

Schedule of SFM-23/CRW-23/BRICS-23

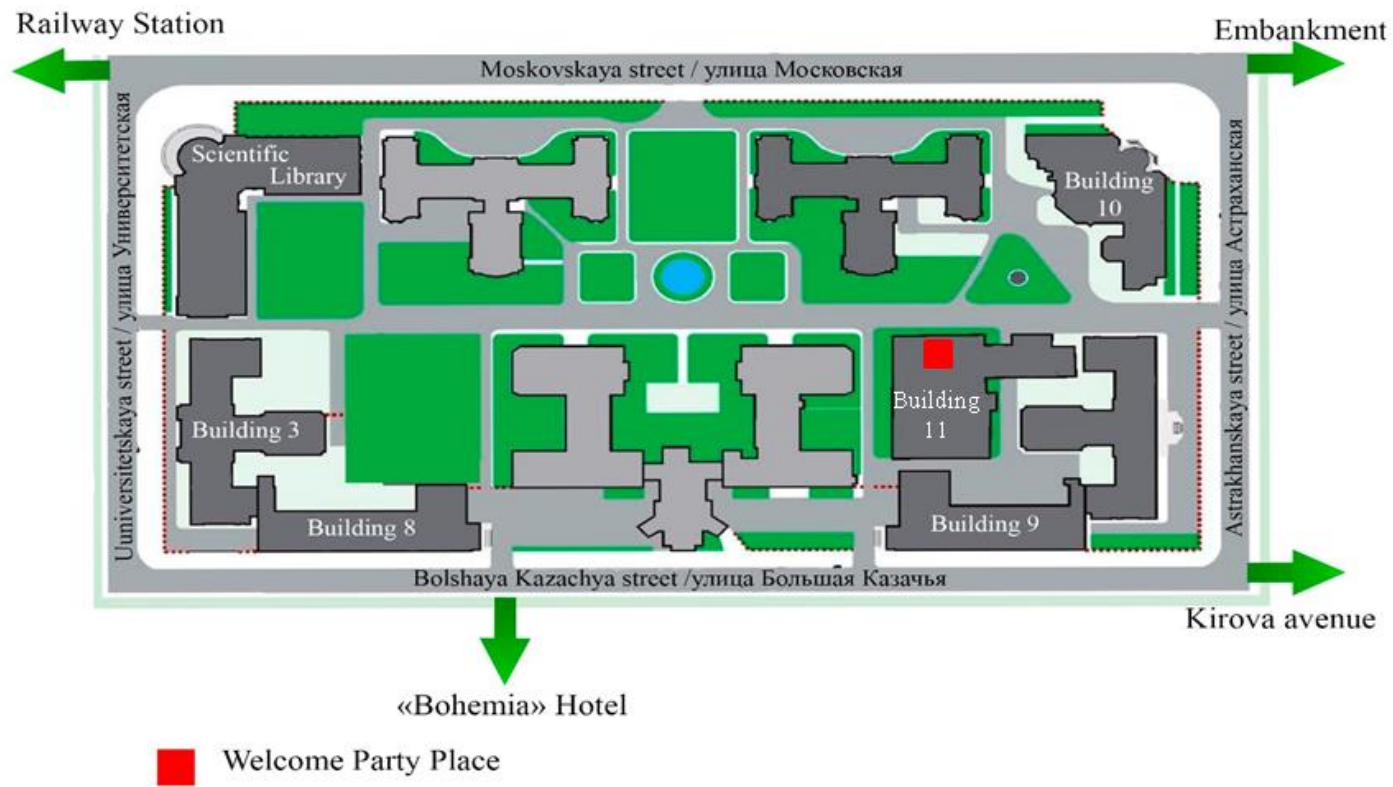
September 25, Monday		
Saratov time UTC+4		
9.20-9.30	Words of welcome to the participants of CRW-BBO-23 Valery V. Tuchin, Saratov State Univ., Russia; Dan Zhu, Huazhong Univ. of Science and Technology, China https://zoom.us/j/97105128804	Zoom
9.30-14.00	ON-LINE CHINESE-RUSSIAN INVITED LECTURE SESSION I Chairs: Valery V. Tuchin, Saratov State Univ., Russia; Dan Zhu, Huazhong Univ. of Science and Technology, China	Building 3, Room 8 Zoom
12.30-13.00	Coffee break	Building 8, 4th floor
September 26, Tuesday		
10.00-13.00	REGISTRATION OF THE PARTICIPANTS OF SFM-23	Building 3, 1 st floor
9.30-12.40	ON-LINE CHINESE-RUSSIAN INVITED LECTURE SESSION II Chairs: Valery V. Tuchin, Saratov State Univ., Russia; Dan Zhu, Huazhong Univ. of Science and Technology, China	Building 3, Room 8 Zoom
13.50-14.00 14.00-18.00	WORDS OF WELCOME TO THE PARTICIPANTS OF SFM-23 /SFM PLENARY SESSION Chairs: Valery V. Tuchin, Saratov State Univ.; Alexander V. Priezzhev, Lomonosov Moscow State Univ., Russia https://zoom.us/j/97105128804	Building 8, Conf. Hall 420 Zoom
14.00-14.35	Multi-focal structured illumination microscopy for deeper penetration superresolution imaging Junle Qu, Shenzhen University, Shenzhen, China	
14.35-15.10	Long-term optical imaging analysis for eye disease Yao He, Soochow University, Suzhou, China	
15.10-15.45	Photosafe non-invasive detection of deep-seated lesions via transmission Raman spectroscopy Jian Ye, School of Biomedical Engineering, Shanghai Jiao Tong University, Shanghai, China	
15.45-16.00	Coffee break	Building 8, 4th floor

16.00-16.35	Single-molecule spectroscopy and nanoscopy: advantages and new horizons Andrei V. Naumov , Department of Condensed Matter Spectroscopy, Institute of Spectroscopy, Russian Academy of Sciences, Troitsk; Institute of Physics, Technology, and Informational Systems, Moscow Pedagogical State University (MPGU), Moscow; Lebedev Physical Institute, Russian Academy of Sciences, Branch in Troitsk, Troitsk, Russia		
16.35-17.10	Biodegradable optical theranostics Andrei V. Zvyagin , Laboratory of Onco Nano Theranostics Shemyakin & Ovchinnikov Institute of Bioorganic Chemistry, RAS, Moscow, Russia	Moscow time 15.35-16.10	<i>Building 8, Conf. Hall 420 Zoom</i>
17.10-17.45	Effects of nanocarriers on lysosomal biology: the last biological barrier to the target Alessandro Parodi , Laboratory of Molecular Nanomedicine Sirius University of Science and Technology, Sochi, Russia		
17.45-18.20	Multiscale SHG microscopy analysis of collagen architecture alterations in human diseases Paul J. Campagnola , Department of Biomedical Engineering, Medical Physics Department, Laboratory for Optical and Computational Instrumentation, UW Carbone Cancer Center, University of Wisconsin, Madison, USA	USA time 8.45-9.20 Zoom	
18.20-18.50	SPONSOR SESSION https://zoom.us/j/97105128804		
18.20-18.30	Light: Advanced Manufacturing is a new, highly selective, open-access, and free of charge international sister journal of the Nature journal Light: Science & Applications Wolfgang Osten , LAM Co-Editor-in-Chief, Institute of Applied Optics, University of Stuttgart, Germany		
18.30-18.50	Zolix confocal Raman microscopes and hyperspectral cameras for biological applications Vitaly V. Muraviev , LLC "Special Systems. Photonics," Saint-Petersburg, Russia		
19.00-22.00	Welcome Party		<i>Building 11</i>
September 27, Wednesday			
10.00-14.00	INVITED LECTURE/ ORAL SESSION BIOPHYSICS I Chair: Elina Genina , Saratov State Univ., Russia; Ivan A. Bratchenko ; Samara National Research Univ., Samara, Russia https://zoom.us/j/97105128804		<i>Building 8, Hall 420 Zoom</i>
	ON-LINE / ORAL SESSION LOW-DIMENSIONAL STRUCTURES Chair: Olga Glukhova , Saratov State Univ., Russia https://meet.google.com/gww-tbbm-two		<i>Building 8, Room 318</i>
	INVITED LECTURE/ORAL SESSION NANOBIPHOTONICS I Chair: Nikolai G. Khlebtsov , IBPPM RAS, Saratov State Univ., Russia https://us06web.zoom.us/j/82452500876		<i>Building 9, Conf. Hall Zoom</i>
14.00-14.30	Coffee break		<i>Building 8, 4th floor</i>

	LECTURE/ORAL SESSION EDUCATION I Chairs: Boris A. Medvedev , Saratov State Univ., Russia	<i>Scientific Library Conf. Hall</i>	ORAL SESSION LASER PHYSICS&PHOTONICS Chair: Vladimir L. Derbov , Saratov State Univ., Russia	<i>Building 10, Hall 503</i>
14.30-19.30	Words of welcome to the participants of BRICS-23 Valery V. Tuchin , Saratov State Univ., Russia; https://zoom.us/j/97105128804	ON-LINE INVITED LECTURE / ON-LINE SESSIONS BIOPHYSICS II/ INTERNET BIOPHOTONICS I/ BRICS WORKSHOP SESSIONS I Chairs: Alexei A. Kamshilin , Inst. of Automation and Control Processes FEB RAS, Vladivostok, Russia; Vladimir Y. Zaitsev , Inst. of Applied Physics of the RAS, Nizhny Novgorod, Russia		<i>Building 8, Conf. Hall 420 Zoom</i>
16.00-16.30	Coffee break			<i>Building 8, 4th floor</i>
14.30-18.00	ON-LINE INVITED LECTURE/ORAL SESSION MACHINE LEARNING I Chair: Yury Kistenev, Denis Vrazhnov , Tomsk State Univ., Russia http://class.tsu.ru/m-course-35700	<i>Building 3, Room 8</i>	ON-LINE INVITED LECTURE/ORAL SESSION NANOBIPHOTONICS II Chair: Nikolai G. Khlebtsov , IBPPM RAS, Saratov State Univ., Russia https://us06web.zoom.us/j/82452500876	<i>Building 9, Conf. Hall Zoom</i>
15.00-20.00	ON-LINE INVITED LECTURE/ORAL SESSION ENDOGENOUS BIOPHOTONICS Chair: Ilya V. Volodyaev , Moscow State Univ., European Medical Center, Elena V. Naumova , Rzhanov Inst. of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences, Russia https://us06web.zoom.us/j/83677281091?pwd=mxqHZGc2bAbQwQXYS3lgFpeqwAHZwS.1			<i>Zoom</i>
15.30-18.00	ON-LINE INVITED LECTURE /ORAL SESSION SPECTROSCOPY AND MOLECULAR MODELING I Chair: Lev M. Babkov , Saratov State Univ., Russia https://us02web.zoom.us/j/9297707272?pwd=QVhzMDdOL2hUbUJKM3BvRks1WWRBdz09			<i>Building 3, Room 34</i>
20.30-23.00	Evening boat trip - the lights of Saratov			
September 28, Thursday				
10.00-13.30	ORAL SESSION QUANTUM SCIENCE I Chair: Aleksey Fedorov , Russian Quantum Center, Russia			<i>Skolkovo Inst. of Science and Technology</i>
	JOINT INVITED LECTURE/ORAL SESSION MACHINE LEARNING II Chair: Yury Kistenev, Denis Vrazhnov , Tomsk State Univ., Russia http://class.tsu.ru/m-course-35700			<i>Building 3, Room 8</i>

	INVITED LECTURE/ ORAL SESSION BIOPHYSICS III Chair: Vladimir Y. Zaitsev , Inst. of Applied Physics of the RAS, Andrei Lugovtsov , Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia https://zoom.us/j/97105128804	Building 8, Conf. Hall 420 Zoom
11.30-12.00	Coffee break	<i>Building 8, 4th floor</i>
12.00-14.30	ON-LINE / ORAL SESSION LOW-DIMENSIONAL STRUCTURES Chair: Olga Glukhova , Saratov State Univ., Russia https://meet.google.com/gww-tbbm-two	<i>Building 8, Room 318</i>
13.00-14.30	ROUND TABLE DICUSSION ENGLISH Chair: Svetlana V. Eremina, Alexander B. Pravdin , Saratov State Univ., Russia	Building 18
13.30-14.00	Coffee break	<i>Building 8, 4th floor</i>
14.00-14.45	PUBLIC LECTURE SESSION MODERN OPTICS Chairs: Georgy V. Simonenko , Saratov State Univ., Anton Dyachenko , Saratov State Univ., Boarding school 64 What is “nanoscopy,” or how to see a single molecule Andrey V. Naumov , Corresponding member of the Russian Academy of Sciences, Institute of Spectroscopy of the Russian Academy of Sciences, Moscow, Russia	<i>Building 3, Big Physical Hall</i>
14.00-16.00	ORAL SESSION NONLINEAR DYNAMICS Chairs: Galina I. Strelkova, Andrei V. Slepnev , Saratov State Univ., Russia https://meet.google.com/itk-jpdc-ran	<i>Building 3, Room 38</i>
14.30-17.30	ORAL SESSION ELECTROMAGNETICS Chair: Michael V. Davidovich , Saratov State University, Russia https://meet.google.com/hzz-vmdy-hwy	Building 8, Room 318
15.30-18.00	ON-LINE INVITED LECTURE /ORAL SESSION SPECTROSCOPY AND MOLECULAR MODELING II Chair: Lev M. Babkov , Saratov State Univ., Russia https://us02web.zoom.us/j/9297707272?pwd=QVhzMDdOL2hUbUJKM3BvRks1WWRBdz09	<i>Building 3, Room 34</i>
14.00-17.40	ON-LINE INVITED LECTURE/ORAL SESSION ENDOGENOUS BIOPHOTONICS Chair: Ilya V. Volodyaev , Moscow State Univ., European Medical Center, Elena V. Naumova , Rzhanov Inst. of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences, Russia https://us06web.zoom.us/j/83677281091?pwd=mxqHZGc2bAbQwQXYS3lgFpeqwAHZwS.1	Zoom
15.20-17.20	ROUND TABLE DICUSSION MITOGENETIC RADIATION, CANCER QUENCHER AND RELATED PHENOMENA Chair: Ilya V. Volodyaev , Moscow State Univ., European Medical Center, Elena V. Naumova , Rzhanov Inst. of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences, Russia https://us06web.zoom.us/j/83677281091?pwd=mxqHZGc2bAbQwQXYS3lgFpeqwAHZwS.1	

14.30-17.45	ON-LINE INVITED LECTURE/ ON-LINE SESSIONS BIOPHYSICS IV/ INTERNET BIOPHOTONICS II/ BRICS WORKSHOP SESSIONS II Chair: Andrei Lugovtsov; Alexander Priezzhev , Lomonosov Moscow State University, Moscow, Russia, https://zoom.us/j/97105128804		<i>Building 8, Conf. Hall 420 Zoom</i>	
17.45-18.15	INTERNET PLENARY SESSION Chair: Valery V. Tuchin , Saratov State Univ., Russia Recent Advances In Optical Coherence Elastography Kirill V. Larin , Department of Biomedical Engineering, University of Houston, Houston, USA https://zoom.us/j/97105128804		<i>Building 8, Conf. Hall 420 Zoom</i>	
15.00-18.00	ORAL SESSION BIOMEDICAL SPECTROSCOPY II Chairs: Vyacheslav I. Kochubey, Alexander B. Pravdin , Saratov State Univ., Russia	<i>Building 3, Room 8,</i>	INVITED LECTURE/ORAL SESSION ADVANCED MATERIALS Chair: Vladimir N. Kurlov, Gleb M. Katyba , ISSP RAS, Maria G. Burdanova , MIPT, Russia https://us06web.zoom.us/j/87196553137	<i>Online</i>
17.30-18.00	Coffee break		<i>Building 3, 2nd floor</i>	
14.00-18.00	ORAL SESSION QUANTUM SCIENCE II Chair: Aleksey Fedorov , Russian Quantum Center, Russia online	<i>Campus of the Skolkovo Institute of Science and Technology</i>	ROUND-TABLE DISCUSSION EDUCATION Moderator: Boris A. Medvedev , Saratov State Univ., Russia	<i>Scientific Library Conf. Hall</i>
18.15-20.30	JOINT POSTER/INTERNET SESSION 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		<i>Building 3</i>	
September 29, Friday				
10.00-13.00	INVITED LECTURE/ORAL SESSION TERAHERTZ OPTICS & BIOPHOTONICS Chair: Kirill I. Zaytsev, Arsenii A. Gavdush, Nikita V. Chernomyrdin , Prokhorov General Physics Institute of RAS, Bauman Moscow State Technical Univ., Russia https://telemost.yandex.ru/j/24881922987292959025771195058111855614		<i>Online</i>	
14.00-18.00	Round-table discussions and closing of SFM-23		<i>Open Air Meeting</i>	



*Dedicated to 300th Anniversary of the Russian Academy of Sciences
To the 95th anniversary of the VI Congress of the Russian Association of
Physicists - Volga Congress*

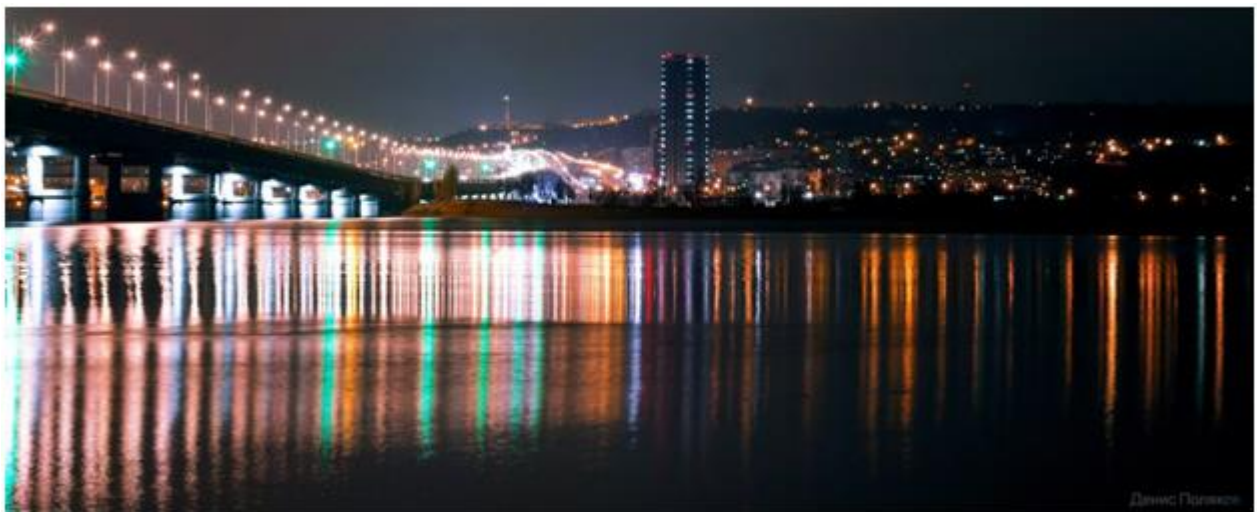
Saratov Fall Meeting SFM'23

**11th International Symposium “Optics and
Biophotonics”**

**27th International School for Junior Scientists
and Students on Optics, Laser Physics &
Biophotonics**

**Chinese-Russian workshop on biophotonics
and biomedical optics-2023**

BRICS Workshop on Biophotonics II – 2023



11th International Symposium on Optics and Biophotonics

Conference on Optical Technologies in Biophysics & Medicine XXV

Chairs:

Elina A. Genina, Saratov State University; Tomsk State University,

Polina A. Dyachenko, Saratov State University; Tomsk State University,

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

Secretary: Isabella A. Serebryakova, Saratov State University, Tomsk State University

International Program Committee: **Heidi Abrahamse**, University of Johannesburg, RSA, **Vanderlei Salvador Bagnato**, University of São Paulo, Brazil, **Walter Blondel**, University of Lorraine (France), **Wei Chen**, University of Central Oklahoma (USA), **Santhosh Chidangil**, Manipal Academy of Higher Education (India), **Kishan Dholakia**, University of St. Andrews (UK), **Maria Farsari**, FORTH-IESL (Greece), **Paul M.W. French**, Imperial College of Science, Technology and Medicine (UK), **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), **Qingming Luo**, Hainan University (China), **Luís M. Oliveira**, Polytechnic of Porto – School of Engineering (Porto, Portugal), **Roberto Pini**, National Research Council of Italy (CNR) (Italy), **Juergen Popp**, Inst. of Photonic Technology, Jena (Germany), **Alexander V. Priezzhev**, Moscow State Univ. (Russia), **Lihong Wang**, Caltech (USA), **Ruikang K. Wang**, University of Washington (USA), **Valery P. Zakharov**, Samara State University (Russia), **Zeev Zalevsky**, Bar Ilan University, Tel Aviv (Israel).

September 27, Wednesday

INVITED LECTURE/ORAL/ SESSION BIOPHYSICS I

**Zoom link: <https://zoom.us/j/97105128804>
ID 971 0512 8804
(Building 8, Hall 420)**

Chairs: **Elina Genina**, Saratov State Univ., Russia,
Ivan A. Bratchenko; Samara National Research
Univ., Samara, Russia

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

Saratov time/Moscow time/ **Speaker country time**

10.00-10.30/9.00-9.30

Invited

Blood flow monitoring during abdominal surgery using imaging photoplethysmography

Alexei A. Kamshilin¹, Valeriy V. Zaytsev¹, Victor A. Kashchenko^{2,3}; ¹Institute of Automation and Control Processes FEB RAS, Vladivostok, Russia, ²North-Western District Scientific and Clinical Center named after L.G. Sokolov FMBA, St. Petersburg, Russia, ³Saint Petersburg State University, St. Petersburg, Russia

10.30-11.00/9.30-11.00

Invited

General description of image formation/transformation in optical coherence tomography using K-space approach: numerical demonstrations without the need of conventional paraxial approximation or Gaussian beams

A.L. Matveyev, L.A. Matveev, G.V. Gelikonov, V.Y. Zaitsev; A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

11.00-11.30/10.00-10.30

Invited

Tunable infrared lasers for biomedical and environmental applications

Igor L. Fufurin, Igor S. Golyak, Andrey N. Morozov, Pavel P. Demkin, Dmirty R. Anfimov, Dmitry A. Nazarov; Bauman Moscow State Technical University, Moscow, Russia

11.30-12.00/10.30-11.00

Invited

Small Spheres, Big Possibilities: Cellular Spheroids and Their Role in Nanobiomedicine

Anatolii A. Abalymov, Saratov State University, Russia

12.00-12.30/11.00-11.30

Invited

Multispectral sensor fusion in SmartWatch for in situ continuous monitoring of human skin hydration and body sweat loss

Elena Volkova¹, Alexey Perchik¹, Konstantin Pavlov¹, Evgenii Nikolaev¹, Alexey Ayuev¹,

Jaehyuck Park², Namseok Chang², Wonseok Lee², Justin Younhyun Kim², Alexander Doronin³, Maksim Vilenskii¹; ¹ Samsung Research, Suwon, Korea; ²Health H/W R&D Group, Samsung Electronics, Suwon, Korea, ³School of Engineering and Computer Science, Victoria University of Wellington, Wellington, New Zealand.

12.30-13.00/11.30-12.00

Invited

Optical and Liquid Biopsy of Non-Communicable Diseases

Ivan A. Bratchenko; Samara National Research University, Samara, Russia

13.00-13.15/12.00-12.15

Oral Report

Modelling of the process of formation of a laser welded seam of biological tissue under irradiation by laser radiation with dynamically changing focal distance

D. I. Ryabkin^{1,2}, V. V. Suchkova^{1,2}, A. Yu. Gerasimenko^{1,2}; ¹I.M. Sechenov First Moscow State Medical University, Moscow, Russia, ²National Research University of Electronic Technology MIET, Zelenograd, Moscow, Russia

13.15-13.30/12.15-12.30

Oral Report

Fluorescent Convertible Polymer Capsules with Various Dyes as Tracking Labels for Macrophages

Zhanna V. Kozyreva¹, Polina A. Demina², Anastasiia Yu. Sapach¹, Daria A. Terentyeva¹, Olga I. Gusliakova^{1,2}, Anna M. Abramova², Irina Yu. Goryacheva², Gleb B. Sukhorukov^{1,3}, and Olga A. Sindeeva¹; ¹Skolkovo Institute of Science and Technology, Moscow, Russia; ²Saratov State University, Saratov, Russia; ³Queen Mary University of London, London, UK

13.30-13.45/12.30-12.45

Oral Report

Differentiation of healthy and malignant brain tissues using optical coherence tomography

Polina V. Aleksandrova¹, Kirill I. Zaytsev¹, Pavel V. Nikitin², Anna I. Alekseeva³, Igor V. Reshetov⁴, Irina N. Dolganova⁵; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia, ²University of Houston, Houston, Texas, USA, ³Research Institute of Human Morphology, Moscow, Russia, ⁴Institute for Cluster Oncology, Sechenov University, Moscow, Russia, ⁵Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia

13.45-14.00/12.45-13.00

Oral Report

Surface-enhanced Raman scattering of blood plasma of patients with malignant and benign neoplasms of the endometrium in comparison with the control group

Dmitry N. Artemyev¹, Lyudmila A. Bratchenko¹, Vladimir I. Kukushkin², Vladimir M. Zuev³, ¹Samara National Research University, Samara, Russia,

²Institute of Solid State Physics RAS, Chernogolovka, Russia, ³Sechenov University, Moscow, Russia

14.00 -14.30

Coffee break

ZOOM INVITED LECTURE / ORAL SESSIONS BIOPHYSICS II/ BRICS

WORKSHOP SESSIONS I

<https://zoom.us/j/97105128804>

ID 971 0512 8804

(Building 8, Hall 420)

Chairs: **Vladimir Y. Zaitsev**, Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia, **Alexei A. Kamshilin**, Institute of Automation and Control Processes FEB RAS, Vladivostok, Russia
Moderator: **Isabella Serebryakova**, Saratov State University, Russia

14.30-14.40/13.30-13.40

Welcome words from Chairs of the BRICS Workshop on Biophotonics -2023

Valery V Tuchin, Saratov State University, Russia
Qingming Luo, Hainan University, China
Vanderlei Salvador Bagnato, University of São Paulo, Brazil

Santhosh Chidangil, Manipal Academy of Higher Education, India

Heidi Abrahamse, University of Johannesburg, RSA

14.40-15.10/13.40-14.10/16.10-16.40

BRICS ZOOM Invited

Body fluid analysis for disease diagnosis using optical techniques

Santhosh Chidangil; Centre of Excellence for Biophotonics, Department of Atomic and Molecular Physics, Manipal Academy of Higher Education, Manipal, India

15.10-15.40/14.10-14.40/13.10-13.40

BRICS ZOOM Invited

Design consideration of phthalocyanines as sensitizers for enhanced sono-photodynamic combinatorial therapy of cancer

Heidi Abrahams; Laser Research Centre, University of Johannesburg, South Africa

15.40-16.10/14.40-15.10/8.40-9.10

BRICS ZOOM Invited

New strategies in combining photodynamic with antibiotics in the resistant infection control

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

16.10 -16.30

Coffee break

16.30-17.00/15.30-16.00/

Invited

Time-resolved multispectral macro-imaging: clinical applications

Vladislav I. Shcheslavskiy^{1,2}, Diana V. Yuzhakova¹, Marina V. Shirmanova¹, Wolfgang Becker²; ¹Privolzhskiy Research Medical University, Nizhny Novgorod, Russia; ²Becker&Hickl GmbH, Berlin, Germany

17.00-17.15/16.00-16.15

Oral Report

Integrated binary hologram to monitor cargo release from a drug-eluting film

Arkady S. Abdurashitov¹, Pavel I. Proshin¹, Valery V. Tuchin^{2,3}, Gleb B. Sukhorukov^{1,4,5}; ¹Center for Neurobiology and Brain Restoration, Skolkovo Institute of Science and Technology, Moscow, Russia, ²Science Medical Center, Saratov State University, Saratov, Russia, ³A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia, ⁴School of Engineering and Materials Science, Queen Mary University of London, London, United Kingdom, ⁵Siberian State Medical University, Moskovskiy Trakt, Tomsk, Russia

17.15-17.30/16.15-16.30

Oral Report

Platelet activation mediated by diffusion of the agonist released via optical stimulus

Ezhena S. Starodubtseva, Alexander E. Moskalensky, Novosibirsk State University, Novosibirsk, Russia

17.30-17.45/16.30-16.45/

Oral Report

Compression optical coherent elastography for detecting microruptures of the intestinal wall during tissue distraction

Elena B. Kiseleva¹, Alexander A. Sovetsky², Anton A. Plekhanov¹, Maxim G. Ryabkov¹, Ekaterina V. Gubarkova¹, Evgeniya L. Bederina¹, Natalia D. Gladkova¹, Vladimir Y. Zaitsev²; ¹Privolzhskiy Research Medical University, Nizhny Novgorod, Russia, ² Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia

17.45-18.00/16.45-17.00/

Oral Report

The experimental study and modeling of liver optical properties in the 350-1300 nm range

Ksenia Y. Kandurova¹, Dmitry S. Sumin^{1,2}, Alexander A. Palalov¹, E.S. Seryogina¹, Viktor V. Dremine¹, Andrian V. Mamoshin^{1,2}, Andrey V. Dunaev¹, Elena V. Potapova¹; ¹Research and Development Center of Biomedical Photonics, Orel State University, Orel, Russia, ²Orel Regional Clinical Hospital, Orel, Russia

18.00-18.15/17.00-17.15

Oral Report

Refractometric analysis of blood serum

L. V. Plotnikova¹, O. S. Vezo¹, A. D. Garifullin^{1,2}, A. Y. Kuvshinov², S.V.Voloshin^{2,3}, A.M. Polyanichko^{1,4}; ¹St. Petersburg State University, ²Russian Research Institute of Hematology and Transfusiology, ³Kirov Military Medical Academy,

⁴Institute of Cytology of the Russian Academy of Sciences

18.15-18.30/17.15-17.30

Oral Report

Optical coherence tomography to evaluate the recovery of the skin after fractional CO₂ laser treatment of Vulvar Lichen Sclerosus

Arseniy L. Potapov¹, Anastasiya E. Bychkova², Alexander A. Moiseev³, Maria M. Karabut¹, Alexandra V. Asaturova², Inna A. Apolikhina², Natalia D. Gladkova¹, Marina A. Sirotkina¹; ¹Privolzhskiy Research Medical University, Nizhny Novgorod, Russia; ²National Medical Research Center for Obstetrics, Gynecology and Perinatology named after academician V.I. Kulakov, Moscow, Russia; ³Institute of Applied Physics RAS, Nizhny Novgorod, Russia

18.30-18.45/17.30-17.45/

Oral Report

Optical scheme for simultaneous measurement of light scattering and attenuation for the cell culture quantification

Alexander E. Moskalensky, Natalia A. Virts, Tatyana Yu. Karogodina; Novosibirsk State University

18.45-19.00/17.45-18.00/

Oral Report

2D binary mapping of nucleotide sequences: polarization encoding versus chaos game representation

M.V. Alonova¹, D.A. Zimnyakov^{1,2}, An.V. Skripal³; ¹Yury Gagarin State Technical University of Saratov, Saratov, Russia, ²Institute for Precision Mechanics and Control Problems of the Russian Academy of Sciences (IPTMU RAS), Saratov, Russia, ³Saratov State University, Saratov, Russia

September 28, Thursday

ZOOM/ INVITED LECTURE/ ORAL REPORT SESSIONS BIOPHYSICS III/ INTERNET BIOPHOTONICS I/ BRICS WORKSHOP SESSIONS II

Zoom link: <https://zoom.us/j/97105128804>
ID 971 0512 8804
(Building 8, Hall 420)

Chair: **Vladimir Y. Zaitsev**, Inst. of Applied Physics of the RAS, **Andrei Lugovtsov**, Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

10.00-10.30/09.00-09.30/Sept. 27, 23.00-23.30

INTERNET BIOPHOTONICS ZOOM Invited

Optical Coherence Tomography Angiography and its Applications for Retina Imaging

Ruikang Wang, University of Washington, Seattle, USA

10.30-11.00/09.30-10.00

INTERNET BIOPHOTONICS ZOOM Invited**Advanced Monte Carlo Simulations for Optical Imaging Modalities**

M. Kirillin¹, D. Kurakina¹, A. Getmanskaya^{1,2}, A. Gorshkov^{1,2}, A. Khilov¹, V. Perekatova¹, V. Shishkova^{1,2}, I. Turchin¹, E. Sergeeva¹; ¹A.V. Gaponov-Grekhov Institute of Applied Physics RAS, Nizhny Novgorod, Russia; ²N.I. Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia

11.00-11.30/10.00-10.30

Zoom Invited

Novel approaches for photo-acoustic sensing

Zeev Zalevsky; Faculty of Engineering, Bar-Ilan University, Israel

11.30 -12.00
Coffee break

12.00-12.30/11.00-11.30/10.00-10.30

INTERNET BIOPHOTONICS ZOOM Invited**In vivo staining-free visualization of macrophages in human skin using two-photon tomography with fluorescence lifetime imaging**

Maxim E. Darwin¹, Marius Kröger¹, Jörg Scheffel^{2,3}, Evgeny A. Shirshin⁴, Johannes Schleusener¹, Martina C. Meinke¹, Jürgen Lademann¹, Marcus Maurer^{2,3}; ¹Charité – Universitätsmedizin Berlin, Department of Dermatology, Berlin, Germany; ²Charité – Universitätsmedizin Berlin, Institute of Allergology, Berlin, Germany; ³Fraunhofer Institute for Translational Medicine and Pharmacology, Allergology and Immunology, Berlin, Germany; ⁴Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia

12.30-12.45/11.30-11.45

Oral Report

An algorithm for analyzing Raman spectra of dental tissues for use in experimental medicine and dentistry

Oleg O. Frolov¹, Pavel E. Timchenko¹, Elena V. Timchenko¹, Irina V. Bazhutova²; ¹Samara National Research University, Samara, Russia; ²Samara State Medical University, Institute of Experimental Medicine and Biotechnology, Samara

12.45-13.00/11.45-12.00

Zoom Oral Report

Assessment of Temporal Characteristics of Perfusion Curves Recorded by Laser Doppler Flowmetry and/or Optical Incoherent Fluctuation Flowmetry in Patients with Diabetes Mellitus

Alexey Glazkov, Ksenia Krasulina, Polina Glazkova, Yulia Kovaleva, Dmitry Rogatkin; Moscow Regional Research and Clinical Institute, Moscow, Russia

13.00-13.15/12.00-12.15

ZOOM Oral Report

Investigation of the influence of thermally induced methemoglobin on the human skin optical reflection depending on temperature

Andrey V. Belikov^{1,2}, Viktor Yu. Chuchin^{1,3}; ¹Institute of Laser Technologies, ITMO University, Russia, ²Research Institute of Dentistry and Maxillofacial Surgery, Pavlov First St. Petersburg State, Medical University, Russia, ³Sector of Medical Laser Technologies, "NPP VOLO" LLC, Russia

13.15-13.30/12.15-12.30/11.15-11.30

BRICS ZOOM Oral report

Formulation, Characterization, and Optimization of Stearic Acid-Based Solid Lipid Nanoparticles with Lauric acid and Tea Tree Oil

Fezile Motsoenea, Heidi Abrahamsea, Sathish Sundar Dhillip Kumara Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, P.O. Box: 17011, Johannesburg 2028, South Africa

13.30-13.45/12.30-12.45/11.30-11.45

BRICS ZOOM Oral report

Effects of Near-Infrared Photobiomodulation at 830 nm in a Diabetic Wounded Cell Model

Lindokuhle Hadebe, and Nicolette N. Hourel, University of Johannesburg, South Africa

13.45 -14.00
Coffee break

ON-LINE INVITED LECTURE/ ON-LINE SESSIONS BIOPHYSICS IV/ INTERNET BIOPHOTONICS II

Zoom link: <https://zoom.us/j/97105128804>

ID 971 0512 8804

(Building 8, Hall 420)

Chair: Alexander Priezzhev, Andrei Lugovtsov Lomonosov Moscow State University, Moscow, Russia

Moderator: Isabella Serebryakova, Saratov State University, Russia

14.30-15.00/13.30-14.00

Invited

Effect of optical clearing agents on blood microrheology in in vitro measurements

Andrei E. Lugovtsov; M.V. Lomonosov Moscow State University, Moscow, Russia

15.00-15.30/14.00-14.30/13.00-13.30

Zoom Invited

Fluorescence guided procedures and photodynamic therapy in neurosurgery

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

15.30-15.45/14.30-14.45/13.30-13.45

Zoom Oral report

Retrospective analysis of MR-images after iPDT-treatment of glioblastoma

Mohamed El Fahim, Marco Foglar, Herbert Stepp, Maximilian Aumiller, Alex Buchner, Stefanie Quach, Niklas Thon, Robert Forbrig, Katja Bochmann, Ronald Sroka, Adrian Rühm

15.45-16.15/14.45-15.15/

Invited

Capillary blood flow characteristics and endothelium function in healthy volunteers and patients suffering from socially significant diseases

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

16.15-16.30/15.15-15.30

Oral Report

Antimicrobial photodynamic exposure using indocyanine green conjugated with various nanoparticles

Elena S. Tuchina¹, Grigoriy K. Savelev², Boris N. Khlebtsov³, Nikolay G. Khlebtsov³; ¹Saratov State University, Saratov, Russia, ²St. Petersburg University, Saint Petersburg, Russia, ³Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia

16.30-16.45/15.30-15.45

Oral Report

Investigation of nonlinear optical effects of hybrid thermosensitive platforms modified with plasmonic and dielectric nanoparticles

L. V. Mikhailova, E. N. Gerasimova, V. V. Yaroshenko, M. V. Zyuzin, Faculty of Physics, ITMO University, Russian Federation

16.45-17.00/15.45-17.00/ 14.45-15.00

BRICS ZOOM Oral report

Cytotoxicity of Senna Didymobotrya Leaves Green Synthesized Silver Nanoparticles and Phototherapy Against A375 Melanoma Cells

Mehak Zahra, Heidi Abrahamse, Blassan P. George, University of Johannesburg, South Africa

17.00-17.15/16.00-16.15/14.55-15.15

BRICS ZOOM Oral report

Photobiomodulation Promotes Wound Healing In A Diabetic Cellular Model

Dimakatso B. Gumede, Nicolette N. Houeild University of Johannesburg, South Africa

17.15-17.30/16.15-16.30/15.15-15.30

BRICS ZOOM Oral report

Enhancing the effects of Photodynamic Therapy on Metastatic Melanoma (A375) using Hypocrellin photosensitizer conjugated to Silver Nanoparticle

Precious Nkosi, Rahul Chandran, and Heidi Abrahamse, Laser Research Centre, Faculty of Health Science, University Of Johannesburg South Africa.

17.30-17.45/16.30-16.45/15.30-15.45

BRICS ZOOM Oral report

The Development of Dual Drug-loaded Dendrimer Nanocarriers for the Treatment of Malignant Melanoma

Aishat Obalola, Heidi Abrahamse, and Satish Sudar Dhillip-Kumar, Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa

17.45-18.15/16.45-17.15

INTERNET PLENARY SESSION

Recent Advances In Optical Coherence Elastography

Kirill V. Larin, Department of Biomedical Engineering, University of Houston, Houston, USA

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

(Building 3, 3rd floor Hall)

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

18.15-20.30

1B. THz polarization-sensitive solid immersion microscopy of brain tissues

Darya Il'enkova¹, Nikita Chernomyrdin¹, Vladislav Zhelnov¹, Anna Alekseeva², Arsenii Gavdush¹, Guzel Musina^{3,4}, Pavel Nikitin⁵, Kirill Zaytsev¹; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia, ²Research Institute of Human Morphology, Moscow, Russia; ³Department of Biomedical Engineering, University of Houston, Houston, TX, United States; ⁴Department of Integrative Physiology, Baylor College of Medicine, Houston, TX, United States; ⁵Department of Biomedical Engineering, University of Houston, Houston, TX, United States.

2B. Laser Doppler flowmetry during orthostatic and thermal tests

AL badri Fargad¹, K.V. Mashkov¹, A.V. Skripal¹, A.P. Averyanov², A.D. Usanov¹; ¹Saratov State University, ²Saratov State Medical University

3B. The impact of endothelium-derived nitric oxide on RBC aggregation studied in vitro by laser tweezers

Matvei K. Maksimov¹, Petr B. Ermolinskiy¹, Andrei E. Lugovtsov¹, Aleksei V. Muravyov², Aleksander V. Priezzhev¹, ¹M.V. Lomonosov Moscow State University, Moscow, Russia, ²K.D. Ushinsky Yaroslavl State Pedagogical University, Yaroslavl, Russia

4B. Criteria for assessing the quality of photodynamic treatment of purulent abscesses in laboratory animals

Ekaterina S. Efimova¹, Maksim A. Polidanov², Maria V. Korchenova¹, Ara G. Musaelyan³, Vladimir V. Alipov³, Elena S.

- Tuchina¹; ¹Saratov State University, Saratov, Russia, ²Almazov National Medical Research Center, Saint Petersburg, Russia; ³Saratov State Medical University, Saratov, Russia
- 5B. Changes in the mechanisms of microcirculation regulation during direct optical generation of singlet oxygen** Lyubov V. Eratova, Irina N. Makovik; Orel State University
- 6B. Dynamic features of peripheral blood flow pulsations across sleep phases: pilot study in search of the central regulatory mechanism** Kryuchkov E. S., Tsoy M.O., Borovkova E. I., Sarantseva E.I., Lykova E.Yu., Iskra T.D., Karavaev A. S., Semyachkina-Glushkovskaya O. V.; ¹Saratov State University, Saratov, Russia;
- 7B. Early prediction of rat hindlimb ischemia using a steady- state spatially resolved visible diffuse reflectance spectroscopy** Alina A. Platonova¹, Daria V. Varvina², Anna I. Alekseeva³, Yulia M. Katyba³, Arsen K. Zotov⁴, Vladimir N. Kurlov⁴, Irina N. Dolganova⁴; ¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia, ²Institute for Regenerative Medicine, Sechenov University, Moscow, Russia, ³Research Institute of Human Morphology, Moscow, Russia, ⁴Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia
- 8B. Experiments with a disc laser ektacytometer and measurement of the red blood cells distribution width in deformability** M. S. Lebedeva, E. G. Tsybrov, S. Yu. Nikitin; Lomonosov Moscow State University, Moscow, Russia
- 9B. Assessment of the group variability of the parameters of the microcirculatory-tissue system by using multimodal wearable device** Viktorya E. Parshakova, Yulia I. Loktionova, Elena V. Zharkikh, Andrey V. Dunaev; Research and Development Center of Biomedical Photonics, Orel State University, Orel, Russia
- 10B. Big imaging data batch processing** Dmitry V. Tuktarov¹, Egor V. Ilyukov¹, Dmitry A. Myagkov¹, Ivan V. Fedosov¹, Oxana V. Semyachkina-Glushkovskaya^{2,3}; ¹Institute of Physics; ¹Saratov State University, Saratov, Russia, ²Department of Biology, Saratov State University, Astrakhanskaya, Saratov, Russia, ³Institute of Physics, Humboldt University, Berlin, Germany
- 11B. Import of biomedical images in third party software using Bio-formats** Dmitry A. Myagkov¹, Egor V. Ilyukov¹, Dmitry V. Tuktarov¹, 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 ³ Institute of Physics, Humboldt University, Berlin, Germany
- 12B. Wireless data transfer protocol in portable bio-medical devices** Egor V. Ilyukov¹, Dmitry V. Tuktarov¹, Dmitry A. Myagkov¹, Inna A. Blokhina², 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.
- 13B. Investigation of the effect of prolonged exposure to OCA-aerosol (glycerin/propylene glycol) on rat plasma by Raman spectroscopy** Arina A. Sokova¹, Ekaterina N. Lazareva^{1,2}, Alexander E. Polozhenkov³, Artem M. Mylnikov³, Alla B. Bucharskaya^{1,2,3}, Valery V. Tuchin^{1,2,4}; ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia; ³Saratov State Medical University, Saratov, Russia; ⁴Institute of Precision Mechanics and Control RAS, Saratov, Russia
- 14B. Combined photodynamic/plasmonic photothermal therapy of a rat model tumor** Vadim D. Genin^{1,2}, Alla B. Bucharskaya^{1,2,3}, Nikita A. Navolokin^{1,3}, Georgy S. Terentyuk³, Boris N. Khlebtsov⁴, Nikolai G. Khlebtsov^{1,4}, Valery V. Tuchin^{1,2,5}, Elina A. Genina^{1,2}; ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia; ³Saratov State Medical University, Saratov, Russia; ⁴Institute of Biochemistry and Physiology of Plants and Microorganisms, Federal Research Center "Saratov Scientific Center of the RAS", Saratov, Russia; ⁵Institute of Precision Mechanics and Control Problems of the Russian Academy of Sciences, Federal Research Center "Saratov Scientific Center of the RAS", Saratov, Russia
- 15B. Study of the effect of detonation nanodiamond on microfungi** E. Perevedentseva¹, V. Sychev¹, E. Kuzmin¹, S. Savinov¹, T. Limonova¹, S. V. Sadykova², A. Kuvarina², O. Streletskiy³, N. Melnik¹; ¹ P. N. Lebedev Physical Institute of Rus Acad Sci, Moscow, Russia, ² Laboratory of Taxonomic Study and Collection of Cultures of Microorganisms, Gause Institute of New Antibiotics, Moscow, Russia, ³Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia
- 16B. Ex vivo study of glycerol and glucose perfusion-kinetics in cat ovaries with serous carcinoma and leiomyosarcoma** Alexey A. Selifonov¹, Andrey S. Rykhlov², Valery V. Tuchin^{3,4,5}; ¹Education and Research Institute of Nanostructures and

- Biosystems, Saratov State University, Saratov, Russia, ²Clinic "Veterinary Hospital", Saratov State University of Genetics, Biotechnology and Engineering named after N.I. Vavilov, Saratov, Russia, ³Science Medical Center, Saratov State University, Saratov, Russia, ⁴Laboratory of laser molecular imaging and machine learning, Tomsk State University, Tomsk, Russia, ⁵Institute of Precision Mechanics and Control, FRC "Saratov Scientific Centre of the Russian Academy of Sciences," Saratov, Russia
- 17B. Laser speckle-contrast imaging in the assessment of cerebral perfusion changes in rats with haemorrhagic shock** Nadezhda Golubova¹, Ivan Ryzhkov², Konstantin Lapin², Evgeniya Seryogina¹, Andrey Dunaev¹, Viktor Dremine¹, Elena Potapova¹; ¹Research and Development Center of Biomedical Photonics, Orel State University, Orel, Russia, ²V.A. Negovsky Research Institute of General Reanimatology, Federal Research and Clinical Center of Intensive Care Medicine and Rehabilitology, Moscow, Russia
- 18B. Photodynamic action of blue light using pyridylporphyrin (Zn-TOEt4PyP) on clinical strains of Staphylococcus aureus** Tatiana V. Sharabarina¹, Anna A. Zakoyan², Maria V. Korchenova¹, Elena S. Tuchina¹, Lusine V. Mkrtchyan², Grigor V. Gyulkhandanyan², Valery V. Tuchin¹; ¹Saratov State University, Saratov, Russia, ²Institute of Biochemistry, NAS of Armenia, Armenia, Yerevan
- 19B. Analysis of the influence of various factors on the interference colors of the image of layered structures in optical microscopy: computer modeling** Arseniy P. Fashchevskiy, Saratov State University
- 20B. Effect of optical clearing agent glycerol on RBC aggregation and deformation: in vitro study by optical techniques** P.A. Moldon¹, E.S. Oreshkin¹, P.B. Ermolinsky¹, A.E. Lugovtsov¹, P.A. Timoshina ² A.V. Priezzhev¹; ¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia, ²Research-Educational Institute of Optics and Biophotonics, Saratov State University, Saratov, Russia
- 21B. Comparative OCT study of the efficiency of different optical clearing agents applied to the human fingernail bed area** P.B. Ermolinsky¹, P.A. Moldon¹, A.E. Lugovtsov¹, P.A. Timoshina² and A.V. Priezzhev¹; ¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia, ²Research-Educational Institute of Optics and Biophotonics, Saratov State University, Saratov, Russia
- 22B. Nailfold video-capillaroscopy in the comparative study of blood microcirculation in patients with paroxysmal and permanent atrial fibrillation** E.N. Sovetnikov¹, Y.I. Gurfinkel¹, L.I. Dyachuk¹, A.E. Lugovtsov², P.B. Ermolinsky², A.A. Romanova², and A.V. Priezzhev²; ¹Medical Research and Education Center of Lomonosov Moscow State University, ²Department of Physics of Lomonosov Moscow State University,
- 23B. Age-related dependencies of aggregation properties of RBCs in healthy individuals and patients suffering from socially significant diseases** Marmylev A.S.¹, Ermolinsky P.B.¹, Umerenkov D.A.¹, Dyachuk L.I.¹, Lugovtsov A.E.¹, Priezzhev A.V.¹; ¹M.V. Lomonosov Moscow State University, Moscow, Russia
- 24B. Differentiation of various forms of basal cell carcinoma and benign neoplasms of human skin by noninvasive method** Izabella A. Serebryakova^{1,2}, Yuriy I. Surkov^{1,2}, Yana K. Kuzinova³, Olga M. Konopatskova³, Elina A. Genina^{1,2}, V.V. Tuchin^{1,2,4}; ¹Saratov State University, Saratov, Russia, ²Tomsk State University, Tomsk, Russia, ³ Saratov State Medical University named after V.I. Razumovsky, Saratov, Russia, ⁴ Institute of Fine Mechanics and Control, Federal Research Center "Saratov Scientific Center of the Russian Academy of Sciences", Saratov, Russia
- 25B. Diagnosis of basal cell carcinoma and benign neoplasms based on texture analysis of optical coherence tomography images** Yuriy I. Surkov^{1,2}, Izabella A. Serebryakova^{1,2}, Yana K. Kuzinova³, Olga M. Konopatskova³, Elina A. Genina^{1,2}, V.V. Tuchin^{1,2,4}; ¹Saratov State University, Saratov, Russia, ²Tomsk State University, Tomsk, Russia, ³ Saratov State Medical University named after V.I. Razumovsky, Saratov, Russia, ⁴ Institute of Fine Mechanics and Control, Federal Research Center "Saratov Scientific Center of the Russian Academy of Sciences", Saratov, Russia
- 26B. Measurement of the refractive index of the different animals' head tissues using OCT and multi-wavelength refractometer: Comparative study** Alaa S. SHanshool¹, E. N. Lazareva^{1,2}, D. K. Tuchina^{1,2}, E. A. Genina^{1,2}, V. V. Tuchin^{1,2}; ¹Saratov National Research State University named after N.G. Chernyshevsky, Saratov, Russia, ²National Research Tomsk State University, Tomsk, Russia.

1. **Application of the combined scattering spectroscopy method to identify Staphylococcus with hemolytic activity in patients with periodontitis** Elena.V. Timchenko¹, Pavel.E. Timchenko¹, Artem.V. Lyamin², Irina.V. Bazhutova², Larisa.T. Volova², Dmitriy.A. Trunin², Oleg.O. Frolov¹, Alena.V. Zotova¹; ¹Samara National Research University, Samara, ²Samara State Medical University, Samara
2. **Optical methods to study the composition of human tissue-based hydrogels for 3D bioprinting and regenerative medicine** Ivanov S.S.¹, Timchenko E.V.¹, Timchenko P.E.¹, Ryabov N.A.², Frolov O.O.¹, Zotova A.V.¹, Volova L.T.²; Korolyov S.P.¹ Samara National Research University Samara, Russia; ²Samara State Medical University Samara, Russia
3. **Examination of the surface and supramolecular structure of thin hydrogel plates of chitosan L- and D-aspartates** Olga S. Ushakova, Natalia O. Gegel, and Anna B. Shipovskaya, Saratov State University, Saratov, Russia
4. **Photocytotoxicity effect of polyelectrolyte microcapsules with chlorin E6** Irina A. Khutorskaya^{1,2}, Ekaterina P. Brodovskaya¹, Denis E. Yakobson¹, Mikhail N. Zharkov¹, Vasilisa I. Shlyapkina¹, Amina M. Al-khadj Aioub¹, Larisa A. Tararina³, Nikolay A. Pyataev¹, ¹National Research Ogarev Mordovia State University, Saransk, Russia; ²M.M. Shemyakin-Yu.A. Ovchinnikov Institute of Bioorganic Chemistry, Russian Academy of Sciences, Moscow, Russia; ³A.I.Yevdokimov Moscow State University of Medicine and Dentistry, Moscow, Russia
5. **FT-IR analysis of pathogen inactivation by middle IR femtosecond laser pulses** S.N. Shelygina¹, I.N. Saraeva¹, A.A. Nastulyavichus¹, E. R. Tolordava^{1,2}, R.A. Khmel'nitskii¹, S. I. Kudryashov¹; ¹Lebedev Physical Institute RAS, Moscow, Russia, ²Gamaleya National Research Center for Epidemiology and Microbiology, Moscow, Russia
6. **Femtosecond laser marking of glass ampoule products** Ruslan V. Chkalov¹, Darya G. Chkalova¹; ¹Vladimir State University named after Alexander and Nicolay Stoletovs, Vladimir, Russia
7. **Investigation of the destruction of biological tissues by laser radiation with a wavelength of 405 nm for surgical correction of an ingrown nail** Sergey N. Smirnov¹, Anastasia D. Kozlova^{1,2}, Yuna D. Shulakova¹; ¹ITMO University, Saint Petersburg, Russia, ²Mozhaisky Military Space Academy, Saint Petersburg, Russia
8. **Modeling of irradiation of plasmon nanoparticles with polarized light and investigation of localization features of electromagnetic and temperature fields** A. Yakunin¹, S. Zarkov¹, Yu. Avetisyan¹, G. Akchurin^{1,2}, V. Tuchin^{1,2,3}; ¹Institute of Precision Mechanics and Control, FRC "Saratov Research Centre of Russian Academy of Sciences," Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Tomsk State University, Tomsk, Russia
9. **Model of fluorescence and quenching of a protein molecule in a plasmonic complex** A. Yakunin¹, S. Zarkov¹, Yu. Avetisyan¹, G. Akchurin^{1,2}, I. Meerovich³, A. Savitsky³, V. Tuchin^{1,2,4}; ¹Institute of Precision Mechanics and Control, FRC "Saratov Research Centre of Russian Academy of Sciences," Saratov, Russia; ²Saratov State University, Saratov, Russia; ³A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia; ⁴Tomsk State University, Tomsk, Russia
10. **Comparative analysis of the blood circulation of the index finger and second toe in middle-aged people in the dynamics of a pharmacological test with nitroglycerin** Igor B. Isupov¹, Rimma Sh. Zatrudina¹, Rodion A. Kudrin², Vladislav Yu. Gribkov¹, ¹Volgograd State University, Volgograd, Russia, ²Volgograd State Medical University, Volgograd, Russia

Workshop on Laser Physics and Photonics XXV

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

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

International Program Committee **Vladimir L. Derbov** (Chair), Saratov State University (Russia), **Alexander V. Gorokhov**, Samara University (Russia), **Bogos B. Joulakian**, University of Metz (France), **Alexander P. Kuznetsov**, Institute of Radio-Engineering of RAS (Russia), **Marian Marciniak**, National Institute of Telecommunications (Poland), **Leonid A. Melnikov**, Yuri Gagarin State Technical University of Saratov (Russia), **Yuri V. Popov**, Lomonosov Moscow State University (Russia), **Vladimir P. Ryabukho**, Saratov State University, IPM&C RAS (Russia), **Alexander P. Nizovtsev**, Institute of Physics of NASB (Belarus), **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), **Dmitrii V. Churochkin**, Saratov State University (Russia)

September 27, Wednesday

ORAL SESSION PHOTONICS / ONLINE ORAL REPORT PHOTONICS

Connection link:

<https://squlive.ktalk.ru/ugyqeltytyoe?pinCode=9136>

Pin code: 9136

(Building 10, Hall 503)

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

14.30-14.50 / 13.30-13.50

**Propagation of circularly polarized laser pulses
in a degenerate lambda-scheme of quantum
levels**

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

14.50-15.10 / 13.50-14.10

Radiation in the graphene: kinetic approach

Vladislav A. Tserypa¹, Dmitrii V. Churochkin¹,
Vadim V. Dmitriev¹, Stanislav A. Smolyansky^{1,2};
¹Saratov State University, Saratov, Russia;
²Tomsk State University, Tomsk, Russia

15.10-15.30 / 14.10-14.30

**Laser-printed plasmonic metasurface
supporting bound states in the continuum
enhances and shapes infrared spontaneous
emission of coupled HgTe quantum dots**

Albert A. Seredin¹, Kseniia V. Baryshnikova¹,
Mihail I. Petrov¹, Aleksandr A. Sergeev², Dmitry V.
Pavlov², Aleksandr A. Kuchmizhak^{2,3}, Eugeny V.
Mitsai², Evgenii B. Modin⁴, Kseniia A. Sergeeva⁵,
Anastasiia V. Sokolova⁵, Stephen V. Kershaw⁵,
Andrey L. Rogach⁵; ¹ITMO University, Saint-
Petersburg, Russia; ²Institute of Automation and
Control Processes of the FEB RAS, Vladivostok,
Russia; ³Pacific Quantum Center, Far Eastern
Federal University, Vladivostok, Russia; ⁴CIC
nanoGUNE BRTA, Donostia - San Sebastian,
Spain; ⁵City University of Hong Kong, Kowloon,
Hong Kong, China

15.30-15.50 / 14.30-14.50

**Investigation of the efficiency of incoherent
external optical injection on stabilization of
broad-area semiconductor VCSELs**

Elizaveta A. Yaronova^{1,2}, Anton A. Krents^{1,2},
Nonna E. Molevich^{1,2}; ¹Lebedev Physical Institute,
Samara, Russia; ²Samara National Research
University, Samara, Russia

16.00-16.30 / 15.00-15.30

Coffee Break

16.30-16.50 / 15.30-15.50

**Square waves in a resonator with Kerr
medium and optical time-delayed feedback**

Elizaveta A. Yaronova^{1,2}, Anton A. Krents^{1,2},
Nonna E. Molevich^{1,2}; ¹Lebedev Physical Institute,
Samara, Russia; ²Samara National Research
University, Samara, Russia

16.50-17.10 / 15.50-16.10

**Investigation of the effect of laser modification
of the surface of stainless steel metal products
using tungsten carbide powder**

Pavel N. Ustinov, Igor V. Rodionov; Yuri Gagarin
State Technical University of Saratov, Saratov,
Russia

17.10-17.30 / 16.10-16.30

**Laser ablation and fragmentation of
nanoparticles in liquid, electrostatic and
magnetic fields for biomedical applications**

Anton S. Chernikov¹, Ulyana E. Kurilova^{1,2,3},
Dmitriy A. Kochuev¹, Dmitrii V. Abramov¹,
Alexander V. Kazak^{1,4}, Ruslan V. Chkalov¹,
Alexander Yu. Gerasimenko^{2,3}, Kirill S. Khorkov¹;
¹Vladimir State University named after Alexander
and Nicolay Stoletovs, Vladimir, Russia; ²I. M.
Sechenov First Moscow State Medical University,
Moscow, Russia; ³National Research University of
Electronic Technology MIET, Zelenograd,
Moscow, Russia; ⁴Moscow Polytechnic University,
Moscow, Russia

17.30-17.50 / 16.30-16.50

Dark and laser-mediated charge transfer in nanostructured semiconductors: the comparison of TiO₂ and In₂O₃ platforms

Alexander F. Dorogov¹, Sergey S. Volchkov¹, Alexey S. Tokarev¹, Dmitry V. Tsybin¹, Dmitry A. Zimnyakov^{1,2}; ¹Yuri Gagarin Saratov State Technical University, Saratov, Russia; ²Institute of Precise Mechanics and Control RAS, Saratov, Russia

17.50-18.10 / 16.50-17.10

Semiconductor Lasers and Process Applications

Eugeny. V. Borisov, Anton V. Kozyrev, Maksim A. Kopyonkin, Oleg V. Korenchenko, Vadim A. Panarin, Sergey N. Sokolov, Mikhail Yu. Starynin, Larisa I. Shestak; INJECT RME LLC, Saratov, Russia

18.10-18.30 / 17.10-17.30

<https://sgulive.ktalk.ru/uqygeltvyoe?pinCode=9136>

Pin code: 9136

Limitation of laser power in the UV region by conjugates of single-wall carbon nanotubes with phthalocyanines

Mikhail S. Savelyev^{1,2}, Pavel N. Vasilevsky¹, Alexander Yu. Tolbin³, Alexander Yu. Gerasimenko^{1,2}; ¹National Research University of Electronic Technology, MIET, Zelenograd, Moscow, Russia; ²I.M. Sechenov First Moscow State Medical University, Sechenov University, Moscow, Russia; ³Institute of Physiologically Active Compounds Federal Research Center of Problems of Chemical Physics and Medicinal Chemistry, RAS, Chernogolovka, Russia

18.30-18.50 / 17.30-17.50

<https://sgulive.ktalk.ru/uqygeltvyoe?pinCode=9136>

Pin code: 9136

Multi-wavelength lamp pumped LiSrAlF₆: Cr laser with Bragg grating

Mikhail V. Gavrish, Pavel K. Rozanov, Ivan S. Khakhalin, Andrey A. Sergeev, Anastasya P. Pogoda, Anatoly S. Boreysho; Baltic State Technical University "VOENMEH" D.F. Ustinov, Saint-Petersburg, Russia

September 28, Thursday

JOINT POSTER/INTERNET SESSION

Chair (P): **Victoria D. Philippova**, Saratov State University, Russia

18.15-20.30

INTERNET POSTERS

1P. **Circular dichroism for non-contact diagnostics of solutions of glutamic acid isomers** Svetlana A. Kutsenko; Volgograd State University, Volgograd, Russia

2P. **Influence of Kerr nonlinearity on the entanglement between two Josephson charge qubits** Eugene K. Bashkirov, Kristina A. Moiseeva; Samara National Research University, Samara, Russia

3P. **Entanglement in the nonlinear three-atom Jaynes-Cummings model** Eugene K. Bashkirov, Alexander R. Bagrov; Samara National Research University, Samara, Russia

4P. **Coherence-enhanced entanglement between isolated atom and Jaynes-Cummings atom** Eugene K. Bashkirov, Ali Othman; Samara National Research University, Samara, Russia

5P. **Per-channel nonlinear-frequency conversion in optical poling of isotropic medium** Liubov I. Vostrikova^{1,2}; ¹Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia; ²Departments of Mathematics and Natural Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia

6P. **Theory of interaction of several multilevel atoms with photon states in nonideal resonators** Alexander V. Gorokhov; Samara University, Samara, Russia

7P. **Generation of increasing light signals during the parametrical process on photo-integrated anisotropy** Liubov I. Vostrikova^{1,2}; ¹Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia; ²Departments of Mathematics and Natural Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia

8P. **Nanoantennas interfaces formation by laser micromachining of thin-film coatings** Ruslan V. Chkalov, Darya G. Chkalova; Vladimir State University named after Alexander and Nicolay Stoletovs, Vladimir, Russia

9P. **Formation of highly homogeneous optical ceramics compacts by pressure slip casting method** Ruslan V. Chkalov, Dmitriy A. Kochuev, Miron N. Gerke, Darya G. Chkalova; Vladimir State University named after Alexander and Nicolay Stoletovs, Vladimir, Russia

10P. **Terahertz laser based on a hyperbolic metamaterial consisting of thin layers of grapheme** Olga N. Kozina¹, Leonid A.

Melnikov²; ¹Kotel'nikov Institute of Radio-Engineering and Electronics of Russian Academy of Science, Saratov Branch Saratov, Russia; ²Yuri Gagarin State Technical University of Saratov, Saratov, Russia

11P. **Experimental researches of speckle interferometry method of lateral micro-displacements of a scattering object with digital processing of registered speckle-modulated interference images** Lyudmila A. Maksimova¹, Natalya Yu. Mysina¹, Vladimir P. Ryabukho^{1,2}; ¹IPTMU RAS - Separate structural subdivision of FRC "Saratov Scientific Center of the Russian Academy of Sciences", Saratov, Russia; ²Saratov State University, Saratov, Russia

POSTER SESSION
(Building 3, 3rd floor Hall)

1P. **Method for analyzing the spectrum of a laser autodyne signal with accelerated motion of the reflector** Maksim G. Inkin, Dmitry A. Yakovlev, Anatoly V. Skripal, Sergey Y. Dobdin, Mikhail Y. Kalinkin; Saratov State University, Saratov, Russia

2P. **Study of migration of elements on the metal surfaces after laser shock peening** Elena L. Surmenko, Tatiana N. Sokolova, Pavel N. Ustinov, Dmitry A. Bessonov; Yuri Gagarin State Technical University of Saratov, Saratov, Russia

3P. **Optimizing laser processing mode for non-destructive crystallization of silicon coating on nanofibrous nonwoven substrate** Anastasia M. Kartashova, Polina A. Demina, Larisa D. Volkovoyanova, Ilya O. Kozhevnikov, Victor V. Galushka, Alexey A. Serdobintsev; Saratov State University, Saratov, Russia

4P. **Modulation of polarized optical radiation of various wavelengths interacting with magnetic fluid** Aleksandr E. Postelga, Semion V Igonin, Tatyana S. Bochkova, Georgy M. Nagornov; Saratov State University, Saratov, Russia

5P. **Simulation of optical cooling of perovskite nanoparticle doped by ytterbium ions** Vitaliy A. Danilin, Anna V. Romanova, Dmitrii P. Shcherbinin, Andrei V. Ivanov; ITMO University, Saint-Petersburg, Russia

6P. **Homogeneity study of a polycrystalline silicone layer formed on a flexible polymer substrate by the laser-stimulated metal-induced crystallization** Larisa D. Volkovoinova, Alexey A. Serdobintsev; Saratov State University, Saratov, Russia

7P. **Modeling of the propagation of adiabatic waveguide mode in a smooth waveguides** Dmitry V. Divakov, Anastasiya A. Tyutyunnik, Danila A. Starikov; Peoples' Friendship University of Russia (RUDN University), Moscow, Russia

8P. **Photothermal response of laser-prepared colloidal solutions based on substoichiometric molybdenum oxide** Anton S. Chernikov, Dmitriy A. Kochuev, Dmitrii V. Abramov, Ruslan V. Chkalov, Kirill S. Khorkov; Vladimir State University named after Alexander and Nicolay Stoletovs, Vladimir, Russia

9P. **Methodological derivation of the eikonal equation** Anna V. Korolkova¹, Migran N. Gevorkyan¹, Arseny V. Fedorov¹, Christina A. Stepa¹, Dmitry S. Kulyabov^{1,2}; ¹Peoples' Friendship University of Russia (RUDN University), Moscow, Russia; ²Joint Institute for Nuclear Research, Dubna, Russia

10P. **Ray tracing visualization based on ray optics** Arseny V. Fedorov¹, Migran N. Gevorkyan¹, Christina A. Stepa¹, Anastasiya V. Demidova¹, Anna V. Korolkova¹, Dmitry S. Kulyabov^{1,2}; ¹Peoples' Friendship University of Russia (RUDN University), Moscow, Russia; ²Joint Institute for Nuclear Research, Dubna, Russia

11P. **Application of machine learning methods to electrodynamics problems** Anna V. Korolkova¹, Christina A. Stepa¹, Arseny V. Fedorov¹, Ekaterina A. Demidova¹, Daria M. Belicheva¹, Dmitry S. Kulyabov^{1,2}; ¹Peoples' Friendship University of Russia (RUDN University), Moscow, Russia; ²Joint Institute for Nuclear Research, Dubna, Russia

12P. **Study of stochastic laser generation in strongly scattering nanostructured systems with added fluorophores** Leonid A. Kochkurov; Yuri Gagarin State Technical University of Saratov, Saratov, Russia

13P. **Transfer of fluorescence light in laser-pumped dye-doped random media: influence of the dwell time of fluorescence**

in the medium and saturation of the exited state of dye molecules Sergey S. Volchkov¹, Ilya N. Mikhailov^{1,2}, Angelika A. Klimova¹, Ekaterina V. Ushakova¹, Marina V. Alonova¹, Dmitry A. Zimnyakov^{1,3}; ¹Yury Gagarin State Technical University of Saratov, Saratov, Russia; ²Institute of Radioengineering and Electronics, Saratov, Russia; ³Precision Mechanics and Control Institute of RAS, Saratov, Russia

14P. **Speckle correlometry approach for the morphofunctional diagnostic of the foam-like multi-phase systems under the low frequency acoustic waves** Anna A. Isaeva, Dmitry A. Zimnyakov; Yuri Gagarin State Technical University of Saratov, Russia

Conference on Spectroscopy and Molecular Modeling XXIV

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

Secretary: **Inna L. Plastun**, Saratov State Technical 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 27, Wednesday

ON-LINE INVITED LECTURE/ORAL SESSION SPECTROSCOPY I

Zoom link:

<https://us02web.zoom.us/j/9297707272?pwd=QVhZMDdOL2hUbUJkM3BvRks1WWRBdz09>

Conference ID: 929 770 7272, Code 6311

(Building 3, Room 34)

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

15.30-15.45

OPTICAL CLEARING OF HUMAN SKIN: MOLECULAR MODELING AND IN VIVO OCT STUDY - PROSPECTS FOR MULTIMODAL IMAGING

Kirill V. Berezin¹, E.V. Grabarchuk², A.M. Likhter², Konstantin N. Dvoretzkiy³, Valery V. Tuchin^{1,4}

¹Saratov State University, Saratov, Russia;

²Astrakhan State University, Astrakhan, Russia

³Saratov State Medical University, Russia;

⁴Science Medical Center, Saratov State University, Saratov, Russia

15.45 - 16.00

OPTICAL CLEARING OF HUMAN SKIN IN VIVO USING AN AQUEOUS SOLUTION OF GLUCOSAMINE HYDROCHLORIDE AND MOLECULAR MODELING OF ITS INTERACTION WITH COLLAGEN

Kirill V. Berezin¹, E.V. Grabarchuk², A.M. Likhter², Konstantin N. Dvoretzkiy³, Valery V. Tuchin^{1,4}

¹Saratov State University, Saratov, Russia;

²Astrakhan State University, Astrakhan, Russia

³Saratov State Medical University, Russia;

⁴Science Medical Center, Saratov State University, Saratov, Russia

16.00–16.30

Coffee break

Building 8, 4th floor

16.30– 16.45

CONFORMATIONS, VIBRATIONAL SPECTRA, ROTATION BARRIERS OF ALCOHOL GROUPS AND COMPLEXES WITH WATER MOLECULES OF GLUCOSAMINE, GALATOSAMINE AND 1- DEOXYNOJIRIMYCIN

Kirill V. Berezin¹, E.V. Grabarchuk², A.M. Likhter², Vladimir V. Nechaev³, Konstantin N. Dvoretzkiy⁴

¹Saratov State University, Saratov, Russia;

²Astrakhan State University, Astrakhan, Russia

³Saratov State Technical University, Saratov, Russia

⁴Saratov State Medical University, Saratov, Russia;

16.45 - 17.00

INFLUENCE OF GOLD PARTICLES ON DNA REPLICATION PROCESS

Galina N. Ten

Saratov State University, Saratov, Russia

17.00 - 17.15

INTERPRETATION OF VIBRATIONAL SPECTRA OF RNA NUCLEOTIDE FRAGMENTS

Galina N. Ten

Saratov State University, Saratov, Russia

17.15 - 17.30

NEURAL NETWORK SOLUTION OF INVERSE PROBLEMS OF SPECTROSCOPY WITH INTEGRATION OF VARIOUS TYPES OF SPECTRA: ITERATIVE FEATURE SELECTION WITH ACCOUNTING FOR REDUNDANCY

Nickolay O. Shchurov^{1,2}, Igor V. Isaev^{2,3}, Olga E. Sarmanova^{1,2}, Sergey A. Burikov^{1,2}, Tatiana A. Dolenko^{1,2}, Kirill A. Laptinskiy², Sergey A. Dolenko²

¹Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia

²D.V. Skobeltsyn Institute of Nuclear Physics, Moscow State University, Moscow, Russia

³Kotelnikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russia

17.30 - 17.45

Internet Report

TRANSFER LEARNING FOR NEURAL NETWORK SOLUTION OF AN INVERSE PROBLEM IN OPTICAL SPECTROSCOPY WITH INTEGRATION OF SPECTROSCOPIC METHODS

Artem A. Guskov¹, Igor V. Isaev^{2,3}, Olga E. Sarmanova^{1,2}, Sergey A. Burikov^{1,2}, Tatiana A. Dolenko¹, Kirill A. Laptinskiy², Sergey A. Dolenko²

¹Faculty of Physics, Moscow State University, Moscow, Russia,

²D.V. Skobeltsyn Institute of Nuclear Physics, Moscow State University, Moscow, Russia

³Kotelnikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russia

17.45 - 18.00

MANIFESTATION OF H-BONDING AT THE IR SPECTRA OF MOLECULAR CRYSTALS

Irina V. Peretokina (Ivlieva), Lev.M. Babkov, Saratov State University, Saratov, Russia

18.00 - 18.15

EFFECT OF DYES ON AMINO ACIDS COMPLEXATION: MODELING BY DFT METHODS

Anatoly A. Naumov, Inna L. Plastun, Saratov State Technical University, Saratov, Russia

19.30-22.00

Evening boat trip - the lights of Saratov

September 28, Thursday

ORAL SESSION SPECTROSCOPY II

Zoom link:

<https://us02web.zoom.us/j/9297707272?pwd=QVhZMDdOL2hUbUJKM3BvRks1VWRBdz09>

Conference ID: 929 770 7272, Code 6311

(Building 3, Room 34)

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

15.30-15.45

QUANTUM-MECHANICAL APPROACH TO ANALYSIS OF THE INTENSITY DISTRIBUTION IN THE ULTRAVIOLET RESONANCE RAMAN AND ABSORPTION SPECTRA: THEORY, CALCULATIONS, AND RESULTS

Tatiana G. Burova

Saratov State University, Saratov, Russia

15.45 - 16.00

PH-DEPENDENT STRUCTURAL CHANGES OF BOVINE SERUM ALBUMIN:

FLUORESCENCE AND CIRCULAR DICHROISM SPECTROSCOPY COMBINED WITH MOLECULAR MODELING

Polina M. Soboleva, Kirill Y. Presnyakov, Pavel S. Pidenko, Natalia A. Burmistrova Institute of Chemistry, Saratov State University, Saratov, Russia

16.00–16.15

EFFECT OF SOLVENT ACIDITY ON FLUORESCENT PROPERTIES OF CARBON DOTS

Anisiya. A. Korepanova, Kirill .A. Laptinskiy, Tatiana A.Dolenko

Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia

16.15–16.30

IR ABSORPTION SPECTROSCOPY OF CARBON DOTS TO ELUCIDATE THE RELATIONSHIP BETWEEN THEIR PHOTOLUMINESCENCE AND STRUCTURE

Alexey M. Vervald¹, Kirill A. Laptinskiy^{1,2}, Maria Yu. Khmeleva¹, Tatiana A. Dolenko¹

¹Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia

²Skobeltsyn institute of nuclear physics, M.V. Lomonosov Moscow State University, Moscow, Russia

16.30–16.50

Coffee break

Building 8, 4th floor

17.00–17.15

PACKING POLYMORPHISM EFFECT ON MODIFIED GLYCINE IR SPECTRUM

Pavel A. Zhulidin¹, Pavel D. Filin¹, Inna L. Plastun¹, Ruslan Yu. Yakovlev²

¹Saratov State Technical University, Russia

² LLC "Smart Polymorph Technologies", Skolkovo, Moscow, Russia

17.15–17.30

INTERPRETATION OF BACTERIOCHLOROPHYLL IR SPECTRUM IN VARIOUS ENVIRONMENTS

Pavel D. Filin, Pavel A. Zhulidin, Inna L. Plastun Saratov State Technical University, Saratov, Russia

17.30 - 17.45

EFFECT OF MICROGEL ON HYALURONIC ACID AND MUCIN INTERACTION – MOLECULAR MODELING

Kirill A. Bryxin, Inna L. Plastun

Saratov State Technical University, Russia

17.45 - 18.00

EFFECT OF MALEIMIDE ON NITROGEN-CONTAINING AMINO ACIDS MOLECULAR COMPLEXES FORMATION

Egor V. Nazarev, Inna L. Plastun, Alexandr A. Zakharov

Saratov State Technical University, Russia

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

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

18.00-20.00

**1S. SPECTRAL STUDIES OF THE
STRUCTURE OF REGIOISOMERIC PYRIDYL
SUBSTITUTED AMINOCROMENCARBO-
NITRILES AND THEIR IODOMETHYLANES**

Alexandr V. Nikulin, Adele P. Kriven'ko
Saratov State University, Saratov, Russia

**2S. SYNTHESIS AND SPECTROSCOPIC
CHARACTERIZATION OF NEW
CHROMENOPYRAZOLES AND
PYRAZOLINES BASED ON HYDRAZIDES OF
AROMATIC ACIDS**

Anna A. Meshcheryakova, Ekaterina A.
Konstantinova, Karina A. Melkonian, Daria V.
Vidlatskaya, Vitaly V. Sorokin
Saratov State University, Saratov, Russia

**3S. THE APPLICATION OF ONE- AND TWO-
DIMENSIONAL NMR SPECTROSCOPY
METHODS IN THE ANALYSIS OF 1,3-
DIPOLAR CYCLOADDITION REACTION
PRODUCTS OF SOME AZOMETHINE YLIDES**

Andrey S. Kochukov, Svetlana V. Borisova,
Vitaly V. Sorokin,
Saratov State University, Saratov, Russia

**4S. 3D FLUORESCENCE SPECTROSCOPY
AS A APPROACH TO MONITORING OF
IMPRINTED PROTEINS PURIFICATION**

Kirill Yu. Presnyakov, Pavel S. Pidenko, Natalia
A. Burmistrova
Saratov State University, Saratov, Russia

**5S. DETERMINATION OF THE DIRECTION OF
REACTIONS OF DIENONE DERIVATIVES OF
CYCLOHEXANE WITH POLYNUCLEOPHILIC
NITROGEN-CONTAINING REAGENTS BY
SPECTRAL AND COMPUTATIONAL
METHODS**

Daniil A. Puzanov, Danila A. Rogov, Natalia O.
Vasilkova, Adel P. Krivenko
Saratov State University, Saratov, Russia

**6S. MODELING OF IR SPECTRA OF
CYCLOHEXANOL IN ANHARMONIC
APPROXIMATION**

Lev M. Babkov¹, Nadezda A. Davydova²
¹Saratov State University, Saratov, Russia,
²Institute of Physics NAS of Ukraine, Kiev

**7S. STRUCTURAL-DYNAMIC MODEL OF THE
CIS-CONFORMER OF BEHENIC ACID**

Mikhail D. Moskvitin¹, Lev M. Babkov²
¹Saratov State Technical University, Russia,
²Saratov State University, Saratov, Russia

**8S. IR SPECTRA AND STRUCTURE OF
PYRIDO[1.2-A]PYRIMIDINE CARBONITRILES**

Irina V. Peretokina (Ivlieva), Lev M. Babkov,
Anna A. Mecheryakova, Vitaly V. Sorokin,
²Saratov State University, Saratov, Russia

**9S. MODELING OF ADIABATIC POTENTIALS
AND SPECTRAL IDENTIFICATION OF
DIHYDROXYFLAMONE CONFORMERS**

Viktor F. Pulin, E.V. Ryzhova, T.Yu. Surinskaya,
O.V. Pulin, P.M. Elkin
Saratov State Technical University, Russia

**10S. MODELING OF FLAVONE STRUCTURE
IN THE CONDENSED STATE**

Viktor F. Pulin, E.V. Ryzhova, T.Yu. Surinskaya,
O.V. Pulin, P.M. Elkin
Saratov State Technical University, Russia

INTERNET POSTER

**1S1. THE INFLUENCE OF THE ALKYL
SUBSTITUENT IN LIGANDS AND
TEMPERATURE ON THE LUMINESCENCE OF
TERBIUM COMPLEXES**

Anastasiia V. Kharcheva, Kirill D. Shmelkov,
Alexey V. Ivanov, Nataliya E. Borisova, Svetlana
V. Patsaeva
Lomonosov Moscow State University, Moscow,
Russia

**2S1. SPECTROPHOTOMETRIC STUDY OF
THE COMPLEX FORMATION REACTION OF
URANYL NITRATE WITH SUBSTITUTED 2,2-
DIPYRIDYL-6,6-DICARBOXYLIC ACIDS**

Tsagana B. Sumyanova, Nataliya E. Borisova,
Anastasiia V. Kharcheva, Roman Pankov,
Lomonosov Moscow State University, Faculty of
Chemistry, Moscow, Russia

Conference on Nanobiophotonics XIX

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

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

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; **Dmitry Gorin**, Scoltech, Saratov State University (Russia); **Irina Goryacheva**, Saratov State University (Russia); **Lev Dykman**, Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, Saratov (Russia); **Alexey Yashchenok**, Scoltech, Russia; **Vitaly Khanadeev**, Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, Saratov State University (Russia); **Boris Khlebtsov**, Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, Saratov (Russia)

September 27, Wednesday

ORAL/INVITED SESSION NANOBIOPHOTONICS

Zoom link:

(Building 9, Conference Hall)

Chair: **Boris N. Khlebtsov**, IBPPM RAS,
Saratov State University, Russia

11.00 – 11.20

Invited

Light- and Ultrasound-activated Reactive Oxygen Species Sensitizers for Biomedical Applications

Anna O. Orlova, ITMO University, Saint-Petersburg, Russia

11.20 – 11.40

Invited

Luminescent metal clusters on biopolymers

Alexey I. Kononov, S. Petersburg State University, St. Petersburg, Russia

11.40 – 11.55

Oral

Influence of polymer structure and properties on protein-polymer microbubble parameters

Tatyana M. Estifeeva¹, Roman A. Barmin¹, Polina G. Rudakovskaya¹, Anna M. Nechaeva², Le-Deygen M. Irina³, Dmitry A. Gorin¹ Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, Nobel str. 3, 121205 Moscow, Russia ²Department of Biomaterials, Dmitry Mendeleev University of Chemical Technology of Russia, Miusskaya sq. 9, 125047 Moscow, Russia ³Laboratory of Chemical Design of Bionanomaterials, Department of Chemical Enzymology, Faculty of Chemistry, Lomonosov Moscow State University, Leninskie Gory, 1, building 11B, 119991 Moscow, Russia

11.55 – 12.10

Oral

A novel method for synthesis of monodisperse, fluorescent and Raman labeled silica particles

Boris N. Khlebtsov, Institute of Biochemistry and Physiology of Plants and microorganisms RAS, Saratov Scientific Center

12.10 – 12.25

Oral

Tissue-mimicking phantom of female reproductive system organs for ultrasound imaging

Alina A. Dedkova,^{1,2} Tatyana M. Estifeeva,² Olga A. Dedkova,³ Roman A. Barmin,² and Polina G Rudakovskaya². ¹Bauman Moscow State Technical University, 105005 Moscow, Russia ²Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, Nobel str. 3, 121205 Moscow, Russia ³"White Rose" Medical Centre, 675000 Blagoveshchensk, Amur Oblast, Russia

12.25 – 12.40

Oral

Detection and imaging of bacterial biofilms using fluorescent nanosensor

Daniil S. Chumakov,¹ Stella S. Evstigneeva,¹ Nikolay G. Khlebtsov,^{1,2,1} Institute of Biochemistry and Physiology of Plants and Microorganisms – Subdivision of the Federal State Budgetary Research Institution Saratov Federal Scientific Centre of the Russian Academy of Sciences (IBPPM RAS), Saratov, Russia ²Saratov State University, Saratov, Russia

12.40 – 12.55

Oral

Luminescent gold nanoclusters for the detection of anti-tumor drugs

Yuliya A. Podkolodnaya, Kseniya R. Kalishina, Irina Yu. Goryacheva and Anna M. Vostrikova Saratov State University, Saratov, Russia

12.55 – 13.10

Oral

Size-selected AgInS₂/ZnS quantum dots in mediums with different ionic strength and pH

Vera V. Olomskaya, Arina V. Dushankova, Tatiana S. Ponomaryova, Olga A. Goryacheva, Irina Yu. Goryacheva. Saratov State University, Saratov, Russia

13.10 – 13.25

Oral

Hydrogel-Supported Microchambers for Modulation of Oxidative Stress During Wound Healing

Ermakov A.V.^{1,2}, Savkina A.A.¹, Stepanova T.A.¹, Lengert E.V.^{1,2}, Sukhorukov G.B.³, Ivanov A.N.¹¹ Central Research Laboratory, Saratov State Medical University of V. I. Razumovsky, Ministry of Health of the Russian Federation, 410012 Saratov, Russia ²Institute of Molecular Theranostics, I. M. Sechenov First Moscow State Medical University, 8 Trubetskaya Str., 119991 Moscow, Russia ³Skolkovo Institute of Science and Technology, 3 Nobelya Str., Moscow 143025, Russia

13.25 – 13.40

Oral

SERS-based aptasensors for bioanalysis

Daria S. Tikhonova^{1,2}; Elena G. Zavyalova ¹; Vladimir I. Kukushkin²; ¹Lomonosov Moscow State University, Moscow, Russia; ²Institute of Solid State Physics, RAS, Chernogolovka, Russia

13.40 – 13.55

Oral

Rapid and sensitive surface enhanced Raman spectroscopy based method of antimicrobial resistance detection

Vladimir A. Mushenkov¹, Elena G. Zavyalova¹, Vladimir I. Kukushkin², Evgeny V. Andreev³, Alexander N. Nechaev³, Alexey B. Gordeev⁴, Tatiana V. Pripitnevich⁴; ¹Chemical Department of Lomonosov Moscow State University, Moscow, Russia; ²Osipyan Institute of Solid State Physics RAS, Chernogolovka, Russia; ³Joint Institute for Nuclear Research, Dubna, Russia; ⁴FSBI «National medical research center for obstetrics, gynecology and perinatology named after academician V.I.Kulakov» ministry of health of the Russian federation, Moscow, Russia

14.00-14.30

Coffee Break
(Building ??,)

14.45 – 15.00

Zoom Oral

Self-assembled porphyrazine nanoparticles interaction with albumin by dynamic light scattering

Aleksei R. Krot, Irina A. Sergeeva, Ksenya V. Fedorova, Aleksandr I. Ladynin Department of molecular processes and extreme states of matter,

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

15.00 – 15.20

Invited

Combination of photonic tools and nanostructured materials for application in biology and medicine

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

15.20 – 15.35

Invited

Introduction to metamaterials with an outlook towards biological applications

Mikhail Lapine, ITMO University, Saint Petersburg, Russia, University of Technology Sydney, Australia, Qingdao Innovation Centre of Harbin Engineering University, China

15.35 – 15.50

Oral

Engineering of magnetic microspheres with polymer coatings and examination of their performance for isolation of small extracellular vesicles

Nikita A. Grishaev¹, Ekaterina O. Moiseeva¹, Vasiliy S. Chernyshev², Alexey M. Yashchenok¹¹ Skoltech Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology Skolkovo Innovation Center, 121205 Moscow, Russia ²National Medical Research Center for Obstetrics, Gynecology and Perinatology Named after Academician V.I. Kulakov, 117997 Moscow, Russia

15.50 – 16.05

Oral

Gold nanostars and nanoantennas: tuning of optical properties and coating with silica shell

Vitaly A. Khanadeev^{1,2} Andrey V. Simonenko^{1,3} Anton S. Oleinikov^{1,3} Kirill V. Lobanov³ Nikolai G. Khlebtsov^{1,31} Institute of Biochemistry and Physiology of Plants and Microorganisms – Subdivision of the Federal State Budgetary Research Institution Saratov Federal 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;

16.05 – 16.20

Oral

Labeling and Tracking of Mesenchymal Stem Cells using Photoconvertible Microcapsules

Olga A. Sindeeva¹ Polina A. Demina² Zhanna V. Kozyreva² Albert R. Muslimov³ Olga I. Gusliakova^{1,2} Ekaterina A. Mordovina² Daria Tsyupka² Anastasiia Yu. Sapach¹ Irina Yu. Goryacheva² and Gleb B. Sukhorukov¹¹ Vladimir Zelman Center for Neurobiology and Brain Rehabilitation, Skolkovo Institute of Science and

Technology, ²Science Medical Center, Saratov State University, ³RM Gorbacheva Research Institute, Pavlov University.

16.20 – 16.35

Oral

Fluorescent turn-off nanosensor for the quantitative determination of doxorubicin

Svetlana A. Mescheryakova, Olga A. Goryacheva, Daniil D. Drozd, Irina Y. Goryacheva Saratov State University, Saratov, Russia

16.35 – 16.50

Oral

The story of how mitoxantrone chose his friends: Surface interaction and semiconductor quantum dots luminescence quenching for mitoxantrone detection

Daria V. Tsyupka, Ekaterina A. Mordovina, Tatiana S. Ponomaryova, Daniil D. Drozd, Irina Yu. Goryacheva, Olga A. Goryacheva Saratov State University, SSU, Saratov, Russia

16.50 – 17.05

Oral

Biodegradable carriers for intradermal delivery of glucocorticoids

Yulia I. Svenskaya, Mariia S. Saveleva, Polina A. Demina, Roman A. Verkhovskii, Roman Anisimov, Ekaterina E. Talnikova, Anastasiia A. Kozlova, Elina A. Genina, Valery V. Tuchin Scientific Medical Center, Saratov State University, Saratov 410012, Russia

17.05 – 17.20

Oral

The mechanism of polysaccharide container formation by the ultrasonication method

Irina V. Marchenko¹, Tatiana V. Bukreeva¹, Yuri .M. Efremov², Tatiana N. Pallaeva¹ ¹FSRC "Crystallography and Photonics" RAS, Moscow, 119333, Leninskii Pr., 59 ²Sechenov University, Moscow, 119991, st. Trubetskaya, 8, build. 2

September 29, Thursday

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

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

18.15-20.30

1NB. Fluorescent photoconvertible polymer markers for individual cell labeling Ilya O. Kozhevnikov, Artem A. Bakal, Polina A. Demina, Saratov State University, Saratov, Russia

2NB. Effect of upconversion nanoparticles on erythrocytes Anna A. Doronkina, Alexander B. Pravdin, V. I. Kochubey, Irina Y. Yanina Saratov State University, Saratov, Russian.

3NB. Mucoadhesive Emulsion Microgels for Intravesical Drug Delivery: Preparation, Retention at Urothelium, and Biodistribution Study Mariia S. Saveleva, Mikhail E. Lobanov, Olga I. Gusliakova, Ekaterina S. Prikhozhenko, Valentina O. Plastun, and Oksana A. Mayorova Remote Controlled Theranostics System Lab, Science Medical Centre, Saratov State University, 410012, 83 Astrakhanskaya Street, Saratov, Russia

4NB. Sonochemical mineralization treatment of biomaterials: surface bioactivation, osseointegration and *in vivo* drug release Mariia Saveleva¹, Alexey Ivanov², Bogdan

Parakhonskiy³, Maria Lomova¹¹ Saratov State University, 410012, 83 Astrakhanskaya Street, Saratov, Russia ²Saratov State Medical University, 410012, 112 Bolshaya Kazachia Street, Saratov, Russia ³Ghent University, 9000, 653 Coupure links, Ghent, Belgium

5NB. Effect of silver nanoparticles on optical extinction spectra of colloidal solutions and flexible substrates Evgeniy A. Ryabov, Daniil N. Bratashov, Ekaterina S. Prikhozhenko Saratov State University, Saratov

6NB. Optimization of SERS-substrates based on nonwoven material and the "silver mirror" reaction Viktorii A. Bakal, Anastasiia M. Kartashova, Ekaterina S. Prikhozhenko Science Medical Center, Saratov State University, Saratov, Russia

7NB. Nanoparticles against tumors: anticancer drugs for use in silica-based drug delivery systems. Anton S. Oleinikov^{1,2}, Vitaly A. Khanadeev,^{1,3} ¹Institute of Biochemistry and Physiology of Plants and Microorganisms – Subdivision of the Federal State Budgetary Research Institution Saratov Federal 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

8NB. Investigation of self-assembled photosensitizers with albumin molecules in solutions by dynamic light scattering Ladynin A.I., Sergeeva I.A., Krot A.R., Fedorova

K.V., Lomonosov Moscow State University, Moscow, Russia

9NB. Synergetic aspect of endovascular administration and immobilization of substances in polymeric microcapsules in targeted delivery Olga I. Gusliakova^{1,2}, Ekaterina S. Prikhozhenko², Valentina O. Plastun², Oksana A. Mayorova², Natalia A. Shushunova², Arkady S. Abdurashitov¹, Dmitry A. Gorin³, Gleb B. Sukhorukov^{1,4} and Olga A. Sindeeva¹, ¹Vladimir Zelman Center for Neurobiology and Brain Rehabilitation, Skolkovo Institute of Science and Technology, ²Science Medical Center, Saratov State University, ³Center for Photonics and Quantum Materials, Skolkovo Institute of Science and Technology, ⁴School of Engineering and Materials Science, Queen Mary University of London

10NB. GaP based structures with luminescent nanoparticles for biophotonics and photosensors systems Maxim A. Rider¹, Maria S. Kovova¹, Arina A. Efimova¹, Stanislav V. Shmakov², Alexey D. Bolshakov^{2,3}, Valeriy M. Kondratev^{2,3}, Alexey S. Kuznetsov^{2,3}, Viktor V. Zakharov¹, Anna O. Orlova¹, ITMO University, St. Petersburg, Russia ²SPbAU RAS im. Zh.I. Alferov, St. Petersburg, Russia ³MIPT, Phystech, Dolgoprudny, Russia

11NB. Study of diffusion properties of chitosan-based nanocomposites with Ag-in-S2 quantum dots, and tetraphenylporphyrin molecules Sergey A. Kabanov¹, Fayza A. Sewid², Anna O. Orlova¹, ITMO University, Saint-Petersburg, Russia ²Faculty of Science, Mansoura University, Egypt

12NB. Immunostimulating effect of gold nanoparticles conjugated with *Brucella abortus* antigen Vyrshchikov R.D., Bogatyrev V.A., Staroverov S.A., Dykman L.A. Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences, Saratov, 410049 Russia

13NB. Express method for determining the concentration of microalgae and the content of basic plant pigments in the culture of *Dunaliella salina* in vivo I. P. Lehman¹, L. A. Dykman², V. A. Bogatyrev^{1,2}, ¹Saratov State University, 83 Astrakhanskaya St., Saratov 410012, Russia ²Institute of Biochemistry and Physiology of Plants and Microorganisms Federal Research Center "Saratov Scientific Center of the Russian Academy of Sciences" (IBPPM RAS), 13 Entuziastov Ave., Saratov 410049, Russia

14NB. Optimization of synthesis conditions protein-modified luminescent gold nanoclusters. Kseniya R. Kalishina, Yulia A.

Podkolodnaya, Anna M. Vostrikova and Irina Y. Goryacheva, Saratov State University, Saratov, Russia, Institute of Chemistry, Saratov, Russia.

15NB. Luminescence of Eu³⁺ doped calcium hydroxyapatite and tricalcium phosphate nanoparticles Ilya D. Sidorov¹, Ekaterina I. Oleinikova¹, Timur M. Minnebaev¹, Alexey S. Nizamutdinov¹, Maxim S. Pudovkin¹, Marat R. Gafurov¹, Yuliya O. Nikitina², Yuliya A. Demina², Natalya V. Petrakova², Vladimir S. Komlev²; ¹Kazan Federal University, Kazan, Russia; ²Federalnoe gosudarstvennoe byudzhethnoe uchrezhdenie nauki "Institut metallurgii imaterialovedeniya im. A.A. Bajkova Rossijskoj akademii nauk (IMET RAN)", Moscow, Russia.

16NB. Influence of chromium ions on the collagenolysis process in solutions Pismennaia A.A., Sergeeva I.A., Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia

17NB. Whey protein-based emulsion microcontainers for prolonged antibacterial therapy Valentina O. Plastun, Olga I. Gusliakova, Maria S. Saveleva, Ekaterina S. Prikhozhenko, Elena S. Tuchina, Oksana A. Mayorova, Saratov State University, Russia

18NB. Instrument-free detection of nucleic acids via gene-targeted four-way-junction sensor coupled with magnetic nanoparticles Maria Y. Berezovskaya, Daria A. Gorbenko, Marta A. Bykovskaya Laboratory of Solution Chemistry of Advanced Materials and Technologies, ITMO university, Saint Petersburg, Russia

19NB. G-quadruplex chemiluminescent sensor for the detection of specific nucleic acid sequences of pathogenic microorganisms Gleb Bobkov¹, Pavel V. Filatov^{1,2}, Daria A. Gorbenko^{1,2}, Daler D. Dadazhanov¹, Tigran A. Vartanyan¹, SCAMT Institute, ITMO University, St. Petersburg, Russian Federation ²PhysNano, ITMO University, St. Petersburg, Russian Federation

20NB. CaCO₃: various shapes, sizes and magnetic phases as a result of synthesis and recrystallization Alexandra E. Kalinova¹, Ludmila I. Kuznetsova¹, Roman A. Anisimov¹, Arseni V. Ushakov², Maria A. Popova², Maria V. Lomova¹; ¹Saratov State University, Science Medical Center, Saratov, Russia; ²Saratov State University, Institute of Chemistry, Saratov, Russia

Internet Poster reports

1NI. Red chiral carbon dots by isocyanate post-synthetic treatment Alexander M. Mitroshin,^{1,2} Elena. V. Ushakova¹ ¹International Research and Education Centre for Physics of Nanostructures, ITMO University, 197101 Saint Petersburg, Russia ²Institute of Macromolecular Compounds, Russian Academy of Sciences, Bol'shoi pr. 31, St. Petersburg, 199004, Russia

2NI. Magnetic smart nanosystems for the treatment of osteoarthritis Galechyan G.Yu.¹, Ichkitidze L.P.^{2,3}, Filippova O. V.³, Orlov A.P.³,

Telyshev D.V.^{2,3} Gerasimenko A. Yu.^{2,3} ¹Laboratory of Clinical Smart Nanotechnologies, Institute for Regenerative Medicine, I. M. Sechenov First Moscow State Medical University, Moscow, Russia ²Institute of Biomedical Systems, National Research University of Electronic Technology (MIET), 124498, Zelenograd, Moscow, Russia ³Institute for Bionic Technologies and Engineering, I. M. Sechenov First Moscow State Medical University, 119991 Moscow, Russia

Conference on Internet Biophotonics XVI

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

Secretary: Sofia V. Atzigeida, Saratov State University, Saratov, Russia; Tomsk State University, Tomsk, Russia

International Program Committee: Heidi Abrahamse, University of Johannesburg (RSA); Vanderlei Salvador Bagnato, University of São Paulo (Brazil); Walter Blondel, University of Lorraine (France); Wei Chen, University of Central Oklahoma (USA); Santhosh Chidangil, Manipal Academy of Higher Education (India); Cornelia Denz, Physikalisch-Technische Bundesanstalt (PTB) (Germany); Kishan Dholakia, University of St. Andrews (UK); Maria Farsari, FORTH-IESL (Greece); Paul M.W. French, Imperial College of Science, Technology and Medicine (UK); Elina A. Genina, Saratov State University (Russia); Mikhail Yu. Kirillin, Institute of Applied Physics RAS, Nizhny Novgorod (Russia); Yury V. Kistenev, Tomsk State University; Kirill V. Larin, University of Houston (USA); Andrew L. Lopez, III, University of Houston (USA); Qingyu Lin, Sichuan University (China); Qingming Luo, Hainan University (China); Luís M. Oliveira, Polytechnic of Porto – School of Engineering (Porto, Portugal); Roberto Pini, National Research Council of Italy (CNR) (Italy); Juergen Popp, Inst. of Photonic Technology, Jena (Germany); Alexander V. Priezhev, Moscow State University (Russia); Edik Rafailov, Aston University (UK); Valery V. Tuchin, Saratov State University; Institute of Precision Mechanics and Control, FRC SSC RAS; Tomsk State University (Russia); Lihong Wang, Caltech (USA); Ruikang K. Wang, University of Washington (USA); Valery P. Zakharov, Samara State University (Russia); Zeev Zalevsky, Bar Ilan University (Tel Aviv, Israel).

September 28, Thursday

INTERNET PLENARY SESSION (Building 8, Hall 420)

17.45-18.15 (Saratov time UTC+4)

16.45-17.15 (Moscow time UTC+3)

Recent Advances in Optical Coherence Elastography (Pre-recorded)

Kirill V. Larin, Department of Biomedical Engineering, University of Houston, Houston, USA

INTERNET INVITED SESSION

Zoom link: <https://zoom.us/j/97105128804>
ID 971 0512 8804
(Building 8, Hall 420)

10.30-11.00 (Saratov time UTC+4)

9.30-10.00 (Moscow time UTC+3)

Advanced Monte Carlo Simulations for Optical Imaging Modalities

M. Kirillin¹, D. Kurakina¹, A. Getmanskaya^{1,2}, A. Gorshkov^{1,2}, A. Khilov¹, V. Perekatova¹, V. Shishkova^{1,2}, I. Turchin¹, E. Sergeeva¹; ¹A.V. Gaponov-Grekhov Institute of Applied Physics RAS, Nizhny Novgorod, Russia; ²N.I. Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia

12.00-12.30 (Saratov time UTC+4)

11.00-11.30 (Moscow time UTC+3)

In vivo staining-free visualization of macrophages in human skin using two-photon tomography with fluorescence lifetime imaging

Maxim E. Darwin¹, Marius Kröger¹, Jörg Scheffel^{2,3}, Evgeny A. Shirshin⁴, Johannes Schleusener¹, Martina C. Meinke¹, Jürgen Lademann¹, Marcus Maurer^{2,3}; ¹Charité – Universitätsmedizin Berlin, Department of Dermatology, Berlin, Germany; ²Charité – Universitätsmedizin Berlin, Institute of Allergology, Berlin, Germany; ³Fraunhofer Institute for Translational Medicine and Pharmacology, Allergology and Immunology, Berlin, Germany; ⁴Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia

Pre-recorded Internet Invited Lectures

(Available during the conference via your own laptop, smartphone or computer labs)

https://sfmconference.org/sfm/sfm23/conferences_workshops/internet-biophotonics-xvi/preliminary/

1. Analysis of the experimental absorption spectrum of the rabbit lung and quantification of its components

Maria Rosário Pinheiro¹, Luís Oliveira^{1,2}, Valery V. Tuchin³⁻⁵; ¹Institute for Systems and Computer Engineering, Technology and Science, Porto, Portugal; ²Polytechnic Institute of Porto – School of Engineering, Porto, Portugal; ³Science Medical Center, Saratov State University, Saratov, Russian Federation; ⁴Tomsk State University, Tomsk, Russia; ⁵Institute of Precision Mechanics and Control RAS, Saratov, Russia

INTERNET POSTERS

(Available during the conference via your own laptop, smartphone or computer labs)
https://sfmconference.org/sfm/sfm23/confere-nces_workshops/internet-biophotonics-xvi/preliminary/

2. Multimodal characterization of optical properties of urinary stones ex vivo for classification based on hyperspectral imaging, terahertz spectroscopy and integrating sphere measurements: Preliminary results (Pre-recorded)

Walter Blondel¹, Mélanie Meneglier¹, Clarice Perrin-Mozet¹, Hoalian Shi², Alexandre Locquet², Arnaud Marotel³, Marie Camonin¹, Christian Daul¹, Béatrice Caillierez⁴, Jacques Hubert^{1,4} and Marine Amouroux¹; ¹Université de Lorraine, CNRS, CRAN UMR 7039, Vandoeuvre-Lès-Nancy, France, ²International Research Laboratory Georgia Tech, CNRS, IRL 2958, Metz, France, ³Ecole Nationale Supérieure de Géologie, Vandoeuvre-Lès-Nancy, France; ⁴Centre Hospitalier Régionale et Universitaire, CHRU, Vandoeuvre-Lès-Nancy, France

3. Multiphoton laser scanning microscopy for detection of cerebral microcirculation heterogeneity in traumatic brain injury and intracranial hypertension (Pre-recorded)

Denis E. Bragin, Lovelace Biomedical Research Institute, Department of Neurology, University of New Mexico School of Medicine, Albuquerque, USA

4. Study of optical characteristics changes of the biological tissues after the injection of nanoparticles of various types without and after PDT (Pre-recorded)

Daria K. Tuchina^{1,2,3}, Ekaterina N. Lazareva^{1,2}, Anna A. Doronkina¹, Roman A. Anisimov⁴, Maria V. Lomova⁴, Artyom M. Mylnikov⁵, Nikita A. Navolokin^{5,6,7}, Vyacheslav I. Kochubey^{1,2}, Irina Yu. Yanina^{1,2}; ¹Department of Optics and Biophotonics, Saratov State University, Saratov, Russian Federation; ²Laboratory of laser molecular imaging and machine learning, Tomsk State University, Russian Federation; ³Institute of Biochemistry, A.N. Bach Federal Research Center of Biotechnology RAS, Moscow, Russian Federation; ⁴Education and Research Institution of Nanostructures and Biosystems, Saratov State University, Russian Federation; ⁵Department of Pathological Anatomy, Saratov State Medical University, Saratov, Russian Federation; ⁶Research-Scientific Institute of Fundamental and Clinic Urology, Saratov State Medical University, Saratov, Russian Federation; ⁷Pathological Department, State Healthcare Institution "Saratov City Clinical Hospital No. 1 named after Yu.Ya. Gordeev" st. them. Kholzunova A.I., Saratov, Russian Federation

1. Tumor pathomorphosis and changes in internal organs of laboratory rats with PC-1 transfected liver cancer at different multiplicity of NaYF₄ +HSA and NaYF₄+HSA+FA particles administration

Artem M. Mylnikov¹, Nikita A. Navolokin^{1,2,3}, Roman A. Anisimov⁴, Maria V. Lomova⁴, Vyacheslav I. Kochubey^{5,6}, Irina Yu. Yanina^{5,6}; ¹Department of Pathological Anatomy, Saratov State Medical University, Saratov, Russian Federation; ²Research-Scientific Institute of Fundamental and Clinic Urology, Saratov State Medical University, Saratov, Russian Federation; ³Pathological Department, State Healthcare Institution "Saratov City Clinical Hospital No. 1 named after Yu.Ya. Gordeev" st. them. Kholzunova A.I., Saratov, Russian Federation; ⁴Education and Research Institution of Nanostructures and Biosystems, Saratov State University (National Research), Russian Federation; ⁵Department of Optics and Biophotonics, Saratov State University (National Research), Saratov, Russian Federation; ⁶Laboratory of laser molecular imaging and machine learning, Tomsk State University (National Research), Russian Federation.

2. Spectral properties of CDOM depending on depth in artificially and naturally separated water bodies

Yulia G. Sokolovskaya¹, Nikolai A. Demidenko², Elena D. Krasnova³, Dmitrii A. Voronov⁴, Alexander S. Savvichev⁵, Denis A. Fedichkin D.A.¹, Svetlana V. Patsaeva¹; ¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia; ²Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow, Russia; ³Biological Faculty, Lomonosov Moscow State University, Moscow, Russia; ⁴Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow, Russia; ⁵Winogradsky Institute of Microbiology, Federal Research Center "Fundamentals of Biotechnology", Russian Academy of Sciences, Moscow, Russia.

3. Chlorophyll fluorescent induction in plants treated with physiologically active compounds

Olesya A. Kalmackaya¹, Vladimir A. Karavaev¹, Anna V. Malozemova¹, Ekaterina I. Gunar²; ¹Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia; ²Institute of Horticulture and Landscape Architecture, Russian State Agrarian University – Moscow Timiryazev Agricultural Academy, Moscow, Russia.

4. Blending of amplitude and phase approaches to evaluation of deformations in soft biological tissues using optical coherence elastography

Anton Yu. Potlov, Sergey V. Frolov; Department of Biomedical Engineering, Tambov State Technical University, Russia.

5. Evaluation of absolute displacements in biological tissues using topological skeletons of multi-dimensional optical coherence tomography raw data

Anton Yu. Potlov; Department of Biomedical Engineering, Tambov State Technical University, Russia.

6. Motion artifacts correction for improving the efficiency of optical coherence elastography

Anton Yu. Potlov; Department of Biomedical Engineering, Tambov State Technical University, Russia.

7. Detection and correction of phase discontinuity in the interference signal of optical coherence tomography using the Hough transform

Anton Yu. Potlov; Department of Biomedical Engineering, Tambov State Technical University, Russia

8. Optical clearing for fluorescence visualization of dCas9/FP expression in tumor subcutaneous xenografts in mice

Gerel Abushinova^{1,2}, Lylia Maloshenok^{1,2}, Victoria Zherdeva¹; ¹Research Center of Biotechnology of the RAS, AN Bach Institute of Biochemistry, Moscow, Russian Federation; ²Vavilov Institute of General Genetics of the RAS, Moscow, Russian Federation

9. Animal anesthesia in long-term experiments on imaging and surgical intervention

Veronika N. Volodina, Elizaveta V. Okuneva, Astemir R. Likhov, Victoria V. Zherdeva; RC of Biotechnology of the RAS, Moscow, Russia

10. Modelling of the polyester copolymers degradation in vitro detected by fluorescence and MRI

Astemir R. Likhov¹, Dmitry D. Demin², Victoria V. Zherdeva¹; ¹RC of Biotechnology of the RAS, Moscow, Russia; ²MIREA — Russian Technological University, Moscow, Russia

11. Ultrasound enhancement of skin optical clearing ex vivo

Daria K. Tuchina^{1,2,3}, Alla B. Bucharskaya⁴, Valery V. Tuchin^{1,2,3,5}; ¹Research-Educational Institute of Optics and Biophotonics, Saratov State University, Saratov, Russia; ²Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk, Russia; ³A.N. Bach Institute of Biochemistry, Research

Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russian Federation; ⁴Saratov State Medical University, Saratov, Russia; ⁵Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of Precision Mechanics and Control RAS, Saratov, Russia

13. Laser-formed electrically conductive nanomaterial for cardiac regeneration

Uliana E. Kurilova^{1,2}, Mikhail S. Savelyev^{1,2}, Irina A. Suetina³, Marina V. Mezentseva³, Leonid I. Russu³, Alexander Yu. Gerasimenko^{1,2}; ¹I.M.Sechenov First Moscow State Medical University, Moscow, Russia ²National Research University of Electronic Technology, ³National Research Center for Epidemiology and Microbiology Named after the Honorary Academician N.F. Gamaleya, Moscow, Russia

14. Detection of pharmaceuticals prohibited in sports by Raman Spectroscopy methods

M. S. Khetseva^{1,*}, E. P. Kozhina^{1,2}, A. V. Naumov^{1,2}; ¹Moscow State Pedagogical University, 119435 Moscow, Russia; ²Lebedev Physical Institute, Russian Academy of Sciences, 119991, Moscow, Russia

Conference on Low-Dimensional Structures XIII

Workshop 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: **Ming-Fa Lin**, National Cheng Kung University, Tainan, Taiwan, **Albert G. Nasibulin**, Skolkovo Institute of Science and Technology, Russia, **Zhang Gang**, Institute of High Performance Computing, Agency for Science, Technology and Research, Singapore, **Tatiana R. Prytkova**, Cloud Pharmaceuticals, USA, **Irina V. Zaporotzkova**, Volgograd State University, Volgograd, Russia, **Galina N. Maslyakova**, Saratov State Medical University named after V.I. Razumovsky, Saratov, Russia, **Igor S. Nefedov**, Aalto University, Espoo, Finland

September 27, Wednesday

ORAL SESSION (Building 8, Room 318)

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

10.00-10.15

Electronic and electrically conductive properties of graphene-nanotube hybrid films

Michael M. Slepchenkov¹, Pavel V. Barkov¹, Olga E. Glukhova^{1,2}

¹Saratov State University, Saratov, Russia;
²Sechenov First Moscow State Medical University, Moscow, Russia

10.15-10.30

Simulation of Graphene Electron Dynamics for Models of Strongly Interacting Nearest Neighbors Based on the Kinetic Approach

Anatolii D. Panferov¹, Ilya A. Sherbakov¹

¹Saratov State University, Saratov, Russia

10.30-10.45

Electrodynamical properties of Cross-Stacked Carbon Nanotube Networks

Igor S. Nefedov¹, Olga E. Glukhova¹, Pavel Barkov¹, Michael V. Davidovich¹, Michael M. Slepchenkov¹, J. Miguel Rubi²

¹Saratov State University, Saratov, Russia;
²Statistical and Interdisciplinary Physics Section, Departament de Física de la Matèria Condensada, Universitat de Barcelona, Martí i Franquès 1, 08028, Barcelona, Spain

10.45-11.00

Effect of temperature on the emission properties of quasi 2D glass-like carbon placed on silicon and silicon dioxide substrates

Alexander A. Petrunin¹, Michael M. Slepchenkov¹, Haifei Zhan^{2,3}, Olga E. Glukhova^{1,4}

¹Institute of Physics, Saratov State University, Saratov, ²Department of Civil Engineering,

Zhejiang University, China; ³Queensland University of Technology (QUT), Brisbane, Australia; ⁴Laboratory of Biomedical Nanotechnology, I.M. Sechenov First Moscow State Medical University, Moscow, Russia

11.00-11.15

pH-Responsive Core-Shell Structures for Controlled Release of Encapsulated Compounds

Alexey V. Ermakov¹, A.O. Kuznetsov¹, Yu.N. Vlasicheva², E.V. Lengert¹, A.V. Zvyagin¹, A.V. Ermakov¹

¹Institute of Molecular Theranostics, I. M. Sechenov First Moscow State Medical University, 8 Trubetskaya Str., 119991 Moscow, Russia; ²Russian University of Chemical Technology DI. Mendeleev, 9/6 Miusskaya Square, Moscow, 125047 Russia

September 28, Thursday

ORAL SESSION/INTERNET REPORTS

(Building 8, Room 318)

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

Ссылка на GoogleMeet:

<https://meet.google.com/gww-tbbm-two>

12.00-12.15

Comparative study of the interaction of a modified borocarbon nanotube of the BC type with carbon-containing molecules

Natalia P. Boroznina¹, Irina V. Zaporotzkova¹, Sergey V. Boroznin¹, Pavel A. Zaporotkov¹

¹Volgograd State University, Volgograd, Russia

12.15-12.30

Endohedral complexes based on small fullerenes with metals as a basis for the formation of heterostructures

Anton R. El Zanin¹, Sergey V. Boroznin¹

¹Volgograd State University, Volgograd, Russia

12.30-12.45

Stable Polyurethane Containers through the Assembly of Cellulose Nanocrystals at the Oil Droplet Interface and Crosslinking with Polymeric Isocyanate

Denis V. Voronin¹, Adeliya R. Sayfutdinova¹, Maria I. Rubtsova¹, Dmitry S. Kopitsyn¹, Kirill A. Cherednichenko¹, Dmitry G. Shchukin², and Vladimir Vinokurov¹

¹National University of Oil and Gas «Gubkin University», Leninsky pr. 65-1, Moscow 119991, Russia; ²Stephenson Institute for Renewable Energy, Department of Chemistry, University of Liverpool, Liverpool L69 7ZD, United Kingdom

12.45-13.00

On the interaction of polyvinylpyrrolidone with carbon nanotubes to create a coating of medical stents

Mariia F. Chesheva¹, Irina V. Zaporotskova¹

¹Volgograd State University, Volgograd, Russia

13.00-13.15

Investigation of the effect of replacement boron atoms in carbon nanotubes on the surface sorption of gas atoms

Sergei V. Boroznin¹, Irina V. Zaporotskova¹, Pavel A. Zaporotskov¹, Natalya P. Boroznina¹

¹Volgograd State University, Institute of the priority technologies, 400062 Volgograd, Russia

13.15-13.30

Sensory properties of carbon nanotubes modified with nickel oxide

Evgeniy S. Dryuchkov¹, Irina V. Zaporotskova¹

¹Volgograd State University, Volgograd, Russia

13.30-13.45

Low-temperature behavior and hysteresis of heat capacity in CNTs are determined by structural disorder

Alexander N. Ponomarev¹, Nadezhda G. Bobenko¹, Valeriy E. Egorushkin¹

¹Institute of Strength Physics and Materials Science of Siberian Branch Russian Academy of Sciences, Tomsk, Russia

13.45-14.00

Mechanism of oxygen regulation during hypoxia by HIF-1 α protein on carboxyl-functionalized MWCNTs

Nadezhda G. Bobenko¹, Vladislav V. Shunaev², Petr M. Korusenko³, Valeriy E. Egorushkin¹, Olga E. Glukhova²

¹Institute of Strength Physics and Materials Science of SB RAS, Tomsk, Russia; ²Department of Physics, Saratov State University, 410012 Saratov, Russia; ³St.

Petersburg State University, Universitetskaya embankment, St. Petersburg, Russia

14.00-14.15

Dynamics of acoustic waves in phosphorene sheet under continuous longitudinal compression

Igor A. Shepelev^{1,2}, Ivan D. Kolesnikov², Sergey V. Dmitriev³;

¹Almetyevsk State Oil Institute, Almetyevsk, Russia; ²Saratov State University, Saratov, Russia; ³Institute of crystal and molecule physics of UFSC RAS, UFA, Russia

JOINT POSTER

(Building 3, 3d floor Hall)

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

18.15-20.30

1L. **Studying of gas sensing properties of graphene oxide Langmuir-Schaeffer films**

Ilya A. Gorbachev¹, Andrey V. Smirnov¹

¹Institute of Radioengineering and Electronics RAS, Saratov, Russia

2L. **Spin waves propagation in a system of laterally coupled interferometers**

A.A. Martyshkin¹, A.A. Grachev¹, A.V. Sadovnikov¹

¹Saratov State University, Saratov, Russia

3L. **Interlayer formation of collimated spin-wave beams**

S.A. Odintsov¹, S.E. Sheshukova¹, S.A. Nikitov², A.V. Sadovnikov¹

¹Saratov State University, Saratov, Russia; ²Kotel'nikov Institute of Radioengineering and Electronics, Moscow, Russia

4L. **Voltage-induced topological transitions of spin waves in multiferroic structures**

Andrey A. Grachev¹, Maxim A. Gorlach², Evgeniy N. Beginin¹, Alexandr V. Sadovnikov¹

¹Laboratory "Magnetic Metamaterials", Saratov State University, Saratov, Russia; ²School of Physics and Engineering, ITMO University, Saint Petersburg, Russia

5L. **Study of the conductivity of a two-phase lattice: theory and computer modeling**

Leonid A. Kochkurov

Yury Gagarin State Technical University of Saratov, Saratov, Russia

6L. **Spin wave propagation in an array YIG microwaveguides at variations of the magnetization angle**

Anna B. Khutieva¹, Roman V. Masliy¹, Alexander V. Sadovnikov¹

¹Saratov State University, Saratov, Russia

7L. **Effects of the spatial distribution of the spin-wave signal power in YIG waveguides**

Roman V. Masliy¹, Anna B. Khutieva¹, Alexander V. Sadvnikov¹

¹Saratov State University, Saratov, Russia

8L. **Hydrothermal synthesis of cerium oxide nanoparticles stabilized with citric acid**

Sergey V. Pigarev¹, Daria V. Tsyupka¹, Ekaterina A. Mordovina¹, Irina Yu. Goryacheva¹, Olga A. Goryacheva¹, Nelli R. Popova²

¹Saratov State University, SSU, Saratov, Russia; ²Institute of Theoretical and Experimental Biophysics, Russian Academy of Sciences, Pushchino, Moscow region, Russia

9L. **Allayed quantum dots: study of the synthesis dynamics and determination of the fluorescence temperature dependence**

D.A. Kornilov¹, D.D. Drozd¹, I.Yu. Goryacheva¹

¹Saratov State University, Institute of Chemistry, Saratov, Russia

10L. **Modification of cerium oxide nanoparticles with polymeric materials**

Anastasia A. Kovyrshina¹, Daria V. Tsyupka¹, Nelli R. Popova², Irina Yu. Goryacheva¹, Olga A. Goryacheva¹

¹Saratov State University, SSU, Saratov, Russia; ²Institute of Theoretical and Experimental Biophysics, Russian Academy of Sciences, Institutskaya 3, Pushchino, Moscow region, 142290 Russia

11L. **Ni/NiO-graphene composite as the prospect material for lithium-ion batteries: ab initio insight**

Vladislav V. Shunaev¹, Olga E. Glukhova

¹Saratov State University, Saratov, Russia

12L. **Physical phenomena in thin films of graphene nanomesh functionalized with COOH groups during its surface interaction with water molecules**

P.V. Barkov¹, O.E. Glukhova^{1,2}

¹Saratov State University, Saratov, Russia; ²Sechenov First Moscow State Medical University, Moscow, Russia

INTERNET SESSION AND INTERNET DISCUSSION

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

13L. **Substrate and Luminescence properties of CdSe/CdS/ZnS Quantum Dots**

A.J. Al-Alwani^{1,2}, V.N. Mironyuk², O.A.H. Hassoon², E.G. Glukhovskoy²

¹Al-Furat Al-Awsat Technical University, Technical Institute Kufa, 3C53+GMJ, Kufa, Iraq; ²Saratov State University, Saratov, Russia

14L. **Investigation of the interaction of iron oxide with carbon nanotubes**

Sergey V. Boroznin¹, Irina V. Zaporotskova¹, Pavel A. Zaporotskov¹, Natalya P. Boroznina¹, Anton R. El Zanin¹

¹Volgograd State University, Institute of the priority technologies, Volgograd, Russia

15L. **Optoelectronic Properties of Van der Waals Heterostructures based on borophene, GaN, ZnO, ReSe₂ and ReS₂ monolayers**

Michael M. Slepchenkov¹, Dmitry A. Kolosov¹, Kirill R. Asanov¹, Olga E. Glukhova^{1,2}

¹Saratov State University, Saratov, Russia; ²I.M. Sechenov First Moscow State Medical University, Moscow, Russia

Conference on Biomedical Spectroscopy IX

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

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

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

September 28, Thursday ORAL SESSION/INTERNET SESSION (Building Room)

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

ZOOM Oral Report

Spectroscopic evaluation of the blood supply to the tracheal tissues during surgeries with anastomosis application Anna A. Krivetskaya^{1,2}, Daniil M. Kustov¹, Vladimir D. Parshin³, Mikhail A. Ursov³, Vladimir V. Levkin³, 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.

ZOOM Oral Report

Multispectral Raman and photoluminescence microanalysis of malignant skin neoplasms Elena Rimskaya¹, Svetlana Shelygina¹, Irina Saraeva¹, Elena Perevedentseva¹, Alina Timurzieva^{1,2}, Konstantin Kudrin^{1,3}, Sergey Kudryashov¹, ¹Lebedev Physical Institute, Moscow, Russia, ²N.A. Semashko National Research Institute of Public Health, Moscow, Russia, ³I.M. Sechenov First Moscow State Medical University, Moscow, Russia.

ZOOM Oral Report

Comparative analysis of the secondary structure of blood serum proteins from patients with multiple myeloma and healthy donors

Alexander M. Polyanchko^{1,2}, Anna D. Kartashova¹, Elina S. Mikhailets¹, Liudmila V. Plotnikova¹, ¹Saint-Petersburg State University, Saint-Petersburg, Russia, ²Institute of Cytology RAS, Saint-Petersburg, Russia.

September 28, Thursday

JOINT POSTER/INTERNET/ INTERNET POSTER SESSION AND INTERNET DISCUSSION (Building 3)

Chair (BS): **Anna Doronkina**, Saratov State University, Russia

18.15-20.30

1BS The possibilities of using a microstructural waveguide for the analysis of biomaterials Pavel A. Lepilin^{1,2}, Anastasia A. Zanishevskaya^{1,2}, Svetlana S. Konnova^{1,2}, Valery Tuchin², Yulia S. Skibina¹, ¹SPE LLC "Nanostructured Glass Technology" Saratov, Russia, ²Institution of Physics and Science Medical Center, Saratov State University, Russia.

2BS Mandelstam-Brillouin spectroscopy for non-invasive magnetic and stiffness properties detection of breast cancer cells in vitro Fedor E. Garanin¹, Anna B. Khutieva¹, Maria V. Lomova², Alexander V. Sadovnikov¹, ¹Saratov State University, Saratov, Russia, ²Scientific Medical Center, Saratov State University, Saratov, Russia.

3BS Multivariate Statistical Analysis of Raman Spectra of Human Skin for Chronic Heart Failure Diagnosis Yulia Khristoforova¹, Lyudmila A. Bratchenko¹, Petr A. Lebedev², Maria A. Skuratova³, Elena A. Lebedeva³, Ivan A. Bratchenko¹, ¹Samara University, Russia, ²Samara State Medical University, Russia, ³Samara City Clinical Hospital №1 named N.I. Pirogova, Russia.

4BS Analysis of Surface-Enhanced Raman spectra of blood serum in patients with COPD Lyudmila

A. Bratchenko¹, Sahar Z. Al-Sammarraie¹, Elena N. Tupikova¹, Vitaly I. Kupaev², Peter A. Lebedev², Ivan A. Bratchenko¹,
¹Samara National Research University, Samara, Russia, ²Samara State Medical University, Samara, Russia.

5BS Study of the process of complexation of glycosylated and non-glycosylated proteins by the method of probe - eosin luminescence polarizationplexation of glycosylated and non-glycosylated proteins by the method of probe - eosin luminescence polarization Andrey G. Melnikov², Vyacheslav I. Kochubey¹, Alexander B. Pravdin¹, Denis A. Bykov², Gennady V. Melnikov², ¹Saratov State University, Saratov, Russia, ²Saratov State Technical University, Saratov, Russia.

6BS Application of methods of luminescence-kinetic spectroscopy and dynamic light scattering in the study of complexes of the composition: glycosylated and non Andrey G. Melnikov², Vyacheslav I. Kochubey¹, Alexander B. Pravdin¹, Denis A. Bykov², Gennady V. Melnikov², ¹Saratov State University, Saratov, Russia, ²Saratov State Technical University, Saratov, Russia.

7BS Raman scattering microspectroscopy of malignant skin neoplasms Alina Timurzieva^{1,2}, Elena Rimskaya¹, Svetlana Shelygina¹, Irina Saraeva¹, Elena Perevedentseva¹, Nikolay Melnik¹, Konstantin Kudrin^{1,3}, Dmitry Reshetov⁴, Alexey Gorevoy¹, Sergey Kudryashov¹, ¹Lebedev Physical Institute, Moscow, Russia, ²N.A. Semashko National Research Institute of Public Health, Moscow, Russia, ³I.M. Sechenov First Moscow State Medical University, Moscow, Russia, ⁴A.I. Evdokimov Moscow State University of Medicine and Dentistry, Moscow, Russia.

INTERNET POSTERS

- 1. Effect Hypochlorite on Structure of Nucleic Acids**, Daria N. Osinnikova, Kristina I Pavlova, Alexander M. Polyanichko, Evgenia B. Moroshkina, St. Petersburg State University, St.Petersburg,Russia.

Workshop on Nonlinear Dynamics XIV

Workshop Co-Chairs: **Galina I. Strelkova**, Saratov State University (Russia), **Andrei V. Slepnev**, Saratov State University (Russia)

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

International Program Committee: **Jürgen Kurths**, Humboldt University, Berlin, Germany; **Alexander Neiman**, Ohio

University, USA; **Igor Khovanov**, Warwick University, UK; **Olga Sosnovtseva**, University of Copenhagen, Denmark;

Alexey N. Pavlov, Saratov State University, Russia; **Tatiana E. Vadivasova**, Saratov State University, Russia; **Alexey V.**

Shabunin, Saratov State University, Russia; **Dmitry E. Postnov**, Saratov State University, Russia

September 28, Thursday

ORAL SESSION NONLINEAR DYNAMICS

(Building 3, Room 38, online:

meet.google.com/itk-jpdc-ran)

Co-Chairs: **Galina I. Strelkova**, **Andrei V. Slepnev**, Saratov State University (Russia)

14.00-14.12

Multiresolution wavelet analysis of transient processes

German A. Guyo¹, Alexey N. Pavlov¹

¹Saratov State University, Saratov, Russia

14.15-14.27

Residual diffusion in the autooscillatory system, demonstrating the stochastic web in the conservative limit, at small values of nonlinear dissipation

Alexander V. Golokolenov¹, Dmitry V. Savin¹

¹Saratov State University, Saratov, Russia

14.30-14.42

Noise mitigation in trained neural networks

Nadezhda Semenova¹

¹Saratov State University, Saratov, Russia

14.45-14.57

Bifurcations without parameters in memristor-based oscillators

Ivan A. Korneev¹, Ibadulla R. Ramazanov¹, Andrei V. Slepnev¹, Tatiana E. Vadivasova¹, Vladimir V. Semenov¹

¹Saratov State University, Saratov, Russia

15.00-15.12

Synchronization in multilayer networks of chaotic maps with inertial nonlinear coupling

Ivan A. Korneev¹, Ibadulla R. Ramazanov¹, Andrei V. Slepnev¹, Vladimir V. Semenov¹, Tatiana E. Vadivasova¹

¹Saratov State University, Saratov, Russia

15.15-15.27

Chimera suppression in rings of maps with noise-modulated nonlocal coupling

Natalya Nikishina¹, Elena Rybalova¹, Galina Strelkova¹, Tatiana Vadivasova¹

¹Saratov State University, Saratov, Russia

15.30-15.42

Astrocytes as an orchestrating force behind blood flow and neuronal activity (online)

Pavel O. Lukin¹, Andrey Yu. Verisokin¹, Darya V. Vervevko¹

¹Kursk State University, Russia

JOINT POSTER/INTERNET SESSION

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

18.15-20.30

1ND. Cooperative dynamics of complex systems studied with joint singularity spectra

German A. Guyo¹, Alexey N. Pavlov¹

¹Saratov State University, Saratov, Russia

2ND. The bias to interpret ambiguous visual information in favor of a perspective from above

Alexander K. Kuc¹, Vladimir A. Maksimenko^{1,2}

¹Immanuel Kant Baltic Federal University, Kaliningrad, Russia

²Innopolis University, Innopolis, Russia

3ND. Amplitude-frequency characteristics of metasurfaces based on YIG-permalloy

Daniil I. Grekhov¹, Anna B. Khutueva¹, Dmitry V. Romanenko¹, Alexander V. Sadovnikov¹

¹Saratov State University, Saratov, Russia

4ND. Influence of ultradian cortisol dynamics on the sleep-wake cycle

Elena S. Litvinenko¹, Ksenia O. Merkulova¹, Dmitry E. Postnov¹

¹Saratov State University, Saratov, Russia

5ND. Non-invasive Methods for EEG Spectrum Analysis

Tatiana R. Bogatenko¹, Konstantin S. Sergeev¹, Galina I. Strelkova¹, Jürgen Kurths²

¹Saratov State University, Saratov, Russia

²Potsdam Institute for Climate Impact Research, Potsdam, Germany

6ND. Influence of coupling topology and Lévy noise on dynamics of neural networks

Elena Rybalova¹, Andrei Bukh¹

¹Saratov State University, Saratov, Russia

7ND. Classification of chaos and quasiperiodicity using machine learning

Andrei D. Ryabchenko¹, Andrei V. Bukh¹, Konstantin S. Sergeev¹

¹Saratov State University, Saratov, Russia

8ND. Chimera resonance in rings of nonlocally coupled chaotic maps under the influence of additive noise

Vasily Nechaev¹, Elena Rybalova¹, Eckehard Schöll², Galina Strelkova¹

¹Saratov State University, Saratov, Russia

²Technische Universität Berlin, Berlin, Germany

9ND. Chimeras and solitary states in a ring of FitzHugh-Nagumo oscillators under noise influence

Andrei Ryabchenko¹, Elena Rybalova¹, Galina Strelkova¹

¹Saratov State University, Saratov, Russia

10ND. Noise influence on a ring of nonlocally coupled Henon-Lozi maps

Vladislav Averyanov¹, Elena Rybalova¹, Galina Strelkova¹

¹Saratov State University, Saratov, Russia

11ND. Dissipation in the network of coupled neuron models

Evgeny M. Elizarov¹, Andrei V. Bukh¹, Igor A. Shepelev¹, Sishu S. Muni², Eckehard Schöll^{3,4,5}, Galina I. Strelkova¹

¹Saratov State University, Saratov, Russia

²Indian Institute of Science Education and Research Kolkata, Mohanpur, India

³Technische Universität Berlin, Berlin, Germany

⁴Bernstein Center for Computational Neuroscience Berlin, Berlin, Germany

⁵Potsdam Institute for Climate Impact Research, Potsdam, Germany

12ND. Comparative analysis of the blood circulation of the index finger and second toe in middle-aged people in the dynamics of a pharmacological test with nitroglycerin

Igor B. Isupov², Rimma Sh. Zatrudina¹, Rodion A. Kudrin², Vladislav Yu. Gribkov¹

¹Volgograd State University, Volgograd, Russia

²Volgograd State Medical University, Volgograd, Russia

Conference on Terahertz Optics & Biophotonics VI

Conference Chairs: Nikita V. Chernomyrdin, Prokhorov General Physics Institute of RAS (Russia); Irina N. Dolganova, Institute of Solid State Physics of RAS (Russia); Institute for Regenerative Medicine, Sechenov University (Russia); Dmitry S. Ponomarev, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russia); Kirill I. Zaytsev, Prokhorov General Physics Institute of RAS (Russia)

Secretary: Arsenii A. Gavdush, Prokhorov General Physics Institute of RAS (Russia), E-mail: arsenii.a.gavdush@gmail.com

International Program Committee: Olga P. Cherkasova, Institute of Laser Physics of SB RAS (Russia); Pavel A. Karalkin, Institute for Cluster Oncology, Sechenov University (Russia); Gleb M. Katyba, Institute of Solid State Physics of RAS (Russia); Rustam A. Khabibullin, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russia); Gennady A. Komandin, Prokhorov General Physics Institute of RAS (Russia); Vladimir N. Kurlov, Institute of Solid State Physics of RAS; Institute for Regenerative Medicine, Sechenov University (Russia); Igor V. Reshetov, Institute for Cluster Oncology, Sechenov University; Academy of Postgraduate Education FSCC FMBA (Russia); Igor E. Spector, Prokhorov General Physics Institute of RAS (Russia)

September 29, 10:00-13:00

Yandex telemost:

<https://telemost.yandex.ru/j/24881922987292959025>

[771195058111855614](https://telemost.yandex.ru/j/24881922987292959025)

10.00-10.20 (9.00-9.20 Moscow local)

Invited

Application of nonstationary THz spectroscopy for medical diagnostics

Vladimir L. Vaks (IPM RAS, Nizhny Novgorod, Russia; Lobachevsky State University, Nizhny Novgorod, Russia), Elena G. Domracheva, Maria B. Chernyaeva, Vladimir A. Anfertev

10.20-10.40 (9.20-9.40 Moscow local)

Invited

Ultrafast spectroscopy of 1D nanomaterials and their applications

Maria G. Burdanova (Center for Photonics and 2D Materials, Moscow Institute of Physics and Technology, Dolgoprudny, Russia; Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia; Institute of Solid State Physics of the Russian Academy of Sciences, Russia)

10.40-11.00 (9.40-10.00 Moscow local)

Invited

Terahertz spectroscopy of blood plasma for cancer diagnosis and treatment

Olga P. Cherkasova (Institute of Automation and Electrometry SB RAS, Novosibirsk, Russia; Institute of Laser Physics of SB RAS, Novosibirsk, Russia), Nazar A. Nikolaev

11.00-11.20 (10.00-10.20 Moscow local) **Invited**

Optical-pump terahertz-probe diagnostics of the ultrafast carrier dynamics in photoconductive materials

Vladislava V. Bulgakova (Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia), Vladimir V. Bukin, Yurii G. Goncharov, Alexander A. Ushakov, K. Zaitsev, Maria G. Burdanova, Maksim I. Paukov, Dmitry V. Krasnikov, Albert G. Nasibulin, Sergey V. Garnov

11.20-11.40 (10.20-10.40 Moscow local)

Strain-induced photoconductive THz detectors for high-speed spectroscopy and imaging

Invited

Dmitry S. Ponomarev, Denis V. Lavrukhin (V.G. Mokerov Institute of Ultra-High Frequency Semiconductor Electronics of the Russian Academy of Sciences, Moscow, Russia; Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia), Alexander E. Yachmenev, Rustam A. Khabibullin, Yurii G. Goncharov, Kirill I. Zaytsev

11.40-12.00 (10.40-11.00 Moscow local)

High-resolution polarization-sensitive solid immersion microscopy of biological tissues in the terahertz frequency range

Invited

Nikita V. Chernomyrdin (Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia), Darya R. Il'enkova, Vladislav A. Zhelnov, Anna I. Alekseeva, Arsenii A. Gavdush, Guzel R. Musina, Pavel V. Nikitin, Kirill I. Zaytsev

12.00-12.20 (11.00-11.20 Moscow local)

Terahertz-infrared spectroscopy of Ge₂Sb₂Te₅ and VO₂ films upon temperature-induced phase transitions

Invited

Arsenii A. Gavdush (Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia), Gennadii A. Komandin, Kirill I. Zaytsev, Dmitry S. Ponomarev, Liwen Tan, Wanxia Huang, Qiwu Shi

12.20-12.35 (11.20-11.35 Moscow local)

Terahertz-wave scattering in tissues: Examining the limits of the effective medium theory applicability

Anna S. Kucheryavenko (Institute of Solid State Physics of the Russian Academy of Sciences, Russia), Irina N. Dolganova, Nikita V. Chernomyrdin, Arsenii A. Gavdush, Daria R. Il'enkova, Vladimir M. Masalov, Valery V. Tuchin, and Kirill I. Zaytsev

12.35-12.50 (11.35-11.50 Moscow local)

The ultrafast study of tungsten disulfide nanotubes

Maksim I. Paukov (Center for Photonics and 2D Materials, Moscow Institute of Physics and Technology, Dolgoprudny, Russia), Anastasia E. Goldt, Gennady A. Komandin, Alexey A. Melnikov, Kirill I. Zaitsev, Albert G. Nasibulin, Valentyn S. Volkov, Maria G. Burdanova

12.50-13.05 (11.50-12.05 Moscow local)

Terahertz generation through coherent excitation of surface plasmon polaritons in an array of carbon nanotubes

Sergey G. Moiseev, Sergey A. Afanas'ev, Aleksei S. Kadochkin, Dmitry G. Sannikov (Ulyanovsk State University, Ulyanovsk, Russia)

13.05-13.20 (12.05-12.20 Moscow local)

Simulation of THz pulse propagation through ceramic materials based on hydroxyapatite

Anastasia E. Rezvanova, Boris S. Kudryashov (Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia), Daniil D. Skorobogatov, Alexander N. Ponomarev

13.20-13.35 (12.20-12.35 Moscow local)

Opto-mechanical terahertz modulators based on single-wall carbon nanotube thin films

Maksim I. Paukov, Vladimir V. Starchenko (Center for Photonics and 2D Materials, Moscow Institute of Physics and Technology, Dolgoprudny, Russia), Dmitry V. Krasnikov, Gennady A. Komandin, Yuriy G. Gladush, Sergey S. Zhukov, Boris P. Gorshunov, Albert G. Nasibulin, Aleksey V. Arsenin, Valentyn S. Volkov, and Maria G. Burdanova

Conference on Advanced Materials for Optics & Biophotonics VI

Conference Chair: Vladimir N. Kurlov, ISSP RAS (Russia); Mikhail S. Kovalev, Lebedev Physical Institute RAS, (Russia); Irina N. Dolganova, ISSP RAS (Russia); Kirill I. Zaytsev, Prokhorov GPI RAS

Secretary: Gleb M. Katyba, ISSP RAS (Russia), E-mail: katyba_gm@issp.ac.ru

Program Committee: Nikita V. Chernomyrdin, Prokhorov General Physics Institute of the RAS (Russia); Alexei K. Fedorov, Russian Quantum Center (Russia); Arseniy A. Gavdush, Prokhorov General Physics Institute of RAS; Bauman Moscow State Technical University (Russia); Pavel A. Karalkin, Institute for Cluster Oncology, Sechenov University (Russia); Rustam A. Khabibullin, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russia); Gennady A. Komandin, Prokhorov General Physics Institute of RAS (Russia), Vladimir A. Lazarev, Bauman Moscow State Technical University (Russia), Vladimir M. Masalov, Institute of Solid State Physics of RAS (Russia), Dmitry S. Ponomarev, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russia), Igor V. Reshetov, Institute for Cluster Oncology, Sechenov University; Academy of Postgraduate Education FSCC FMBA (Russia), Igor E. Spector, Prokhorov General Physics Institute of RAS (Russia), Stanislav O. Yurchenko, Bauman Moscow State Technical University (Russia)

September 28

ZOOM:

<https://us06web.zoom.us/j/87196553137?pwd=a2svUmN2MmlvN1RlVWVs1NmVyeWZkZz09>

15.00-15.20 (14.00-14.20 Moscow local)

Internet Invited Lecture

Recent achievements in the THz super-resolution endoscopy and tunable optical element designing

Gleb M. Katyba, A.S. Kucheryavenko, V.A. Zhelnov (Osipyan Institute of Solid State Physics RAS, Russia; Prokhorov General Physics Institute RAS, Russia), M.G. Burdanova (Osipyan Institute of Solid State Physics RAS, Russia; Moscow Institute of Physics and Technology, Russia), N. I. Raginov, D.V. Krasnikov, A. G. Nasibulin (Skolkovo Institute of Science and Technology, Russia), A. V. Arsenin, V. S. Volkov (Moscow Institute of Physics and Technology, Russia), K. I. Zaytsev (Prokhorov General Physics Institute RAS, Russia), and V. N. Kurlov (Osipyan Institute of Solid State Physics RAS, Russia)

15.20-15.40 (14.20-14.40 Moscow local)

Internet Invited Lecture

Standard Of Up-Conversion Luminescence Based On Single Crystals Of Alkaline Earth Fluorides Doped With Ytterbium And Erbium/Thulium/Holmium

Sergey V. Kuznetsov, A.A. Alexandrov, V.A. Konyushkin, A.N. Nakladov, V.V. Voronov, P.P. Fedorov (Prokhorov General Physics Institute RAS, Russia).

15.40-15.55 (14.40-14.55 Moscow local)

Zoom Opal Report

Tunable Spiral Zone Plates for THz Vortex Optical Beam Generation

Arina V. Radivon (Moscow Institute of Physics and Technology, Russia), A. V. Chernykh, A. S. Ezerskii, N. V. Petrov (ITMO University, Russia), N. I. Raginov, D. V. Krasnikov, A. G. Nasibulin (Skolkovo Institute of Science and Technology, Russia), A. V. Arsenin, V.S. Volkov (Moscow Institute of Physics and Technology, Russia; Emerging Technologies Research Center, XPANCEO, United Arab Emirates), K.I. Zaytsev (Prokhorov General Physics Institute RAS, Russia), Gleb M. Katyba (Osipyan Institute of Solid State Physics RAS, Russia; Prokhorov General Physics Institute RAS, Russia), M. G. Burdanova (Moscow Institute of Physics and Technology, Russia; Prokhorov General Physics Institute RAS, Russia, Osipyan Institute of Solid State Physics RAS, Russia)

15.55-16.10 (14.55-15.10 Moscow local)

Zoom Opal Report

Ice ball formation monitoring during tissue cryoablation using sapphire shaped crystals

Arsen K. Zotov (Osipyan Institute of Solid State Physics of the RAS, Russia), Dolganova I.N. (Osipyan Institute of Solid State Physics RAS, Russia; Bauman Moscow State Technical University, Russia), Shikunova I.A. and Kurlov V.N. (Osipyan Institute of Solid State Physics RAS, Russia)

16.10-16.25 (15.10-15.25 Moscow local) – coffee break

16.25-16.40 (15.25-15.40 Moscow local)

Zoom Opal Report

Interplay between structural parameters and electro-physical characteristics in hyperdoped silicon: a complex analysis

Ivan M. Podlesnykh, Michael S. Kovalev, Sergey I. Kudryashov (Lebedev Physical Institute RAS)

16.40-16.55 (15.40-15.55 Moscow local)

Zoom Opal Report

New method for deposition of silicon carbide functional coatings

Alexei V. Kaledin, Shikunov S.L., Zubareva I.N., Kurlov V.N. (Osipyan Institute of Solid State Physics RAS, Russia),

15.55-17.10 (15.55-16.10 Moscow local)

Zoom Opal Report

Sapphire and oxide eutectic fibers grown by the EFG technique

Dmitry O. Stryukov, V. N. Kurlov (Osipyan Institute of Solid State Physics RAS, Russia)

17.10-17.25 (16.10-16.25 Moscow local)

Zoom Opal Report

Polyvinyl alcohol-based microbubbles as a multifunctional tool for theranostics

Galina L. Kalinichenko, Estifeeva T.M., Rudakovskaya P.G. (Skolkovo Institute of Science and Technology, Russia)

JOINT INTERNET POSTER SESSION

Advanced Materials for Optics and Biophotonics VI

Method for obtaining a multispectral grade of zinc sulfide

Ruslan V. Chkalov, Kochuev A. Dmitriy, Gerke N. Miron, Darya G. Chkalova (Vladimir State University named after Alexander and Nicolay Stoletovs, Russia)

Active substrates for observing SERS based on porous silicon with nanostructured Ag

V.V. Tregulov, A.I. Ivanov (Yesenin Ryazan State University, Ryazan, Russia), D.S. Kostsov, Elena V. Perevedentseva, N.N. Melnik (P.N. Lebedev Physical Institute RAS)

Photoinduced NO generation and controlled release from BODIPY-doped polymer films

Natalia A. Virts (Novosibirsk State University, Novosibirsk, Russia), Tatyana Yu. Karogodina, Mikhail A. Panfilov, Alexey Yu. Vorob'ev N.N. Vorozhtsov Novosibirsk Institute of Organic Chemistry SB RAS, Russia), and Alexander E. Moskalensky Virts (Novosibirsk State University, Novosibirsk, Russia)

Workshop on Medical Applications of Laser Molecular Imaging and Machine Learning III

Co-chairs: **Igor K. Lednev**, University at Albany, USA; Tomsk State University, Russian Federation, **Yury V. Kistenev**, Tomsk State University, Russian Federation, **Walter Blondel**, Université de Lorraine, France

Secretary: **Sergey M. Zaytsev**, Saratov State University, Russian Federation

International Program Committee: **Arnaud Coussiet**, Université du Littoral Côte d'Opale, France, **Vladimir L. Vaks**, Institute of Applied Physics of RAS, Nizhny Novgorod, Russian Federation, **Olga P. Cherkasova**, Institute of Laser Physics of SB of RAS, Russian Federation, **Denis A. Vrazhnov**, Tomsk State University, Russian Federation, **Alexey V. Borisov**, Tomsk State University, Russian Federation

September 28, Thursday ON-LINE INVITED LECTURE/ORAL SESSION MACHINE LEARNING II (On-line)

<http://class.tsu.ru/m-course-35700>

Chairs: Yuri Kistenev, Denis Vrazhnov
Moderator: Denis A. Vrazhnov

10.00-10.20 (Manipal time 11.30-11.50)

On-line Invited

Polarization Resolved Second Harmonic Generation (SHG) Microscopy for investigating Gamma-irradiated Starch Granules

Indira Govindaraju¹, Ishita Chakraborty¹, Sindhoora Kaniyala Melanthota¹, Guan-Yu Zhuo^{2,3}, Sib Sankar Mal⁴, Bhaswati Sarmah⁵, Vishwa Jyoti Baruah⁶, Krishna Kishore Mahato¹, Nirmal Mazumder¹; ¹Department of Biophysics, Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal-576104, India

²Institute of New Drug Development, China Medical University, No. 91, Hsueh-Shih Road, Taichung 40402, Taiwan

³Integrative Stem Cell Center, China Medical University Hospital, No. 2, Yude Road, Taichung 40447, Taiwan

⁴Materials and Catalysis Lab, Department of Chemistry, National Institute of Technology Karnataka, Surathkal, Karnataka, India-575025

⁵Department of Plant Breeding and Genetics, Assam Agricultural University, Jorhat, Assam, 785001, India

⁶Centre for Biotechnology & Bioinformatics, Dibrugarh University, Assam-786004, India

10.20-10.35 (Manipal time 11.50-12.05)

Machine learning aided analysis of SHG microscopy images of oesophageal squamous cell carcinoma progression and high-grade

dysplasia

Kausalya Neelavara Makkithaya¹, Guan-Yu Zhuo², Nirmal Mazumder¹;

¹Department of Biophysics, Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal, Karnataka, India;

²Institute of Translational Medicine and New Drug Development, China Medical University, Taichung, Taiwan

10.35-10.50 (Tomsk time 13.35-13.50)

Biomarkers in the blood serum of patients with unipolar depression and bipolar affective disorder: results of a study using Raman spectroscopy and machine learning

Mikhail S. Snegerev¹, Alice A. Samarinova¹, Denis A. Vrazhnov^{1,2}, Igor A. Trimasov¹;

¹Tomsk State University, Lenin Ave. 36, 634050, Tomsk, Russia;

²Institute of Atmospheric Optics SB RAS, Academician Zuev square, 1, Tomsk, 634055, Russia.

10.50-11.05 (Paris time 13.50-14.05)

Analysis of THz and Raman spectra of glioma patients biofluids by machine learning methods

Denis A. Vrazhnov¹, Olga P. Cherkasova², Yuri V. Kistenev³;

¹V.E. Zuev Institute of Atmospheric Optics SB RAS, Tomsk, Russia;

²Institute of Automation and Electrometry, SB RAS, Novosibirsk, Russia;

³Tomsk State University, Tomsk, Russia

11.05-11.20 (Paris time 14.05-14.20)

Two-photon microscopy with time resolution to assess the metabolic status of cells grown on porous ceramics

T. B. Lepekhina¹, V. V. Nikolaev¹, H. Zuhayri¹, M. S. Snegerev¹, A. S. Lozhkomoev², E. I. Senkina^{1,2};

¹Tomsk State University, Lenin Ave. 36, 634050, Tomsk, Russia;

²Institute of Strength Physics and Materials Science of the Siberian Branch of the Russian Academy of Sciences (ISPMS SB RAS), 634021 Tomsk, Russia

**11.20-11.35 (Tomsk time 14.20-14.35)
Development of a differential photo-acoustic detector with high Q-factor**

Didar R. Makashev¹, Georgiy K. Raspopin¹,
A.V. Borisov¹, Yu. V. Kistenev¹;

¹Tomsk State University, Lenin Ave. 36,
634050, Tomsk, Russia;

11.35-11.50 (Saint Petersburg time 10.35-10.50)

A Combination of the K-nearest Neighbor Algorithm and the Principal Component Analysis for Classification and Screening of Patients with Chronic Lymphocytic Leukemia and Multiple Myeloma

Robert V. Butyaev, Daniil A. Chernyshev,
Ludmila V. Plotnikova, Alexander M. Polyanichko;

Saint Petersburg State University, Saint Petersburg

11.50-12.05 (Moscow time 10.50-11.05)

Development of an algorithm for predicting the results of laser surgical procedures based on ensemble methods of machine learning

Victoria V. Suchkova^{1,2}, Dmitry I. Ryabkin^{1,2},
Alexander Yu. Gerasimenko^{1,2};

¹I. M. Sechenov First Moscow State Medical University, Moscow, Russia

²National Research University of Electronic Technology MIET, Zelenograd, Moscow, Russia

12.05-12.25 (Nancy time 10.05-10.25)

On-line invited

The use of data mixing to increase the size of the dataset for colon cancer diagnosis using diffuse reflectance spectroscopy and machine learning

Valentin Kupriyanov^{1,2}, Maria R. Pinheiro³,
Sónia D. Carvalho^{4,5}, Isa C. Carneiro^{4,6}, Rui M. Henrique^{4,7}, Valery V. Tuchin^{2,8,9}, Luís M. Oliveira^{3,10}, Marine Amouroux¹, Yury Kistenev² and Walter Blondel¹;

¹Université de Lorraine, CNRS, CRAN UMR 7039, Vandoeuvre-Lès-Nancy, France

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

³Institute for Systems and Computer Engineering, Technology and Science (INESC TEC), Porto, Portugal

⁴Department of Pathology and Cancer Biology and Epigenetics Group, Portuguese Oncology Institute of Porto, Porto, Portugal

⁵Department of Pathology, Santa Luzia Hospital (ULSAM), Viana do Castelo, Portugal

⁶Department of Pathological, Cytological and Thanatological Anatomy, Polytechnic of Porto – School of Health (ESS), Porto, Portugal

⁷Department of Pathology and Molecular Immunology, Porto University – Institute of Biomedical Sciences Abel Salazar, Porto, Portugal

⁸Science Medical Center, Saratov State University, Saratov, Russian Federation

⁹A. N. Bach Institute of Biochemistry, RC “Biotechnology of the Russian Academy of Sciences,” Moscow, Russian Federation

¹⁰Physics Department, Polytechnic of Porto – School of Engineering (ISEP), Porto, Portugal

**September 28, Thursday
JOINT INVITED LECTURE/ORAL
SESSION/ONLINE SESSION
MACHINE LEARNING II &
MICROSCOPY AND LOW-COHERENCE
METHODS IN BIOMEDICAL AND NON-
BIOMEDICAL APPLICATIONS &
BIOMEDICAL SPECTROSCOPY
(Building 3, Room 8, Zoom)**

<http://class.tsu.ru/m-course-35700>

Chairs: Yuri V. Kistenev, Denis Vrazhnov, Kirill V. Larin, Vyacheslav I. Kochubey, Alexander B. Pravdin

15.00-15.20

Invited

Machine and deep learning methods in applied tasks of biology and medicine

Igor S. Golyak¹, Igor L. Fufurin¹, Dmitriy R. Anfimov¹, Pavel V. Berezanskiy², Andrey Morozov¹;

¹Bauman Moscow State Technical University, 105005, Moscow, Russia

²Morozov Children’s Clinical Hospital, State Budgetary Healthcare Institution, Moscow Healthcare Pulmonology Department, Moscow 119049, Russia

15.20-15.35

Using Machine Learning Methods to Analyze Microcirculation

Reshetnikov Vladislav, ITMO University, Saint Petersburg

15.35-15.55

Invited

Rutile Solid Immersion Terahertz Microscopy with Superior 0.06–0.11λ Resolution for medical application

Vladislav Zhelnov^{1,2}, Nikita Chernomyrdin¹, Anna Kucheryavenko^{1,2}, Gleb Katyba^{1,2}, M. Skorobogatiy³, and Kirill Zaytsev¹;

¹Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia;

²Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia;

³Polytechnique Montreal, Montreal, Canada.

15.55-16.10

Increasing data representativity with variational autoencoders to create a multimodal fluorescent carbon dots-based nanosensor of ions

Olga E. Sarmanova¹, Galina N. Chugreeva¹, Kirill A. Laptinskiy², Sergey A. Burikov¹, Sergey A. Dolenko², Tatiana A. Dolenko¹;

¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

²Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia

16.10-16.25

Ultrasound microbubbles functionalized with photodithazine for photodynamic therapy in an experimental orthotopic renal cancer model

Daria A. Terentyeva¹, Olga A. Sindeeva¹, Olga I. Gusliakova², Polina G. Rudakovskaya¹, Dmitry A. Gorin¹;

¹Skolkovo Institute of Science and Technology, Moscow, Russia

²Saratov State University, Saratov, Russia

16.25-16.40

Photonic integrated circuit design for the dual band swept-source OCT

Ivan V. Stepanov¹, Elizaveta P. Grakhova¹, Vladimir S. Lyubopytov¹, Anton A. Ivanov¹, Ruslan V. Kutluyarov¹;

¹Ufa University of Science and Technology

16.40-16.55

Online report

Spectroscopic evaluation of the blood supply to the tracheal tissues during surgeries with anastomosis application

Anna A. Krivetskaya^{1,2}, Daniil M. Kustov¹, Vladimir D. Parshin³, Mikhail A. Ursov³, Vladimir V. Levkin³, 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 MEPH, Moscow, Russia

³Department of Faculty Surgery No. 1, I.M. Sechenov First Moscow State Medical University, Moscow, Russia

16.55-17.10

Online report

Multispectral Raman and photoluminescence microanalysis of malignant skin neoplasms

Elena Rimskaya¹, Svetlana Shelygina¹, Irina Saraeva¹, Elena Perevedentseva¹, Alina

Timurzieva^{1,2}, Konstantin Kudrin^{1,3}, Sergey Kudryashov¹;

¹Lebedev Physical Institute, Moscow, Russia

²N.A. Semashko National Research Institute of Public Health, Moscow, Russia

³I.M. Sechenov First Moscow State Medical University, Moscow, Russia

17.10-17.25

Online report

Comparative analysis of the secondary structure of blood serum proteins from patients with multiple myeloma and healthy donors

Anna D. Kartashova¹, Elina S. Mikhailets¹, Liudmila V. Plotnikova¹, Alexander M. Polyanichko^{1,2};

¹Saint-Petersburg State University, Saint-Petersburg, Russia

²Institute of Cytology RAS, Saint-Petersburg, Russia

**POSTER SESSION
MACHINE LEARNING III**

Chair (ML): Sergey Zaytsev

18.15-20.30

ML1. Multimodal data analysis of Raman spectra and dermatoscopic images for the diagnosis of skin cancer Irina A. Matveeva¹, Viktoria A. Derugina¹; ¹Samara National Research University named after academician S.P. Korolev, Samara, Russia

ML2. Integration of optical spectroscopy methods for determining the ionic composition of water using machine learning techniques Kirill A. Buzanov¹, Olga E. Sarmanova^{1,2}, Kirill A. Laptinskiy², Sergey A. Burikov^{1,2}, Tatiana A. Dolenko^{1,2}; ¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia ²Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia

ML3. Segmentation of hyperspectral images of skin neoplasms using convolutional neural networks Marina O. Vakhlaeva, Irina A. Matveeva; Samara National Research University

ML4. Machine learning methods for classifying Raman skin spectra Irina A. Matveeva¹, Ksenia E. Tomnikova¹; ¹Samara National Reserch University, Samara, Russia

INTERNET POSTERS

1. **Raman spectroscopy and Excitation Emission Matrix for analyzing adulteration in coconut oil** Manikanth Karnati¹, Sudeeksha H. C.², Nirmal Mazumder¹; ¹Department of Biophysics, Manipal School of Life Sciences, Manipal Academy of Higher

Education, Manipal, Karnataka, India -576104
²Horiba Pvt Ltd, Bangalore, Karnataka, India -
560001

Conference on Endogenous Biophotonics: Ultra-Weak Luminescence From Biological Systems II

Chairs: **Ilya V. Volodyaev**, Moscow State University, European Medical Center, Moscow, Russia **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

Secretary: **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

International Program Committee: **Yury A. Vladimirov**, Lomonosov Moscow State University, Moscow, Russia
Honourable Member of the Programme Committee, **Vladimir L. Voeikov**, Lomonosov Moscow State University, Moscow, Russia. **Alexey V. Trofimov**, N.M. Emanuel Institute of Biochemical Physics, RAS, Moscow, Russia, **Cristiano de Mello Gallep**, University of Campinas, Brazil, **Ilya V. Volodyaev**, Lomonosov Moscow State University, European Medical Centre, Moscow, Russia **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

September 27, Wednesday

ON-LINE INVITED LECTURE/ORAL SESSION, ENDOGENOUS BIOPHOTONICS: ULTRA-WEAK LUMINESCENCE FROM BIOLOGICAL SYSTEMS I

Zoom link:

<https://us06web.zoom.us/j/83677281091?pwd=mxqHZGc2bAbQwQXYS3lgFpeqwAHZwS.1>
ID: 836 7728 1091
Passcode: 123

Chairs: **Ilya V. Volodyaev**, Moscow State University, European Medical Center, Moscow, Russia, **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

Moderator: **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

15.00-15.30 Saratov time (UTC+4)

14.00-14.30 Moscow time, local time of the speaker (UTC+3)

Introduction and Internet Report

Ultraweak photon emission: From mitogenetic rays to free-radical biology

Ilya V. Volodyaev¹, Elena V. Naumova²;
¹Faculty of Biology, Moscow State University, Moscow, Russia, ²Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences, Novosibirsk, Russia

15.30-16.00 Saratov time (UTC+4)

14.30-15.00 Moscow time, local time of the speaker (UTC+3)

Internet Invited

Oxy-chemiluminescence: New Mechanistic and Kinetic Intricacies and Application Perspectives

Galina F. Fedorova, Valerii A. Menshov, Vladimir V. Naumov, Aleksei V. Trofimov, Yurii B. Tsaplev, Timur L. Veprintsev, Olga I. Yablonskaya; Emanuel Institute of Biochemical Physics, RAS, Moscow, Russia

16.00-16.30 Saratov time (UTC+4)

15.00-15.30 Moscow time, local time of the speaker (UTC+3)

Internet Invited

Ultraweak luminescence and free-radical reactions: a basic mechanism of pathological process development

German O. Stepanov¹, Yury A. Vladimirov^{1,2}, Anatoly N. Osipov¹; ¹Department of General and Medical biophysics, Medical biological faculty, Pirogov Russian National Research Medical University, Moscow, Russia, ²Department of Medical biophysics, Faculty of Fundamental Medicine, Lomonosov Moscow State University, Moscow, Russia

16.30-16.50 Saratov time (UTC+4)

15.30-15.50 Moscow time

19.30-19.50 Novosibirsk time, local time of the speaker (UTC+7)

Internet Report

Some cancer-related results of mitogenetic radiation research in the 1920s-1950s

Elena V. Naumova¹, Ilya V. Volodyaev², Maira S. Aristanbekova³; ¹Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia, ²Moscow State University, Moscow, Russia, ³Saratov Regional Center for the Prevention and Control of AIDS, Saratov, Russia

16.50-17.20 Saratov time (UTC+4)

15.50-16.20 Moscow time (UTC+3)

17.50-18.20 Perm time, local time of the speaker (UTC+5)

Internet Invited

In vivo morphology and cell dynamics: laser microscopy and patterns of "criticality" in oncological transformations

Oleg B. Naimark, Institute of Continuous Media Mechanics UB RAS, Perm, Russia

17.20-17.40 Saratov time (UTC+4)

16.20-16.40 Moscow time (UTC+3)

Coffee break

17.40-18.00 Saratov time (UTC+4)

16.40-17.00 Moscow time, local time of the speaker (UTC+3)

Internet Report

Detector system based on PMT for Measuring Ultraweak Optical Emission from Biocultures

Nikita V. Dunin, Sergey A. Savinov, Timofei E. Demikhov, Sergey N. Mayburov, Eugeny. I. Demikhov, Lebedev Physical Institute, Russian Academy of Sciences

18.00-18.20 Saratov time (UTC+4)

17.00-17.20 Moscow time (UTC+3)

17.30-17.50 Iran time, local time of the speaker (UTC+3:30)

Internet Report

Autofluorescence imaging of A375 human melanoma cells: A pilot Quantitative In-Vitro Study

Afshan Shirkavand^{1,2}, Ezeddin Mohajerani², Shirin Farivar³, Leila Ataie-Fashtami⁴; ¹Photodynamic Department, Medical Laser Research Center, Yara Institute, Tehran, Iran, ²Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran, ³Department of Cell and Molecular Biology, Faculty of Life Sciences and Biotechnology, Shahid Beheshti University, Tehran, Iran, ⁴Department of Regenerative Medicine, Royan Institute for Stem Cell Biology & Technology, ACECR, Tehran, Iran

18.20-18.40 Saratov time (UTC+4)

17.20-17.40 Moscow time (UTC+3)

16.20-16.40 Hungary time, local time of the speaker (UTC+2)

Internet Report

Detection of Ultraweak Photon Emissions from Mouse Embryos with Implications for Assisted Reproduction

József Bódis¹, József Berke^{2,3}, Zoltán Bognár¹, István Gulyás¹; ¹University of Pécs, Hungary, ²Dennis Gabor University, Budapest, Hungary, ³John von Neumann Computer Society, Hungary

18.40-19.10 Saratov time (UTC+4)

17.40-18.10 Moscow time (UTC+3)

16.40-17.10 Switzerland time, local time of the speaker (UTC+2)

Internet Invited

Chronobiological Aspects of Spontaneous Ultra-Weak Photon Emission in Humans: Ultradian, Circadian and Infradian Rhythms

Felix Scholkmann^{1,2}; ¹Biomedical Optics Research Laboratory, Department of Neonatology, University Hospital Zurich, University of Zurich, Zurich, Switzerland, ²Institute of Complementary and Integrative Medicine, University of Bern, Bern, Switzerland

19.10-19.40 Saratov time (UTC+4)

18.10-18.40 Moscow time, local time of the speaker (UTC+3) (local time of the speaker)

Internet Invited

The role of the electronically excited state of bicarbonate water systems in the vital activity

Vladimir L. Voeikov, Ekaterina V. Buravleva; Faculty of Biology, Lomonosov Moscow State University, Moscow, Russia

19.40-20.00 Saratov time (UTC+4)

18.40-19.00 Moscow time, local time of the speaker (UTC+3)

12.40-13.00 Brasília time, local time of the speaker (UTC-3)

Internet Invited

Delayed luminescence in algae: Applications in toxicology

Cristiano de Mello Gallep, Universidade Estadual de Campinas - UNICAMP, Limeira/SP – Brazil

September 28, Thursday

ON-LINE INVITED LECTURE/ORAL SESSION, ENDOGENOUS BIOPHOTONICS: ULTRA-WEAK LUMINESCENCE FROM BIOLOGICAL SYSTEMS II

Zoom link:

<https://us06web.zoom.us/j/83677281091?pwd=mxqHZGc2bAbQwQXYS3lgFpeqwaHZwS.1>

ID: 836 7728 1091

Passcode: 123

Chairs: **Ilya V. Volodyaev**, Moscow State University, European Medical Center, Moscow, Russia, **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

Moderator: **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

14.00-14.20 Saratov time (UTC+4)

13.00-13.20 Moscow time, local time of the speaker (UTC+3)

Internet Report

Why are planarians the "gold standard" for studying weak and ultra-weak impacts?

Kharlampy P. Tiras¹, Kirill N. Novikov², Vladimir L. Voeikov²; ¹Institute of Theoretical and Experimental Biophysics RAS, Pushchino, Russia, ² Moscow State University, Faculty of Biology, Moscow, Russia

14.20-14.40 Saratov time (UTC+4)

13.20-13.40 Moscow time, local time of the speaker (UTC+3)

Internet Report

Strange and mitogenetic radiation

Victor A. Panchelyuga, Institute of Theoretical and Experimental Biophysics, Pushchino, Russia

14.40-15.10 Saratov time (UTC+4)

13.40-14.10 St Petersburg/Moscow time, local time of the speaker (UTC+3)

Internet Invited

On the energetic mechanism of mitogenetic radiation in A.G. Gurvich's experiments with onion roots.

Lydia N Gall, Institute for Analytical Instrumentation RAS, St. Petersburg, Russia

15.10-15.20 Saratov time (UTC+4)

14.10-14.20 Moscow time (UTC+3)

Coffee break

15.20-17.20 Saratov time (UTC+4)

14.20-16.20 Moscow time (UTC+3)

**ROUND TABLE DISCUSSION
MITOGENETIC RADIATION,
CANCER QUENCHER AND RELATED
PHENOMENA (In Russian)**

Zoom

link:

<https://us06web.zoom.us/j/83677281091?pwd=mxqHZGc2bAbQwQXYS3lgFpeqwAHZwS.1>
ID: 836 7728 1091

Passcode: 123

Moderators: **Ilya V. Volodyaev**, Moscow State University, European Medical Center, Russia
Moscow, Russia, **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

17.20-17.40 Saratov time (UTC+4)

16.20-16.40 Moscow time (UTC+3)

6.20-6.40 San Diego time, local time of the speaker (UTC-7)

Internet Report

Dynamic sequence-specific homologues in chromatin: imperfection as a driving force of life.

Ivan Savelev¹, Aleksandr Vikhorev¹, Nelly Zyryanova¹, Oksana Poleskaya¹, Richard Alan Miller¹, Inna Plastun², Pavel Zhylidin², Pavel Filin², Michael Rempel¹, and Max Myakishev-Rempel¹; ¹DRRF, USA, ²Saratov State Technical University, Russia

27th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Workshop on Modern Optics XXII

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

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

Secretary: **Ekaterina N. Lazareva**, Saratov State University, Tomsk State University

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

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

September 28, Thursday

PUBLIC LECTURE SESSION MODERN OPTICS

(Building 3, Big Physical Hall)

Chairs: **Georgy V. Simonenko**, Saratov State University, **Anton Dyachenko**, Saratov State University, Boarding school 64

14.00-14.45

What is “nanoscopy,” or how to see a single molecule

Andrey V. Naumov,

Corresponding member of the Russian Academy of Sciences, Institute of Spectroscopy of the Russian

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

Workshop Chairs: **Boris A. Medvedev, Alexander A. Skaptsov**, Saratov State University, Russia
Secretary: **Alexey V. Markin**, Saratov State University, Russia

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

September 27, Wednesday

LECTURE/ORAL SESSION I (Scientific Library Conf. Hall)

Co-chairs: **Boris A. Medvedev, Alexander A. Skaptsov**,
Saratov State University, Russia

14.30-15.10

Diffractive microstructure of optical holograms of scattering object

Vladimir P. Ryabukho, Saratov State University, IPM&C RAS, Saratov, Russia

15.10-15.30

Boris V. Gnedenko and Georgy P. Boev: joint methodological activity

Dmitry B. Gnedenko¹, Valery M. Anikin²
¹Moscow State University, Moscow, Russia
²Saratov State University, Saratov, Russia

15.30-16.00

VI Congress of the Russian Association of Physicists as a "mirror" of Russian Science in the late 1920s

Valery M. Anikin, Dmitry V. Churochkin, Svetlana V. Churochkina Saratov State University, Saratov, Russia

16.00-16.30

Coffee break

16.30-16.40

Thoughts and blunders of ancient treatises. New facets of old experience

Mikhail A. Starshov, Saratov State University, Saratov, Russia

16.40-16.50

Some concepts of educational physics

Mikhail A. Starshov, Saratov State University, Saratov, Russia

16.50-17.00

Lecture demonstrations on random subjects

Mikhail A. Starshov, Saratov State University, Saratov, Russia

17.00-17.15

Pierre Bouguer: Man in Shadow of Law

Michael M. Stolnitz, Saratov State University, Saratov, Russia

17.15-17.30

Summary of the materials of the I All-Russian school-seminar of the NCFM "Center for Research of Supercomputer Architectures"

Lozhkina E. A., Churochkin D. V., Churochkina S. V., Saratov State University, Saratov, Russia

17.30-17.45

A test algorithm for pattern recognition in the differential diagnosis of degenerative diseases of the cervical spine

Elina I. Garaeva, Julia Anatolevna Brodskaya, Yuri Gagarin State Technical University of Saratov, Saratov, Russia

17.45-18.00

Use of a linear accelerator in experimental and clinical oncology

Andrew D. Yankevich¹, Alla B. Bucharskaya^{2,3}
¹Lomonosov Moscow State University, Moscow, Russia;

²Saratov State Medical University, Saratov, Russia; ³Saratov State University, Saratov, Russia

18.00-18.15

Synthesis and analysis of a mathematical model of noise of the output signal of a fiber-optic gyroscope with a noise compensation system

Dmitriy M. Spiridonov, Saratov State University, Saratov, Russia

September 28, Thursday

ROUND TABLE

**Man and light in natural and art treatment
of the Universe
(Scientific Library Conf. Hall)**

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

Panel members:

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

^aSaratov State University, Saratov, Russia

^bSamara University, Samara, Russia

^cYuri Gagarin State Technical University of
Saratov, Russia

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

14.00-14.20

**Towards the 300th anniversary of the Russian
Academy of Sciences. Princess E.R. Dashkova:
Service to Russian science and education**
Boris A. Medvedev, Saratov State University,
Saratov, Russia

14.20-14.40

**By the 160th birthday of Academician V.I.
Vernadsky. From the noosphere of Vernadsky
to the pneumatosphere of P.A. Florensky**
Boris A. Medvedev¹, Julia A. Brodskaya²,
¹Saratov State University,
Saratov, Russia
²Yuri Gagarin State Technical University, Saratov,
Russia"

14.40-14.55

**Pulsars of scientific research of the nature
Russian Empire in the XVIII century**
Vasily V. Anikin, Saratov State University, Saratov,
Russia

14.55-15.10

Zinin Nikolay Nikolaevich. Molecules of history
V. V. Sorokin. Saratov State University, Saratov,
Russia

15.10-15.25

**Vitaly Stafeev – developer of semiconductor
devices**
A. G. Rokakh., Saratov State University, Saratov,
Russia

15.25-15.40

**Zhores Alferov – microelectronic hetero-
structures developer of semiconductor devices**
A. Rokakh, Saratov State University, Saratov,
Russia

15.40-15.55

The great age began
Mikhail A. Starshov, Saratov State University,
Saratov, Russia

15.55-16.10

**Outstanding cyberneticist Arkady Dmitrievich
Zakrevsky and his contribution to the
mathematical theory of pattern recognition: on
the 95th anniversary of his birth**
Julia A. Brodskaya, Saratov State University,
Saratov, Russia

16.10-16.25

About proofs in physics and mathematics
Victor V. Rozen, Saratov State University, Saratov,
Russia

16.25-16.40

**The role of mathematical models in the
transformation of reality**
Oleg V. Shimelfenig, Saratov State University,
Saratov, Russia

16.40-16.55

**The origins of academic philosophy in Russia:
E.L. Radlov**
Natal'ya V. Dovgalenko, Yuri Gagarin State
Technical University of Saratov, Saratov, Russia

16.55-17.10

**Academic, non-academic, post-academic
science in a situation of radical pluralism of
truths**
Yuliya M. Duplinskaya, Yuri Gagarin State
Technical University of Saratov, Saratov, Russia

**17.10-17.40
Coffee break**

17.40-17.50

**A brief history of musical innovations in
western european culture**
Vladimir V. Orlov, Saratov State Conservatory,
Saratov, Russia

17.50-18.00

**Irreversibility of time in Newton's equation and
Schrodinger's equation**
V.I. Tsoy, Saratov State University, Russia

**JOINT POSTER/INTERNET SESSION AND
INTERNET DISCUSSION
(On-line)**

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

**1H. Optical methods for studying the effect of
light on the microstructure of peas**

Elena V. Timchenko¹, Alisa P. Timchenko²,

Olga V. Nikulkina²

¹Samara University, Samara, Russia;

²Lyceum "Technical", Samara, Russia

2H. Optical methods for determining the maturity of apple fruits

Elena V. Timchenko¹, Lidiia P. Timchenko²,

Irina V. Kurbatova²

¹Samara University, Samara, Russia;

²Lyceum "Technical", Samara, Russia

INTERNET POSTER

1. Notes on the margins of the proof of the Fermat Great Theorem

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

2. Sixty years of the method of coherent states in quantum optics

Alexander V. Gorokhov, Samara University, Samara, Russia

3. Study of insect metamorphosis by means of Raman spectroscopy

Matvey I. Nikelshparg¹, Daniil N. Bratashov¹, Evelina I. Nikelshparg², Vasily V. Anikin¹

¹Saratov State University, Saratov, Russia

²Lomonosov Moscow State University, Moscow, Russia

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XXIII

Workshop Chair: Michael V. Davidovich, Saratov State University

Secretaries: Alexander N. Savin, Istok, Fryazino. (Russia), Kirill A. Sayapin, Saratov State University (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 Tirnovo, (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 28

GoogleMeet Oral Report JOINT POSTER/INTERNET SESSION (Building 8, 3rd floor, Room 318, SSU)

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

<https://meet.google.com/gww-tbbm-two>

14.00–14.15

Diffraction of electromagnetic waves on a graphene diffraction grating in a magnetic field Lerer A.M.¹, Makeeva G.S.^{2,1}. ¹Southern Federal University, Rostov-on-Don, Russia; ²Penza State University, Penza, Russia

14.15–14.30

Phenomenological model of a broadband optical absorber Lerer A.M., Timoshenko P.E. Southern Federal University, Rostov-on-Don, Russia

14.30–14.45

Квазиэллиптический полосно-пропускающий фильтр, выполненный по SIW-технологии Букин С.П., Крутиев С.В. Southern Federal University, Rostov-on-Don, Russia

14.45–15.00

Компактный полосно-пропускающий фильтр, выполненный по SIW-технологии на бумажной подложке . Сдобнова В.П., Крутиев С.В. Southern Federal University, Rostov-on-Don, Russia

15.00–15.15

Полосно-пропускающий SIW-фильтр на бумажной подложке Grizodub A.N., Крутиев С.В. Southern Federal University, Rostov-on-Don, Russia

15.15-15.30

Synthesis of L-band diplexer for high power operation Kobrin K.V., Manuilov M.B. Southern Federal University, Rostov-on-Don, Russia

ORAL SESSION ELECTROMAGNETICS

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

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

15.30–15.50

Dynamics of underlimit high-current relativistic electron beam in coaxial resonator with external nonuniform magnetic field of complex profile Kolesov H.N., Dubinov A.E. Russian Federal Nuclear Center – All-Russia Scientific Research Institute of Experimental Physics, Russia

15.50–16.10

Radiative heat transfer between Cross-Stacked Carbon Nanotube Networks The lines of the terahertz range. Nefedov I.S.¹ Rubi J.M.² ¹Saratov State University, Saratov, Russia; ²Statistical and Interdisciplinary Physics Section, Departament de Física de la Matèria Condensada, Universitat de Barcelona, Martí i Franquès 1, 08028, Barcelona, Spain

16.10–16.30

Numerical Simulation for Phase Locking of High-Power Gyrotrons Coupled with Delay Adilova A.B.^{1,2}, Rozhnev A.G.^{1,2}, Ryskin N.M.^{1,2}. ¹Saratov State University, Saratov, Russia; ²Kotelnikov Institute of Radioengineering and Electronics RAS, Saratov Branch, Russia

16.30–16.50

Model for theoretical analysis of a gyrotron driven by an external harmonic signal
Grigorieva N.V.^{1, 2}, Rozhnev A.G.^{1, 2}, Ryskin N.M.^{1,2} ¹Kotelnikov Institute of Radioengineering and Electronics RAS, Saratov Branch, Russia; ²Saratov State University, Saratov, Russia

16.50–17.10

Development of Double-Beam Miniaturized Millimeter-Band Traveling-Wave Tube
Torgashov R.A.^{1,2}, Nozhkin D.A.^{1,2}, Ryskin N.M.^{1,2}, Starodubov A.V.^{1,2} ¹Kotelnikov Institute of Radioengineering and Electronics RAS, Saratov Branch, Russia; ²Saratov State University, Saratov, Russia

17.10–17.30

Electrodynamic parameters of metamaterial-inspired slow-wave structures for miniature W-band traveling-wave tubes
Rostuntsova A.A.^{1,2}, Ryskin N.M.^{1,2}, Torgashov R.A.^{1,2} ¹Kotelnikov Institute of Radioengineering and Electronics RAS, Saratov Branch, Russia; ²Saratov State University, Saratov, Russia

17.30–17.50

Plasmons along graphene sheets: effect of spatial dispersion
Davidovich M.V. Saratov State University, Saratov, Russia

17.50–18.10

Nonstationary tunneling and flight time in diode structures
Davidovich M.V. Saratov State University, Saratov, Russia

Listeners

1. **Astafev Pavel Andreevich**
Southern Federal University

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

18.-00–20.-00

1EM Design of a Wideband Differential Phase Shifter
Kirill A. Sayapin^{1,2}, Valery P. Meshchanov^{2,1} ¹Saratov State University, Saratov, Russia, ²Nika-Microwave, Ltd.

2EM The liquid cooling system of the microwave generator in the sterilization unit
Alexander A. Nikiforov¹, Yuri A. Zakharov¹, Yaroslav A. Pakhomov¹, Vil B. Baiburin¹, Valentina M. Doroshenko¹, Vyachaslav V. Komarov¹ ¹Yuri Gagarin State Technical University of Saratov, Russia

3EM Development of a vacuum window for a miniature W-band TWT
Oleg R. Abramov², Roman A. Torgashov^{1,2} ¹Saratov Branch Kotel'nikov Institute of Radioengineering and Electronics RAS, Saratov, Russia; ²Saratov State University, Saratov, Russia

4EM On the examination of prototyping of key electromagnetic components for vacuum microelectronic devices by vat photopolymerization and magnetron sputtering
Ivan S. Ozhogin¹, Ilya O. Kozhevnikov¹, Alexey A. Serdobintsev¹, Andrey V. Starodubov², Nikita M. Ryskin^{1,2}, ¹Saratov State University Saratov, Russia; ²Saratov Branch, V.A. Kotel'nikov Institute of Radio Engineering and Electronics RAS Saratov, Russia

5EM Microfabrication of 2D slow-wave structures for vacuum microelectronic devices using laser micro-processing
Nozhkin D.^{1,2}, Starodubov A.^{1,2}, Torgashov R.^{1,2}, Galushka V.^{1,2}, Serdobintsev A.¹, Kozhevnikov I.¹, Ryskin N.^{1,2}; ¹Saratov State University, Saratov, Russia; ²Saratov Branch, V.A. Kotelnikov Institute of Radio Engineering and Electronics RAS, Saratov, Russia

Workshop English as a Communicative Tool in the Scientific Community XXII

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

Alexander B. Pravdin, Saratov State University (Russia)

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

Secretary: **Kseniya O. Merkulova**, Saratov State University (Russia)

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

September 27, Wednesday

ROUND TABLE DISCUSSION

(Building 18)

1. **13.00-14.30**

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

1. **20 years of experience in translating scientific papers from Russian into English** *Keynote speaker:* Vladimir L. Derbov, Saratov State University, Saratov, Russia
2. **Cover letter writing** *Keynote speaker:* Arina O. Shelyugina, Saratov State University, Saratov, Russia
3. **Formal letter writing** *Keynote speakers:* Svetlana V. Eremina, Alexander B. Pravdin, Saratov State University, Saratov, Russia

Workshop on Quantum Science and Technologies IV

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); Moscow Institute of Physics and Technology (Russia)

International Program Committee:

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

September 28, Thursday

ORAL SESSION

Campus of the Skolkovo Institute of Science and Technology

Chair: Aleksey Fedorov, Russian Quantum Center (Russia)

12:00 - 12:05

Aleksey Fedorov, Opening Ceremony

12:10 - 12:35

Stanislav Straupe, Randomized benchmarking of single-qubit gates on a neutral atom quantum processor

12:40 - 13:05

Evgeniy Kiktenko, Time-bidirectional state formalism

13:10 - 13:35

Andrey Chernyavskiy, Entropic property of QAOA with random choice of parameters

13:40 - 14:05

Maxim Gavreev, Controlling quantum many-body systems using reduced-order modeling

14:10 - 14:35

Ivan Dyakonov, Implementing quantum operations in a fusion-based quantum computer

14:40 - 15:05

Ilya Simakov, Transmon coupler activated CCZ gate on fluxonium qubits

15:10 - 15:35

Anatoly Antipov, Processing defects movements in surface codes