Carneiro¹, Sonia Carvalho¹, Rui Henrique^{1,2}, Luís Oliveira^{3,4}, Valery V. Tuchin^{5,6,7}, ¹Portuguese Oncology Institute of Porto, ²Institute of Biomedical Sciences Abel Salazar – University of Porto, ⁴Centre of Innovation in Engineering and Industrial Technology, Porto, Portugal, ⁵Saratov State University, ⁶Institute of Precision Mechanics and Control Institute of the Russian Academy of Sciences, Saratov, Russia, ⁷Samara University, Samara, Russia

2. Mapping viscoelasticity of biological tissue by using laser speckle contrast

imaging Xiao Cheng, Jinling Lu and Pengcheng Li, Britton Chance Center for Biomedical Photonics, Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology

3. Investigation of the reversible permeability of neuron membrane induced by terahertz radiation A.S. Ratushniak¹, T.A. Zapara¹, A.L. Proskura¹, A.S. Kozlov², D.S. Serdyukov³, Olga Cherkasova³, ¹Institute of Computational Technologies of SB RAS, Novosibirsk, Russia, ²Institute of Chemical Kinetics and Combustion of SB RAS, Novosibirsk, Russia, ³Institute of Laser Physics of SB RAS, Novosibirsk, Russia

4. Skull optical clearing for cortical vascular imaging Dan Zhu, Britton Chance Center for Biomedical Photonics, Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology

5. Novel protocols for PDT treatment under optical monitoring M.Yu. Kirillin¹, A.V. Khilov¹, D.A. Loginova¹, E.A. Sergeeva¹, V.V. Perekatova¹, M.A. Shakhova^{1,2}, A.E. Meller^{1,2}, D.A. Sapunov^{1,2}, A.V. Shakhov^{1,2}, N.Yu. Orlinkskaya^{1,2}, and I.V. Turchin¹, ¹Institute of Applied Physics RAS, Nizhny Novgorod, Russia, ²Privolzhsky Research Medical University, Nizhny Novgorod, Russia

6. Optical study of the possibilities to affect RBC aggregation by inhibition of fibrinogen adsorption on the cell membrane integrin glycoproteins A.E. Lugovtsov¹, A.N. Semenov¹, K. Lee², A.V. Myravyev³, A.V. Priezzhev¹, ¹Physics Departments and International Laser Center, M.V. Lomonosov Moscow State University, Moscow, Russia, ²Ulsan National Institute of Science and Technology, Institute of Basic Science, Center for Soft and Living Matter, Ulsan, Korea, ³Ushinskiy Yaroslavl State Pedagogical University, Yaroslavl, Russia

7. Confocal Raman imaging of the skin containing hair follicles Johannes Schleusener¹, Victor Carrer^{1,2}, Alexa Patzelt¹, Shuxia Guo^{3,4}, Thomas Bocklitz^{3,4}, Jürgen Lademann¹, Maxim E. Darwin¹, ¹Charité -

Universitätsmedizin Berlin, Department of Dermatology, Venerology and Allergology, Center of Experimental and Applied Cutaneous Physiology, Berlin, Germany, ²Institute of Advanced Chemistry of Catalonia, Department of Chemical and Surfactants Technology, Barcelona, Spain, ³Institute of Physical Chemistry and Abbe Center of Photonics, Friedrich Schiller University of Jena, Jena, Germany, ⁴Leibniz Institute of Photonic Technology, Member of Leibniz Research Alliance 'Health Technologies', Jena, Germany

8. Applications of cw and pulsed lasers for in-vivo skin diagnostics: some recent results J. Spigulis, University of Latvia, Latvia

9. Celebrating 25-year anniversary of biomedical optoacoustics: From basic science to FDA-compliant optoacoustic systems Rinat O. Esenaliev, University of Texas Medical Branch, USA

10. Numerical processing in multiphoton fluorescence microscopy for breast cancer detection E.A. Sergeeva¹, M.Yu. Kirillin¹, V.V. Dudenkova², N.Yu. Orlynskaia², N.M. Shakhova¹, ¹Institute of Applied Physics RAS, Russia, ²Privolzhsky Research Medical University, Nizhny Novgorod, Russia

11. NIR-Photosensitizers as a tool of head and neck cancers investigation Yu.S. Maklygina¹, I.D. Romanishkin¹, A.V. Ryabova¹, M. Millard², I. Yakavets^{2,3}, H.P. Lassalle², L. Bolotine², V.B. Loschenov¹, ¹GPI RAS, Moscow, Russia, ²CRAN, Université de Lorraine, Nancy, France, ³BSU, Minsk, Belarus

12. Spatial distribution of optical characteristics of paraffin block embedded malignant tumor tissues Irina Yanina^{1,2}, Nikita A. Navolokin³, Viktor V. Nikolaev², Daria K. Tuchina^{1,2,4}, Anastasia I. Knyazkova², Yuri V. Kistenev², Valery V. Tuchin^{1,2,5}, ¹Saratov State University, Saratov, Russia, ²Tomsk State University (National Research University), Tomsk, Russia, ³Saratov State Medical University, Saratov, Russia, ⁴Prokhorov General Physics Institute of RAS, Moscow, Russia, ⁵Institute of Precision Mechanics and Control RAS, Russia

13. Investigation of changes in hydrogen bound water profiles of porcine skin under optical clearing Anton Yu. Sdobnov¹, Maxim E. Darvin², Johannes Schleusener², Jürgen Lademann², Valery V. Tuchin³, ¹University of Oulu, Oulu, Finland, ²Center of Experimental and Applied Cutaneous Physiology, Charité – Universitätsmedizin Berlin, Corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, Berlin Institute of Health, Berlin, Germany, ³Research-Educational Institute of Optics and Biophotonics, Saratov State University

14. Application of multiphoton microscopy in research of biotissue Yu. Kistenev¹, N. Mazumder², Sh. Prasada², K. Satyamoorthy², K.K. Mahato³, N. Krivova¹, O. Cherkasova³, I. Yanina^{1,4}, V.V. Nikolaev¹, E.E. Ilyasova¹,

¹Tomsk State University, Tomsk, Russia; ²Manipal Academy of Higher Education, Manipal, India; ³Institute of Laser Physics, Siberian Branch of Russian Academy of Science, Novosibirsk, Russia; ⁴Saratov State University

15. Optical studies of topically delivered optical clearing agents and cosmetic preparations through the skin components: from ex vivo to in vivo Anton Sdobnov¹,

Ekaterina Lazareva², Alexey N. Bashkatov^{2,3}, Elina A. Genina^{2,3}, Vyacheslav I. Kochubey^{2,3}, Irina Yu. Yanina^{2,3}, Santhosh Chidangil⁴, Srinivas Mutalik⁴, Sathish Pai Ballambat⁵, V.K. Unnikrishnan⁴, Aseefhali Bankapur⁴, Jijo Lukose⁴, Valery V. Tuchin^{2,3}, Maxim E. Darvin⁶ ¹Faculty of Information Technology and Electrical Engineering, University of Oulu, Finland; ²Research-Educational Institute of Optics and Biophotonics, Saratov State University, Saratov, Russian Federation; ³Tomsk State University, Tomsk, Russia; ⁴Manipal Academy of Higher Education, Karnataka, India; ⁵Manipal College of Pharmaceutical sciences, India; ⁶Center of Experimental and Applied Cutaneous Physiology, Charité – Universitätsmedizin Berlin, Germany

16. Pioneer: SPAD camera based TR NIROT system for preterm brain imaging Alexander Kalyanov¹, Jingjing Jiang¹, Scott Lindner^{1,2}, Linda Ahnen¹, Aldo Di Costanzo Mata¹, Juan Mata Pavia¹, Salvador Sanchez Majos¹, Chao Zhang³, Martin Wolf¹, Eduardo Charbon², ¹University of Zurich; ²EPFL Lausanne; ³Delft University of Technology

17. Super resolved and focal depth extended ophthalmology Zeev Zalevsky, Bar Ilan University, Israel

18. SPR biochip with immobilized myoglobin and hemoglobin E. Belina¹, H. Kisov¹, G. Dyankov¹, E. Borisova^{2,3}, E. Pavlova⁴, ¹Institute of Optical Materials and Technologies, Sofia, Bulgaria; ²Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria; ³Biology Department, Saratov State University, Saratov, Russia; ⁴Faculty of Physics, Sofia University “St. Kl. Ohridski” Sofia

19. Comprehensive in vivo analysis of keratin in the human stratum corneum using confocal Raman microscopy Maxim Darvin¹, Johannes Schleusener¹, Chunsik Choe^{1,2}, Jürgen Lademann¹, ¹Charite-Universitaetsmedizin Berlin, Germany; ²Kim Il Sung University, Ryongnam-Dong, Pyongyang, DPR Korea

20. Interferometric fiber-optic sensors for medical application Małgorzata Jędrzejewska-Szczerska, Gdańsk University of Technology, Poland

21. Research and development of effective optical technologies for diagnostics in dermatology Elina Genina¹, Alexander Pravdin¹, Darya Tuchina¹, Viktor Nikolaev¹, Ekaterina Lazareva¹, Dmitry Yakovlev¹, Irina

Yanina¹, Marine Amouroux², Alexey Bashkatov¹, Vyacheslav Kochubey¹, Walter Blondel², Valery Tuchin¹, ¹Saratov State University, Russia; ²University of Lorraine, France

INTERNET REPORTS

1. Dual-wavelength fluorescence monitoring of PDT with chlorin e6 photosensitizer A.V. Khilov, D.A. Loginova, I.V. Turchin. M.Yu. Kirillin, Institute of Applied Physics RAS, Nizhny Novgorod, Russia

2. Effect of irradiation wavelength in PDT with chlorine-based photosensitizers: Monte Carlo simulations and experimental study D.A. Kurakina¹, A.V. Khilov¹, E.A. Sergeeva¹, A.E. Meller², D.A. Sapunov², M.A. Shakhova², I.V. Turchin¹, N.Yu. Orlinskaya², M.Yu. Kirillin¹, ¹Institute of Applied Physics RAS, Nizhny Novgorod, Russia; ²Privolzhsky Research Medical University, Nizhny Novgorod, Russia

3. Functional and morphological changes in the mother-fetus system in chronic hypoxia (experimental study) Tatyana V. Palatova¹, Galyna N. Maslyakova¹, Marina L. Chekhonatskaya¹, Alla B. Bucharskaya¹, Elina A. Genina^{2,3}, Alexey N. Bashkatov^{2,3}, ¹Saratov State Medical University n.a. V.I. Razumovsky, ²Saratov State University, Saratov, ³Tomsk State University, Tomsk, Russia

4. Investigation of Ce6 accumulation and distribution in cell cultures of head and neck cancers D.S. Farrakhova¹, Yu.S. Maklygina¹, I.D. Romanishkin¹, A.V. Ryabova¹, I.V. Yakavets², M. Millard², L. Bolotine², V.B. Loschenov¹, ¹GPI RAS, Russia, ²CRAN, France

5. Thermal fields in biotissues during controlled thermolysis Irina Yanina^{1,2}, Elena Volkova¹, Elena Sagaidachnaya¹, Irina Vidyasheva¹, Aleksander Skaptsov¹, Vyacheslav Kochubey^{1,2}, ¹Saratov State University, Saratov, Russia, ²Tomsk State University, Russia

6. Photodynamic effect of red diode laser radiation (662 nm) on *Staphylococcus Aureus* stained by Methylene Blue A.A. Selifonov¹, O.G. Shapoval², S.A. Yuvchenko¹, D.A. Zimnyakov³, A.N. Mikerov², V.V. Tuchin¹, ¹Saratov State University, ²Saratov Medical University, ³Saratov State Technical University, Saratov, Russia

7. Application of laser tweezers for studying the interaction parameters of two red blood cells in blood plasma during reversible aggregation *in vitro* Petr B. Ermolinkiy¹, Anastasiya I. Maslyanitsina¹, Andrei E. Lugovtsov^{1,2}, Alexei N. Semenov¹, Alexander V. Priezhev^{1,2}, ¹Department of Physics and ²International Laser Center of M.V. Lomonosov Moscow State University, Russia

8. An algorithm for speckle noise reduction in endoscopic optical coherence tomography structural imaging A.Yu. Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University

9. Young's modulus evaluation for blood vessel equivalent phantoms using optical coherence elastography A.Yu. Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University

10. Neuroimaging technique using time-resolved diffuse optical tomography and inhomogeneity localization algorithm A.Yu. Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University

11. Detection of pathology of development of chicken embryo, infected by *Chlamydia Trachomatis* cells by methods of Doppler diagnostics I.A. Subbotina^{1,2}, O.V. Ulianova¹, S.S. Zaytsev¹, Yu.V. Saltykov¹, N. Filonova¹, A.M. Lyapina¹, S.S. Ulyanov^{1,2}, An.V. Skripal², S. Yu. Dobdin², O.S. Larionova¹, V.A. Feodorova^{1,3}, ¹Saratov Research Veterinary Institute – Branch of Federal Research Center for Virology and Microbiology; ²Saratov State University; ³Saratov State Agrarian University, Russia

12. The simulation of optoacoustic signals from human vein Mohammad Ali Ansari¹, Amir Mohammad Hasanzade¹, Zahra Akbari², ¹Laser and Plasma Research Institute, Shahid Beheshti University, Iran; ²Laser Application in Medical Sciences Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

13. Estimation of statement of blood microcirculation of chicken embryo using s-LASCA technique and laser oviscopy with application of new techniques of optical clearing N. Filonova^{1,2}, O.V. Ulianova¹, Yu.V. Saltykov¹, I.A. Subbotina^{1,3}, S.S. Zaytsev¹, A.A. Kolosova¹, S.S. Ulyanov^{1,3}, V.A. Feodorova^{1,2}, ¹Saratov Research Veterinary Institute – Branch of Federal Research Center for Virology and Microbiology; ²Saratov State Agrarian University; ³Saratov State University, Russia

14. *In-vivo* pulse wave diagnostics of chicken embryo using high-frequency modulation of intensity of illuminating laser light O.V. Ulianova¹, I.A. Subbotina^{1,2}, N. Filonova¹, S.S. Zaytsev¹, Yu.V. Saltykov¹, S.S. Ulyanov^{1,2}, A.M. Lyapina¹, An.V. Skripal², S.Yu. Dobdin², O.S. Larionova³, V.A. Feodorova^{1,3} ¹Saratov Research Veterinary Institute – Branch of Federal Research Center for Virology and Microbiology; ²Saratov State University; ³Saratov State Agrarian University, Russia

15. Amplification of output signal of laser scanning speckle-microscope using gold nanoparticles: detection of single chlamydial cell in a clinical sample O.V. Ulianova¹, N.N. Filonova^{2,3}, S.S. Ulyanov^{1,3}, L.A. Dykman³, S.S. Zaytsev¹, Yu.V. Saltykov¹, I.A. Subbotina^{1,3}, O.S. Larionova^{1,2}, V.A. Feodorova^{1,2}, ¹Saratov Research Veterinary Institute – Branch of Federal Research Center for Virology and

Microbiology; ²Saratov State Agrarian University; ³Saratov State University, Russia; ⁴Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences (IBPPM RAS), Russia

16. Study of statistical properties of GB-speckles, generated on nucleotide sequences of omp1 gene of Chlamydia Trachomatis, simulated using different algorithms of re-coding O.V. Ulianova¹, S.S. Zaytsev¹, Yu.V. Saltykov¹, S.S. Ulyanov^{1,2}, V.A. Feodorova^{1,3}, ¹Saratov Research Veterinary Institute – Branch of Federal Research Center for Virology and Microbiology, Russia; ²Saratov State University, Russia; ³Saratov State Agrarian University, Russia

17. Statistics of GB-speckles, coding sequences of nucleotide sequences of omp1 gen of Chlamydia Trachomatis, processed by s-LASCA technique S.S. Ulyanov^{1,2}, O.V. Ulianova¹, S.S. Zaytsev¹, Yu.V. Saltykov¹, V.A. Feodorova^{1,3}, ¹Saratov Research Veterinary Institute – Branch of Federal Research Center for Virology and Microbiology; ²Saratov State University; ³Saratov State Agrarian University, Russia

18. Investigation of statistical characteristics of GB-speckles, coding nucleotide sequences of the gene GPCR of lumpy skin disease virus Yu.V. Saltykov¹, O.V. Ulianova¹, S.S. Zaytsev¹, S.S. Ulyanov^{1,2}, V.A. Feodorova^{1,3}, ¹Saratov Research Veterinary Institute – Branch of Federal Research Center for Virology and Microbiology; ²Saratov State University; ³Saratov State Agrarian University, Russia

19. Study of statistical properties of GB-speckles, coding nucleotide sequences of the target genes of avian influenza virus S.S. Zaytsev¹, O.V. Ulianova¹, Yu.V. Saltykov¹, S.S. Ulyanov^{1,2}, V.A. Feodorova^{1,3}, ¹Saratov Research Veterinary Institute – Branch of Federal Research Center for Virology and Microbiology; ²Saratov State University; ³Saratov State Agrarian University, Russia

20. Laser speckle contrast imaging of pancreas Polina Timoshina^{1,2}, Denis Alexandrov³, Valery Tuchin^{1,2,4}, ¹Saratov State University; ²Tomsk State University; ³Saratov State Medical University; ⁴Institute of Precision Mechanics and Control, Russian Academy of Sciences, Russia

21. Complementary optoacoustic and fluorescence monitoring of glioblastoma for photodynamic therapy with target nanostructures: numerical simulations V.V. Perekatova¹, M.Yu. Kirillin¹, D.A. Kurakina¹, A.G. Orlova¹, E.A. Sergeeva¹, A.V. Khilov¹, P.V. Subochev¹, I.V. Turchin¹, S. Mallidi², T. Hasan², ¹Institute of Applied Physics RAS,

Nizhny Novgorod, Russia, ²Wellman Center for Photomedicine, Massachusetts General Hospital, Harvard Medical School, Boston, MA 02114, USA

22. The effect of light on the species composition of fungi in the system of the parasite (Aulacidea hieracii Bouche, 1834) – superparasite (Eurytoma cynipsea Boheman, 1836) E.V. Glinskaya¹, V.V. Anikin¹, M.I. Nikelshparg², ¹Saratov State University, Saratov, Russia; ²Saratov High School N 3, Saratov, Russia

23. The computer algorithm for the synthesis of dermatoscopic RGB phantoms Malica B. Iralieva, Oleg O. Myakinin, Ivan A. Bratchenko, Valery P. Zakharov, Samara University, Russia

24. Using OpenFoam to numerical simulation of diffusion processes in tissues Oksana M. Romakina¹, Yury A. Blinkov¹, Elina A. Genina^{1,2}, Alexey N. Bashkatov^{1,2}, ¹Saratov State University; ²Tomsk State University, Russia

25. Study of early stages of lymphedema using multiphoton and THz microscopy Yury V. Kistenev^{1,2}, Alexey V. Borisov^{1,2}, Ekaterina Sandykova^{1,2}, Daria Tuchina³, Polina Timoshina³, Anastasya Knyazkova¹, ¹TSU, ²Siberian State Medical University, ³SSU, Russia

26. New photosensitizer for photodynamic inactivation of gram-positive and gram-negative planktonic bacteria and bacterial biofilms G.A. Meerovich^{1,2}, E.V. Akhlyustina², I.G. Tiganova³, E.A. Makarova⁴, N.I. Philipova³, N.I. Philipova³, E.A. Lukyanets⁴, Yu.M. Romanova³, V.B. Loschenov^{1,2}, ¹Prokhorov General Physics Institute of the Russian Academy of Sciences; ²National Research Nuclear University "MEPHI"; ³N.F. Gamaleya National Research Center of Epidemiology and Microbiology; ⁴Organic Intermediates and Dyes Institute, Russia

27. Combined video analysis of ICG and 5-ALA induced protoporphyrin IX fluorescence and hemoglobin oxygen saturation for neurosurgery T.A. Savelieva^{1,2}, P.V. Grachev¹, V.I. Makarov¹, U.S. Maclygina¹, G.V. Pavlova³, S.A. Goryajnov⁴, A.A. Potapov⁴, V.B. Loschenov^{1,2}, ¹Prokhorov General Physics Institute of the Russian Academy of Sciences; ²National Research Nuclear University "MEPHI"; ³Institute of Gene Biology, Russian Academy of Sciences; ⁴N.N. Burdenko National Scientific and Practical Center for Neurosurgery, Russia

28. Neurosurgical suction tube with embedded video fluorescence control in bio-tissue transparency range Maxim Loshchenov¹, Tatyana Savelieva^{1,2}, Kirill Linkov¹, Viktor Loshchenov^{1,2}, ¹Prokhorov General Physics Institute of the Russian Academy of Sciences; ²National Research Nuclear University "MEPHI"

Conference on Low-Dimensional Structures VIII

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

Secretaries: **Vladislav V. Shunaev**, Saratov State University (Russia), **Michael M. Slepchenkov**, Saratov State University (Russia)

International Program Committee: **Ming-Fa Lin**, National Cheng Kung University, Tainan (Taiwan), **Irina V. Zaporotskova**, Volgograd State University, Volgograd (Russia), **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 27, Thursday

ORAL SESSION

(Building 8, Room 82)

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

14.30-14.50

Formation of Low Resistance Pd-Ge-Au Ohmic Contact to n-GaAs

D.M. Mitin, Ioffe Physical Technical Institute, Russia

14.50-15.05

The construction algorithm of full-atomic models of seamless junctions between single-walled carbon nanotubes G. Savostyanov, O.E. Glukhova, Saratov State University, Russia

15.05-15.25

Two-dimensional colloidal suspensions in rotating electric fields: particle-resolved studies

S.O. Yurchenko, E.V. Yakovlev, N.P. Kryuchkov, K.I. Komarov, K.I. Zaytsev, P.V. Ovcharov, Bauman Moscow State Technical University (BMSTU), Russia

15.25-15.40

Polyelectrolyte submicrocapsules, functionalized by magnetite nanoparticles for MR contrast control A.A. Kozlova, Saratov State University, Russia

15.40-16.00

Electrical conductivity and emission properties of pillared grapheme D.S. Shmygin, Olga E. Glukhova, Saratov State University, Russia

16.00-16.15

Exact dynamics of two-level quantum systems V. Semin, Samara National Research University, Russia

16.15-16.30

Formation and study of the properties of copper nanoparticles monolayers at the «gas-liquid» and «gas-solid state» phase interfaces N.N. Begletsova, 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

18.30-19.30

- Seamless nanotube connections for flexible and transparent electronics** K.R. Asanov, O.E. Glukhova, Saratov State University, Russia
- Electronic structure and electrical properties of mono- and bi-layer graphen-nanotube films** M.M. Slepchenkov, O.E. Glukhova, Saratov State University, Russia
- High density hydrogen storage in 2D-matrix from graphenenanoblister** P. Barkov, O.E. Glukhova, Saratov State University, Russia
- Investigation of structures based on CNT @ γ -Fe₂O₃ for lithium ion batteries of new generation** D.A. Kolosov, O.E. Glukhova, Saratov State University, Russia
- Electronic structure and electrical properties of mono- and bilayer graphen-nanotube films** V.V. Mitrofanov, O.E. Glukhova, Saratov State University, Russia
- Calculation of the electronic properties of graphene/CNTs 2D-composites** D.S. Shmygin, Olga E. Glukhova, Saratov State University, Russia
- Emission properties of pillared graphene in presence of potassium atoms** D.S. Shmygin, Olga E. Glukhova, Saratov State University, Russia

- 8L. **The technique of reducing the time required to calculate the transmission of planar nanostructures**D.S. Shmygin, Olga E. Glukhova, Saratov State University, Russia
- 9L. **Conductive properties of three-layered graphene-graphane structure**V.V. Shunaev, O.E. Glukhova, Saratov State University, Russia
- 10L. **Colloidal suspension in external rotating electric field with tunable interactions**E.V. Yakovlev, Kryuchkov N.P., K.I. Komarov, K.I. Zaytsev, P.V. Ovcharov, S.O. Yurchenko, Bauman Moscow State Technical University (BMSTU), Russia
- 11L. **Creation of concave reticulate electrodes from annealed pyrolytic graphite with ultrashort pulsed laser radiation technological cutting process**D.A. Bessonov, T.N. Sokolova, I.A. Popov, E.L. Surmenko, S.D. Zhuravlev, Yuri Gagarin State Technical University of Saratov, Russia
- 12L. **Creation of hafnium field emission cathodes with ultrashort pulsed laser radiation technological milling process**D.A. Bessonov, T.N. Sokolova, I.A. Popov, E.L. Surmenko, Yuri Gagarin State Technical University of Saratov, Russia
- 13L. **Preparation of indium antimonide nanoparticles by liquid chemical etching in isopropyl alcohol**N.Yu. Yashina, O.Yu. Tsvetkova, Saratov State University, Russia
- 14L. **Formation of metallic nanoparticles under Langmuir monolayers**A.S. Chumakov, Saratov State University, Russia
- 15L. **Structuring the glass by picosecond laser RAPID 06 (1064 nm)**I.A. Popov, RPF "Pribor-T" Gagarin SSTU
- 16L. **Electromagnetic properties of self-assembled protein films**M.A. Baranov, Peter the Great Saint-Petersburg Polytechnic University, Russia
- 17L. **Methodology for analyzing the A₃B₅ semiconductor nanoparticles parameters by tunnel CVC method**M.V. Gavrikov, Saratov State University, Russia
- 18L. **Studying the self-assembly of quantum dots Langmuir monolayer**AL-Alwani Ammar Jaber Kadhim, Saratov State University, Russia
- 19L. **Investigation of the behavior of aromatics at the interface**O.A. Shinkarenko, Saratov State University, Russia
- 20L. **Optical and morphological properties of Al₂O₃ layer deposited by E-beam evaporation for optical waveguide applications**Andra Naresh Kumar Reddy, M.A. Butt, S.N. Khonina, Saratov State University, Russia
- 21L. **Exploration of the molecular interaction of the liposome and phospholipid bilayer**K.A. Minenkov, O.E. Glukhova, Saratov State University, Russia
- 22L. **Citrate stabilized copper nanoparticles for preparation of SERS nanolabels**A.V. Markin, N.E. Markina, A.M. Zakharevich, Saratov State University, Russia
- 23L. **Imprinted proteins synthesis in microstructured optical fiber**P. Pidenko, Saratov State University, Russia
- 24L. **Investigation of nonlinear and resonance optical properties of small structures based on molybdenum silicide**S. Volchkov, Saratov State University, Russia
- 25L. **The influence of modifying additives on the optic-luminescent properties of a phosphor, based on Y₂O₃:Eu**T. Ponomaryova, Saratov State University, Russia
- 26L. **An electrochemical nano-scale boron-doped diamond surface biosensor for influenza virus detection**, D. Nidzworski^{1,2}, K. Siuzdak³, P. Niedzialkowski⁴, R. Bogdanowicz^{5*}, M. Ryciewicz⁵, M. Sobaszek⁵, P. Weiher¹, M. Sawczak⁴, E. Wnuk⁴, W. A. Goddard⁶, A. Jaramillo-Botero⁶, and T. Ossowski^{4,1}, Institute of Biotechnology and Molecular Medicine, ²SensDx Ltd, ³Polish Academy of Sciences, Szewalski Institute of Fluid-Flow Machinery, ⁴Faculty of Chemistry, University of Gdansk, ⁵Faculty of Electronics, Gdansk University of Technology, Poland, ⁷California Institute of Technology, USA

INTERNET REPORTS

1. **Simulation of the temperature fields of titanium discs at high-temperature treatment with high frequency currents**A.A. Fomin, Yuri Gagarin State Technical University of Saratov, Russia
2. **Analysis of (ti, zr, ta)-(o, c, n) systems for obtaining metal-ceramic coatings of the required composition at high-temperature treatment with high frequency currents**A.A. Fomin, Yuri Gagarin State Technical University of Saratov, Russia
3. **Induction heat treatment of ti-6al-4v titanium alloy and increase of its mechanical properties**A.A. Fomin, Yuri Gagarin State Technical University of Saratov, Russia
4. **Electrospark alloying of zirconium and subsequent induction heat treatment**A.A. Fomin, Yuri Gagarin State Technical University of Saratov, Russia

Conference on Biomedical Spectroscopy V

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

Secretaries: **Elena K. Volkova, Natalia Kazadaeva**, 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)

ORAL SESSION II (Building 10, Hall 108)

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

September 26, Wednesday

ORAL SESSION I (Building 10, Hall 108)

Chair: **Vyacheslav I. Kochubey**,
Saratov State University, Russia

15.30-16.00

Invited lecture

Non-invasive in vivo visualization of collagen III in human papillary dermis using two-photon tomography with fluorescence lifetime imaging. Evgeny Shirshin^{1,2}, Maxim E. Darwin¹, Juergen Lademann¹, Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Department of Dermatology, Venerology and Allergology, Center of Experimental and Applied Cutaneous Physiology, Berlin, Germany, ²Lomonosov Moscow State University, Moscow, Russia

16.00-16.15

Identification of M.tuberculosis cell components for clinical strains using Raman spectroscopy Andrey Zyubin¹, Anastasia Lavrova², Olga Manicheva², Marine Dogonadze², ¹Immanuel Kant Baltic Federal University, Russia, ²Saint-Petersburg State Research Institute of Phthisiopulmonology, Russia

16.15-16.30

Determination of luminescent characteristics of proteins at sorption on contact lenses Asiya Hairusheva, Andrei Melnikov, Gennady Melnikov, Yuri Gagarin State Technical University of Saratov, Russia

16.30-17.00

Coffee break

17.00-17.15

Optical device for controlled laser thermolysis. S.O. Ustalkov¹, A.A. Skaptsov¹, I.Yu. Yanina^{1,2}, Kozyrev A.A.³, ¹Saratov State University, Saratov, Russia, ²Tomsk State University, Russian, ³National Research Nuclear University MEPhI, Moscow, Russia

17.15-17.30

Fluorescence detection of 5-ALA/PpIX and Zn-Pc distribution in the body of experimental animals with stomach neoplasia I. Agranovich¹, E. Borisova^{1, 2}, Al. Khorovodov¹, M. Kanevsky¹, N. Navolokin³, L. Avramov², I. Angelov⁴, V. Mantareva⁴, O. Semyachkina-Glushkovskaya¹, ¹Saratov State University, Russian Federation ²Institute of Electronics-Bulgarian Academy of Sciences, Bulgaria, ³Saratov State Medical University, Russian Federation ⁴Institute of Organic Chemistry with Centre of Phytochemistry - Bulgarian Academy of Sciences, Bulgaria

17.30-17.45

Fluorescent indices of Tradescantia leaves under various lighting conditions Olesya Kalmatskaya, Vladimir Karavaev, Alexander Tikhonov, Faculty of Physics, Lomonosov MSU, Russia

September 27, Thursday

**JOINT POSTER/INTERNET SESSION
AND INTERNET DISCUSSION
(Building 3, 1st-3rd floor Halls)**

Chair (BS): **Natalia Kazadaeva**, Saratov State University, Russia

18.30-19.30

1BS. **Fluorescence spectroscopy approach with blood influence compensation** Valerii Shupletsov¹, Victor Dremin¹, Evgeny Zherebtsov^{1, 2}, Mikhail Mezentsev¹, Igor Kozlov¹, Elena Potapova¹, Andrey Dunaev¹, ¹Research and Development Center of Biomedical Photonics, Orel State University, Orel, Russia; ²Optoelectronics and Biomedical Photonics Group, Aston Institute of Photonic Technologies, Aston University, Birmingham, UK

2BS. **Detection of malignant skin tumors with Raman and fluorescence spectroscopy** Yulia Khristoforova¹, Ivan Bratchenko¹, Dmitry Artemyev¹, Oleg Myakinin¹, Oleg Kaganov², Alexandr Moryatov², Sergey Kozlov², Valery Zakharov¹, ¹Samara University, Russia, ²Samara State Medical University, Russia,

3BS. **Optical analysis of joints pathology.** Elena F. Yagofarova, Samara National Research University, Samara, Russia

4BS. **Effect of ethanol on the transport of methylene blue through rat skin *ex vivo*** Elizaveta Basko¹, M. Klementeva¹, A. N. Bashkatov^{1,2}, E. A. Genina^{1,2}, V. V. Tuchin¹⁻³, ¹Saratov State University, Saratov, Russia, ²Tomsk State University, Tomsk, ³Institute of Precise Mechanics and Control RAS, Saratov, Russia

5BS. **Optical methods for evaluating the protocols for decellulization of cardiac aortic valve implants in their manufacture.** Denis S. Trapeznikov, Samara University, Samara, Russia

6BS. **Singlet oxygen quenching estimation for mice tissues *in vivo* determined by delayed fluorescence of sensitizer** Azamat Ishemgulov, Sergey Letuta, Sergey Pashkevich, Orenburg State University, Orenburg, Russia

7BS. **Capabilities of optical spectroscopy for diagnostics of**

fibrotic skin changes. Irina A. Raznitsyna^{1,2}, ¹Moscow Regional Research & Clinical Institute "MONIKI", ²National Nuclear Research University "MEPhI", Moscow, Russia

8BS. **Study of models of osteoporosis in rats and evaluation of the effectiveness of its treatment with Raman spectroscopy.** Anna S. Tyumchenkova, Samara University, Samara, Russia

9BS. **Assessment of biological tissue temperature using NaYF₄:Yb³⁺, Er³⁺@SiO₂ upconversion nanoparticles** Elena Volkova¹, Irina Yanina^{1,2}, Elena Sagaidachnaia¹, Julia Konyukhova¹, Vyacheslav Kochubey^{1,2}, Valery Tuchin^{1,2,3}, ¹Saratov State University, Saratov, Russia, ²Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk, Russia, ³Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of Precise Mechanics and Control of the Russian Academy of Sciences, Saratov, Russia

10BS. **Increase the efficiency of upconversion of NaYF₄:Er,Yb particles at SiO₂ coating and annealing** Elena Sagaidachnaya¹, Elena Volkova¹, I. Yu. Yanina^{1,2}, Vyacheslav Kochubey^{1,2}, ¹Saratov State University, Russian Federation, ²Tomsk State University, Russian

11BS. **Changes in the spectral characteristics of preparations containing ascorbic acid during the addition of stabilizers** Yuliya Danyaeva, Svetlana A. Kutsenko, Natalya A. Kudrya, Volgograd State University, Russian Federation

12BS. **The effect of characteristics solutions of antiseptic-photosensitizers on their fluorescent properties.** Svetlana Anatolievna Kutsenko, Maria A. Kornaukhova, Mikhail S. Baranov, Anton A. Adamov, Volgograd State University, Volgograd, Russia

13BS. **Alumina based composite with incorporated copper nanoparticles for SERS detection of some drugs** Alexey V. Markin, Natalia E. Markina, Andrey M. Zakharevich, Saratov State University, Russia

14BS. **Creatinine SERS detection using molecularly imprinted silica gel** Natalia E. Markina, Alexey V. Markin, Andrey M. Zakharevich, Saratov State University, Russia

15BS. **Nanodiamond based complexes for prolonged dexamethasone release** Kirill Laptinskiy^{1,2}, H. Kettiger³, O. Shenderova⁴, S. Burikov², J.M.Rosenholm³, T. Dolenko^{2,1}, Skobeltsyn Institute of Nuclear Physics, Moscow State University, Moscow, Russia, ²Phaculty of Physics, Moscow State University, Russia, ³Pharmaceutical Sciences Laboratory, Faculty of Science and Engineering, Åbo Akademi University, Turku, Finland, ⁴Adámas Nanotechnologies, Inc., Raleigh, North Carolina, United States

16BS. **Dynamics of skin physiological parameters under external compression** Olga Zyuryukina, Yuriy P. Sinichkin, Saratov State University, Russia

17BS. **SAW based method to study photothermal response of plasmonic coupled nanosystems** Vladimir Kaydashev, Southern Federal University, Russia

19BS. **Study of ATP and chlorine-ion concentration changes in the cytosol of individual cultured neurons during glutamate-induced deregulation of calcium homeostasis** R.R. Sharipov¹, A.V. Galachova², I. Akutin³, I.A. Krasilnikova², D.P. Boyarkin², L.R. Gorbacheva³, A.M. Surin^{1,2}, V.G. Pinelis², ¹Institute of General Pathology and Pathophysiology; ²National Medical Research Center for Children's Health, Russian Ministry of Health; ³Lomonosov Moscow State University, Moscow, Russia

20BS. **Synthesis and characterization CuInS₂ nanoparticles** Ekaterina Kozlova¹, Vyacheslav Kochubey^{1,2}, ¹Saratov State University; ²Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Russia

Conference on Computation Biophysics and Analysis of Biomedical Data V

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

Secretary: **Elena S. Stiukhina**, Saratov State University

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

September 26, Wednesday

ORAL SESSION I

(Building 8, Conference Hall)

Chair: **Dmitry E. Postnov, Eugene B. Postnikov**, Saratov State University; Kursk State University, Russia

14.00-14.10

Opening remarks

Dmitry E. Postnov, Saratov State University, Russia

14:10-14:30

Spectrophotometric and colorimetric analysis of Mycobacterium tuberculosis population growth curves in resazurin assay: implications from data analysis

Eugene B. Postnikov¹, A.I. Lavrova^{2,3}, A.A. Khalin¹, M.Z. Dogonadze², O.A. Manicheva², ¹Kursk State University; ²Saint-Petersburg State Research Institute of Phthisiopulmonology; ³Saint-Petersburg State University, Russia

14.30-14.50

Recurement of the meningeal lymphatics by the brain barriers

Oxana V. Semyachkina-Glushkovskaya, N. Navolokin^{1,2}, A. Shirokov^{1,3}, A. Abdurashitov¹, A. Namikin¹, A. Khorovodov¹, A. Terskon¹, M. Klimova¹, A. Mamedova¹, A. Dubrovskiy¹, A. Bodrova¹, E. Saranceva¹, I. Fedosov¹, V. Tuchin^{1,4,5}, Ju. Kurths^{1,6,7}, ¹Saratov State University; ²Saratov State Medical University; ³Institute of Biochemistry and Physiology of Plants and Microorganisms RAS; ⁴Tomsk State University; ⁵Institute of Precision Mechanics and Control of RAS, Russia; ⁶Humboldt University; ⁷Potsdam Institute for Climate Impact Research, Germany

14.50-15.10

Occlusion-triggered flow redistribution in adaptive vascular networks: the modeling study

Dmitry E. Postnov, E.S. Stiukhina, Saratov State University, Russia

15.10-15.30

Characterization of cerebral blood flow dynamics with complexity measures

Alexey N. Pavlov¹, O.N. Pavlova², O.V. Semyachkina-Glushkovskaya^{2,1}, Yuri Gagarin State Technical University of Saratov; ²Saratov State University, Russia

15.30-15.50

Biomechanical analysis of the embryonic mouse heart by OCT and optogenetic control

Andrew L. Lopez III, Sh. Wang, I. Larina, Baylor College of Medicine, USA

15.50-16.10

Phase synchronization of human cardiovascular oscillations using photoplethysmography and laser Doppler flowmetry techniques Arina V. Tankanag, A.A. Grinevich, I.V. Tikhonova, N.K. Chemeris, Institute of Cell Biophysics RAS, Russia

16.10-16.30

Multiscale topology of the links between the brain regions during visual perception

Vladimir A. Maksimenko, V.O. Nedayvozov, A.N. Pisarchik, Yuri Gagarin State Technical University of Saratov, Russia

16.30-17.00

Coffee break

ORAL SESSION II

(Building 8, Conference Hall)

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

17.00-17.20

Modeling and analysis of pacemakers in a neural network

Andrey Yu. Verisokin¹, D.V. Vervevko¹, E.A. Kuryshova², D.E. Postnov²,¹Kursk State University,²Saratov State University, Russia

17.20-17.40

Analysis of physiological processes with extreme data loss

Olga N. Pavlova¹, A.S. Abdurashitov¹, O.V. Semyachkina-Glushkovskaya¹, A.N. Pavlov²,¹Saratov State University; ²Yuri Gagarin State Technical University of Saratov, Russia

17.40-18.00

Detection of EEG patterns related to real and imaginary arm movements with fluctuation analysis

Daria S. Grishina¹, A.E. Runnova², V.A. Maksimenko², O.N. Pavlova¹, A.N. Pavlov², A.E. Hramov²,¹Saratov State University; ²Yuri Gagarin State Technical University of Saratov, Russia

18.00-19.00

The Batch of 1-minute poster advertisement by

Evgeniya A. Kozlova, Kristina V. Rogatina, Yuri N. Avtomonov, Dmitry Raupov, Anastasia Ustinova, Anastasia A.Shatskaya, Elena N. Rimskaya, Irina A. Mizeva, Maksim O. Zhuravlev, Vladimir A. Maksimenko, Vyacheslav Yu. Musatov, Semen A. Kurkin, Nikita S. Frolov, E.N.Pitsik, Victoria V. Skazkina, Yuri M. Ishbulatov, Igor B. Isupov, Julia A. Shatyr, Alexander V. Mulik, Margarita V. Postnova, Oleg A. Melsitov, Vadim V. Grubov, Leyla Mohammadzade, Alexandr V. Dol, Daniil V. Kirsanov, Anastasia E. Runnova, Pavel Protasov, Daria V. Vervevko

September 27, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION (Building 3, 1-3rd floor Hall)

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

18.30-19.30

- 1BC. **Laser mediated lymphangeon activity in rat mesentery**Evgeniya A. Kozlova¹,N.I. Lvov², E.S. Stiukhina¹, G.E. Brill², D.E. Postnov¹,¹Saratov State University; ²Saratov State Medical University, Russia
- 2BC. **Electrical communication of vascular cells: endothelial cells and smooth muscle cells** Kristina V. Rogatina, D.E. Postnov, Saratov State University, Russia
- 3BC. **Nonlinear wave regimes in the vessel model** Yuri N. Avtomonov, D.E.

- Postnov, Saratov State University, Russia
- 4BC. **Increasing diagnosis precision for skin cancer on multimodal data by machine&deep learning methods** Dmitry Raupov, O.O. Myakinin, I. A. Bratchenko, V. P. Zakharov, Samara University, Russia
- 5BC. **Mathematical modeling of skin multispectral autofluorescence**Anastasia Ustinova, D.N. Artemyev, I.A. Bratchenko, Samara University, Russia
- 6BC. **Mathematical modeling of optical fiber systems for efficient registration of skin fluorescence** Anastasia A.Shatskaya, D.N. Artemyev, I.A. Bratchenko, Samara University, Russia
- 7BC. **Development of an automated complex for early diagnostics of pigmented skin lesions** Elena N. Rimskaya^{1,2}, I.A. Apollonova¹, A.P. Nikolaev², K.G. Kudrin², N.V. Chernomyrdin¹, I.V. Reshetov², K.I. Zaytsev³,¹Bauman Moscow State Technical University; ²First Sechenov Moscow State Medical University; ³Head of the Laboratory of the IOP RAS. A.M. Prokhorov, Russia
- 8BC. **Recovery of microcirculation system in patients with peripheral artery disease after conservative and surgery treatment** N. Zubareva¹, A. Parshakov¹, S. Podtaev², P. Frick²,Irina A. Mizeva^{2,1}Perm Medical University,²Institute of continuous media mechanics, Russia
- 9BC. **The investigation of synchronization between different areas of the brain in locomotor activity** Maksim O. Zhuravlev, A.E. Runnova, Yu. Kryuchkov, Yuri Gagarin State Technical University of Saratov, Russia
- 10BC. **Methods of assessing the degree of synchronization of multichannel EEG recordings** Maksim O. Zhuravlev, A.E. Runnova, A.E. Hramov, Yuri Gagarin State Technical University of Saratov, Russia
- 11BC. **Technique for identifying patterns on myographic data in real time** Vladimir A. Maksimenko, M.O. Zhuravlev, A.E. Runnova, A.E. Hramov, Yuri Gagarin State Technical University of Saratov, Russia
- 12BC. **Use of artificial intelligence for study of the visual perception** Vladimir A. Maksimenko, M.O. Zhuravlev, Yuri Gagarin State Technical University of Saratov, Russia
- 13BC. **Control of the human attention via biological feedback** Vladimir A. Maksimenko, A.E. Runnova, A.E. Hramov, Yuri Gagarin State Technical University of Saratov, Russia

- 14BC. **The application of electromyograms data processing system for mechatronic device control** Vyacheslav Yu. Musatov, S.A. Kurkin, A.P. Niyazov, A.B. Ishanov, Yuri Gagarin State Technical University of Saratov, Russia
- 15BC. **Research of gender differences in EEG responses to real and imaginary operator movements using ANN** Vyacheslav Yu. Musatov, T.Yu Efremova, A.E. Runnova, S.A. Kurkin, Yuri Gagarin State Technical University of Saratov, Russia
- 16BC. **Artificial intelligence systems for classifying EEG responses to imaginary and real movements of operators** Semen A. Kurkin, E.N. Pitsik, V.Yu. Musatov, N.S. Frolov, V.V. Martynov, M.V. Brovkova, V.M. Brzhovsky, Yuri Gagarin State Technical University of Saratov, Russia
- 17BC. **Study of EEG characteristics during the observation of an educational material** Nikita S. Frolov, V.Yu. Makarov, V. Nedajvozov, V. Grubov, A. Runnova, R. Kulanin, Yuri Gagarin State Technical University of Saratov, Russia
- 18BC. **Multistability of macroscopic behavior in multilayer multiplex network** Nikita S. Frolov, V. Zhukov, A.N. Pisarchik, A.E. Hramov, Yuri Gagarin State Technical University of Saratov, Russia
- 19BC. **Pattern formation in spatially-distributed networks via spatially-correlated preferential attachment** E.N. Pitsik¹, V. Makarov¹, S. Boccaletti², ¹Yuri Gagarin State Technical University of Saratov, Russia; ²CNR-Institute of Complex Systems, Italy
- 20BC. **Comparison of the statistical properties of the phase synchronization index of the electrocardiogram and the photoplethysmogram signals from the ear and the finger by 2-hours time series** Victoria V. Skazkina¹, A.S. Karavaev^{1,2}, E.I. Borovkova¹, Yu.M. Ishbulatov^{1,2}, A.R. Kiselev^{1,3,5}, V.A. Shartz⁴, V.P. Bezruchko¹, ¹Saratov State University; ²Saratov Branch of the Institute of Radio Engineering and Electronics of RAS; ³Saratov State Medical University; ⁴Bakulev Scientific Center for Cardiovascular Surgery, Russia
- 21BC. **Synchronization of low-frequency processes in the regulation of blood circulation and spectral density estimation of heart rate variability in newborns** Victoria V. Skazkina¹, Yu.V. Chernenkov², O.S. Panina², A.S. Karavaev^{1,3}, A.R. Kiselev^{1,2,4}, E.I. Borovkova¹, V.I. Grindev¹, E.N. Mureeva², V.P. Bezruchko¹, ¹Saratov State University; ²Saratov State Medical University; ³Saratov Branch of the Institute of Radio Engineering and Electronics of RAS; ⁴Bakulev Scientific Center for Cardiovascular Surgery, Russia
- 22BC. **Detection of 0.1 Hz rhythms of autonomous regulation of blood circulation from mathematical model of electrocardiogram** Yuri M. Ishbulatov^{1,2}, A.S. Karavaev^{1,2}, V.A. Shartz³, S.A. Mironov⁴, A.R. Kiselev^{3,5}, V.P. Bezruchko^{1,2}, ¹Saratov Branch of the Institute of Radio Engineering and Electronics of RAS; ²Saratov State University; ³Bakulev Scientific Center for Cardiovascular Surgery; ⁴Central Clinical Military Hospital; ⁵Saratov State Medical University, Russia
- 23BC. **Variational-statistical and spectral analysis of photoplethysmograms** Igor B. Isupov, R.Sh. Zatrudina, V.V. Bumagin, V. Gribkov, Volgograd State University, Russia
- 24BC. **Crystallography of oral fluid as an element of personalized evaluation of the functional state of the human organism** Julia A. Shatyr, V.V. Novochadov, M.V. Postnova, I.V. Ulesikova, A.B. Mulik, Volgograd State University, Russia
- 25BC. **The personalised diagnosis program of functional maladjustment of the human organism** Alexander V. Mulik, M.V. Postnova, V.O. Samarskaya, I.V. Ulesikova, U.A. Shatyr, Volgograd State University, Russia
- 26BC. **Molecular docking data preparation tool** Margarita V. Postnova, A. V. Kovalenko, G.A. Sroslova, A.A. Shiroky, V.O. Samarskaya, A.G. Serov, Volgograd State University, Russia
- 27BC. **The docking as a way to analyze biomedical data** Margarita V. Postnova, G.A. Sroslova, J. A. Zimina, A.V. Kovalenko, Volgograd State University, Russia
- 28BC. **Use of a neuron network for predicting the impact of chemical compounds on plant development** Margarita V. Postnova, A.V. Kovalenko, G.A. Sroslova, S.V. Safonov, J.A. Zimina, Volgograd State University, Russia
- 29BC. **Melanoma recognition system** Oleg A. Melsitov, Samara University, Russia
- 30BC. **Detection of EEG oscillatory patterns corresponding to human concentration of attention with help of perceptron-type artificial neural network** Vadim V. Grubov, N.S. Frolov, Yuri Gagarin State Technical University of Saratov, Russia

- 31BC. **Detection of pro epileptic activity patterns in EEG of WAG/Rij rats** Vadim V. Grubov, E.Yu. Sitnikova, Yuri Gagarin State Technical University of Saratov, Russia
- 32BC. **Measuring the functional connectivity of rat's brain by using deconvolution method in optical intrinsic signal imaging** Leyla Mohammadzade, M. Mohammadi Balsini, A. Mohammadi Balsini, Shahid Beheshti University (SBU), Iran
- 33BC. **Atherosclerosis of carotid arteries as a factor in the formation of cerebral aneurysms** Alexandr V. Dol, Saratov State University, Russia
- 34BC. **Emergence of macroscopic chimera states in multilayer multiplex network** Daniil V. Kirsanov, Saratov State University, Russia
- 35BC. **The study of the correlation between EEG-EMG signals for the simple test "fist-rib"/"palm-fist"** Anastasia E. Runnova, M.O. Zhuravlev, Yu. Kryuchkov, Yuri Gagarin State Technical University of Saratov, Russia
- 36BC. **The study of the spatial distribution of non-invasive electromyographic signals on the front surface of a human hand arm during movement in the elbow joint** Anastasia E. Runnova, M.O. Zhuravlev, Yu. Kryuchkov, Yuri Gagarin State Technical University of Saratov, Russia
- 37BC. **Structural properties of brain function network during Schulte table solving** Pavel Protasov, V. Makarov, M.O. Zhuravlev, A.E. Runnova Yuri Gagarin State Technical University of Saratov, Russia
- 38BC. **The study the individual characteristics of the functioning of the brain with the passage of psychological testing** Pavel Protasov, A.E. Runnova, M.O. Zhuravlev, Yuri Gagarin State Technical University of Saratov, Russia
- 39BC. **Simulation of muscle forces and joint moments by EMG signals using OpenSim Software** Daniil V. Kirsanov¹, P. Storozhev², A.E. Hramov¹, ¹Yuri Gagarin State Technical University of Saratov; ²Research-and-production enterprise "Android Technics", Magnitogorsk, Russia
- 40BC. **Mathematical simulation of coherent resonance phenomenon in a network of Hodgkin-Huxley biological neurons** A.V. Andreev, Yuri Gagarin State Technical University of Saratov, Russia; Technical University of Madrid, Spain
- 41BC. **Calcium waves formation by the Na/Ca-exchangers in astrocyte** Daria V. Verveiko¹, A.R. Brazhe², A.Yu. Verisokin¹, D.E. Postnov³, ¹Kursk State University; ²Moscow State University. M.V. Lomonosov; ³Saratov State University, Russia
- 42BC. **Theoretical study for the motion of blood in a tube in the presence of magnetic field produced by permanent magnet** Samia F. I. Salem, Maxim A. Kurochkin, and Valery V. Tuchin, Saratov State University, Russia

Workshop on Nonlinear Dynamics IX

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

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

September 27, Thursday

ORAL SESSION (Building 3, Room 38)

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

14.30-14.50

Mechanism of appearance of solitary states and solitary state chimeras in ensembles of coupled oscillators

Vadim Anishchenko, Saratov State University, Russia; Elena Rybalova, Saratov State University, Russia; Galina Strelkova, Saratov State University, Russia

14.50-15.05

Looking for embedding dimension of the attractor of a distributed system employing methods of machine learning

Pavel Kuptsov, Yuri Gagarin State Technical University of Saratov, Russia; Anna Kuptsova, Yuri Gagarin State Technical University of Saratov, Russia

15.05-15.20

Coherence resonance in two-layer network with weak coupling

Nadezhda Semenova, Saratov State University, Russia

15.20-15.35

Investigation of the dynamics of 0.1 Hz rhythms and their synchronization in the finger photoplethysmogram signals during the tilt-test in healthy subjects

Sergey Mironov, Central Clinical Military Hospital, Moscow, Russia

15.35-15.45

Dissipative breathers in a chain of Rayleigh oscillators

Konstantin Sergeev, Saratov State University, Russia; Evgeniy Elizarov, Saratov State University, Russia; Alexandr Chetverikov, Saratov State University, Russia

15.45-16.00

Fermi-Pasta-Ulam phenomenon in model of nonlinear Schroedinger equation with variable coefficients

Andrey Konyuhov, Saratov State University, Russia

16.00-16.15

Retranslation of a chimeric structure by a network of many layers of nonlocally coupled chaotic maps with unidirectional interaction of layers

Tatiana Vadivasova, Saratov State University, Russia

16.15-16.30

Pattern formation in spatially-distributed networks via spatially-correlated preferential attachment

Vladimir Makarov, Yuri Gagarin State Technical University of Saratov, Russia; Daniil Kirsanov, Yuri Gagarin State Technical University of Saratov, Russia; Alexander Hramov, Yuri Gagarin State Technical University of Saratov, Russia

POSTER SESSION

(Building 3, 3rd floor Hall)

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

1ND. **Analysis of synchronous operation modes of a coupled oscillators of power grids** Pavel Arinushkin, Saratov State University, Russia

2ND. **Wavelet analysis of MEG data with imaginary movements** Anton Selskij, Yuri Gagarin State Technical University of Saratov, Russia

3ND. **Recurrence plots of MEG data with imaginary movements** Anton Selskij, Yuri Gagarin State Technical University of Saratov, Russia

4ND. **Impact of noise on intermittency between chimeras in an ensemble of nonlocally coupled logistic maps** Darya Klyushina, Saratov State University, Russia; Elena Rybalova, Saratov State University, Russia; Galina Strelkova, Saratov State University, Russia

- 5ND. **Analysis of a new type of chimera structure – a solitary state chimera**Elena Rybalova, Saratov State University, Russia; Vadim Anishchenko, Saratov State University, Russia
- 6ND. **Coherent resonance phenomenon in a network of Hodgkin-Huxley biological neurons**Andrey Andreev, Yuri Gagarin State Technical University of Saratov, Russia
- 7ND. **Spatiotemporal structures in a two-dimensional lattice of nonlocally coupled neuron maps**Andrei Bukh, Saratov State University, Russia; Galina Strelkova, Saratov State University, Russia; Vadim Anishchenko, Saratov State University, Russia
- 8ND. **Synchronization of periodic self-oscillators interacting via memristor-based coupling**Ivan Korneev, Saratov State University, Russia; Vladimir Semenov, Saratov State University, Russia; Tatiana Vadivasova, Saratov State University, Russia

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

Workshop Co-chairs: **Dmitry A. Zimnyakov**, Yuri Gagarin State Technical University of Saratov, Russia, Institute of Precise Mechanics and Control RAS, Russia

Secretaries: **Elena A. Isaeva, Anna A. Isaeva**, Yuri Gagarin State Technical University of Saratov, 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 State Technical University of Saratov of Saratov, Russia; **Alexander G. Ushenko** Chernivtsi National University, Ukraine; **Lihong Wang**, California Institute of Technology, CA, USA

Thursday September 28

INVITED LECTURE/ORAL SESSION

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

11.30-11.50

Invited

Probing of biological tissues with polarized light, **A.P. Sviridov**, Institute of Photon Technologies of Federal Scientific Research Centre "Crystallography and Photonics" of Russian Academy of Sciences, Russia, 108840, Moscow, Troitsk, Pionerskaya, 2.

ORAL SESSION (Building 10, 503 room)

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

11.50-12.00

Polarized photoluminescence of eye cornea ex vivo under internal mechanical loading, **A.G. Shubnyy**, Institute of Photon Technologies of Federal Scientific Research Centre "Crystallography and Photonics" of the RAS, A.P. Sviridov, Institute of Photon Technologies of Federal Scientific Research Centre "Crystallography and Photonics" of the RAS, S.Y. Petrov, Scientific Research Institute of Eye Diseases, Moscow, Russia.

12.00-12.10

Speckle-contrast method for diagnosis of thermal-stress fields in costal cartilage during laser reshaping, **A.V. Yuzhakov**, O.I. Baum, A.P. Sviridov, M.L. Novikova, E.N. Sobol, Federal

Scientific Research Centre "Crystallography and Photonics" of the RAS, Moscow, Russia.

12.10-12.20

Spectral and polarization characteristics of a broadband vacuum photosensor with tunnel emission of a metal nanoscale blade

G.G. Akchurin, Institute of Precision Mechanics and Control, D.A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, N.P. Aban'shin, G.G. Akchurin, Yu.A. Avetisyan, Institute of Precision Mechanics and Control, A.P. Loginov, S.A. Yuvchenko, Yuri Gagarin State Technical University of Saratov, A.N. Yakunin, Institute of Precision Mechanics and Control, Saratov, Russia

12.20-12.30

Monitoring changes in fibril composition in collagen fibers subjected to dehydration, rehydration, and immersion clearing using birefringence measurements

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

12.30-12.40

Angular distributions of orthogonally polarized components of light scattered by mosaic birefringent layers

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

12.40-12.50

Optical diffusion technologies in characterization of supercritical fluidic systems: a brief review, D.A. Zimnyakov (1,2), **V.N. Bagratashvili** (3); (1)Yuri Gagarin State Technical University of Saratov, (2) Precision Mechanics and Control Institute of the RAS, (3)

Institute of Photon Technologies of Federal Scientific Research Centre "Crystallography and Photonics" of the RAS, Russia

12.50-13.00

Peculiarities of photoinduced charge transfer in nanostructured anatase, D.A. Zimnyakov (1,2), M. Yu. Vasilkov (1), S.A. Yuvchenko (1), S.S. Volchkov (1), A. S. Varezchnikov (1), V. V. Sysoev (1); (1)Yuri Gagarin State Technical University of Saratov, (2) Precision Mechanics and Control Institute of Russian Academy of Sciences, Saratov, Russia.

13.00-13.10

Signal detrending in low-coherence reflectometry: physical basis and simulation resultsE. Ushakova (1), D. Zimnyakov (1,2); (1)Yuri Gagarin State Technical University of Saratov, (2) Precision Mechanics and Control Institute of Russian Academy of Sciences, Saratov, Russia.

13.10-13.20

A hybrid approach in modeling of statistical characteristics of multiple scattered light, M.V. Alonova, Yuri Gagarin State Technical University of Saratov, Russia

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

Chairs (P): **Dmitry A. Zimnyakov**, Yuri Gagarin State Technical University of Saratov, Russia

September 27, Thursday

18.30-19.30

- 1P. **The long-term activation effect of a planar field emission cathode on the basis of a diamond-like carbon film under polarized pulsed irradiation**, G.G. Akchurin, Institute of Precision Mechanics and Control, D.A. Zimnykov, Yuri Gagarin State Technical University of Saratov, N.P. Aban'shin, Institute of Precision Mechanics and Control, G.G. Akchurin, Institute of Precision Mechanics and Control, Yu.A. Avetisyan, Institute of Precision Mechanics and Control, A.P. Loginov, S.A. Yuvchenko, Yuri Gagarin State Technical University of Saratov, A.N. Yakunin, Institute of Precision Mechanics and Control, Saratov, Russia
- 2P. **Determination of proteins lacrimal fluid - contact lenses interaction by the methods of polarization spectroscopy**Melnikov A. G., Khairusheva A. M., Melnikov G.V., Yuri Gagarin State Technical University of Saratov, Russia

- 3P. **Polarization of protein luminescence in application to human body aging determining** Melnikov A. G., Khairusheva A. M., Melnikov G.V., Yuri Gagarin State Technical University of Saratov, Russia
- 4P. **Monte Carlo simulation oftissue phantom in application of speckle-correlation and polarization analysis** Pantuykov Aleksey V., Isaeva Anna A., Isaeva Elena A., Yuri Gagarin State Technical University of Saratov, Russia
- 5P. **Study of temperature kinetics and structure of gel polymerization** Anna Isaeva, Elena Isaeva, Aleksej Pantuykov, Yuri Gagarin State Technical University of Saratov, Russia
- 6P. **Optical properties of foam-like structures** Elena A. Isaeva, Anna A. Isaeva, Dmitry A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia
- 7P. **Non-equilibrium equations of state of SCF-foamed polymer substances: phenomenoly and experiments** O.Slavnetskov, A. Kalacheva, Yuri Gagarin State Technical University of Saratov, S.A. Gavrilov, D.A. Tumachev, A.M. Likhter, Astrakhan State University, S.A. Yuvchenko, D.A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia
- 8P. **Effect «inversion» of aged foams in the wet-to-dry transition** Olga V. Ushakova, Dmitry A. Zimnyakov, Sergey A. Yuvchenko, Yuri Gagarin State Technical University of Saratov, Russia
- 9P. **Investigation of nonlinear and resonance optical properties of small structures based on molybdenum silicide**, Sergey S. Volchkov, Yuri Gagarin State Technical University of Saratov, Sergey A. Yuvchenko, Dmitry A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Institute of Precise Mechanics and Control of the RAS, Saratov, Russia

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XVII

Workshop Chair: Michael V. Davidovich, Saratov State University, Russia, Institute of Radio Engineering & Electronics RAS, Saratov Branch

Secretaries: Alexander N. Savin, Saratov State University (Russia), Dmitry A. Kolosov, Saratov State University (Russia), Pavel A. Khmelnitsky, Saratov State University (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" University, Veliko Tirnovo, (Bulgaria); **Andrei D. Grigoriev**, St. Petersburg Electrotechnical University LETI (Russia); **Josef Modelsky**, Warsaw University of Technology (Poland); **Dmitry I. Trubetskov**, Saratov State University (Russia); **Alexander M. Lerer**, South Federal University, Rostov-Don (Russia)

September 27, Thursday

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

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

18.-30-19.-30

- 1EM. **Amplification of terahertz plasmons in the active graphene screened by dielectric with high dielectric permittivity** Moiseenko Iliia, M. Yu. Morozov, V. V. Popov, Kotelnikov Institute of Radio Engineering and Electronics of RAS (Saratov Branch)
- 2EM. **Backward plasmon-polaritones in multilayered dissipative structures** Michael V. Davidovich, Saratov State University, Russia
- 3EM. **Integral equations and Green's functions for analysis of terahertz plasmonic structures** Pavel A. Khmelnitsky, Michael V. Davidovich, Saratov State University, Russia
- 4EM. **Design and Simulation of Folded-Waveguide Slow-Wave Structures for Millimeter-Band Traveling-Wave Tube** Artem G. Terentyuk, Saratov State University, Russia.
- 5EM. **Resistive thin-film coatings as an alternative to classical slow wave structures in millimeter-wave vacuum electronic devices** Andrey V. Starodubov, Stanislav A. Makarkin, Alexey A. Serdobintsev, Dmitriy M. Mitin, Anton M. Pavlov, Victor V. Galushka, Saratov State University, Russia.

- 6EM. **Modeling of electrom transport in a vacuum photosensor with a composite structure based on a nanoscale DLC film** Alexander Yakunin, Institute of Precision Mechanics and Control of the RAS, Saratov, Russia
- 7EM. **On the localization of thermal sources in an auto-emission planar nanostructure with a DLC film on a metal edge** Alexander Yakunin, Institute of Precision Mechanics and Control of the RAS, Saratov, Russia

INTERNET REPORTS

1. **Plasmon-Polaritons in Plan-Multilayered Structures: the Methods of Simulation and Properties** Michael V. Davidovich, Saratov State University, Saratov, Russia

September 28, Friday

ORAL SESSION ELECTROMAGNETICS (Building 8, Room 82, SSU)

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

11.00-11.15

Bent optical fiber as a sensing element for evanescent wave spectroscopy Svetlana V. Korsakova, Elena Romanova, Andrei Rozhnev, Saratov State University, Alexander Velmuzhov, Tatiana Kotereva, Maxim Sukhanov, Vladimir Shiryayev, Institute of Chemistry of High

Purity Substances of the RAS, Nizhny Novgorod, Russia.

11.15-11.30

The behavior of the dispersion surface plasmons along a conducting film

Michael V. Davidovich, Saratov State University, Russia

11.30-11.45

Amplification of THz surface plasmons by electron beams

Michael V. Davidovich, Saratov State University, Russia

11.45-12.00

Frequency stabilization of a THz-band gyrotron by delayed reflection

Maria M. Melnikova, Alexandra V. Tyshkun, Saratov State University, Andrey G. Rozhnev, Nikita M. Ryskin, Saratov Branch, Institute of Radio Engineering & Electronics of the RAS, Saratov, Russia

12.00-12.15

Excitation of plasmon resonances in periodic double-layer graphene-based PT system

O.V. Polischuk, V.V. Popov, Kotelnikov Institute of Radio Engineering and Electronics of RAS (Saratov Branch), I.M. Moiseenko, D.V. Fateev, Kotelnikov Institute of Radio Engineering and Electronics of RAS (Saratov Branch), Saratov State University Saratov, Russia

12.15-12.30

Experimental and numerical study of electromagnetic parameters of planar slow-wave structures for millimeter-wave vacuum electronic devices

Andei V. Starodubov, Alexey A. Serdobintsev, Anton M. Pavlov, Victor V. Galushka, Peter V. Ryabukho, Saratov State University, Andrey G. Rozhnev, Roman A. Torgashov, Gennadiy V. Torgashov, Nikita M. Ryskin, Saratov Branch, V.A. Kotel'nikov Institute of Radio Engineering and Electronics RAS, Saratov, Russia

12.30-12.45

Trapping of terahertz plasma waves in tapered metal-insulator-graphene heterostructure

Mikhail Yu. Morozov, Vyacheslav V. Popov, Saratov Branch, V.A. Kotel'nikov Institute of Radio Engineering and Electronics RAS, Saratov, Russia

Conference on Advanced Materials for Optics and Biophotonics I

Conference Chair: **Vladimir N. Kurlov**, ISSP RAS (Russia)

Secretary: **Gleb M. Katyba**, ISSP RAS (Russia)

International Program Committee **Vladimir N. Kurlov (Chair)**, ISSP RAS (Russia), **Maksim Skorobogatiy**, Polytechnique Montréal (Canada), **Vyacheslav G. Artyushenko**, ART Photonics (Germany), **Vincent Patrick Wallace**, University of Western Australia (Australia), **Vladimir S. Gorelik**, Lebedev Physical Institute RAS (Russia), **Yusef D. Khesuani**, 3D Bioprinting Solutions (Russia), **Marina A. Schcedrina**, Sechenov MSMU (Russia), **Igor V. Minin**, SSAG (Russia), **Oleg V. Minin**, SSAG (Russia), **Vladimir A. Lazarev**, BMSTU (Russia), **Irina N. Dolganova**, ISSP RAS (Russia), **Gennady A. Komandin**, Prokhorov GPI RAS (Russia), **Igor E. Spector**, Prokhorov GPI RAS (Russia)

September 27, Friday

INVITED/ORAL SESSION ADVANCED MATERIALS I

(Building 10, Main Conference Hall)
Chair: **Vladimir N. Kurlov**, ISSP RAS Russia

11.30-11.50

Invited

Hybrid biomaterials in tissue engineering

Petr S. Timashev, Sechenov First MSMU (Russia)

11.50-12.10

Invited

Use of Nanosized Elements for THz Generation, Manipulation, and Detection Enhancement

Andrei Gorodetsky, ITMO University / Imperial College London

12.10-12.20

Plasmonic terahertz photoconductive antennas for spectroscopy and imaging systems

A.E. Yachmenev, D.V. Lavrukhin, I.A. Glinskiy, R.A. Khabibullin, Yu.G. Goncharov, I.E. Spector, T. Otsuji, M. Shur, K.I. Zaytsev, and D.S. Ponomarev, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russia)

12.20-12.30

Sapphire shaped crystals for medical diagnosis, therapy and surgery

V.N. Kurlov, ISSP RAS (Russia),
I.A. Shikunova, G.M. Katyba, K.I. Zaytsev, I.N. Dolganova, A.A. Potapov, I.V. Reshetov, and V.V. Tuchin

12.30-12.40

Sapphire cryosurgery tools providing with optical diagnosis of ice-ball formation

I.A. Shikunova, ISSP RAS (Russia),
I.N. Dolganova, N.V. Chernomyrdin,
A.A. Kuznetsov, E.E. Mukhina, L.P. Safonova,
A.I. Donodin, K.I. Zaytsev, and V.N. Kurlov

12.40-12.50

Modified fibrin gel as a flexible tool for tissue engineering

Anastasia Shpichka, Sechenov First MSMU

12.50-13.00

Terahertz high-temperature intrawaveguide spectroscopy and interferometry based on sapphire shaped crystals

G.M. Katyba, ISSP RAS (Russia),
K.I. Zaytsev, M. Skorobogatiy, and V.N. Kurlov

Conference on Terahertz Optics and Biophotonics I

Conference Chair: **Valeriy E. Karasik**, Bauman Moscow State Technical University (Russia)

Secretary: **Nikita V. Chernomyrdin**, BMSTU (Russia)

International Program Committee **Valeriy E. Karasik (Chair)**, BMSTU (Russia), **Stanislav O. Yurchenko**, BMSTU (Russia), **Vincent P. Wallace**, University of Western Australia (Australia), **Igor V. Reshetov**, Sechenov MSMU (Russia), **Alexei Ivlev**, Max-Planck-Institut für Extraterrestrische Physik (Germany), **Barbara M. Giuliano**, Max-Planck-Institut für Extraterrestrische Physik (Germany), **Victor I. Ryzhii**, BMSTU (Russia), **Igor V. Minin**, SSAG (Russia), **Oleg V. Minin**, SSAG (Russia), **Dmitry S. Ponomarev**, IUHFSE RAS (Russia), **Vladimir N. Kurlov**, ISSP RAS (Russia), **Olga P. Cherkasova**, ILP SB RAS (Russia), **Olga A. Smolyanskaya**, ITMO University (Russia)

September 27, Thursday

INVITED/ORAL SESSION THZ OPTICS & BIOPHOTONICS I

(Building 10, Main Conference Hall)

Chair: **Valeriy E. Karasik**, BMSTU Russia

14.30-14.50

Invited

**Dielectric universities and
transport phenomena in various bioorganic
materials**

Konstantin Motovilov, Moscow Institute of
Physics and
Technology (Russia)

14.50-15.10

Invited

**THz spectroscopy of solutions and
tissues** Maxim Nazarov, NRC "Kurchatov
Institute" (Russia)

15.10-15.30

Invited

**Nano-confined water: from
incipient ferroelectricity to relaxor behavior**

Elena S. Zhukova, Moscow Institute of Physics
and Technology (Russia)

15.30-15.40

**THz quantum cascade lasers with gold-
and silver based double metal waveguide**

Rustam A. Khabibullin, Institute of Ultra High
Frequency Semiconductor Electronics of
RAS (Russia), N.V. Shchavruk, D.S.
Ponomarev, D.V. Ushakov,
A.A. Afonenko, O.Yu. Volkov, V.V. Pavlovskiy,
and A.A. Dubinov

15.40-15.50

**Using terahertz solid immersion
microscopy for sub-wavelength-resolution
visualization of soft objects and tissues**

Nikita V. Chernomyrdin, Bauman Moscow
State Technical University (Russia), A.S.
Kucheryavenko, G.S. Kolontaeva, E.N.
Rimskaya, G.A. Komandin, V.E. Karasik, and
K.I. Zaytsev

15.50-16.00

**Terahertz Electro-Optic Sampling
in Birefringent Crystals**

Igor Ilyakov, IAP RAS

16.00-16.10

**Terahertz and Infrared Spectroscopy
of Water in Protein Systems**

Zarina Gagkaeva, Moscow Institute of Physics
and Technology (Russia)

16.10-16.20

**Terahertz spectroscopy and imaging
of malignant tissues**

Kirill I. Zaytsev, Prokhorov General Physics
Institute of RAS, (Russia), N.V. Chernomyrdin,
A.A. Gavdush, I.N. Dolganova, Sh.-I.T.
Beshplav, K.M. Malakhov, M.A. Schcedrina,
G.A. Komandin, A.A. Potapov, I.V. Reshetov,
M. Skorobogatiy, and V.V. Tuchin

16.20-16.30

**Terahertz and infrared
dielectric spectroscopy of laboratory
analogues of circumstellar and interstellar
ices: Pilot measurements**

Arsenii A. Gavdush, Bauman Moscow State
Technical University (Russia), A.A. Gavdush,
B.M. Giuliano, B. Müller, E.A. Gorbunov,
P.V. Ovcharov, G.A. Komandin,
S.O. Yurchenko, K.I. Zaytsev, A.V. Ivlev, and P.
Caselli

22nd International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Workshop on Modern Optics XVI

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, Tomsk State University

International Program Committee: **Valery V. Tuchin, Vladimir P. Ryabukho, Vladimir L. Derbov, Alexander B. Pravdin, Boris A. Medvedev, Mikhail A. Starshov**, Saratov State University, **Leonid A. Melnikov, Boris B. Gorbatenko**, Yuri Gagarin State Technical University of Saratov, **Alexander V. Priezhev**, Moscow State University

September 27, Thursday

LECTURE SESSION: (Building 3, Big Physical Hall)

Chair: **Georgy V. Simonenko** and **Alexander B. Pravdin**, Saratov State University

14.00-14.30

How Does the Brain Works? The Worldwide Initiatives

Francesco S. Pavone, European Lab. for Non-linear Spectroscopy, Florence, Italy

14.30-15.00

Shining Light on Biology with Optogenetics

Andrew L. Lopez III, Department of Molecular Physiology and Biophysics, Baylor College of Medicine, Houston, Texas, USA

15.00-15.30

Show "Exciting Light"

Presentation for for University Students, Postgraduate Students and High School Students

Ivan V. Fedosov, Saratov State University, Russia

Workshop on English as a Communicative Tool in the Scientific Community XVII

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

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

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

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

September 28, Friday

ORAL SESSION (Scientific Library Conference Hall)

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

11.30-11.40

Definition to be Understood

Svetlana V. Eremina, Alexander B. Pravdin, Saratov State University, Saratov, Russia

11.40-11.50

Abstracts of Scientific Articles as They Are and as They Should Be Written

Dina Alexeeva, Saratov State University, Russia

11.50-12.00

Guidelines for Delivering an Oral Conference Presentation

Anna A. Sosnovskaya, Dina Alexeeva, Saratov State University, Saratov, Russia

12.00-12.10

Successful Academic Discussion at a Conference

Anna Smirnova, Saratov State University, Saratov, Russia

12.10-12.20

The Noun Chains Challenge in Translation

Darya N. Tselovalnikova, Saratov State University, Saratov, Russia

12.20-12.30

Lexico-grammatical features of a functional style on the example of chemical texts

Arina O. Shelyugina, Saratov State University, Saratov, Russia

12.30-12.40

Use of graphical structures of Chinese characters for more effective teaching of Chinese writing

Konstantin A. Grebenyuk, Saratov State University, Saratov, Russia

12.40-12.50

About Self-Similar Nature of Short Electromagnetic Pulses Generation in the Backward-Wave Tube

Alyona Rostuntsova, Saratov State University, Saratov, Russia

12.50-13.00

New Terminology Dictionary of Biophotonics: Introduction

Alexander B. Pravdin, Svetlana V. Eremina, Saratov State University, Saratov, Russia

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

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

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

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

September 26, Wednesday

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

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

14.00-14.13

Decoherence as the foundation of Macroscopic World

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

14.13-14.26

Applied and scientific importance of fundamental constants

N.A. Boykova, Saratov State University, Russia

14.26-14.39

The birth of Quantum Electrodynamics

S.O. Pirogov, Saratov State University, Russia

14.39-14.52

Theoretical simulation of the problem of an atom-surface noncontact friction

S. Churochkina, I. Demin, Saratov State
University, Russia

14.52-15.05

Physics of free-electron lasers in Saratov State University

V.M. Anikin, V.I. Tsoy, Saratov State University,
Russia

15.05-15.18

Delta-function: how to explain it to students?

K.A. Grebenyuk, Saratov State University,
Russia

15.18-15.30

Complex methods of improving accuracy in computer modeling of small size fields

V.A. Malyarchuk, Saratov State University,
Russia

15.30-15.42

Application of a heteromagnetic primary converter for detecting of Iron Oxide Nanoparticles

S.Zh. Zhusubaliyeva, B.A. Medvedev,
A.V. Vasiliev, A.A. Ignatiev, V.I. Kochubey,
Saratov State University, Russia

15.42-15.54

The observation of phenomenon of nonlinear resonance in the structures YIG

A.V. Vasilyev, A.A. Ignatiev, Saratov State
University, Russia

15.54-16.06

Profiles of oxygen and sulfur under ion etching PbS film on light

D.M. Utkin, A.A. Serdobintsev, V.V. Galushka,
M.I. Shishkin, A.G. Rokakh, Saratov State
University, Russia

16.06-16.18

Development of spectroscopic techniques to study mitochondria

E. Nikelshparg, Lomonosov Moscow State
University, Russia

16.18-16.30

Contrast in the physics, the technician and biology

M. Nikelshparg¹, E. Nikelshparg²,
¹Gimnasium №3 of Saratov, Russia,
²Lomonosov Moscow State University, Russia

16.30-17.00
Coffee break

17.00-17.13

Rene Descartes. «Discourse on the Method...»

D.M. Klychkova, Saratov State University, Russia

17.13-17.26

Experimental setting and method of sound velocity in air measurement

A.B. Kalinin, L.L. Strakhova, A.A. Ignatiev, Saratov State University, Russia

17.26-17.39

«Foolish question... good question... trivial question...» «Awkward questions» and evolution of scientific theories

M. Stolnitz, Saratov State University, Russia

17.39-17.52

Mind and feelings: emotions in decision-making

A. Y. Kochetkova, Yuri Gagarin State Technical University of Saratov, Russia

17.52-18.05

The scientific prose of Leonardo da Vinci

E.A. Kuryshova, Saratov State University, Russia

18.05-18.18

The polarized light in lecture demonstrations

M.A. Starshov, Saratov State University, Russia

18.18-18.32

Riddles of the elementary optical device

N. Lubimov, M. Starshov, Saratov State University, Russia

18.32-18.45

Stories and methodology of experience of Malus

J. Gudova, M.A. Starshov, Saratov State University, Russia

18.45-19.00

Contrast in the physics, the technician and biology

T. Kozlova, M. Starshov, Saratov State University, Russia

September 27, Thursday

ROUND TABLE

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, Evgeniya V. Listvina^a, Oleg M. Parshkov^c, A. V. Priezzhev^d,
^aSaratov State University, Saratov, Russia
^bSamara University, Samara, Russia
^cState Technical University of Saratov, Saratov, Russia
^dM.V. Lomonosov Moscow State University, Moscow, Russia

14.30-14.37

Coherent states of photons and qubits and their superpositions

A. Gorokhov, Samara National Research University, Russia

14.37-14.44

Pure Quantum States of Macroscopic Parameters and Quantum Mechanics Capability to Describing of Macroscopic World

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

14.44-14.51

Reality as illusion, "nothing" as reality

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

14.51-14.58

On the principles of cognition on the swing of time

B. Medvedev, Saratov State University, Russia

14.58-15.05

The consonance between the physics of Lucretius and modern physics

V. Tsoy, Saratov State University, Russia

15.05-15.12

The doctrine of the light of Goethe in the light of the story-game paradigm

O. Shimelfenig, Saratov State University, Russia

15.12-15.19

Sounding Number: from Pythagoras to Gubaidulina

V. Genin, Saratov State University, Russia

15.19-15.26

Crisis of physics and the poetry of “the silver age”

A. Rokakh, Saratov State University, Russia

15.26-15.33

On the correlation of logic and intuition in the process of cognition of the world

V. Rozen, Saratov State University, Russia

15.33-15.40

The Legacy of Boltzmann: Entropy in Inanimate and Living Nature

B. Medvedev, O.A. Budko, Saratov State University, Russia

15.40-15.47

Pattern recognition in a visual art and the theoretical works of Vasili Kandinsky

J. Brodskaya, Saratov State University, Russia

15.47-15.54

Request for an integrative approach in higher education

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

15.54-16.01

Human capital in the post-industrial era

B. Faifel Yuri Gagarin State Technical University of Saratov, Russia

16.01-16.08

Stereochemistry lesson

V. Sorokin, Saratov State University, Russia

16.08-16.15

Artificial light sources - a disaster for the world of insects

V.V. Anikin, Saratov State University, Russia

16.15-16.22

The psychology of the artificial intelligence. Is it possible?

A. Rokakh, Saratov State University, Russia

16.22-16.30

On an creation attempt of the “physics of spirit”

A. Rokakh, Saratov State University, Russia

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

(Building 3, 3d floor Hall)

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

17.00-19.00

1H. **Laboratory model of the RS flip-flop for educational purposes** P.P. Nelyubov, Saratov State University, Russia

2H. **A Digital Chaotic Sequences Generator** V.S. Chesakov, L.S. Sotov, Saratov State University, Russia

3H. **Results of polygon tests of the magneto-inertial module** E. D. Shatalov, A.A. Ignatiev, Saratov State University, Russia

INTERNET REPORTS

(Building 3, 3d floor Hall)

1. **The Proof of the Riemann Hypothesis on a Relativistic Turing Machine**

Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia

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**, Solar-Terrestrial Influences Laboratory, Bulgarian Academy of Sciences (Bulgaria); **Anton V. Vladzimirsky**, Prezident of AfUTeHD (Ukrainia); **Valery V. Tuchin** Saratov State University (Russia)

September 28, Friday

PLENARY SESSION V

**(Clinics of Skin and Venereal Diseases,
SSMU)**

Chair **Valery V. Bakutkin**, Saratov Research Institute of Rural Hygiene and **Sergey R. Utz**, Clinics of Skin and Venereal Diseases, SSMU, Russia

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

Telemedicine technologies of percutaneous electroneurostimulation of intraocular muscles of the human eye

Valery Bakutkin Saratov Research Institute of Hygiene; **Ilya Bakutkin**, Sartechinform, Russia

11.40-11.50

Telemedical monitoring of optical characteristics of long-wearing contact lenses

Anastasia Bakutkina, Saratov State University, Russia; **Valery Bakutkin**, Saratov Research Institute of Hygiene, Russia

11.50-12.00

Methods for constructing high-speed algorithms for recognizing the anterior part of the eye and pupillary reactions of a person for their autonomous use on mobile devices

Valery Bakutkin, Saratov Research Institute of Hygiene; **Ilya Bakutkin**, Sartechinform, Russia

12.00-12.10

Remote analysis of colorimetry parameters of the iris of the eye.

Nailya Nugaeva, Saratov State Medical University; **Valery Bakutkin**, Saratov Research Institute of Hygiene, Russia

12.10-12.20

Fetal heart auscultation and its telemedicine applications

Marine Gevorgyan, Saratov State Medical University; **Leonid Melnikov**, Yuri Gagarin State Technical University of Saratov, Russia

12.20-12.30

Elements of telemedicine for orthodontic clinic

O.V. Popkova, R.K. Nasrullaev, R.S. Anisimov, Saratov State Medical University, Russia

12.30-12.40

IRIS's stereoscopic image visualization

Tatyana Danilova, Alexey Tebyakin, Yuri Gagarin State Technical University of Saratov, Russia

12.50-13.00

Distance learning methods of ophthalmoscopy

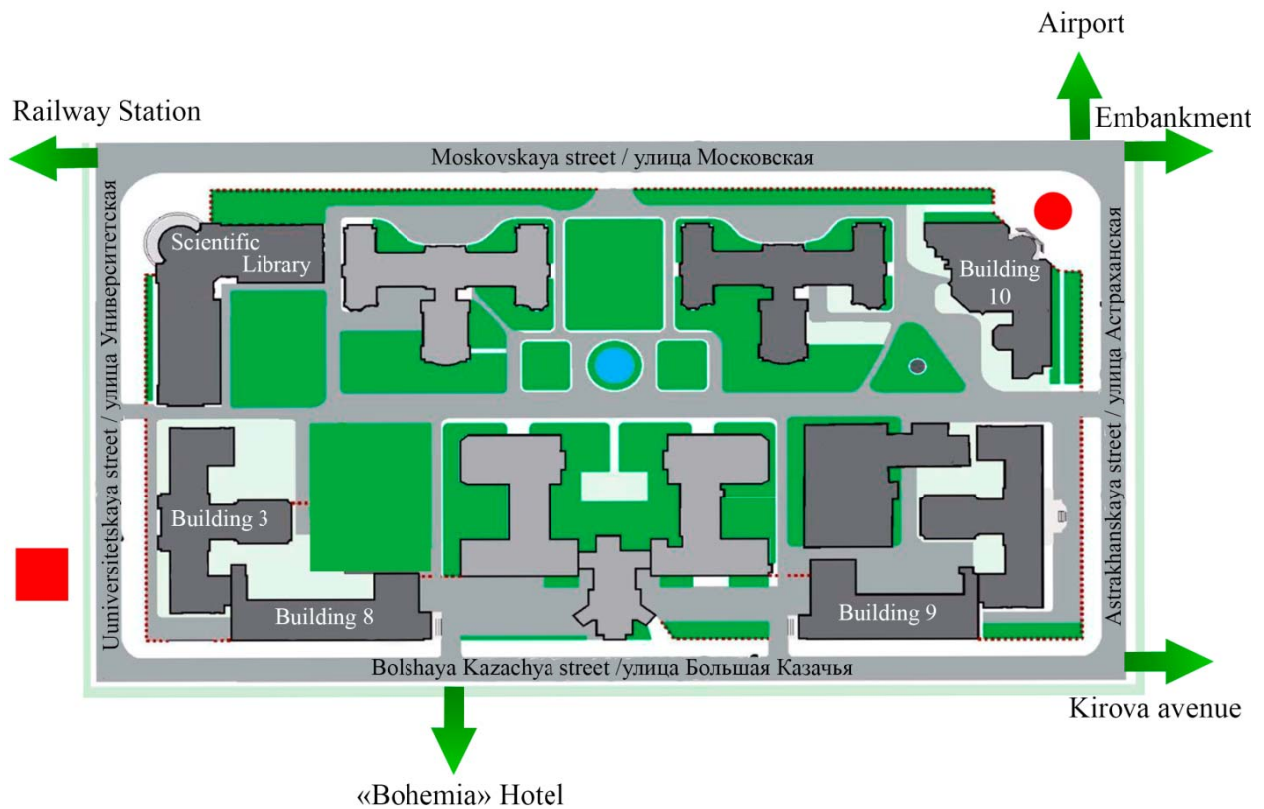
Oleg Chichev, Yuri Gagarin State Technical University of Saratov, Russia

13.00-13.10

Hardware-software complex for determining the volume of stereoscopy and its possible use in telemedicine

Elena Perechodzeva, Yuri Gagarin State Technical University of Saratov, Russia

MAP OF THE SSU CAMPUS



● Place to board a bus to go to Volga Boat Tour and Open Air Meeting

■ Welcome Party Place «Poliglot»

Saratov Fall Meeting
(<http://sfm.eventry.org/2018/>)



Saratov State University
(<https://www.sgu.ru/structure/fiz/saratov-fall-meeting>)



Facebook
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(<https://vk.com/saratovfallmeeting>)

