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SFM'15

International Symposium Optics and Biophotonics-III

19th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Organized by

N.G. Chernyshevsky Saratov State University

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

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

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

Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences

Institute of Precise Mechanics and Control, Russian Academy of Sciences

V.I. Razumovsky Saratov State Medical University

Yuri Gagarin State Technical University of Saratov

Volga Region Center of New Information Technologies at Saratov State University

Biomedical Photonics Committee of Chinese Optical Society

University of Oulu, Finland

SPIE Student Chapter

OSA Student Chapter

Saratov/Penza IEEE Chapter

In cooperation with

Academy of Natural Sciences, Saratov Regional Division

Russian Society for Photobiology

Saratov Science Center of the Russian Academy of Sciences

Photonics4Life Consortium of EC FP7: Network of Excellence for Biophotonics

The Biophotonics4Life Worldwide Consortium (BP4L) and
BiophotonicsWorld.org

Co-sponsored by

RFBR – Russian Foundation for Basic Research

RAS – Russian Academy of Sciences

SPIE – The International Society of Photo-Optical Instrumentation
Engineers

OSA – Optical Society of America

IEEE - Institute of Electrical and Electronics Engineers

LLC SPE Nanostructured Glass Technology, Saratov

Russian Technology Platform “The Medicine of the Future”

Russian Technology Platform “Photonics”

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

RME "INJECT" LLC, Saratov

NT-MDT NTK, Zelenograd

SPE “Fire Dance”, Saratov

Co-located with

The 7th Finnish-Russian Photonics and Laser Symposium PALS'15

Chair

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

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

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Alexander B. Pravdin, Saratov State University

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Julia S. Skibina, SPE "Nanostructured Glass Technology" Ltd., Russia

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Internet group

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

Members

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Alexey V. Shabunin, Saratov State University
Andrey V. Slepnev, Saratov State University
Maxim A. Kurochkin, Saratov State University

Schedule of SFM-15
International Symposium “Optics and Biophotonics-III”
19th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

September 21, Monday

12.00-14.00	Registration			<i>Building 10, Foyer</i>
14.00-14.10	Opening of 19th International School on Optics, Laser Physics & Biophotonics Valery V. Tuchin, Saratov State University, Russia			<i>Building 10, Hall 503</i>
14.10-15.30	OSA SHORT COURSE Raman Spectroscopy in Life Science and Medicine Juergen Popp, Leibniz Institute of Photonic Technology, Jena, Germany	<i>Building 10 Hall 503</i>	ORAL SESSION ENGLISH I Co-chairs: Alexander B. Pravdin, Svetlana V. Eremina, Saratov State University, Russia	<i>Scientific Library Conference Hall</i>
15.30-16.00	Coffee break			
16.00-17.30	OSA SHORT COURSE Raman Spectroscopy in Life Science and Medicine Juergen Popp, Leibniz Institute of Photonic Technology, Jena, Germany	<i>Building 10 Hall 503</i>	ORAL SESSION ENGLISH II Co-chairs: Alexander B. Pravdin, Svetlana V. Eremina, Saratov State University, Russia	<i>Scientific Library Conference Hall</i>

September 22, Tuesday

9.00-14.00	Registration	<i>Building 3, Foyer</i>
9.30-11.00	FOUNDATION “DYNASTY” SHORT COURSE Structural and Functional Imaging of Tissues and Cells with Optical Coherence Tomography Kirill V. Larin, University of Houston, USA	<i>Building 10, Hall 503</i>
11.00-11.30	Coffee break	
11.30-13.00	FOUNDATION “DYNASTY” SHORT COURSE Structural and Functional Imaging of Tissues and Cells with Optical Coherence Tomography Kirill V. Larin, University of Houston, USA	<i>Building 10, Hall 503</i>
13.00-14.00	Lunch	
14.00-14.10	Opening of International Symposium “Optics and Biophotonics-III” and PALS-15 Valery V. Tuchin, Saratov State University and Timo Jääskeläinen, University of Eastern Finland	<i>Building 10 Main Conference Hall</i>
14.10-15.30	JOINT SFM/PALS PLENARY SESSION I Chair: Valery V. Tuchin, Saratov State University, Russia Delivery Systems: How to Delivery and to Activate at Time and Site Specific Manner, Gleb B. Sukhorukov , The Queen Mary University of London, UK; Saratov State University, Russia Biophotonics on its Way into the Clinic, Juergen Popp , Leibniz Institute of Photonic Technology, Jena, Germany	<i>Building 10 Main Conference Hall</i>
15.30-16.00	Coffee break	
16.00-18.00	JOINT SFM/PALS PLENARY SESSION II Chair: Juergen Popp, Leibniz Institute of Photonic Technology, Jena, Germany Nonlinear Metasurfaces, Ildar Gabitov , Skolkovo Institute of Science and Technology, Moscow, Russia; University of Arizona, USA Plasmonics Engineering for SERS Detection, Nicolás Pazos-Pérez , Centre Tecnologic de la Química de Catalunya, Spain (moved to PS V) Fiber spectroscopy to detect tumor margins, Viacheslav Artyushenko , art photonics GmbH, Berlin, Germany; Prokhorov General Physics Institute, Russian Academy of Sciences, Russia	<i>Building 10 Main Conference Hall</i>
18.00-18.30	Lighting the future: International Year of Light video from The National University of Ireland, Galway and International Year of Light – Laser/Light Show “Fire Dance”, Saratov	
18.30-21.00	Welcome Party	<i>University campus</i>

September 23, Wednesday

9.00-10.20	<p>JOINT SFM/PALS PLENARY SESSION III Chair: Aleš Lapanje, Institute of Metagenomics and Microbial Technologies, Slovenija Hybrid Plasmonic Nanoparticles and Atomic Clusters for Analytical and Theranostic Applications, Nikolay G. Khlebtsov, Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov State University, Russia Wavefront Imaging and Shaping Techniques for Biomedicine & Nanotechnology, YongKeun (Paul) Park, Department of Physics, KAIST, South Korea</p>				Building 10 Main Conference Hall	<p>LECTURE/ORAL SESSION EDUCATION I Co-chairs: Boris A. Medvedev and Vladimir P. Ryabukho, Saratov State University, Russia</p>	Scientific Library Conference Hall	
10.20-10.50 Coffee break								
10.50-12.00	<p>PLENARY SESSION IV Chair: Nicolás Pazos-Pérez, Centre Tecnologic de la Quimica de Catalunya, Spain Advanced Software «KVAZAR» for Molecular Biology, Olga Glukhova, Department of mathematical modeling of Educational scientific institute of nanostructures and biosystems, Saratov State University, Russia Naming Bacteria: Revolutionising Molecular Microbial Ecology, Aleš Lapanje, Institute of Metagenomics and Microbial Technologies, Slovenija</p>				Building 10 Main Conference Hall	<p>INVITED LECTURE/ORAL PALS I SESSION Co-chairs: Timo Jääskeläinen, University of Eastern Finland, Valery V. Tuchin, Saratov State University, Russia</p>	Building 10, Hall 503	
						<p>LECTURE/ORAL SESSION EDUCATION II Co-chairs: Boris A. Medvedev and Vladimir P. Ryabukho, Saratov State University, Russia</p>	Scientific Library Conference Hall	
12.00-13.30	<p>INVITED/ORAL SESSION BIOPHYSICS I Chairs: Valery V. Tuchin, Saratov State University, Russia; Andrey Bednov, Baylor College of Medicine, USA</p>	Building 10 Main Conference Hall	<p>INVITED LECTURE/ORAL PALS II SESSION Chair: Alexey Kamshilin, ITMO University, Russia</p>	Building 10, Hall 503	<p>ORAL SESSION POLARIZATION Co-chairs: Dmitry A. Zimnyakov, Saratov State University, Russia, Igor V. Meglinski, University of Oulu, Finland</p>	Building 3, Room 34	<p>ORAL SESSION NONLINEAR DYNAMICS Chair: Vadim S. Anishchenko, Saratov State University, Russia</p>	Building 3, Room 38
						<p>LECTURE/ORAL SESSION EDUCATION III Co-chairs: Boris A. Medvedev and Vladimir P. Ryabukho, Saratov State University, Russia</p>	Scientific Library Conference Hall	
13.30-14.30 Lunch								
15.00-17.00 Social program (Volga boat trip)								

September 24, Thursday

9.30-11.00	SPIE SHORT COURSE Quantitative Phase Imaging and Wavefront Shaping Techniques YongKeun (Paul) Park, Department of Physics, KAIST, South Korea	<i>Building 10, Hall 503</i>	LECTURE/ORAL SESSION EDUCATION IV Co-chairs: Boris A. Medvedev and Vladimir P. Ryabukho , Saratov State University, Russia	<i>Scientific Library Conference Hall</i>				
9.20-10.00	PLENARY SESSION V Chair: Alexey Yashchenok , Saratov State University, Russia Silicon-iron Hybrid Nanoparticles with Optical, Luminescent and Magnetic Functionality , Munir Nayfeh , Department of Physics, University of Illinois at Urbana-Champaign, USA <i>(moved to PS II)</i>			<i>Building 10 Main Conference Hall</i>				
10.00-11.00	JOINT INVITED/ORAL SESSION NANOBIOPHOTONICS I/ PALS III Chair: Nikolai G. Khlebtsov , IBPPM RAS, Saratov State University, Russia							
11.00-11.30	Coffee break							
11.30-13.00	SPIE SHORT COURSE Quantitative Phase Imaging and Wavefront Shaping Techniques YongKeun (Paul) Park, Department of Physics, KAIST, South Korea	<i>Building 10, Hall 503</i>	JOINT INVITED/ORAL SESSION NANOBIOPHOTONICS II/ PALS IV Chair: Nikolai G. Khlebtsov , IBPPM RAS, Saratov State University, Russia	<i>Building 10 Main Conference Hall</i>	ROUND-TABLE DISCUSSION EDUCATION I Co-chairs: Boris A. Medvedev and Vladimir P. Ryabukho , Saratov State University, Russia	<i>Scientific Library Conference Hall</i>		
13.00-14.00	Lunch							
14.00-16.00	INVITED LECTURE/ORAL SESSION BIOPHYSICS II Co-chairs: Alexander Savitsky , A.N. Bach Institute of Biochemistry of RAS, Russia; Tatiana Novikova , LPICM, Ecole polytechnique, CNRS, France	<i>Building 10 Main Conference Hall</i>	INVITED/ORAL SESSION PHOTONICS I Chair: Vladimir L. Derbov , Saratov State University, Russia	<i>Building 10, Hall 503</i>	LECTURE SESSION MODERN OPTICS Chair: Vladimir P. Ryabukho , Saratov State University, Russia	<i>Building 3, Big Physical Hall</i>	ROUND-TABLE DISCUSSION EDUCATION II Co-chairs: Boris A. Medvedev and Vladimir P. Ryabukho , Saratov State University, Russia	<i>Scientific Library Conference Hall</i>
					INVITED/ORAL SESSION NANOBIOPHOTONICS III Chair: Nikolai G. Khlebtsov , IBPPM RAS, Saratov State University, Russia	<i>Building 8, Room 3</i>		
16.00-16.30	Coffee break							
16.30-17.30	PLENARY SESSION INTERNET BIOPHOTONICS Chair: Valery V. Tuchin , Saratov State University, Russia Advance in multimodality intravascular imaging for diagnosis and characterization of vulnerable plaques , Zhongping Chen , University of California, Irvine, USA Quantitative phase imaging for basic and clinical biomedical applications , Gabriel Popescu , University of Illinois at Urbana-Champaign, Beckman Institute for Advanced Science and Technology, IL, USA			<i>Building 3, Big Physical Hall</i>				
17.30-19.30	JOINT SFM/PALS POSTER/INTERNET SESSION AND INTERNET DISCUSSION Moderators: Dmitry Agafonov , Ivan V. Fedosov , Saratov State University, Russia			<i>Building 3, 3rd floor Hall</i>				

September 25, Friday

9.00-11.00	JOINT INVITED/ORAL SESSION MICROSCOPY AND LOW-COHERENCE METHODS/ PALS V Chair: Kirill V. Larin , University of Houston, USA	<i>Building 10 Main Conference Hall</i>	INVITED LECTURE/ORAL PALS VI SESSION Chair: Sergey M. Arakelian , Vladimir State University, Russia	<i>Building 10, Hall 503</i>	ORAL SESSION SPECTROSCOPY Co-chairs: Kirill I. Berezin , and Lev M. Babkov , Saratov State University, Russia	<i>Building 3, Room 34</i>	INVITED/ORAL SESSION BIOMEDICAL SPECTROSCOPY I Co-chairs: Vyacheslav I. Kochubey and Alexander B. Pravdin , Saratov State University, Russia	<i>Scientific Library Conference Hall</i>
			ORAL SESSION MANAGEMENT I U.M.N.I.K. Co-chairs: Sergey N. Sokolov , RME "INJECT" LLC, Saratov, Russia; Julia S. Skibina , Saratov State University, SPE LLC "Nanostructured Glass Technology"	<i>Building 8, Room 3</i>	ORAL SESSION BIOCOMPUTING Chair: Dmitry E. Postnov , Saratov	<i>Building 3, Room 38</i>		
11.00-11.30 Coffee break								
11.30-13.00	JOINT INVITED/ORAL SESSION BIOPHYSICS III/ PALS VII Chair: Ivan V. Fedosov , Saratov State University, Russia	<i>Building 10 Main Conference Hall</i>	ORAL SESSION LOW-DIMENSIONAL STRUCTURES Chair: Olga Glukhova , Saratov State University, Russia		<i>Building 3, Room 34</i>	ORAL SESSION BIOMEDICAL SPECTROSCOPY II Co-chairs: Vyacheslav I. Kochubey and Alexander B. Pravdin , Saratov State University, Russia	<i>Scientific Library Conference Hall</i>	
	INVITED/ORAL SESSION PHOTONICS II Chair: Vladimir L. Derbov , Saratov State University, Russia	<i>Building 10, Hall 503</i>	ORAL SESSION BIOCOMPUTING Chair: Dmitry E. Postnov , Saratov		<i>Building 3, Room 38</i>	ORAL SESSION TELEMEDICINE Co-chairs: Elena V. Karchenova , ISfTeH and Saratov Alfa-Health-centre, and Valery V. Bakutkin , Saratov Research Institute of Rural Hygiene, Russia	<i>Dr. Paramonov's Clinics</i>	
14.00-17.00	Round-table discussions and closing of the School and The Symposium		ORAL SESSION ELECTROMAGNETICS Chair: Michael V. Davidovich , Saratov State University, Russia			<i>Building 3, Room 34</i>		

PLENARY LECTURES

September 22, Tuesday

JOINT SFM/PALS PLENARY SESSION I

(Building 10, Main Conference Hall)

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

14.10-14.50

Delivery Systems: How to Delivery and to Activate at Time and Site Specific Manner

Gleb B. Sukhorukov, The Queen Mary University of London, UK; Saratov State University, Russia

14.50-15.30

Biophotonics on Its Way into the Clinic

Juergen Popp, Leibniz Institute of Photonic Technology, Jena, Germany

15.30-16.00

Coffee break

JOINT SFM/PALS PLENARY SESSION II

(Building 10, Main Conference Hall)

Chair: **Juergen Popp**, Leibniz Institute of Photonic Technology, Jena, Germany

16.00-16.40

Nonlinear Metasurfaces

Ildar Gabitov, Skolkovo Institute of Science and Technology, Moscow, Russia; University of Arizona, USA

16.40-17.20

Plasmonics Engineering for SERS Detection

Nicolás Pazos-Pérez, Centre Tecnologic de la Quimica de Catalunya, Spain **(moved to Plenary Session V, Sept. 24, 9.20-10.00)**

17.20-18.00

Fiber spectroscopy to detect tumor margins

Viacheslav Artyushenko, art photonics GmbH, Berlin, Germany; Prokhorov General Physics Institute, RAS, Russia

September 23, Wednesday

JOINT SFM/PALS PLENARY SESSION III

(Building 10, Main Conference Hall)

Chair: **Aleš Lapanje**, Institute of Metagenomics and Microbial Technologies, Slovenija

9.00-9.40

Hybrid Plasmonic Nanoparticles and Atomic Clusters for Analytical and Theranostic Applications,

Nikolay G. Khlebtsov, Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov State University, Russia

9.40-10.20

Wavefront Imaging and Shaping Techniques for Biomedicine & Nanotechnology

YongKeun (Paul) Park, Department of Physics, KAIST, South Korea

10.20-10.50

Coffee break

PLENARY SESSION IV

(Building 10, Main Conference Hall)

Chair: **Nicolás Pazos-Pérez**, Centre Tecnologic de la Quimica de Catalunya, Spain

10.50-11.25

Advanced Software «KVAZAR» for Molecular Biology

Olga Glukhova, Department of mathematical modeling of Educational scientific institute of nanostructures and biosystems, Saratov State University, Russia

11.25-12.00

Naming Bacteria: Revolutionising Molecular Microbial Ecology

Aleš Lapanje, Institute of Metagenomics and Microbial Technologies, Slovenija

September 24, Thursday

PLENARY SESSION V

(Building 10, Main Conference Hall)

Chair: **Alexey Yashchenok**, Saratov State University, Russia

9.20-10.00

Silicon-iron Hybrid Nanoparticles with Optical, Luminescent and Magnetic Functionality

Munir Nayfeh, Department of Physics, University of Illinois at Urbana-Champaign, USA **(moved to Plenary Session II, Sept. 22, 16.00-18.00)**

PLENARY SESSION

INTERNET BIOPHOTONICS

(Building 3, Big Physical Hall)

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

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

16.30-17.00

Advance in multimodality intravascular imaging for diagnosis and characterization of vulnerable plaques

Zhongping Chen, University of California, Irvine, USA

17.00-17.30

Quantitative phase imaging for basic and clinical biomedical applications

Gabriel Popescu, University of Illinois at Urbana-Champaign, Beckman Institute for Advanced Science and Technology, IL, USA

The 7th Finnish-Russian Photonics and Laser Symposium PALS'15

Co-chairs: **Vladimir A. Makarov**, Lomonosov Moscow State University, Russia; **Timo Jääskeläinen**, University of Eastern Finland, Finland; **Valery V. Tuchin**, Saratov State University, Russia

Secretary: **Olga Bibikova**, University of Oulu, Finland, Saratov State University, Russia

Program Committee: **Alexander V. Priezzhev**, Lomonosov Moscow State University, Russia; **Igor V. Meglinski**, University of Oulu, Finland; **Sergey M. Arakelian**, Vladimir State University, Russia; **Alexey N. Bashkatov**, Saratov State University, Russia; **Igor P. Gurov**, Saint Petersburg National Research University ITMO, Russia; **Seppo Honkanen**, University of Eastern Finland, Finland; **Martti Kauranen**, Tampere University of Technology, Finland; **Nikolai G. Khlebtsov**, Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Russia; **Jyrki Saarinen**, University of Eastern Finland, Finland; **Alexander M. Sergeev**, Institute of Applied Physics RAS, Russia; **Alexander P. Shkurinov**, Lomonosov Moscow State University, Russia

September 23, Wednesday

INVITED LECTURE/ORAL PALS I SESSION

(Building 10, Hall 503)

Chairs: **Timo Jääskeläinen**, University of Eastern Finland, **Valery V. Tuchin**, Saratov State University, Russia

10.50-11.10

Invited

Interaction of visible light with blood vessels in human skin **Alexey Kamshilin**, ITMO University, Russia

11.10-11.30

Invited

Addressed thermogenetic activation of cells by infrared and microwave radiation

Andrei B. Fedotov^{1,2}, **I.V. Fedotov**^{1,2}, **A.A. Lanin**^{1,2}, **D.I. Kulik**¹, **N.A. Safronov**¹, **Yu.G. Ermakova**³, **M.E. Matlashov**³, **D.A. Sidorov-Biryukov**^{1,2}, **V.V. Belousov**³, **A.M. Zheltikov**^{1,2,4}

¹Physics Department, International Laser Center, M.V. Lomonosov Moscow State University, Moscow, Russia; ²Russian Quantum Center, Moscow Region, Russia; ³M.M. Shemyakin and Yu.A. Ovchinnikov Institute of Bioorganic Chemistry, Russian Academy of Sciences, Moscow, Russia; ⁴Department of Physics and Astronomy, Texas A&M University, College Station TX, USA

11.30-11.45

Implantable bio-markers for in vivo physiological assessment **Anton Sadovoy**¹, **A. Gurkov**², **C. Teh**³, **M. Timofeyev**², **I.**

Meglinski⁴, ¹Institute of Materials Research and Engineering, A*STAR, Singapore; ²Institute of Biology, Irkutsk State University, Russia; ³Institute of Molecular and Cell Biology, A*STAR, Singapore; ⁴University of Oulu, Optoelectronics and Measurement Techniques Laboratory, Finland

11.45-12.00

Investigation of bovine serum albumin glycation by THz spectroscopy **Olga P. Cherkasova**¹, **M. M.Nazarov**², **A. P. Shkurinov**^{2,3}, ¹Institute of Laser Physics of SB RAS, Novosibirsk, Russia; ²Institute on Laser and Information Technologies of RAS, Shatura, Russia; ³Lomonosov Moscow State University, Moscow, Russia

INVITED LECTURE/ORAL PALS II SESSION

(Building 10, Hall 503)

Chair: **Alexey Kamshilin**, ITMO University, Russia

12.00-12.20

Invited

Parametric interaction of polarization singularities in isotropic chiral medium **Igor A. Perezhogin**¹, **K. S. Grigoriev**², **V. A. Makarov**^{1,2}, ¹International Laser Center of M.V. Lomonosov Moscow State University, Russia; ²Faculty of Physics of M.V. Lomonosov Moscow State University, Russia

12.20-12.40

Invited

Pulsed picosecond lasers with the dynamical operation control

Nikita G. Mikheev, V.B. Morozov, A.N. Olenin, D.V. Yakovlev, International Laser Center and Physics Department, M.V. Lomonosov Moscow State University, Russia

12.40-13.00

Invited

Monte Carlo simulations of optical brain imaging: Approaches, verifications, applications

Mikhail Kirillin^{1,2}, A. Gorshkov^{1,2}, E. Sergeeva¹, H. Wabnitz³, A. Bykov⁴, A. Popov⁴, T. Myllylä⁴, V. Kiviniemi⁵, ¹Institute of Applied Physics of RAS, Nizhny Novgorod, Russia, ²N.I. Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia, ³Physikalisch-Technische Bundesanstalt (PTB), Berlin, Germany, ⁴Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Oulu, Finland, ⁵Department of Diagnostic Radiology, Oulu University Hospital, Oulu, Finland

13.00-13.15

Invited

Deep UV LEDs expand photonics world: devices, applications and markets

Sergey Paltsev¹, Y. Bilenko², ¹Profina Oy, Finland; ²Sensor Electronic Technology, Inc. (SETi), Columbia, South Carolina, USA

13.15-13.30

Invited

FiDiPro Project on Biophotonics: Finland-Russian Collaboration

Valery V. Tuchin, Saratov State University; Institute of Precision Mechanics and Control RAS, Saratov; Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk, Russia

September 24, Thursday

**JOINT INVITED/ORAL SESSION
NANOBIOPHOTONICS I / PALS III
(Building 10, Main Conference Hall)**

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

10.00 – 10.20

Invited (PALS)

Laser-induced semiconductor nano-microstructures with controlled topology: functional properties and verification of macroscopic quantum effects in thin-film and cluster Sergey Arakelian¹, A. Kucherik¹, S. Kutrovskaya¹, D. Nogtev¹, A. Osipov¹, T. Vartanyan², S. Zimin³, ¹Vladimir State University named after A.G. and N.G. Stoletovs, Vladimir, Russia; ²St. Petersburg National Research University of Information Technologies, Mechanics and Optics, St. Petersburg, Russia; ³P.G. Demidov Yaroslavl State University, Yaroslavl, Russia

10.20 – 10.40

Invited

Super-resolution optical imaging and spectroscopy by scanning optical nano-antennas Pavel Dorozhkin, A. Shelaev, I. Arkov, E. Kuznetsov, S. Timofeev, V. Bykov, NT-MDT Co., Russia;

10.40 – 10.55

Investigation of cell proliferative activity on the surface of the nanocomposite material produced by laser radiation Alexander Gerasimenko, U. Kurilova, N. Zhurbina, National Research University "MIET", Russia

11.00-11.30

Coffee break

**JOINT INVITED/ORAL SESSION
NANOBIOPHOTONICS II / PALS IV
(Building 10, Main Conference Hall)**

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

11.30 – 11.50

Invited (PALS)

Application of atomic layer deposition in polymer based nanophotonic devices Seppo Honkanen¹, M. Kuittinen¹, J. Saarinen¹, M. Roussey¹, R. Saleem², P. Stenberg¹, L. Ahmadi¹, R. Ali¹, ¹Institute of Photonics, University of Eastern Finland, Joensuu, Finland; ²National University of

Sciences and Technology (NUST), Islamabad, Pakistan

11.50-12.10

Invited (PALS)

Generation of electromagnetic radiation in nano-structural matter Alexander Shkurinov, Moscow State University, Moscow, Russia

12.10 – 12.25

Efficient up-conversion phosphors on the basis of fluorides for photonics Sergey V. Kuznetsov¹, D.S. Yasyarkina¹, Y.A. Rozhnova¹, A.V. Ryabova¹, D.V. Pominova¹, A.A. Luginina^{1,2}, M.N. Mayakova¹, V.V. Voronov¹, A.E. Baranchikov³, V.K. Ivanov³, P.P. Fedorov¹, ¹Prokhorov General Physics Institute of RAS; ²All-Russian Institute of Scientific and Technical Information of RAS; ³Kurnakov Institute of General and Inorganic Chemistry of RAS, Russia

12.25 – 12.40

Up-conversion nanoparticles surface modification with photosensitizer molecules or gold nanoparticles for biomedical applications Daria Pominova, A.V. Ryabova, S.V. Kuznetsov, J.A. Rozhnova, A.M. Prokhorov General Physics Institute of RAS, Russia

12.40 – 12.55

Mechanisms of adsorption of nitrogenous bases on the surface of nanodiamonds Ekaterina Khusainova, K. Laptinskiy, Faculty of Physics, Moscow State University, Russia

12.55 – 13.10

The laser-ablative synthesis and the spectral-optical diagnostic of the ruby nanoparticles M.S. Baranov, A. A. Bardina, V. N. Khramov, Volgograd State University, Russia

**PALS POSTER/INTERNET SESSION
AND INTERNET DISCUSSION**

(Building 3, 3rd floor Hall)

Chair (RF): **Olga Bibikova**; University of Oulu, Finland; Saratov State University, Russia

17.30-19.30

1RF. **Iridium nanopillar arrays for highly reproducible surface-enhanced Raman spectroscopy (SERS)** Antti Matikainen¹, Tarmo Nuutinen², Guoguo Kang³, Seppo Honkanen¹, Pasi Vahimaa¹, ¹Institute of

Photonics, University of Eastern Finland, Joensuu, Finland; ²Department of Biology, University of Eastern Finland, Joensuu, Finland; ³School of optoelectronics, Beijing Institute of Technology, Beijing, China

2RF. **From silver chloride intermediate to sers applications** Tarmo Nuutinen^{1,2}, A. Matikainen¹, S. Honkanen¹, P. Vahimaa¹, ¹ Institute of Photonics, University of Eastern Finland, Joensuu, Finland; ²Department of Biology, University of Eastern Finland, Joensuu, Finland

3RF. **The effect of viscosity on the thermal stability of coupled multi-enzyme system lactate dehydrogenase + Nad(p)h:fmn-oxidoreductase + bacterialLuciferase** Maria S. Nemchinova¹, Oleg S. Sutormin¹, Irina E. Sukovataya¹, Valentina A. Kratasyuk^{1,2}, ¹Department of Biophysics, Institute of Fundamental Biology and Biotechnology, Siberian Federal University, Krasnoyarsk, Russia; ²Institute of Biophysics of RAS, Russia

4RF. **UV laser-induced fluorescence spectroscopy and laser-Doppler flowmetry in the diagnostics of alopecia** Diana P. Skomorokha, Yulia N. Pigareva, Vladimir V. Salmin, Krasnoyarsk State Medical University named after Prof. V.F. Voino-Yasenetsky, Krasnoyarsk, Russia

5RF. **Surface-enhanced Raman spectroscopy for enzymatic activity detection** Natalia L. Nechaeva, I.N. Kurochkin, Chemical Enzymology Department, Faculty of Chemistry, Lomonosov Moscow State University, Russia

6RF. **Plasmon-resonant nanoparticles with variable morphology for optical imaging** Olga Bibikova¹, S. Prateek¹, I. Skovorodkin¹, A. Popov¹, A. Bykov¹, E. Panfilova², M. Kinnunen¹, V. Bogatyrev², S. Vainio¹, K. Kordas¹, N. Khlebtsov^{2,3}, V. Tuchin^{1,3,4}, ¹University of Oulu, Oulu, Finland; ²Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS; ³Saratov State University; ⁴Institute of Precision Mechanics and Control of RAS, Saratov, Russia

7RF. **The morphological changes in transplanted tumors of rats at plasmonic photothermal therapy** Alla B. Bucharskaya¹, G.N. Maslyakova¹, N.A. Navolokin¹, N.I. Dikht¹, G.S. Terentyuk^{1,2}, A.N. Bashkatov^{2,3}, E.A. Genina^{2,3}, B.N. Khlebtsov⁴, N.G. Khlebtsov⁴, V.V. Tuchin^{2,3,5}, ¹Saratov State Medical University; ²Research-Educational Institute of Optics and Biophotonics, Saratov

State University; ³Interdisciplinary Laboratory on Biophotonics, Tomsk State University; ⁴Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS; ⁵Institute of Precision Mechanics and Control of RAS, Saratov, Russia

8RF. **Monitoring properties of biological tissues Using [Y2O3:Yb, Er] upconversion particles** Elena Volkova^{1,2}, I. Yanina^{1,2,3}, A. Popov², A. Bykov², A. Skaptsov¹, M. Kozintseva¹, J. Konyukhova¹, V. Kochubey¹, I. Meglinski², V. Tuchin^{1,2,4}, ¹Saratov State University, Research-Educational Institute of Optics and Biophotonics, Russia; ²University of Oulu, Optoelectronics and Measurement Techniques Laboratory, Oulu, Finland; ³Saratov State Medical University, Department of Medical and Biological Physics; ⁴Laboratory of Laser Diagnostics of Technical and Living Systems of Precise Mechanics and Control Institute of RAS, Saratov, Russia

9RF. **Multimodal coherent nonlinear raman microspectroscopy by chirped ultrashort laser pulses** A. A. Lanin^{1,2}, E.A. Stepanov^{1,2}, R.A. Tikhonov¹, A.B. Fedotov^{1,2}, A.M. Zheltikov¹⁻⁴, ¹Faculty of Physics, International Laser Center, Moscow State University; ²Russian Quantum Center, Moscow State University, Russia; ³Texas A&M University, College Station, USA; ⁴National Research Centre Kurchatov Institute, Moscow, Russia

INTERNET INVITED LECTURES

Improvement of upconversion deep-tissue imaging with optical clearing Alexey P. Popov¹, E. V. Khaydukov², A. V. Bykov¹, V. A. Semchishen¹, V. V. Tuchin^{3,4}, I. V. Meglinski¹, ¹Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Oulu, Finland; ²Institute on Laser and Information Technologies of RAS, Moscow, Russia; ³Research-Educational Institute of Optics and Biophotonics, Saratov State University; ⁴Institute of Precise Mechanics and Control of RAS, Saratov, Russia

Optical properties of tissues in the visible-NIR spectral range Alexey N. Bashkatov, E. A. Genina, V. V. Tuchin Research-Educational Institute of Optics and Biophotonics, Saratov State University; Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Russia

September 25, Friday

**JOINT INVITED LECTURE/ORAL SESSION
MICROSCOPY AND LOW-COHERENCE
METHODS/ PALS V**

(Building 10, Main Conference Hall)

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

9.00-9.20

Invited (PALS)

**Experience in collaborative construction
and biomedical applications of laser
tweezers**

Alexander Priezzhev^{1,2}, K. Lee^{1,3}, M.
Kinnunen³, R. Myllyla³, I. Meglinski³, ¹Laser
Biomedical Photonics Laboratory, Physics
Department; ²International Laser Centre,
Lomonosov Moscow State University,
Moscow, Russia; ³Optoelectronics and
Measurement Techniques Laboratory,
University of Oulu, Oulu, Finland **(moved to
Internet Session)**

9.20-9.40

Invited (PALS)

**Quantified monitoring of skin OCT-image
evolution under external action**

Pavel D. Agrba^{1,2}, M.A. Pasukhin¹, M.Yu.
Kirillin^{2,1}, ¹Lobachevsky State University of
Nizhny Novgorod, Russia, ²Institute of Applied
Physics of Russian Academy of Sciences,
Russia

9.40-9.55

(PALS)

**Effects of cisplatin on the level of
hydrogen peroxide and cell death in HeLa
Kyoto cells**

Anastasya S. Belova^{1,2}, A.G.,
Orlova^{1,2,3}, I.V. Balalaeva², N.N. Razumkova²,
A.V. Maslennikova^{1,3}, N.M. Mishina^{3,4}, N.M.
Shakhova^{1,3}, E.V. Zagaynova³, V.V.
Belousov^{3,4}, ¹Institute of Applied Physics of
the Russian Academy of Sciences, Nizhny
Novgorod, Russia; ²Lobachevsky State
University of Nizhni Novgorod, Nizhni
Novgorod, Russia; ³N. Novgorod State
Medical Academy, Nizhny Novgorod, Russia;
⁴Shemyakin-Ovchinnikov Institute of
Bioorganic Chemistry, Moscow, Russia

9.55-10.10

**Vessel-contrast enhancement in label-free
optical coherence angiography based on
phase and amplitude speckle variability**

Lev A. Matveyev¹, Vladimir Yu. Zaitsev¹,
Alexander A. Moiseev¹, Grigory V. Gelikonov¹,
Alexander L. Matveyev¹, Sergey Yu.
Ksenofontov¹, Marina A. Sirotkina², Valentin
M. Gelikonov¹, Natalia D. Gladkova², Valentin
V. Demidov³, Alex Vitkin³, ¹Institute of Applied

Physics RAS; ²Medical Academy of Nizhny
Novgorod, Russia; ³University of Toronto,
Canada

10.10-10.25

**Stochastic optical reconstruction
microscopy (STORM) image restoration
from subsets of localizations insufficient
for Nyquist criterion** Alexander Moiseev,
Grigory Gelikonov, Valentine Gelikonov, IAP
RAS, Russia

10.25-10.40

**Digital holography methods for optical
aberrations measurement and
compensation** Vasiliy Matkivskiy, Dmitriy
Shabanov, Shilagin Pavel, Moiseev
Aleksandr, Grigoriy Gelikonov, Valentin
Gelikonov, IAP RAS, Russia

10.40-10.55

**Analysis of dynamics of a caspase-3
activity in cancer cells during apoptosis
using FLIM/FRET technique** Tatiana F.
Sergeeva¹, Marina V. Shirmanova¹, Varvara
M. Dudenkova^{1,2}, Olga A. Zlobovskaya³,
¹Nizhny Novgorod State Medical Academy;
²Nizhny Novgorod State University;
³Shemyakin-Ovchinnikov Institute of
Bioorganic Chemistry, Russia

**INVITED LECTURE/ORAL PALS VI
SESSION**

(Building 10, Hall 503)

Chair: **Sergey M. Arakelian**, Vladimir State
University, Russia

9.00-9.20

Invited

**Superfilamentation in water with tight
focusing laser beams: from femtoseconds
to microseconds** Fedor V. Potemkin, E. I.

Mareev, A. A. Podshivalov, V. M. Gordienko,
Faculty of Physics and International Laser
Center M. V. Lomonosov Moscow State
University, Moscow, Russia

9.20-9.40

Invited

**Photo-induced phenomena in
chalcogenide glasses irradiated by high-
intensity laser pulses** Elena Romanova¹, Yu.

S. Kuz'yutkina¹, S. Guizard², N. Abdel-
Moneim³, D. Furniss³, A. B. Seddon³, T. M.
Benson³, ¹Saratov State University, Saratov,
Russia; ²Laboratoire des Solides
Irradiés, CNRS-Ecole Polytechnique,
Palaiseau, France; ³University of Nottingham,
Nottingham, UK

9.40-9.55

Calibration of miniature prism-based stereoscopic imagers for precise spatial measurements Alexander S. Machikhin¹, A. V. Gorevoy^{1,2}, ¹Scientific and Technological Center of Unique Instrumentation of Russian Academy of Sciences, Moscow, Russia; ²Bauman Moscow State Technical University, Moscow, Russia

9.55-10.10

Acousto-optical method for full-field high temperature measurement Alexander S. Machikhin, P. V. Zinin, Scientific and Technological Center of Unique Instrumentation of Russian Academy of Sciences, Moscow, Russia

10.10-10.25

Raman scattering and fluorescence of graphitic phases from B-C-N triangle Pavel V. Zinin, Scientific and Technological Center of Unique Instrumentation, Russian Academy of Sciences, Moscow, Russia

11.00-11.30
Coffee break

**JOINT INVITED LECTURE/ORAL SESSION
BIOPHYSICS III/ PALS VII**

(Building 10, Main Conference Hall)

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

11.30-11.50

Invited

The regularizing functional minimization based reconstruction of tissue scattering inhomogeneities from time-resolved optical projections Alexander B. Konovalov, Vitaly V. Vlasov, Russian Federal Nuclear Center - Zababakhin Institute of Applied Physics, Russia

11.50-12.10

Invited

A robust method of strain mapping in compressional optical coherence elastography using combined sub-wavelength phase-resolved measurements and pixel-scale displacement tracking Vladimir Y. Zaitsev¹, Alexander L. Matveyev¹, Lev A. Matveyev¹, Grigory V. Gelikonov¹, Ekaterina V. Gubar'kova², Natalia D. Gladkova², Alex Vitkin³, ¹Institute of Applied Physics RAS; ²Medical Academy of Nizhny Novgorod, Russia; ³University of Toronto, Canada

12.10-12.30

Invited (PALS)

Mechanisms of tissue optical immersion clearing Elina Genina, Alexey N. Bashkatov, Valery V. Tuchin, Saratov State University, Russia

12.30-12.45

Neoplasms treatment by diode laser with and without real time temperature control on operation zone A.V. Belikov¹, M.L. Gelfond², Ksenia V. Shatilova¹, S.A. Sosenkova¹, A.A. Lazareva¹, ¹ITMO University, Saint Petersburg; ²N.N.Petrov Scientific Research Institute of Oncology, Russia

12.45-13.00

Study of human skin neoplasms with autofluorescence method in NIR region Julia A. Khristoforova, Valery P. Zakharov, Ivan A. Bratchenko, Dmitriy N. Artemev, Samara State Aerospace University, Russia

International Symposium Optics and Biophotonics - III

Conference on Optical Technologies in Biophysics & Medicine XVII

Co-chairs: **Elina A. Genina**, Saratov State University (Russia); **Igor V. Meglinsky**, University of Oulu (Finland); and **Valery V. Tuchin**, Saratov State University, Institute of Precision Mechanics and Control RAS (Russia)

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

International Program Committee **Victor N. Bagratashvili**, Inst. of Laser & Inform. Technol. RAS (Russia); **Alexey N. Bashkatov**, Saratov State Univ. (Russia); **Wei Chen**, Univ. of Central Oklahoma (USA); **Kishan Dholakia**, Univ. of St. Andrews (UK); **Paul M.W. French**, Imperial College of Sci., Technol. & Med. (UK); **James G. Fujimoto**, MIT (USA); **Steven L. Jacques**, Oregon Medical Laser Ctr. (USA); **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); **Risto Myllylä**, Univ. of Oulu (Finland); **Juergen Popp**, LeibnizInst. of Photonic Technol., Jena (Germany); **Alexander V. Priezzhev**, M.V. Lomonosov Moscow State Univ. (Russia); **Lihong Wang**, Washington Univ. in St. Louis (USA); **Ruikang K. Wang**, Univ. of Washington (USA); **Dan Zhu**, Huazhong Univ. of Sci. and Technol. (China)

September 23, Wednesday

INVITED LECTURE/ORAL SESSION BIOPHYSICS I

(Building 10, Main Conference Hall)

Chairs: **Valery V. Tuchin**, Saratov State University, Russia; **Andrey Bednov**, Baylor College of Medicine, USA

12.00-12.20

Invited

Laser-induced breakdown of optically trapped nanoparticles for cell transfection Yoshihiko Arita, Maciej Antkowiak, Frank Gunn-Moore, Kishan Dholakia, University of St Andrews, United Kingdom (moved to Session Biophysics III Sept. 25, 11.30-11.50)

12.20-12.40

Invited

Study of placenta vascular physiology and transplacental substance transfer using the human placenta dual perfusion model Andrey Bednov, Baylor College of Medicine, USA

12.40-13.00

Invited

Quality control of packed food Anton Sadovoy, Seok Hong Goh, Institute of Materials Research and Engineering, A*STAR, Singapore

13.00-13.15

Laser speckle imaging reveals large scale oscillations of renal blood flow caused by inhomogeneous drugs distribution during intrarenal infusion Dmitry D Postnov, Olga V. Sosnovtseva, Copenhagen University, Denmark

13.15-13.30

Detection of drugs of abuse in blood with surface-enhanced Raman spectroscopy Maciej Wróbel¹, Soumik Siddhanta², Marcin Gnyba¹, Małgorzata Jędrzejewska-Szczerska¹, Ishan Barman², ¹Gdańsk University of Technology, Poland; ²Johns Hopkins University, USA

September 24, Thursday

INVITED LECTURE/ORAL SESSION
BIOPHYSICS II

(Building 10, Main Conference Hall)

Chair: **Alexander Savitsky**, A.N. Bach Institute of Biochemistry of RAS, Russia; **Tatiana Novikova**, LPICM, Ecole polytechnique, CNRS, France

14.00-14.20

Invited

Structure and physico-chemical properties of the novel photoconvertible fluorescent protein for subdiffractional localization microscopy (PALM) Alexander Savitsky¹, Grigory Lapshin¹, Tatiana Ivashina², Leonid Vinokurov³, ¹A.N. Bach Institute of Biochemistry of RAS; ²G.K. Skryabin Institute of Biochemistry and Physiology of Microorganisms of RAS; ³Branch of Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry of RAS, Moscow, Russia

14.20-14.40

Invited

Polarimetric imaging for cancer detection Tatiana Novikova¹, Pierre Validire², Abdelali Benali², Brice Gayet³, Angelo Pierangelo¹, Antonello De Martino¹, ¹LPICM, Ecole polytechnique, CNRS, Palaiseau; ²Département d'Anatomopathologie de l'Institut Mutualiste Montsouris; ³Département médico-chirurgical de pathologie digestive de l'Institut Mutualiste Montsouris, Paris, France

14.40-15.00

Invited

Optical assessment of bio-markers of socially important diseases Alexander V. Priezhev¹, Andrey E. Lugovtsov¹, S.Yu. Nikitin¹, K. Lee¹, V. Ustinov¹, V.B. Koshelev¹, O.E. Fadyukova¹, M.D. Lin¹, E.A. Shirshin¹, T.N. Tikhonova¹, Yu.I. Gurfinkel², ¹Lomonosov Moscow State University; ²Research Clinical Center of JSC "Russian Railways", Moscow, Russia (moved to Internet Session)

15.00-15.15

Diffuse light tomography to detect blood vessels using Tikhonov regularization Huseyin Ozgur Kazanci¹, Steve L. Jacques², ¹Biomedical Engineering, Faculty of Engineering Akdeniz University, Turkey; ²Biomedical Engineering Oregon Health & Science University, Portland, Oregon, USA

15.15-15.30

Study of the functional state of peripheral vessels in fingers on rheumatological patients by means of laser Doppler flowmetry and

cutaneous thermometry measurements Angelina I. Zhrebtsova¹, Evgeny A. Zhrebtsov¹, Andrey V. Dunaev¹, Konstantin V. Podmasteryev¹, Olga V. Pilipenko¹, Alexander I. Krupatkin², Lyudmila S. Khakhicheva³, Vadim F. Muradyan³, ¹State University – Educational-Scientific-Production Complex; ²Priorov Central Research Institute of Traumatology and Orthopaedics, Moscow; ³Oryol Regional Clinical Hospital, Oryol, Russia

15.30-15.45

Analysis of blood proteins and formed elements by Raman spectroscopy Dmitry Artemyev¹, Valery Zakharov¹, Julia Khristoforova¹, Anastasia Lykina¹, Igor Davydkin², SSMU, Russia, Tatiana Kuzmina², ¹SSAU; ²SSMU, Samara, Russia

15.45-16.00

The reasons and consequences of changes in the THz response of diabetic blood plasma Maxim M. Nazarov, ILIT RAS, Russia Olga P. Cherkasova, Institute of Laser Physics of SB RAS, Novosibirsk, Russia

16.00-16.30

Coffee break

POSTER SESSION BIOPHYSICS

(Building 3, 3rd floor Hall)

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

17.30-19.30

- 1B. **An investigation of spectral characteristics of water-glucose solutions** Elena A. Lastovskaia, Elena V. Gorbunova, Aleksandr N. Chertov, Valery V. Korotaev, ITMO University, Saint Petersburg, Russia
- 2B. **Research of spectral characteristics of ubiquinone solution and explore of the solvent effect on the experimental results** Elvira Timofeeva, Elena Gorbunova, Valery Korotaev, ITMO University, Saint Petersburg, Russia
- 3B. **Modeling of structure and properties of thermo-optical converters for laser surgery** A.V. Belikov, A.V. Skrypnik, Vadim Y. Kurnyshev, V.O. Akulov, ITMO University, Saint Petersburg, Russia
- 4B. **Evaluation of biocompatibility of polycaprolactone/hydroxyapatite composite scaffolds by laser Doppler flowmetry** A.N. Ivanov^{1,2}, M.N. Kozadaev¹, Yu.E. Sal'kovskii³, Sergey I. Kireev^{2,3}, I.A.

Norkin^{1,2},¹Saratov Scientific Research Institute of Traumatology and Orthopedics;²Saratov State Medical University;³Saratov State University, Russia

- 5B. **Photodynamic impact induces production of nitric oxide in crayfish neurons and glial cells** Vera Kovaleva, Southern Federal University, Rostov-on-Don, Russia
- 6B. **Spectroscopic algorithms to estimate concentration of different groups of green sulfur bacteria within the community of phototrophic microorganisms** Anna A. Zhiltsova¹, A.V.Kharcheva¹, P.M.Norin², O.N. Isaeva³, S.V.Patsaeva¹, ¹Faculty of Physics, Lomonosov Moscow State University;²Faculty of Biology, Lomonosov Moscow State University;³Winogradsky Institute of Microbiology of RAS, Moscow, Russia
- 7B. **Model propagation of a femtosecond laser radiation in the vitreous of the human eye** Paul I. Rogov, Bupalov V.G, ITMO University, Saint Petersburg, Russia
- 8B. **Soft biological tissue deformation modeling for time-resolved diffuse optical tomography** Anton Yu. Potlov, T.I.Avsievich, S.V.Frolov, S.G.Proskurin, Tambov State Technical University, Russia
- 9B. **Skin neoplasms control by 457 nm laser stimulated autofluorescence** Kirill Shpunteko, Ivan Bratchenko, Samara State Aerospace University, Russia
- 10B. **Depth distribution of hydrogen sulfide and anoxygenic phototrophic bacteria in water bodies separating from the White sea** Anastasia V. Kharcheva¹, E.D. Krasnova^{2,3}, D.A. Voronov⁴, O.M. Gorshkova⁵, K.A. Chevel⁵, S.V. Patsaeva¹, ¹Faculty of Physics, Lomonosov Moscow State University;²Nikolai Pertsov White Sea Biological Station;³Faculty of Biology, Lomonosov Moscow State University;⁴Institute for Information Transmission Problems of RAS;⁵Faculty of Geography, Lomonosov Moscow State University, Moscow, Russia
- 11B. **Chlorophyll fluorescence spectra of beans grown under various light intensities** Olesya Kalmatskaya, Vladimir Karavaev, Faculty of Physics, Lomonosov Moscow State University, Russia
- 12B. **Influence of temporal noise on the skin blood flow measurements performed by cooled thermal imaging cameras: limit possibilities within each physiological frequency band** Andrey Sagaidachnyi, A.V. Fomin, A.V. Skripal, I.U. Volkov, Saratov State University, Russia
- 13B. **The effect of terahertz-modulated infrared irradiation on left ventricular function in langendorff-perfused isolated rat heart** Evgenii Liakhov¹, Sarkis Minasian^{1,2}, Egor Sedykh¹, Alexander Yurov¹, Egor Kornilov¹, Yury Nazarov¹, Michael Khodzitsky¹, Michael Galagudza^{1,2}, Dmitry Korolev^{1,2}, Alexander Kulagin¹, ¹ITMO University;²Almazov North-West Federal Medical Research Centre, Saint Petersburg, Russia
- 14B. **Study of electromechanical properties of cartilage under laser radiation** Ekaterina Kasianenko, Alexander Omelchenko Emil Sobol, ILIT RAS, Troitsk, Russia
- 15B. **Optical diagnosis of structural changes of costal cartilage under deformation and laser heating** Aleksey Yuzhakov, Ekaterina Kasyanenko, Olga Baum, Aleksandr Omelchenko, Emil Sobol, ILIT RAS, Troitsk, Russia
- 16B. **Photodynamic impact induces ischemic tolerance in models *in vivo* and *in vitro*** Svetlana Demyanenko, Svetlana Sharifulina, Elena Berezhnaya, Vera Kovaleva, Maria Neginskaya, Ludmila Zhukovskaya, Southern Federal University, Rostov-on-Don, Russia
- 17B. **Mechanism underlying stress-related mucosal damage: upper optical gastroscopy** Oxana Semyachkina-Glushkovskaya¹, Nikita Navolokin², Ilana Agranovich¹, Arkadii Abdurashitov¹, Valery Tuchin¹¹Saratov State University;²Saratov State Medical University, Russia
- 18B. **Diagnostics of anoxygenic phototrophic microorganisms in natural water reservoirs using spectral methods: depth distribution of differently pigmented bacteria and analysis of their habitat conditions** Anna A. Zhiltsova¹, Anastasiia V. Kharcheva¹, Elena D. Krasnova^{2,3}, Vladimir M. Gorlenko⁴, Olga N. Isaeva⁴, Aleksander S. Savvichev⁴, Svetlana V. Patsaeva¹, ¹Faculty of Physics, Lomonosov Moscow State University;²Pertsov White Sea Biological Station;³Faculty of Biology, Lomonosov Moscow State University;⁴Winogradsky Institute of Microbiology, RAS, Moscow, Russia
- 19B. **The pathological changes in arterial and venous cerebral circulation in hypertensive rats with stress-induced intracranial hemorrhage using DOCT** Sergey Sindeev, Oxana Semyachkina-Glushkovskaya, Ekaterina Zinchenko, Arkadii Abdurashitov, Valery Tuchin, Saratov State University, Russia
- 20B. **Stress-related pathological changes in cerebral venous blood flow in newborn rats assessed by DOCT** Oxana Semyachkina-Glushkovskaya, Maria Ulanova, Olga Sindeeva, Arkadii

Abdurashitov, Viktoria Razubaeva, Valery Tuchin, Saratov State University, Russia

- 21B. **The potential role of sulfonyleurea receptor 1 in development and therapy of neonatal hemorrhagic stroke** Artem Gekaluyk¹, Oxana Semyachkina-Glushkovskaya¹, Alexander Shirokov², Nikita Navalokin³, ¹Saratov State University; ²Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS; ³Saratov State Medical University, Russia
- 22B. **Optical monitoring of pathological changes in the cerebral vessels and tissues associated with stress-induced stroke in newborn rats** Ekaterina Zinchenko¹, Arkadii Abdurashitov¹, Oxana Semyachkina-Glushkovskaya¹, Alexander Shirokov², Nikita Navalokin³, Valery Tuchin¹, ¹Saratov State University; ²Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS; ³Saratov State Medical University, Russia
- 23B. **Diffuse reflectance spectral detection of stress-induced stomach ulcers in animal models** Ekaterina M. Zinchenko¹, Ilana M. Agranovich¹, Oksana V. Semyachkina-Glushkovskaya¹, Ekaterina G. Borisova², Latchezar A. Avramov², ¹Saratov State University, Russia, ²Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria (moved to Internet Session)
- 24B. **Learning features of the mechanism of collagen's interaction with collagenase in water solutions by fluorescence spectroscopy** Anna Sukneva, I.A. Sergeeva, V.B. Zaicev, K. Anenkova, A. Krot, Lomonosov Moscow State University, Russia
- 25B. **Improved detectability of microcirculatory dynamics by laser speckle imaging: effect of different power density** Dmitry D Postnov¹, O.V. Sosnovtseva¹, V.V. Tuchin², Copenhagen University, Denmark; ²Saratov State University, Russia
- 26B. **Digital diaphanoscopy of paranasal sinuses with image processing methods** Urszula Zabarylo¹, Viacheslav Artyushenko², Georgy Danielyan², Stefan Koss³, Katharina Stölzel³, Olaf Minet¹, ¹AG Medical Physics and Optical Diagnosis, Charité Universitätsmedizin; ²art photonics GmbH; ³Clinic for ENT, Charité Universitätsmedizin, Berlin, Germany
- 27B. **Optical diagnosis of rheumatoid diseases with image processing methods** Urszula Zabarylo¹, Isabella Amitai², Bernd Schicke³, Marina Backhaus², Viacheslav Artyushenko⁴, Olaf Minet¹, ¹AG Medical Physics and Optical Diagnosis, Charité Universitätsmedizin; ²Department of Rheumatology and Clinical Immunology, Charité Universitätsmedizin; ³Tumorzentrum Berlin; ⁴art photonics GmbH, Berlin, Germany
- 28B. **Evaluation of red blood cells deformability of newborn mice** Anton A. Namykin, I.V. Fedosov, O.V. Semyachkina-Glushkovskaya, V.V. Tuchin, Saratov State University, Saratov, Russia
- 29B. **Terahertz spectroscopic analysis in multiple myeloma** Polina B. Bunina¹, O.A. Smolyanskaya¹, O.V. Kravtsenyuk¹, L.V. Plotnikova¹, M.V. Uspenskaya¹, S.V. Voloshin², A.D. Garifullin², N.S. Balbekin¹, M.K. Khodzitskiy¹, A.M. Polyanichko³, ¹ITMO University; ²Russian Scientific Research Institute of Hematology and Transfusion; ³Saint-Petersburg State University, Russia
- 30B. **Influence of neurotransmitters GABA and glutamate to responses of neurons and glial cells of crayfish on photodynamic damage of radachlorin** Maria Neginskaya, Elena Berezhnaya, Anatoly Uzdensky, Academy of Biology and Biotechnology SFU, Rostov-on-Don, Russia
- 31B. **Monitoring of blood proteins concentration by Raman spectroscopy method** Anastasia A. Lykina¹, Dmitry N. Artemyev¹, Valery P. Zakharov¹, Julia A. Khristoforova¹, Igor L. Davydkin², Tatiana P. Kuzmina², ¹Samara State Aerospace University; ²Samara State Medical University, Russia
- 32B. **Optical researches for cyanobacteria bloom monitoring in Curonian lagoon** Olga V. Proskurina, E.A. Shirshin, G.S. Budylin, B.P. Yakimov, V.V. Fadeev, Department of Physics, M.V. Lomonosov Moscow State University, Russia
- 33B. **Spectral holographic imaging of transparent objects in the visible range based on acousto-optic filtration of wideband light** Alexander Machikhin, Olga Polschikova, Alina Ramazanova, Vitold Pozhar, Scientific and Technological Center of Unique Instrumentation of RAS, Moscow, Russia
- 34B. **The control of optical and physiological properties of the human skin in vivo with use of external mechanical compression: effect of the size of the compression** Inara A. Nakhaeva¹, Ol'ga A. Zyuryukina¹, Yury P. Sinichkin^{1,2}, ¹Saratov State University; ²Tomsk State University, Russia
- 35B. **Single-sensor methane gas detector** Andrey Konyukhov, Alexander Plastun, Saratov State University, Russia
- 36B. **Changes of erythrocytes membranes mechanical strength and its permeability under the influence of plant extracts** Natalie V. Tkachenko¹, Alexander B. Pravdin¹, Alexander A. Serov¹, Nikita A. Navalokin², Natalia V. Polukonova², Alla B. Bucharskaya², ¹Saratov State

- University;²Saratov State Medical University, Russia
- 37B. **Comparison of membrane-protective activity of antioxidants quercetine and Gratiola Officinalis L. extract** Natalie V. Tkachenko¹, Alexander B. Pravdin¹, Ekaterina V. Narzyaeva¹, Nikita A. Navolokin², Natalia V. Polukonova², Alla B. Bucharskaya², ¹Saratov State University;²Saratov State Medical University, Russia
- 38B. **Temperature dependence of red blood cells interaction at reversible doublet formation in autologous plasma** Kisung Lee^{1,2}, Anna V. Danilina¹, Matti Kinnunen², Anton V. Potkin¹, Alexander V. Priezzhev^{1,3}, Igor Meglinski², ¹Department of Physics, Lomonosov Moscow State University, Russia;²Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Finland;³International Laser Center, Lomonosov Moscow State University, Russia
- 39B. **On the influence of optical clearing on collagen crosslinking of sclera** Marina Shvachkina, Alexander Pravdin, Saratov State University, Russia
- 40B. **Excitation-wavelength dependent fluorescence quantum yield of chromophoric dissolved organic matter (CDOM) from fresh-water and marine sources** Daria A. Khundzhua¹, Anastasiia V. Kharcheva¹, Olga E. Trubetskaya², Oleg A. Trubetskoj³, Viktor I. Yuzhakov¹, Svetlana V. Patsaeva¹, ¹Faculty of Physics, Lomonosov Moscow State University;²Branch of Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry of RAS;³Institute of Basic Biological Problems of RAS, Pushchino, Moscow region, Russia
- 41B. **The tensile strength characteristics study of the laser welds of biological tissue using the solder based on MWCNTS** Dmitry Ryabkin, Irina Rimshan, Alexander Gerasimenko, National Research University of Electronic Technology, Zelenograd, Russia
- 42B. **Concentration dependence of glycerol diffusion coefficient in skin tissue** Vadim D. Genin¹, Alexey N. Bashkatov^{1,2}, Elina A. Genina^{1,2}, Darya K. Tuchina¹, Sadeq Ali Jafar¹, Valery V. Tuchin^{1,2}, ¹Saratov State University;²Tomsk State University, Russia
- 43B. **Real-time enzymatic biodegradation of collagen molecules monitored by dynamic light scattering method** Ksenia A. Anenkova, Irina A. Sergeeva, Galina P. Petrova, Anastasia V. Shlenskaya, Anna V. Sukneva, Moscow State University, Russia
- 44B. **Mathematical modeling of nonlinear diffusion of optical clearing agents in biotissues** Mikhail Stolnitz, Saratov State University, Russia
- 45B. **Quantification of absolute blood velocity using LDA** Maria Borozdova, Ivan Fedosov, Tuchin Valery, Saratov State University, Russia
- 46B. **Peculiarities of interection of gamma-globulin and FECL3** Maria Riabchikova, V. Gibizova, G. Petrova, Faculty of Physics, Lomonosov Moscow State University, Russia
- 47B. **On the local and averaged temperature photoinduced by nanoparticles in the medium** Yury A. Avetisyan^{1,2}, A.A. Bykov², A.N. Yakunin^{1,2}, V.V. Tuchin^{1,2,3}, ¹Institute of Precise Mechanics and Control of RAS;²Saratov State University;³Tomsk State University, Russia
- 48B. **Optical clearing effects investigation of Omnipaque solution on porcine skin** Anton Sdobnov¹, Valery Tuchin¹, Maxim Darwin², ¹Saratov State University, Russia;²Charite-Universitaetsmedizin Berlin, Germany
- 49B. **Identification and counting of blood cells based on digital microscopy method** Valery A. Doubrovski, I.V. Zabenkov, S.O. Torbin, Saratov State Medical University, Russia
- 50B. **A comparison of applicability of anti-A and anti-B monoclonal antibodies (Tsoliclones) and standard heamoagglutinating sera for erythrocyte agglutination reaction registration in vitro by acousto-optical method** Valery A. Doubrovski, Maria F. Medvedeva, Saratov State Medical University, Russia
- 51B. **Investigation of erythrocytes sedimentation rate dependence on their concentration by digital photo-images analysis** Maria F. Medvedeva, V.A. Doubrovski, K.N. Dvoretzki, Saratov State Medical University, Russia
- 52B. **OCT study of optical clearing kinetics of human epidermis and dermis in vivo** Polina A. Timoshina¹, D.K. Tuchina¹, O.A. Zyuryukina¹, A.N. Bashkatov^{1,2}, E.A. Genina^{1,2}, V.V. Tuchin^{1,2,3}, ¹Research-Educational Institute of Optics and Biophotonics, Saratov State University;²Interdisciplinary Laboratory of Biophotonics, Tomsk State University;³Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of Precise Mechanics and Control RAS, Saratov, Russia
- 53B. **The temperature dependence of refractive index of hemoglobin on the wavelengths 930 and 1100 nm** Ekaterina N. Lazareva¹, Valery V. Tuchin^{1,2,3}, ¹Research Educational Institute of Optics & Biophotonics, Saratov State University; Interdisciplinary Laboratory of Biophotonics, Tomsk State University;³Laboratory of Laser Diagnostics of

Technical and Living Systems, Institute of Precise Mechanics and Control of RAS, Saratov, Russia

- 54B. **In vivo spectral study of kinetics of optical properties of human skin at optical clearing** Elizaveta Basko¹, Anastasia Evstigneeva¹, Tatyana Kashina¹, Maxim Malovetsky¹, Daria K. Tuchina¹, Polina A. Timoshina¹, Alexey N. Bashkatov^{1,2}, Elina A. Genina^{1,2}, Valery V. Tuchin¹⁻³, ¹Research-Educational Institute of Optics and Biophotonics, Saratov State University; ²Interdisciplinary Laboratory of Biophotonics, Tomsk State University; ³Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of Precise Mechanics and Control RAS, Saratov, Russia
- 55B. **Investigation of travatan-benzalkonium-chlorid and travatan-polyquaternium-1 diffusion through rabbit eye cornea** Natalia D. Nechaeva¹, Alexey N. Bashkatov^{1,2}, Ilya S. Evseev³, Elina A. Genina^{1,2}, Tatyana G. Kamenskikh², Valery V. Tuchin^{1,2}, ¹Saratov State University; ²Tomsk State University; ³Saratov State Medical University, Russia
- 56B. **Follicular delivery of nanoparticles and microcontainers ex vivo and in vivo** Sergey Zaitsev¹, Natalia Ksenofontova¹, Yulia I. Svenskaya¹, Olga Guslyakova¹, Elina A. Genina^{1,2}, Vsevolod Atkin¹, Georgy S. Terentyuk¹, Alexey N. Bashkatov^{1,2}, Dmitry A. Gorin¹, Valery V. Tuchin^{1,2}, Gleb B. Sukhorukov^{1,3}, ¹Saratov State University; ²Tomsk State University, Russia; ³Queen Mary, University of London, UK
- 57B. **Microparticles investigation using digital holographic methods** Denis Kamenev, Tomsk State University, Russia
- 58B. **Obtaining of polyelectrolyte microcapsules on the basis of template cores with the subsequent modification of fluorescent nanoparticles** Artem Bakal, A.M. Vostrikova, I.Yu. Goryacheva, Saratov State University, Russia
- 59B. **Submersible digital holographic module for investigation of plankton** Alexey Olshukov, V. Dyomin, I. Polovcev, D. Kamenev, Alena Kozlova, S. Zuev, Tomsk State University, Russia

September 25, Friday

**JOINTINVITED LECTURE/ORAL SESSION
BIOPHYSICS III/ PALS VIII**

(Building 10, Main Conference Hall)

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

11.30-11.50

Invited

The regularizing functional minimization based reconstruction of tissue scattering inhomogeneities from time-resolved optical projections Alexander B. Konovalov, Russian Federal Nuclear Center - Zababakhin Institute of Applied Physics, Russia Vitaly V. Vlasov, Russian Federal Nuclear Center - Zababakhin Institute of Applied Physics, Russia

11.50-12.10

Invited

A robust method of strain mapping in compressional optical coherence elastography using combined sub-wavelength phase-resolved measurements and pixel-scale displacement tracking Vladimir Y. Zaitsev¹, Alexander L. Matveyev¹, Lev A. Matveyev¹, Grigory V. Gelikonov¹, Ekaterina V. Gubar'kova², Natalia D. Gladkova², Alex Vitkin³, ¹Institute of Applied Physics RAS; ²Medical Academy of Nizhny Novgorod, Russia; ³University of Toronto, Canada

12.10-12.30

Invited (PALS)

Mechanisms of tissue optical immersion clearing Elina A. Genina, Alexey N. Bashkatov, Valery V. Tuchin, Saratov State University, Tomsk State University, Russia

12.30-12.45

Neoplasms treatment by diode laser with and without real time temperature control on operation zone A.V. Belikov¹, M.L. Gelfond², Ksenia V. Shatilova¹, S.A. Sosenkova¹, A.A.Lazareva¹, ¹ITMO University, Saint Petersburg; ²N.N. Petrov Scientific Research Institute of Oncology, Russia

12.45-13.00

Study of human skin neoplasms with autofluorescence method in NIR region Julia A. Khristoforova, Valery P. Zakharov, Ivan A. Bratchenko, Dmitriy N. Artemev, Samara State Aerospace University, Russia

Conference on Laser Physics and Photonics XVII

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

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

International Program Committee **Vladimir L. Derbov (Chair)**, Saratov State University (Russia), **Alexander P. Kuznetsov**, Saratov Division of Institute of Radio-Engineering of RAS (Russia), **Leonid A. Melnikov**, Saratov State University (Russia), **Marian Marciniak**, National Institute of Telecommunications (Poland), **Alexander P. Nizovtsev**, Institute of Physics of NASB (Belarus), **Aleksey M. Zheltikov**, Lomonosov Moscow State University (Russia), **Vladimir P. Ryabukho**, Saratov State University, IPM&C RAS (Russia), **Alexander V. Gorokhov**, Samara State University (Russia), **Yuri V. Popov**, Lomonosov Moscow State University (Russia), **Bogos B. Joulakian**, University of Metz (France), **Sergue I. Vinitsky** (Joint Institute for Nuclear Research, Dubna, Russia)

September 24, Thursday

INVITED LECTURE/ORAL SESSION I (Building 10, Hall 503)

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

14.00-14.30

Invited

Electron scattering and diffraction by atoms and molecules in ultrashort intense laser fields

Kaoru Yamanouchi, The University of Tokyo, Japan

14.30-14.45

Laser-induced CdS nanoparticles in polymer matrices

Anton Smirnov¹, Andrey Afanasiev¹, Nickolay Ermolaev¹, Nadezhda Agareva¹, Vladimir Bredikhin¹, Alexander Pikulin¹, Natalia Sapogova¹, Larissa Smirnova², Evgeniya Salomatina², Irina Glazova², Nikita Bityurin¹;
¹Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia; ²Nizhniy Novgorod State University, Nizhniy Novgorod, Russia

14.45-15.00

Distortion of THz substance spectrum by transparent disordered cover

Dmitry Zagursky, V.A. Trofimov, I.G. Zakharova, Lomonosov Moscow State University, Russia

15.00-15.15

Relaxation of a three-level atom interacting with a thermostat and an external stochastic field

Victor Mikhailov, Nikolay Troshkin, Samara State Aerospace University, Russia

15.15-15.30

The Fokker-Planck equation for relaxation of a system of two dipole-dipole interacting atoms

Victor Mikhailov¹, Nikolay Troshkin¹, Anton Trunin²; ¹Samara State Aerospace University, Russia; ²BLTP, JINR, Russia

15.30-15.45

Birefringence effects in short probe pulse electromagnetically induced transparency

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

15.45-16.00

Control atomic entanglement by the initial atomic coherence

Eugene Bashkirov, Mastyugin Michail, Samara State University, Russia

16.00-16.30

Coffee break

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

Chair (LP): **Sergey V. Zar'kov**, Saratov State University, Russia

17.30-19.30

- LP1. **Polarizing properties of single-wall carbon nanotubes (SWCNT) ensembles – new approaches to calculations** Inna Plastun, Andrey Bokarev, Saratov State Technical University, Russia.
- LP2. **Measurement of nonlinear susceptibility in third-harmonic generation experiments** Sergey V. Zarkov, Andrey I. Konyukhov, Saratov State University, Russia
- LP3. **Dynamics of spin waves in laterally-bound ferrite structure by means of Brillouin spectroscopy** Sergey Odintsov, Andrey

- Grachev, Alexander Sadovnikov, Saratov State University, Russia
- LP4. **Propagation of EMSW in bound multiferroic structures using Brillouin spectroscopy** Andrey Grachev, Sergey Odintsov, Alexander Sadovnikov, Saratov State University, Russia
- LP5. **Reflection and transmission on the finite-thickness sic-graphene slab of hyperbolic medium and the threshold conditions for THz generation** Olga Kozina¹, Leonid Melnikov², A.S. Zotkina², ¹Saratov Branch of the Kotelnikov Institute of Radio-Engineering and Electronics Electronics of RAS; ²Saratov State Technical University, Russia
- LP6. **Application of laser operations to analysis of contamination of metal fence** Elena Surmenko, Ivan Popov, Dmitry Bessonov, Tatiana Sokolova, Saratov State Technical University, Russia
- LP7. **Application of numerical post-processing to correct phase shift for scattering object micro-inclination and translation in digital holographic interferometry** Sergey A. Savonin¹, Vladimir P. Ryabukho², ¹Educational-Research Institute of Nanostructures and Biosystems, Saratov State University; ²Saratov State University, Institute of Precision Mechanics and Control of RAS, Saratov, Russia
- LP8. **Computer modeling of optical microresonators made of highly non-linear glass** Daniil Zhivotkov, Elena Romanova, Saratov State University, Russia
- LP9. **Dynamics of long ring fiber Raman laser** Sergey Sukhanov, Leonid Melnikov, Yulia Mazhirina, Saratov State Technical University, Russia
- LP10. **Entanglement between qubits interacting with thermal field** Michail Mastuyugin, Eugene Bashkirov, Samara State University, Russia
- LP11. **Dynamics of three qubits interacting with lossless cavity** Ekaterina Averchenko, Eugene Bashkirov, Michail Mastuyugin, Samara State University, Russia
- LP12. **Laser-assisted singly and doubly ionizing electron-helium collisions at high impact energy and large momentum transfer** Andrew Bulychev¹, Konstantin A. Kouzakov², ¹Joint Institute for Nuclear Research, Russia; ²Department of Nuclear Physics and Quantum Theory of Collisions, Faculty of Physics, Lomonosov Moscow State University, Russia
- LP13. **Design of narrow band-stops in transmission spectrum of solid-core photonic bandgap fibre** Andrey I. Konyukhov, Alexander S. Plastun, Sergey V. Zar'kov, Saratov State University, Russia
- LP14. **The shortening of the laser pulses in a medium with reverse saturable absorption** Vladislav Gribkov, Rimma Zatrudina, VolGU, Russia
- LP15. **Controlled soliton transformations in dispersion oscillating fiber** Andrey I. Konyukhov¹, Marta A. Dorokhova², ¹Saratov State University; ²Saratov State Technical University, Russia
- LP16. **Evanescence wave sensors for mid-infrared spectroscopy** Svetlana V. Korsakova, Elena A. Romanova, Saratov State University, Russia
- LP17. **Nonlinear optical response and charge carriers kinetics in arsenic trisulfide illuminated by an ultra-short laser pulse** N.A. Fedyukina, E.A. Romanova, Saratov State University, Russia
- LP18. **Optimization of the optical scheme for non-linear constants measurement by Z-scan method** Ilya I. Ovchinnikov, Elena A. Romanova, Saratov State University, Russia
- LP19. **Non-linear dynamics of a ring fiber laser** Vadim Razukov, Leonid A. Melnikov, Saratov State Technical University, Russia
- LP20. **Correlation processing of spatial spectrum of specklegram in digital speckle photography** Ludmila L. Maksimova¹, Peter V. Ryabukho², Natalia Yu. Mysina¹, Vladimir P. Ryabukho¹, ¹Institute of Precision Mechanics and Control, RAS, Saratov, Russia; ²Saratov State University, Russia
- LP21. **Elongate optical bottle beam generated by composite binary axicons** Alexey Porfirev¹, Roman Skidanov², ¹Samara State Aerospace University, Samara, Russia; ²Image Processing Systems Institute of the Russian Academy of Sciences, Samara, Russia
- LP22. **Coherent response of multilayer graphene systems to laser radiation: nonlinear effects and many electron correlations** Anahit Djotyan, Artak Avetisyan, Yerevan State University, Armenia
- LP23. **Definition of temperature deformation fields of electronic device blocks by digital holographic interferometry** P.V. Ryabukho¹, S.A. Savonin¹, A.N. Yakunin², O.A. Shaposhnikov³, V.P. Ryabukho^{1,3}, ¹Saratov State University, Russia; ²Institute of

Precision Mechanics and Control, RAS, Russia; ³SPC "Almaz-Fazotron", Russia

Popov, A.N. Litvinov, Peter the Great St.Petersburg Polytechnic University, Russia

LP24. **Measurement of fluid flow using optical fiber sensor of fluid flow** Elena Shachneva¹, Tatiana Murashkina, ¹Penz GTU, Russia, ²PGU, Russia

LP33. **Analysis of plasmons and homogenization in a flat-layered photonic crystals and hyperbolic metamaterials** Michael Davidovich, Saratov State University, Russia

LP25. **Digital holography interferometry of plates deformation under the influence of the concentrated and distributed forces** Bogdan A. Grizbil¹, Vladimir P. Ryabukho^{1,2}, ¹Saratov State University, Russia; ²Institute of Precision Mechanics and Control, RAS, Russia

LP34. **Glauber p-function in model of single-atom laser generating in strong coupling regime** Evgenij Popov, Nikolay Larionov, Saint-Petersburg Polytechnic University, Russia

LP26. **Behaviour of asymmetric bessel beam in focal plane of high numerical aperture objective** Sergey S. Stafeev¹, Victor V. Kotlyar¹, Alexey P. Porfirev², ¹Image Processing Systems Institute, Russia; ²Samara State Aerospace University, Samara, Russia

LP27. **Special focusing of optical fields with axicons** Sergey Degtyarev¹, Svetlana Khonina², ¹Samara State Aerospace University, Samara, Russia; ²Image Processing Systems Institute, Russia

LP28. **The polarization-optical measuring method of linearity of radiant-power characteristic of the laser emission photodetectors** M.S. Baranov, V.N. Khramov, R.A. Chebanenko, Volgograd State University, Volgograd, Russia

LP29. **Propagation of the electromagnetic wave with angular momentum in a turbulent medium** Sergey Burlov, Alexander Gorokhov, Samara State University, Russia

LP30. **Interaction of a hydrogen like atom with circularly polarized electromagnetic field** Alexander Gorokhov, Sergey Burlov, Samara State University, Russia

LP31. **On calculations of two-electron atoms in spheroidal coordinates mapping on hypersphere** Sergue Vinitzky¹, A.A. Gusev¹, O. Chuluunbaatar¹, V.L. Derbov², A.S. Zotkina³, ¹Joint Institute for Nuclear Research, Dubna, Russia; ²Saratov State Technical University, Saratov, Russia; ³Saratov State Technical University, Saratov, Russia

LP32. **Controlled propagation of laser pulse in the medium with a closed excitation contour** Konstantin A. Barantsev, E.N.

INTERNET REPORTS

1. **Induced phenomena by all-optical poling** Vitaly A. Smirnov, Liubov I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculty of Information and Technologies of NSUEM, Russia

2. **Green light optical micro-sources** Vitaly A. Smirnov, Liubov I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculty of Information and Technologies of NSUEM, Russia

3. **Raman-Nath scattering in induced gratings** Vitaly A. Smirnov, Liubov I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculty of Information and Technologies of NSUEM, Russia

4. **Generation of harmonic in susceptibility gratings** Vitaly A. Smirnov, Liubov I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculty of Information and Technologies of NSUEM, Russia

5. **All-optical poling for creation of new nonlinear optical materials** Vitaly A. Smirnov, Liubov I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculty of Information and Technologies of NSUEM, Russia

Alexander Gorokhov, Samara State University, Russia

September 25, Friday

INVITED LECTURE/ORAL SESSION II

(Building 10, Hall 503)

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

11.30-11.50

Invited

High purity chalcogenide glasses and fibers for the 3-15 μm infrared range

Vladimir Shiryaev, G.G.Devyatykh, Institute of Chemistry of High-Purity Substances of the Russian Academy of Sciences, Russia

11.50 – 12.00

The path integral approach and coherent dynamics for some quantum optomechanical models

Alexander Gorokhov, Samara State University, Russia

12.00 – 12.10

Calculation of the maximum Lyapunov coefficient for the coherent dynamics of three-level atoms in an ideal cavity Sergey Agapov, Alexander Gorokhov, Samara State University, Russia

12.10 – 12.20

V.A. Fock's discovery of "hidden" $O(4)$ symmetry of the H-atom and dynamical groups in quantum physics

12.20 – 12.30

Selective excitation of diatomic molecules by laser pulses Alexander Biryukov, Mark Shleenkov, Samara State University, Russia

12.30–12.40

Laser control of two qubits entanglement

Mark Shleenkov, Alexander Biryukov, Samara State University, Russia

12.40–12.50

Evidence of fragment ejection symmetry breaking in dissociative photoionization of H_2

Vladislav Serov, Saratov State University, Russia

12.50–13.00

Super-resolution optical imaging and spectroscopy by scanning optical nano-antennas

Pavel Dorozhkin, Artyom Shelaev, Igor Arkov, Eugenii Kuznetsov, Sergey Timofeev, Victor Bykov, NT-MDT Co, Zelenograd Moscow, Russia

Conference on Spectroscopy and Molecular Modeling XVI

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

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

International Program Committee **Lev M. Babkov**, Saratov State University (Russia), **Michael D. Elkin**, Saratov State Technical University Saratov (Russia), **Lev A. Gribov**, Institute named by V. I. 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 24, Thursday

POSTER SESSION SPECTROSCOPY

(Building 3, 3rd floor Hall)

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

17.30-19.30

- 1S. **UV laser-induced fluorescence spectroscopy and laser-doppler flowmetry in the diagnostics of alopecia** Diana P. Skomorokha, Y. N. Pigareva, V. V. Salmin, Krasnoyarsk State Medical University named after Prof. V. F. Voino-Yasenetsky, Russia
- 2S. **Monitoring of manganese and copper in the waters by Raman spectroscopy** Elena V. Timchenko, P. E. Timchenko, N. V. Tregub, A. A. Asadova, SSAU, Russia
- 3S. **The role of Fermi and Darling-Dennison resonances in formation of water Raman spectrum** Ivan V. Plastinin, S. A. Burikov, T. A. Dolenko. MSU, Department of Physics, Russia
- 4S. **Modeling and interpretation of vibrational spectra of polymorphic modifications of salol** Lev Babkov, I. Ivlieva, Saratov State University, Russia, N. Davydova, National Academy of Science, Kiev, Ukraine
- 5S. **Molecular modeling of the structural and dynamical properties of 1,2- and 1,4-dihydroxy-9,10-anthraquinones (alizarin and quinizarin)** Kirill V. Berezin, Saratov State University, Russia, V. V. Nechaev, Saratov State Technical University, Russia, A. M. Lihter, D. D. Kochergina, T. A. Egorenkova, E. M. Antonova, Astrahan State University, Russia
- 6S. **Quantum chemical calculations of structure and vibrational spectra of aza-9,10-anthraquinones** Kirill V. Berezin, Saratov State University, Russia, V. V. Nechaev, Saratov State Technical University, Russia, A. M. Lihter, D. D. Kochergina, T. A. Egorenkova, E. M. Antonova, Astrahan State University, Russia
- 7S. **Calculation by DFT method and interpretation of vibrational spectra of 3-bromobenzophenone** Lev M. Babkov, V. A. Boykov, Saratov State University, Russia, N. A. Davydova, Institute of Physic of National Academy of Ukraine, Kiev, Ukraine
- 8S. **Structural and dynamic models of monogaloidosubstituted six-membered cyclic compounds and interpretation of their spectra of fundamental vibration** Mihail D. Elkin, Saratov State Technical University, Russia, V. F. Pulin, Saratov State Agrarian University, Russia, L. M. Babkov, Saratov State University, Russia
- 9S. **Mapping of industrial organizations to identify with heavy metals by Raman spectroscopy** Ekaterina A. Selezneva, E. V. Timchenko, P. E. Timchenko, N. V. Tregub, SSAU, Russia

September 25, Friday

ORAL SESSION

(Building 3, Room 34)

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

9.00–9.10

Structure, vibrational states and thermodynamic parameters for complexes of metallophorbide with imidasole

Maria L. Chernavina, K. V. Berezin, Saratov State University, Russia, V. V. Nechaev, Saratov State Technical University, Russia

9.10 – 9.20

Thermodynamic analysis of hydrogen bonding in complementary DNA base pairs

Kirill V. Berezin, Saratov State University, Russia, V. V. Nechaev, E. A. Piskunova, Saratov State Technical University, Russia, A. M. Lihter, D. D. Kochergina, T. A. Egorenkova, I. T. Shagautdinova, E. M. Antonova, Astrahan State University, Russia

9.20–9.30

Structure and thermodynamics for the van der Waals complexes of benzene - rare gas

Andrey V. Kozlov, K. V. Berezin, Saratov State University, Russia, V. V. Nechaev, Saratov State Technical University, Russia

9.30–9.40

Vibrational spectra of the redox-active sites in PSII photosynthetic reaction center: A computational study

Vladimir V. Nechaev, Saratov State Technical University, Russia, O. V. Kozlov, K. V. Berezin, Saratov State University, Russia

9.40 – 9.50

Triphenylphosphite structure and IR spectrum modeling using density functional method

Lev M. Babkov, I. V. Ivlieva, Saratov State University, Russia, N. A. Davydova, Institute of Physics of National Academy of Ukraine, Kiev, Ukraine

9.50 – 10.00

Calculation and interpretation of electron-vibrational absorption spectrum of the first $n\pi^*$ electronic transition of pyrazine

Galina N. Ten, M. K. Berezin, E. M. Slepchenkova, Saratov State University, Russia

10.00 -10.10

The influence of water on the fluorescence spectra of tryptophan

Galina N. Ten, E. M. Slepchenkova, N. E. Scherbakova, Saratov State University, Russia

10.10 – 10.20

The vibronic spectra of GFP chromophore
Galina N. Ten, N. E. Scherbakova, E.M. Slepchenkova, Saratov State University, Russia

10.20 – 10.30

Structure and electron-vibrational spectra of purine tautomers

Galina N. Ten, E. M. Slepchenkova, Saratov State University, Russia

10.30 – 10.40

The influence of boron doped nanodiamonds on hydrogen bonds in suspensions of proton solvents

Alexey M. Verval, T. A. Dolenko, Physical Department of M. V. Lomonosov Moscow State University E. A. Ekimov, Institute of High Pressure Physics of Russian Academy of Sciences O. S. Kudryavtsev, I. I. Vlasov, A. M. Prokhorov General Physics Institute of RAS, Moscow, Russia

10.40 – 10.50

Luminescence quantum yield and lifetimes of rare earth complexes with ligands of the pyridine type (moved to Post Deadline Poster Session)

Anastasia V. Kharcheva, S. V. Patsaeva, Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia, N. E. Borisova, A. V. Ivanov, Faculty of Chemistry, Lomonosov Moscow State University, Russia

10.40-10.50

Logarithmic in the mass ratio contributions to the fine shift of S energy levels in hydrogen-like atoms

S. V. Churochkina, A. Udalova, Saratov State University, Russia

10.50-11.00

Investigation of long-chain compounds optical properties on the example of single-wall carbon nanotubes (SWCNT) with different configurations

A. Bokarev, I. Plastun, Y. Gagarin State Technical University of Saratov, Russian Federation

11.00-11.10

Fine shift calculation method in exotic atoms

N. Boykova, Saratov State University, Russia

11.10-11.20

Superfine splitting in quasipotential approach

O. A. Boykova, N. A. Boykova, Saratov State University, Russia

Conference on Nanobiophotonics XI / PALS'15

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

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

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

September 24, Thursday

JOINT INVITED/ORAL SESSION NANOBIOPHOTONICS II/ PALS III (Building 10, Main Conference Hall)

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

10.00 – 10.20

Invited

Laser-induced semiconductor nano-microstructures with controlled topology: functional properties and verification of macroscopic quantum effects in thin-film and cluster Sergey Arakelian¹, A.Kucherik¹, S.Kutrovskaya¹, D.Nogtev¹, A. Osipov¹, T.Vartanyan², S.Zimin³, ¹Vladimir State University named after A.G. and N.G. Stoletovs, Vladimir, Russia; ²St. Petersburg National Research University of Information Technologies, Mechanics and Optics, St. Petersburg, Russia; ³P.G. Demidov Yaroslavl State University, Yaroslavl, Russia

10.20 – 10.40

Invited

Super-resolution optical imaging and spectroscopy by scanning optical nano-antennas Pavel Dorozhkin, A. Shelaev, I. Arkov, E. Kuznetsov, S. Timofeev, V. Bykov, NT-MDT Co., Russia

10.40 – 10.55

Investigation of cell proliferative activity on the surface of the nanocomposite material produced by laser radiation Alexander Gerasimenko, U. Kurilova, N. Zhurbina, National Research University "MIET", Zelenograd, Russia

11.00-11.30

Coffee break

JOINT INVITED/ORAL SESSION NANOBIOPHOTONICS II/ PALS IV (Building 10, Main Conference Hall)

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

11.30 – 11.50 Invited

Application of atomic layer deposition in polymer based nanophotonic devices Seppo Honkanen¹, M. Kuittinen¹, J. Saarinen¹, M. Roussey¹, R. Saleem², P. Stenberg¹, L. Ahmadi¹, R. Ali¹, ¹ Institute of Photonics, University of Eastern Finland, Joensuu, Finland; ² National University of Sciences and Technology (NUST), Islamabad, Pakistan

11.50-12.10

Invited

Generation of electromagnetic radiation in nano-structural matter Alexander Shkurinov, Moscow State University, Moscow, Russia

12.10 – 12.25

Efficient up-conversion phosphors on the basis of fluorides for photonics Sergey V. Kuznetsov¹, D.S. Yasyarkina¹, Y.A. Rozhnova¹, A.V. Ryabova¹, D.V. Pominova¹, A.A. Luginina^{1,2}, M.N. Mayakova¹, V.V. Voronov¹, A.E. Baranchikov³, V.K. Ivanov³, P.P. Fedorov¹, ¹ - Prokhorov General Physics Institute of Russian Academy of Sciences, Russia ² - All-Russian Institute of Scientific and Technical Information, Russian Academy of Sciences, Russia ³ - Kurnakov Institute of General and Inorganic Chemistry of Russian Academy of Sciences, Russia

12.25 – 12.40

Up-conversion nanoparticles surface modification with photosensitizer molecules or gold nanoparticles for biomedical applications Daria Pominova, A.V. Ryabova, S.V. Kuznetsov, J.A. Rozhnova, A.M. Prokhorov General Physics Institute of the Russian Academy of Sciences, Russia

12.40 – 12.55

Mechanisms of adsorption of nitrogenous bases on the surface of nanodiamonds Ekaterina Khusainova, K. Laptinskiy, Faculty of physics, MSU, Russia

12.55 – 13.10

The laser-ablative synthesis and the spectral-optical diagnostic of the ruby nanoparticles M.S. Baranov, A.A. Bardina, V.N. Khramov, Volgograd State University, Volgograd, Russia

13.00-14.00

Lunch

**JOINT INVITED/ORAL SESSION
NANOBIOPHOTONICS III**

(Building 8, Room 3)

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

14.00 – 14.15

Comparative study on effectiveness of anticancer drugs conjugated with colloidal gold and phosphate dextran Artur Yu. Prilepskiy¹, V.A. Bogatyrev¹, A.A. Kladiyev² ¹Institute of Biochemistry and Physiology of Plants and Microorganisms RAS; ²BelarusianStateUniversity

14.15 – 14.30

A new synthetic approach to fine-tuning the wavelength of the gold nanorods' plasmon resonance, Sergey Semyonov, V. Rudoy, A.N. Frumkin Institute of Physical Chemistry and Electrochemistry, RussianAcademy of Sciences, Russian Federation;

14.30 – 14.45

Gold nanoparticles as PCR enhancers: Putative mechanisms study and biomedical applications Timofey Pylaev, E. Vanzha, IBPPM RAS, Saratov, Russia; N. G. Khlebtsov IBPPM RAS, Saratov State University, Saratov, Russia;

14.45 – 15.00

Formation of functional calcium carbonate coatings on polymeric fibers for biomedical applications Marya Savelyeva, G. Lyubun, V. Atkin, I. Kozhevnikov, Saratov State University, Russia; G. Sukhorukov, Queen Mary University of London, UK; D. Gorin, Saratov State University, Russia; B. Parakhonskiy, A.V. Shubnikov Institute of Crystallography RAS, Russia

15.00 – 15.15

Optical properties of monodisperse gold nanoshells Vitaly Khanadeev, B. Khlebtsov, N. Khlebtsov, Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS, Saratov State University, Russia

15.15 – 15.30

Microcapsules based on carbon nanotubes and gold nanoparticles as multimodal photoacoustic

and SERS platform Alexey Yashchenok, Remote Controlled Theranostic Systems Lab, Institute of Nanostructures and Biosystem, Saratov State University, Russia; G. Sukhorukov, Queen Mary University of London, London, UK; D. Gorin, Institute of Nanostructures and Biosystem, Saratov, Saratov State University, Russia

15.30 – 15.45

Porous calcium carbonate submicron particles for the photosensitizer encapsulation Yulia Svenskaya, D. Gorin, B. Parakhonskiy, SaratovStateUniversity, Saratov, Russia; G. Sukhorukov, Queen Mary, University of London, London, UK;

15.45 – 16.00

Analyzing Raman spectra from the first principles Daniil Bratashov, Saratov State University, Russia;

16.00-16.30

Coffee break

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

(Building 3, 3rd floor Hall)

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

17.30 – 19.30

- 1N. Colorimetric evaluation of nanomaterial toxicity on the basis of viability of the microalga *dunaliella salina*** Alexander Golubev, A. Prilepskiy, V. Bogatyrev, Institute of Biochemistry and Physiology of Plants and Microorganisms, Russia
- 2N. Thermodynamic basicities and lanthanides binding constants of pyridine-type ligands** Tsagana Sumyanova, N.E. Borisova, A.V. Ivanov, L.A. Korotkov, E.A. Eroshkina, Faculty of Chemistry, Lomonosov Moscow State University, Moscow, Russia
- 3N. Anticancer platform based on inorganic nanostructured calcium carbonate** Irina Vidyasheva, Saratov State University named after N.G. Chernyshevsky, Saratov Russia; B. Parakhonskiy, Institute of Crystallography RAS, Moscow, Russia; Saratov State University, named after N.G. Chernyshevsky, Saratov, Russia; D. Gorin, Saratov State University named after N.G. Chernyshevsky, Saratov Russia; A. Skirtach, State University of Ghent, Ghent, Belgium
- 4N. Synthesis and antimicrobial activity of gold nanoparticle conjugates with cefotaxime** Elena Titanova, SSU, Russia; G. Burygin, IBPPM RAS, Russia
- 5N. Biocompatible silica-coated quantum dots** Daniil Drozd, Saratov State University,

- Russia; V.V. Gofman Saratov State University, Russia, UGent, Belgium; I.Yu. Goryacheva, Saratov State University, Russia
- 6N. **Influence of pH and the ionic strength on the permeability of multilayer capsules** Anna Vostrikova, National Research Saratov State University, Russia
- 7N. **Study of Ag cubes extinction spectral changes during the silica coating** E. Panfilova, V. Bogatyrev, B. Khlebtsov, N.G. Khlebtsov, The Russian Academy of Sciences' Institute of Biochemistry and Physiology of Plants and Microorganisms (IBPPM RAS), Russia; Saratov State University, Russia
- 8N. **Application of the quantum dots to the inner surface of the fiber waveguides** Irina Zharkova, Saratov State University, Russian Federation; Y. Skibina, Nanostructured glass technology, Russian Federation; I. Goryacheva, Saratov State University, Russia
- 9N. **Luminescence of europium (III) complexes for visualization** Olga Kolontaeva, M. Pozharov, V. Korolovich, A. Khokhlova, A. Kirdyanova, N. Burmistrova, T. Zakharova, I. Goryacheva, Saratov State University, Russia
- 10N. **Incorporation of iodine in polymeric microparticles and emulsions** O. Kolontaeva, N. Markina, A. Markin, N. Burmistrova, Saratov State University, Russia
- 11N. **Modification of inner surface of photonic crystal fibers with self-assembled films of polyaniline** P.S. Pidenko, S.A. Pidenko, N.A. Burmistrova, I.Y. Goryacheva, Saratov State University, Russia
- 12N. **Silica coated microcapsules** Goryacheva O.A., Tarakina N., Hui Gao, Saratov State University, Russia; Queen Mary University London, United Kingdom
- 13N. **Green synthesis of gold nanoparticles using silymarin and investigation of their effect on animal cell culture** Staroverov S.A., Fomin A.S., IBPPM RAS, Saratov Scientific and Research Veterinary Institute, Russia; Rybin A.O., Kurilova A.A., Kozlov S.V., Volkov A.A., Saratov State Agrarian University, Russia; Dykman L.A., IBPPM RAS, Russia
- 14N. **Study of immunogenic properties of transmissible gastroenteritis virus antigen conjugated with selenium and gold nanoparticles** Mezhenny P.V., Saratov State Agrarian University, Russia; Staroverov S.A., Fomin A.S., IBPPM RAS, Saratov Scientific and Research Veterinary Institute, Russia; Volkov A.A., Kozlov S.V., Domnitsky I.Y., Saratov State Agrarian University, Russia; Laskavy V.N., Saratov Scientific and Research Veterinary Institute, Russia; Dykman L.A., IBPPM RAS, Russia
- 15N. **Chitosan based silver nanofibrous SERS-substrate enables label-free detection of molecules as well as intact bacterium cells** E.S. Prikhozhenko, A. N. Severyukhina, V. S. Atkin, D. N. Bratashov, Saratov State University, Saratov, Russia; B. V. Parakhonsky, Institute of Crystallography RAS, Moscow, Russia; D. A. Gorin, Saratov State University, Saratov, Russia; G. B. Sukhorukov, Queen Mary University, London, United Kingdom A. M. Yashchenok, Saratov State University, Saratov, Russia;
- 16N. **Hollow plasmonic silver alginate microspheres as effective SERS-substrate for detection of low concentrated samples** Ekaterina Lengert, I. Vidyasheva Saratov State University, Russia; B.V. Parakhonskiy Institute of Crystallography RAS, Moscow, Russia; A.M. Yashchenok, D.A. Gorin Saratov State University, Russia; G.B. Sukhorukov Queen Mary University of London, UK
- 17N. **Modifications of nanodiamond properties and investigation of their interactions with human blood** Mateusz Ficek¹, Macie Wróbel¹, Daria Milewska¹, Katarzyna Karpieńko¹, Katarzyna Mitura², Przemek Ceynowa², Małgorzata Jędrzejewska-Szczerska¹, ¹Gdansk University of Technology; ²Koszalin University of Technology, Poland

INTERNET REPORTS

1. **The morphological changes in the internal organs of laboratory animals after prolonged oral administration of gold nanoparticles** Alla Bucharskaya, G.N. Maslyakova, S.S. Pakhomy, O.V. Zlobina, I.O. Bugaeva, N.A. Navolokin, Saratov State Medical University, Russia; B.N. Khlebtsov, V.A. Bogatyrev, N.G. Khlebtsov, Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Russia
2. **Morphological changes in organs of immunogenesis and indicators of peripheral blood under the influence of gold nanoparticles in the experiment** Alla Bucharskaya, S.S. Pakhomy, O.V. Zlobina, G.N. Maslyakova, O.V. Matveeva, I.O. Bugaeva, N.A. Navolokin, Saratov State Medical University, Russia; B.N. Khlebtsov, V.A. Bogatyrev, N.G. Khlebtsov, Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Russia;
3. **The assessment of lipid peroxidation in rat with alloxan diabetes and transplanted liver cancer after intravenous administration of**

polymer-coated gold nanorods Alla B. Bucharskaya, N.I. Dikht, G.A. Afanasyeva, A.V. Ivlichev, S.V. Shevchenko, N.V. Zараeva, G.Terentyuk, Saratov State Medical University, Saratov State University, Russia; G. Maslyakova, Saratov State Medical University, Russia; B.N. Khlebtsov, N.G. Khlebtsov, Institute of Biochemistry and Physiology of

Plants and Microorganisms RAS, Saratov State University, Russia;

4. **New SERS-platforms based on alumina containing silver nanoparticles** Nadezhda Yurova V. Markin, T. Rusanova, Saratov State University, Russia;

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

Co-chairs: **Kirill V. Larin**, University of Houston, USA

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

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

September 24, Thursday

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

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

17.30-19.30

1M. **Spectral characteristics of shuttle motility with influence of the respiration inhibitors on P.polycephalum plasmodium** Tatyana Avsievich, Sergey Frolov, Sergey Proskurin Tambov State Technical University, Russia

2M. **Estimation of red cell distribution width by polychromatic interference microscopy of thin film** Anton Dyachenko¹, Lidia Malinova², Vladimir Ryabukho^{1,3}, ¹Saratov State University; ²Saratov Scientific Research Institute of Cardiology; ³Institute of Precision Mechanics and Control of RAS, Saratov, Russia

3M. **Shadow scanning lens-free microscopy with tomographic reconstruction of 2D images** Alexey Manturov, Eugeny Blushtein, Vladislav Morev, Yuri Gagarin Saratov State Technical University, Russia

4M. **The holographic processing of interferogram obtained in partially coherent light** Sergey Savonin¹, Vladimir Ryabukho^{1,2}, ¹Saratov State University; ²Institute of Precision Mechanics and Control of RAS, Saratov, Russia

5M. **The study of the structural features of the lymphocytes in patients with diabetes using atomic force microscopy** Ekaterina Krasnikova¹, Olga Stolbovskaya², Radik Khairullin², Boris Kostishko², Ekaterina Pchelintseva², Aleksander Fomin³, Aleksander Skaptsov⁴, ¹Saratov State Agrarian University ; ²USU; ³Saratov State Technical University; ⁴Saratov State University, Russia

6M. **In vitro metabolism study of normal and tumor cells when exposed to red LED light** Ekaterina Krasnikova¹, Olga Stolbovskaya², Radik Khairullin², Yuri Saenko², Aleksander Krasnikov¹, Aleksandr Fomin³, Aleksander Skaptsov⁴, ¹Saratov State Agrarian University; ²USU; ³Saratov State Technical University ⁴Saratov State University, Russia

7M. **The modification of digital phase contrast microscope optical scheme for RBC imaging** Olga Izotova¹, Vladimir Ryabukho^{1,2}, ¹Saratov State University; ²Institute of Precision Mechanics and Control of RAS, Russia

8M. **Numerical focusing in diffraction phase microscopy** Natalia Talaikova¹, Anton Grebenyuk¹, Alexander Kalyanov², Vladimir Ryabukho^{1,3}, ¹Saratov State University; ²University Clinic of Zurich (USZ), Switzerland; ³Institute of Precision Mechanics and Control, RAS, Russia

9M. **Partial spatial coherence effects in numerically focused Fourier domain optical coherence microscopy with structured illumination** Anton Grebenyuk, Vladimir Ryabukho, Saratov State University, Russia

INTERNET REPORTS

1. **Spectral characteristics of P. polycephalum plasmodium endoplasmic shuttle motility using sing-sensitive velocity registration** Tatyana Avsievich, Saif Abdulkarim, Sergey Proskurin Tambov State Technical University, Russia

2. **Depth-resolved incoherent and coherent wide-field high-content imaging** Peter So, Massachusetts Institute of Technology, USA
3. **Co-focused ultrasound and optical coherence elastography system for the study of biomechanical properties change of crystalline lens in rabbit eyes** Chen Wu¹, Zhaolong Han¹, Shang Wang², Manmohan Singh¹, Chih-hao Liu¹, Salavat Aglyamov³, Stanislav Emelianov³, Fabrice Manns⁴, Kirill Larin^{1,11} University of Houston, United States; ²Baylor College of Medicine United States; ³University of Texas at Austin, United States; ⁴University of Miami, United States
4. **Tissue analysis of nephritic kidney using OCE** Chih Hao Liu, University of Houston, United States
5. **Quantitative Assessment of the Elasticity Change in Hyaline Cartilage during Optical Clearing using Optical Coherence Elastography** Chih Hao Liu, University of Houston, United States

September 25, Friday

JOINT INVITED LECTURE/ORAL SESSION MICROSCOPY AND LOW-COHERENCE METHODS/ PALS V
(**Building 10, Main Conference Hall**)

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

9.00-9.20

Invited (PALS)

Experience in collaborative construction and biomedical applications of laser tweezers

Alexander Priezzhev^{1,2}, K. Lee^{1,3}, M. Kinnunen³, R. Myllyla³, I. Meglinski³, ¹Laser Biomedical Photonics Laboratory, Physics Department; ²International Laser Centre, Lomonosov Moscow State University, Moscow, Russia; ³Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Oulu, Finland

9.20-9.40

Invited (PALS)

Quantified monitoring of skin OCT-image evolution under external action

Pavel D. Agrba^{1,2}, M.A. Pasukhin¹, M.Yu. Kirillin^{2,1}, ¹Lobachevsky State University of Nizhny Novgorod, Russia, ²Institute of Applied Physics of Russian Academy of Sciences, Russia

9.40-9.55

(PALS)

Effects of cisplatin on the level of hydrogen peroxide and cell death in HeLa Kyoto cells

Anastasya S. Belova^{1,2}, A.G., Orlova^{1,2,3}, I.V. Balalaeva², N.N. Razumkova², A.V. Maslennikova^{1,3}, N.M. Mishina^{3,4}, N.M. Shakhova^{1,3}, E.V. Zagaynova³, V.V. Belousov^{3,4}, ¹Institute of Applied Physics of RAS, Nizhny Novgorod; ²Lobachevsky State University of Nizhny Novgorod; ³N. Novgorod State Medical

Academy; ⁴Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia

9.55-10.10

Vessel-contrast enhancement in label-free optical coherence angiography based on phase and amplitude speckle variability

Lev A. Matveyev¹, Vladimir Yu. Zaitsev¹, Alexander A. Moiseev¹, Grigory V. Gelikonov¹, Alexander L. Matveyev¹, Sergey Yu. Ksenofontov¹, Marina A. Sirotkina², Valentin M. Gelikonov¹, Natalia D. Gladkova², Valentin V. Demidov³, Alex Vitkin³, ¹Institute of Applied Physics RAS; ²Medical Academy of Nizhny Novgorod, Russia; ³University of Toronto, Canada

10.10-10.25

Stochastic optical reconstruction microscopy (STORM) image restoration from subsets of localizations insufficient for Nyquist criterion Alexander Moiseev, Grigory Gelikonov, Valentine Gelikonov, IAP RAS, Russia

10.25-10.40

Digital holography methods for optical aberrations measurement and compensation Vasiliy Matkivskiy, Dmitry Shabanov, Shilagin Pavel, Moiseev Aleksandr, Grigoriy Gelikonov, Valentin Gelikonov, IAP RAS, Russia

10.40-10.55

Analysis of dynamics of a caspase-3 activity in cancer cells during apoptosis using FLIM/FRET technique

Tatiana F. Sergeeva¹, Marina V. Shirmanova¹, Varvara M. Dudenkova^{1,2}, Olga A. Zlobovskaya³, ¹Nizhny Novgorod State Medical Academy; ²Nizhny Novgorod State University; ³Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia

Conference on Internet Biophotonics VIII

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

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

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

September 24, Thursday

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

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

16.30-17.30

1. Advance in multimodality intravascular imaging for diagnosis and characterization of vulnerable plaques Zhongping Chen, Beckman Laser Institute, University of California, USA

2. Quantitative phase imaging for basic and clinical biomedical applications Gabriel Popescu, University of Illinois at Urbana-Champaign, Beckman Institute for Advanced Science and Technology, IL, USA

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

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

17.30-19.30

INTERNET INVITED LECTURES

1. Pilot *in vivo* animal study of bone regeneration by fractional YAG:ER laser G.B. Altshuler¹, A.V. Belikov², **Ksenia Shatilova**², A.I. Yaremenko³, A.Y. Zernitskiy³, E.A. Zernitckaia³, ¹Dental Photonics, Inc., USA; ²ITMO University,

Russia; ³Pavlov First Saint Petersburg State Medical University, Russia

2. Horizontal translation in practice: recipes for medical device innovation **Pavel Zakharov**, M. S. Talary, IROC Science AG, Zurich, Switzerland, Daniel Boss, Michael Mrochen, IROC Science AG, Zurich, Switzerland

3. Why neonatal and adult strokes are different? The role of blood-brain barrier and cerebral blood flow **Olga Sindeeva**, O.Semyachkina-Glushkovskaya, Saratov State University, Russia

4. Implementation of digital optical capillaroscopy for quantifying and estimating the microvascular abnormalities in diabetes mellitus **Yury Gurfinkel**¹, O. Suchkova¹, M. Sasonko¹, A.Priezzhev, ¹Research Clinical Center of Russian Railways, Moscow, Russia, ²Physics Department and International Laser Center of Lomonosov Moscow State University, Moscow, Russia

5. Fluorescence spectroscopy and microscopy of cutaneous tumours – correlation between micro- and macro-spectral measurements **Ekaterina Borisova**¹, L. Avramov¹, M. Lomova², O.Semyachkina-Glushkovskaya², D. Gorin², ¹Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria; ²Saratov State University, Saratov, Russia

6. Single-cell elastic light scattering techniques and applications **Matti Kinnunen**¹, A. Karmenyan^{2,3}, ¹University of Oulu, Finland; ²National Yang-Ming University, Taipei; ³National Dong-Hwa University, Hualien, Taiwan

7. **Interaction of red blood cells in the environment inducing their aggregation: laser tweezers study** Kisung Lee¹, A. V. Danilina¹, M. Kinnunen², A.V.Priezzhev^{1,3}, I. Meglinski², ¹Department of Physics, Lomonosov Moscow State University, Russia; ²Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Finland; ³International Laser Center, Lomonosov Moscow State University, Russia
8. **Tissue optical clearing for enhancement of *in vivo* blood flow imaging** Dan Zhu, Britton Chance Center for Biomedical Photonics, Huazhong University of Science and Technology, P.R. China
9. **About influence of nanoparticle size and laser pulse duration on biotissue's damage** Alexander N. Yakunin^{1,2}, Yu.A. Avetisyan^{1,2}, A.A. Bykov², V.V.Tuchin¹⁻³, ¹Institute of Precise Mechanics and Control of the Russian Academy of Science, Russia; ²Saratov State University, Russia; ³Tomsk State University, Tomsk, Russia
10. **Detailed analysis of the structural changes of bone matrix during the demineralization process using Raman spectroscopy** Elena V. Timchenko¹, P.E. Timchenko¹, L.A. Zherdeva¹, L.T. Volova², J.V. Ponomareva² Samara State Aerospace University (SSAU), Samara, Russia; ²Experimental Medicine And Biotechnologies Institute of the Samara Medicine University, Samara, Russia
11. **Effect of human erythrocyte shape on oxygenation of intra-cellular hemoglobin** A.Chowdhury, Raktim Dasgupta, A. Uppal, P.K.Gupta, Laser Biomedical Applications and Instrumentations Division, Raja Ramanna Centre for Advanced Technology, Indore, India
12. **Optical methods, device and statistics of determination of albumin and/or protein concentration in human urine** A.Sünter^{1,2}, Artur Kuznetsov^{1,2}, A.Frorip², V.Korsakov³, M.Rosenberg¹, ¹Tartu University, Estonia; ²AS Ldiamon, Estonia; ³Jeko Disain OÜ, Estonia
13. **Optical coherence elastography for corneal biomechanics** Shang Wang, K. V. Larin, Department of Biomedical Engineering, University of Houston, Houston, Texas, United States; Department of Molecular Physiology and Biophysics, Baylor College of Medicine, Houston, Texas 77030, United States
14. **Comparison of optical projection tomography and optical coherence tomography for murine embryonic developmental imaging** Manmohan Singh¹, V. Piazza², A. Nair¹, T. Vedakkan², M. V. Frazier¹, T. Janeček¹, I. Larina², M. E. Dickinson², K.V. Larin^{1,2}, ¹Department of Biomedical Engineering, University of Houston, USA; ²Department of Molecular Physiology and Biophysics, Baylor College of Medicine, USA
15. **Multi-wavelength Doppler phase-shift holography and interferometry** Toyohiko Yatagai, Center for Optical Research and Education, Utsunomiya University, Japan
16. **NIROT for imaging of hypoxia in cancer tumors: preclinical study** Alexander Kalyanov¹, J. M. Pavia¹, C. Germanier², M.Rudin², M. Wolf¹, ¹University Clinic of Zurich, Switzerland; ²Swiss Federal Institute of Technology in Zurich, Switzerland
17. **In vitro and in vivo kinetics of optical clearing of fat tissue in rats** Irina Yu. Yanina¹, Y.Tanikawa², E.A. Genina¹, Y.V.Tarakanchikova¹, P.A. Timoshina¹, D.K.Tuchina¹, A.N. Bashkatov¹, L.E. Dolotov¹, G.S. Terentyuk¹, N.A. Navolokin¹, G.N. Maslyakova¹, Y. Iga², Sh. Takimoto², V.V. Tuchin¹, ¹Saratov State University, ²Olympus corporation, Japan
18. **Usage of lipid/keratin Raman peak (2820-3030 cm⁻¹) for investigation of oil penetration into the skin** Maxim E. Darwin¹, C.-S. Choe^{1,2}, J. Lademann¹, ¹Charité Universitätsmedizin Berlin (Germany); ²Kim Il Sung University, Ryongnam-Dong, DPR Korea
19. **Plasmonic particles that target hypoxic tumors** Fulvio Ratto¹, E.Witort², F.Tatini¹, S.Centi¹, L.Lazzeri², F.Carta³, M.Lulli², D.Vullo³, F.Fusi², C.T.Supuran⁴, A.Scozzafava³, S.Capaccioli², R.Pini¹, ¹Institute of Applied Physics, National Research Council, Via Madonna del Piano 10, Sesto Fiorentino, Italy; ²Dept. Experimental and Clinical Biomedical Sciences, Univ. Florence, Viale Pieraccini 6, Firenze, Italy; ³Dept. Chemistry, Univ. Florence, Via della Lastruccia 3, Sesto Fiorentino, Italy; ⁴Dept. NEUROFARBA, Univ. Florence, Viale Pieraccini 6, Firenze, Italy

POST DEADLINE

20. **Monte Carlo simulation on polarization features in tissue optical clearings** Dongsheng Chen, Nan Zeng, Yunfei Wang, Hui Ma, Tsinghua University, China
21. **Photonics non- and minimally-invasive diagnosis and therapy of diseases** Zeev Zalevsky, Yevgeny Beiderman, Javier Garcia and Asaf Shahmoom, Faculty of Engineering, Bar-Ilan University, 52900, Israel

22. **Experience in collaborative construction and biomedical applications of laser tweezers** Alexander^{1,2}, K. Lee^{1,3}, M. Kinnunen³, R. Myllyla³, I. Meglinski³, ¹Laser Biomedical Photonics Laboratory, Physics Department; ²International Laser Centre, Lomonosov Moscow State University, Moscow, Russia; ³Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Oulu, Finland
23. **Optical assessment of bio-markers of socially important diseases** Alexander V. Priezzhev¹, Andrey E. Lugovtsov¹, S.Yu. Nikitin¹, K. Lee¹, V. Ustinov¹, V.B. Koshelev¹, O.E. Fadyukova¹, M.D. Lin¹, E.A. Shirshin¹, T.N. Tikhonova¹, Yu.I. Gurfinkel², ¹Lomonosov Moscow State University; ²Research Clinical Center of JSC "Russian Railways", Moscow, Russia
24. **Optical study of the effect of diabetes mellitus on microrheological properties of blood** Andrei E. Lugovtsov¹, Alexander V. Priezzhev¹, Vladislav D. Ustinov², Vladimir B. Koshelev³, Olga E. Fadyukova³, Maria D. Lin³, ¹M.V. Lomonosov Moscow State University, Physics Department and International Laser Centre; ²M.V. Lomonosov Moscow State University, Faculty of Computational Mathematics and Cybernetics; ³M.V. Lomonosov Moscow State University, Faculty of Basic Medicine, Russia
- M.S.Talary, D. Boss, M. Mrochen, IROC Science AG, Zurich, Switzerland
5. **Spectrophotometric differentiation of human skin melanoma. I. Diffuse reflectance of light** V.G. Petruk¹, A.P. Ivanov², S.M. Kvaternyuk¹, Vladimir V. Barun^{2,1} Vinnytsia National Technical University, Ukraine; ²B.I. Stepanov Institute of Physics, National Academy of Sciences of Belarus, Minsk
6. **Spectrophotometric differentiation of human skin melanoma. II. Diagnostic characteristics** V.G. Petruk¹, A.P. Ivanov², S.M. Kvaternyuk¹, Vladimir V. Barun², ¹Vinnytsia National Technical University, Ukraine; ²B.I. Stepanov Institute of Physics, National Academy of Sciences of Belarus, Minsk
7. **Monte Carlo modeling of reflectance of human skin with embedded TiO₂ nanoparticles** Roman Karandashov, A.N. Bashkatov, E.A. Genina, V. V. Tuchin, Saratov State University, Tomsk State University, Russia
8. **Sonodynamic treatment: search conditions for bioeffect** Mikhail Kolosov, R. Arefev, E. Kuchma, V. Yacenko, Southern Federal University, Russia
9. **Investigating catalase based antioxidant mechanism for erythrocytes under mechanical stress** A. Chowdhury, Raktim Dasgupta, A. Uppal, P. K. Gupta, Laser Biomedical Applications and Instrumentations Division, Raja Ramanna Centre for Advanced Technology, Indore, India
10. **The effects of curvature and thickness of cornea-based structures assessed by finite element modeling and optical coherence elastography** Zhaolong Han¹, J. Li¹, M. Singh¹, S. R. Aglyamov², Ch. Wu¹, Ch. Liu¹, K. V. Larin¹, ¹University of Houston, United States; ²University of Texas at Austin, United States
11. **Optical activity of chitosan films with induced anisotropy** Natalia Gegel, A. Shipovskaya, Saratov State University, Russia
12. **Specific optical rotation indicatrices of chitosan films** Darya Rudenko, A. Shipovskaya, Saratov State University, Russia

INTERNET REPORTS

1. **Wavelength dependence of muscle RI and its time dependence in the course of optical clearing** Luis Oliveira¹, M. I. Barbosa Carvalho², E. M. Nogueira¹, V. V. Tuchin³, ¹Instituto Superior de Engenharia do Porto, Portugal; ²FEUP, Portugal; ³Saratov State University, Russia
2. **Localization of inhomogeneities in time-domain diffuse optical tomography** Anton Potlov, Frolov S.V., Proskurin S.G., Tambov State Technical University, Russia
3. **Photon migration in turbid media, diffusion approximation and Monte Carlo simulation** Anton Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University, Russia
4. **Coping with eye motion in eye measurements** Pavel Zakharov,

13. **Fractional laser ablation as physical enhancement of skin optical clearing** Elina A. Genina^{1,2}, A. N. Bashkatov^{1,2}, L.E.Dolotov¹, E. A. Kolesnikova¹, G.S.Terentyuk¹, V. V. Tuchin^{1,2}, ¹Saratov State University, Russia; ²Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk, Russia
 14. **Optical properties of chitosan in aqueous solutions of L- and D-ascorbic acids** Olga Malinkina, O. Kazmicheva, A. Shipovskaya, Saratov State University, Russia
 15. **Diffusion of PEG-200 in skin tissue** Vadim D. Genin, A. N. Bashkatov, E. A. Genina, V.V. Tuchin, Saratov State University, Tomsk State University, Russia
 16. **Glycerol as optical clearing agent for biotissues: terms, properties, constants and formulas. Quick reference** Mikhail Stolnitz, Saratov State University, Russia
 17. **Assessment of the viability of the tooth pulp using a laser speckle** Nina V. Venatovskaya¹, S. S. Ulyanov², D.E.Suetenkov¹, ¹Department of pediatric dentistry and orthodontics, Razumovsky Saratov state medical university, Russia; ²Department of medical physics, Chernyshevsky Saratov state university, Russia
 18. **Anisotropy of glucose diffusion in muscle tissue** Alexey N. Bashkatov, E. A. Genina, M. D. Kozintseva, V. V. Tuchin, Saratov State University, Tomsk State University, Russia
 19. **Impact of 40%-glucose solution on skin optical properties, morphology and microcirculation** Daria K.Tuchina¹, A.N.Bashkatov^{1,2}, P.A. Timoshina¹, E.A.Genina^{1,2}, V.V. Tuchin¹⁻³, ¹Research-Educational Institute of Optics and Biophotonics, Saratov 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 RAS, Saratov, Russia
 20. **Advanced light sheet microscopy for bioscience and nanofluidics** Ivan V. Fedosov, V.V. Tuchin, Saratov State University, Russia
 21. **Photosensitizer fluorescence changing in biological liquid flow (theory and experiment)** Valeriya Maryakhina, Orenburg State University, Russia
 22. **Doppler spectra broadening depending on absolute value of flow velocity** Denis A. Petrov, K.E.S. Ghaleb, S.N. Abdulkarim, S.G. Proskurin, Tambov State Technical University, Russian Federation
- POST DEADLINE**
23. **Diffuse reflectance spectral detection of stress-induced stomach ulcers in animal models** Ekaterina M. Zinchenko¹, Ilana M. Agranovich¹, Oksana V. Semyachkina-Glushkovskaya¹, Ekaterina G. Borisova², Latchezar A. Avramov², ¹Saratov State University, Russia, ²Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria
 24. **Method for defocus correction in optical coherence microscopy** Dmitry Lyakin¹, Anton Sdobnov², Vladimir Ryabukho^{1,2}, ¹Saratov State University, Institute of Precision Mechanics and Control, RAS, Russia, ²Saratov State University, Russia

Conference on Low-Dimensional Structures V

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

Secretaries: **Vladislav V. Shunaev**, SaratovStateUniversity (Russia), **Anna S. Kolesnikova**, SaratovStateUniversity (Russia), **Michael M. Slepchenkov**, SaratovStateUniversity (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 24, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

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

Department of molecular physics,
Ukraine; D. Gorin, Education and
Research Institute of Nanostructures and
Biosystems, Saratov State University,
Russia; G. Sukhorukov, School of
Engineering & Materials Science, Queen
Mary University of London

17.30-19.30

- 1L. **Control of the electronic structure of corrugated graphene nanoribbons** O. E. Glukhova, M. Slepchenkov, V. Shunaev, M. Shubin, SaratovStateUniversity, Saratov, Russia
- 2L. **Building a model of DNA** O. E. Glukhova, K. Asanov, G. V. Savostyanov, Saratov State University, Saratov, Russia
- 3L. **Promising for emission electronics composite material based on nanotubes and graphite** A. S Kolesnikova, O. E. Glukhova, M. M. Slepchenkov, G. V. Savostyanov, D. S. Shmygin, SaratovStateUniversity, Saratov, Russia
- 4L. **The phenomenon of the current occurrence during the motion of the fullerene C60 in the substrate-supported graphene** V.V. Shunaev, G. V. Savostyanov, M. M. Slepchenkov, O. E. Glukhova, Saratov State University, Russia
- 5L. **The new modification of glassy with position of applications emission electronics** A. A. Fadeev, A. S Kolesnikova, O. E. Glukhova, Saratov State University, Saratov, Russia
- 6L. **The behavior of the microcapsule with the zinc oxide particles under ultrasound influence: an integrated approach** O. Grishina, Education and Research Institute of Nanostructures and Biosystems, Saratov State University, Russia; V. Korolovich, Taras Shevchenko National University of Kyiv, Physics Faculty, Department of molecular physics, Ukraine; L. Bulavin, Taras Shevchenko National University of Kyiv, Physics Faculty,
- 7L. **Evaluating of the effectiveness of filtering materials based on polyamide nanofibers with active antibacterial additive** L. German, Saratov State University, Russia
- 8L. **A study of hydrogen functionalization for carbon nanotori: predictive modeling** O.E. Glukhova, I.A. Kuprianov, M.M. Slepchenkov, Saratov State University, Russia
- 9L. **Prediction of the effect of the circular current flow in graphene-fullerene complex** V. Mitrofanov, O. E. Glukhova, M. Slepchenkov, Saratov State University, Russia
- 10L. **Simulation of the selective hydrogenation of curved graphene for formation of electronic circuits** Safaa Hussain, O. E. Glukhova, M. Slepchenkov, Saratov State University, Russia
- 11L. **The atomic and electronic structure of the new composite material based on carbon nanotubes and titanium oxide** Alboedam Muthana, O. E. Glukhova, M. Slepchenkov, Saratov State University, Russia
- 12L. **Prospects for the use of crown ethers to create miniature radiating systems on their basis** O.E. Glukhova, A.S. Kolesnikova, D.A. Melnikov, M.M. Slepchenkov Saratov State University, Russia

- 13L. **Laser forming of emission structure of metal-porous cathodes** I. Popov, Gagarin Saratov State Technical University, Russia G. V. Sakhadzi, T. M. Krachkovskaya, AO "NPP" Almaz", Russia T.N. Sokolova, E.L. Surmenko, D.A. Bessonov, Gagarin Saratov State Technical University, RPF "Pribor-T" Russia
- 14L. **Quantum chemical modeling of metal phthalocyanines molecules** I. Malyar, V. Lukyanova, A. Kletsov, E. Glukhovskoy, Saratov State University, Russia
- 15L. **Program package kvazar for molecular systems modeling** Glukhova O.E., Kolesnikova A.S., Slepchenkov M.M., Savostianov G.V., D. Shmygin, Saratov State University, Russia
- 16L. **Development of technique for transfer of metal films from water surface on the surface of solid substrates** Makarova N., Pereverzev Y., Lukyanova V., Safonov R., Malyar, I., Glukhovskoy Evgeny, Saratov State University, Russia
- 17L. **Influence of aqueous subphase preparation on langmuir-blodgett monolayers: research of effect of electric field on the water ionization** Pereverzev Y., Lukyanova V., Safonov R., Makarova N., Chumakov A., Glukhovskoy E., Saratov State University, Russia
- 18L. **Morphological characteristics of zirconium surface after microtexturizing treatment and thermal modification with high-frequency currents** A. Fomin, M. Fomina, V. Koshuro, I. Rodionov, A. Zakharevich, SSTU, Russia; Aleksandr Skaptsov, SSU, Russia
- 19L. **Peculiarities of structure formation of layered metal-oxide system ti-ta-(ti,ta)xoy during electro-spark alloying and thermally stimulated modification** M. Fomina, V. Koshuro, A. Fomin, I. Rodionov, SSTU, Russia A. Skaptsov, A. Zakharevich, SSU, Russia A. Aman, FHB, OvGU, Germany Aleksander Oseev, FHB, Germany Sören Hirsch, Soeren Majcherek, OvGU, Germany
- 20L. **Development of software module for visualization of slater-type atomic orbitals for software package kvazar** A. Kuryleva, O. Glukhova, Saratov State University, Russian
- 21L. **Program realization of repulsive energy in the frame semiempirical quantum-chemical method "PM6"** A. Zyktin, G. V. Sanostyanov, O. E. Glukhova, Saratov State University, Saratov, Russia
- 22L. **The emitter based on a single-walled carbon nanotube with encapsulated fullerenes** O. Glukhova, A. Kolesnikova, M. Slepchenkov, N. Ryskin, Saratov State University, Russia
- 23L. **Modeling physical and chemical processes in the langmuir-blodgett technology: the applicability of various models and scenarios** V. Lukyanova, Safonov R., Makarova N., Pereverzev Y., Malyar, I., A. Kletsov, Glukhovskoy E., Saratov State University, Russia
- 24L. **The complex of laser technological processes in the formation of microtip field emission cathode structures** D. Bessonov, T. Sokolova, E. Surmenko, I. Popov, SSTU, Russia
- 25L. **A new approach to synthesis of copper sulfide / graphene sheets (cus/gs) at low temperature** Ammar Al-Alwani, E. G. Glukhovskoy, Educational and Research Institute of Nanostructures and Biosystems & Faculty of Nano- and Biomedical Technologies, Saratov State University, Russia

INTERNET REPORTS

1. **DNA sequencing based on analysis of transverse electron current** O. Isaeva, V. Katkov, V. Osipov, Bogoliubov Laboratory of Theoretical Physics, Joint Institute for Nuclear Research, Dubna, Russia
2. **Many electron correlations and small silicon nanocluster energetics** N.L. Matsko, Physical Institute P. N. Lebedev, Moscow, Russia, Tomsk State University, Department of Physics, Tomsk, Russia; E. Tikhonov, Y. A. Uspensky, V. Baturin, S. Lepeshkin, Physical Institute P. N. Lebedev, Moscow, Russia
3. **Graphene-based tunnel junction** V. Katkov, JINR, Russia
4. **The prospect of using agents for targeted delivery of drugs and a contrasting agents** N. Navolokin, O. Godage, S. German, A. Bucharskaya, G. Maslyakova, V. Zuev, G. Terentyuk, Saratov State Medical University, Saratov, Russia; D. Gorin, Saratov State University, Saratov, Russia

September 25, Friday

ORAL SESSION

(Building 3, Room 34)

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

11.30-11.40

Theoretical studies of the mechanical properties of multilayer pillared graphene

G. V. Sanostyanov, O. E. Glukhova, A.S. Kolesnikova,
D.S. Shmygin, Saratov State University, Saratov, Russia

11.40-11.50

Development of radiation sensor based on carbon nanotube array

A. Polokhin, National Research University of Electronic
Technology, Saratov, Russia

11.50-12.00

Numerical study of the characteristics of multibeam electron gun with glassy field emission cathodes

D.V. Ivanov, O. E. Glukhova, A. S. Kolesnikova, Saratov
State University, Saratov, Russia; V.I. Shestyorkin,
Almaz, Saratov, Russia

12.00-12.10

Application of the genetic algorithm for the task of determination of a total energy of nanoclusters

N.E. Timofeeva, A.N. Savin, A.S. Geras'kin,
Saratov State University, Saratov, Russia;

12.10-12.20

Fabrication of nanodimensional polyelectrolyte films on silicon substrates using photo-assisted layer-by-layer assembly

I. Malyar, V. Lukyanova, A. Kletsov, S. Stetsyura, D.
Gorin Saratov State University, Saratov, Russia

12.20-12.30

Tunneling and field emission in one-dimensional and three-dimensional nanostructures

M. Davidovich, Saratov State University,
Saratov, Russia N. Bushuev, JSC "Almaz",
Russia Ravil Yafarov, Institute of Radio-
engineering and Electronics of RAS, Saratov

12.30-12.40

Studying of quantum dots monolayer formation at different conditions

I. Gorbachev, E. Gluhovskoy, Saratov State
University, Saratov, Russia

12.40-12.50

Specific behavior of monolayers on the water surface after field ionization

Chumakov A., Pereverzev Y., Makarova N.,
Lukyanova V., Safonov R., Kletsov A.,
Glukhovskoy E., Saratov State University,
Russia

12.50-13.00

Electronic Structure And Boundary Conditions In The Graphitic Nanocone

Jan Smotlaka, Joint Institute For
Nuclear Research, Dubna, Russia Richard
Pincak, Institute Of Experimental Physics,
Slovak Academy Of Sciences, Kosice,
Slovakia

Conference on Biomedical Spectroscopy II

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

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

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

September 25, Friday

INVITED LECTURE/ORAL SESSION I

(Scientific Library, Conference Hall)

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

9.15-9.45

Invited

From silver chloride intermediate to SERS applications Tarmo Nuutinen, University of Eastern Finland, UEF, Finland

9.45-10.15

Invited

Semiconductor nanoparticles as luminescent labels: Biomedical and analytical application Irina Yu. Goryacheva, SSU, Russia

10.15-10.30

New applications of Raman, luminescence and SER spectroscopy in medical diagnostics Ramil Ibragimov, Development Department of Enhanced Spectrometry Inc.

10.30-10.45

Quenching of fluorescence of protein tryptophanys by ions of copper, lead, and cadmium Olga Plotnikova, Andrei Melnikov, Alexander Kovalenko, Yuri Gagarin State Technical University of Saratov, Russia

11.00-11.30

Coffee break

ORAL SESSION II

(Scientific Library, Conference Hall)

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

11.30-11.45

The development of attenuation compensation models of fluorescence spectroscopy signals

Victor Dremine¹, Evgeny Zherebtsov¹, Irina Novikova¹, Angelina Zherebtsova¹, Andrey Dunaev¹, Karina Litvinova², Ilya Rafailov², Victor Sidorov³, ¹SEC "Biomedical engineering" State University ESPC, Russia, ²Optoelectronics and Biomedical Photonics Group, Aston Institute of Photonic Technologies, Aston University, Aston Triangle, Birmingham, UK, ³SPE "LAZMA" Ltd, Moscow, Russia

11.45-12.00

Forster resonance energy transfer between proteins and luminescent probes Vyacheslav Kochubey¹, Alexander Pravdin¹, Andrei Melnikov², Irina Konstantinova¹, Gennady Melnikov², ¹Saratov State University, Russia, ²Saratov State Technical University, Russia

12.00-12.15

An investigation of the liquid phantom of tissue fluorescence for the evaluation of attenuation correction techniques

E. Zherebtsov¹, V. Dremine¹, A. Vinokurov², A. Dunaev¹, K. Litvinova³, I. Rafailov³, V. Sidorov⁴, S. Sokolovski³, E. Rafailov³, ¹Biomedical Photonics Instrumentation Group, Scientific-Educational Centre of "Biomedical Engineering", State University – Education-Science-Production Complex, Oryol, Russia, ²State University – Education-Science-Production Complex, Oryol, Russia, ³Optoelectronics and Biomedical Photonics Group, Aston Institute of Photonic Technologies, Aston University, Aston Triangle, Birmingham, UK, ⁴SPE "LAZMA" Ltd, Moscow, Russia

12.15-12.30

Surface-enhanced Raman spectroscopy for enzymatic activity detection Natalia Nechaeva, Ilya Kurochkin, Lomonosov Moscow State University, Russia

12.30-12.45

Characterization of Thioflavin T interaction with blood plasma proteins Tatiana Tikhonova, Evgeny Shirshin, Natalia Rovnyagina, Victor Fadeev, Alexander Priezzhev

12.45-13.00

Analyzing the spectroscopy volumes: which data representations are the best Daniil Bratashov, Saratov State University, Russia

September 24, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

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

Aerospace University, Russia,
²Experimental Medicine And
Biotechnologies Institute of the Samara
Medicine University, Samara

17.30-19.30

1BS. **Development optoelectronic hardware - program complex for the analysis of hypoxia in the anterior eye camera in persons wearing contact lenses** Vladimir Salmin, Victor Lazarenko, Victor Gar'kavenko, Yulia Levchenko, Anastasia Topakova, KRASGMU, Russia

2BS. **The study of myocardium autofluorescence kinetics in the Langendorff model of isolated heart with ischemia and cardioplegia** P. V. Lavrentyev, V. V. Salmin, O. V. Frolova, Krasnoyarsk State Medical University named after Prof. V.F.Voino-Yasenetsky,, Krasnoyarsk, Russia, E.V. Grigoriev, Ya. G. Toropova, G.P. Plotnikov, S.S. Krutitsky, Shukevich, A.S. Golovkin, Kuzbass Center of Cardiology, Research Institute of Complex Problems of Cardiovascular Diseases, Kemerovo, Russia

3BS. **Raman spectroscopy to assess derm decellularization biomatrix** E.V Timchenko¹, P.E Timchenko¹, L.T Volova², S.V Pershutkina¹, P.Y Shalkovsky¹, ¹Samara State Aerospace University, Samara, ²Experimental Medicine And Biotechnologies Institute of the Samara Medicine University, Samara

4BS. **Application of the method Raman spectroscopy for diagnosis of dental tissues** Timchenko E.V.¹, Timchenko P.E.¹, Zherdev L.A.¹, Volova L.T.², Kulabuhova A.Yu.¹, Arina Kulabuhova¹, ¹Samara State

5BS. **Synthesis and characterization of CuInS₂ Quantum Dots** A.S. Novikova, E.S. Speranskaya, A.M. Sobolev, I. Yu. Goryacheva SSU, Russia.

6BS. **Effect of temperature and viscosity on the quantum yield of the multi-enzyme system lactate dehydrogenase + NAD(P)H:FMN-oxidoreductase coupled with bacterial luciferase** Maria S. Nemchinova¹, Oleg S. Sutormin¹, Irina E. Sukovataya¹, Valentina A. Kratasyuk^{1,2}, ¹Department of Biophysics, Institute of Fundamental Biology and Biotechnology, Siberian Federal University, Krasnoyarsk, Russia; ²Institute of Biophysics, Russian Academy of Sciences, Siberian Branch, Krasnoyarsk, Russia

7BS. **Polarized luminescence of biological tissue phantoms** Natalia Kazadaeva, Saratov State University, Russia Alexander Pravdin, Saratov State University, Russia

8BS. **On the absorption spectrum of riboflavin introduced into sclera** Marina Shvachkina, Saratov State University, Russia Alexander Pravdin, Saratov State University, Russia

9BS. **Detection of sulfonamide drug in urine using liquid-liquid extraction and surface-enhanced Raman spectroscopy** Natalia E. Markina, Victoria V. Shalabay, Alexey V. Markin, Saratov State University, Russia

- 10BS. **Fluorimetric determination of pefloxacin using micellar solutions of surfactants** Tatyana Danilina, Elena Zhelobitskaya, Tatyana Smirnova, Saratov State University, Russia
- 11BS. **The synthesis and the study of photocatalytic activity spectral dependence of iron oxide nanoparticles and their complexes with TiO₂ nanoparticles** Yulia Apostolova, Alexander Shlykov, Vyacheslav Kochubey, Saratov State University, Russia
- 12BS. **Some possibilities of using the complex of samarium in the bioassay** Elena Zhelobitskaya, Tatyana Smirnova, Saratov State University, Russia
- 13BS. **Thermosensitivity of nanothermometer: CdSe/ZnS vs CuInS₂/ZnS** A.A. Skaptsov, V.I. Kochubey, V.V. Galushka, I.Yu. Goryacheva, Saratov State University, Russia
- 14BS. **Red and blue shift of spectral luminescence band of CuInS₂ nanothermometers** A.A. Skaptsov, V.I. Kochubey, V.V. Galushka, I.Yu. Goryacheva, Saratov State University, Russia
- 15BS. **Investigation of bilirubin, triglycerides and uric acid concentrations influence on blood optical properties in THz frequency range** S. I. Gusev, N. S. Balbekin, E. A. Sedykh, M. K. Khodzitsky, ITMO University, Russia, Yu. A. Kononova, E. V. Litvinenko, E. N. Grineva, A. Yu. Babenko, Federal Almazov North-West Medical Research Centre, Russia
- 16BS. **Assessment of biological tissue temperature using upconversion nanoparticles by spectroscopic methods** Elena Volkova^{1,2}, Irina Yanina^{1,2,3}, Alexey Popov², Alexander Bykov², Alexander Skaptsov¹, Marina Kozintseva¹, Julia Konyukhova¹, Vyacheslav Kochubey¹, Igor Meglinski², Valery Tuchin^{1,2,4,1} Saratov State University, Saratov, Russia, ²University of

Oulu, Finland, ³Saratov State Medical University (SSMU), Russia, ⁴Institute of Precise Mechanics and Control RAS, Russia

INTERNET REPORTS

Synchronous Fluorescence Spectroscopy (SFS) of cutaneous tumours – principles and applications Ekaterina Borisova, Aleksandra Zhelyazkova, Tsanislava Genova, Latchezar Avramov, Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria, Petranka Troyanova, Elmira Pavlova, Ivan Terziev, Nikolay Penkov, University hospital “Queen Jiovanna-ISUL”, Sofia, Bulgaria

Albumin Conformational Changes in Human Blood Plasma Monitored by SDS-binding Assay Nadezda Zhdanova, Evgeny Shirshin, Alexander Priezzhev, Moscow State University, Faculty of Physics, Quantum Electronics Division, Russian Federation

Optical properties of pyrene in surfactants solutions and on the cellulose diacetate matrices I.M. Uchaeva, S.M. Rogacheva, A.V. Strashko, E.V. Volkova, T.I. Gubina, A.G. Melnikov, Yuri Gagarin State Technical University of Saratov, Russia, A.N. Pankratov, National Research Saratov State University, Russia

Detailed analysis of the structural changes of bone matrix during the demineralization process using Raman spectroscopy Elena Timchenko, P.E. Timchenko, L.A. Zherdeva, SSAU, Russia, L.T. Volova, J.V. Ponomareva, Experimental Medicine and Biotechnologies Institute of the Samara Medicine University, Russia

Conference on Computational Biophysics and Analysis of Biomedical Data II

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

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

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

September 24, Thursday

POSTER SESSION

(Building 3, 3rd floor Hall)

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

17.30-19.30

- 1BC. **Modulation and detection of the THz range signals using the highest harmonics of the fundamental frequency of the superlattice-based generator for biomedical applications** V.V. Makarov^{1,2}, E.P. Seleznev³, V.I. Ponomarenko³, M.V. Khramova¹, A.A. Koronovskii¹, V.A. Maksimenko^{1,2}, A.N. Pavlov^{1,2}, A.E. Hramov^{1,2}, ¹Saratov State University; ²Saratov State Technical University; ³Saratov Branch of IREE, Russia
- 2BC. **Perspective sub-thz powerful microwave generator 'nanovircator' for t-rays biomedical diagnostics** Frolov N.S.^{1,2}, S.A. Kurkin^{1,2}, M.V. Khramova¹, A.A. Badarin^{1,2}, A.A. Koronovskii¹, A.N. Pavlov^{1,2}, A.E. Hramov^{1,2}, ¹Saratov State University; ²Saratov State Technical University, Russia
- 3BC. **Application of the extended Kalman particle filter for dynamic interference fringe processing** Petr A. Ermolaev, Maxim A Volynsky, ITMO University, Russia
- 4BC. **The method of empirical dependences in estimation and prediction of activity of creatine kinase isoenzymes in cerebral ischemia** Albina N. Moshkova¹, T.F. Sergeeva², E.M. Khvatova², ¹Nizhny Novgorod State Technical University; ²Nizhny Novgorod State Medical Academy, Russia
- 5BC. **Etalon-photometric method for measuring the density of the material at x-ray images** Sergey I. Suyatinov, N.S. Buldakov, T.I. Buldakova, BMSTU, Russia
- 6BC. **Modeling study of terminal transients of blood flow** Elena S. Stiukhina, D.E. Postnov, Saratov State University, Russia
- 7BC. **Application of cross-wavelet transform to pulse wave velocity data: seeking for inter-limb coherence** Maria O. Tsoy, E.S. Stiukhina, D.E. Postnov, Saratov State University, Russia
- 8BC. **"How can gaming pc improve your scientific performance" for beginners** Dmitry D. Postnov, Copenhagen University, Denmark
- 9BC. **Computational side of micro-circulation assessment by PIV** Maxim A. Kurochkin, I.V. Fedosov, V.V. Tuchin, Saratov State University, Russia
- 10BC. **Method of assessment mucociliary clearance** Igor Yu. Ermakov¹, O.V. Mareev¹, G.O. Mareev¹, T.V. Danilova², ¹Saratov State Medical University; ²Saratov State Technical University, Russia
- 11BC. **Virtual endoscopy software** Innokenty K. Alajcev¹, R.V. Fedorov¹, G.O. Mareev², O.V. Mareev², A.O. Manturov¹, T.V. Danilova¹, ¹Saratov State Technical University; ²Saratov State Medical University, Russia
- 12BC. **Numerical simulation of optical trapping dynamics of a cell model** Sergey S. Klykov, I.V. Fedosov, V.V. Tuchin, Saratov State University, Russia
- 13BC. **Research of properties of numerical lenses by different approximation levels for a holographic lensless microscopy** Oleg V. Grishin, I.V. Fedosov, V.V. Tuchin, Saratov State University, Russia
- 14BC. **Determination of type and concentration of nitrogenous bases by raman spectroscopy using artificial neural networks** Kirill A. Laptinsky¹, S.A. Burikov¹, S. Dolenko^{1,2}, O. Sarmanova¹, T.A. Dolenko¹, ¹Lomonosov Moscow State University; ²SINP MSU, Russia

September 25, Friday

ORAL SESSION I
(Building 3, Room 38)

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

9:00-9:15

Modeling of vascular responses - how to assemble the puzzle Dmitry E. Postnov, Saratov State University, Russia

9:15-9:30

Modern wavelet-based methods of local periodic pattern analysis in application to processing of imaging data and neurophysiological signals Eugene B. Postnikov¹, A.I. Lavrova², E.A. Lebedeva^{3,4}, ¹Kursk State University; ²Immanuel Kant Baltic Federal University; ³Saint-Petersburg State University; ⁴Saint-Petersburg State Polytechnic University, Russia

9:30-9:45

Toward realistic mathematical model of renal blood flow: vascular network structure Dmitry D. Postnov¹, D.E. Postnov², T. Braungsten¹, N.-H. Holstein-Rathlou¹, O.V. Sosnovtseva¹, ¹Copenhagen University, Denmark; ²Saratov State University, Russia

9:45-10:00

Analysis of characteristics of the synchronous clusters in neural networks of the brain by the eeg signals A.A. Kharchenko^{1,2}, V.V. Makarov^{1,2}, M.V. Khramova¹, A.A. Koronovskii¹, V.A. Maksimenko^{1,2}, A.N. Pavlov^{1,2}, A.E. Hramov^{1,2}, ¹Saratov State University; ²Saratov State Technical University, Russia (moved to Post Deadline Poster Session)

10:00-10:15

Mathematical modelling of cerebral blood flow redistribution and neurovascular coupling during cortical spreading depression Andrey Yu. Verisokin¹, D.V. Verveiko¹, D.E. Postnov², ¹Kursk State University; ²Saratov State University, Russia

10:15-10:30

Analysing coupling architecture in cortex from eegs of children with cerebral palsy Maxim Kornilov^{1,2}, S. Markov¹, M.L.A. Jongsma³, C.M. van Rijn³, I.V. Sysoev^{1,2}, ¹Saratov Branch of IREE; ²Saratov State University, Russia; ³Radboud University, the Netherlands

10:30-10:45

Cannabis agonist injection effect on the coupling architecture in cortex of Wag/Rij rats during absence seizures Ilya V. Sysoev¹, M.V.

Sysoeva², G.D. Kuznetsova³, C.M. van Rijn⁴, ¹Saratov State University; ²Saratov State Technical University; ³Institute of Higher Nervous Activity and Neurophysiology of RAS, Russia; ⁴Radboud University, the Netherlands

10:45-11:00

Evaluation of nonlinear properties of epileptic activity using largest Lyapunov exponent Tatiana M. Medvedeva¹, A. Luetjohann², G. van Lijstelaar³, I.V. Sysoev^{1,4}, ¹Saratov State University; ²Radboud University, the Netherlands; ³Universitätsklinikum, Germany; ⁴Saratov Branch of IREE, Russia

11:00-11:30

Coffee break

ORAL SESSION II
(Building 3, Room 38)

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

11:30-11:45

Generalized synchronization in the complex network: theory and applications to epileptic brain Olga I. Moskalenko^{1,2}, A.A. Pyvovarov^{1,2}, A.N. Pavlov^{1,2}, A.A. Koronovskii¹, M.V. Khramova¹, A.E. Hramov^{1,2}, ¹Saratov State University; ²Saratov State Technical University, Russia

11:45-12:00

Biomechanical analysis of dental implants Aleksandr V. Dol', D. Ivanov, D. Smirnov, Saratov State University, Russia

12:00-12:15

Multifractal analysis of macro- and microcerebral circulation in rats Alexey N. Pavlov^{1,2}, O.A. Siniteeva¹, S.S. Siniteev¹, O.N. Pavlova¹, A.S. Abdurashitov¹, G.M. Shihalov¹, O.V. Semyachkina-Glushkovskaya¹, ¹Saratov State University; ²Saratov State Technical University, Russia

12:15-12:30

Synchronization of DNA array replication kinetics A. Manturov, Anton Grigoryev, Saratov State Technical University, Russia

12:30-12:45

Biomechanics of the bone-implant system for fixation intramedullary nail Dmitrii Ivanov¹, A. Barabash², Y. Barabash², ¹Saratov State University; ²Sarniito, Russia

Workshop on Nonlinear Dynamics VI

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

Secretary: **Alexander P. Chetverikov**, Saratov State University (Russia)

September 23, Wednesday

ORAL SESSION

(Building 3, Room 38)

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

12.30-12.40

Image denoising with wavelet-based approaches

A.S. Yaseen, Saratov State University, Russia & University of Technology, Baghdad, Iraq; O.N. Pavlova, Saratov State University, Russia; A.N. Pavlov, Saratov State University & Saratov State Technical University, Russia

12.40-12.50

Characterizing complex dynamics based on integrate-and-fire interspike intervals at the presence of noise

Y.K. Mohammad, Saratov State University, Russia & Tikrit University, Iraq; O.N. Pavlova, Saratov State University, Russia; A.N. Pavlov, Saratov State University & Saratov State Technical University, Russia

12.50-13.00

Noise-induced loss of multifractability in the dynamics of oscillating systems

G.M. Shihalov, Saratov State University, Russia; O.N. Pavlova, Saratov State University, Russia; A.N. Pavlov, Saratov State University & Saratov State Technical University, Russia

13.00-13.10

Dissipative solitons in ensemble of active Brownian particles interacting via Morse potential forces

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

13.10-13.20

Phase and frequency locking in the model of cardiovascular system baroreflexory regulation

Y. M. Ishbulatov, Saratov State University, Russia; A.S. Karavaev, Saratov Branch of V.A. Kotel'nikov

Institute of Radio Engineering and Electronics of RAS, Russia; A.R. Kiselev, Saratov State Medical University, Russia; V.I. Ponomarenko, Saratov Branch of V.A. Kotel'nikov Institute of Radio Engineering and Electronics of RAS, Russia; M.D. Prokhorov, Saratov Branch of V.A. Kotel'nikov Institute of Radio Engineering and Electronics of RAS, Russia

13.20-13.30

The role of delay in a system of two coupled Van der Pol oscillators

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

September 24, Thursday

INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

INTERNET REPORTS

1. **The mechanism of information storage in open systems** Y. Zayko, Stolypin Volga Region Institute of Administration Russian Presidential Academy of National Economy and Public Administration, Russia
2. **Propagation of signals in chains of bistable elements** Y. Zayko, Stolypin Volga Region Institute of Administration Russian Presidential Academy of National Economy and Public Administration, Russia
3. **Physics of color formation** Yu. Zayko, Stolypin Volga Region Institute of Administration Russian Presidential Academy of National Economy and Public Administration, Russia

Workshop on Advanced Polarization Technologies in Biomedicine and Material Science II

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

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

International Program Committee: **Robert R. Alfano**, CCNY, USA; **Stefan Andersson-Engels**, Lund University, Sweden; **Oleg V. Angelsky**, Chernivtsi National University, Ukraine; **Vadim Backman**, Northwestern University, USA; **Victor N. Bagratashvili**, Inst. of Laser and Information Technologies RAS, Russia; **Claude Boccara**, ESPCI, France; **Stephen A. Boppart**, University of Illinois, USA; **Alexander V. Bykov**, University of Oulu, Finland; **Stavros Demos**, LLNL, USA; **Alexander V. Doronin**, University of Otago, New Zealand; **Ma Hui**, Tsinghua University, China; **Steven L. Jacques**, Oregon Health Sciences Univ., USA; **Alwin Kienle**, ILM Ulm, Germany; **Vladimir Kuzmin**, St. Petersburg State University, Russia; **Igor Meglinski**, University of Otago, New Zealand; **Lev Perelman**, Harvard University, USA; **Alexey P. Popov**, University of Oulu, Finland; **Alexander P. Sviridov**, Inst. of Laser and Information Technologies RAS, Russia; **Valery V. Tuchin**, Saratov State University, Institute of Precise Mechanics and Control RAS, Russia, University of Oulu, Finland; **Olga V. Ushakova**, Yuri Gagarin Saratov, State Technical University of Saratov, Russia; **Alexander G. Ushenko**, Chernivtsi National University, Ukraine; **Alex Vitkin**, University of Toronto, Canada; **Lihong Wang**, Washington University in St. Louis, USA; **Adam Wax**, Duke University, USA; **Dmitry A. Zimnyakov**, Yuri Gagarin Saratov State Technical, Russia

Wednesday September 23

ORAL SESSION

(Building 3, Room 34)

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

12.30-12.40

Propagation of polarized light in two-phase random media Alexander Sviridov, IPLIT RAS, Moscow, Russia

12.40-12.50

Features of light scattering by thin anisotropic layers consisting of quasisimilar anisotropic domains with random azimuthal orientation Dmitry D. Yakovlev, Maria M. Sherman, Saratov State University, Russia

12.50-13.00

Modeling of polarization transformation in the course of low-step scattering in random media Marina V. Alonova, Dmitry A. Zimnyakov, Yuri Gagarin Saratov State Technical University, Russia

13.00-13.10

Modifying of light depolarization by disperse systems of titania-based Olga V. Ushakova, Dmitry A. Zimnyakov, Sergey A. Yuvchenko, Yuri Gagarin Saratov State Technical University, Russia

13.10-13.20

Correlation polarisation analysis of the temperature governed gelation

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

13.20-13.30

Resonance excitation of surface modes in semiconductor nanoparticles and enhancement of depolarization properties of nanostructured dispersive systems

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

September 24, Thursday

POSTER SESSION

(Building 3, 3rd floor Hall)

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

17.30-19.30

- 1P. **Polarization of the fluorescence of fluorescent probes in the study of the interaction of proteins with nanoparticles of titanium dioxide** Andrei G. Melnikov, Viktoriya Efremova, Yuri Gagarin State Technical University of Saratov, Russia
- 2P. **Transmission microscopic polarization mapping as a tool in studying collagen-based tissues** Dmitry D. Yakovlev, Marina E. Shvachkina, Alexander B. Pravdin, Andrey V. Spivak, Saratov State University, Russia
- 3P. **In vivo measurements of human skin polarization degree at decreasing thickness of the epidermis** Elena A. Isaeva, Anna A. Isaeva, Michael Machev, Yulia Agapova, Yuri Gagarin State Technical University of Saratov, Russia
- 4P. **A process to contrast increasing in the classical and modified method LASCA** Ivan Skurlov, Tverdova Anasasiya, Sergey A. Yuvchenko, Yuri Gagarin State Technical University of Saratov, Russia
- 5P. **OCT image processing techniques to recover information relevant voxels** Anastasia A. Tverdova, Marina V. Alonova, Alexandr Rahvalov, Sergey A. Yuvchenko, Yuri Gagarin State Technical University of Saratov, Russia
- 6P. **Simulation of speckle-polarization imaging of multiple scattering media with complex structure and dynamics by Monte Carlo modeling: possibilities and perspectives** Anna A. Isaeva, Elena A. Isaeva, Aleksej Pantjukov, Yuri Gagarin State Technical University of Saratov, Russia
- 7P. **The nonlinear behavior of silicon nanoparticles near the fundamental absorption band** Sergey A. Yuvchenko, Dmitry A. Zimnyakov, Ivan Skurlov, Ekaterina Ushakova, Yuri Gagarin Saratov State Technical University, Russia

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XV

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

Secretaries: **Evgeny A. Torgashov**, Saratov Central Research Institute of Measurement Equipments (Russia), **Alexander N. Savin**, Saratov State University (Russia), **Pavel A. Shilovski**, Acronis, Saratov Region (Russia)

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

September 24, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

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

17.30-19.30

- 1EI. **Biophysical Approach to the Correction of Supporting Tissue Microcirculation Impairments** S.I. Kireev^{1,2}, A.G. Kurmanov², A.M. Imamov²,
¹Saratov State University n.a. N.G. Chernyshevsky,
²Saratov State Medical University n.a. V. I. Razumovsky, Russia
- 2EI. **Graphene-Based Magnetless Converter of Terahertz Wave Polarization** V.S. Melnikova¹, O.V. Polischuk², V.V. Popov^{1,2},
¹National Research Saratov State University, Saratov, Russia,
²Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch) of RAS, Saratov, Russia
- 3EI. **Amplification of Plasmons in Screened Active Graphene** M. Moiseenko¹, M.Yu. Morozov², V.V. Popov^{1,2},
¹National Research Saratov State University, Saratov, Russia,
²Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch), Russian Academy of Sciences, Saratov, Russia
- 4EI. **Differentiation Plasmonic Drag Induced in a Grating-Gated Graphene by the Normally Incident Terahertz Radiation** K.V. Mashinskiy^{1,2}, D.V. Fateev², V.V. Popov^{1,2},
¹Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch) of RAS;
²Saratov State University n.a. N.G. Chernyshevsky, Russia
- 5EI. **Localized Plasmons in Metall, Dielectric, and Graphene Inclusions: Methods of Analysis** M.V. Davidovich,
M.M. Slepchenkov, Saratov State University, Russia
- 6EI. **Design and Simulation of a Sub-THZ Vacuum Tube Power Amplifier** N. Ryskin¹, T. Karetnikova¹, A. Rozhnev¹,
G. Torgashov², N. Bushuev³, P.D. Shalaev^{3,1},
¹Saratov State University, Russia,
²Saratov Branch, IRE RAS, Russia,
³JSC "Almaz", Saratov, Russia

INTERNET REPORTS

1. **Some Thoughts on the Theory of Analytical Signal** Yu.N. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Saratov, Russia
2. **The Electrodynamic System of Vacuum Devices of Millimeter and Terahertz Ranges** A.D. Grigorev, Saint-Petersburg State Electrotechnical University "LETI", Russia

September 25, Friday

ORAL SESSION

(Building 3, Room 34)

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

14.00-14.20

Terahertz Radiation and its Biohazard

V. I. Fedorov, Institute of Laser Physics of SB RAS, Russia

14.20-14.50

Plasmons Along Flat-Layered Quasiperiodic Hyperbolic Metamaterial Structures

M. V. Davidovich, Saratov State Technical University, Saratov, Russia

14.50-15.10

Fast Calculation of the Fresnel-Kirchhoff Integral

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

15.10-16.30

Improving Frequency Stability of a Gyrotron by Delayed Reflection

M. Melnikova, Saratov State University, Russia, A. Tyshkun, Saratov State University, Russia, A. Rozhnev, Saratov State University, Russia Nikita Ryskin, Saratov State University, Russia, M. Glyavin, Institute of Applied Physics, Nizhniy Novgorod, Russia, Yu. Novozhilova, Institute of Applied Physics, Nizhniy Novgorod, Russia

19th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Workshop on Modern Optics XIV

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

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

Secretary: **Ol'ga A. Perepelitsina**, Saratov State University (Russia)

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

September 24, Thursday

LECTURE SESSION: (Building 3, Big Physical Hall)

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

14.00-14.15

**UNESCO International Year of Light
Address to students**
SPIE President, Prof. Toyohiko Yatagai, Japan

14.15-14.30

**Video "Lighting the future",
The National University of Ireland, Galway**

14.30-15.00

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

15.00-16.00

Modern Laser Spectroscopy Prof. Vladimir L. Derbov
Saratov State University, Russia

Workshop English as a Communicative Tool in the Scientific Community XIV

Workshop 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); **Valery V. Tuchin**, Saratov State University (Russia); **Dmitry A. Zimnyakov**, Saratov State Technical University (Russia)

September 21, Monday

ORAL SESSION I

(Scientific Library Conference Hall)

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

14.30-14.45

Terminology: Concept versus Meaning

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

14.45-15.00

The Role of Definite Article in ESP Context

Svetlana Shilova, Saratov State University, Russia

15.00-15.15

A metaphor as a tool and as an obstacle

Dina Alexeeva, Saratov State University, Russia

15.15-15.30

Teaching mechanisms of words formation in "Chinese for Physicists" elective course

Konstantin Grebenyuk, Saratov State University, Russia

15.30-16.00

Coffee break

ORAL SESSION II

Chair: **Svetlana V. Eremina**, Saratov State University, Russia

16.00-16.15

The use of Greek and Latin elements as a way of term formation in natural sciences

Arina Shelyugina, Saratov State University, Russia

16.15-16.30

Discrepancy of Meaning faced in Russian-English Translation

Alexander Pravdin, Saratov State University, Russia
Svetlana Eremina, Saratov State University, Russia

16.30-16.45

Frequency of occurrences of definite article *the* in ESP literature

Andrew Elistratov, Alexander Koronvskiy, Saratov State University, Russia

16.45-17.00

Formation of the plural in ESP texts

Nadezhda Sergeeva, Saratov State University, Russia

POSTER SESSION

(Building 3, 3rd floor Hall)

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

1E. Synthesis of N-containing heterocycles on the basis 5R-3H-furan-2-ones

Eugenia Stulova, Alexandr Osipov, Tatyana Anis'kova, Alevtina Yegorova, Saratov State University, Russia

2E. Activation effect of high modulus silicate systems and volumetric feed rate on the conversion of n-hexane

Iaroslav Rybkin, Remote Controlled Theranostic Systems Laboratory, SSU, Russia, Anton Pilipenko, Sergey Ignatiev, Department of Petrochemistry, SSU, Russia

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

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

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

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

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

September 25, Friday

ORAL SESSION:
(Building 8, Room 3)

Management of High Technologies Commercialization and Regional Innovation Systems XII

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

9.00-9.20

Invited

Modern semiconductor diode lasers and their applications

G.T. Mikaelan, Sergei N. Sokolov, RME "INJECT" LLC, Saratov, Russia

9.20-9.40

Invited

Deep UV LEDs Expand Photonics World: Devices, Applications and Markets

Sergey Paltsev, Profina Oy, Finland

9.40-10.00

Invited

Perspectives of Russian scientists' participation in Horizon 2020 program

Artem Balyakin, NRC "Kurchatov institute", Russia

10.00-10.15

Laser technics and technology in development and manufacture of electronic devices

A.V. Konushin, Tatiana Sokolova, Saratov State Technical University, Saratov, Russia

10.15-10.30

Application of laser microspectral analysis in the development and manufacture of electronic devices

Elena Surmenko, Saratov State Technical University, Russia

10.30-10.45

The complex of laser manufacturing processes of formation of the microtip field emission cathodes

D.A. Bessonov, Tatiana Sokolova, Saratov State Technical University, Saratov, Russia

10.45-11.00

Laser technology in the design and manufacture of metal porous cathodes with a structured surface

A.V. Konushin, I.A. Popov, Saratov State Technical University, Russia

11.00-11.15

How to diagnose real cognitive and motivational qualities of future undergraduates?

Valery M. Anikin, Boris N. Poizner, Tomsk State University, Russia

11.15-11.30

Startup investment opportunities in Russia

Dmitry Faleev, Moscow Institute of Physics and Technology (State University), Russia

11.30-12.00

Coffee break

ORAL SESSION

(Building 8, Room 3)

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

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

12.00-12.10

Development of automated chemical reactor for preparing of magnetite nanoparticles

Damir Rahmanov, Saratov State University, Russia

12.10-12.20

Modification of physiological properties of bacteria caused by surface modification

Yaroslav Rybkin, Remote controlled theranostic systems lab, SSU, Russia

12.20-12.30

Development of methodology and software for microscopic polarization cartography of biological tissues and technical environment

Dmitry D. Yakovlev, Saratov State University, Russia

12.30-12.40

Development of sensitive elements of fiber optic sensors for mid-IR spectroscopy

Svetlana Korsakova, Saratov State University, Russia

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

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 23, Wednesday

LECTURE/ORAL SESSION I

(Scientific Library, Conference Hall)

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

9.00-9.15

Inverse camera-obscure

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

9.15-9.30

To the law through the chart: Bouguer, Ohm, Sutherland

M. Starshov, Saratov State University, Russia

9.30-9.45

The problem kT in magnetobiology: methodical aspect

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

9.45-10.00

Bank of presentations on optics

M. Gorbunov, B. Medvedev, M. Starshov, Saratov State University, Russia

10.00-10.30

Coffee break

LECTURE/ORAL SESSION II

(Scientific Library, Conference Hall)

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

10.30-10.45

Magnetometric control of the nanoparticles concentration by using of heteromagnetic sensing device.

A. Maslow, E. Kosoruchkina, A. Ignatiev, B. Medvedev, Saratov State University, Russia

10.45-11.00

Nonlinear model of YiG resonator

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

11.00-11.15

Automatic adjustment ferro magnetic straight resonator in the frequency converter

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

11.15-11.30

Positioning by earth magnetic field using IGRF model

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

11.30-11.45

Heteromagnetic electronic module signal processing.

A. Retunskiy, D. Spiridonov, A. Ignatiev, Saratov State University, Russia

11.45-11.52

Hydrophilization of quantum dots using amphiphilic polymers

A. Vostrikova, Saratov State University, Russia

11.52-12.00

Obtaining of luminescent semiconductor nanocrystals

I. Zharkova, Saratov State University, Russia

12.00-12.30

Coffee break

LECTURE/ORAL SESSION III

(Scientific Library, Conference Hall)

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

12.30-12.40

Photoluminescence of heterophase CdS-PbS films at low temperature.

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

12.40-12.50

Influence of a grounding on the secondary-ion photoeffect in the structure of GaAs-AlGaAs-SiO.

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

12.50-13.00

Features of photocarrier recombination in CdS-PbS films.

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

13.00-13.10

Degradation resistant CdS-PbS films: stages of research.

A. Rokakh Saratov State University, Russia

13.10-13.20

Optical reflection of CdS-PbS composite: experiment and modeling.

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

13.20-13.30

Nanoscience education at high school: research and practice

A. Markin, Saratov State University, Russia

September 24, Thursday

LECTURE/ORAL SESSION IV

(Scientific Library, Conference Hall)

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

9.30-10.00

Complex of laser equipment and methodical techniques in education of future specialists in laser technology

T. Sokolova, Saratov State Technical University, Russia

10.00-10.15

How to write proposal: The expert opinion

V. Kochubey, Saratov State University, Russia

10.15-10.30

Condition of an unchromaticity of the LC modulator of light

G. Simonenko, Saratov State University, Russia

10.30-10.45

Abraham and Minkowski field momenta in brewster wave

V. Tsoy, Saratov State University, Russia

10.45-11.00

Maxwell's equations: early years of long life

M. Stolnitz, Saratov State University, Russia

11.00-11.30

Coffee break

ROUND TABLE I

Man and light in natural and art treatment of the Universe

(Scientific Library, Conference Hall)

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

Panel members:

Valery V. Tuchin^a, Vladimir P. Ryabukho^a, Vladimir L. Derbov^a, Victor V. Rozen^a, Oleg V. Shimelfenig^a, Alexander G. Rokakh^a, Lev M. Babkov^a, Vyacheslav I. Kochubey^a, Svetlana P. Pozdneva^a, Alexander 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, ^aSaratov State University, Saratov, Russia, ^bSamara State University, Samara, Russia, ^cSaratov State Technical University, Saratov, Russia

11.30-11.45

Remembering our teachers: Mark L. Katz and his staff

Associate Prof. V. Tsoy, Saratov State University, Russia

11.45-12.00

Remembering our teachers: Mikhail A. Kovner

Prof. L. Babkov, Saratov State University, Russia

12.00-12.15

Peter Lebedev: The life and the light. To the 150th anniversary of the birth

Prof. Valery Anikin, Saratov State University, Russia

12.15-12.30

Auguste Fresnel. Formation of the wave nature of light

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

12.30-12.45

Role of the light in the universe appearance

Dr. M. Matasov, Saratov State University, Russia

12.45-13.00

To the evolution of scientific picture of the world

Prof. V. Rozen, Saratov State University, Russia

13.00-14.00

Lunch

ROUND TABLE II

Man and light in natural and art treatment of the Universe

(Scientific Library, Conference Hall)

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

14.00-14.15

Man and light in the picture of the world of the Italian renaissance

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

14.15-14.30

"Smart" eye of modern cameras

Prof. A. Rokakh, Saratov State University, Russia

14.30-14.45

Visual perception, optical imaging and physical model of light

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

14.45-15.00

The see skill: "what" or "through what"?

Prof. Y. Duplinskya, Saratov State Technical University, Saratov, Russia

15.00-15.15

Continuity and discontinuity of light from a philosophical perspective

Associate Prof. N. Dovgalenko, Saratov State Technical University, Russia

15.15-15.30

Light as the nature of consciousness

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

15.30-15.45

Remarks about EPR effect, entangled states and physics philosophy

Prof. O. Parshkov, Y. Saratov State Technical University, Russia

15.45-15.52

Metaphysics of light St. Gregory Palamas

Prof. V. Belov, Saratov State University, Russia

15.52-16.00

Light and darkness in the anatomy lesson by Rembrandt

Prof. D. Mikhel, Associate Prof. I. Mikhel, Saratov State Technical University, Russia

16.00-16.15

New light in the systematics of living organisms

Prof. Vasilii Anikin, Saratov State University, Russia

16.15-16.30

The great "glass bead game players": The picture of the world in semitones of experiences

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

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

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

17.30-19.30

1H. Estimate the temperature and noise characteristics of magnetometer on magnetoresistors

D. Spiridonov, A. Ignatiev, Saratov State University, Russia

2H. Method of investigation of magnetic permeability of ferrites in frequency band

A. Gunstvin, K. Sayapin, L. Strakhova, A. Ignatyev Saratov State University, Russia

3H. Suppression of harmonic magnetic interference

E. Zaiceva, L. Romanchenko, Saratov State University, Russia

4H. Dependence of the recorded signal level on magnetic carrier thickness

N. Borodina, S. Kudryavceva, Saratov State University, Russia

5H. Computer simulation of the bipolar transistor and electronic circuits

A. Vorobiev^a, A. Khvalin^b, A. Bondarenko^c,
^aSaratov Technical University,
^bSaratov State University,
^cNIKA-Microwave, Saratov

6H. High performance permutation routing and applications

V. Chesakov^a, P. Korolkov^b, L. Sotov^a,
^aSaratov State University, Russia,
^bVoronezh Experimental Plant The Software, Russia

7H. Heteromagnetic module thermo-physical simulation

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

8H. Autonomous orientation algorithms using of weak magnetic fields sensors by earth's magnetic field

A. Maslov, G. Proskuryakov, A. Ignatiev, Saratov State University, Russia

INTERNET REPORTS

1. Computer analysis of the optic disc nerve

V. Bakutkin^a, V. Gorelov^b, Y. Zayko^b,
^aSaratov Research Institute of Rural Hygiene, Russia.

^bStolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia

2. Some thoughts on the theory of the analytical signal

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

3. Physics of color formation

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

September 24, Thursday

**POST DEADLINE
POSTER SESSION**

(Building 3, 3rd floor Hall)

- Fluorescent response of triptofan spectra in contact lens** Valery Bakutkin, Anastasy V. Bakutkina, Andrei Melnikov, Saratov State University, Russia
- Generation of Thz radiation in two-color fiber laser with frequency selection** Leonid A. Kochkurov, Leonid A. Melnikov, Yuri Gagarin State Technical University of Saratov, Russia
- Multistability and complex dynamics in coupled semiconductor lasers with time-delayed feedback** Maksim Balakin, Leonid Kochkurov, Leonid Melnikov, Vladimir Astakhov, Yuri Gagarin State Technical University of Saratov, Russia
- Optical properties and morphology of zing oxide nanowires** Alena V. Natalich, T. Yu. Grevtseva, Al-Farabi Kazakh National University, Almaty, Kazakhstan
- Luminescence quantum yield and lifetimes of rare earth complexes with ligands of the pyridine type** Anastasia V. Kharcheva, S. V. Patsaeva, Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia, N. E. Borisova, A. V. Ivanov, Faculty of Chemistry, Lomonosov Moscow State University, Moscow, Russia
- Basic features of the low-temperature plasma formation in the course of composite coating synthetsis at the active faces of complex contoured hard tools** B.M. Brojovsky, D.A. Zimnyakov, E.P. Zinina, V.V. Martynov, E.S. Pleshakova, S.A. Yuvchenko, Yuri Gagarin Saratov State Technical University, Russia
- Polyelectrolyte microcapsules and living cells exposed in external electric fields** Alexey Ermakov¹, Maria Lomova², Dmitry Gorin², Evgeny Glukhovskoy², ¹Institute of Materials Research and Engineering, A*STAR, Singapore; ²Saratov State University, Russia
- Analysis of characteristics of the synchronous clusters in neural networks of the brain by the eeg signals** A.A. Kharchenko^{1,2}, V.V. Makarov^{1,2}, M.V. Khramova¹, A.A. Koronovskii¹, V.A. Maksimenko^{1,2}, A.N. Pavlov^{1,2}, A.E. Hramov^{1,2}, ¹Saratov State University; ²Saratov State Technical University, Russia
- Composite theranostics platforms based on anisotropic vaterite particles decorated with silver nanoparticles** Bogdan Parakhonskiy¹, Y. Svenskaya², A. Yaschenok², I. Vidyasheva², I. Marchenko¹, T. Bukreeva¹, D. Gorin², G. Sukhorukov³, ¹Institute of Crystallography RAS, Moscow; ²Institute of Nanostructures and Biosystems, Saratov State University, Russia; ³School of Engineering and Materials Science, Queen Mary, University of London, UK
- Phase transfer of quantum dots with dendrimers** Dmitry V. Potapkin, I.Yu. Goryacheva, Saratov State University, Russia
- Phase locking of a gyrotron oscillator in the hard excitation mode** Ksenia Yakunina, Nikita Ryskin, Saratov State University, Russia
- Synchronization, chaos and wild multistability of dynamical networks with star-like coupling topology** Pavel Kuptsov, Anna Kuptsova, Yuri Gagarin State Technical University of Saratov, Russia
- Multistability and complex dynamics in coupled Lang-Kobayashi oscillators** Maksim Balakin, Leonid Kochkurov, Leonid Melnikov, Vladimir Astakhov, Yuri Gagarin State Technical University of Saratov, Russia