

Saratov Fall Meeting SFM'26

**14th International Symposium “Optics and
Biophotonics”**

**30th International School for Junior Scientists
and Students on Optics, Laser Physics &
Biophotonics**



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РОСАТОМ

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Schedule of SFM-26

September 21, Monday

Saratov time UTC+4		
11.00-13.00	REGISTRATION	Building 3, 1 st floor
14.00-14.45	MODERN OPTICS: PUBLIC LECTURE SESSION I SHORT COURSE SFM-26 Chairs: Ekaterina Lazareva , Saratov State Univ., Russia, Dmitry A. Gorin , Skolkovo Institute of Science and Technology, Skoltech; Central University, Moscow, Russia	Building 8, Room 420
	CREATION OF BIOMATERIALS WITH CONTROLLED PROPERTIES: HOW CAN NATURE HELP US? Gleb B. Sukhorukov , Skolkovo Institute of Science and Technology, Skoltech; Life Improvement by Future Technologies, LIFT Center, Moscow, Russia	

September 22, Tuesday

9.30-13.00	REGISTRATION	Building 10
10.30-11.00	Coffee break	
11.00-12.30	PLENARY SESSION I Chairs: Valery V. Tuchin , Saratov State Univ.; Alexander V. Priezzhev , Lomonosov Moscow State Univ., Russia	Building 10, Main Hall
11.00-11.10	WORDS OF WELCOME TO THE PARTICIPANTS OF SFM-26 Valery V. Tuchin , Saratov State Univ.	
11.10-11.50	CELL STIMULATION AND DELIVERY VIA REMOTE CONTROLLED COLLOIDS Gleb B. Sukhorukov , Skolkovo Institute of Science and Technology, Skoltech; Life Improvement by Future Technologies, LIFT Center, Moscow, Russia	
11.50-12.30	MULTIMODAL NONLINEAR OPTICAL IMAGING: INTEGRATING FLIM, SUPER-RESOLUTION, AND LABEL-FREE CONTRAST FOR BIOMEDICAL APPLICATIONS Junle Qu , Medical Photonics Innovation Institute, College of Physics and Optoelectronic Engineering, Shenzhen University, Shenzhen, China; Ioffe Institute, Russian Academy of Sciences, Russia	

	SPONSOR SESSION I Chairs: Valery V. Tuchin, Saratov State Univ.; Alexander V. Priezzhev, Lomonosov Moscow State Univ., Russia	
12.30-12.50	CUSTOMIZATION OF FLIM SYSTEMS: SELECTION OF HARDWARE CONFIGURATIONS FOR SPECIFIC SCIENTIFIC TASKS Anton I. Pavlikov, Scientific Microscopy, Biovitrum LLC, Moscow, Russia	
12.50	GENERAL PHOTO OF THE PARTICIPANTS	<i>In front of the Building 10</i>
13.00-14.00	A TOUR OF THE RESEARCH LABORATORIES OF THE DEPARTMENT OF OPTICS AND BIOPHOTONICS AND THE SCIENCE MEDICAL CENTER	<i>Buildings 3, 5 and 8</i>
14.00-16.00	LUNCH	
16.00-18.30	PLENARY SESSION II Chairs: Valery V. Tuchin, Saratov State Univ.; Alexander V. Priezzhev, Lomonosov Moscow State Univ., Russia	<i>Building 10, Main Hall</i>
16.00-16.40	MULTIFUNCTIONAL IRON OXIDE NANOPARTICLES: MRI CONTRAST AND LIGHT INDUCED DISSOLUTION Dmitry A. Gorin, Skolkovo Institute of Science and Technology, Skoltech; Central University, Moscow, Russia	
16.40-17.20	SPECTROSCOPY OF ASTROPHYSICAL ICE ANALOGUES: FROM THE MOST COMMON MOLECULES TOWARD SEEDS OF LIFE IN SPACE Kirill Zaytsev, Prokhorov General Physics Institute of RAS, Moscow, Russia	
17.20-17.50	Coffee break	
17.50-18.30	ENDOGENOUS FLUORESCENCE OF TISSUES: NEW MECHANISMS AND CLINICAL TRANSLATION Evgeny Shirshin, Lomonosov Moscow State University, Moscow, Russia	
18.30-18.50	SPONSOR SESSION II	
18.30-18.50	IN VIVO OPTICAL IMAGING SYSTEMS Sergey E. Chalov, LUMINON™ IE Chalov S.E., Moscow, Russia; Wuhan BIOVIVO Biotechnology Co., Ltd., China	<i>Building 11</i>
19.00-22.00	WELCOME PARTY	

September 23, Wednesday

10.00-13.00	PLENARY SESSION III Chairs: Dmitry A. Gorin, Skoltech, Central University, Moscow, Russia, Evgeny A. Shirshin , Lomonosov Moscow State University, Moscow, Russia	<i>Building 10, Main Hall</i>
10.00-10.40	COMPUTING WITH QUANTUM FLUIDS OF LIGHT Pavlos Lagoudakis , Skolkovo Institute of Science and Technology, Skoltech, Moscow, Russia	
10.40-11.20	ADVANCES IN OPTICAL AND OPTOACOUSTIC IMAGING Vasilis Ntziachristos , Technical University of Munich, Munich, Germany	
11.20-13.00	INVITED LECTURE/ORAL/ON-LINE SESSION BIOPHYSICS I / INTERNET BIOPHOTONICS I Chairs: Ivan A. Bratchenko, Immanuel Kant Baltic Federal University, Russia; Andrey Dunaev , Orel State University, Orel, Russia	
10.00-15.30	INVITED LECTURE/ORAL SESSIONS TERAHERTZ OPTICS & BIOPHOTONICS/ ADVANCED MATERIALS Chairs: Kirill I. Zaytsev, Arsenii A. Gavdush, Nikita V. Chernomyrdin, Prokhorov General Physics Institute of RAS, Bauman Moscow State Technical Univ., Russia	<i>Online</i>
11.30-18.50	INVITED LECTURE/ ORAL SESSIONS OPTICAL AND BIOMEDICAL ENGINEERING Chairs: Igor Fufurin, Igor Golyak, Bauman Moscow State Technical Univ., Russia	<i>Building 8, Room 201</i>
11.00-13.45	ON-LINE / ORAL SESSION LOW- DIMENSIONAL STRUCTURES I Chair: Olga Glukhova, Saratov State Univ., Russia	<i>Building 8, Room 318</i>
12.00-19.00	INVITED LECTURE/ORAL SESSION NANOBIPHOTONICS I Chair: Nikolai G. Khlebtsov, IBPPM RAS, Saratov State Univ., Russia	<i>Building 9, Conf. Hall</i>
12.00-13.00	ROUND TABLE OF HIGH TECHNOLOGIES COMMERCIALIZATION AND REGIONAL INNOVATION SYSTEMS XX Chairs: Daniil N. Bratashov, MIPT and Saratov State Univ., Russia; Andrey P. Rytic Saratov State Univ., Russia	<i>Building 6, Room 204</i>
13.00-14.30	INVITED LECTURE/ ORAL SESSION MACHINE LEARNING I Chairs: Igor K. Lednev, Univ. at Albany, USA, Yury V.Kistenev, Tomsk State Univ., Russian Federation	<i>Online</i>
13.00-14.00	LUNCH	
14.00-18.10	INVITED LECTURE/ORAL/ON-LINE SESSION LASER PHYSICS AND PHOTONICS Chair: Vladimir L. Derbov, Saratov State Univ., Russia	<i>Building 10, Hall 503</i>
14.00-18.30	INVITED LECTURE/ORAL/ON-LINE SESSION BRILLOUIN SPECTROSCOPY Chair: Alexander V. Sadovnikov, Saratov State Univ., Russia	<i>Building 8, Room 005</i>
14.00-16.00	INVITED LECTURE/ORAL/ON-LINE SESSION BIOPHYSICS II / INTERNET BIOPHOTONICS II Chairs: Alexander V. Priezhev, Andrei E. Lugovtsov, M.V. Lomonosov Moscow State University, Russia	<i>Building 10, Main Hall</i>

14.00-17.30	INVITED LECTURE/ ORAL SESSIONS HISTORY, METHODOLOGY AND PHILOSOPHY OF THE OPTICAL EDUCATION Chair: Boris A. Medvedev , Saratov State Univ., Russia	<i>Scientific Library Conf. Hall</i>
15.00-18.30	ON-LINE INVITED LECTURE /ORAL SESSION SPECTROSCOPY AND MOLECULAR MODELING I Chair: Kirill V. Berezin , Saratov State Univ., Inna L. Plastun , Saratov State Technical Univ., Russia	<i>Building 8, Room 216</i>
16.00-16.30	Coffee break	<i>Building 10, 2nd floor</i>
16.30-19.00	INVITED LECTURE/ORAL/ON-LINE SESSION BIOPHYSICS III Chairs: Nikolay A. Gippius , Skoltech, Moscow, Russia; Sergey I. Kudryashov , Lebedev Physical Institute, Moscow, Russia	<i>Building 10, Main Hall</i>
20.00-23.00	EVENING BOAT TRIP - THE LIGHTS OF SARATOV	
September 24, Thursday		
9.40-13.15	INVITED LECTURE/ ORAL SESSIONS BIOPHYSICS IV Chairs: Valery V. Tuchin , Saratov State Univ., Russia; Dmitry A. Gorin , Skolkovo Institute of Science and Technology, Skoltech; Central University, Moscow, Russia	<i>Building 10, Room 503</i>
10.00-14.15	INVITED LECTURE/ORAL SESSIONS TERAHERTZ OPTICS & BIOPHOTONICS/ ADVANCED MATERIALS Chairs: Kirill I. Zaytsev , Arsenii A. Gavdush , Nikita V. Chernomyrdin , Prokhorov General Physics Institute of RAS, Bauman Moscow State Technical Univ., Russia	<i>Online</i>
11.00-12.30	ON-LINE / ORAL SESSION LOW-DIMENSIONAL STRUCTURES II Chair: Olga Glukhova , Saratov State Univ., Russia	<i>Building 8, Room 318</i>
11.30-12.00	Coffee break	<i>Building 10, 2nd floor</i>
13.00-14.00	LUNCH	
14.00-15.00	MODERN OPTICS: PUBLIC LECTURE SESSION II Chairs: Georgy V. Simonenko , Ekaterina N. Lazareva , Saratov State Univ., Russia THE ADVENTURE OF PHOTONS IN THE SKY AND ON EARTH: WHO IS STRONGER THAN LIGHT SCATTERING OR ABSORPTION? Dmitry Gorin , Skolkovo Institute of Science and Technology, Central University, Moscow, Russia	<i>Building 3, Big Physical Hall</i>
14.00-17.30	ROUND-TABLE DISCUSSION EDUCATION Chair: Boris Medvedev , Saratov State Univ., Russia	<i>Scientific Library Conf. Hall</i>

14.00-17.15	ORAL SESSION ELECTROMAGNETICS Chair: Michael V. Davidovich, Saratov State Univ., Russia			<i>Building 8, Room 318</i>
14.00-16.00	ORAL SESSION NONLINEAR DYNAMICS Chairs: Galina I. Strelkova, Andrei V. Slepnev, Saratov State Univ., Russia			<i>Building 3, Room 38</i>
15.00-18.10	ON-LINE INVITED LECTURE /ORAL SESSION SPECTROSCOPY AND MOLECULAR MODELING II Chair: Kirill V. Berezin, Saratov State Univ., Russia	<i>Building 8, Room 216</i>	INVITED LECTURE/ ORAL SESSIONS BIOPHYSICS V Chairs: Mikhail Yu. Kirillin; Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Andrei E. Lugovtsov ; M.V. Lomonosov Moscow State University, Moscow, Russia	<i>Building 10, Room 503</i>
18.00-18.30	Coffee break			<i>Building 3, 2nd floor</i>
18.00-20.30	JOINT POSTER/INTERNET SESSION Chairs: Ivan V. Fedosov, Daria K. Tuchina, Saratov State Univ., Russia Moderators: Ivan V. Fedosov, Michael M. Slepchenkov, Arseniy P. Fashchevskiy, Alexander I. Dubrovsky, Saratov State Univ., Russia			<i>Building 3</i>
September 25, Friday				
9.30-12.45	INVITED LECTURE/ ORAL SESSIONS BIOPHYSICS VI Chairs: Elina Genina, Saratov State Univ., Russia			<i>Building 10, Room 503</i>
11.00-14.45	ON-LINE INVITED LECTURE/ORAL SESSION QUANTUM SCIENCE AND TECHNOLOGIES Chairs: Aleksey K. Fedorov, Evgeniy O. Kiktenko, Russian Quantum Center, Russia; National University of Science and Technology “MISIS” (Russia)			<i>Online</i>
14.00-18.00	OUTDOOR ROUND-TABLE DISCUSSIONS AND THE CONCLUSION OF SFM-25			<i>Open Air Meeting</i>

PLENARY SESSIONS

Saratov time/Moscow time

September 22, Tuesday

PLENARY SESSION I



11.10-11.50/10:10-10:50

CELL STIMULATION AND DELIVERY VIA REMOTE CONTROLLED COLLOIDS

Gleb B. Sukhorukov, Skolkovo Institute of Science and Technology, Skoltech; Life Improvement by Future Technologies, LIFT Center, Moscow, Russia



11.50-12.30/10:50-11:30

MULTIMODAL NONLINEAR OPTICAL IMAGING: INTEGRATING FLIM, SUPER-RESOLUTION, AND LABEL-FREE CONTRAST FOR BIOMEDICAL APPLICATIONS

Junle Qu, Medical Photonics Innovation Institute, College of Physics and Optoelectronic Engineering, Shenzhen University, Shenzhen, China; Ioffe Institute, Russian Academy of Sciences, Russia

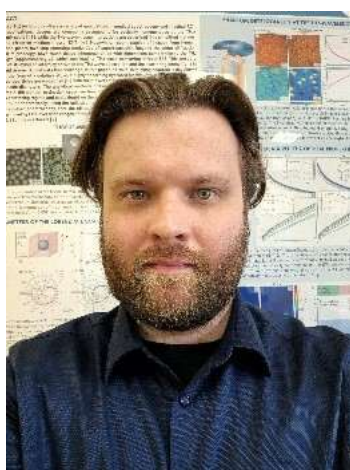
PLENARY SESSION II



16.00-16.40/15.00-15.40

MULTIFUNCTIONAL IRON OXIDE NANOPARTICLES: MRI CONTRAST AND LIGHT INDUCED DISSOLUTION

Dmitry A. Gorin, Skolkovo Institute of Science and Technology, Skoltech, Central University, Moscow, Russia



16.40-17.20/ 15.40-16.20

THZ-IR SPECTROSCOPY OF ASTROPHYSICAL ICE ANALOGUES: FROM THE MOST COMMON MOLECULES TOWARD SEEDS OF LIFE IN SPACE

Kirill Zaytsev, Prokhorov General Physics Institute of RAS, Moscow, Russia



17.50-18.30/ 16.50-17.30

ENDOGENOUS FLUORESCENCE OF TISSUES: NEW MECHANISMS AND CLINICAL TRANSLATION

Evgeny Shirshin , Lomonosov Moscow State University, Moscow, Russia

**September 23, Wednesday
PLENARY SESSION III**



10.00-10.40/9.00-9.40

COMPUTING WITH QUANTUM FLUIDS OF LIGHT

Pavlos Lagoudakis, Skolkovo Institute of Science and Technology, Skoltech, Moscow, Russia



10.40-11.20/9.40-10.20

ADVANCES IN OPTICAL AND OPTOACOUSTIC IMAGING

Vasilis Ntziachristos, Technical University of Munich, Munich, Germany

Conference on Optical Technologies in Biophysics & Medicine XXVII

Chairs: Valery V. Tuchin, Saratov State University, Institute of Precision Mechanics and Control of FRC "Saratov Scientific Centre of the RAS", Tomsk State University, Polina A. Timoshina, Elina A. Genina, Saratov State University; Tomsk State University (Russia)

Secretary: Isabella A. Serebryakova, Saratov State University (Russia)

International Program Committee: Vanderlei Salvador Bagnato, University of São Paulo (Brazil); Ivan A. Bratchenko, Samara University (Russia); Santhosh Chidangil, Manipal Academy of Higher Education (India); Elina A. Genina, Saratov State University (Russia); Mikhail Yu. Kirillin, Institute of Applied Physics RAS, Nizhny Novgorod (Russia); Yury V. Kistenev, Tomsk State University (Russia); Kirill V. Larin, University of Houston (USA); Ekaterina N. Lazareva, Saratov State University (Russia); Luís M. Oliveira, Polytechnic of Porto – School of Engineering (Porto, Portugal); Alexander V. Priezzhev, Moscow State University (Russia); Vladislav Shcheslavskiy, Privolzhsky Research Medical University, Nizhny Novgorod (Russia); Evgeny A. Shirshin, Research and Educational School "Photonic and Quantum Technologies. Digital Medicine," Lomonosov Moscow State University (Russia); Lihong Wang, Caltech (USA); Vladimir Yu. Zaitsev, FRC A.V. Gaponov-Grekhov Institute of Applied Physics of the RAS, Nizhny Novgorod (Russia); Valery P. Zakharov, Samara State University (Russia).

September 23, Wednesday

INVITED LECTURE/ORAL/ ON-LINE SESSION BIOPHYSICS I (Building 10, Main Hall)

Chairs: Ivan A. Bratchenko, Immanuel Kant Baltic Federal University, Russia; Andrei Dunaev, Orel State University, Orel, Russia
Moderator: Isabella Serebryakova, Saratov State University, Russia

Saratov time/Moscow time

11:20-11:40/10:20-10:40

Invited

Features of light modulation caused by a pulse wave of blood pressure

Natalia P. Podolyan, Mariya A. Asalkhanova, Timofey A. Efimov, Roman V. Romashko, Alexei A. Kamshilin; Institute of Automation and Control Processes of Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia

11:40-12:00/10:40-11:00

Invited

QPI, FLIM and AI in analysis of cell response to photodynamic treatment

Irina Semenova; Ioffe Institute, St. Petersburg, Russia

12:00-12:20/11:00-11:20

Invited

Optical biopsy in oncology: the promise of macroscopic fluorescence lifetime imaging

Marina V. Shirmanova; Institute of Experimental Oncology and Biomedical Technologies, Privolzhsky Research Medical University, Nizhny Novgorod

12:20-12:40/11:20-11:40

Invited

Advancing biomedical optoacoustic tomography: from 3D vascular imaging to deep-tissue 5D functional imaging

Pavel Subochev; Laboratory of Ultrasound and Optoacoustic Diagnostics, Department of Radiophysical Methods in Medicine, Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

13:00-14:00/12:00-13:00
LUNCH

INVITED LECTURE/ORAL/ ON-LINE SESSION BIOPHYSICS II (Building 10, Main Hall)

Chairs: Alexander V. Priezzhev, Andrei E. Lugovtsov, M.V. Lomonosov Moscow State University, Russia

Moderator: Isabella Serebryakova, Saratov State University, Russia

14:00-14:20/13:00-13:20

Invited

Optical resonances in photonic structures

Nikolay A. Gippius; Skoltech, Moscow, Russia

14:20-14:40/13:20-13:40

Invited

Quantum state dynamics in organic dyes and bacterial macromolecules excited by ultrashort resonant laser pulses

Sergey I. Kudryashov, Lebedev Physical Institute, Moscow, Russia

14:40-15:00/13:40-14:00

Invited

Mesoscopic fluorescence molecular tomography: a numerical study of the optical clearing effect

Alexander B. Konovalov¹, V. V. Vlasov¹, S. I. Samarin¹, D. K. Tuchina², V. V. Tuchin^{2,3,4}; ¹Russian Federal Nuclear Center – E. I. Zababakhin Institute of Technical Physics, Snezhinsk, Russia, ²Saratov State University, Saratov, Russia, ³Tomsk State University, Tomsk, Russia, ⁴FRC “Saratov Scientific Research Centre of the Russian Academy of Sciences”, Saratov

15:00-15:20/14:00-14:20

Invited

Optical multisensor wearable systems for non-invasive diagnostics of human functional state

Anna Zaitseva; Institute for Analytical Instrumentation of the Russian Academy of Sciences, Saint-Petersburg, Russia

15:20-15:40/14:20-14:40

Invited

Optical biopsy of human skin for the detection of neurological diseases and other non-infectious diseases

Ivan A. Bratchenko¹, Lyudmila A. Bratchenko¹, Yulia A. Khristoforova², Petr A. Lebedev³, Maria A. Skuratova⁴, Alexandr V. Zakharov³; ¹Immanuel Kant Baltic Federal University; ²Samara university; ³Samara state medical university; ⁴Samara City Clinical Hospital No.1 named after N.I.Pirogov

15:40-16:00/14:40-15:00

Invited

Sharpness enhancement of transmission imaging of structural objects in thick scattering media

Svetlana Shmavonyan¹, Aleksandr Khanbekyan¹, Marina Movsisyan¹, **Aram Papoyan**¹; ¹Institute for Physical Research, NAS of Armenia, Ashtarak-2, 0204, Armenia

16:00-16:30/15:00-15:30

Coffee break

**INVITED LECTURE/ORAL/
ON-LINE SESSION BIOPHYSICS III
(Building 10, Main Hall)**

Chairs: Nikolay A. Gippius; Skoltech, Moscow, Russia; **Sergey I. Kudryashov**, Lebedev Physical Institute, Moscow, Russia

Moderator: Isabella Serebryakova, Saratov State University, Russia

16:30-16:50/15:30-15:50

Invited

Wearable Multimodal Optical Analyzers: opportunities, problems and development prospects

Andrey Dunaev; Orel State University, Orel, Russia

16:50-17:10/15:50-16:10

Invited

Advances in Monte Carlo simulations for various optical diagnostics modalities

Mikhail Yu. Kirillin; Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

17:10-17:30/16:10-16:30

Invited

Laser-optical evaluation of blood microrheology preconditioning effect *in vitro*

Alexander V. Priezzhev¹, Matvei K. Maksimov¹, Danila A. Umerenkov¹, Pavel A. Moldon¹, Alexei V. Muravyov², Andrei E. Lugovtsov¹; ¹Lomonosov Moscow State University, Moscow, Russia; ²Ushinsky Yaroslavl State Pedagogical University, Yaroslavl, Russia

17:30-17:50/16:30-16:50

Invited

Physics-based adaptation of foundation models for applications in optical coherence tomography

Lev Matveev¹, Denis Nikoshin^{1,2}, Daniil Mikhailenko², Nataliya Matveeva^{1,2}, Konstantin Yashin³, Elena Kiseleva³, Sovetsky Alexander¹, Radik Zinatullin³, Olga Streltsova³, Petrova Ksenia⁴, Mariam Novgorodskaya³, Maria Kulagina^{1,4}, Kulagin Pavel^{1,4}, Artem Grishin³, Liudmila Kukhnina³, Svetlana Korikova³, Maxim Ryabkov³, Vladimir Y. Zaitsev¹, Alexander Matveyev¹; ¹Institute of Applied Sciences RAS, Nizhny Novgorod, Russia; ²HSE University, Nizhny Novgorod, Russia; ³Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ⁴N.I. Lobachevsky Research State University, Nizhny Novgorod, Russia

17:50-18:10/16:50-17:10

Invited

Photonics in Advanced Drug Delivery Systems

Arkady S. Abdurashitov^{1,2}, Olga A. Sindeeva¹, Pavel I. Proshin^{1,2}, Alexandra Y. Sain¹, Alexey S. Sokolov¹, Gleb B. Sukhorukov^{1,2}; ¹Center for Bio- and Medical Technologies, Skoltech; ²Life Improvement by Future Technology (LIFT) Center, Moscow, Russia

20.00-23.00

**EVENING BOAT TRIP - THE LIGHTS OF
SARATOV**

September 24, Thursday

INVITED LECTURE/ ORAL REPORT SESSIONS BIOPHYSICS IV (Building 10, Room 503)

Chairs: Valery V. Tuchin, Saratov State Univ., Russia; Dmitry A. Gorin, Skolkovo Institute of Science and Technology, Skoltech; Central University, Moscow, Russia

Moderator: Isabella Serebryakova, Saratov State University, Russia

09:40-10:00/08:40-09:00

Invited

Leaves are more than green: photonic crystal effects in photosynthesis and crop productivity

Eugene Bukhanov; Federal Research Center "Krasnoyarsk Science Center SB RAS", Krasnoyarsk, Russia

10:00-10:20/09:00-09:20

Invited

Metabolically activated Raman contrast enhanced by optical clearing for label-assisted mapping of tissue pathology

Olga Gusliakova¹, Ekaterina Prikhozhenko², Yuriy Surkov¹, Isabella Serebryakova¹, Natalia Shushunova¹, Valery Tuchin¹; ¹Science Medical Centre, Saratov State University, Russia; ²Laboratory of medical equipment in the field of in vitro diagnostics, Moscow Institute of Physics and Technology, Russia

10:20-10:40/09:20-09:40

Invited

Laser-assisted microfluidic analysis of red blood cell biomechanics and the effect of endothelial monolayer in the channel

Andrei E. Lugovtsov¹, Matvey K. Maksimov¹, Danila A. Umerenkov¹, Alexey N. Semenov², Olga N. Scheglovitova³ and Alexander V. Priezzhev¹; ¹M.V. Lomonosov Moscow State University, Moscow, Russia; ²University of Science and Technology MISIS, Moscow, Russia; ³N.F. Gamaleya National Research Center for Epidemiology and Microbiology, Moscow, Russia

10:40-11:00/09:40-10:00

Invited

Macrophage-mediated photodynamic therapy for renal cancer

Olga A. Sindeeva¹, Aleksandra Sain¹, Olga I. Gusliakova^{1,2}, Polina A. Demina^{1,2}, Gleb B. Sukhorukov^{1,3}; ¹Skolkovo Institute of Science and Technology, Moscow, Russia; ²Saratov State University, Saratov, Russia; ³Life Improvement by Future Technologies Center, Moscow, Russia; ⁴National Research Ogarev Mordovia State University, Saransk, Russia

11:00-11:15/10:00-10:15

Oral Report

Time-Resolved Fluorescence Polarization Spectroscopy Reveals the Origin of the Spectroscopic Properties of Natural Heterogeneous Molecular Systems

Egor V. Kvasov¹, Ioanna A. Gorbunova², Yaroslav M. Beltukov³, Maxim E. Sasin³, Boris P. Yakimov¹, Irina V. Perminova⁴, Peter S. Timashev^{2,5}, Evgeny A. Shirshin^{1,2}; ¹Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia; ²Institute for regenerative medicine, Sechenov First Moscow State Medical University, Moscow, Russia; ³Ioffe Institute, Saint-Petersburg, Russia; ⁴Department of Chemistry, Lomonosov Moscow State University, Moscow, Russia; ⁵Department of Biological Chemistry, Sechenov First Moscow State Medical University, Moscow, Russia

Photodynamic therapy in the trap of resistance: a path to overcoming through the induction of immunogenic cell death

Ekaterina Sleptsova¹, Alina Khuzina¹, Daria Sachkova^{2,3}, Diana Yuzhakova², Yevgeniya Sannova¹, Konstantin Yashin⁴, Nina Peskova³, Svetlana Lermontova⁵, Ilya Shchechkin^{2,6}, Larisa Klaphina⁵, Irina Balalaeva³, **Victoria Turubanova^{1,7}**; ¹Department of Genetics and Life Sciences, Sirius University, Sochi, Russia; ²Institute of Experimental Oncology and Biomedical Technologies, Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ³Institute of Biology and Biomedicine, Lobachevsky State University, Nizhny Novgorod, Russia; ⁴Department of Neurosurgery, Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ⁵Sector of Chromophors for Medicine, G.A. Razuvaev Institute of Organometallic Chemistry of the Russian Academy of Sciences, Nizhny Novgorod, Russia; ⁶Institute of Information Technology, Mathematics and Mechanics, Lobachevsky State University, Nizhny Novgorod, Russia; ⁷Institute of Neurosciences, Lobachevsky State University, Nizhny Novgorod, Russia

11:15-11:30/10:15-10:30

Oral Report

Polarization-modulation pump-probe spectroscopy for biological molecules: Linear dichroism and birefringence

Denis A. Volkov¹, Maxim V. Belashov^{1,2}, Anastasia V. Dmitrieva^{1,3}, Maria A. Plotitsyna^{1,3}, Maxim E. Sasin¹, Oleg S. Vasutinskii¹; ¹Ioffe Institute, St. Petersburg, Russia; ²ITMO University, St. Petersburg, Russia; ³Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia

11:30-12:00/10:30-11:00
Coffee break

12:00-12:15/11:00-11:15

Oral Report

Multispectral optical coherence tomography: longitudinal spatial resolution improvement and limitations Ulyana A. Makarenko¹, Zoya A. Erovenko¹, Aleksandr V. Petrov¹, **Nikolai A. Ushakov¹**; ¹Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia

12:15-12:30/11:15-11:30

Oral Report

Local heating of water by high-intensity laser radiation
Ivan S. Petrov¹, Sergey A. Burikov¹, Tatiana A. Dolgova¹; ¹Lomonosov Moscow State University, Moscow, Russia

12:30-12:45/11:30-11:45

Oral Report

Numerical study of the effect of an external field on the synchronization of a small ensemble of nanooscillators
Kristina M. Stankevich¹, Oleg Y. Butkovskiy¹; ¹Vladimir State University, Vladimir, Russia

12:45-13:00/11:45-12:00

Oral Report

Time-Domain NIRS system for Deep Tissue Probing
Vladislav I. Sharov¹; ¹Joint Institute for Nuclear Research, Dubna, Russia

13:00-13:15/12:00-12:15

Online Oral Report

Analysis of Spectral properties of DNA complexes with biological active dyes *in vitro* to establish the molecular mechanism of their action
Nina Kasyanenko¹, Boris Paponov², Ariana Chuvakina¹, Vladimir Bakulev¹; ¹Saint Petersburg State University, Saint Petersburg, Russia; ²Pavlov University, Saint Petersburg, Russia

13:15-15:00/12:15-14:00
LUNCH

**INVITED LECTURE/ ORAL REPORT
SESSIONS BIOPHYSICS V
(Building 10, Room 503)**

Chairs: Mikhail Yu. Kirillin; Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, **Andrei E. Lugovtsov**; M.V. Lomonosov Moscow State University, Moscow, Russia
Moderator: Isabella Serebryakova, Saratov State University, Russia

15:00-15:15/14:00-14:15

Oral Report

Fluorescence lifetime imaging microscopy and its biological applications

Fangrui Lin^{1,2}, Xin Zhen¹, Min Yi¹, Junle Qu¹; ¹Shenzhen Key Laboratory of Photonics and Biophotonics, College of Physics and Optoelectronic Engineering, Shenzhen University, Shenzhen, China; ²Department of Biomedical Engineering, the Hong Kong Polytechnic University, Hong Kong, China.

15:15-15:30/14:15-14:30

Oral Report

Wearable optical devices for assessing cosmonauts microcirculatory-tissue system responses to simulated spaceflight factors
Yulia I. Loktionova¹, Kireev K.S.^{1,2}, Zharkikh E.V.¹, Lutsevich D.N.², Yanushin V.S.¹, Sidorov V.V.³, Dunaev A.V.¹; ¹Orel State University named after I.S. Turgenev, Orel, Russia; ²State Organization "Gagarin Research and Test Cosmonaut Training Center", Zvyozdny gorodok, Russia; ³SPE "LAZMA" Ltd., Moscow, Russia

15:30-15:45/14:30-14:45

Oral Report

Application of terahertz microscopy in biophotonics and microfluidics
V.A. Zhelnov¹, D.R. Il'enkova¹, D.D. Rybnikov¹, D.S. Ustyantseva¹, V.V. Koroleva¹, K.I. Zaytsev¹, **N.V. Chernomyrdin¹**; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

15:45-16:00/14:45-15:00

Oral Report

Optical methods of hydrodynamic cavitation validation: correlation with hydrodynamic parameters
Anna A. Pronchenko¹, M.A. Zavyalova^{1,2}, Eduard V. Arbuzov^{1,3}, Igor F. Sekiro³, Aleksandr A. Drannikov^{1,4,5}, Igor I. Korel¹; ¹Novosibirsk State Technical University, Novosibirsk, Russia; ²Design and Technological Institute of Scientific Instrumentation SB RAS, Novosibirsk, Russia; ³S.S. Kutateladze Institute of Thermophysics Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia; ⁴Novosibirsk State University, Novosibirsk, Russia; ⁵N.N. Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences, Novosibirsk, Russia

16:00-16:20/15:00-15:20

Invited online

Polarized femtosecond spectroscopy as a tool for understanding of the mechanisms of intercellular reactions
Oleg Vasyutinskii; Ioffe Institute, St.Petersburg, Russia

16:20-16:35/15:20-15:35

Oral Report

Nonlinear thermal response of water-saturated tissue phantoms under IR laser heating: experiment and modelling

Alexey V. Konovalov¹, Yulia K. Sedova¹,
Alexander P. Sviridov¹; ¹NRC "Kurchatov
Institute", Moscow, Russia

16:35-16:50/15:35-15:50

Oral Report

**Determination of the Refractive Index
Increment for Binary Mixtures of Albumin and
Gamma-Globulin**

Tamara M. Innokenteva¹, Victoria V. Gibizova¹;
¹Federal State Budgetary Educational Institution of
Higher Education "Lomonosov Moscow State
University", Moscow, Russia

16:50-17:05/15:50-16:05

Oral Report

**Photodynamic therapy in the trap of resistance:
a path to overcoming through the induction of
immunogenic cell death**

Ekaterina Sleptsova¹, Alina Khuzina¹, Daria
Sachkova^{2,3}, Diana Yuzhakova², Yevgeniya
Sannova¹, Konstantin Yashin⁴, Nina Peskova³,
Svetlana Lermontova⁵, Ilya Shchechkin^{2,6}, Larisa
Klapshina⁵, Irina Balalaeva³, **Victoria
Turubanova^{1,7}**; ¹Department of Genetics and Life
Sciences, Sirius University, Sochi, Russia; ²Institute
of Experimental Oncology and Biomedical
Technologies, Privolzhsky Research Medical
University, Nizhny Novgorod, Russia; ³Institute of
Biology and Biomedicine, Lobachevsky State
University, Nizhny Novgorod, Russia; ⁴Department
of Neurosurgery, Privolzhsky Research Medical
University, Nizhny Novgorod, Russia; ⁵Sector of
Chromophors for Medicine, G.A. Razuvaev Institute
of Organometallic Chemistry of the Russian
Academy of Sciences, Nizhny Novgorod, Russia;
⁶Institute of Information Technology, Mathematics
and Mechanics, Lobachevsky State University,
Nizhny Novgorod, Russia; ⁷Institute of
Neurosciences, Lobachevsky State University,
Nizhny Novgorod, Russia

17:05-17:20/16:05-16:20

Online Oral Report

**Development of a Photoacoustic Sensor
Prototype for Non-Invasive In Vivo Glucose
Concentration Measurement**

Vladimir A. Kozlov¹, Anna A. Kozlova¹, Daniil N.
Bratashov¹; ¹Moscow Institute of Physics and
Technology (National Research University),
Moscow, Russia

17:20-17:30/16:20-16:30

Online Report (recorded)

**Evaluation of laser-induced effects on
multilayer tissues of hollow organs by
determining their optical properties**

Anna A. Krivetskaya^{1,2}, Daniil M. Kustov¹,
Vladimir V. Levkin³, Sergey S. Kharnas³, and
Tatiana A. Savelieva^{1,2}; ¹Prokhorov General
Physics Institute of the Russian Academy of
Sciences, Moscow, Russia; ²Institute of
Engineering Physics for Biomedicine, National
Research Nuclear University MEPhI, Moscow,
Russia; ³Department of Faculty Surgery No. 1, I.M.

Sechenov First Moscow State Medical University,
Moscow, Russia

17:30-17:40/16:30-16:40

Online Report (recorded)

**Synergy of LIFT- produced Metal Nanoparticles
and antibiotics against clinical bacterial strains**

Alena A. Nastulyavichus¹, Eteri R. Tolordava¹,
Evgenia V. Ulturgasheva¹, Sofia P. Babina¹, Sergey
I. Kudryashov¹; ¹P.N. Lebedev Physical Institute of
the Russian Academy of Sciences, Russia

17:40-17:50/16:40-16:50

Online Report (recorded)

**Frontiers of Nano-Optics: Contemporary
Research and Emerging Applications**

Anastasia Vorobyova¹, Karolina Ilyenkova²;
¹Physics and Mathematics, Specialized
Educational and Scientific Center URFU (SESC
URFU), Ekaterinburg, Russian Federation;
²Environmental protection and energy
conservation, Gazprom Corporate Institute

17:50-18:00/16:50-17:00

Online Report (recorded)

**Correlation of Optical and Thermodynamic
Methods for Detecting Skin Collagen
Denaturation under IR Laser Heating**

Yulia K. Sedova², Natalia Y. Ignatieva¹, Olga L.
Zakharkina², Olga I. Baum², Alexei V. Yuzhakov²,
Alexander P. Sviridov²; ¹M. V. Lomonosov Moscow
State University; ²Institute of Photon Technologies
Kurchatov Complex of Crystallography and
Photonics NRC "Kurchatov Institute"

18:00-18:10/17:00-17:10

Online Report (recorded)

**Photocatalytic optical fibers with ZnO:Sn,Fe
coatings for localized reactive oxygen species
generation**

Egor P. Bykov¹, Larisa L. Khomutinnikova¹, Kirill V.
Babaev¹; ¹ITMO University, St. Petersburg, Russia

**JOINT INTERNET/POSTER SESSION
BIOPHYSICS (B)**

(Building 3, 3rd floor Hall)

*Chairs (B): Ivan V. Fedosov,
Saratov State Univ., Russia*

18:00-20:00

- 1B. Raman Spectroscopy Method for
Assessing the Quality of Buffer
Solutions Used in Biotechnology
Laboratories** Pavel E. Timchenko¹, Artem
D. Volov^{2,3}, Elena V. Timchenko^{1,3}, Larisa T.
Volova³, Alexander K. Strelkov², Andrei A.
Chernukhin¹; ¹Samara University, Samara,
Russia; ²Samara State Technical
University, Samara, Russia; ³Samara State
Medical University, Samara, Russia
- 2B. Raman spectroscopy method for
differentiating streptococcal strains**

- grown on agar media E.V. Timchenko^{1,2}, A.V. Lyamin², K.A. Kayumov², I.V. Bazhutova², D.G. Glubokov², L.T. Volova², P.E. Timchenko¹, Yu.D. Ityaksov¹, F.R. Bazhutov³; ¹Samara University, Samara, Russia; ²Samara State Medical University, Samara, Russia; ³M.V. Lomonosov Moscow State University, Faculty of Chemistry, Moscow, Russia
- 3B. Laser speckle-contrast imaging with light guidance by spatial light modulator for flow analysis (pilot study)** Igor O. Kozlov¹, Dmitry D. Stavtsev¹, Andrei A. Galiastov¹, Dmitry V. Telyshev^{1,2}; ¹Sechenov University, Moscow, Russia; ²National Research University of Electronic Technology, Moscow, Zelenograd, Russia
- 4B. Spectral Diagnostics of the Femoral Compact Bone Condition in Gangrene and Phlegmon** E.V. Timchenko^{1,2}, D.G. Glubokov², P.E. Timchenko¹, I.V. Bazhutova², L.T. Volova², F.R. Bazhutov³; ¹Samara University, Samara, Russia; ²Samara State Medical University, Samara, Russia; ³Lomonosov Moscow State University, Faculty of Chemistry, Moscow, Russia
- 5B. Using infrared oculography with the GVS-1 scientific equipment to study galvanic vestibular stimulation** Grigoriy L. Grigoryan, Grigoriy S. Bugriy, Anna P. Krutchinina, Anastasia A. Gross, Oleg V. Morozov, Vasily V. Sazonov, Matvey V. Egorov, David E. Kharabadze, Georgiy M. Nikoladze, Maksim A. Proshkin, Andrej V. Pravdivtsev, Denis G. Kim, Anna A. Ganitcheva, Yevgeniy A. Nabiulin, Andrey Ye. Sankin, Pavel Yu. Sukhotshev; Lomonosov Moscow State University
- 6B. Influence of microenvironmental parameters on the photophysical properties of protoporphyrin IX for bladder cancer diagnostics** Daria O. Suverneva¹, Afraa A. Hasan^{1,5}, Gleb S. Budylin², Ivan D. Filippov¹, Dmitry A. Davydov^{1,2}, Natalia V. Korneva⁶, Dmitry A. Kislyakov³, Vladislav I. Shcheslavskiy⁴, Evgeny A. Shirshin^{1,2}; ¹Lomonosov Moscow State University, Moscow, Russia; ²I.M. Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russia; ³Voskresensk Hospital, Voskresensk, Russia; ⁴Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ⁵VPG Laserone LLC, Fryazino, Russia; ⁶University Clinic of the Medical Scientific and Educational Center of Lomonosov Moscow State University, Moscow, Russia
- 7B. Ensemble learning for melanoma detection in hyperspectral skin images using chromophore-based features** Artem A. Borovkov¹, Irina A. Matveeva¹; ¹Samara National Research University, Samara, Russia
- 8B. Hybrid multiclass classification of dermatoscopic images based on clinically interpretable features and convolutional neural networks** Ekaterina S. Parfenova¹, Irina A. Matveeva¹; ¹Samara National Research University, Samara, Russia
- 9B. Photoditazine-Loaded Polyelectrolyte Microcapsules for Differentiation-Enhanced Photodynamic Therapy of Neuroblastoma** Alexandra Yu. Sain¹, Sofia A. Kreshchanovskaya^{1,2}, Olga I. Efimova¹, Vladimir P. Baklaushev³, Olga A. Sindeeva¹; ¹Skolkovo Institute of Science and Technology, Moscow, Russia; ²National Research University Higher School of Economics, Moscow, Russia; ³FSBI "Federal Center of Brain Research and Neurotechnologies", Moscow, Russia
- 10B. Mueller polarimetry for Alzheimer's disease analysis** Daria A. Kargina¹, Aleksandr S. Dyatlov¹, Dmitry V. Karlovets¹; ¹School of Physics and Engineering, ITMO University, St. Petersburg, Russia
- 11B. Hyperspectral Medical Image Alignment Method for Extracting Spectral Features** Artem P. Nepovinnov¹, Irina A. Matveeva¹; ¹Samara National Research University, Samara, Russia
- 12B. Raman spectroscopy of skin in predicting prognosis in patients with heart failure** Lyudmila A. Bratchenko¹, Yulia A. Khristoforova², Maria A. Skuratova³, Petr A. Lebedev⁴, Ivan A. Bratchenko¹; ¹Immanuel Kant Baltic Federal University, Kaliningrad, Russia; ²Samara University, Samara, Russia; ³Samara City Clinical Hospital No 1 named after N. I. Pirogov, Samara, Russia; ⁴Samara State Medical University, Samara, Russia
- 13B. The Influence of Feature-Space Similarity Between Original and Synthetic Dermoscopic Images on Classification Performance** Nikita K. Zakharov¹, Irina A. Matveeva¹; ¹Samara National Research University, Samara, Russia
- 14B. Biophysical profiling of tissue hypoxia via delayed luminescence of erythrosine** Azamat Ishemgulov¹, Sergey Letuta¹, Marina Senchukova²; ¹Institute of Micro- and Nanotechnology, Orenburg State University, Orenburg, Russia; ²Scientific and Clinical Center No. 3, Petrovsky National Research Centre of Surgery, Moscow, Russia
- 15B. Early Detection of Myocardial Infarction Based on Surface-Enhanced Raman Spectroscopy and Machine Learning** Irina A. Pimenova¹; ¹Samara National Research University, Samara, Russia
- 16B. Testing the hypothesis of the universality of the biochemical basis of**

- the skin in the diagnosis of chronic kidney disease using Raman spectroscopy and artificial intelligence Ksenia E. Tomnikova; Samara National Research University, Samara, Russia
- 17B. **Comparative analysis of deep learning architectures and ensemble methods for semantic segmentation of breast cancer histopathological images** Igor N. Tyrin¹, Irina A. Matveeva¹; ¹Samara National Research University, Samara, Russia
- 18B. **Visualization of cardiac-related perfusion oscillations using a laparoscopic laser speckle contrast imaging system** Vadim N. Prizemin¹, Nadezda V. Golubova¹, Viktor V. Dremin¹, Elena V. Potapova¹; ¹Orel State University named after I.S. Turgenev, Orel, Russia
- 19B. **Integrating Ultrasound and Optical Modalities to Characterize the Coupling Between Macrovascular and Microvascular Tone Dynamics** Andrey A. Sagaidachnyi¹, Andrey V. Antonov¹, Artyom S. Bakhmetyev^{1,2}, Dmitriy I. Mayskov¹, Ivan S. Zaletov¹, Anatoly V. Skripal¹; ¹Saratov State University, Saratov, Russia; ²Saratov State Medical University, Saratov, Russia
- 20B. **Method of spatial scanning of modulated laser radiation for outline imaging of interphalangeal joints** Svetlana Shmavonyan¹, Aleksandr Khanbekyan¹, Marina Movsisyan¹, Valery Tuchin^{2,3}, Aram Papoyan¹; ¹Institute for Physical Research of National Academy of Sciences of Armenia, Ashtarak-2, Armenia; ²Saratov State University, Institute of Physics and Science Medical Center, Saratov, Russian Federation; ³Institute of Precision Mechanics and Control, FRC "Saratov Scientific Centre of the RAS," Saratov, Russian Federation
- 21B. **The effect of selecting the measuring volume under structured illumination using LED** Victoria P. Fomicheva, Ivan V. Fedosov; Saratov State University, Saratov, Russia
- 22B. **Investigation of the Optical Properties of Rat Cholangiocarcinoma Tissue Using Upconversion Nanoparticles** Victoria A. Kovalenko¹, Navolokin N.A.², Mylnikov A.M.², Yanina I.Yu.¹; ¹Saratov State University, Saratov, Russia; ²Saratov State Medical University, Saratov, Russia
- 23B. **Study of microhemodynamic parameters and characteristics of erythrocytes during the development of pathology during photodynamic therapy with submicron nanoparticles** Ekaterina N. Lazareva¹, Arseniy P. Fashchevskiy¹, Artyom M. Mylnikov², Nikita A. Navolokin^{1,2,3}, Natalia A. Shushunova², Irina Yu. Yanina¹; ¹Saratov National Research State University named after N. G. Chernyshevsky, Saratov, Russia; ²Saratov State Medical University named after V. I. Razumovsky, Saratov, Russia; ³Pathomorphology Department of the State Healthcare Institution "Saratov City Clinical Hospital No. 1 named after Yu.Ya. Gordeeva", Saratov, Russia;
- 24B. **Experimental Comparison of Photodynamic Therapy Efficacy Using Indocyanine Green and Photosens in a Colorectal Cancer Model** Alena K. Shatenova¹, Natalia A. Shushunova², Vadim D. Genin¹, Alla B. Bucharaskaya², Elina A. Genina¹; ¹Saratov State University, Saratov, Russia; ²Saratov State Medical University, Saratov, Russia
- 25B. **Characteristics of Peripheral Blood Flow in Patients with Obstructive Sleep Apnea** Vyacheslav S. Yanushin¹, Yulia I. Loktionova¹, Elena V. Zharkikh¹, Viktor V. Sidorov², Viktoria K. Vorsina³, Yulia S. Kuznetsova³, Anastasia D. Solonina³, Alexander L. Kalinkin³, Andrei V. Dunaev¹; ¹Research and Development Center of Biomedical Photonics, Orel State University Named After I.S. Turgenev, Orel, Russia; ²"SPE LAZMA" Ltd., Moscow, Russia; ³Sleep Medicine Center, University Clinic, Moscow Research and Education Institute, Lomonosov Moscow State University, Moscow, Russia.
- 26B. **Numerical Simulation of Light Propagation in Blood Layer and Estimation of Wavelength Dependence of Absorbed Light Portion** Stepan Goncharov¹, Andrei Lugovtsov¹, Alexander Priezzhev¹; ¹Lomonosov Moscow State University, Moscow, Russia
- 27B. **Comparison of the effects of RBC manipulation with optical tweezers and with photonic nanojet** Lugovtsov A.E.¹, Ermolinskiy P.B.¹, Maksimov M.K.¹, Yu-Xuan Ren², Priezzhev A.V.¹; ¹Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia; ²Institute for Translational Brain Research, Fudan University, Shanghai, China
- 28B. **Investigation of Raman Signals from Healthy and Diabetic Animals** Asiedu Da-Costa Aboagye¹, Natalia Shushunova¹, D.N. Bratashov^{1,2}; ¹Saratov State University, Saratov, Russia; ²Moscow Institute of Physics and Technology, Dolgoprudny, Russia
- 29B. **Changes in diochemical and biophysical characteristics of blood in rats with model diabetes** Angelina A. Avanesyan¹, E.S. Tuchina¹, A.A. Doronkina¹, N.A. Shushunova¹; ¹Saratov State University, Saratov, Russia
- 30B. **Development of photodynamic therapy for cancer using nanoconjugates and indocyanine green** Maria Afonina¹, Elina Genina¹, Alla Bucharaskaya^{2,3}, Natalia Shushunova³, Vadim Genin¹, Vladimir

Bogatyrev⁴, Vitaly Khanadeev⁴, A. Simonenko⁴, Boris Khlebtsov⁴, Valery Tuchin^{1,6}; ¹Optics and Biophotonics Department, Saratov State University, Russia; ²Science Medical Center, Saratov State University, Russia; ³Department of Pathological Anatomy, Saratov State Medical University named after V.I. Razumovsky, Russia; ⁴Institute of Biochemistry and Physiology of Plants and Microorganisms, FRC "Saratov Scientific Centre of the Russian Academy of Sciences" (IBPPM RAS), Russia; ⁵Institute of Precision Mechanics and Control, FRC "Saratov Scientific Centre of the Russian Academy of Sciences", Russia; ⁶Laboratory of laser molecular imaging and machine learning, National Research Tomsk State University, Russia

- 31B. Alterations of blood microrheology in patients with cardiovascular diseases** Danila A. Umerenkov¹, Matvei K. Maksimov¹, Pavel A. Moldon¹, Larisa I. Dyachuk¹, Andei E. Lugovtsov¹, Alexander V. Priezzhev¹; ¹M.V. Lomonosov Moscow State University
- 32B. Morphometric and Optical Density Alterations of Red Blood Cells under PC-1 Tumor Progression and Upconversion Nanoparticle-Mediated Laser Exposure** Irina Y. Yanina, Ekaterina N. Lazareva, Arseniy P. Fashchevskiy; Saratov State University, Saratov, Russia
- 33B. Optical transparency enhancement of biological tissue using tartrazine-based food dye** Serafim E. Solovev¹, Valery V. Tuchin^{2,3,4}; ¹High School Ivlgino, Saratov, Russia; ²Saratov State University, ³FRC «Saratov Research Centre of the RAS», Saratov, Russia; ⁴Tomsk State University, Tomsk, Russia
- 34B. Analysis of Fluorescence Lifetime for the Characterization of the State of Dental Enamel** Varvara V. Dudenkova¹, Svetlana I. Gazhva¹, Anton A. Filimonov¹, Vladislav I. Shcheslavskiy¹; ¹Privolzhsky Research Medical University (PIMU)
- 35B. Application of a modified laser diffractometry method for assessing the morphological parameters of human and rat erythrocytes** Maria S. Lebedeva¹, Evgeniy G. Tsybrov², Sergey Yu. Nikitin¹; ¹Lomonosov Moscow State University, Faculty of Physics; ²Lomonosov Moscow State University, Faculty of Computational Mathematics and Cybernetics
- 36B. Data Augmentation and Machine Learning Classification of Serum SERS Spectra in Patients with Non-Infectious Diseases** Yulia Khristoforova¹, Angelina

Melnikova¹, Lyudmila Bratchenko², Maria Skuratova³, Petr Lebedev⁴, Ivan Bratchenko²; ¹Samara National Research University, Samara, Russian Federation; ²Immanuel Kant Baltic Federal University, Kaliningrad, Russian Federation; ³Samara City Clinical Hospital No. 1 named after N. I. Pirogov, Samara, Russian Federation; ⁴Samara State Medical University, Samara, Russian Federation

- 37B. Optical Transparency Enhancement of Biological Tissue Using Tartrazine-Based Food Dye** Serafim Solovev, Valery V. Tuchin; Saratov State University, Russia
- 38B. Development of a Nailfold Capillaroscopy System and a Simple Lightsheet Mesoscopy System Based on the OpenSPIM Open Project** Mikhail A. Makhortov¹, Ilya O. Kozhevnikov¹, Daniil N. Bratashov¹; ¹Saratov State University, Saratov, Russia
- 39B. Age as a limiting factor for the effectiveness of photostimulation of brain drainage function and cognitive abilities** Andrey V. Terskov¹, Viktoria V. Adushkina¹, Daria A. Zlatogorskaya¹, Alexander A. Shirokov^{1,2}, Oxana V. Semyachkina-Glushkovskaya¹; ¹Saratov State University, Saratov, Russia; ²Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia
- 40B. Alterations of blood microrheology in patients with autoimmune diseases** Pavel A. Moldon¹, Natalia A. Isaenko (Chernova)¹, Danila A. Umerenkov¹, Vera A. Podzolkova², Andrey E. Lugovtsov¹, Alexander V. Priezzhev¹, Pavel V. Berezhanskiy²; ¹M.V. Lomonosov Moscow State University, Moscow, Russia; ²I.M. Sechenov First Moscow State Medical University, Moscow, Russia
- 41B. Comparative analysis of simulation results for metal-enhanced fluorescence of fluorophore molecules using 0D and 3D approximations** Alexander N. Yakunin¹, Sergey V. Zarkov¹, Yuri A. Avetisyan¹, Garif G. Akchurin^{1,2}, Valery V. Tuchin^{1,2,3}; ¹Institute of Precision Mechanics and Control, Federal Research Centre "Saratov Scientific Centre of the Russian Academy of Sciences", Saratov, Russia; ²Department of Optics and Biophotonics and Science Medical Center, Saratov State University, Saratov, Russia; ³Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Tomsk, Russia

- 42B. Effect of photobiomodulation on the contractility of cervical lymphatic vessels in mice of different ages** Inna A. Blokhina¹, Anastasiia D. Kolabukhova¹, Anastasiia Semiachkina-Glushkovskaia¹, Dmitry V. Tuktarov², Nikita A. Navolokin³; ¹Department of Biology, Saratov State University, Saratov, Russia; ²Institute of Physics, Saratov State University, Saratov, Russia; ³Department of Pathological Anatomy, Saratov State Medical University, Saratov, Russia.
- 43B. A study of the effects of photobiomodulation on the elimination of beta-amyloid and the correction of age-related cognitive impairments in mice** Daria A. Zlatogorskaya¹, Victoria V. Adushkina¹, Alexander A. Shirokov²; ¹Department of Biology, Saratov State University, Saratov, Russia; ²Institute of Biochemistry and Physiology of Plants and Microorganisms of the Russian Academy of Sciences, Saratov, Russia
- 44B. Methylene Blue as a Novel Optical Clearing Agent** Aleksandr A. Petrov, Elina A. Genina; Saratov State University, Saratov, Russia
- 45B. Therapeutic effects of photobiomodulation for traumatic brain injury** Arina S. Evsiukova, Oxana V. Semyachkina-Glushkovskaya; Department of Biology, Saratov State University, Saratov, Russia
- 46B. Mechanisms of Age Differences in the Effectiveness of Phototherapy of Glioblastoma** Anastasiia D. Kolabukhova¹, Inna A. Blokhina¹, Aleksander V. Dmitrenko¹, Mohammad Reza Rashidian Vaziri², Ameneh Sazgarnia^{3,4}, Armin Imanparast^{3,4}, Alexander Shirokov^{5,6}; ¹Department of Biology, Saratov State University, Saratov, Russia; ²Department of Physics, Faculty of Sciences, Ferdowsi University of Mashhad, Mashhad, Iran; ³Medical Physics Research Center, Basic Sciences Research Institute, Mashhad University of Medical Sciences, Mashhad, Iran; ⁴Department of Medical Physics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran; ⁵Institute of Biochemistry and Physiology of Plants and Microorganisms; ⁶Saratov Scientific Centre of the Russian Academy of Sciences, Saratov, Russia
- 47B. Issues related to the optimization of plasmonic nanoparticles with enhanced hot electron generation for applications in biomedicine, photocatalysis, and technology** Sergey V. Zarkov¹, Yuri A. Avetisyan¹, Garif G. Akchurin^{1,2}, Alexander N. Yakunin¹, Valery V. Tuchin^{1,2,3}; ¹Institute of Precision Mechanics and Control, Federal Research Centre "Saratov Scientific Centre of the Russian Academy of Sciences", Saratov, Russia; ²Department of Optics and Biophotonics and Science Medical Center, Saratov State University, Saratov, Russia; ³Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Tomsk, Russia
- 48B. On the nonlinearity of the process of generating nonequilibrium hot electrons in the biological tissues of the eye in optical Femto Lasik technologies during laser vision correction** Garif G. Akchurin^{1,2}, George G. Akchurin^{1,3}, Yuri A. Avetisyan¹, Sergey V. Zarkov¹, Alexander N. Yakunin¹, Vladimir Yu. Maksimov³, Valery V. Tuchin^{1,2,4}; ¹Institute of Precision Mechanics and Control, Federal Research Centre "Saratov Scientific Centre of the Russian Academy of Sciences", Saratov, Russia; ²Department of Optics and Biophotonics and Science Medical Center, Saratov State University, Saratov, Russia; ³Laser Vision Correction and Microsurgery Center, Saratov, Russia; ⁴Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Tomsk, Russia
- 49B. Photobleaching fluorescent microscopy lymph flow velocimetry in lymphatic vessels associated with deep cervical lymph node in mice** Alexander I. Dubrovsky¹, Inna A. Blokhina², Alexander V. Dmitrenko², Ivan V. Fedosov¹, Oxana V. Semyachkina-Glushkovskaya²; ¹Institute of Physics, Saratov State University, Saratov, Russia; ²Department of Biology, Saratov State University, Saratov, Russia
- 50B. Time-Resolved OCT Tracking of Diffusion Kinetics in Collagen Matrices and Gelatin Phantoms During Optical Clearing** Arseniy P. Fashchevskiy, Yuriy I. Surkov, Isabella A. Serebryakova, Valery V. Tuchin; Saratov State University, Russia
- 51B. Multimodal imaging for the control of melanocytic neoplasms** Isabella A. Serebryakova¹, Yuriy I. Surkov¹, Olga Gusliakova¹, Natalia A. Shushunova¹, Arseniy P. Fashchevskiy¹, Elina A. Genina¹, Valery V. Tuchin¹; ¹Saratov State University, Saratov, Russia

52B. Optical clearing alters the sensitivity of laser speckle contrast imaging to flow velocity Surkov Y. I., Serebryakova I.A., Fashchevskiy A. P., Timoshina P.A., Genina E. A., Tuchin V. V.; Institute of Physics, Saratov State University, Saratov, Russia

53B. Electromagnetic device for modeling traumatic brain injury in rodents Dmitry V. Tuktarov^{1,2}, Dmitry A. Myagkov¹, Arina S. Evsyukova², Timofey S. Inozemtsev¹, Ivan V. Fedosov¹, Oxana V. Semyachkina-Glushkovskaya^{2,3}; ¹Institute of Physics, Saratov State University, Saratov, Russia; ²Department of Biology, Saratov State University, Saratov, Russia; ³Institute of Physics, Humboldt University, Berlin, Germany

54B. Multimodal Biophotonic Monitoring of Local Drug Delivery to the Kidney Natalia A. Shushunova¹, Arkady S. Abdurashitov², Ekaterina S. Prikhodzhenko³, Oksana A. Mayorova¹, Valentina O. Plastun¹, Olga I. Gusliakova¹, Oleg A. Kulikov⁴, Valery V. Tuchin¹, Gleb B. Sukhorukov², and Olga A. Sindeeva²; ¹Saratov State University, Saratov, Russia; ²Skolkovo Institute of Science and Technology, Moscow, Russia; ³Moscow Institute of Physics and Technology (National Research University), Moscow, Russia; ⁴Ogarev Mordovia State University, Saransk, Russia

55B. Spectroscopic Characterization of Dermatophyte Pigments: Implications for Photodynamic Therapy Ksenia A. Molchanova¹, Tatiana B. Nesterova², Elena S. Tuchina¹, Tatiana V. Sharabarina¹, Vadim D. Genin¹; ¹Saratov State University, Saratov, Russia; ²Saratov Regional Clinical Dermatology and Venereology Dispensary, Ministry of Healthcare of the Saratov Region, Saratov, Russia

September 25, Friday

INVITED LECTURE/ ORAL REPORT SESSIONS BIOPHYSICS V (Building 3, Big Physical Hall)

Chair: **Elina Genina**, Saratov State Univ., Russia

Moderator: **Isabella Serebryakova**, Saratov State University, Russia

09:45-10:00/8:45-09:00

Oral Report

Combined method for characterization of biological phantoms using optical coherence

tomography and a fiber-optic refractive Index sensor

Liubov D. Zavalishina¹, Aleksandr A. Markvart¹, Uliana A. Makarenko¹, Leonid B. Liokumovich¹, Nikolai A. Ushakov¹; ¹Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia

10:00-10:15/09:00-09:15

Oral Report

Laser vaccine adjuvants in mice: laser sources and biological mechanisms

Anna Khokhlova¹, Yury Saenko¹, Anastasiia Spiridonova¹, Dmitry Korobko¹, Pavel Itrin¹, Maxime Pribylov¹, Aleksei Abanin¹, Sergei Sokolovski², Edik Rafailov² and Andrei Fotiadis^{1,3}; ¹S.P. Kapitsa Scientific Technological Research Institute, Ulyanovsk State University, Ulyanovsk, Russia; ²Optoelectronics and Biomedical Photonics Group, School of Engineering and Applied Science, Aston University, Birmingham, UK; ³Electromagnetism and Telecommunication Department, University of Mons, Mons, Belgium

10:15-10:30/09:15-09:30

Oral Report

Application of Dynamic Light Scattering to study microparticles in platelet concentrates

Peter A. Volkov¹, Alexander S. Gur'ev¹, Gleb M. Perepelkin¹, Alexander D. Levin¹; ¹All-Russian Research Institute for Optical and Physical Measurements, Moscow, Russia

10:30-10:45/09:30-09:46

Oral Report

Building an intelligent system for differential diagnosis of blood cancer through pattern recognition modules

Matvey V. Sedykh¹, Julia A. Brodskaya¹; ¹Gagarin's State Technical University of Saratov, Saratov, Russia

10:45-11:00/09:45-10:00

Oral Report

Intraoperative Diagnosis of Bladder Tumors Using Protoporphyrin IX (PpIX) Fluorescence Lifetime

Ivan D. Filippov¹, A. Hasan^{1,5}, Gleb S. Budylin², D. O. Suverneva¹, Denis A. Davydov^{1,2}, Nadezhda V. Korneva⁶, Dmitry A. Kislyakov³, Vladislav I. Shcheslavskiy⁴, Evgeny A. Shirshin^{1,2}; ¹Lomonosov Moscow State University, Moscow, Russia; ²I.M. Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russia; ³Voskresensk Hospital, Voskresensk, Moscow Region, Russia; ⁴Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ⁵VPG LaserONE LLC, Fryazino, Moscow Region, Russia; ⁶Lomonosov University Clinic, Moscow, Russia

11:00-11:15/10:00-10:15

Oral Report

Modeling of Intermolecular Interactions between Cyanine 7 and TNF-Related Amino Acid Chains

Bogdan A. Mishunin¹, Inna L. Plastun¹, Egor V. Nazariyev¹, Kirill A. Laptinsky², Tatyana A. Dolenko², Ruslan Y. Yakovlev³; ¹Yuri Gagarin State Technical University of Saratov; ²Lomonosov Moscow State University; ³LLC «Protonica», cluster «Lomonosov», Moscow

11:15-11:30/10:15-10:30

Oral Report

Phasor-based approach for resolving multicomponent fluorescence signals in frequency-domain FLIM

Ilya A. Goryunov¹, Daniil Y. Popov¹, Andrey Y. Vinokurov¹, Elena V. Potapova¹, Viktor V. Dremin¹; ¹Orel State University named after I.S. Turgenev, Orel, Russia

11:30-11:45/10:30-10:45

Oral Report

Assessment of developmental stages of infantile hemangiomas using hyperspectral imaging

Valery V. Shupletsov¹, Ilya A. Goryunov¹, Elena V. Potapova¹, Ivan P. Zhurilo², Andrey V. Dunaev¹, Victor V. Dremin¹; ¹Orel State University named after I.S. Turgenev, Orel, Russia; ²Tochka Opory Medical Center, Orel, Russia

11:45-12:00/10:45-11:00

Oral Report

Specific features of chromophore concentration estimation from multispectral data

Dariia Musaeva¹, T. Torokhov^{1,3}, B. Sheludko², S. German¹, R. Korobeinikov¹, M. Kuzyuk¹, V. Shibaeva¹, S. Korchagin², D. Gorin¹, S. Perkov^{1,2}; ¹Skolkovo Institute of Science and Technology (Skoltech), Moscow, Russia; ²Prokhorov General Physics Institute, Russian Academy of Sciences, Moscow, Russia; ³Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow, Russia

Conference on Internet Biophotonics XIX

Chairs: Daria K. Tuchina, Ivan V. Fedosov, Saratov State University, Saratov, Russia.

Secretary: Ksenia O. Merkulova, Saratov State University, Saratov, Russia.

International Program Committee: **Vanderlei Salvador Bagnato**, University of São Paulo (Brazil); **Ivan A. Bratchenko**, Samara University (Russia); **Santhosh Chidangil**, Manipal Academy of Higher Education (India); **Elina A. Genina**, Saratov State University (Russia); **Mikhail Yu. Kirillin**, Institute of Applied Physics RAS, Nizhny Novgorod (Russia); **Yury V. Kistenev**, Tomsk State University (Russia); **Kirill V. Larin**, University of Houston (USA); **Ekaterina N. Lazareva**, Saratov State University (Russia); **Luís M. Oliveira**, Polytechnic of Porto – School of Engineering (Porto, Portugal); **Alexander V. Priezzhev**, Moscow State University (Russia); **Vladislav Shcheslavskiy**, Privolzhsky Research Medical University, Nizhny Novgorod (Russia); **Evgeny A. Shirshin**, Research and Educational School “Photonic and Quantum Technologies. Digital Medicine,” Lomonosov Moscow State University (Russia); **Lihong Wang**, Caltech (USA); **Vladimir Yu. Zaitsev**, FRC A.V. Gaponov-Grekhov Institute of Applied Physics of the RAS, Nizhny Novgorod (Russia); **Valery P. Zakharov**, Samara State University (Russia).

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Physics-assisted light-field microscopy enables high temporal-spatial resolution 3D observation

Dongyu Li; Huazhong University of Science and Technology, Wuhan, China

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Physiological effects of photobiomodulation therapy in the treatment of multiple concussive traumatic brain injury

Denis E. Bragin^{1,2,3}, **Fazle Kibria**¹, **Olga A. Bragina**¹, **Eduardo Colombari**⁴, **Alexey Trofimo**⁵, **Dmitriy Atochin**⁶, **Satoshi Kashiwagi**⁶, **Patric Stanton**³, **Edwin Nemoto**²; ¹Lovelace Biomedical Research Institute, Albuquerque, NM, USA, ²University of New Mexico School of Medicine, Albuquerque, NM, USA, ³New York Medical College, Valhalla, NY, ⁴São Paulo State University, Araraquara, Brazil, ⁵Privolzhsky Research Medical University, Nizhny Novgorod, Russia, ⁶Massachusetts General Hospital, Harvard University, Charlestown, MA, USA

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Micro-Raman spectroscopy of extracellular vesicles derived from stored blood components: towards label-free molecular characterization

Mithun N¹, **Santhosh Chidangil**^{1,2}; ¹Centre of Excellence for Biophotonics, Manipal Institute of Applied Physics, Manipal Academy of Higher Education, Manipal, Karnataka, India, ²Department of Physics, JSS Science and Technology University, Mysuru, Karnataka, India

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Characterization of optical clearing mechanisms in kidney tissues: discrimination of clear cell renal cell carcinoma

Maria R. Pinheiro^{1,2}, **Maria I. Carvalho**^{1,2}, **Valery V. Tuchin**^{3,4,5}, **Luís M. Oliveira**^{1,6}; ¹Institute for Systems and Computer Engineering, Technology and Science (INESC TEC), Porto, Portugal, ²Faculty of Engineering, University of Porto (FEUP), Porto, Portugal; ³Saratov State University, Saratov, Russia, ⁴Institute of Precision Mechanics and Control, Saratov Scientific Centre of the Russian Academy of Sciences, Saratov, Russia, ⁵Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Tomsk, Russia, ⁶School of Engineering, Polytechnic of Porto, Porto, Portugal

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Sub-femtonewton force sensing and super-resolved temperature measuring

Fan Wang; Beihang University, Peking, China

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Nonlinear optical microscopy for biomedical applications

Nirmal Mazumder; Department of Biophysics, Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal, India

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Indocyanine green-mediated photodynamic therapy in combined chemotherapy of tsc cancer model

Afshan Shirkavand, Medical Laser Research Center, YARA institute, ACECR, Tehran, Iran

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Dual-wavelength laser system for skin vessels treatment: theory and experiments

Andrei V. Belikov¹, **Viktor Yu. Chuchin**^{1,2}; ¹ITMO University Saint Petersburg, Russia; ²VOLO LLC, Saint Petersburg, Russia

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Photosensitizer-free singlet oxygen release: from cancer treatment to cell bioenergetic stimulation

Viktor V. Dremine, Orel State University, Orel, Russia; Aston University, UK

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Hydration kinetics of the dorsal stratum corneum studied by ultra-high-resolution visible-light OCT

Stephen J. Matcher^{1,2,3}, M Duan^{1,2,*}, D Revin¹;

¹School of Electrical and Electronic Engineering, University of Sheffield, UK; ²Sheffield Dermatology Research, University of Sheffield, UK; ³INSIGNEO Institute, University of Sheffield, UK; *current address: Department of Dermatology, West China Hospital, Sichuan University, China

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The synergistic effect of light and sound waves on melanoma treatment

Vanderlei S. Bagnato; University of São Paulo, IFSC, Brazil

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Laser-induced graphene on a polyimide film for photothermal skin tumor therapy

Lyubov S. Parshina, Alexey V. Kiselev, Dmitry S. Gusev, Maria R. Konnikova, Vladimir A. Mikhalevsky, Olga P. Cherkasova; National Research Centre «Kurchatov Institute», Moscow, Russia

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1 T MRI and biophotonics methods: synergy of approaches in biomedical research

Victoria Zherdeva; Research Center of Biotechnology Russian Academy of Sciences, Moscow, Russia

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In vivo evaluation of dental restorations: colour image analysis vs low-coherent optical computer tomography

Nadezda O. Bessudnova, Sergey B. Venig; Saratov State University, Saratov, Russia

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Assessment of peripheral hemodynamics by diffuse reflectance spectroscopy in the visible and near-infrared range in the cuprizone-induced demyelination model

Veronika N. Volodina¹, Anastasia A. Chervakova¹, Alexander V. Kolpakov², Diana Yu. Sokolova², Petr E. Zaitsev¹, Ulyana A. Apukhtina¹, Tatiana I. Yaremenko¹, Mikhail S. Krasnov¹, Nikolai N. Kuznetsov^{1,3}, Viktoria V. Zherdeva¹; ¹A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia, ²Faculty of Biomedical Engineering, Department of Biomedical Technical Systems, Bauman Moscow State Technical University, Moscow, Russia, ³FN 5 "Chemistry", Bauman Moscow State Technical University, Moscow, Russia

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Optical stimulation of nerve cell growth on nanoparticles arrays

Uliana E. Kurilova^{1,2}, Denis V. Novikov¹, Yulia V. Chumachenko¹, Andrey M. Tarasov¹, Sergey V. Dubkov¹, Dmitry G. Gromov¹, Irina A. Suetina³, Marina V. Mezentseva³, Alexander Yu. Gerasimenko^{1,2}; ¹National Research University "MIET", Moscow, Russia, ²Sechenov First Moscow State Medical University, Moscow, Russia, ³National Research Center for Epidemiology and Microbiology named after Honorary Academician N.F. Gamaleya, Moscow, Russia

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Detection of stromal collagen alterations in oral squamous cell carcinoma with ex vivo polarized light microscopy

Vathsala Patil¹, Adarsh Kudva², Nirmal Mazumder³, Gagan Raju³, Albin Joseph³, Chetana Chandrashekar⁴; ¹Department of Oral Medicine and Radiology, Manipal College of Dental Sciences, Manipal Academy of Higher Education, Manipal, Karnataka, India; ²Department of Oral and Maxillofacial Surgery, Manipal College of Dental Sciences, Manipal Academy of Higher Education, Manipal, Karnataka, India; ³Department of Biophysics, Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal, Karnataka, India; ⁴Department of Oral Pathology and Microbiology, Manipal College of Dental Sciences, Manipal Academy of Higher Education, Manipal, Karnataka, India

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Combined method for characterization of biological phantoms using optical coherence tomography and a fiber-optic refractive index sensor

Daniella L. Peres^{1,2}, Joaquim C. Felipe², Leandro L. Matos², Thiago M. Pereira³, Denise M. Zezell¹; ¹Nuclear and Energy Research Institute, Brazil; ²University of São Paulo, Brazil; ³Federal University of São Paulo, Brazil

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Deep Learning-Driven Preprocessing of FTIR Spectra via 1D-CNN for Antibiotic Monitoring

Vinicius P. Anjos¹, Daniela F. T. Silva¹, Mario O. Menezes¹, Denise M. Zezell¹; ¹Instituto de Pesquisas Energéticas e Nucleares, Universidade de São Paulo, São Paulo, Brazil

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INTERNET POSTERS

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1. Intelligent data analysis of electrophysical characteristics of nanocomposites for microelectronics and biosensors

Sergey Korchagin; Financial University under the Government of the Russian Federation, Moscow, Russia

2. Comparison of morphological changes in organs and tumors in mice bearing CT-26 tumors and rats bearing PC-1 tumors during photodynamic therapy with a submicron-scale complex

Artyom M. Mylnikov¹, Nikita A. Navolokin¹, Irina Yu. Yanina²; ¹Saratov State Medical University, Saratov, ²Saratov State University, Saratov

3. Protein-like and humic fluorescence of CDOM in meromictic lakes of the White sea

Anna A. Afanaseva¹, Yulia G. Sokolovskaya¹, Elena D. Krasnova², Dmitry A. Voronov³, Svetlana V. Patsaeva¹; ¹Department of Physics, Moscow State University, Moscow, Russia, ²Department of Biology, Moscow State University, Moscow, Russia, ³Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow, Russia

4. Detection of fluoroquinolone antibiotics in water using spectrophotometry and fluorimetry

Yulia G. Sokolovskaya, Svetlana V. Patsaeva; Lomonosov Moscow State University, Moscow, Russia

5. Optical characteristics of CDOM in meromictic water bodies (White Sea) and their relationship with salinity

Anastasia I. Deeva¹, Yulia G. Sokolovskaya¹, Elena D. Krasnova², Dmitry A. Voronov³, Svetlana V. Patsaeva¹; ¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia, ²Faculty of Biology, Lomonosov Moscow State University, Moscow, Russia, ³Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow, Russia

6. In vivo study of skin optical clearing in rats with alloxan diabetes of varying duration

Daria K. Tuchina^{1,2}, Alla B. Bucharskaya³, Valery V. Tuchin^{1,2,4}; ¹Saratov State University, Saratov, Russia, ²Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University,

Tomsk, Russia, ³Saratov State Medical University, Saratov, Russia, ⁴Institute of Precision Mechanics and Control, FRS "Saratov Scientific Centre of the RAS", Saratov, Russia

7. DNA binding with metallocomplexes of lanthanide (III) in solution

Natalia A. Komolkina¹, Marina A. Uvarova², Nina A. Kasyanenko¹; ¹Faculty of Physics of Saint Petersburg State University, Saint Petersburg, Russia; ²Kurnakov Institute of General and Inorganic Chemistry of the Russian Academy of Sciences, Moscow, Russia

8. Spectral Analysis of Allogeneic Coatings of Combined Biosynthetic Mesh Implants

Polina I. Pyataeva¹, Pavel V. Shulepov², Elena V. Timchenko^{1,2}, Pavel E. Timchenko², Nicolay A. Ryabov^{1,2}, Larisa T. Volova^{1,2}; ¹Samara University, Samara, Russia; ²Samara State Medical University, Samara, Russia

9. Investigation of Combined Photodynamic and Plasmonic Photothermal Therapy in a Murine Model of Colorectal Carcinoma

Alla B. Bucharskaya^{1,2*}, Vadim D. Genin², Nikita A. Navolokin^{1,2}, Vladimir A. Bogatyrev³, Natalya A. Shushunova^{1,2}, Olga I. Gusliakova², Boris N. Khlebtsov³, Nikolay G. Khlebtsov³, Elina A. Genina², Valery V. Tuchin²; ¹Saratov State Medical University, Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia

10. Combined disorders in the brain and heart at the early stages of the stress response in arterial hypertension (experimental study)

Tatyana P. Romanova¹, Olga V. Zlobina¹, Ekaterina M. Kostromina¹, Tatyana V. Perevoznikova¹, Svetlana S. Pakhomiy¹, Oleg O. Zlobin²; ¹Saratov State Medical University named after V. I. Razumovsky, Saratov, Russia; ²Saratov Medical University "Reaviz", Saratov, Russia

11. FEM solver for confined quantum system: hydrogen atom or ion in uniform magnetic

Oleg O. Kovalev^{1,2}, Vladimir L. Derbov³, Alexander A. Gusev^{2,3,4}, Luong Le Hai⁵, Sergue I. Vinitisky^{1,2,6}; ¹Joint Institute for Nuclear Research, Dubna, Russia; ²Dubna State University, Dubna, Russian Federation; ³N.G. Chernyshevsky Saratov State University, Saratov, Russia; ⁴School of Applied Sciences, Mongolian University of Science and Technology, Ulaanbaatar, Mongolia; ⁵Ho Chi Minh city University of Education, Ho Chi Minh City, Viet Nam; ⁶RUDN University, Moscow, Russia.

12. Prevention and early diagnosis of diabetic skin complications using optical and biophotonic imaging in Niger

Adamou Soli Idrissa¹, Mahamane Sani M. Aminou^{1,4}, Moussa Issoufou Djibrillou^{1,2}, Mamane Barga Aboubacar^{1,4}, Salissou Laouali^{2,3}, Ali Ada⁵; ¹Radio-isotopes Institute, Abdou Moumouni University, Niamey, Niger; ²Faculty of Health Sciences, Abdou Moumouni University, Niamey, Niger; ³National Hospital of Niamey; ⁴Reference General Hospital of Niamey; ⁵Magori Policlinic of Niamey, Niger

Workshop on Laser Physics and Photonics XXVIII

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

Secretary: **Svetlana V. Churochkina**, Saratov State University (Russia)

Program Committee **Vladimir L. Derbov** (Chair), Saratov State University (Russia), **Alexander V. Gorokhov**, Samara University (Russia), **Alexander P. Kuznetsov**, Institute of Radio-Engineering of RAS (Russia), **Leonid A. Melnikov**, Yuri Gagarin State Technical University of Saratov (Russia), **Yuri V. Popov**, Lomonosov Moscow State University (Russia), **Vladimir P. Ryabukho**, IPM&C RAS (Russia), **Sergue I. Vinitsky**, Joint Institute for Nuclear Research (Russia), **Aleksey M. Zheltikov**, Lomonosov Moscow State University (Russia), **Ivan A. Shcherbakov**, Prokhorov General Physics Institute of RAS (Russia), **Dmitry V. Churochkin**, Saratov State University (Russia)

September 23, Wednesday

**INVITED LECTURE / ORAL SESSION
PHOTONICS / ONLINE ORAL REPORT
PHOTONICS**

(Building 10, Hall 503)

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

Saratov time/Moscow time

14:00-14:25 / 13:00-13:25

Semiconductor lasers - new directions of development and applications: agrobiophotonics and laser medicine

Sergey N. Sokolov, Gevork T. Mikaelyan; INJECT RME LLC, Saratov, Russia

14:25-14:45 / 13:25-13:45

Pulse mode of electromagnetically induced transparency in a degenerate lambda-type energy level scheme

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

14:45-15:05 / 13:45-14:05

The influence of sub-cycle electric field pulse parameters on the excitation spectrum in boron nitride and its model analogues

Anatolii D. Panferov; Saratov State University, Saratov, Russia

15:05-15:25 / 14:05-14:25

Evolution of Airy beams in a mixed carbon nanotube medium

Natalia N. Yanyushkina; Volgograd State University, Volgograd, Russia

15:25-15:45 / 14:25-14:45

Spatiotemporal dynamics of broad-area VCSELs under external optical injection: stabilization of emission, pattern formation, and dissipative soliton structures

Elizaveta A. Yaronova^{1,2}, Dmitrii S. Riashchikov^{1,2}, Daria V. Agapova^{1,2}; ¹Samara Branch, Lebedev Physical Institute, Russian Academy of Sciences, Samara, Russia; ²Samara University, Samara, Russia

16:00-16:30 / 15:00-15:30

Coffee break

16:30-16:50 / 15:30-15:50

Exact dynamics of three Tavis–Cummings atoms interacting with a coherent resonator field

Alexander R. Bagrov, Eugene K. Bashkirov; Samara University, Samara, Russia

16:50-17:10 / 15:50-16:10

Spatial coherence analysis of wave fields in 4f system in diffraction phase microscopy

Natalia A. Talaikova; HSE University, Moscow, Russia

17:10-17:30 / 16:10-16:30

Optical square waves in a Kerr-nonlinear resonator with two delayed feedback loops

Anton A. Krents^{1,2}; ¹Samara University, Samara, Russia; ²Samara Branch, Lebedev Physical Institute, Russian Academy of Sciences, Samara, Russia

17:30-17:50 / 16:30-16:50

Design of a thin-film waveguide Luneburg lens within the framework of the asymptotic model of electromagnetic radiation

Danila A. Starikov^{1,2}, Dmitriy V. Divakov²; ¹Joint Institute for Nuclear Research, Dubna, Russia; ²Peoples' Friendship University of Russia, Moscow, Russia

17:50-18:10 / 16:50-17:10

Non-contact assessment of coating thickness of metal products using hyperspectral imaging

Kirill K. Nastepanin, Ilya A. Goryunov, Valera V. Shupletsov, Roman N. Polyakov; Orel State University named after I. S. Turgenev, Orel, Russia

September 24, Thursday

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

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

18:00-20:00 / 17:00-19:00

INTERNET POSTERS

- 1P. **Optically-integrated periodical micro- and nano-patterns in amorphous materials** Liubov I. Vostrikova^{1,2}; ¹Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia; ²Department of Informational Technologies of NSUEM, Novosibirsk, Russia
- 2P. **Structural distributions of induced electrostatic field upon volumetric all-optical poling** Igor A. Kartashev, Liubov I. Vostrikova; Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia
- 3P. **Atom-field entanglement in two-atom model with degenerate two-photon Raman transitions** Rodion K. Zakharov, Ali Othman, Eugene K. Bashkurov; Samara University, Samara, Russia
- 4P. **Study of caustics in the diffraction of a plane laser beam by a slit in form of a prescribed curve** Lyubov B. Dubman; Samara University, Samara, Russia
- 5P. **Dynamics of quantum and classical correlations in the three-qubit multiphoton Tavis-Cummings model with a vacuum resonator field** Eugene K. Bashkurov, Alexander R. Bagrov; Samara University, Samara, Russia
- 6P. **Raman spectroscopy for evaluating the effect of a paste based on allogeneic hydroxyapatite on the enamel of bovine molars** Nelly R. Valieva¹, Polina I. Pyataeva¹, Elena V. Pisareva¹, Elena V. Timchenko^{1,2}, Michael Yu. Vlasov^{1,2}, Pavel E. Timchenko¹, Larisa T. Volova^{1,2}; ¹Samara University, Samara, Russia; ²Samara State Medical University, Samara, Russia
- 7P. **Geometric analysis of the spiral intensity distribution to determine the order of the vortex phase component** Dmitry P. Serafimovich, Svetlana N. Khonina; Samara University, Samara, Russia
- 8P. **Non-coherent stimulation of all-optically created nonlinear polarizability in glass** Liubov I. Vostrikova^{1,2}; ¹Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia; ²Department of Informational Technologies of NSUEM, Novosibirsk, Russia
- 9P. **Three-dimensional intensity distribution of beams under double phase quantization in**

an asymmetric lens Olga A. Dyukareva; Samara University, Samara, Russia

- 10P. **Formation of light fields with variable orbital angular momentum using a diffractive spiral-toroidal lens** Valentin I. Logachev, Svetlana N. Khonina; Samara University, Samara, Russia
- 11P. **Dynamics of manylevel atoms in nonideal cavities** Alexander V. Gorokhov; Samara University, Samara, Russia
- 12P. **High order schemes for solving the time-dependent Schrödinger equation** Diana A. Volobueva^{1,2}, Alexandr A. Gusev^{1,3,4}, Ochdadrakh Chuluunbaatar^{1,4,5}, Vladimir L. Derbov⁶, Sergey I. Vinitsky^{1,7}; ¹Joint Institute for Nuclear Research, Dubna, Russia; ²Dubna branch of Lomonosov Moscow State University, Dubna, Russia; ³Dubna State University, Dubna, Russia; ⁴Mongolian University of Science and Technology, Ulaanbaatar, Mongolia; ⁵Institute of Mathematics and Digital Technology, Ulaanbaatar, Mongolia; ⁶Saratov State University, Saratov, Russia; ⁷RUDN University, Moscow, Russia
- 13P. **A study using mathematical modeling the dependence of the longitudinal coherence length of wave field from the width of its angular and frequency spectra** Lyudmila A. Maksimova, Natalya Yu. Mysina, Vladimir P. Ryabukho; IPTMU RAS - Separate structural subdivision of FRC "Saratov Scientific Center of the Russian Academy of Sciences", Saratov, Russia
- 14P. **Multi-order diffractive optical element for parallel optical classification of corneal pathologies** Pavel A. Khorin; Samara University, Samara, Russia

POSTER SESSION

- 1P. **Derivation of effective classical Hamiltonian for a single particle bouncing on a 3D system of oscillating atomic mirrors** Svetlana V. Churochkina, Petr D. Baranovsky, Dmitry V. Churochkin; Saratov State University, Saratov, Russia
- 2P. **Laser-processed multifunctional titanium metasurfaces for optics and biophotonics** Michael S. Kuritskij¹, Anna V. Tsibulnikova¹, Ivan I. Lyatun¹, Alena A. Kostrina¹, Vasily A. Slezhkin^{1,2}, Ilia G. Samusev¹; ¹Immanuel Kant Baltic Federal University, Kaliningrad, Russia; ²Kaliningrad State Technical University, Kaliningrad, Russia
- 3P. **Design of an effective refractive index for a generalized Luneburg lens with accuracy control** Enoel Arrokhó Ernandes, Dmitriy V. Divakov; RUDN University, Moscow, Russia
- 4P. **Influence of crystallographic orientation of diamond on the electrical and optical**

properties of the laser-graphitized surface

Kirill M. Dordzhiev, Yuri I. Borisov; Prokhorov
General Physics Institute of the Russian
Academy of Sciences, Moscow, Russia

5P. **Optical properties of graphene in a
quantum kinetic equation approach**

Vladislav A. Tseryupa, Stanislav A.
Smolyansky, Vadim V. Dmitriev, Dmitry V.
Churochkin; Saratov State University,
Saratov, Russia

6P. **RIT technologies in light diffusion
diagnostics: SCF against gaseous
immersion**

Anastasia O. Nazarova, Maria A.
Novikova, Dmitry A. Zimnyakov; Yuri Gagarin
State Technical University of Saratov,
Saratov, Russia

7P. **Single-wavelength photoacoustic
tomography for in vivo assessment of
polyelectrolyte carrier delivery**

Oksana A. Mayorova¹, Polina A. Demina¹, Natalia A.
Shushunova¹, Yulia I. Svenskaya¹, Ekaterina
S. Prikhodzhenko², Svetlana A. Shevtsova¹,
Ilia O. Kozhevnikov¹, Daniil N. Bratashov^{1,2};

¹Saratov State University, Saratov, Russia;

²Moscow Institute of Physics and Technology,
Dolgoprudnyy, Russia

Conference on Low-Dimensional Structures XVI

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

Secretaries: **Pavel V. Barkov**, Saratov State University (Russia), **Dmitry A. Kolosov**, Saratov State University (Russia)

International Program Committee: **Albert G. Nasibulin**, Skolkovo Institute of Science and Technology, Russia, **Irina V. Zaporotskova**, Volgograd State University, Volgograd, Russia, **Galina N. Maslyakova**, Saratov State Medical University named after V.I. Razumovsky, Saratov, Russia

September 23, Wednesday

INVITED LECTURE/ORAL/ ON-LINE SESSION (Building 8, Room 318)

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

Moderator: **Pavel Barkov**, Saratov State
University, Russia

Saratov time/Moscow time

11.00-11.30/10.00-10.30

Role of topology in electronic and electrical properties of hybrid graphene-carbon nanotube structures

Mikhail M. Slepchenkov; Saratov State University, Saratov, Russia

11.30-12.00/10.30-11.00

Unified deep potential model for hydrogen adsorption on pristine and Ti-decorated graphene

Sergey A. Sozykin; South Ural State University, Chelabinsk, Russia

12.00-12.15/11.00-11.15

Temperature effect on the resistivity of a photocurable biocompatible hydrogel based on a composite carbon nanomaterial with metallic nanoparticles and eosin y

Mikhail S. Savelyev¹; Alena A. Velchinskaya ¹; Ekaterina P. Otsupko¹; Ulyana E. Kurilova ^{1,2}; Alexander Yu. Gerasimenko^{1,2}; ¹ National Research University of Electronic Technology, MIET, Zelenograd, Moscow, Russia, ² I. M. Sechenov First Moscow State Medical University, Sechenovskiy University, Moscow, Russia

12.15-12.30/11.15-11.30

Surface degradation of M-type cathodes modified with nanocarbon

Tatyana M. Krachkovskaya¹, Yuliya V. Yakimovich^{1,2}, Anna A. Akst^{1,3}, Olga E. Glukhova^{1,3,4}, Aleksandr A. Petrunin³; ¹JSC "RPE "Almaz", Saratov, Russia; ²Saratov State Technical University, Saratov, Russia; ³Saratov State University, Saratov, Russia; ⁴First Moscow State Medical University named after I. M. Sechenov, Moscow, Russia

12.30-12.45/11.30-11.45

Unlocking the Dual-Functionality of G/LCO Cathodes: A DFT Study of Quantum Capacitance Evolution under Delithiation

Vladislav V. Shunaev¹, Alexander A. Petrunin¹, Semen G. Levitskiy¹, Olga E. Glukhova^{1,2}; ¹Saratov State University, Saratov, Russia; ²I. M. Sechenov First Moscow State Medical University

12.45-13.00/11.45-12.00

Control of Electron Transport in Quasi-2D Layered ZnO and CuO Films via Surface Modification

Pavel A. Kolesnichenko¹, Olga E. Glukhova^{1,2}; ¹Saratov State University, Saratov, Russia; ² I. M. Sechenov First Moscow State Medical University, Moscow, Russia

13.00-13.15/12.00-12.15

Carbon nanotubes (6,6) modified with copper and nickel atoms for detecting CO, CO₂, CH₄, and C₃H₆O

Dmitry F. Sergeev^{1,2}; ¹Volgograd State University, Volgograd, Russia; ²JSC All-Russian Research and Design Institute of Equipment for the Oil Refining and Petrochemical Industry, Volgograd, Russia

13.15-13.30/12.15-12.30

Ellipsometric analysis of a corrosion inhibitor in the mode of broken total internal reflection

Yatsyshen Valery Vasilyevich¹, Godlyauskas Oleg Vladislavas¹; ¹Volgograd State University, Volgograd, Russia

13.30-13.45/12.30-12.45

Calculation of ellipsometric parameters of reflected circularly polarized light from a dielectric film under surface plasmon resonance conditions

Yatsyshen Valery Vasilyevich¹, Ivanov Peter Sergeevich¹; ¹Volgograd State University, Volgograd, Russia

September 24, Wednesday

**INVITED LECTURE/ORAL/
ON-LINE SESSION**

(Building 8, Room 318)

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

Moderator: **Pavel Barkov**, Saratov State
University, Russia

Saratov time/Moscow time

11.00-11.15/10.00-10.15

Study of the electrophysical properties of multiscale structures based on carbon nanomaterials for neural interfaces

Denis T. Murashko¹, Boris M. Putrya¹, Krisitina D. Efremova^{1,2}, Ulyana E. Kurilova^{1,2}, Pavel N. Vasilevsky¹, Irina A. Suetina³, Marina V. Mezentseva³, Alexander Yu. Gerasimenko^{1,2}; ¹National Research University of Electronic Technology MIET, Shokin Square 1, 124498 Zelenograd, Moscow, Russia; ²I.M. Sechenov First Moscow State Medical University, Bolshaya Pirogovskaya street 2-4, 119991 Moscow, Russia; ³National Research Center for Epidemiology and Microbiology Named after the Honorary Academician N.F. Gamaleya, Gamaleya Street 18, 123098 Moscow, Russia

11.15-11.30/10.15-10.30

Development of laser-induced thin-film hybrid carbon nanocomposites for neurointerfaces and stimulation of neuroregeneration

Victoria V. Suchkova^{1,2}, Alexandra S. Ivanova¹, Ekaterina A. Demirskaya¹, Artem V. Kuksin², Alexander Yu. Gerasimenko^{1,2}; ¹Institute of Biomedical Systems, National Research University of Electronic Technology, Shokin Square 1, Zelenograd, 124498 Moscow, Russia; ²Institute for Bionic Technologies and Engineering, I.M. Sechenov First Moscow State Medical University, Bolshaya Pirogovskaya Street 2-4, 119435 Moscow, Russia

11.30-11.45/10.30-10.45

Carbon heterostructures based on carbon nanotubes and graphite formed by laser radiation

Artem V. Kuksin¹, Anastasia S. Morozova¹, Alexander Yu. Gerasimenko^{1,2}; ¹National Research University of Electronic Technology MIET, Zelenograd, Russia; ²I.M. Sechenov First Moscow State Medical University, Moscow, Russia

11.45-12.00/10.45-11.00

Investigation of the influence of the spatial structure of film strain-sensitive sensors on electromechanical properties

Anastasia S. Morozova¹, Ekaterina A. Demirskaya¹, Alexander Yu. Gerasimenko^{1,2}; ¹National Research University of Electronic Technology, Moscow, Zelenograd, Russia; ²I.M. Sechenov First Moscow State Medical University, Moscow, Russia

12.00-12.15/11.00-11.15

Experimental evaluation of the functional properties of carbon-based coatings for titanium biomedical devices

Kristina D. Efremova^{1,2}, Alexander Yu. Gerasimenko^{1,2}; ¹Institute of Biomedical Systems, National Research University "Moscow Institute of Electronic Technology," Zelenograd, Moscow, Russia; ²Institute of Bionic Technologies and Engineering, I.M. Sechenov First Moscow State Medical University, Moscow, Russia

12.15-12.30/11.15-11.30

Optical passive limiting of composite carbon nanomaterial: multi-walled nanotubes, reduced graphene oxide sheets, and zinc phthalocyanine

Pavel N. Vasilevsky¹, Mikhail S. Savelyev^{1,2}, Alexander Yu. Tolbin², Alexander Yu. Gerasimenko^{1,3}; ¹Institute of Biomedical Systems, National Research University of Electronic Technology, Zelenograd, Moscow, 124498, Russian Federation; ²FSBIS Institute of Physiologically Active Compounds of the Russian Academy of Sciences, Russian Academy of Sciences, Chernogolovka, Moscow Region, 142432, Russian Federation; ³Institute for Bionic Technologies and Engineering, Sechenov University, Moscow, 119991, Russian Federation

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

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

Saratov time/Moscow time

18.00-20.00/17.00-19.00

- 1L. **Investigation of the Morphology and Piezoelectric Properties of Mixed Langmuir Monolayers of PVDF and P(VDF:TFE)**

Ilya A. Gorbachev¹, Vladimir V. Kolesov¹;
¹IRE Kotelnikova RAS

- 2L. **The effect of iron doping of cadmium sulfide on the optical and photoelectric characteristics of the material**

Polina G. Kharitonova, Svetlana V. Stetsyura, Larisa D. Volkovoyanova, Saratov State University, Saratov, Russia

- 3L. **Key Parameters Screening of the Quantum Dot Synthesis**

Artyom K. Skvortsov, Victoria D. Gorlo, Danila A. Kornilov, Daniil D. Drozd, Pavel S. Pidenko, Irina Yu. Goryacheva, Natalia A. Burmistrova; Saratov State University, Saratov, Russia

- 4L. **Van der Waals heterostructures based on graphene and graphene-like materials: theoretical prediction**

Michael M. Slepchenkov¹, Dmitry A. Kolosov¹, Olga E. Glukhova^{1,2}; 1Saratov State University, Saratov, Russia; 2I.M. Sechenov First Moscow State Medical University, Moscow, Russia

- 5L. **Tunneling Current Control in Graphene-Nanotube Structures**

Michael M. Slepchenkov¹, Dmitry A. Kolosov¹, Olga E. Glukhova^{1,2}; 1Saratov State University, Saratov, Russia; 2I.M. Sechenov First Moscow State Medical University, Moscow, Russia

- 6L. **Patterns of influence of atomic network stretching on the electron-energy characteristics of thin films of perforated graphene**

Pavel V. Barkov¹, Mikhail M. Slepchenkov¹, Maria A. Davydova¹; 1Saratov State University, Saratov, Russia

- 7L. **Effect of Surface Adsorption of Ba, O, and BaO on the Work Function of Different Hafnium Phases**

Dmitry A. Kolosov¹, Olga E. Glukhova^{1,2}; 1Saratov State University, Saratov, Russia; 2I.M. Sechenov First Moscow State Medical University, Moscow, Russia

- 8L. **Adaptive Peptides as Promising Gas-Sensing Materials: Insights from Molecular Modeling**

Alexander A. Petrunin¹, Olga E. Glukhova^{1,2}; 1Saratov State University, Saratov, Russia; 2I.M. Sechenov First Moscow State Medical University

- 9L. **Binding of HIF-1 α on COOH-N-MWCNTs: Effect of Local Curvature**

Tatyana A. Sapezhinskaya¹, Nadezhda G. Bobenko¹, Vladislav V. Shunaev², Pavel A. Kolesnichenko^{1,2}, Olga E. Glukhova^{2,3}; 1Institute of Strength Physics and Materials Science of SB RAS, Tomsk, Russia; 2Saratov State University, Saratov, Russia; 3Institute for Bionic Technologies and Engineering, I.M. Sechenov First Moscow State Medical University, Moscow, Russia

- 10L. **Formation of polyaniline Langmuir films in various solvents**

Andrey D. Taranenko¹, Tatyana Ya. Karatyshova¹, Mikhail S. Korolev¹, Evgeny G. Glukhovskoy¹; 1Saratov State University, Saratov, Russia

- 11L. **Speckle-Mediated Gain Localization and Random Lasing Threshold in Scattering Media: A Numerical Study**

Leonid A. Kochkurov; Yuri Gagarin State Technical University of Saratov

Workshop on Nonlinear Dynamics XVII

Chair: Galina I. Strelkova, Institute of Physics, Saratov State University (Russia)

Secretary: Tatiana R. Bogatenko, Institute of Physics, Saratov State University (Russia)

International Program Committee: Jüergen Kurths, Humboldt University (Germany); Alexander Neiman, Ohio University (USA); Igor Khovanov, Warwick University (UK); Olga Sosnovtseva, University of Copenhagen (Denmark); Alexey N. Pavlov, Saratov State University (Russia); Tatjana E. Vadivasova, Saratov State University, (Russia); Alexey V. Shabunin, Saratov State University, (Russia); Dmitry E. Postnov, Saratov State University, (Russia).

September 24, Thursday

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

Chairs: **Galina I. Strelkova, Tatiana R. Bogatenko**, Saratov State University, Russia

Saratov time/Moscow time

14:00-14:15/13:00-13:15

Oral Report

Impact of Power Fluctuations on Synchronization in a Power Grid Model with Hub Topology

Vladislav D. Kuprijanov, Tatiana E. Vadivasova; Institute of Physics, Saratov State University, Saratov, Russia

14:15-14:30/13:15-13:30

Oral Report

Impact of combined coupling on the dynamics of a self-sustained oscillatory system with two degrees of freedom

Igor M. Nazin, Vladimir V. Astakhov, Galina I. Strelkova; Institute of Physics, Saratov State University, Saratov, Russia

14:30-14:45/13:30-13:45

Oral Report

Peculiarities of Synchronization of Randomly Interlayer Coupled Networks of Chaotic Maps

Vladislav M. Averyanov, Elena V. Rybalova, Galina I. Strelkova; Institute of Physics, Saratov State University, Saratov, Russia

14:45-15:00/13:45-14:00

Oral Report

A Numerical Study of the Effect of an External Field on the Synchronization of a Small Ensemble of Nano-Oscillators

Kristina M. Stankevich, Oleg Y. Butkovskiy; Vladimir State University, Vladimir, Russia

15:00-15:15/14:00-14:15

Oral Report

The effect of nonlocal coupling on coherent resonance in an ensemble of oscillators

Aleksey A. Ryabov, Vladimir V. Semenov; Institute of Physics, Saratov State University, Saratov, Russia

15:15-15:30/14:15-14:30

Oral Report

Chimera and solitary states in the ring of nonlocally coupled FitzHugh-Nagumo neurons with Lévy noise

Nataliia N. Nikishina, Elena V. Rybalova, Galina I. Strelkova; Institute of Physics, Saratov State University, Saratov, Russia

JOINT INTERNET/POSTER SESSION NONLINEAR DYNAMICS (ND) (Building 3)

Chairs: **Tatiana R. Bogatenko**, Saratov State University, Russia

18.15-20.30

1ND. Effects of coupling memristor noise on synchronization of periodic oscillators

V. A. Leonenko, T. E. Vadivasova; Institute of Physics, Saratov State University, Saratov, Russia

2ND. Impact of Internal Noise on the Performance of Trained Spiking Neural Networks

D. A. Maksimov, V. M. Moskvitin, N. I. Semenova; Institute of Physics, Saratov State University, Saratov

Conference on Nanobiophotonics XXII

Chair: **Nikolai G. Khlebtsov**, Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS), Saratov State University (Russia)

Secretary: **Vitaly A. Khanadeev**, Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS); Saratov State University of Genetics, Biotechnology, and Engineering named after N. I. Vavilov (Russia)

International Program Committee: **Roberto Pini**, Institute of Applied Physics (IFAC-CNR) National Research Council of Italy; **Jian Ye**, School of Biomedical Engineering & Med-X Research Institute Shanghai Jiao Tong University, China; **Boris Khlebtsov**, Saratov Scientific Centre of the Russian Academy of Sciences, Director (Russia); **Dmitry Gorin**, Scoltech, Saratov State University (Russia); **Irina Goryacheva**, Saratov State University (Russia); **Lev Dykman**, Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS, Russia); **Alexey Kononov**, Department of Molecular Biophysics and Polymer Physics, Saint Petersburg State University (Russia).

;

September 22, Tuesday

PLENARY SESSION (Building 10, Main Hall)

Chairs: **Valery V. Tuchin**, Saratov State Univ.; **Alexander V. Priezzhev**, Lomonosov Moscow State Univ., Russia;

16.00 – 16.40

Plenary Lecture

Multifunctional Iron Oxide Nanoparticles: MRI Contrast and Light Induced Dissolution

Ekaterina O. Moiseeva¹, Vsevolod A. Skribitsky², Dmitry E. Tsiurko¹, Sergei V. German^{1,3}, Alexey A. Lipengolts², Dmitry A. Gorin^{1,3}; ¹Skolkovo Institute of Science and Technology, Moscow, Russia; ²N.N. Blokhin National Medical Research Center of Oncology, Moscow, Russia; ³Central University, Moscow, Russia

September 23, Wednesday

ORAL/INVITED SESSION NANOBIOPHOTONICS (Building 9, Conference Hall)

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

12.00 – 12.20

Internet Invited

Mild metabolic imbalances rewiring the protein corona dictate albumin nanoparticle mechanics, cellular processing, and in vivo trafficking

Evgeniya R. Denisova^a, Maya V. Voronina^a, Daria S. Volkova^a, Dmitry Kostyushev^{b,c,d,e}, Andrey A. Zamyatnin Jr.^{e,f}, Marina V. Serebryakova^g, Andrey V. Zvyagin^a, Yan Wang^h, Neng Yan^h, Veronika A. Dimitrevaⁱ, Anton V. Zalyginⁱ, Elena N. Subcheva^a, Sabrina Biancol^{j,k}, Michele Costanzo^{k,l}, Armando Cevenini^{k,l}, Lyubov V. Krylova^{a,m}, Alessandro Parodi^{a,e}; ^aScientific Center for Translation Medicine, Sirius University of Science and

Technology, Sirius, Russia; ^bDepartment of biotechnology, Sechenov University; ^cLaboratory of genetic technologies in drug development, Sechenov University; ^dEngelhardt Institute of Molecular Biology, RAS; ^eFaculty of Bioengineering and Bioinformatics, Lomonosov Moscow State University; ^fDepartment of Biological Chemistry, Sechenov First Moscow State Medical University; ^gBelozersky Institute of Physico-Chemical Biology, Lomonosov Moscow State University; ^hSchool of Environmental Studies, China University of Geosciences, Wuhan, China; ⁱShemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Russian Academy of Sciences, Moscow, Russia; ^jDepartment of Experimental and Clinical Medicine, University of Catanzaro Magna Graecia, Viale Europa, Catanzaro, Italy; ^kCEINGE – Biotecnologie Avanzate Franco Salvatore, Naples, Italy; ^lDepartment of Molecular Medicine and Medical Biotechnology, University of Naples Federico II, Naples, Italy; ^mLobachevsky State University of Nizhny Novgorod, Russia

12.20 – 12.40

Invited

Bimetallic luminescent nanoclusters

Varvara G. Kubenko, Nikolay V. Shekhovtsov, Andrey A. Buglak, Alexei I. Kononov; Saint Petersburg State University, Saint Petersburg, Russia

**13.00–14.00
LUNCH**

14.00 – 14.20

Invited

Luminescent composite diamonds with core-shell and film architecture based on diamond with nanoparticles for photonics

Sergey V. Kuznetsov, V.S. Sedov, A.K. Martyanov, I.A. Tiazhelov, R.V. Romashchenko, S.Ch. Batygov, A.A. Alexandrov, D.S. Yasyrkina, A.S. Zaharova, V.V. Voronov; Prokhorov General Physics Institute of the Russian Academy of Sciences, Russia

14.20 – 14.35

Oral

Detection of the anti-tuberculosis antibiotic linezolid using AgInS/ZnS quantum dots

Vera V. Rodionova, Goryacheva I. Yu.; Saratov State University, Saratov, Russia

14.35 – 14.50

Oral

Application of machine learning methods for classification of biological tissue using the spectra of upconversion luminescence of NaYF₄:Yb³⁺/Tm³⁺ nanocomplexes

Kirill A. Buzanov, Sergey A. Burikov, Tatiana A. Dolenko; Moscow State University, Faculty of Physics, Moscow, Russia

14.50 – 15.05

Oral

CeYbF₃–Photoran complex for X-ray-Induced photodynamic therapy: energy transfer and cellular toxicity

Kamila E. Akhmetzyanova¹, Nail I. Shamsutdinov¹, Pavel V. Zelenikhin¹, Sergey Kh. Batygov², Sergey V. Kuznetsov², Sergey V. Zinchenko¹, Damir I. Safin¹, Maksim S. Pudovkin¹, Aleksey S. Nizamutdinov¹; ¹Kazan (Volga Region) Federal University, Kazan, Russia; ²Prokhorov General Physics Institute, Russian Academy of Sciences, Moscow, Russia

15.05 – 15.20

Oral

Sensing of various biomarkers with gold and gold-silver luminescent nanoclusters

Nikolay V. Shekhovtsov, Varvara G. Kubenko, Egor I. Alekseenko, Tomash S. Sych, and Alexei I. Kononov; Saint Petersburg State University, Saint Petersburg, Russia

15.20 – 15.35

Oral

Fiber optic few-mode needle for refractive index sensing

Aleksandr Markvart, Zavalishina L., Filonov V., Bobyleva O., Grazhdian A., Petrov A., Liokumovich L., Ushakov N.; Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia

15.35 – 15.50

Oral

Comparative photophysical characterization of chitosan-coated isotropic and anisotropic gold nanoparticles conjugated with a phthalocyanine photosensitizer

Puzanov-Tyurin D.A., Bogatyrev V.A., Khlebtsov N.G.; Institute of Biochemistry and Physiology of Plants and Microorganisms Russian Academy of Sciences (IBPPM RAS)

16.30 – 16.45

Oral

How to surface: facile technique for the Zn-rich QDs ligand exchange

Daniil D. Drozd, Artyom K. Skvortsov, Danila A. Kornilov, Daria G. Koganova, Olga A. Goryacheva, Irina Yu. Goryacheva; Saratov State University, Saratov, Russia

16.45 – 17.00

Oral

Intrafollicular glucocorticoid delivery to treat psoriasis-like skin inflammation

Yulia Svenskaya¹, Yury Surkov^{1,2}, Isabella Serebryakova^{1,2}, Mikhail Lobanov¹, Polina Demina¹, Mariia Saveleva¹, Natalia A. Shushunova¹, Elina A. Genina², Georgy S. Terentyuk¹, Valery V. Tuchin^{1,2,3}; ¹Science Medical Center, Saratov State University, Saratov, Russia; ²Institution of Physics, Saratov State University, Saratov, Russia; ³Institute of Precision Mechanics and Control, FRC "Saratov Scientific Centre of the RAS", Saratov, Russia

17.00 – 17.15

Oral

Protein Hydrogels as a Thermoinduced Platform for Controlled Antibiotic Release

Oksana A. Mayorova, Olga I. Gusliakova, Valentina O. Plastun; Saratov State University, Saratov, Russia

17.15 – 17.30

Oral

Aggregation-induced emission enhancement (AIEE) of gold nanoclusters in biopolymer hydrogel nanoparticles

Daniil S. Chumakov¹, Stella S. Evstigneeva^{2,3}, Andrey M. Burov¹, Nikolai G. Khlebtsov¹; ¹Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS), Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Saratov State Medical University of V.I. Razumovsky, Ministry of Health of the Russian Federation, Saratov, Russia

17.30 – 17.45

Oral

Raman Spectroscopy Meets Machine Learning: From Data Generation to Molecular Interpretation

Ekaterina S. Prikhodzhenko; Laboratory of medical equipment in the field of in vitro diagnostics, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow region, Russia

17.45 – 18.00

Oral

Erythrocytes-like particles with tunable oxygenation state: fabrication and optical properties

Andrei A. Pilnik^{1,2}, Timofei N. Torokhov^{1,3}, Sergei A. Perkov^{1,4}, Vladislav I. Shcheslavskiy^{1,5,6}, Dmitry A. Gorin^{1,4}; ¹Skolkovo Institute of Science and

16.00–16.30
Coffee break

Technology, Moscow, Russia; ²Institute of Automation and Control Processes, Far Eastern Branch, Russian Academy of Science, Vladivostok, Russia; ³Prokhorov General Physics Institute, Moscow, Russia; ⁴Central University, Moscow, Russia; ⁵Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ⁶Becker & Hickl GmbH, Berlin, Germany

18.00 – 18.15

Oral

Photodissolution of ultrasmall maghemite nanoparticles

Dmitrii Tsiurko¹, Ekaterina Moiseeva¹, Sergei German^{1,2}, Daria Terentyeva¹, Arsen Zotov³, Alina Platonova^{1,3}, Vsevolod Skribitsky⁴, Alexey Lipengolts⁴, Zhanna Bochkova^{1,5}, Semen Domarev⁶, Nadezhda Brazhe⁵, Anna Orlova⁶, Dmitry Gorin^{1,2}; ¹Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, 143026 Moscow, Russia; ²Central University, 125047 Moscow, Russia; ³A.M. Prokhorov Institute of General Physics of the Russian Academy of Sciences (IGF RAS), 119991 Moscow, Russia; ⁴N.N. Blokhin National Medical Research Center of Oncology, 115522 Moscow, Russia; ⁵Faculty of Physics, M.V. Lomonosov Moscow State University, 119991 Moscow, Russia; ⁶International Research and Education Centre for Physics of Nanostructures, ITMO University, 197101 Saint Petersburg, Russia

18.15 – 18.30

Oral

Engineering Strategies to Overcome Biological Barriers

Alexey V. Ermakov, Andrey V. Zvyagin; Research Center for Translational Medicine, Sirius University of Science and Technology, Olympic Av., 1, 354340 Sirius Federal Territory, Russia

18.30 – 18.45

Oral

Spectral measurements of fluorescence lifetimes for RPE lipofuscin with MM-fiber coupled SNSPD FLIM system

Pavel V. Morozov^{1,2}, Vladislav Andreev^{1,2,3}, Marina Yakovleva^{4,5}, Tatiana Feldman^{4,5}, Anastasiya Ryabova⁵, I. Romanishkin⁵, G.N. Goltsman^{1,2,3}; ¹Moscow Pedagogical State University, Moscow, Russia; ²Superconducting Nanotechnology, Moscow, Russia; ³National University Higher School of Economics, Moscow, Russia; ⁴N.M. Emanuel Institute of Biochemical Physics RAS, Moscow, Russia; ⁵Lomonosov Moscow State University, Moscow, Russia; ⁶Prokhorov General Physics Institute, RAS, Moscow, Russia;

18.45 – 19.00

Online Oral

Production of hybrid iron-carbon ultradispersed particles and their application in immunoassay

Nadezhda A. Taranova, Alisa A. Bulanaya, Anatoliy V. Zherdev, Boris B. Dzantiev; A.N. Bach

Institute of Biochemistry, Centre of Biotechnology of the Russian Acad. Sci., Moscow, Russia

September 24, Thursday

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

Chair (N): **Vitaly A. Khanadeev**,
IBPPM RAS; Saratov State University of Genetics,
Biotechnology, and Engineering named after
N.I. Vavilov

18.00-20.00

1NB. Study of the electrical characteristics of epithelial cell layers for the development of an organ-on-a-chip system

Ilya A. Gorbachev¹, Zhukova O.A.², Baklaushev V.P.², Zikov K.A.², Kuznetsova I.E.¹, Kolesov V.V.¹; ¹IRE Kotelnikova RAS; ²Federal State Budgetary Institution "Research Institute of Pulmonology" of the Federal Medical-Biological Agency of Russia

2NB. The use of bifunctional gold nanoparticles in enzyme-linked immunosorbent assay

Yulia A. Raspopova¹, Gennady L. Burygin^{1,2}; ¹Saratov State University, Saratov, Russia; ²Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre RAS, Saratov, Russia

3NB. A comparative evaluation of the antibacterial activity of gold nanoparticle conjugates with ceftazidime and cefepime

Daria Galeeva¹, Gennady Burygin^{1,2}; ¹Saratov State University, Saratov, Russia; ²Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre RAS, Saratov, Russia

4NB. Chip design for surface-enhanced Raman spectroscopy based on silicon nitride photonic integrated circuits for small extracellular vesicles detection

Sandal N. Vasilev^{1,2}, Aleksei Yu. Kuzin^{2,4}, Vadim V. Kovalyuk^{2,3}, Alexander D. Golikov^{2,3}, Ksenia O. Sedykh^{2,4}, Irina N. Florya^{2,3}, Alexey N. Semenov², Gregory N. Goltsman^{4,5}, Dmitry A. Gorin¹, Alexey M. Yashchenok¹; ¹Skolkovo Institute of Science and Technology, Moscow, Russia; ²National University of Science and Technology MISIS, Moscow, Russia; ³Moscow State Pedagogical University, Moscow, Russia; ⁴National Research University Higher School of Economics, Moscow, Russia; ⁵Russian Quantum Center, Moscow, Russia

5NB. Determination of quantum dots AgInS/ZnS concentration for linezolid determination in the presence of levofloxacin

Kseniia S. Tumerbulatova, Violetta S. Yaroslavtseva, Vera V. Rodionova, Irina Yu. Goryacheva; Saratov State University, Saratov, Russia

6NB. Preparation of stable conjugates of gold nanoparticles with disaccharide aglycones

Anastasia S. Demidova¹, Alena S. Redjepova²,
Gennady L. Burygin^{1,2}; ¹Institute of Biochemistry
and Physiology of Plants and Microorganisms,
Saratov Scientific Centre RAS, Saratov, Russia;
²Saratov State University, Saratov, Russia

7NB. Separation and analysis of polydisperse mixtures of gold nanobipyramids via centrifugation and digital photometry

V.A. Bogatyrev, D.A. Puzanov-Tyurin, A.M. Burov,
N.G. Khlebtsov; Institute of Biochemistry and
Physiology of Plants and Microorganisms, Russian
Academy of Sciences (IBPPM RAS)

8NB. Polydopamine-coated, folic acid-functionalized gold nanostars for photothermal therapy

Andrey V. Simonenko^{1,2}, Darya V. Manushina³,
Vitaly A. Khanadeev^{1,3}; ¹Institute of Biochemistry
and Physiology of Plants and Microorganisms,
Saratov Scientific Centre of the Russian Academy
of Sciences (IBPPM RAS), Saratov, Russia;
²Saratov State University, Saratov, Russia;
³Saratov State University of Genetics,
Biotechnology and Engineering named after N.I.
Vavilov, Saratov, Russia

9NB. Intrafollicular delivery of glucocorticoids using vaterite particles and optical monitoring of their degradation process

Yury I. Surkov¹, Mariia S. Saveleva¹, Polina A.
Demina¹, Isabella A. Serebryakova¹, Mikhail E.
Lobanov¹, Valery V. Tuchin^{1,2}, Yulia I. Svenskaya¹;
¹Saratov State University, Saratov, Russia;
²Institute of Precision Mechanics and Control RAS,
Saratov, Russia

10NB. Silver nanostars: influence of synthesis parameters on optical and morphological properties and potential for biosensing applications

Vitaly A. Khanadeev^{1,2}, Andrey V. Simonenko^{1,3},
Andrey M. Burov¹, Maria A. Marinina^{1,2}; ¹Institute of
Biochemistry and Physiology of Plants and
Microorganisms, Saratov Scientific Centre of the
Russian Academy of Sciences (IBPPM RAS),
Saratov, Russia; ²Saratov State University of
Genetics, Biotechnology and Engineering named
after N.I. Vavilov, Saratov, Russia; ³Saratov State
University, Saratov, Russia

11NB. Use of gold nanoparticle conjugates for cancer immunotherapy

Roman D. Vyrshchikov, S. A. Staroverov, L. A.
Dykman; Institute of Biochemistry and Physiology
of Plants and Microorganisms, Saratov Scientific
Centre of the Russian Academy of Sciences,
Saratov, Russia

12NB. Effect of surface modification of non-woven materials on their adsorption and optical properties

Victoria S. Isaeva, Mariia S. Saveleva, Polina A.
Demina; Saratov State University, Saratov, Russia

13NB. Donor-acceptor properties of luminophores in citric acid and ethylenediamine-based carbon dots

Anisiya A. Korepanova, Kirill A. Laptinskiy, Tatiana
A. Dolenko; Lomonosov Moscow State University,
Moscow, Russia

Conference on Spectroscopy and Molecular Modeling XXVI

Workshop Chairs: Kirill V. Berezin, Alexander B. Pravdin, Lev M. Babkov, Saratov State University (Russia), Inna L. Plastun, Saratov State Technical University (Russia).

Secretary: Anna A. Doronkina, Saratov State University (Russia)

International Program Committee: Lev M. Babkov, Saratov State University (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), Alexander 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 23, Wednesday

ON-LINE INVITED LECTURE/ORAL SESSION SPECTROSCOPY I (Building 8, Room 216)

Co-chairs: Kirill V. Berezin¹, Inna L. Plastun²

¹Saratov State University, Russia

²Saratov State Technical University

Saratov time/Moscow time

15.00 - 15.15 / 14.00 – 14.15

Oral Report

Rapid evaluation of the linoleic-to-oleic acid ratio in sunflower oil using Raman spectroscopy

Sergey M. Kuznetsov¹, D.D. Vasimov^{1,2}, Z.I. Kalugina³, V.I. Andreev^{1,4}, V.S. Novikov¹, E.A. Sagitova¹; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia; ³Research Institute of Canning Technology – branch of the V. M. Gorbатов Federal Research Center for Food Systems of the RAS, Vidnoe, Moscow region, Russia; ⁴D. Mendeleev University of Chemical Technology of Russia, Moscow, Russia.

15.15 - 15.30 / 14.15 – 14.30

Oral Report

Developing of a method for absolute dating of archaeological bone tissue using Raman spectroscopy

Dmitrii V. Abramov¹, Oleg V. Danilov², Viktoriya A. Bykova², Kristina M. Stankevich¹, Kirill S. Khorkov¹, Anton S. Chernikov¹, Anastasiya N. Tselikova¹; ¹Vladimir State University, Vladimir, Russia; ²State Center for the Conservation, Use and Restoration of Cultural Objects and Cultural Heritage, Vladimir, Russia.

15.30 - 15.45 / 14.30 – 14.45

Oral Report

Molecular Dynamics Simulation of the Interaction of Carbon Dot Models with Transition Metal Nitrates in water

Kirill Kozhushnyi, A.M. Vervald, T.A. Dolenko; Lomonosov Moscow State University, Moscow, Russia.

15.45 - 16.00 / 14.45 – 15.00

Oral Report

Solving Multi-Parameter Optical Spectroscopy Inverse Problems Using Transfer Learning

Artem A. Guskov^{1,2}, Alexander P. Mardanov¹, Igor V. Isaev², Kirill A. Laptinskiy ², Tatiana A. Dolenko^{1,2}, Sergey A. Dolenko²; ¹Faculty of Physics, Moscow State University, Moscow, Russia; ²D.V. Skobeltsyn Institute of Nuclear Physics, M.V. Lomonosov Moscow State University, Moscow, Russia.

16.30 - 16.45 / 15.30 – 15.45

Oral Report

Unsupervised Domain-Adversarial Adaptation of Neural Networks for Analysis of Real Wines Using IR Absorption Spectroscopy

Louisa Salavatovna Utegenova¹, Sergey A. Burikov¹, Artem A. Guskov^{1,2}, Kirill A. Laptinskiy^{1,2}, Tatiana A. Dolenko^{1,2}, and Sergey A. Dolenko²; ¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia, ²Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia.

16.45 – 17.00 / 15.45 – 16.00

Oral Report

Nucleic acid base SERS vibrational spectra

Galina Nikolaevna Ten, M.I. Plaksin; Saratov State University, Saratov, Russia.

17.00 - 17.15 / 16.00 - 16.15

Oral Report

Vibrational spectra of uracil tautomers

Galina Nikolaevna Ten, M.I. Plaksin; Saratov State University, Saratov, Russia.

17:15-17:30 / 16:15-16:30

Online Oral Report

Analysis of collagen presence in brain tumors by raman spectroscopy

Antipova E¹, Romanishkin I.D², Savelieva T.A^{1,2}, Ryabova A.V.^{1,2}. ¹National Research Nuclear University "MEPhI", Moscow, Russia. ²Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia.

20.00-23.00

Evening boat trip - the lights of Saratov

September 24, Thursday

ORAL SESSION SPECTROSCOPY II
(Building 8, Room 216)

Co-chairs: **Kirill V. Berezin¹**, **Inna L. Plastun²**

¹Saratov State University, Russia

²Saratov State Technical University

Saratov time / Moscow time

15.00 - 15.15 / 14.00 – 14.15

Oral Report

Raman spectroscopy of metallic ferromagnetic foreign bodies extracted from the human body: identification of materials, biocorrosion products, and assessment of clinical hazard

Varvara V Dudenkova¹, Maxim G Ryabkov¹, Evgeny O. Bazhenov²; ¹Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ²Nizhny Novgorod State Technical University, Nizhny Novgorod, Russia.

15.15 - 15.30 / 14.15 – 14.30

Oral Report

Effect of Non-Enzymatic Glycation on the Hydration of Collagen and Membrane Phospholipids: A DFT Study of the Energetics and Structure of the First Hydration Shell

Kirill V. Berezin^{1,2}, E. Yu. Stepanovich², A. M. Likhter², E. V. Grabarchuk², K. N. Dvoretzky³, Yu. Yanina¹; ¹N.G. Chernyshevsky Saratov State National Research University, Saratov, Russia; ²V.N. Tatishchev Astrakhan State University, Astrakhan, Russia; ³V.I. Razumovsky Saratov State Medical University, Saratov, Russia.

15.30 - 15.45 / 14.30 – 14.45

Oral Report

Effect of Non-Enzymatic Collagen Glycation on Intermolecular Interaction with Optical Clearing Agents: A DFT Study of the Thermodynamics and Structure of Complexes with DMSO, Urea, and Glycerol

Kirill V. Berezin^{1,2}, E. Yu. Stepanovich², A. M. Likhter², E. V. Grabarchuk², K. N. Dvoretzky³, Yu. Yanina¹, V. V. Tuchin^{1,4,5}; ¹N.G. Chernyshevsky Saratov State National Research University, Saratov, Russia; ²V.N. Tatishchev Astrakhan State University, Astrakhan, Russia; ³V.I. Razumovsky Saratov State Medical University, Saratov, Russia; ⁴National Research Tomsk State University,

Tomsk, Russia; ⁵Institute of Precision Mechanics and Control, Federal Research Center "Saratov Scientific Center of the Russian Academy of Sciences," Saratov, Russia.

15.45 - 16.00 / 14.45 – 15.00

Oral Report

Spectral manifestations of urea effect on glycylglycine self-association

Egor V. Nazarev¹, Inna L. Plastun¹, Lev M. Babkov²; ¹Saratov State Technical University, Saratov, Russia; ²Saratov State University, Saratov, Russia.

16:00-16:30/15:00-15:30

Coffee break

16.30 - 16.45 / 15.30 – 15.45

Oral Report

Effect of crystal modification on the spectral characteristics of chromium picolinate

Pavel D. Filin, Inna L. Plastun; Yuri Gagarin State Technical University of Saratov, Russia

16.45 – 17.00 / 15.45 – 16.00

Oral Report

DFT Analysis of Cyanine 7 Binding to TNF Receptor–Ligand Amino Acid Chains

Bogdan A. Mishunin¹, Egor V. Nazarev¹, Inna L. Plastun¹, Kirill A. Laptinsky², Tatyana A. Dolenko², Ruslan Y. Yakovlev³; ¹Yuri Gagarin State Technical University of Saratov, Saratov, Russia; ²Lomonosov Moscow State University, Moscow, Russia; ³LLC «Protonica», cluster «Lomonosov», Moscow, Russia.

17.00 – 17.15 / 16.00 – 16.15

Oral Report

Response surface modeling for the multifactorial synthesis of imprinted polyaniline
Victoria D. Gorlo, Pavel S. Pidenko, Natalia A. Burmistrova; Saratov State University, Saratov, Russia.

17:15 - 17:30 / 16:15 — 16:30

Oral Report

Imprinted analytical approaches for determination of antibiotics. Do we catch up with antibodies?

Pavel P. Pidenko, Victoria D. Gorlo, Daria G. Koganova, Natalia A. Burmistrova, Daniil D. Drozd; Saratov State University, Saratov, Russia.

17:30 - 17:45 / 16:30 — 16:45

Online Oral Report

DFT-Based Modeling and Interpretation of the Rat Skin Raman Spectrum

Piri Aliyev¹, E.Yu. Stepanovich¹, A.M. Likhter¹, K.V. Berezin²; ¹V.N. Tatishchev Astrakhan State University, Astrakhan, Russia; ²N.G. Chernyshevsky Saratov State National Research University, Saratov, Russia

September 24, Thursday

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

Co-chairs: Kirill V. Berezin¹, Inna L. Plastun²

¹Saratov State University, Russia

²Saratov State Technical University

18:00-20:00

1S. **Structural Determination of Spiropyrazolines and Spiropyrrolizidines by Spectral Methods**

Andrey S. Kochukov¹, Anna A. Meshcheryakova¹, Nikolay I. Davydov¹, Alisa A. Zhidkova¹, Dmitry P. Vozyagin¹, Nikita V. Oprishchenko¹, Efrosinya M. Erkina¹, Svetlana V. Borisova², Vitaly V. Sorokin¹; ¹Saratov State University, Saratov, Russia; ²Saratov Higher Military Engineering School of Radiation, Chemical and Biological Defense, Saratov, Russia.

2S. **Raman spectroscopy monitoring of hydrogen-deuterium exchange kinetics in lyophilized lysozyme at controlled humidity**

Elizaveta A. Dobrynina, Nikolay V. Surovtsev; Institute of Automation and Electrometry, Russian Academy of Sciences, Novosibirsk, Russia.

3S. **Quantum Chemical Modeling of IR Spectra of Aldol and Knoevenagel Condensation Products Catalyzed by Organotellurium Compounds to Improve Component Identification Accuracy**

Denis A. Korsikov, Nikolay A. Redkin, Samara State University, Samara, Russia.

4S. **Comparative analysis of data balancing methods for the classification of raman spectra of skin growths based on a convolutional neural network**

Angelina.O. Kapkaeva, I.A. Matveeva; Samara National Research University, Samara, Russia.

5S. **Raman spectroscopy of erythrocyte membranes: investigation of the molecular conformational state**

Sergey V. Adichtchev, Elizaveta A. Dobrynina, Nikolay V. Surovtsev; Institute of Automation and Electrometry SB RAS, Novosibirsk, Russia.

6S. **A method of fluorescence polarization of probes in the study of the interaction of glycated serum albumin with non-glycated one**

Andrei G. Melnikov¹; Alexander B. Pravdin²; ¹Saratov State Technical University, Saratov, Russia; ²Saratov State University, Saratov, Russia.

7S. **Machine learning assisted spectral analysis for non-invasive skin lesion**

classification Ekaterina A. Beshanova, Irina A. Matveeva; Samara National Research University, Samara, Russia.

8S. **Effect of Transition Metals on the Fluorescence Excitation-Emission Matrices of Carbon Dots and Their Fractions in water**

Matvey S. Kulikov¹, Kirill A. Laptinsky^{1,2}, Tatyana A. Dolenko¹; ¹Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia; ²D.V. Skobeltsyn Institute of Nuclear Physics, M.V. Lomonosov Moscow State University, Moscow, Russia.

9S. **Comparative analysis of the principle of complementarity of N. Bohr in physics and teaching the German language**

Galina.N. Ten, A.A. Minor, Saratov State University, Saratov, Russia.

10S. **Quantum-Chemical Study of the Structure, Vibrational Spectra, and Stabilization Mechanism of the Triplet State in β -Carotene Isomers**

E. Yu. Stepanovich¹, A. M. Likhter¹, K. V. Berezin², V.V. Nechaev³; ¹V.N. Tatishchev Astrakhan State University, Astrakhan, Russia; ²N.G. Chernyshevsky Saratov State National Research University, Saratov, Russia; ³Saratov State Technical University named after Yuri Gagarin, Saratov, Russia.

11S. **Quantum-Chemical Study of the Structure, Vibrational Spectra, and Isotopic Effects of Chlorin: Force Field Modeling, Scaling, and Correlation with Porphine**

E. Yu. Stepanovich¹, A. M. Likhter¹, K. V. Berezin², V.V. Nechaev³; ¹V.N. Tatishchev Astrakhan State University, Astrakhan, Russia; ²N.G. Chernyshevsky Saratov State National Research University, Saratov, Russia; ³Saratov State Technical University named after Yuri Gagarin, Saratov, Russia.

12S. **Structure, IR Spectra, and NH-Tautomerism of Chlorin: Nonlocal Force Field Changes upon Rearrangement of the Central Protons**

E. Yu. Stepanovich¹, A. M. Likhter¹, K. V. Berezin², V.V. Nechaev³; ¹V.N. Tatishchev Astrakhan State University, Astrakhan, Russia; ²N.G. Chernyshevsky Saratov State National Research University, Saratov, Russia; ³Saratov State Technical University named after Yuri Gagarin, Saratov, Russia.

13S. **IR spectra and structure of chromenopiridine and pyrido[1,2-a]pyrimidine systems**

Irina V. Peretokina, Lev M. Babkov, Anna A. Mecheryakova, Vitaly V. Sorokin; Saratov State Univetsity, Saratov, Russia

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XXVI

Workshop Chair: Michael V. Davidovich, Saratov State University

Secretaries: **Alexander N. Savin**, Istok, Fryazino. (Russia), **Kirill A. Sayapin**, Saratov State University, Saratov (Russia)

International Program Committee:

Nikita M. Ryskin, Kotelnikov Institute of Radio-Engineering of RAS (Russia); **Igor S. Nefedov**, Aalto University, Espoo (Finland); **Georgi N. Georgiev**, "Sts. Cyril and Methodius" University, Veliko Tirnov, (Bulgaria); **Andrei D. Grigoriev**, St. Petersburg Electrotechnical University LETI (Russia); **Josef Modelsky**, Warsaw University of Technology (Poland); **Alexander M. Lerer**, South Federal University, Rostov-Don (Russia), **Vyacheslav V. Popov**, Kotelnikov Institute of Radio-Engineering of RAS (Russia)

Thursday, September 24

Online Oral Report Session

(Building 8, 3rd floor, Room 318, SSU)

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

14.00–14.15

Влияние модели эффективной среды на расчетные характеристики поглощающих метаповерхностей с плазмонными наночастицами

Lerer A.M.¹, Kleshnikov A.B.¹, Gorbachev N.V.¹, Ivanova I.N.¹; ¹Southern Federal University, Rostov-on-Don, Russia, ²Penza State University, Penza, Russia

14.15–14.30

Comparative analysis of cylindrical lenses made of photonic crystals formed from solid and cut metal cylinders

Donets I.V.¹, Lerer A.M.¹, Danelyan M.¹, Tsvetkovskaya S.M.^{2,1}; ¹Southern Federal University, Rostov-on-Don, Russia; ²Don State Technical University, Rostov-on-Don, Russia

ORAL SESSION

ELECTROMAGNETICS

(Building 8, 3rd floor, Room 318, SSU)

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

14.30–14.45

PIC Modeling of the Self-Oscillatory Generation of a Continuous RF Train of Short Electron Bunches in a Vircator with a Magnetic Mirror

Kolesov H.N.¹, Dubinov A.E.¹; ¹Russian Federal Nuclear Center—All-Russia Scientific and Research Institute of Experimental Physics (RFNC-VNIIEF), Sarov, 607188 Russia

14.45–15.00

The dynamics of a high-current relativistic electron beam passing through a magnetic mirror

Kolesov H.N.¹, Dubinov A.E.¹; ¹Russian Federal Nuclear Center – All-Russia Scientific and Research Institute of Experimental Physics (RFNC-VNIIEF), Sarov, 607188 Russia

15.00–15.15

NORMAL MODES OF ELECTROMAGNETICALLY INDUCED TRANSPARENCY IN A LAMBDA-TYPE QUANTUM TRANSITION SCHEME

Parshkov O.M., Yuri Gagarin State Technical University of Saratov, Russia, Saratov, 410054, ul. Politekhnikeskaya, 77

15.15–15.30

Development of a W-Band Sheet-Beam Phase-Velocity-Tapered Traveling-Wave Tube

Roman A. Torgashov^{1,2}, Alina D. Murlaeva^{1,2}, Nikita M. Ryskin^{1,2}; ¹Saratov Branch Kotelnikov Institute of Radioengineering and Electronics of RAS, Saratov, Russia; ²Saratov State University, Saratov, Russia

15.30–15.45

Theoretical analysis of mode competition in a gyrotron

Grigorieva N.V.¹, Ryskin N.M.^{1,2}; ¹Kotelnikov Institute of Radio-Engineering of RAS, Saratov Branch; ²Saratov State University

15.45–16.00

Casimir pressure on two graphene sheets on the substrate

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

16.00–16.15

On Casimir force between two real metallic plates

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

16.15–16.30

Optical Quantum Cascade Laser on MIM-Structure

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

16.30–16.45

Ensuring the required electrical parameters in coaxial switches

Molchanov S.Yu., Dovgan A.A., Bahteev I.Sh., Ogorodnik V.O., Dmitrichkova N.V., Kuzyutkin S.I., RPE «Almaz», Saratov, Russia

16.45–17.00

Waveguide Multiplexers for Terrestrial and Satellite Communication Systems

Kirill A. Sayapin^{1,2}, Maxim E. Golubtsov¹, Boris M. Katz¹, Nikita M. Gerasimov¹, Nikita A. Shkunov¹; ¹Waveguide-based Systems LLC, Saratov, Russia; ²Saratov State University, Saratov, Russia

17.00–17.15

Synthesis of Narrowband Channel Filters Based on High-Q TE₀₁₁-Mode Resonators for Satellite DVB-T/DVB-T2 TV Signal Relay Systems

Boris M. Kats¹, Nikita M. Gerasimov¹, Nikita A. Shkunov¹, Kirill A. Sayapin^{1,2}; ¹Waveguide-based Systems LLC, ²Saratov State University, Saratov, Russia

JOINT POSTER/INTERNET SESSION

(Building 3, 3rd floor Hall)

Chairs: **Ivan V. Fedosov, Daria K. Tuchina**, Saratov State Univ., Russia

Moderators: **Ivan V. Fedosov, Michael M. Slepchenkov, Alexander I. Dubrovsky**, Saratov State Univ., Russia

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

Thursday September 24

18.-00–20.-00

1. Investigation of W-Band Traveling-Wave Tube Amplifiers with Folded Waveguide Slow Wave Structures

I.S. Dmitriev¹, A.A. Rostuntsova^{1,2}, ¹Saratov State University, Saratov, Russia; ²Saratov Branch, Kotelnikov Institute of Radioengineering and Electronics RAS, Saratov, Russia

2. Development of Periodic Cusped Magnet Focusing System for a miniaturized W-band Sheet-Beam Traveling-Wave Tube

Alina D. Murlaeva, Roman A. Torgashov Saratov Branch Kotelnikov Institute of Radioengineering and Electronics of RAS, Saratov, Russia; Saratov State University, Saratov, Russia

3. Study of the characteristics of micro-sized millimeter-wave waveguides fabricated using laser microfabrication technology

Veronika D. Churikova¹, Dmitry A. Nozhkin^{1,2}, Roman A. Torgashov^{1,2};

¹Saratov State University, Saratov, Russia;

²Saratov Branch Kotelnikov Institute of Radioengineering and Electronics of RAS, Saratov, Russia

4. Development and Fabrication of Electron-Optical System With Elliptic Electron Beam for a W-Band Traveling-Wave Tube

Dmitry A. Nozhkin^{1,2}, Roman A. Torgashov^{1,2}, Igor A. Navrotsky¹, Anna A. Akst², Dmitry A. Bessonov¹, Nikita M. Ryskin^{1,2}; ¹Saratov Branch, Kotelnikov Institute of Radioengineering and Electronics RAS; ²Saratov State University, Saratov, Russia

5. Micromagnetic investigation of spin waves propagation in nanoscale YIG waveguides

Varvara A. Ochkina¹, Vera V. Balaeva¹, Maria A. Morozova^{1,2}; ¹Saratov State University, Saratov, Russia; ²Saratov Branch of V.A. Kotelnikov Institute of Radioengineering and Electronics RAS

6. Optical properties of graphene-nanotube hybrids

Mikhail M. Slepchenkov, Saratov State University, Saratov, Russia

7. Design of Highly Selective Microwave Filters and a Multiplexer Based on Them

Kirill A. Sayapin^{1,2}; ¹Waveguide-based Systems LLC, ²Saratov State University, Saratov, Russia

8. Compact Multimode Microwave Filter with Cascaded-Triple Topology

Nikita M. Gerasimov; Waveguide-based Systems LLC, Saratov, Russia

Workshop on Medical Applications of Laser Molecular Imaging and Machine Learning

Chairs: Yury V. Kistenev, Tomsk State University (Russia)

Secretary: Tatiana B. Lepekhina, Tomsk State University (Russia)

International Program Committee: Vladimir L. Vaks, Institute of Applied Physics of RAS, Nizhny Novgorod (Russia), Olga P. Cherkasova, Institute of Laser Physics of SB of RAS (Russia), Denis A. Vrazhnov, Tomsk State University (Russia), Alexey V. Borisov, Tomsk State University (Russia)

September 23, Wednesday

ON-LINE SESSION APPLICATIONS OF LASER MOLECULAR IMAGING AND MACHINE LEARNING VI (On-line)

Chairs: Yury V. Kistenev, Denis A. Vrazhnov,
Tomsk State University, Russia,

Moderator: Denis A. Vrazhnov, Tomsk State
University, Russia

Tomsk time/ Indian time

16.00-16.15/14.30-14.45

Internet Poster

Two-Photon Microscopy based Oral lesion classification using AI models

Edwin Pious¹, Manikanth Karnati¹, Jackson Rodrigues², Gagan Raju¹, Guan-Yu Zhuo², Nirmal Mazumder¹; ¹Department of Biophysics, Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal, India; ²Institute of Biophotonics, College of Biomedical Science and Engineering, National Yang Ming Chiao Tung University, Taipei, Taiwan

16.15-16.30/14.45-15.00

Online Oral Report

Two-photon microscopy as a method for studying the biocompatibility of medical implants

Tatiana B. Lepekhina¹, Viktor V. Nikolaev², Yury V. Kistenev¹; ¹Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University 36, Lenin Ave., Tomsk, 634050 Russia; ²Laboratory of Ecophotonics, Tomsk State University 36, Lenin Ave., Tomsk, 634050 Russia

16.30-16.45/15.00-15.15

Online Oral Report

Quantitative Analysis of Eutrophication Marker Molecules in Atmospheric Air Based on Model IR Spectra and the SIMCA Method

Akim K. Tretyakov¹, Viktor V. Nikolaev¹, Yury V. Kistenev²; ¹Laboratory of Ecophotonics, Tomsk State University 36, Lenin Ave., Tomsk, 634050 Russia; ²Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University 36, Lenin Ave., Tomsk, 634050 Russia

16.45-17.00/15.15-15.30

Online Oral Report

Experimental verification of a method for quasi-continuous monitoring of the resonance frequency of a quartz tuning fork based photoacoustic detector

Georgii K. Raspopin¹, Viktor V. Nikolaev¹, Alexei V. Borisov¹, Yury V. Kistenev²

¹Laboratory of Ecophotonics, Tomsk State University, 634050, Tomsk, Russia

²Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, 634050, Tomsk, Russia

17.00-17.15/15.30-15.45

Online Oral Report

Infrared photoacoustic spectrometer for CO₂ detection

Didar R. Makashev¹, David A. López Guardado¹, Viktor V. Nikolaev¹, Yury V. Kistenev²;

¹Laboratory of Ecophotonics, Tomsk State University 36, Lenin Ave., Tomsk, 634050 Russia

²Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University 36, Lenin Ave., Tomsk, 634050 Russia

17.15-17.30/15.45-16:00

Online Oral Report

Quartz-Enhanced Photoacoustic Detection of Gases in the Sub-Terahertz Range

Viktor V. Nikolaev¹, Akim K. Tretyakov¹, Georgii K. Raspopin¹, Didar R. Makashev¹, Yury V. Kistenev²

¹Laboratory of Ecophotonics, Tomsk State University 36, Lenin Ave., Tomsk, 634050 Russia

²Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University 36, Lenin Ave., Tomsk, 634050 Russia

Workshop on Quantum Science and Technologies VI

Co-Chairs: **Aleksey K. Fedorov**, and **Evgeniy O. Kiktenko**, Russian Quantum Center (Russia); National University of Science and Technology “MISIS” (Russia)

Secretary: **Alena S. Mastiukova**, Russian Quantum Center (Russia); National University of Science and Technology “MISIS” (Russia)
(a.mastiukova@rqc.ru, +7 (906) 747-72-29)

International Program Committee:

Vladimir L. Derbov, Saratov State University (Russia)

Igor V. Meglinski, Aston University, Birmingham (UK), Sechenov University, Moscow (Russia)

Lingyan Shi, University of California San Diego (USA)

Georgy Shlyapnikov, LPTMS, University of Paris-Sud (France), University of Amsterdam (The Netherlands), Russian Quantum Center (Russia)

Lihong Wang, Caltech, Pasadena (USA)

Aleksei M. Zheltikov, Lomonosov Moscow State University, Russian Quantum Center (Russia), Texas A&M University (USA)

September 25, Friday

ORAL SESSION

*Chair: Evgeniy O. Kiktenko,
Russian Quantum Center
(Russia)*

11:00 – 11:25

Polina R. Sharapova, Invited Talk
Multimode squeezed light: generation, characterization, applications

11:25 – 11:50

Andrey Yu. Chernyavskiy, Denis A. Kulikov, Boris I. Bantysh, Empirical Evaluation of the Approximation Ratio in Scalable Fixed-Point QAOA

11:50 – 12:15

Boris I. Bantysh, Andrey Yu. Chernyavskiy, Denis A. Kulikov, Entanglement Analysis of QAOA with Increasing Circuit Depth

12:15 – 12:40

Maksim A. Gavreev, Evgeniy O. Kiktenko, Aleksey K. Fedorov, Anastasiia S. Nikolaeva, Qudit-native simulation of the Quantum Potts model

12:40 – 13:05

Grigori A. Grechkin, **Daniil S. Bagaev**, Evgeniy O. Kiktenko, Adaptive neural-network decoding for quantum error correction

13:05 – 13:30

Elisaveta Krendeleva, Evgeniy O. Kiktenko, Resource-Efficient Grover-Mixer QAOA for Higher-Order Optimization via Analytical Parameter Pre-optimization

13:30 – 13:55

Vladislav I. Katkov, Phase-sensitive signal detection with a Rydberg-atom quantum receiver based on a Raman two-photon process

13:55 – 14:20

Andrey Konyukhov, Quantum noise correlations in optical dispersive waves

14:20 – 14:45

T. A. Voronova, G. A. Vishnyakova, Trapping of Ultracold Rydberg Atoms in a 1012-nm Optical Dipole Potential

Workshop on Brillouin, Ultrafast and Terahertz, Spectroscopy of Micro- and Nanostructures, Including Living Objects

Workshop Co-Chairs: **Alexander V. Sadovnikov**, Saratov State University, Russia; **Valery V. Tuchin**, Saratov State University, Russia

Secretary: **Alexey A. Solyanov**, Saratov State University, Russia, E-mail: solyanov555@gmail.com;
Anna A. Manyшева, Saratov State University, Russia, E-mail: aamsigmaam2006@gmail.com

September 23, Wednesday

INVITED LECTURE/ ORAL REPORT BRILLOUIN SPECTROSCOPY I

(Building 8, Room 005)

Chairs: **Alexander V. Sadovnikov**, Saratov State Univ., Russia; **Valery V. Tuchin**, Saratov State Univ., Russia;

Moderator: **Alexander V. Sadovnikov**, Saratov State Univ., Russia

Saratov time

14:00-14:30

Online Oral Report

How Reticular Chemistry Pushes the Limits in Physics

Valentin A. Milicko;
New Uzbekistan University, Tashkent, Uzbekistan

14:30-15:00

Oral Report

Brillouin scattering sensitivity to mechanical stiffness changes in hydrated protein systems

Elizaveta A. Dobrynina, Nikolay V. Surovtsev;
Institute of Automation and Electrometry, Russian Academy of Sciences, Novosibirsk, Russia

15:00-15:30

Online Oral Report

Control of Extreme Radiation Tolerance in Ceramics by Depth Profiling of Structure-Property Relations

Vladimir D. Bessonov;
Nazarbayev University, Astana, Kazakhstan

15:30-16:00

Online Oral Report

Computer modeling of the properties of magnetic nanoparticles and their influence on the dynamic magnetomechanical characteristics of soft materials

Sofia S. Kontorovich;
University of Vienna Kolingasse, Vienna, Austria

16:15-16:45

Oral Report

Rigidity properties of biological objects measured using BLS

Maria V. Lomova;
Saratov State University, Saratov, Russia

16:45-17:15

Oral Report

Single-molecule study of SMC-like protein RecN-DNA binding using optical tweezers

Natalia E. Morozova;
Peter the Great St.Petersburg Polytechnic University, St. Petersburg, Russia

17:15-17:30

Online Oral Report

Biophysical Differences Between Macrophages of Distinct Origin

Dmitry Kolesov;
Saratov State University, Saratov, Russia;

17:30-17:45

Oral Report

Resonant Routing of Spin Waves in YIG Structures with Ring Resonators: Effect of Geometry and External Magnetic Field

Anna A. Manyшева, Nikita Y. Yasnev, Alexander V. Sadovnikov;
Saratov State University, Saratov, Russia

17:45-18:00

Oral Report

Control of Resonance Properties in a "Microwave Waveguide – Ring Resonator" System Based on Yttrium Iron Garnet Films

Nikita Y. Yasnev, Anna A. Manyшева, Alexander V. Sadovnikov;
Saratov State University, Saratov, Russia

18:00-18:15

Oral Report

Edge modes in strip-loaded bilayer YIG waveguides

Alexander A. Martyshkin;
Saratov State University, Saratov, Russia

16:00-16:15

Coffee break

18:15-18:30

Oral Report

Phase and Symmetry Control Strategies for Spin Wave Routing in Hybrid Magnonic Networks with a Central Resonator

Alexey A. Solyanov, Alexander V. Sadovnikov;
Saratov State University, Saratov, Russia;

September 24, Thursday

JOINT INTERNET/POSTER SESSION

BRILLOUIN SPECTROSCOPY (BS)

(Building 3, 3rd floor Hall)

Chairs (B): Alexander V. Sadovnikov,
Saratov State Univ., Russia

1BS. Spin Wave Propagation in a System of Laterally Coupled Mach-Zehnder Interferometers

Ilya R. Klovov;
Saratov State University, Saratov, Russia

2BS. Analysis of Edge Modes in Magnetostatic Surface Spin Waves for Different Waveguide Widths Comparable to Thickness

Pavel A. Zhironkin;
Saratov State University, Saratov, Russia

3BS. A study of the effect of the width of a YIG microwave waveguide on the spectra of surface and inverse bulk spin waves

Karina E. Zhumabekova;
Saratov State University, Saratov, Russia

4BS. Edge Mode Coupling and Controlled Propagation in YIG Microstructures for Magnonic Logic

Vitalii A. Boldyrev;
Saratov State University, Saratov, Russia

5BS. Influence of a Square Resonator on Spin-Wave Routing in a YIG Structure of Connected Zigzags

Arsenii K. Timofeev;
Saratov State University, Saratov, Russia

6BS. Controlling the propagation of spin waves in hybrid YIG/FeRh structures through thermally induced modulation of magnetization.

Andrey S. Ptashenko, Alexandr V. Sadovnikov;
Saratov State University, Saratov, Russia

Joint session of Workshop on Terahertz Optics and Biophotonics IX & Advanced Materials for Optics and Biophotonics IX

Chairs: **Nikita V. Chernomyrdin**, Prokhorov General Physics Institute RAS (Russia); **Arseniy A. Gavdush**, Prokhorov General Physics Institute RAS (Russia); **Mariya V. Ponarina**, Prokhorov General Physics Institute RAS (Russia); **Stanislav O. Yurchenko**, Bauman Moscow State Technical University (Russia); **Egor V. Yakovlev**, Bauman Moscow State Technical University (Russia); **Irina N. Dolganova**, Osipyan Institute of Solid State Physics RAS (Russia); **Vladimir N. Kurlov**, Osipyan Institute of Solid State Physics RAS (Russia); **Kirill I. Zaytsev**, Prokhorov General Physics Institute RAS (Russia)

Secretary: **Vladislav A. Zhelnov**, Prokhorov General Physics Institute RAS (Russia), E-mail: vleder.zel@mail.ru;

Polina V. Aleksandrova, Prokhorov General Physics Institute RAS (Russia), E-mail: aleksandrovapolina98@gmail.com

International Program Committee: **Maria G. Burdanova**, Moscow Institute of Physics and Technology (Russia); **Nikita V. Chernomyrdin**, Prokhorov General Physics Institute RAS (Russia); **Gleb M. Katyba**, Osipyan Institute of Solid State Physics RAS (Russia); **Arseniy A. Gavdush**, Prokhorov General Physics Institute RAS (Russia); **Sergey V. Garnov**, Prokhorov General Physics Institute RAS (Russia); **Gennady A. Komandin**, Prokhorov General Physics Institute RAS (Russia); **Olga P. Cherkasova**, Institute of Automation and Electrometry SB RAS, Institute of Laser Physics SB RAS (Russia); **Vladimir M. Masalov**, Osipyan Institute of Solid State Physics RAS (Russia); **Irina N. Dolganova**, Osipyan Institute of Solid State Physics RAS (Russia); **Vladimir N. Kurlov**, Osipyan Institute of Solid State Physics RAS (Russia); **Dmitry S. Ponomarev**, NRC "Kurchatov Institute" (Russia); **Igor V. Reshetov**, Sechenov University, Academy of Postgraduate Education FSCC FMBA (Russia); **Stanislav O. Yurchenko**, Bauman Moscow State Technical University (Russia); **Egor V. Yakovlev**, Bauman Moscow State Technical University (Russia)

September 23, Wednesday

INVITED LECTURE/ORAL/ ON-LINE SESSION

*(Cluster for Engineering for Life Sciences,
Centre for Soft Matter and Physics of Fluids,
BMSTU)*

Chairs: **Arsenii A. Gavdush**, Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

Saratov time/Moscow time

09:30-10:00 / 8:30-09:00
Welcome coffee break

10:00-10:30/09:00-09:30

Online Invited Lecture

Terahertz pyroelectric detectors based on tetraaminodiphenyl thin films

Vasily V. Gerasimov^{1,2}, Sergei A. Kuznetsov^{2,3}, Vladislav S. Vanda^{1,2}, Aleksey G. Lemzyakov^{1,4}, D.V. Fromichev⁵, N.M. Shemyagin⁵, V.A. Stepanov⁵, Alexey K. Nikitin⁶; ¹Budker Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia; ²Department of Physics, Novosibirsk State University, Novosibirsk, Russia; ³Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk,

Russia; ⁴Synchrotron Radiation Facility SKIF, Kol'tsovo, Russia; ⁵Joint Stock Company "Novosibirsk factory of semiconductor device EAST", Novosibirsk, Russia; ⁶Scientific and Technological Centre of Unique Instrumentation of the Russian Academy of Sciences, Moscow, Russia

10:30-10:45 / 9:30-9:45

Oral

Effect of thickness and morphology on terahertz and optical properties of ultrathin gold films

Aleksandr S. Marakulin¹, Maksim I. Paukov¹, Maria G. Burdanova¹, Gennadii A. Komandin², Alexey V. Arsenin¹, Dmitry I. Yakubovsky¹; ¹Moscow Institute of Physics and Technology, Dolgoprudny, Russia; ²Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

10:45-11:00 / 9:45-10:00

Oral

Broadband dielectric spectroscopy of astrophysically relevant phases of water ice

Maria K. Matveyshina^{1,2}, Arsenii A. Gavdush¹, Kirill I. Zaytsev¹; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Bauman Moscow State Technical University, Moscow, Russia

11:00-11:15 / 10:00-10:15

Oral

Terahertz scattering in biological tissues: spherical and cylindrical scatterers

Anna S. Kucheryavenko^{1,2}, Irina N. Dolganova², Nikita V. Chernomyrdin¹, Kirill I. Zaytsev¹; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Osipyan Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia

11:15-11:30 / 10:15-10:30

Oral

Immersion optical clearing of biological tissues in the THz range

Daria S. Ustiantseva¹, Daria R. Il'enkova¹, Valery V. Tuchin², Nikita V. Chernomyrdin², Kirill I. Zaytsev¹; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Saratov State University, Saratov, Russia

11:30-12:00 / 10:30-11:00

Coffee break

12:00-12:15 / 11:00-11:15

Oral

Polarization-sensitive terahertz solid immersion microscopy for probing heterogeneity and birefringence in soft tissues

Daria R. Il'enkova¹, Demyan D. Rybnikov¹, Anna I. Alekseeva², Anna S. Kucheryavenko^{1,3}, Kirill I. Zaytsev¹, Nikita V. Chernomyrdin¹; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Research Institute of Human Morphology, Moscow, Russia; ³Osipyan Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia

12:15-12:30 / 11:15-11:30

Oral

Superresolution THz solid immersion microscopy

Demyan D. Rybnikov, Vladislav A. Zhelnov, Kirill I. Zaytsev, Nikita V. Chernomyrdin; Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

12:30-12:45 / 11:30-11:45

Oral

A method for local evaluation of optical properties of heterogeneous media of various nature using a pulsed terahertz solid immersion microscope

Vladislav A. Zhelnov, Demyan D. Rybnikov, Kirill I. Zaytsev, Nikita V. Chernomyrdin; Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

12:45-13:00 / 11:45-12:00

Oral

Study of diffusion processes in microfluidic chips using super-resolution terahertz solid immersion microscopy

Vera V. Koroleva^{1,2}, Daria R. Il'enkova¹, Demyan D. Rybnikov¹, Ivan A. Kushnir², Vladislav A. Zhelnov¹, Stanislav O. Yurchenko², Kirill I. Zaytsev¹, Nikita V. Chernomyrdin¹; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Bauman Moscow State Technical University, Moscow, Russia

13:00-14:00 / 12:00-13:00

Coffee break

ORAL/ON-LINE SESSION

(Cluster for Engineering for Life Sciences, Centre for Soft Matter and Physics of Fluids, BMSTU)

Chair: **Stanislav O. Yurchenko**,
Bauman Moscow State Technical University,
Moscow, Russia

14:00-14:15 / 13:00-13:15

Oral

Microfluidic "angiogenesis-on-a-chip" test system for studying fundamental mechanisms of angiogenesis and testing pharmacological drugs

Ksenia O. Salina, Anna A. Kopylova, Ivan A. Kushnir, Maxim A. Dragun, Daniil A. Bystrov, Nikita P. Kryuchkov, Egor V. Yakovlev, Stanislav O. Yurchenko; Bauman Moscow State Technical University, Moscow, Russia

14:15-14:30 / 13:15-13:30

Oral

Vortex micromixing by magnetic particles via tunable rotating magnetic fields and its application for early diagnosis of neurodegenerative diseases

Aksinya A. Bondareva¹, Ivan A. Kushnir¹, Viktoriya I. Zhdankina², Valeriya S. Voronina², Kseniya V. Barinova³, Stanislav O. Yurchenko¹, Nataliya A. Kolotieva^{1,2}, Egor V. Yakovlev¹; ¹Bauman Moscow State Technical University, Moscow, Russia; ²Research center of neurology, Moscow, Russia; ³Lomonosov Moscow State University, Moscow, Russia.

14:30-14:45 / 13:30-13:45

Oral

Evaluating dynamic light scattering for α -synuclein oligomer analysis in cerebrospinal fluid

Aleksandr Shefer, Mariia S. Kuzmina, Stanislav O. Yurchenko, Anastasia A. Belyaeva; Centre for Soft Matter and Physics of Fluids, Bauman Moscow State Technical University, Moscow, Russia

14:45-15:00 / 13:45-14:00

Oral

Dielectrophoresis: physical principles, applications, and future perspectives

Leonid Y. Polynkin, Aleksandra V. Kokhanovskaia, Oleg I. Pohodyaev, Maksim A. Dragun, Tatiana G. Statsenko, Margarita A. Zhgut, Stanislav O. Yurchenko, Egor V. Yakovlev; Center for Soft Matter and Physics of Fluids, Bauman Moscow State Technical University, Moscow, Russia

15:00-15:15 / 14:00-14:15

Oral

Cellulose nanocrystal-based hydrogels as tunable platforms for 2D and 3D cell culture system

Ksenia O. Salina, Ivan A. Kushnir, Anna S. Kopylova, **Anastasia A. Belyaeva**; Centre for Soft Matter and Physics of Fluids, Bauman Moscow State Technical University, Moscow, Russia

15:15-15:30 / 14:15-15:30

Oral

The biocompatibility of hydrogels from nanocrystalline cellulose with gelatin, PAM, or hyaluronic acid

Anna G. Erokhina^{1,2}, Anna A. Kopylova¹, Ksenia O. Salina¹, Anastasia A. Belyaeva¹; ¹Centre for Soft Matter and Physics of Fluids, Bauman Moscow State Technical University, Moscow, Russia; ²I.M. Sechenov First Moscow State Medical University, Moscow, Russia

September 24, Thursday

INVITED LECTURE/ORAL/

ON-LINE SESSION

*(Cluster for Engineering for Life Sciences,
Centre for Soft Matter and Physics of Fluids,
BMSTU)*

*Chairs: **Arsen K. Zotov**, Prokhorov General
Physics Institute of the Russian Academy of
Sciences, Moscow, Russia*

Saratov time/Moscow time

09:30-10:00 / 8:30-09:00

Welcome coffee break

10:00-10:30 / 09:00-09:30

Invited Lecture

Developing multimodal fiber-optic probe and calibration materials for combined laser spectroscopy of intracranial tumors

Tatiana A. Savelieva¹, Vadim Yu. Yunanov², Igor D. Romanishkin¹, Alexander V. Borodkin¹, Kirill G. Linkov¹, Anastasia V. Ryabova^{1,2,3}, Svetlana V. Shugay⁴, Alexandra V. Kosyrkova⁴, Galina V. Pavlova^{4,5}, Igor N. Pronin⁴, Victor B. Loschenov^{1,2}; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia;

²National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, Russia; ³RUDN University, Moscow, Russia; ⁴N.N. Burdenko National Medical Research Center of Neurosurgery, Moscow, Russia; ⁵Institute of Higher Nervous Activity and Neurophysiology of the Russian Academy of Sciences, Moscow, Russia

10:30-10:45 / 09:30-09:45

Oral

Interaction of microsecond dual-wavelength laser radiation with soft tissues

Danil V. Pechenkin, Arsen K. Zotov, Yuriy A. Suchkov, David G. Kochiev; Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

10:45-11:00 / 09:45-10:00

Oral

Ablation and coagulation of soft biological tissues induced by microsecond pulsed laser

Polina V. Aleksandrova¹, Arsen K. Zotov¹, Danil V. Pechenkin¹, Yuriy A. Suchkov¹, David G. Kochiev¹, Anna I. Alekseeva², Irina N. Dolganova^{1,3}; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Avtsyn Research Institute of Human Morphology of Federal State Budgetary Scientific Institution "Petrovsky National Research Centre of Surgery", Moscow, Russia; ³Osipyan Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia

11:00-11:15 / 10:00-10:15

Oral

Tissue-mimicking phantoms for investigating laser ablation and thermotherapy

Sofia A. Mirzaeva¹, Danil V. Pechenkin¹, Polina V. Aleksandrova¹, Irina N. Dolganova^{1,2}, David G. Kochiev¹, Arsen K. Zotov¹; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Osipyan Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia

11:15-11:30 / 10:15-10:30

Oral

Optoacoustic and fluorescence lifetime visualization based on chlorophyll-loaded particles in phantoms

Timofei Torokhov^{1,2}, Sergei Perkov^{1,3}, Julijana Cvjetinovic¹, Alexey Kurnikov⁴, Maksim Mokrousov^{1,5}, Igor Sergeev¹, Arkady Abdurashitov^{6,7}, Pavel Subochev⁴, Vladislav Shcheslavskiy^{8,9}, Dmitry Gorin^{1,3}; ¹Laboratory of Biophotonics, Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, Moscow, Russia; ²Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ³Laboratory of Digital Biophotonics, Central University, Moscow, Russia; ⁴Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia; ⁵Moscow Institute of Physics and Technology,

Dolgoprudny, Russia; ⁶Center for Bio- and Medical Technologies, Skolkovo Institute of Science and Technology, Moscow, Russia; ⁷Life Improvement by Future Technologies Center, Moscow, Russia; ⁸Institute of Experimental Oncology and Biomedical Technologies, Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ⁹Becker&Hickl GmbH, Berlin, Germany

11:30-11:45 / 10:30-10:45

Oral

Assessment of optical parameters changes in biological tissues via diffuse reflectance spectroscopy using sapphire-fiber probe

Alina A. Platonova¹, Arsen K. Zotov¹, David G. Kochiev¹, Vladimir N. Kurlov², Irina N. Dolganova²; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Osipyan Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia

11:45-12:00 / 10:45-11:00

Oral

Development of terahertz step-index fibers based on crystalline materials

Polina A. Tsabolova^{1,2}, Leonid N. Butvina¹, Vladimir N. Kurlov², Kirill I. Zaytsev¹, Gleb M. Katyba^{1,2}; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; ²Osipyan Institute of Solid State Physics Russian Academy of Sciences, Chernogolovka, Russia

12:00-12:15 / 11:00-11:15

Oral

Opal-like matrices based on hollow SiO₂ nanoparticles

Aysiena-Ekaterina P. Protopopova¹, Vladimir M. Masalov¹, Nadezhda S. Sukhinina¹, Vladimir N. Kurlov¹, Kirill I. Zaytsev², Gleb M. Katyba¹; ¹Osipyan Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia; ²Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

12:15-12:30 / 11:15-11:30

Coffee break

INVITED LECTURE/ORAL/

ON-LINE SESSION

**(Cluster for Engineering for Life Sciences,
Centre for Soft Matter and Physics of Fluids,
BMSTU)**

Chair: Nikita P. Kryuchkov,
Bauman Moscow State Technical University,
Moscow, Russia

12:30-12:45 / 11:30-11:45

Online Oral Report

Machine-learned interaction potentials for colloidal systems

Anton I. Shvetsov, Raniya R. Nafikova, Nikita P. Kryuchkov, Stanislav O. Yurchenko, Ivan V. Simkin; Bauman Moscow State Technical University, Moscow, Russia

12:45-13:00 / 11:45-12:00

Online Oral Report

Orientation-controlled three-body polarization in rotating-field colloidal materials

Ivan V. Simkin, Anton I. Shvetsov, Rania R. Nafikova, Nikita P. Kryuchkov, Stanislav O. Yurchenko; Soft Matter and Physics of Fluids Centre, Bauman Moscow State Technical University, Moscow, Russia

13:00-13:15 / 12:00-12:15

Online Oral Report

An in silico model of vascular organoid growth and fusion dynamics for early detection of neurodegenerative diseases

Alina R. Krasina, Nikita P. Kryuchkov; Bauman Moscow State Technical University, Moscow, Russia

13:15-13:30 / 12:15-12:30

Oral

Self-assembly of various structures in colloidal systems with controlled interactions under confinement conditions

Konstantin P. Zhukov, Alexandra V. Kokhanovskaia, Raniya R. Nafikova, Anastasia A. Simkina, Aksinya A. Bondareva, Oleg I. Pokhodyaev, Artur D. Nasyrov, Roman V. Shumilin, Nikita P. Kryuchkov, Egor V. Yakovlev, and Stanislav O. Yurchenko; Bauman Moscow State Technical University, Moscow, Russia

13:30-13:45 / 12:30-12:45

Oral

Surface diffusion in two-dimensional clusters

Raniya R. Nafikova, Nikita P. Kryuchkov, Stanislav O. Yurchenko; Soft Matter and Physics of Fluid Centre, Bauman Moscow State Technical University, Moscow, Russia

13:45-14:15 / 12:45-13:15

Invited Lecture

Diagnostic and multimodal sapphire applicators and probes

Irina N. Dolganova; Osipyan Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia

14:15-15:00/13:15-14:00

Coffee break

JOINT POSTER SESSION
(Cluster for Engineering for Life Sciences,
Centre for Soft Matter and Physics of Fluids,
BMSTU)

Chair: **Egor V. Yakovlev**,
 Bauman Moscow State Technical University,
 Moscow, Russia

15:00-17:00 / 14:00-16:00

- 1B. Membrane-based biosensors for detecting hypocalcemia in blood** Polina S. Kazaryan¹, Vadim V. Zefirov¹, Evgeny A. Shirshin^{1,2}; ¹Center for Photonics, Institute of Robotics Systems, HSE University, Moscow, Russia; ²Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia
- 2B. Development of silver SERS-active substrates for spectroscopic analysis of blood plasma** M.A. Borozdova¹, P.S. Kazaryan¹, E.A. Shirshin^{1,2}; ¹Center for Photonics, National Research University Higher School of Economics; ²Lomonosov Moscow State University, Faculty of Physics
- 3B. Oxidized polypropylene-derived water-soluble fluorescent oligomers as model nonconventional luminophores for optical bioanalysis** V.V. Zefirov¹, P.S. Kazaryan¹, M.A. Borozdova¹, E.A. Shirshin^{1,2}; ¹Center for Photonics, Institute for Robotics Systems, HSE University, Moscow, Russia; ²Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia
- 4B. Development of a low-cost extrusion-based 3D printer for hydrogel printing** Mariia S. Kuzmina, Ksenia O. Salina, Dmitriy S. Titeev, Tatiana G. Statsenko, Anastasia A. Belyaeva; Centre for Soft Matter and Physics of Fluids, Bauman Moscow State Technical University, Moscow, Russia
- 5B. Dielectrophoresis: physical principles, applications, and future perspectives** Margarita A. Zhgut, Leonid Y. Polynkin, Oleg I. Pohodyaev, Aleksandra V. Kokhanovskaia, Maksim A. Dragun, Tatiana G. Statsenko, Stanislav O. Yurchenko, Egor V. Yakovlev; Center for Soft Matter and Physics of Fluids, Bauman Moscow State Technical University, Moscow, Russia
- 6B. Numerical simulation of electric fields for TEER "brain on a chip"** Maksim E. Kovalev, Leonid Y. Polynkin, Maksim A. Dragun, Ivan A. Kushnir, Stanislav O. Yurchenko; Center for Soft Matter and Physics of Fluids, Bauman Moscow State Technical University, Moscow, Russia
- 7B. Automated morphometric analysis and machine learning classification of iPSC-derived vascular organoids in Alzheimer's and Parkinson's disease models** Roman V. Shumilin¹, Anna A. Kopylova¹, Daria D. Volegova¹, Elizaveta S. Pereplitsa², Anna V. Blagova², Ksenia O. Salina¹, Ilya K. Lanikin¹, Petr I. Kupriyanov¹, Anna V. Zubova², Marina R. Kapkaeva², Ivan V. Simkin¹, Alla B. Salmina^{1,2}, Stanislav O. Yurchenko¹ and Sergei N. Illarioshkin²; ¹Laboratory of Cellular Technologies and Tissue Engineering, Center "Soft Matter and Physics of Fluids," Bauman Moscow State Technical University, Moscow, Russia; ²Laboratory of Neurobiology and Tissue Engineering, Brain Science Institute, Russian Center of Neurology and Neurosciences, Moscow, Russia
- 8B. Structural MRI preprocessing for biological brain-Age estimation** Mikhail S. Sokolov¹, Anton I. Shvetsov¹, Ivan V. Simkin¹, Elena I. Kremneva², Polina S. Shlapakova², Larisa A. Dobrynina², Stanislav O. Yurchenko¹, Elena V. Gnedovskaya², Mikhail A. Piradov²; ¹Bauman Moscow State Technical University, Moscow, Russia; ²Russian Center of Neurology and Neurosciences, Moscow, Russia
- 9B. Development of a method for modeling cell dynamics considering the microenvironment based on cellular potts model** Olesya S. Kuznetsova, Artur D. Nasyrov, Leonid Y. Polynkin, Stanislav O. Yurchenko, Nikita P. Kryuchkov; Center for Soft Matter and Physics of Fluids, Bauman Moscow State Technical University, Moscow, Russia
- 10B. Ab-initio simulations of ZnSe point defects revealed** Egor A. Nikulchin and Gennady A. Komandin; Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

Workshop on Optical and Biomedical Engineering

Chairs: **Igor L. Fufurin**, Bauman Moscow State Technical University (Russia), **Igor S. Golyak**, Bauman Moscow State Technical University (Russia), **Alexander V. Kolpakov**, Bauman Moscow State Technical University (Russia), **Elena N. Rinskaya**, Lebedev Physical Institute of the Russian Academy of Sciences (Russia)

Secretary: **Olga A. Nebritova**, Bauman Moscow State Technical University (Russia)

International Program Committee: **Andrey N. Morozov**, Bauman Moscow State Technical University (Russia), **Stanislav O. Yurchenko**, Bauman Moscow State Technical University (Russia), **Nikolay N. Evtihiyev**, Laser Association (Russia), **Dmitry A. Rogatkin**, «MONIKI» M. F. Vladimirovskii Moscow Regional Scientific Research Institute (Russia), **Andrey V. Samorodov**, Bauman Moscow State Technical University (Russia), **Igor L. Fufurin**, Bauman Moscow State Technical University (Russia), **Igor S. Golyak**, Bauman Moscow State Technical University (Russia), **Alexander V. Kolpakov**, Bauman Moscow State Technical University (Russia), **Elena N. Rinskaya**, Lebedev Physical Institute of the Russian Academy of Sciences (Russia), **Alexander A. Apolonsky**, Institute of Automation and Electrometry of the Siberian Branch of the Russian Academy of Sciences (Russia), **Vladimir A. Lazarev**, Bauman Moscow State Technical University (Russia), **Stanislav G. Sazonkin**, Bauman Moscow State Technical University (Russia), **Pavel V. Berezhaniky**, Sechenov University (Russia), **Mohammad Ali Ansari**, Shahid Beheshti University, Tehran (Iran), **Santhosh Chidangil**, Manipal Academy of Higher Education (India), **Yury Zakharov**, Harvard University, Cambridge (United States), **Li Dongyu**, Huazhong University of Science and Technology, Wuhan, Hubei (China), **Pengcheng Li**, School of Biomedical Engineering, Hainan University (China), **Polina A. Timoshina**, Saratov State University (Russia), **Qingyu Lin**, Sichuan University, Chengdu (China)

September 23, Wednesday

INVITED LECTURE/ORAL/ ON-LINE SESSION OPTICAL AND BIOMEDICAL ENGINEERING (Building 8, Room 201)

Chairs: **Igor L. Fufurin**, **Igor S. Golyak**, Bauman Moscow State Technical University, Russia

Moderator: **Olga A. Nebritova**, Bauman Moscow State Technical University, Russia

Saratov time/Moscow time

11:30-11:50/10:30-10:50

Invited

A comprehensive approach to evaluating therapy and controlling asthma symptoms in children using the method of Fourier-transform infrared spectroscopy

Igor S. Golyak; Bauman Moscow State Technical University, Moscow, Russia

11:50-12:10/10:50-11:10

Oral

High-resolution sonography of fish organs and tissues at early stages of development

Sergey A. Titov; Scientific and Technological Centre of Unique Instrumentation of the Russian Academy of Sciences, Moscow, Russia

12:10-12:30/11:10-11:30

Oral

Molecular Stratification of Sperm by Raman Spectroscopy

Elena Rinskaya; Lebedev Physical Institute, Moscow, Russia; V.I. Kulakov National Medical Research Center for Obstetrics Gynecology and Perinatology, Ministry of Healthcare of Russian Federation, Moscow, Russia

12:30-12:50/11:30-11:50

Oral

The effect of subpicosecond laser irradiation on wound healing in a rat skin flap excision model

Vasily M. Bogomolov; Scientific and Educational Center "Photonics and IR Technology", Bauman Moscow State Technical University, Moscow, Russia

**13.00–14.30/12.00-13.30
LUNCH**

14:30-14:50/13:50-14:10

Oral

Development and validation of a Russian-made NDIR gas analyzer NGAP-1 for CO₂ and H₂O flux measurements by the Eddy Covariance technique

Pavel P. Demkin; Bauman Moscow State Technical University, Russia

14:50-15:10/14:10-14:30

Oral

Development of a method for analyzing two-component mixtures using raman spectra

Roman A. Gylka; Bauman Moscow State Technical University, Russia

15:10-15:30/17:30-17:50

Oral

Human exhaled breath for non-invasive disease detection

Olga A. Nebritova; Bauman Moscow State Technical University, Russia

15:30-15:50/14:30-14:50

Oral

Tunable diode laser spectroscopy for analysis of gas impurities

Igor L. Fufurin; Bauman Moscow State Technical University, Russia

15:50-16:10/14:50-15:10

Oral

Breathomics using IR spectroscopy. A way to monitor noncompliance

Igor L. Fufurin; Bauman Moscow State Technical University, Russia

16:10-16:30/15:10-15:30
Coffee break

16:30-16:50/15:30-15:50

Online Oral

Development of a dynamic Fourier-transform Raman spectrometer

Dmitriy R. Anfimov; Bauman Moscow State Technical University, Moscow, Russia

16:50-17:10/15:50-16:10

Online Oral

Optimization of endoscopic illumination system parameters for contrast-enhanced mucosal vascular structures visualization

Evgeniia D. Kulikova; Federal State Budgetary Institution of Science "Scientific and Technological Centre of Unique Instrumentation" of the Russian Academy of Sciences, Moscow, Russia

17:10-17:30/16:10-16:30

Online Oral

Comparison of digital filtering methods for diffuse reflectance spectra of the oral mucosa

Maxim A. Mamaev; Bauman Moscow State Technical University, Moscow, Russia

17:30-17:50/16:30-16:50

Online Oral

Numerical model of refractive-index writing inside an intraocular lens at a laser wavelength of 1550 nm

Uliana S. Averkieva; Bauman Moscow State Technical University, Moscow, Russia

17:50-18:10/16:50-17:10

Online Oral

Numerical Modeling of Laser-Assisted Blood Vessel Welding

Dmitrii I. Ryabkin; National Research University of Electronic Technology, Moscow, Russia; Sechenov University или I.M. Sechenov First MSU, Moscow, Russia

18:10-18:30/17:10-17:30

Online Oral

Objective monitoring of muscle spasticity treatment in children using frequency-domain near infrared spectroscopy

Mikhail A. Naumov; Bauman Moscow State Technical University, Moscow, Russia

18:30-18:50/17:30-17:50

Oral Report

Microcirculatory Response of Tumor and Healthy Tissues to Various Photodynamic Therapy Protocols

Irina V. Makarova¹, A.V. Guryleva¹, A.S. Machikhin¹, T.G. Grishacheva², S.G. Chefou², A.S. Belyaeva¹, E.D. Kulikova¹; ¹Scientific and Technological Centre of Unique Instrumentation RAS, Moscow, Russia; ²Pavlov University, Saint Petersburg, Russia

September 24, Thursday

JOINT INTERNET/POSTER SESSION BIOPHYSICS (B)

(Building 3, 3rd floor Hall)

Chairs (B): Ivan V. Fedosov,
Saratov State Univ., Russia

18:00-20:00

1B. Raman spectroscopy of DNA packaging in human sperm cells Alina Negin¹, Elena Rimskaya¹, Alexey Gorevoy¹; ¹Lebedev Physical Institute, Moscow, Russia

2B. Raman Spectroscopy of Cell-Free Cervicovaginal Lavage for Differentiation of HPV-Associated Cervical Lesions Anastasia Devyatkina¹, Elena Rimskaya^{1,2}, Alexey Gorevoy^{1,2}, Niso Nazarova¹, Natalia Starodubtseva^{1,3}, Patimat Abakarova¹, Anna Mgeryan¹, Sergey Kudryashov¹, Vera Prilepskaya¹ and Gennady Sukhikh^{1,4}; ¹V.I. Kulakov National Medical Research Center for Obstetrics Gynecology and Perinatology, Russia; ²Lebedev Physical Institute, Russia; ³Moscow Center for Advanced Studies, Russia; ⁴Department of Obstetrics, Gynecology, Perinatology and Reproductology, Institute of Professional Education, Federal State Autonomous Educational Institution of Higher Education

I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation, Russia.

- 3B. Comparative analysis of data balancing methods for the classification of raman spectra of skin growths based on a convolutional neural network** Angelina O.Kapkaeva¹, Irina A. Matveeva¹; ¹Samara National Research University
- 4B. In Vivo Evaluation of Biointegration and Resorption of Polypropylene and Vicryl-Based Tissue-Engineered Meshes via MRI and ICG Fluorescence Imaging** Astemir R. Likhov¹, Natalia V. Rassomakhina¹, Veronika N. Volodina¹, Mikhail S. Krasnov¹, Ulyana A. Apukhtina¹, Tatiana I. Yaremenko¹, Ilya V. Turchin², Victoria V. Zherdeva¹; ¹Federal Research Centre of Biotechnology of the Russian Academy of Sciences, Moscow, Russia; ²Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia
- 5B. Evaluation of DNA Damage in Brain Tissue Using the Comet Assay in a Cuprizone-Induced Mouse Model of Demyelination** Ulyana A. Apukhtina¹, Veronika N. Volodina¹, Olga I. Klein¹, Tatiana I. Yaremenko¹, Astemir R. Likhov¹, Victoria V. Zherdeva¹; ¹Federal Research Centre of Biotechnology of the Russian Academy of Sciences, Moscow, Russia
- 6B. Assessment of Peripheral Hemodynamics by Diffuse Reflectance Spectroscopy in the Visible and Near-Infrared Range in the Cuprizone-Induced Demyelination Model** Veronika N. Volodina¹, Anastasia A. Chervakova¹, Alexander V. Kolpakov², Diana Y. Sokolova², Petr E. Zaitsev¹, Ulyana A. Apukhtina¹, Tatiana I. Yaremenko¹, Mikhail S. Krasnov¹, Nikolai N. Kuznetsov^{1,2}, Viktoria V. Zherdeva¹; ¹A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia; ²Bauman Moscow State Technical University, Moscow, Russia.
- 7B. Machine-learning pipeline for cardiovascular risk prediction from clinical datasets** Karina A. Zhubanazarova¹, Irina A. Matveeva¹; ¹Samara National Research University, Samara, Russia

30th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Workshop on Modern Optics XXV

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

Chairs: **Georgy V. Simonenko, Ekaterina N. Lazareva**, Saratov State University

Secretary: **Arseny P. Fashevski, Nadezhda A. Krapivina**, Saratov State University

Moderator: **Isabella Serebryakova**, Saratov State University

International Program Committee: **Ivan V. Fedosov, Alexander B. Pravdin, Valery V. Tuchin**, Saratov State University,
Alexander V. Priezzhev, Moscow State University

September 21, Monday

PUBLIC LECTURE SESSION MODERN OPTICS

(Building 8, room 420)

Chairs: **Georgy V. Simonenko, Ekaterina N. Lazareva**, Saratov State University

14.00-14.45

CREATING BIOMATERIALS WITH CONTROLLED PROPERTIES: HOW CAN NATURE HELP US?

Gleb B. Sukhorukov, Skolkovo Institute of Science and Technology, Skoltech; Life Improvement by Future Technologies, LIFT Center, Moscow, Russia

September 24, Thursday

PUBLIC LECTURE SESSION MODERN OPTICS

(Building 3, Big Physical Hall)

Chairs: **Georgy V. Simonenko, Ekaterina N. Lazareva**, Saratov State University

14.00-14.40

Photon adventures in the sky and on the ground: which is stronger, light scattering or absorption?

Dmitry A. Gorin, Skolkovo Institute of Science and Technology, Skoltech, Moscow, Russia

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

Workshop Chairs: **Boris A. Medvedev, Irina Yu. Yanina**, Saratov State University, Russia

Secretary: **Anton A. Kharchenko**, 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;

September 23, Wednesday

PLENARY LECTURE/ORAL SESSION/

(Scientific Library, Conf. Hall)
Co-chairs: **Boris A. Medvedev,**
Irina Yu. Yanina,
Saratov State University, Russia

Saratov time

14:00-14:30

PLENARY LECTURE

**History, Semantics, and Explication of the Term
"Artificial Intelligence"**

Valery M. Anikin;

Saratov State University, Saratov, Russia

ROUND TABLE:

**Man and light in natural and art treatment
of the Universe**

14:30-14:50

Oral Report

**Patterns of natural and artificial intelligence:
basic differences**

Yuliya M. Duplinskaya;

Saratov State University, Saratov, Russia

14:50-15:10

Oral Report

About the limitations of artificial intelligence

Natal'ya V. Dovgalenko

Gagarin's State Technical University of Saratov,
Saratov, Russia

15:10-15:30

Oral Report

**The Power of Color. Food Colorants. Between
Substance and Meaning.**

Vitaly V. Sorokin;

Saratov State University, Saratov, Russia

15:30-15:50

Oral Report

**Three Ways to Make Science: Resources and
Outcomes**

Ivan V. Fedosov;

Saratov State University, Saratov, Russia

15:50-16:10
Coffee break

ORAL SESSION

16:10-16:25

Oral Report

**Relevance of Quantum Informatics in School
Motivated by International Experience**

Svetlana V. Churochkina¹, Dmitry V. Churochkin¹,
Ekaterina Lozhkina²;

¹Saratov State University, Saratov, Russia;

²Novosibirsk State University, Novosibirsk, Russia

16:25-16:40

Oral Report

**Ontology of an Interactive Learning Laboratory
Complex for the General Physics Course for
Natural Science Majors at Saratov State
University**

Petr E. Shlygin, Ol'ga G. Danke, Anton A.
Kharchenko ;

Saratov State University, Saratov, Russia

16:40-16:55

Oral Report

**Statistical Analysis of Polarized Speckle Fields
Scattered by Skin Dermis During Optical
Immersion Clearing**

Anton A. Kharchenko¹, Valery V. Tuchin^{1,2,3};

¹Saratov State University, Saratov, Russia

²Tomsk State University, Tomsk, Russia

³Institute of Precision Mechanics and Control, FRC
"Saratov Scientific Center of the Russian Academy
of Sciences", Saratov, Russia

16:55-17:10

Oral Report

**On the implementation of pattern recognition
methods in the diagnosis of non-communicable
blood diseases**

Ivan N. Beglakov, Julia A. Brodskaya;

Gagarin's State Technical University of Saratov,
Saratov, Russia

17:10-17:25

Oral Report

Building a system of differential diagnosis of oncological diseases of the thoracic region

Sergey V. Mikhailov, Julia A. Brodskaya; Gagarin's State Technical University of Saratov, Saratov, Russia

September 24, Thursday

(Scientific Library, Conf. Hall)

Co-chairs: **Boris A. Medvedev,**
Irina Yu. Yanina,
Saratov State University, Russia

Panel members:

Valery V. Tuchin^a, Vladimir L. Derbov, Victor V. Rozen^a, Oleg V. Shimelfenig^a, Lev M. Babkov^a, A. V. Gorokhov^b, Dmitry A.

Zimnyakov^c, Leonid A. Melnikov^c, Julia M. Duplinskay^c, Oleg M. Parshkov^c, A. V. Priezzhev^d,

^aSaratov State University, Saratov, Russia;

^bSamara University, Samara, Russia, ^cYuri Gagarin State Technical University of Saratov, Russia, ^dM.V. Lomonosov Moscow State University, Moscow, Russia

ROUND TABLE

Man and light in natural and art treatment of the Universe

Saratov time

14:00-14:15

Oral Report

Modern technologies and competencies in the zoological research profession

Vasily V. Anikin;
Saratov State University, Saratov, Russia

14:15-14:30

Oral Report

Descartes vs. Aristotle: a Comparative picture of the World.

Victor V. Rozen,
Saratov State University, Saratov, Russia

14:30-14:45

Oral Report

On the 430th Anniversary of René Descartes: The

Triumph and Defeat of Rationalism

Boris A. Medvedev¹, Maria I. Kharkovenko²;

¹Saratov State University, Saratov, Russia

²State Autonomous Culture Institution "Markin Classic Music Center, Vladimir, Russia

14:45-15:00

Oral Report

Modern Quantum Technologies and Its Realisation in Leader Russian Scientific Institutes. Part 1

Alexander V. Gorokhov;

Samara State University, Samara, Russia

15:00-15:15

Oral Report

Proof of Gödel's theorem

Boris L. Faifel;

Gagarin's State Technical University of Saratov, Saratov, Russia

15:15-15:35

Coffee break

15:35-15:50

Oral Report

On approaches to solving the problem of attribution of works by representatives of the Russian avant-garde through the implementation of image recognition methods

Julia A. Brodskaya;

Gagarin's State Technical University of Saratov, Saratov, Russia

15:50-16:05

Oral Report

On the Origins and Evolution of Niels Bohr's Concept of Complementarity

Boris A. Medvedev

Saratov State University, Saratov, Russia

16:05-16:20

Oral Report

The Torus as a Universal Form of Nature

Oleg V. Shimelfenig;

Saratov State University, Saratov, Russia

16:20-16:35

Oral Report

«Just» questions of interpretation (On the 100th anniversary of the creation of quantum mechanics)

Michael M. Stolnitz,

Saratov State University, Saratov, Russia

16:35-16:50

Oral Report

The International Festival "Days of Contemporary Music in Saratov".

Vladimir V. Orlov;

Saratov State Conservatory, Saratov, Russia

16:50-17:10

Oral Report

"Artistic ways of reflecting mystical ideas in the late piano works of A. Scriabin"

Vasily S. Igonin;

Saratov State Conservatory, Saratov, Russia

**JOINT POSTER/INTERNET SESSION AND
INTERNET DISCUSSION
(Online)**

**1H. Modern Quantum Technologies and Its
Realisation in Leader Russian Scientific
Institutes. Part 2**

Alexander V. Gorokhov;
Samara State University, Samara, Russia

**2H. Stabilizer as an Order Parameter: Bridging
Chemistry and Photonics in Gold Nanoclusters**

Anna Abramova;
Moscow Institute of Physics and Technology,
Moscow, Russia

3H. Physics of the mental activity of the brain

Yuriy N. Zayko;
Russian Presidential Academy of National
Economy and Public Administration, Saratov,
Russia

4H. Exploring the Universe around the Big Bang

Yuriy N. Zayko;
Russian Presidential Academy of National
Economy and Public Administration, Saratov,
Russia

**5H. Using Optical Methods to Study the Effect of
Detergents on *Elodéa canadensis***

Olesya A. Trutko¹, Ekaterina S. Vasilenko², Lidia P.
Timchenko², Elena V. Timchenko¹;

¹ Samara National Research University, Samara,
Russia;

² MBGF Institution Lyceum "Technical" named after
S.P. Korolev of the Samara City District. Samara,
Russia

Round Table of High Technologies Commercialization and Regional Innovation Systems XIX

Workshop Chairs: Julia S. Skibina LLC SPE “Nanostructured Glass Technology”, Russia, **Andrey Shuvalov** LLC SPE “Nanostructured Glass Technology”, Russia, **Sergey N. Sokolov**, RME “Inject” LLC, Saratov, Russia, **Daniil N. Bratashov** MIPT and Saratov State University, Russia, **Andrey P. Rytik**, Saratov State University, Russia

September 23, Wednesday

**ORAL SESSION / ROUND TABLE
HIGH TECHNOLOGY
COMMERCIALIZATION
(Building 6, Room 204)**

Chairs: **Daniil N. Bratashov**, MIPT and Saratov State University, Russia; **Andrey P. Rytik** Saratov State University, Russia

Saratov time/Moscow time

12:00-12:20/11:00-11:20

Oral Report

Custom DNA designs: how to vibe-code full-scale app in the two years

Daniil N. Bratashov; Future biophysics institute, MIPT, Russia and Chair of innovations, Saratov State University, Saratov, Russia

12.20-12.40/11:20-11:40

Oral Report

On approaches to solving the problem of attribution of works by representatives of the Russian avant-garde through the implementation of image recognition methods

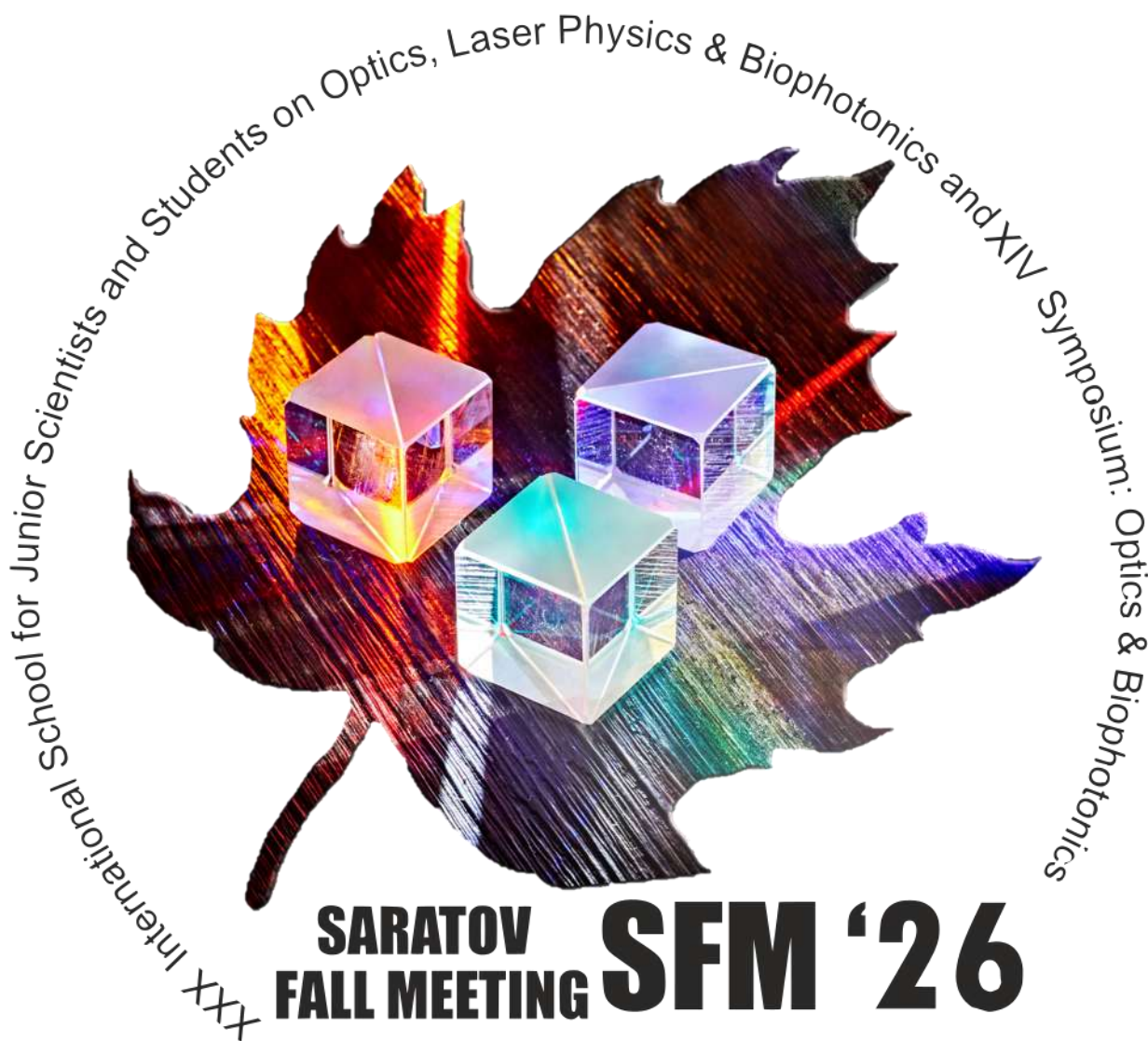
Julia A. Brodskaya; Gagarin's State Technical University of Saratov, Saratov, Russia

12:40-13:00/11:40-12:00

Online Oral Report

Development of a Wearable Optical Sensor for Non-Medical Glucose Dynamics Monitoring: Crowdfunding as a Tool for Early User Engagement and Device Validation

Vladimir Kozlov; PROBA lab, MIPT, Russia



**SARATOV
FALL MEETING SFM '26**

September 21 - 25, 2026