

*In commemoration of the 80th birthday of
Valery Tuchin*

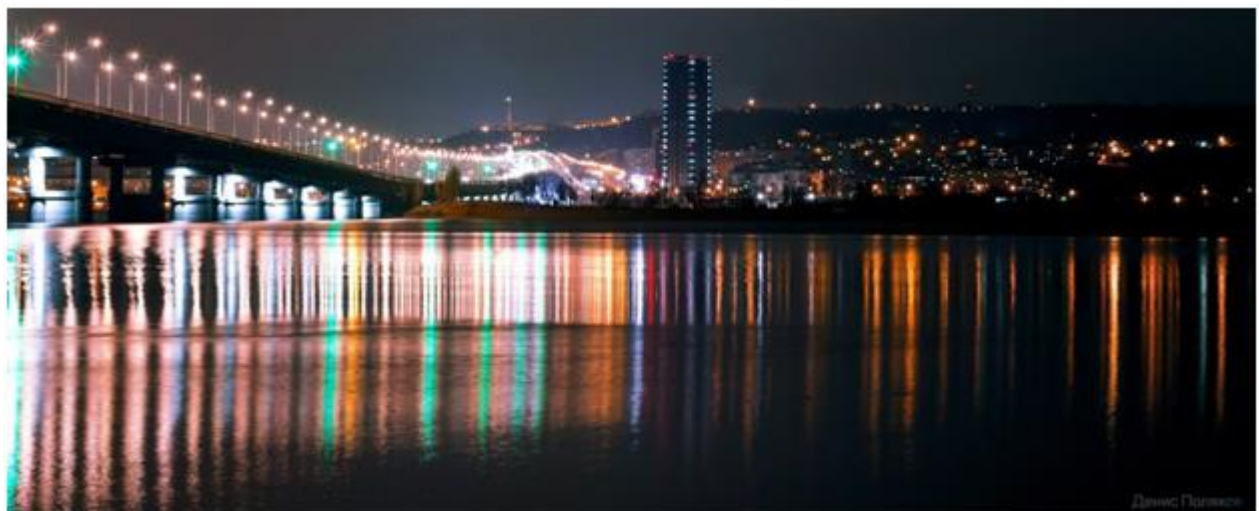
Saratov Fall Meeting SFM'24

**12th International Symposium “Optics and
Biophotonics”**

**28th International School for Junior Scientists
and Students on Optics, Laser Physics
&Biophotonics**

**International School for Students and Young
Scientists on Fluorescent Dyes, Proteins, and
Instrumentation in Life Science**

**Chinese-Russian Workshop on Biophotonics
and Biomedical Optics-2024**



Joint session of Conference on Optical Technologies in Biophysics & Medicine XXVI,

Workshop on Laser Physics and Photonics XXVI,

Chinese-Russian Workshop on Biophotonics and Biomedical Optics-2024

Chairs: **Elina A. Genina**, Saratov State University; Tomsk State University, **Polina A. Timoshina**, Saratov State University; Tomsk State University, **Valery V. Tuchin**, Saratov State University, Institute of Precision Mechanics and Control of FRS "Saratov Scientific Centre of the RAS", Tomsk State University, **Vladimir L. Derbov**, Saratov State University, **Dan Zhu**, Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China, **Tingting Yu**, Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China.

Secretary: **Isabella A. Serebryakova**, Saratov State University, **Svetlana V. Churochkina**, Saratov 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), **Luis 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), **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), **Dmitry V. Churochkin**, Saratov State University (Russia).

September 25, Wednesday

INVITED LECTURE/ORAL/
ON-LINE SESSION BIOPHYSICS I
/CHINESE-RUSSIAN WORKSHOP
SESSIONS I

(Building 8, Hall 420)

<https://onlinessu.ktalk.ru/v4p1rves4d6o>



Chairs: **Igor Fufurin**, Bauman Moscow State Technical University, Moscow, Russia; **Aram Papoyan**, Institute for Physical Research, NAS of Armenia, Ashtarak, Armenia
Moderator: **Isabella Serebryakova**, Saratov State University, Russia

Saratov time/Moscow time/China time

9:35-10:00/08:35-09:00

Invited

Raman-based optical and liquid biopsy

Ivan Bartchenko¹, Yulia Khristoforova¹, Irina Matveeva¹, Irina Pimenova¹, Elena Tupikova¹, Peter Lebedev², Maria Skuratova³, Lydmila Bratchenko¹; ¹Samara National Research University, Samara, Russia, ²Samara State Medical University, Samara, Russia, ³Samara regional clinic named after IV Pirogov, Samara, Russia

10:00-10:25/09:00-09:25

Invited *On-line*

The quest for novel endogenous contrast for optical in vivo diagnostics

Evgeny Shirshin; Lomonosov Moscow State University

10:25-10:50/09:25-09:50

Invited

Scanning technique for direct optical transmission imaging of highly-scattering objects

Svetlana Shmavonyan, Aleksandr Khanbekyan, Marina Movsisyan, Aram Papoyan; Institute for Physical Research, NAS of Armenia, Ashtarak, Armenia

10:50-11:15/09:50-10:15

Invited

Early-photon mesoscopic fluorescence molecular tomography: Potential ways to increase the depth sensitivity

Alexander Kononov¹, Vitaly Vlasov¹, Sergei Samarin¹, Ilya Solovyev², Daria Tuchina^{3,4}, Alexander Savitsky², Valery Tuchin^{3,4,5}; ¹FSUE "Russian Federal Nuclear Center – Zababakhin All-Russia Research Institute of Technical Physics," Snezhinsk, Russia, ²Bach Institute of Biochemistry, RC "Biotechnology of the RAS", Moscow, 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, FRS "Saratov Scientific Centre of the RAS", Saratov, Russia

11:15-11:40/10:15-10:40

Invited *On-line*

Laser Speckle Contrast Imaging System for Neurosurgical Procedures: Development, Implementation, and Prospects

Anton Kononov^{1,2}, Fedor Grebenev^{1,2}, Dmitry Stavtsev^{2,3}, Igor Kozlov^{2,3}, Gennadii Piavchenko², Dmitry Telyshev^{2,3}, Andrey Galyastov^{2,3}, Anastasia Gorina^{2,3}, Igor Meglinski^{2,4}, Sergey Kuznetsov², Alexander Gerasimenko³, Dmitry Okishev¹, Yury Pilipenko¹, Shalva Eliava¹; ¹Burdenko Neurosurgical Center, Moscow, ²I.M. Sechenov First Moscow State Medical University, Moscow, ³National Research University of Electronic Technology, Moscow, ⁴College of Engineering and Physical Sciences, Aston University, Birmingham, UK

11:40-12:05/10:40-11:05

Invited

Measuring techniques and devices based on infrared spectroscopy for medical and ecological applications

Igor Fufurin, Andrey Morozov, Dmitry Anfimov, Pavel Platonov, Ivan Vintaikin, Pavel Demkin; Bauman Moscow State Technical University, Moscow, Russia

12:05-12:30/11:05-11:30/15:05-15:30

CHINESE-RUSSIAN WORKSHOP

Invited *On-line*

Template-free manufacturing of biopolymer microlens array on low energy fluorinated ethylene propylene substrates

Arkady Abdurashitov^{1,2}, Pavel Proshin^{1,2}, Gleb Sukhorukov^{1,2}; ¹Vladimir Zelman Center for

Neurobiology and Brain Rehabilitation, Skoltech, Moscow, Russia, ²Life Improvement by Future Technologies (LIFT) Center, Skolkovo, Moscow, Russia

12:30-12:55/11:30-11:55

Invited

Spectral FLIM: addressing endogenous fluorophores with a single wavelength

Vladislav Shcheslavskiy^{1,2}, Boris Yakimov³, Anastasia Komarova², Eugene Shirshin³, Marina Shirmanova², Wolfgang Becker¹; ¹Becker&Hickl GmbH, Germany, ²Privolzhsky Research Medical University, ³M.V. Lomonosov Moscow State University, Moscow, Russia

12:55-13:20/11:55-12:20

Invited

Wearable optical technologies in space research

Andrey Dunaev; Orel State University, Russia

13:20-13:45/12:20-12:45

Invited *On-line*

Methods and devices for optical imaging of tissue metabolism

Viktor Dremine^{1,2}; ¹Orel State University, Orel, Russia; ²Aston University, Birmingham, UK

13:45-14:00/12:45-13:00

Oral Report

Investigation of the time to formation of laser-induced cavitation bubbles in water

Egor Tulnikov^{1,2}, Nikita Kovalenko^{1,2}, Oleg Ryabushkin^{1,2}; ¹Moscow Institute of Physics and Technology, Moscow, Russia, ²NTO IRE-Polus, Moscow, Russia

14:00-14:30/13:00-13:30

Coffee break

**INVITED LECTURE/ORAL
/ON-LINE SESSION BIOPHYSICS II
/INTERNET BIOPHOTONICS/PHOTONICS I
/CHINESE-RUSSIAN WORKSHOP
SESSIONS II**

(Building 8, Hall 420)

Link to connect in Tolka:

<https://onlinessu.ktalk.ru/v4p1rves4d6o>



Chairs: Vladimir L. Derbov, Saratov State University, Andrey Dunaev, Orel State University, Moderator: Isabella Serebryakova, Saratov State University, Russia

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

PHOTONICS

Oral Report

Polarization effects at double resonance in a degenerate energy level lambda-scheme

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

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

PHOTONICS

Oral Report

Contributions of intraband dynamics and interband transitions in the generation of high-frequency harmonics by graphene

Anatolii D. Panferov, Nikolay A. Novikov; Saratov State University, Saratov, Russia

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

INTERNET BIOPHOTONICS

Oral Report *On-line*

Studies of solder compositions with nanoparticles for laser welding of damaged tissues

Uliana Kurilova^{1,2}, Victoria Suchkova^{1,2}, Polina Varlamova², Dmitry Ryabkin^{1,2}, Alexander Gerasimenko^{1,2}; ¹I.M. Sechenov First Moscow State Medical University, Moscow, Russia; ²National Research University of Electronic Technology, Moscow, Zelenograd, Russia

15:15-15:30/14:15-14:30/19:15-19:30

CHINESE-RUSSIAN WORKSHOP

Invited *On-line*

Dual-wavelength laser action on blood vessels: theory and experiment

Andrey Belikov¹, Viktor Chuchin^{1,2}, Alexandra A. Masharskaya^{1,2}, Pavel Panchenko³; ¹Institute of Laser Technologies, ITMO University, Russia, ²"NPP VOLO" LLC, Russia, ³Department of Upper Respiratory Tract Pathology, Saint-Petersburg Research Institute of Ear, Throat, Nose and Speech, Russia

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

PHOTONICS

Oral Report

Secondary instabilities in broad-area class C lasers

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

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

PHOTONICS

Oral Report

Laser synthesis of magnetic nanoparticles based on iron in various media

Kirill S. Khorkov; Vladimir State University named after Alexander and Nicolay Stoletovs, Vladimir, Russia

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

Coffee Break

16:30-16:45/15:30-15:45

PHOTONICS

Oral Report

Amplification of terahertz surface plasmons in structures with active graphene and an electron beam

Michael V. Davidovich; Saratov State University, Saratov, Russia

16:45-17:00/15:45-16:00

PHOTONICS

Oral Report

Prospective applications of semiconductor lasers

Igor V. Galushka, Oleg V. Korenchenko, Vadim A. Panarin, Sergey N. Sokolov, Mikhail Yu. Starynin; INJECT RME LLC, Saratov

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

CHINESE-RUSSIAN WORKSHOP

Oral Report

Analysis of the metabolic profile of human respiration was conducted to identify specific biomarker molecules

Olga Nebritova, Igor Fufurin; Bauman Moscow State Technical University, Moscow, Russia

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

Oral Report

Cellular mechanisms of the response of HeLa Kyoto tumor cells to the complex effects of photobiomodulation and ionizing radiation at doses used in clinical practice

Arteom Belotelov¹, Elena Cherkasova¹, Vladimir Yusupov², Anna Maslennikova¹; ¹Lobachevsky State University of Nizhni Novgorod, Nizhni Novgorod, Russia, ²NRC Kurchatov Institute, Moscow Russia

17:30-17:45/16:30-16:45

Oral Report

Mathematical modelling of the mitochondria response of cancer cells to NIR laser irradiation

Ksenia Tikunov¹, Gleb Golyshev¹, Edik Rafailov², Alexey Goltsov¹; ¹MIREA - Russian Technological University, Moscow, Russia, ²Aston University, Birmingham, UK.

17:45-18:00/16:45-17:00

PHOTONICS

Oral Report *On-line*

Mathematical theory of optimal processes in a common path interferometer using a diffraction phase microscope

Natalia A. Talaikova; HSE University, Moscow, Russia

18:00-18:15/17:00-17:15

Oral Report *On-line*

OCT-based complementary mapping of osmotically-induced strains and attenuation coefficient

Aleksander Sovetsky¹, Yulia Alexandrovskaya², Alexander Matveyev¹, Lev Matveev¹, Peter Chizhov¹, Vladimir Zaitsev¹; ¹A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia, ²Terra Quantum, Munich, Germany

18:15-18:30/17:15-17:30

Oral Report *On-line*

Application of the multimodal method and device for assessing the functional state of the liver in patients with obstructive jaundice

Ksenia Kandurova¹, Dmitry Sumin^{1,2}, Andrian Mamoshin^{1,2}, Elena Potapova¹; ¹Research and Development Center of Biomedical Photonics, Orel State University, Orel, Russia, ²Orel Regional Clinical Hospital, Orel, Russia

18:30-18:45/11:35-11:55

Oral Report *On-line*

Investigation of the effect of the tracheal optical properties on the possibility of spectral assessment of the level of its blood supply *in vivo*

Anna Krivetskaya^{1,2}, Daniil Kustov¹, Vladimir Parshin³, Mikhail Ursov³, Alexander Mariyko³, Vladimir Levkin⁴, Sergey Kharnas⁴, Tatiana 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, ³NMRC PhPI M.H, Moscow, Russia, ⁴Department of Faculty Surgery No. 1, I.M. Sechenov First Moscow State Medical University, Moscow, Russia

September 26, Thursday

**INVITED LECTURE/ORAL REPORT
SESSIONS BIOPHYSICS III/PHOTONICS II**

**/CHINESE-RUSSIAN WORKSHOP
SESSIONS III**

(Building 8, Hall 420)

<https://onlinessu.ktalk.ru/v4p1rves4d6o>



Chairs: Polina A. Timoshina, Saratov State Univ., Russia; Tingting Yu, Huazhong Univ. of Science and Technology, Wuhan, China
Moderator: Isabella Serebryakova, Saratov State University, Russia

10:00-10:25/09:00-09:25

PHOTONICS

Invited

Quantum fluctuation of laser pulses in telecom and sensing

Leonid A. Melnikov¹, Yulia A. Mazhirina¹, Mikhail V. Fedorov², Alexei A. Sysolyatin², Irina V. Zluktova², Andrei D. Zverev², Andrei I. Konukhov³; ¹Yuri Gagarin State Technical University of Saratov, Russia; ²Prokhorov General Physics Institute, Moscow, Russia; ³Saratov State University, Saratov, Russia

10:25-10:50/9:25-9:50/14:25-14:50

CHINESE-RUSSIAN WORKSHOP

Invited *On-line*

Deep learning-based light field microscopy for ultra-high spatiotemporal resolution living cell tracking

Dongyu Li, School of Optical Electronic Information – Wuhan National Laboratory for Optoelectronics – Advanced Biomedical Imaging Facility, Huazhong University of Science and Technology, Wuhan, Hubei, China

10:50-11:15/9:50-10:15/14:50-15:15

CHINESE-RUSSIAN WORKSHOP

Invited *On-line*

Tissue Optical Clearing for 3D Profiling of Whole Organs

Tingting Yu, Britton Chance Center for Biomedical Photonics - MoE Key Laboratory for Biomedical Photonics, Advanced Biomedical Imaging, Facility - Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China

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

CHINESE-RUSSIAN WORKSHOP

Oral Report

Efficacy of radiopaque substances in optical clearing and their impact on red blood cell aggregation

Pavel Moldon¹, M.K. Maksimov¹, Yury Surkov², Andrey Lugovtsov¹, Polina Timoshina², Pengcheng Li³, Alexander Priezzhev¹, ¹Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia, ²Institute of Physics, Saratov State University, Saratov, Russia, ³Huazhong University of Science and Technology, China

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

Oral Report

Study of the effect of laser pulse duration in the ultraviolet spectral range on fibroblasts

Yara Hamdan¹, Daria Makarova¹, Nail Shamsutdinov¹, Pavel Zelenikhin¹, Alexey Nizamutdinov¹, Andrey Buglak²; ¹Kazan Federal University, Kazan, Russia, ²Saint Petersburg State University, Saint Petersburg, Russia

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

Oral Report

Temperature-mediated variability of skin vascular reactivity indices in monthly measurements

Alexey Glazkov, Ksenia Krasulina, Polina Glazkova, Daria Selivanova, Denis Lapitan, Dmitry Rogatkin; Moscow Regional Research and Clinical Institute, Moscow, Russia

CHINESE-RUSSIAN WORKSHOP

Invited recorded

Multimodal Optical Imaging and Nanotechnology

Huanhuan Yu, Fengxian Du, and Qingliang Zhao; State Key Laboratory of Infectious Disease Vaccine Development School of Public Health, Xiamen University

<https://disk.yandex.ru/i/IUn-MKmWCVwFKA>

JOINT INTERNET/POSTER SESSION BIOPHYSICS (B)/PHOTONICS(P)

(Building 3, 3rd floor Hall)

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

18:00-20:00

- 1B. A platform for antibacterial photodynamic therapy based on vaterite particles containing a porphyrin derivative as a photosensitizer** A. A. Zakoyan^{1,2}, E.S. Tuchina³, E.S. Prikhodzhenko³, O.I. Guslyakova³, V.V. Tuchin³, O.A. Inozemtseva³; ¹Scientific & Production Center "Armbiotechnology", NAS RA, Yerevan, Armenia, ²Institute of Biochemistry, NAS RA, Yerevan, Armenia; ³Saratov State University, Saratov, Russia
- 2B. A simple optical scanner for transmission imaging of biological objects** A. Khanbekyan, S. Shmavonyan, P. Saakyan, H. Sultanyan, M. Movsisyan, A. Papoyan; Institute for Physical Research, NAS of Armenia, Ashtarak, Armenia
- 3B. Direct optical generation of singlet oxygen at 1267 nm wavelength stimulates bioenergetics of insulin-producing cells** L.V. Eratova¹, I.N. Makovik¹, A.Y. Vinokurov¹, V.V. Dremine^{1,2}; ¹Research & Development Center of Biomedical Photonics, Orel State University, Orel, Russia, ²College of Engineering and Physical Sciences, Aston University, UK
- 4B. Assessment of blood microcirculation and oxidative metabolism of biological tissue in limb vessels during traumatic operations using laser Doppler flowmetry and fluorescence spectroscopy** A.D. Usanov¹, M.V. Prigorodov², S.V. Kapralov², A.V. Skripal¹;

¹Saratov State University, Saratov, Russia,

²Saratov State Medical University, Saratov, Russia

- 5B. Laser Doppler Flowmetry of Blood Microcirculation in the Phenomenon of the Venoarteriolar Reflex** Konstantin V. Mashkov¹, Dmitriy G. Verkhov¹, Farkad Al-Badri¹, Andrey D. Usanov¹; Andrey A. Sagaidachnyi¹, Viktor A. Klochkov², Anatoly V. Skripal¹; ¹Saratov State University, Saratov, Russia, ²Saratov State Medical University, Saratov, Russia
- 6B. The Monte Carlo method to simulate the trajectories of a large number of photon packets on a multilayer biotissue** Izabella A. Serebryakova¹, Yanwen Xu², Qing Xia², Dongyu Li², Dan Zhu², Yuriy I. Surkov¹, Elina A. Genina^{1,3}, Valery V. Tuchin^{1,3,4}; ¹Saratov State Univ., Russia, ²Huazhong Univ. of Science and Technology, Wuhan, China, ³Tomsk State University, Russia, ⁴Institute of Precision Mechanics and Control, FRC "Saratov Scientific Centre of the RAS," Russia
- 7B. Analyzing OCT-based methods of depth-resolved optical attenuation mapping using digital phantoms** Peter A. Chizhov, Aleksander A. Sovetsky, Alexander L. Matveyev, Lev A. Matveev, Vladimir Y. Zaitsev; A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia
- 8B. Laparoscopic assessment of intestinal wall microcirculation impairment using laser speckle contrast imaging** Vadim N. Prizemin, Nadezhda V. Golubova, Evgeniya S. Seryogina, Viktor V. Dremine, Elena V. Potapova; Orel State University, Orel, Russia
- 9B. Hyperspectral imaging for evaluating the degree of mesenteric ischemia** Ilya A. Goryunov¹, Valery V. Shupletsov¹, Nikita A. Adamenkov², Andrian V. Mamoshin^{1,2}, Elena V. Potapova¹, Andrey V. Dunaev¹, Viktor V. Dremine¹; ¹Orel State University named after I.S. Turgenev, Orel, Russia, ²Orel Regional Clinical Hospital, Orel, Russia
- 10B. The semi-empirical approach to data analysis in laser diffractometry of wet blood smears** Mariia S. Lebedeva, Evgeniy G. Tsybrov, Sergey Yu. Nikitin; Lomonosov Moscow State University, Moscow, Russia
- 11B. Comparison of LSCI and TR-LSC using Monte Carlo simulation** Arsenii P. Fashchevskii¹, Qing Xia², Yanwen Xu², Valery V. Tuchin^{1,3,4}, Dan Zhu², Dongyu Li⁵; ¹Saratov State Univ., Russia; ²Britton Chance Center for Biomedical Photonics - MoE Key Laboratory for Biomedical Photonics, Wuhan National Laboratory for Optoelectronics - Advanced Biomedical Imaging Facility, Huazhong University of

- Science and Technology, Wuhan, Hubei, China; ³Tomsk State Univ., Russia; ⁴Institute of Precision Mechanics and Control, FRC "Saratov Scientific Centre of the RAS," Saratov, Russia; School of Optical Electronic Information, Huazhong University of Science and Technology, Wuhan, Hubei, China
- 12B. Application of the time correlated single photon counting and fluorescence spectroscopy methods for assessment of oxidative metabolism of biotissue** V.S. Yanushin, E.V. Zharkikh, Yu.I. Loktionova, A.V. Dunaev; Orel State University named after I.S. Turgenev
- 13B. Low-Level Laser Treatment Induces the Blood-Brain Barrier Opening and the Brain Drainage System Activation: Delivery of Liposomes into Mouse Glioblastoma** Arina Evsukova¹, Andrey Terskov¹, Ivan Fedosov¹, Egor Ilyukov¹, Inna Blokhina¹, Alexander Shirokov^{1,2}, Nikita Navolokin^{1,3}, Oxana Semyachkina-Glushkovskaya¹; ¹Saratov State University, Scientific Medical Center, laboratory "Smart Sleep", Saratov, Russia, ²Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS), Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov, Russia, ³Department of Pathological Anatomy, Saratov Medical State University, Saratov, Russia
- 14B. Device for creating concussive brain injury in rodents** Dmitry V. Tuktarov¹, Dmitry A. Myagkov¹, Tuzhilkin M. A.², 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
- 15B. Study of the relationship between changes in blood microrheology and the hemostatic system in age-associated diseases of the cardiovascular system** Danila A. Umerenkov¹, Petr B. Ermolinskiy¹, Matvei K. Maksimov¹, Anastasia N. Sveshnikova¹, Larisa I. Dyachuk², Andrei E. Lugovtsov¹, Alexander V. Priezhev¹; ¹Moscow State University, Moscow, Russia, ²Medical Research and Educational Center of Moscow State University, Moscow, Russia
- 16B. Principal Component Analysis Based Filtering for Laser Speckle Imaging** Ivan S. Uvakin¹, Yuri I. Surkov^{1,2}, Polina A. Timoshina^{1,2}, Isabella A. Serebryakova^{1,2}, Elina A. Genina^{1,2}; ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia
- 17B. Effect of upconversion nanoparticles on refractometric properties of tumor tissue** Kovalenko V. A.¹, Kochubey V. I.¹, Navolokin N. A.², Mylnikov A. M.², Yanina I. Yu^{1,3}, ¹Saratov State Univ., ²Saratov State Medical Univ., ³Tomsk State Univer., Russia
- 18B. Optical methods for analysing the dynamics of foam formation** Ekaterina V. Ushakova¹, Marina V. Alonova¹, Sergey S. Volchkov^{1,2}, Dmitry A. Zimnyakov^{1,2}; ¹Yury Gagarin Saratov State Technical Univ., ²FRC "Saratov Scientific Center of the RAS"
- 19B. Criteria for evaluating the effectiveness of plasmonic nanoparticles for biomedical and technical applications** Alexander N. Yakunin¹, Sergey V. Zarkov¹, Yuri A. Avetisyan¹, Garif G. Akchurin^{1,2}, Valery V. Tuchin^{1,2,3}; ¹Institute of Precision Mechanics and Control, FRS "Saratov Scientific Centre of the RAS"; ²Saratov State Univ.; ³Tomsk State Univ., Russia
- 20B. Development of combined PDT/PTT of model cancer in rats** Elina Nikolaeva¹, Elizaveta Diplomatovala¹, Vadim Genin^{1,2}, Alla Bucharskaya³, Nikita Navolokin³, Boris Khlebtsov⁴, Valery Tuchin^{1,2,5}, Elina Genina^{1,2}; ¹Saratov State Univ., ²Tomsk State Univ., ³Saratov State Medical University, ⁴Institute of Biochemistry and Physiology of Plants and Microorganisms, FRC "Saratov Scientific Center of the RAS", ⁵Institute of Precision Mechanics and Control, FRC "Saratov Scientific Centre of the RAS", Saratov, Russia
- 21B. Dispersion dependence of the refractive index of lipophilic immersion agents at room and physiological temperatures** Alexander A. Petrov¹, Elina A. Genina^{1,2}; ¹Saratov State Univ., ²Tomsk State Univ., Tomsk, Russia
- 22B. Visualization of optical clearing of biological tissue using a smartphone** Vyacheslav K. Leshchev¹, Valery V. Tuchin^{1,2,3}; ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia; ³Institute of Precision Mechanics and Control RAS, Saratov, Russia
- 23B. Study of changes in the optical properties of ex vivo sections of ovarian tissue under the influence of 99.5 % glycerol** Arseniy D. Elizarov¹, Ekaterina I. Selifonova¹, Andrey S. Rykhlov², Valery V. Tuchin^{1,3,4}; ¹Saratov State University, Saratov, Russia, ²Clinic "Veterinary Hospital" of Saratov State University of Genetics, Biotechnology and Engineering, Saratov, Russia, ³Tomsk State University, Tomsk, Russia, ⁴Institute of Precision Mechanics and Control RAS, Saratov, Russia
- 24B. Effectiveness of using X-ray contrast agents for optical clearing skin** Stepanov Maksim¹, Yuri I. Surkov¹, Polina Timoshina^{1,2}, Valery Tuchin^{1,2,3}; ¹Saratov State University, Saratov, Russia, ²Tomsk

State University, Tomsk, Russia, ³Institute of Precision Mechanics and Control RAS, Saratov, Russia

- 25B. Study of the effectiveness of clearing skin using MRI agents by optical coherence tomography** Alexander D. Kovalev¹, Yuri I. Surkov¹, Mikhail V. Syrov¹, Polina A. Timoshina^{1,2}, Valery V. Tuchin^{1,2,3}; ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia; ³Institute of Precision Mechanics and Control RAS, Saratov, Russia
- 26B. Image processing of human blood cell aggregates using artificial intelligence in norm and pathology** Aleksandr I. Ladynin, Peter B. Ermolinsky, Maria S. Lebedeva, Irina A. Sergeeva, Andrey E. Lugovtsov, Aleksandr V. Priezzhev Lomonosov Moscow State University, Moscow, Russia
- 27B. Experimental study of increasing the depth of light penetration into the gray matter of the rat brain with optical clearing** Alaa Sabeeh Shanshool^{1*}, Saeed Ziaee^{1,3}, E. N. Lazareva^{1,2}, Yu. I. Surkov¹, P.A. Timoshina^{1,2}, I. A. Serebryakova¹, D. K. Tuchina^{1,2}, E. A. Genina^{1,2}, V. V. Tuchin^{1,2}; ¹Saratov State University, Saratov, Russia, ²Tomsk State University, Tomsk, Russia, ³Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran
- 28B. Photobiomodulation system under EEG observation** Sergey V. Popov¹, Egor V. Ilukov¹, ¹Saratov State University, Scientific Medical Center, laboratory "Smart Sleep", Saratov, Russia
- 29B. Gold nanomaterials with uniform properties: synthesis and applications** Yuliya A. Podkolodnaya, Ksenia R. Kalishina, Ekaterina A. Zobnina, Daria V. Tsyupka Ekaterina A. Khudina, Tatyana S. Ponomareva, Alina A. Kokorina, Irina Yu. Goryacheva, Anna M. Abramova Saratov State University, Saratov, Russia

PHOTONICS (P)

- 1P. Refractive index for vanadium redox flow battery electrolyte states of charge and health analysis** Valentin I. Vlasov¹, Alexei Y. Kuzin¹, Irina N. Florya², Nikita S. Buriak¹, Mikhail A. Pugach¹, Yury G. Gladush¹, Albert G. Nasibulin¹, Dmitry A. Gorin¹; ¹Skolkovo Institute of Science and Technology, Moscow, Russia; ²University of Science and Technology, Moscow, Russia
- 2P. Experimental study on increasing the penetration depth when treating head tissue with laser using optical clearing** Alaa Sabeeh Shanshool¹, Ekaterina N. Lazareva¹, Valery V. Tuchin^{1,2,3}; ¹Saratov State Univ.; ²Tomsk State Univ., Tomsk;

³Institute of Precision Mechanics and Control, FRC "Saratov Scientific Centre of the RAS," Saratov, Russia

- 3P. Integrated multilevel optical devices based on thin films of phase-change materials** Petr I. Lazarenko¹, Vadim V. Kovalyuk², Victoria B. Pestova^{1,3}, Pavel P. An², Alexandr D. Golikov², Evgeny P. Kitsyuk³, Alexey A. Sherchenkov¹, Sergey A. Kozyukhin⁴, Gregory N. Goltsman²; ¹National Research University of Electronic Technology, Zelenograd, Russia; ²Moscow State Pedagogical University, Moscow, Russia; ³Scientific-Manufacturing Complex "Technological Centre", Zelenograd, Russia; ⁴Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow, Russia
- 4P. Optical rogue waves in semiconductor laser with time-delayed loss-controlling optoelectronic feedback** Maxim S. Podgorny¹, Anton A. Krents^{1,2}; ¹Samara University, Samara, Russia; ²Lebedev Physical Institute, Samara, Russia
- 5P. Chaos-based true random number generator in a semiconductor laser** Vadim E. Odin¹, Anton A. Krents^{1,2}; ¹Samara University, Samara, Russia; ²Lebedev Physical Institute, Samara, Russia
- 6P. Laser methods for the synthesis of cobalt-based magnetic nanoparticles** Elena I. Shingareva, Mariya A. Dzus, Anton S. Chernikov, Dmitriy A. Kochuev, Anna A. Voznesenskaya, Ruslan V. Chkalov, Dmitrii V. Abramov, Kirill S. Khorkov; Vladimir State University named after Alexander and Nicolay Stoletovs, Vladimir, Russia
- 7P. Enhanced algorithm for recovering complex dielectric functions in nanosystems between the Rayleigh-Mie Scattering modes** Leonid A. Kochkurov, Sergey S. Volchkov¹, Ekaterina V. Ushakova¹, Dmitry A. Zimnyakov^{1,2}; ¹Yury Gagarin State Technical University of Saratov, Saratov, Russia; ²Precision Mechanics and Control Institute of Russian Academy of Sciences, Saratov, Russia
- 8P. Influence of laser surfacing modes of aluminum oxide powder on the surface characteristics of 12X18N10T steel** Pavel N. Ustinov, Igor V. Rodionov, Dmitry A. Bessonov, Elena L. Surmenko, Tatiana N. Sokolova; Yuri Gagarin State Technical University of Saratov, Saratov, Russia
- 9P. Method for manufacturing a diffraction grating on a convex surface for hyperspectral equipment** Sergey A. Fomchenkov; Samara University, Samara, Russia

INTERNET POSTERS

- 1P. Entanglement in three-qubit nonlinear Tavis-Cummings model** Alexander R. Bagrov; Samara University, Samara, Russia
- 2P. Entanglement in the Tavis-Cummings model with Ising interaction** Ali Othman, Samara University, Samara, Russia
- 3P. Possibilities of phase correlations for dimensional photo-integrated anisotropy micro-lattices** 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
- 4P. General characteristics of the electromagnetic fields in a resonator with hyperbolic metamaterial** Olga N. Kozina¹, Leonid A. Melnikov²; ¹Kotelnikov Institute of Radio-Engineering and Electronics of Russian Academy of Science, Saratov Branch, Saratov, Russia; ²Yuri Gagarin State Technical University of Saratov, Saratov, Russia
- 5P. Method for investigating the spatial correlation properties of stochastic wave field with a wide angular spectrum based on the correlation analysis of the realization of the spatial distribution of the complex amplitude of the field formed using numerical** Lyudmila A. Maksimova¹, Natalya Yu. Mysina¹, Vladimir P. Ryabukho^{1,2}; ¹IPTMU RAS, FRC "Saratov Scientific Center of the Russian Academy of Sciences", Saratov, Russia; ²Saratov State University, Saratov, Russia
- 6P. Single-lens speckle interferometer of tangential micro-displacements of the scattering surface with a single illuminating laser beam** 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
- 7P. Stabilization of VCSEL radiation using external optical injection with consideration of nonlinear gain effects** Elizaveta A. Yarusova^{1,2}, Anton A. Krents^{1,2}, Nonna E. Molevich^{1,2}; ¹Samara University, Samara, Russia; ²Lebedev Physical Institute, Samara, Russia
- 8P. Entanglement in two-qubit model with Raman transitions** Il'ya Vasiliev, Ali Osman, Rodion K. Zakharov, Eugene K. Bashkirov; Samara University, Samara, Russia
- 9P. Sudden death of entanglement in the three-qubit many-photon cavity quantum electrodynamics model** Alexander R. Bagrov, Eugene K. Bashkirov; Samara University, Samara, Russia
- 10P. Dynamics of manylevel atoms in nonideal cavities** Alexander V. Gorokhov, Samara University, Samara, Russia
- 11P. Calculation and simulation of a multichannel DOE with increased diffraction efficiency** Pavel A. Khorin¹, Aleksey P. Dzyuba¹, Svetlana N. Khonina^{1,2}; ¹Samara University, Samara, Russia; ²Image Processing Systems Institute, NRC "Kurchatov Institute", Samara, Russia

Conference on Spectroscopy and Molecular Modeling XXV

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 25, Wednesday

ON-LINE INVITED LECTURE/ORAL SESSION SPECTROSCOPY I

Zoom link:

<https://us05web.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

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

Oral Report

Molecular modeling and OCT monitoring of optical clearing of human skin

Ekaterina Yu. Stepanovich¹, Kirill V. Berezin², E.V. Grabarchuk¹, A.M. Likhter¹, Konstantin N. Dvoretzkiy³, Valery V. Tuchin^{2,4}; ¹Astrakhan State University, Astrakhan, Russia, ²Saratov State University, Saratov, Russia, ³Saratov State Medical University, Russia, ⁴Science Medical Center, Saratov State University, Saratov, Russia

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

Oral Report

Optical clearing of human skin *in vivo* using an aqueous solution of glucosamine hydrochloride and molecular modeling of its interaction with collagen

Elena V. Grabarchuk¹, Kirill V. Berezin², A.M. Likhter¹, Konstantin N. Dvoretzkiy³, Valery V. Tuchin^{2,4}; ¹Astrakhan State University, Astrakhan, Russia, ²Saratov State University, Saratov, Russia; ³Saratov State Medical University, Russia, ⁴Science Medical Center, Saratov State University, Saratov, Russia

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

Oral Report

Conformational analysis of the xylose molecule and interpretation of the raman spectrum

Ekaterina Yu. Stepanovich¹, Kirill V. Berezin², A.M. Likhter¹, Vladimir V. Nechaev³, Konstantin N. Dvoretzkiy⁴; ¹Astrakhan State University, Astrakhan, Russia, ²Saratov State University, Saratov, Russia, ³Yuri Gagarin state technical university of Saratov, Russia, ⁴Saratov State Medical University, Russia

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

Oral Report

Conformational analysis of the xylose molecule and interpretation of the raman spectrum

Ilmira T. Shagautdinova¹, Kirill V. Berezin², A.M. Likhter¹, Vladimir V. Nechaev³, Konstantin N. Dvoretzkiy⁴; ¹Astrakhan State University, Astrakhan, Russia, ²Saratov State University, Saratov, Russia, ³Yuri Gagarin state technical university of Saratov, Russia, ⁴Saratov State Medical University, Russia

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

Oral Report

Analysis of the content of oleic and linoleic acids in a binary mixture of vegetable oils using raman spectroscopy

Ekaterina M. Antonova¹, Kirill V. Berezin², A.M. Likhter¹, Vladimir V. Nechaev³, Konstantin N. Dvoretzkiy⁴; ¹Astrakhan State University, Astrakhan, Russia, ²Saratov State University, Saratov, Russia, ³Yuri Gagarin State Technical University of Saratov, Russia, ⁴Saratov State Medical University, Russia

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

Oral Report

Interpretation of vibrational spectra of metformin hydrochloride

Galina N. Ten; Saratov State University, Saratov, Russia

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

Oral Report

Vibrational spectra of methylene blue

Galina N. Ten; Saratov State University, Saratov, Russia

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

Oral Report

Manifestation of isomorphism and hydrogen bonding in the ir spectra of cresol

Irina V. Ivlieva (Peretokina)¹, Lev M. Babkov¹, Nadezda A. Davydova², P.I. Alexyunina¹, M.A. Molkova¹; ¹Saratov State University, Saratov, Russia, ²Institute of Physics NAS of Ukraine, Kiev

September 26, Thursday

ORAL SESSION SPECTROSCOPY II

Zoom link:

<https://us05web.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

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

Oral Report

The method of identification of substances by the position of individual characteristic lines in the raman spectra

Dmitriy R. Anfimov, Igor L. Fufurin, Andrey N. Morozov, Ivan B. Vintaikin, Sergey V. Bashkin;
Bauman Moscow State University, Moscow, Russia

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

Oral Report

Development of methods for studying substances on surfaces by diffuse reflectance spectroscopy and infrared quantum cascade lasers

Dmitriy R. Anfimov, Igor S. Golyak, Igor L. Fufurin, Andrey N. Morozov; Bauman Moscow State University, Moscow, Russia

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

Oral Report

Towards optic temperature sensor: luminescence of complexes with ligands based on 2,2'-bipyridyldicarboxylic acid

Kirill D. Shmelkov; Lomonosov Moscow State University, Moscow, Russia

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

Oral Report

Result correction of concentration ratio inlet measurement for quantitative mass-spectrometry

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

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

Oral Report

Comparing approaches to improving representativity of spectroscopic data using variational autoencoders

Anastasiiia S. Mushchina^{1,2}, Igor V. Isaev¹, Olga E. Sarmanova^{1,2}, Tatiana A. Dolenko^{1,2}, Sergey A. Dolenko¹; ¹D.V. Skobeltsyn Institute of Nuclear Physics, Moscow State University, Moscow, Russia ²Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia

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

Oral Report

Conformational dynamics of bovine serum albumin: molecular metadynamics combined with spectroscopy

Ivan A. Reshetnik, P.M. Ilicheva, Natalia A. Burmistrova; Institute of Chemistry, Saratov State University, Saratov, Russia

16:00–16:30
Coffee break

16:30-16:45/15:30-15:45

Oral Report

Modelling of intermolecular interactions between the components of Citophlavine

Pavel A. Zhulidin, Pavel D. Filin, Inna L. Plastun; ¹Saratov State Technical University, Russia

16:45-17:00/15:45-16:00

Oral Report

Mathematical modeling of interactions of the carbon dots surface with metal ions using the method of molecular dynamics

Kirill K. Kozhushnyy, Alexey M. Vervalde, Tatiana A. Dolenko; Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia

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

Oral Report

Computational study of betulin hydrogen interaction with polar solvent

Pavel D. Filin, Pavel A. Zhulidin, Inna L. Plastun; SaratovStateTechnicalUniversity, Saratov, Russia

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

Oral Report

Integration of Raman Spectroscopy and Principal Component Analysis for Quality Assessment of Omega-3 Fatty Acids

Dmitry D. Vasimov, Vasiliy S. Novikov, Sergey M. Kuznetsov; Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

17:30-17:45/16:30-16:45

Oral Report

Analysis of basic polar amino acids interaction with fluorescent dyes

Egor V. Nazarev, Inna L. Plastun; Saratov State Technical University, Russia

17:45-18:00/16:45-17:00

Oral Report

Analysis of the intermolecular interaction of hyaluronic acid with a solvent

Kirill A. Bryxin, Inna L. Plastun; 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

18:15-20:30

- 1S. Towards optic temperature sensor: luminescence of complexes with two emitting centers (Tb/EU) and ligands based on 2,2'-bipyridyldicarboxylic acid Kirill D. Shmelkov, Anastasia V. Kharcheva, Alexey V. Ivanov, Natalia E. Borisova, Svetlana V. Patsaeva; Lomonosov Moscow State University, Moscow, Russia
- 2S. Analysis of resonant hyperraman scattering of light by lo phonons in a cds crystal Ludmila E. Semenova; Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow
- 3S. Spectroscopic structural studies of polysubstituted (POLY)heterocyclic spiro compounds Anna A. Meshcheryakova, Svetlana V. Borisova, Ekaterina F. Konstantinova, Kirill R. Bolkvadze, Nikita A. Plotnikov, Nikolaj I. Davydov, Andrej S. Kochukov, Koffi-Joseph Ayena, Vitaly V. Sorokin; Saratov State University, Saratov, Russia
- 4S. Determination of the structure and separation of regio isomeric pyridyl containing aminochromen carbon Alexander V. Nikulin, Adel' P. Krivenko; Saratov State University, Saratov, Russia
- 5S. Effect of cis-trans conformational transition on the ir spectrum of behenic acid Mikhail D. Moskvitin¹, Lev M. Babkov²; ¹Saratov State Technical University, Russia, ²Saratov State University, Saratov, Russia
- 6S. Structural-dynamic anharmonic models and ir spectra of 2-benzilphenol conformers Mikhail D. Moskvitin¹, Lev M. Babkov²; ¹Saratov State Technical University, Russia, ²Saratov State University, Saratov, Russia
- 7S. Quantum chemical studies of the dynamics of biologically active and environmentally significant molecular compounds Viktor F. Pulin¹, E.V. Ryzhova², T.Yu. Surinskaya², O.V. Pulin¹, P.M. Elkin¹; ¹Saratov State Technical University, Saratov, Russia; ²Saratov State Agricultural University, Saratov, Russia
- 8S. System analysis of vibrational spectra of 5xsubstituted uracil dimers Viktor F. Pulin¹, E.V. Ryzhova², T.Yu. Surinskaya², O.V. Pulin¹, P.M. Elkin¹; ¹Saratov State Technical University, Saratov, Russia, ²Saratov State Agricultural University, Saratov, Russia

INTERNET POSTER

- 1SI. Dynamics of manylevels atoms in nonideal cavities Alexander V. Gorokhov; Samara University, Russia
- 2SI. Influence of the structure of tetradentate phosphonate esters on stability constants of their complexes with F-elements (LA, ND, EU, LU И TH) Tsagana B. Sumyanova, Anna A. Kirsanova, Nataliya E. Borisova; Lomonosov Moscow State University, Moscow, Russia
- 3SI. Influence of the structure of 2,2'-bipyridyldicarboxamides on stability constants of their complexes with europium and thorium Tsagana B. Sumyanova, Aleksey B. Ivanov, Nataliya E. Borisova; Lomonosov Moscow State University, Moscow, Russia

Conference on Nanobiophotonics XX

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

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

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

September 25, Wednesday

ORAL/INVITED SESSION NANOBIOPHOTONICS

(Building 9, Conference Hall)

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

Link to connect in Yandex Telemost:

<https://telemost.yandex.ru/j/34840089632494>



10.00 – 10.30

Invited

Nanomedicine-Mediated Nanosecond Pulsed Electric Field Ablation for Enhanced Cancer Treatment: The Case of Anti-HCC

Xinzhu Yang¹, Qiong Wu¹, Xiaoxiong Zhao¹, Yujun Song¹, Danjing Guo², Liangjie Hong², Xinhua Chen²; ¹Center for Modern Physics Technology, School of Mathematics and Physics, University of Science and Technology Beijing, Beijing, China; ²Key Laboratory of Combined Multi-Organ Transplantation, Ministry of Public Health Department of Hepatobiliary and Pancreatic Surgery, The First Affiliated Hospital Zhejiang University School of Medicine, Hangzhou, China

10.30 – 10.45

Oral Report

Using physical methods to create photosensitive structures based on CdSe nanoparticles and CNTs

O.A.H. Hassoon^{1,2}, O.N.S. Salman³, V.N. Mironyuk², M.V. Pozharov², A.M. Zakharevich², E.G. Glukhovskoy²; ¹Ministry of Iraqi electricity, Baghdad, Iraq; ²Saratov State University named after N.G. Chernyshevsky, Saratov, Russia; ³University of Technology, Baghdad, Iraq

10.45 – 11.00

Oral Report

Anti-Stokes luminescence of BaY2F8 crystals with coactivation by Tb3+ and Yb3+ ions

Anna M. Zubareva, Nizamutdinov A.S., Minnebaev T.M., Oleinikova E.I., Shakirov A.A.; Kazan, Federal University, Institute of Physics, Russia

11:00 – 11.15

Oral Report

Luminescent sensors for detection of pterin and its analogues based on amino-acid stabilized gold clusters

Tomash S. Sych¹, Nikolai V. Shekhovtsov¹, Andrey A. Buglak¹, Alexei I. Kononov¹; ¹Department of Molecular Biophysics and Polymer Physics, St. Petersburg University, Saint-Petersburg, Russia

11.15 – 11.35

Oral Report

Detection of hydrogen peroxide in blood serum using tyrosine-stabilized silver nanoparticles

Nikolai V. Shekhovtsov¹, Tomash S. Sych¹, Andrey A. Buglak¹, Alexei I. Kononov¹; ¹Department of Molecular Biophysics and Polymer Physics, St. Petersburg University, Saint-Petersburg, Russia

11.35 – 11.50

Oral Report

Gold nanoclusters-based fluorescence assay for detection of lipopolysaccharide endotoxins

Daniil S. Chumakov¹, Stella S. Evstigneeva¹, Nikolai G. Khlebtsov^{1,2}; ¹Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS); ²Institute of Physics, Saratov State University, Saratov, Russia

11.50 – 12.10

Nanoparticles for SERS detection of formazan

Vladimir A. Mushenkov¹, Boris N. Khlebtsov², Elena G. Zavyalova¹; ¹Moscow State University, Moscow, Russia; ²Institute of biochemistry and physiology of plants and microorganisms, Saratov scientific center RAS, Saratov, Russia

12.10 – 12.30

Oral Report

Development of pH-Sensitive Drug Carriers for Improved Therapeutic Efficacy: *In Vitro* and *In Vivo* Evaluation

Kuznetsov A.O.¹, Vlasicheva Yu.N.², Lengert E.V.¹, Alexey V. Ermakov^{1,3}; ¹Institute of Molecular Theranostics, I.M. Sechenov First Moscow State Medical University, Moscow, Russia; ²D.I. Mendeleev University of Chemical Technology of Russia, Miusskaya square, Moscow, Russia; ³Life Improvement by Future Technologies (LIFT) Center, Moscow, Russia

12.30 – 12.45

Oral Report

Nanocomposites based on silica-coated gold nanostars for controlled delivery of antitumor drugs

Vitaly A. Khanadeev^{1,2}, Andrey V. Simonenko^{1,3}, Andrey M. Burov¹; 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 of Genetics, Biotechnology and Engineering Named after N. I. Vavilov, Saratov, Russia; ³Saratov State University, Saratov, Russia;

12.45 – 13.05

Oral Report

Magnetic CaCO₃-protein-cyanine dyes multicomposite for co-visualization in vitro and in vivo

Alexandra E. Kalinova¹, Ludmila I. Kuznetsova¹, Roman A. Anisimov¹, Alla B. Bucharskaya², Maria V. Lomova¹; ¹Science Medical Centre, Saratov State University; ²Head of the Center for Collective Use of Economic Opportunities, Deputy Director of the Research Institute for Scientific Work, Saratov State Medical University named after V. I. Razumovsky

13.05 – 13.20

Oral Report *On-line*

Study of porosity of nanostructured silicon films

Anastasiya A. Fronya^{1,2}, Egor I. Mavreshko^{1,2}, Mariya S. Grigoryeva^{1,2}, Irina N. Zavestovskaya^{1,2,3}, Ivan M. Tupitsyn¹, Alexander M. Tupitsyn¹; ¹P. N. Lebedev Physical Institute of the Russian Academy of Sciences, 53 Leninskiy Prospekt, Moscow 199991, Russian Federation; ²National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), 31 Kashirskoye Shosse, Moscow 115409, Russian Federation; ³National Research Center «Kurchatov Institute», 1 Academicheskaya Street, Moscow 123182, Russian Federation

13.20 – 13.40

Oral Report *On-line*

Functionalization of magnetic colloidal particles for bioanalytical applications

Nadezhda A. Taranova¹, Anatoly V. Zherdev¹, Boris B. Dzantiev¹; ¹A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian

Academy of Sciences, Leninsky prospect 33, 119071 Moscow, Russia

13.40 – 13.55

Oral Report *On-line*

***In vivo* validation of laser soft tissue reconstruction technology using laser speckle contrast imaging**

Dmitry I. Ryabkin^{1,2}, Dmitry D. Stavtsev^{1,2}, Victoria V. Suchkova^{1,2}, Elena A. Morozova³, Gennady A. Pyavchenko², Alexander Yu. Gerasimenko^{1,2}; ¹National Research University of Electronic Technology (MIET), Moscow, Russia; ²I.M. Sechenov First Moscow State Medical University, Moscow, Russia; ³Peoples' Friendship University of Russia named after Patrice Lumumba, Moscow, Russia

September 26, Thursday

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

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

18.15-20.30

- 1NB. Composite hydrogel-based materials with CaCO₃ particles: preparation, long-term degradation and in vitro drug release
Mariia Saveleva, Polina Demina; Saratov State University, Saratov, Russia
- 2NB. Effect of doxorubicin on the photoluminescent properties of AgInS₂/ZnS quantum dots in the presence of bovine serum albumin
Vera V. Olomskaya, Yulia A. Kornysheva¹, Irina Yu. Goryacheva¹; ¹Saratov State University, Saratov, Russia
- 3NB. Determination of doxorubicin in blood plasma based on quantum dots fluorescence quenching process
Darya G. Koganova, Meshcheriakova S.A., Goryacheva O.A., Goryacheval. Yu.; Saratov State University, Saratov, Russia;
- 4NB. Gold nanoparticles linked by conductive molecules. Preparation and characterization of dimers.
Anna V. Lukyanenko^{1,2}, Andrey V. Tsarenko^{1,2}, Amina Sh. Umarova³, Alexander S. Alexandrovsky¹, Alexander S. Fedorov^{1,2}; ¹Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk, Russia; ²Siberian Federal University, Krasnoyarsk, Russia; ³Reshetnev Siberian State University of Science and Technology, Krasnoyarsk, Russia
- 5NB. Luminescent nanofiber composite materials based on perovskite

nanoparticles and fluoroplast Iliia O. Kozhevnikov, Alexey A. Serdobintsev, Polina A. Demina; Saratov State University

6NB. Pathogen detection using SERS-based aptasensors Rugiyya Aliyeva¹, Kukushkin V.I.², Zavyalova E. G.¹; ¹Faculty of Chemistry, Lomonosov Moscow State University, Moscow, Russia, ²Institute of Solid State Physics, Russian Academy of Sciences, Chernogolovka, Moscow Region, Russia

7NB. Study of the effect of synthesis conditions on the size and stability of submicron droplets, development of a technique for the synthesis of multilayer monodisperse droplets Arina V. Papugaeva¹, Polina G. Rudakovskaya¹, Tatyana M. Estifeeva¹, Dmitry A. Gorin¹; ¹Skolkovo Institute of Science and Technology, Moscow, Russia

8NB. Methods for the determination of chemotherapy drug - mitoxantrone Olga A. Goryacheva, Goryacheval.Yu.; Saratov State University, Institute of chemistry, Astrakhanskaya 83, Saratov, Russia

9NB. Gold nanoparticles coupled with tumor antigens have an immunomodulatory impact Roman D. Vyrshchikov, Sergey A. Staroverov, Lev A. Dykman; Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences, Saratov, Russia

10NB. SERS tags based on silica microspheres with adsorbed gold nanostars Olga A. Inozemtseva^{1,2}, Ekaterina S. Prikhozhenko¹, Anastasia M. Kartashova¹, Yulia A. Tyunina^{1,2}, Andrey M. Zakharevich¹, Andrey M. Burov², Boris N. Khlebtsov²; ¹Saratov State University, Saratov, Russia; ²Institute of Biochemistry and Physiology of Plants and Microorganisms of the Russian Academy of Sciences

11NB. Multifunctional wound care platforms based on microchamber technology for tailored modulation of wound physiology Ekaterina V. Lengert^{1,2}, Angelina A. Savkina², Tatiana V. Stepanova², Olga I. Guslyakova^{3,4}, Ekaterina S. Prikhozhenko⁴, Valentina O. Plastun⁴, Gleb B. Sukhorukov^{3,5,6}, Alexey N. Ivanov², Alexey V. Ermakov^{1,2,6}; ¹I.M. Sechenov First Moscow State Medical University, Moscow, Russia; ²Saratov State Medical University of V.I. Razumovsky, Ministry of Health of the Russian Federation, Saratov, Russia; ³Skolkovo Institute of Science and Technology, Moscow, Russia; ⁴Saratov State University, Saratov, Russia; ⁵Queen Mary University of London, London, UK; ⁶Life Improvement by Future Technologies (LIFT) Center, Moscow, Russia

12NB. Temperature-sensitive drug delivery system based on gold nanostars coated with etched silica shell and tetradecanol Andrey V. Simonenko^{1,2}, Andrey M. Burov¹, Vitaly A. Khanadeev^{1,3}; ¹Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of

the Russian Academy of Sciences (IBPPM RAS), Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Saratov State University of Genetics, Biotechnology and Engineering named after N.I. Vavilov, Saratov, Russia

13NB. Nanocomposites based on gold nanorods with a hollow silica shell for biomedical applications Maria A. Marinina^{1,2}, Daria V. Manushina^{1,2}, Andrey V. Simonenko^{1,3}, Andrey M. Burov¹, Vitaly A. Khanadeev^{1,2}; ¹Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS), Saratov, Russia; ²Saratov State University of Genetics, Biotechnology and Engineering named after N.I. Vavilov, Saratov, Russia; ³Saratov State University, Saratov, Russia

14NB. Comparison of silica coating methods for Triton-based gold nanostars Daria V. Manushina^{1,2}, Maria A. Marinina^{1,2}, Andrey V. Simonenko^{1,3}, Andrey M. Burov¹, Vitaly A. Khanadeev^{1,2}; 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 of Genetics, Biotechnology and Engineering Named after N. I. Vavilov, Saratov, Russia; ³Saratov State University, Saratov, Russia;

15NB. Optical monitoring of the development of Dunaliella salina microalgae cultures Daniil A. Puzanov¹, Vladimir A. Bogatyrev¹, Lev A. Dykman¹, Nikolai G. Khlebtsov¹; ¹Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS), Saratov, Russia

INTERNET POSTERS

1NI. Possibilities of formation of micro- and nano-converters on all-optically inserted nonlinear modification Liubov I. Vostrikova^{1,2}; ¹Rzhanov Institute of Semiconductor Physics SB RAS; ²Departments of Mathematics and Natural Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia

Conference on Internet Biophotonics XVII

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

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

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

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https://sfmconference.org/sfm/sfm24/conferences_workshops/workshops/internet-biophotonics-xvii/preliminary/



Label-free Nonlinear Optical Microscopy for Biomedical Research

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

Assessing Glycerol Diffusion Properties in the Pancreas

Maria R. Pinheiro^{1,2}, Maria I. Carvalho^{1,2}, Valery V. Tuchin^{3,4,5}, Luís M. Oliveira^{1,6}; ¹Institute for Systems and Computer Engineering, Technology and Science (INESC TEC), ²Department of Electrical and Computer Engineering, Faculty of Engineering of Porto University (FEUP), ³Saratov State Univ., ⁴Institute of Precision Mechanics and Control of the FRC "Saratov Scientific Centre of the RAS", ⁵Tomsk State University, Tomsk, Russia; ⁶Physics Department, School of Engineering, Polytechnic of Porto, Portugal

Optical probing depth in a wearable device: a Monte Carlo study

Egor Esipenok¹, Mikhail Kirillin²; ¹N. I. Lobachevsky State University of Nizhny Novgorod; ²A. V. Gaponov-Grekhov Institute of Applied Physics of RAS, Nizhny Novgorod, Russia

September 25, Wednesday

INTERNET BIOPHOTONICS/ BIOPHYSICS II

(Building 8, Hall 420)

Link to connect in Tolka:

<https://onlinesu.ktalk.ru/v4p1rves4d6o>



Chairs: **Igor Fufurin**, Bauman Moscow State Technical University, Moscow, Russia; **Aram Papoyan**, Institute for Physical Research, NAS of Armenia, Ashtarak, Armenia
Moderator: **Isabella Serebryakova**, Saratov State University, Russia

Saratov time / Moscow time

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

Oral Report *On-line*

Studies of solder compositions with nanoparticles for laser welding of damaged tissues

Uliana E. Kurilova^{1,2}, Victoria V. Suchkova^{1,2}, Polina A. Varlamova², 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, Moscow, Zelenograd, Russia

INTERNET POSTERS

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

https://sfmconference.org/sfm/sfm24/conferences_workshops/workshops/internet-biophotonics-xvii/preliminary/



- 1. Investigating the potential benefits of using nanoparticle contrast agents to enhance OCT images**
Seyyede Sarvenaz Khatami¹, Mohammad Ali Ansari¹, Behnam Shariati B. K.¹, Valery V. Tuchin^{2,3}; ¹Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran; ²Science Medical Center, Saratov State University, Saratov, Russia; ³Institute of Precision Mechanics and Control, Federal Research Center "Saratov Scientific Center of the Russian Academy of Sciences", Russia
- 2. The comparison of spectral and optical properties of dissolved organic matter of the Lake Kislo-Sladkoe in the winter and summer seasons** Anastasia D. Tsvetkova¹, Yulia G. Sokolovskaya¹, Elena D. Krasnova¹, Dmitry A. Voronov², Svetlana V. Patsaeva¹; ¹M.V. Lomonosov Moscow State University, Moscow, Russia, ²A. Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow, Russia
- 3. Fluorescent indices of bean seedlings leaves during de-etiolation**
Anna V. Mikhalkova; M.V. Lomonosov Moscow State University, Moscow, Russia
- 4. Determination of ciprofloxacin concentration in aqueous soil extracts in the presence of humic substances using synchronous fluorescence spectra**
Anastasia D. Tsvetkova¹, Yulia G. Sokolovskaya¹, Andrey D. Batakov^{1,2}, Vera A. Terekhova^{1,2}, Svetlana V. Patsaeva¹; ¹M.V. Lomonosov Moscow State University, Moscow, Russia, ²A.N. Severtsov Institute of Ecology and Evolution, RAS, Moscow, Russia
- 5. Monte Carlo simulations of digital diaphanoscopy in spherical geometry: a pilot study**
Denis A. Shumilin¹, Ekaterina O. Bryanskaya², Mikhail Yu. Kirillin^{3,1}; ¹N.I. Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia; ²Research and Development Center of Biomedical Photonics, Orel State University, Orel, Russia; ³A.V. Gaponov-Grekhov Institute of Applied Physics RAS, Nizhny Novgorod, Russia
- 6. Raman spectroscopy for evaluation of the bladder capsule after the lyophilization process**
Elena V. Timchenko^{1,2}, Pavel E. Timchenko^{1,2}, Larisa T. Volova², Oleg O. Frolov¹, Ekaterina S. Semibratova¹; ¹Samara National Research University, Samara, Russia, ²Samara State Medical University, Samara, Russia
- 7. Spectral investigation of clinical isolates of S.pneumoniae, S.oralis and S.mitis by Raman spectroscopy**
Elena V. Timchenko^{1,2}, Pavel E. Timchenko^{1,2}, Larisa T. Volova², Artyom V. Lyamin², Karim A. Kayumov², Irina V. Bazhutova², Oleg O. Frolov¹, Alena V. Zotova¹; ¹Samara University, Samara, Russia, ² Samara State Medical University, Samara, Russia
- 8. Optical methods for evaluating the composition of combined materials based on bacterial cellulose**
Elena V. Timchenko^{1,2}, Pavel E. Timchenko^{1,2}, Mihail S. Alekhin¹, Natalya A. Klenova¹, Elena V. Pisareva¹, Oleg O. Frolov¹, Michael Y. Vlasov^{1,2}; ¹Samara university, Samara; ²Samara State Medical University, Samara
- 9. Application of optical methods in the standardization of collagen-containing hydrogel for 3D bioprinting of supporting and connective tissues**
Elena V. Timchenko^{1,2}, Nikolai A. Ryabov, Oleg O. Frolov¹, Pavel E. Timchenko^{1,2}, Larisa T. Volova², Sergey S. Ivanov¹; ¹Samara National Research University, Samara, Russia, ² Samara State Medical University, Samara, Russia
- 10. Raman spectroscopy for assessing the effect of bone mineral component on animal bone tissue**
Yuri D. Ityaksov¹, Elena V. Timchenko^{1,2}, Pavel E. Timchenko^{1,2}, Oleg O. Frolov¹, Elena V. Pisareva¹, Mikhail Yu. Vlasov^{1,2}, Larisa T. Volova², Eizons M. Tchang¹, Yves N. Lemba¹; ¹Samara National Research University named after academician S.P. Korolev, Samara, Russia, ²Samara State Medical University, Samara, Russia.
- 11. Laser Doppler flowmetry to assess the function of the skin microvasculature in white outbred rats with diet-induced obesity**
Era B. Popyhova, Timofey E. Pylaev; Saratov State Medical University n.a. V.I. Razumovsky, Saratov, Russia
- 12. L-menthol crystallization in an aqueous dispersion of biologically active nanoparticles of chitosan L- and D-aspartate**
Xenia M. Shipenok, Aliya M. Mazhikenova, Evgeny G. Glukhovskoy, Anna B. Shipovskaya; Saratov State University, Saratov, Russia
- 13. Photoplethysmographic study of age-related dynamics of peripheral circulation**
Igor B. Isupov¹, Rimma Sh. Zatrudina², Rodion A. Kudrin¹; ¹Volgograd State Medical University, Volgograd, Russia, ² Volgograd State University, Volgograd, Russia

- 14. Optical Parameters of Adipose Tissue During Phase Transition**
Vadim D. Genin^{1,2}, Irina Yu. Yanina^{1,2}, Elina A. Genina^{1,2}, Valery V. Tuchin^{1,2,3}; ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia; ³Institute of Precision Mechanics and Control of RAS, Saratov, Russia
- 15. Photodynamic therapy of tumors in mice with colorectal cancer**
Alla B. Bucharskaya^{1,2}, Vadim D. Genin², Nikita A. Navolokin^{1,2}, Marina L. Chekhonatskaya¹, Natalya A. Shushunova^{1,2}, Olga I. Guslyakova², Maria V. Lomova², Elina A. Genina², Valery V. Tuchin²; ¹Saratov State Medical University, Saratov, Russia; ² Saratov State University, Saratov, Russia
- 16. Structural changes in skin and skeletal thigh muscle of the rat in experimental diabetes**
Ekaterina N. Lazareva^{1,2,3}, Alla B. Bucharskaya^{1,3}, Andrey M. Zakharevich¹, Nikita A. Navolokin^{1,3}, Natalya A. Shushunova^{1,3}, Valery V. Tuchin^{1,2,3,4}; ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia; ³ Saratov State Medical University, Saratov, Russia; ⁴ Institute of Precision Mechanics and Control RAS, Saratov, Russia.
- 17. Quantification of human skin diffusivity during in vivo optical clearing**
Daria K. Tuchina^{1,2}, Polina A. Timoshina^{1,2}, Valery V. Tuchin^{1,2,3,4}; ¹Institute of Physics and Science Medical Center, Saratov State University, Saratov, Russia; ²Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Tomsk, Russia; ³Institute of Precision Mechanics and Control, FRS "Saratov Scientific Centre of the RAS", Saratov, Russia
- 18. Modeling of emission and absorption distributions in a finite-size quantum molecular emitter**
Alexander N. Yakunin¹, Sergey V. Zarkov¹, Yuri A. Avetisyan¹, Garif G. Akchurin^{1,2}, Valery V. Tuchin^{1,2,3}; ¹Institute of Precision Mechanics and Control, Federal Research Centre "Saratov Scientific Centre of the Russian Academy of Sciences", Saratov, Russia; ²Department of Optics and Biophotonics and Science Medical Center, Saratov State University, Saratov, Russia; ³Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Tomsk, Russia
- 19. Nanoparticles' diffusivity studied by fluorescence recovery and holographic grating relaxation techniques**
Lyubov' N. Borodina, Tatiana O. Oskolkova, Irina A. Arefina, AliakseiDubavik, Andrei V. Veniaminov; ITMO University, St. Petersburg, Russia
- 20. Influence of residual polyvinyl alcohol on protein corona formation of polymer particles**
Maria B. Sokol¹, Olga E. Kamaeva^{1,2}, Maksim A. Klimenko¹, Ivan A. Gulyaev¹, Nikita G. Yabbarov¹, Mariia R. Mollaeva¹, Margarita V. Chirkina¹, Elena D. Nikolskaya¹; ¹N. M. Emanuel Institute of Biochemical Physics of Russian Academy of Sciences, Moscow, Russia; ²National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, Russia
- 21. In vivo monitoring of degradation of ICG-labeled polymer implants using optical clearing**
Uliana A. Apukhtina, Astemir R. Likhov, Victoria V. Zherdeva; Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia
- 22. Efficiency of optical luminescence in visualization of ICG-labeled polymer implants**
Astemir R. Likhov¹, Victoria V. Zherdeva¹, Valery V. Tuchin²; ¹Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia, ²Saratov State University, Saratov, Russia
- 23. Generation and visualization the 3D mice-derived tumor organoids, expressing dcas9-FP probes**
Natalia V. Rassomakhina¹, Liliya G. Maloshenok^{1,2}, Gerel A. Abushinova^{1,2}, Victoria V. Zherdeva¹; ¹Bach Institute of Biochemistry, Federal Research Center of Biotechnology, Russian Academy of Sciences, Moscow, Russia, ²Vavilov Institute of General Genetics, Russian Academy of Sciences, Moscow, Russia

Conference on Low-Dimensional Structures XIV

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 25, Wednesday

ORAL SESSION/INTERNET REPORTS

(Building 8, Room 318)

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

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



11.00-11.25

**Graphene-nanotube hybrid structure:
atomic structure and electrical properties**

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

11.25-11.50

**Graphene aerogel: deformation behaviour
from molecular dynamics**

Julia A. Baimova, Institute for Metals
Superplasticity Problems of RAS, Ufa, Russia

11.50-12.05

**VAC, heat balance and transfer in a
nanodiode**

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

12.05-12.20

**Investigation of the nonlinear photothermal
effect in the process of laser ablation of
oxide films with different thermal
conductivity coefficients**

Sergey D. Poletayev¹, Dmitry A. Savelyev^{1,2};
¹Image Processing Systems Institute, NRC
"Kurchatov Institute" Samara, Russia, ²Samara
National Research University, Samara, Russia

12.20-12.35

**Manufacturing technology and emission
properties of metal-porous cathodes modified
with nanocarbon structures**

Tatiana M. Krachkovskaya¹, Andrey S.
Emelyanov¹, Rostislav U. Bogachev¹, Olga E.
Glukhova^{1,2,3}, Dmitry A. Kolosov^{1,2}; ¹SC "RPE
"Almaz", Saratov, Russia; ²Saratov State
University, Saratov, Russia; ³I.M. Sechenov First
Moscow State Medical University, Moscow,
Russia

12.35-12.50

**Chemiresistive response of SnO₂ thin films
during adsorption of alcohols and ketones**

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

12.50-13.05

**Influence of synthesis parameters on size,
composition and fluorescent properties of
CdZnSeS alloyed quantum dots**

D. A. Kornilov¹, D. D. Drozd¹, I. Yu. Goryacheva¹;
¹Saratov State University, Saratov, Russia

13.05-13.20

**Study of physical properties of layered
nanostructures for creation of bioelectronic
components**

D.T. Murashko¹, U.E. Kurilova^{1,2}, A.Yu.
Gerasimenko^{1,2}; ¹National Research University of
Electronic Technology MIET, Zelenograd,
Moscow, Russia; ²I.M. Sechenov First Moscow
State Medical University, Moscow, Russia

13.20-13.35

**Creation of Slater-Koster tables for transition
metals using the example of copper oxide**

Pavel A. Kolesnichenko¹, Olga E. Glukhova¹;
¹Saratov State University, Saratov, Russia

13.35-13.50

Electronic and Electrical Properties of Monolayer Thin Structures of MXenes and Transition Metal Dichalcogenides

Semyon G. Levitsky¹, Olga E. Glukhova¹;
¹Saratov State University, Saratov, Russia

September 26, Thursday

ORAL SESSION/INTERNET REPORTS

(Building 8, Room 318)

Chair: Olga E. Glukhova,
Saratov State University
Russia

Ссылка на Google Meet:

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



11.00-11.15

Mechanical and thermal properties of graphene/Ni composites: atomic simulation

Karina A. Krylova¹, Liliya R. Safina¹, Ramil T. Murzaev¹, Julia A. Baimova¹;
¹Institute for Metals Superplasticity Problems RAS, Ufa, Russia

11.15-11.30

Comparison of interatomic potentials for the simulation of graphene/metal composites

Liliya R. Safina¹, Ramil T. Murzaev¹, Karina A. Krylova¹, Julia A. Baimova¹;
¹Institute for Metals Superplasticity Problems RAS, Ufa, Russia

11.30-11.45

Phase transformations under deformation of chiral diamanes: atomistic simulations

Polina V. Polyakova¹, Julia A. Baimova¹;
¹Institute for Metals Superplasticity Problems of RAS, Ufa, Russia

11.45-12.00

Computer modeling of carbon nanotubes with substituted nitrogen atoms: investigation of physico-chemical properties and carbon structure

Aleksander D. Grigoriev¹, Irina V. Zaporotzkova¹, Sergei V. Boroznin¹, Natalia P. Boroznina¹, Pavel A. Zaporotzkov¹;
¹Volgograd State University, Volgograd, Russia

12.00-12.15

Carbon nanolayers containing substituted boron atoms – study of electronic properties and structure

Ivan A. Chelnintsev¹, Irina V. Zaporotzkova¹, Sergei V. Boroznin¹, Natalia P. Boroznina¹, Pavel A. Zaporotzkov¹;
¹Volgograd State University, Volgograd, Russia

12.15-12.30

Correlation of X-ray, TEM and Raman in the ground MWCNTs stacking disorder investigation

Nadezhda Bobenko¹, Valery Egorushkin¹, Alexander Ponomarev¹;
¹Institute of Strength Physics and Materials Science, Tomsk, Russia

12.30-12.55

Laser methods for forming bioelectronic components from low-dimensional carbon nanostructures

A.Yu. Gerasimenko^{1,2}, A.V. Kuksin¹, D.T. Murashko¹, M.S. Savelyev^{1,2}, O.E. Glukhova^{2,3};
¹National Research University of Electronic Technology MIET, Zelenograd, Moscow, Russia, ²I.M. Sechenov First Moscow State Medical University, Moscow, Russia, ³Saratov State University, Saratov, Russia

12.55-13.05

The selection of phthalocyanine structures for the creation of composites with carbon nanotubes based on quantum chemical correlation models for predicting the effectiveness of optical limiters

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 at the Federal Research Center of Problems of Chemical Physics and Medicinal Chemistry RAS, Chernogolovka, Russia

JOINT POSTER

(Building 3, 3d floor Hall)

Chair: Olga E. Glukhova, Saratov State University Russia

18.00-20.00

1L. High-ordered Langmuir-Blodgett films as a sensitive coatings for acoustic sensors

Ilya A. Gorbachev¹, Andrey V. Smirnov¹, Vladimir V. Kolesov¹, Iren E. Kuznetsova¹;
¹Institute of Radioengineering and Electronics RAS, Moscow, Russia

2L. Synthesis of fluorophore-modified cerium oxide nanoparticles

Daria V. Tsyupka¹, Sergey V. Pigarev¹, Yuliya A.

Podkolodnaya¹, Ekaterina A. Khudina¹, Nelli R. Popova², Irina Yu. Goryacheva¹, Olga A. Goryacheva¹; ¹Saratov State University, Saratov, Russia, ²Institute of Theoretical and Experimental Biophysics, Russian Academy of Sciences, Moscow Region, Pushchino, Russia

- 3L. Patterns of influence of metric parameters and functionalization with carbonyl and carboxyl groups on the electrical conductivity properties of perforated graphene films** Pavel V. Barkov¹, Mikhail M. Slepchenkov¹, Olga E. Glukhova^{1,2}; ¹Saratov State University, Saratov, Russia; ²I.M. Sechenov First Moscow State Medical University, Russia
- 4L. Deformation mechanisms for graphyne under tensile loading** Angelina Kh. Akhunova¹, Julia A. Baimova¹; ¹Institute for Metals Superplasticity Problems of the Russian Academy of Sciences, Ufa, Russia
- 5L. Effect of deformation on optical and optoelectronic properties of quasi-2D van der Waals heterostructures based on borophene** Mikhail M. Slepchenkov¹, Dmitry A. Kolosov¹, Olga E. Glukhova¹, ¹Saratov State University, Saratov, Russia
- 6L. Correlation of the surface density and size of FeSnanoinclusions with the electrophysical and photoelectric characteristics of the heterophase material CdS:Fe** Polina G. Kharitonova¹, Svetlana V. Stetsyura¹, Evgeny G. Glukhovskoy¹, ¹Saratov State University, Saratov, Russia
- 7L. Quantum capacitance of graphene/LVP/LTO composite during lithiation** Vladislav V. Shunaev¹, Alexandr A. Petrunin¹, Arseniy V. Ushakov¹, Olga E. Glukhova¹; ¹Saratov State University, Saratov, Russia

Conference on Biomedical Spectroscopy XI

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

Secretary: **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 25, Wednesday

ORALSESSION/INTERNETSESSION

<https://us05web.zoom.us/j/9297707272?pwd=QVhzMDdOL2hUbUJKM3BvRks1WWRBdz09>

Conference ID 929 770 7272

Password 6311



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

16.30-16.45

Oral Report

Gold nanoparticles modified with aromatic alkynes for surface-enhanced Raman scattering bioimaging

Demenshin A.I., Solovyeva E.V., Sorokoumov V.N.; Saint-Petersburg State University, Saint-Petersburg, Russia.

16.45-17.00

Oral Report On-line

Raman spectroscopy as a method to study the haemocompatibility of materials containing carbon nanostructures in a biopolymer matrix

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

17.00-17.15

Oral Report

SERS as a tool for determination of structurally related drugs

Alexey V. Markin; Saratov State University, Saratov, Russia.

17.15-17.30

Oral Report

Approach to building a decision support system in neuro-oncology based on fluorescence, diffuse and raman scattering spectroscopy methods

Tatiana A. Savelieva^{1,2*}, Igor D. Romanishkin¹, Anuar Ospanov², Svetlana V. Shugai³, Sergei A. Goryaynov³, Galina V. Pavlova^{3,4}, Igor N. Pronin³, Victor B. Loschenov^{1,2} GPI RAS, Moscow, Russia.

17.30-17.45

Oral Report

SERS as a tool for determination of structurally related drugs

Egor V. Nazarev, Inna L. Plastun; Gagarin Y.A. Saratov State Technical University, Saratov, Russia.

September 26, Thursday

JOINT POSTER/INTERNET/ INTERNETPOSTER SESSION AND INTERNETDISCUSSION (Building3)

Chair: **Anna Doronkina**, Saratov State University, Russia

18.00-20.00

1BS. Multi-Wavelength Raman Differentiation of Malignant Skin Neoplasms Elena N. Rimskaya¹, Alexey Gorevoy¹, Svetlana Shelygina¹, Elena Perevedentseva¹, Alina Timurzieva^{1,2}, Irina Saraeva¹, Nikolay Melnik¹, Sergey Kudryashov¹; ¹Lebedev Physical Institute, Moscow, Russia; ²Semashko National Research Institute of Public Health, Moscow, Russia.

2BS. Gold nanoparticles and propranolol drug: single electron transfer instead chiral discrimination

- Ekaterina A. Kolobova¹, Kseniia N. Makarova¹, Elena V. Solovyeva¹; ¹Saint-Petersburg State University, Saint Petersburg, Russia
- 3BS. Effect of coating of NaYF₄:Er:Yb nanoparticles on their interaction with body cells** Anna A. Doronkina¹, E.N. Lazareva¹, D.K. Tuchina¹, A. B. Pravdin¹, V. I. Kochubey¹, I.Y. Yanina¹, A. M. Mylnikov², N. Navolokin²; ¹Saratov State University, Saratov, Russian, ²Saratov State Medical University, Saratov, Russian
- 4BS. Synthesis and study of the photo- and sonodynamic properties of microbubbles functionalized with photodynamically active dye** Ksenia A. Parutina, Polina G. Rudakovskaya, Roman A. Barmin, Tatyana M. Estifeeva; Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, Moscow, Russia
- 5BS. Liquid biopsy in multiple myeloma based on a combination of SERS and multivariate analysis** Lyudmila A. Bratchenko¹, Yulia A. Khristoforova¹, Irina A. Pimenova¹, Elena N. Tupikova¹, Maria A. Skuratova², Georgy A. Dvoynikov-Sechnoy³, Petr A. Lebedev⁴, Ivan A. Bratchenko¹; ¹Samara University, Samara, Russia; ²Samara City Clinical Hospital №1 named after N. I. Pirogov, Samara, Russia; ³Samara Clinical Regional Hospital named after V.D. Seredavin, Samara, Russia; ⁴Samara State Medical University, Samara, Russia
- 6BS. Class-specific SERS-based determination of sulfanilamide antibiotics in body fluids** Natalia E. Markina, Alexey V. Markin; Saratov State University, Saratov, Russia.
- 7BS. Non-invasive diagnosis of Parkinson's disease based on skin autofluorescence spectra** Nikita P. Bainaev-Mangilev³, Vladimir V. Salmin^{1,2}, Victor B. Loschenov^{3,4}, Aryuna. B. Ochirova³, Maxim N. Andreev⁵, Ekaterina Yu. Fedotova⁵, Alla B. Salmirina⁵, Sergey N. Illarionov⁵; ¹Moscow Institute of Physics and Technology; ²Bauman Moscow State Technical University; ³National Research Nuclear University MEPhI; ⁴Prokhorov General Physics Institute of the Russian Academy of Sciences; ⁵Research Center of Neurology, Moscow, Russia
- 8BS. Study of spin wave propagation in a microwave guide based on a YIG film with magnetite nanoparticles** Fedor E. Garanin, Maria V. Lomova, Alexander V. Sadovnikov; Saratov State University, Saratov, Russia
- 9BS. Determination of the characteristics of complexes of native with glycated human serum albumin based on the results of polarization measurements of eosin - probe fluorescence** Vyacheslav I. Kochubey¹, Alexander B. Pravdin¹, Andrey G. Melnikov², Denis A. Bykov², Alexander R. Milkin², Rustam D. Sadykov²; ¹Saratov State University, Saratov, Russia; ²Yuri Gagarin State Technical University of Saratov, Russia.
- 10BS. Study of stiffness of biological objects by Brillouin spectroscopy** Igor O. Filchenkov, Maria V. Lomova, Alexander V. Sadovnikov; Saratov State University, Saratov, Russia

Workshop on Nonlinear Dynamics XV

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 26, Thursday

ORAL SESSION NONLINEAR DYNAMICS XV

(Building 3, Room38)

Chairs: **Galina I. Strelkova**, **Andrei V. Slepnev**, Saratov State Univ., Russia

Saratov time/Moscow time

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

Oral Report

Wavelet analysis of phase synchronization destruction in nocturnal EEG and ECG recordings in patients with apnea and healthy volunteers

Elizaveta Emelyanova^{1,2}, Anastasiya Runnova¹, Maksim Zhuravlev^{1,2,3}; ¹Saratov State Medical University, Saratov, Russia, ²Saratov State University, Saratov, Russia, ³National Medical Research Center for Therapy and Preventive Medicine, Moscow, Russia

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

Oral Report

Cognitive load change the betweenness centrality in human EEG records

K.S. Sergeev¹, M.O. Zhuravlev^{1,3}, D.S. Morev², A.E. Runnova^{1,2,3}; ¹Saratov State University, Saratov, Russia, ²Saratov State Medical University named after V. I. Razumovsky, Saratov, Russia, ³Federal State Budgetary Institution National Medical Research Center for Therapy and Preventive Medicine of the Ministry of Healthcare of the Russian Federation, Moscow, Russia

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

Oral Report

How internal noise impacts the performance of recurrent neural network

Nadezhda Semenova; Saratov State University, Saratov, Russia

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

Oral Report

Lévy noise-controlled coherence resonance

Ivan A. Korneev¹, Anna S. Zakharova², Vladimir V. Semenov¹; ¹Saratov State University, Saratov, Russia, ²Humboldt-Universität zu Berlin, Berlin, Germany

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

Oral Report

Signal accumulation in FitzHugh-Nagumo neurons

Andrei V. Bukh, Igor A. Shepelev, Tatiana E. Vadivasova; Saratov State University, Saratov, Russia

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

Oral Report

Travelling waves in interacting rings of coupled FitzHugh-Nagumo neurons

Andrei V. Bukh, Galina I. Strelkova; Saratov State University, Saratov, Russia

JOINT INTERNET/POSTER SESSION NONLINEAR DYNAMICS (ND)

(Building 3, 3rd floor Hall)

Chairs: **Andrei V. Slepnev**, Saratov State Univ., Russia

18.00-20.30

1ND. Noise Properties of Percolation Systems Near the Percolation Threshold Leonid A. Kochkurov; Yuri Gagarin State Technical University of Saratov, Saratov, Russia

2ND. FitzHugh–Nagumo systems in trainable artificial neural network Nadezhda Semenova; Saratov State University, Saratov, Russia

- 3ND. Impact of internal noise on trained deep neural network** Daniil Maksimov, Nadezhda Semenova; Saratov State University, Saratov, Russia
- 4ND. Delay and Lévy noise influence on the behavior of a ring of FitzHugh–Nagumo neurons** Nikishina Nataliya, Bukh Andrei; Saratov State University, Saratov, Russia
- 5ND. Peculiarities of coherence resonance in neural maps under Lévy noise** E. Rybalova¹, A. Ryabov¹, S. Muni², G. Strelkova¹; ¹Saratov State University, Saratov, Russia, ²Digital University Kerala, India
- 6ND. Classification of chaos and quasiperiodicity using artificial neural network** A. D. Ryabchenko, A.V. Bukh, K.S. Sergeev; Saratov State University, Saratov, Russia
- 7ND. The influence of noise on the synchronization regime in an ensemble of first- and second-order phase oscillators simulating the operation of a power grid** Kuprijanov Vladislav, Vadivasova Tatiana; Saratov State University, Saratov, Russia
- 8ND. Modeling synaptic plasticity of the FitzHugh-Nagumo neuron using memristive coupling elements** Fediukov Danila, Vadivasova Tatiana; Saratov State University, Saratov, Russia
- 9ND. The influence of noise on neural networks** I.D. Kolesnikov, N.I. Semenova; Saratov State University, Saratov, Russia
- 10ND. Interactions between chimeras and solitary states in two-layer systems with dynamic interlayer coupling** Vladislav Averyanov, Elena Rybalova; Saratov State University, Saratov, Russia
- 11ND. Influence of couplings and noise on dynamics of ensembles of FitzHugh–Nagumo oscillators** Novichkova V.A.¹, Rybalova E.V.¹, Ponomarenko V.I.^{1,2}, Vadivasova T.E.¹; ¹Saratov State University, Saratov, Russia, ²Saratov Branch of Kotel'nikov Institute of Radioengineering and Electronics, Saratov, Russia
- 12ND. Features of the spectral characteristics of conductivity fluctuations of dispersed systems near the percolation threshold** D.V. Tsypin¹, S.S. Volchkov¹, D.A. Zimnyakov^{1,2}; ¹Yury Gagarin State Technical University of Saratov, Saratov, Russia; ²Institute for Problems of Precision Mechanics and Control RAS, Saratov, Russia
- 13ND. Meal as a factor impact on dynamic of the sleep-wake switch** Ksenia O. Merkulova, Elena S. Smirnova, Dmitry E. Postnov; Saratov State University, Saratov, Russia

Joint sessions of Terahertz Optics and Biophotonics VII & Advanced Materials for Optics&Biophotonics VII

Conference Chair: **Vladimir N. Kurlov**, Osipyan Institute of Solid State Physics RAS (Russia); **Egor V. Yakovlev**, Bauman Moscow State Technical University (Russia); **Irina N. Dolganova**, Osipyan Institute of Solid State Physics RAS (Russia); **Nikita V. Chernomyrdin**, Prokhorov General Physics Institute of RAS (Russia); **Dmitry S. Ponomarev**, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russia); **Kirill I. Zaytsev**, Prokhorov General Physics Institute RAS (Russia)

Secretary: **Gleb M. Katyba**, ISSP RAS (Russia), E-mail: katyba_gm@issp.ac.ru; **Arsenii A. Gavidush**, Prokhorov General Physics Institute of RAS (Russia), E-mail: arsenii.a.gavidush@gmail.com

Program Committee: **Polina V. Aleksandrova**, Prokhorov General Physics Institute RAS (Russia), Maria G. Burdanova, Moscow Institute of Physics and Technology (Russia), **Nikita V. Chernomyrdin**, Prokhorov General Physics Institute of the RAS (Russia); **Pavel A. Karalkin**, Institute for Cluster Oncology, Sechenov University (Russia); **Arseniy A. Gavidush**, Prokhorov General Physics Institute RAS (Russia), **Gennady A. Komandin**, Prokhorov General Physics Institute of RAS (Russia), Vladimir M. Masalov, Institute of Solid State Physics RAS (Russia), **Dmitry S. Ponomarev**, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russia), **Igor V. Reshetov**, 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); **Olga P. Cherkasova**, Institute of Automation and Electrometry SB RAS; Institute of Laser Physics SB RAS (Russia); **Irina N. Dolganova**, Osipyan Institute of Solid State Physics RAS (Russia); **Gleb M. Katyba**, Osipyan Institute of Solid State Physics RAS (Russia); **Vladimir N. Kurlov**, Osipyan Institute of Solid State Physics RAS (Russia); **Vladislav A. Zhelnov**, Prokhorov General Physics Institute RAS (Russia).

September 26, Thursday

**Saratov time/Moscow time
10:00-15:00/09:00-14:00**

Chairs: Vladimir N. Kurlov, Osipyan Institute of Solid State Physics RAS

Yandex telemost:

<https://telemost.yandex.ru/j/67009101302104>



10.00-10.20 (09.00-09.20 Moscow local)

Internet Invited Lecture

Controllable air plasma treatment modification of the terahertz response of single-walled carbon nanotubes at both low and high fields

Maksim I. Paukov (Moscow Institute of Physics and Technology, Dolgoprudny, Russia) Arina V. Radivon, Aleksey V. Chernykh, Dmitry V. Krasnikov, Emil O. Chiglintzev, Stanislav Kolar, Kirill A. Brekhov, Gennagy A. Komandin, Aleksandr I. Chernov, Albert G. Nasibulin, Valentyn Volkov, Aleksey V. Arsenin and Maria G. Burdanova.

10.20-10.40 (09.20-09.40 Moscow local)

Internet Invited Lecture

Application of NIR laser pulses with microsecond duration for surgery

Polina V. Aleksandrova (Prokhorov General Physics Institute of the Russian Academy of Science, Moscow, Russia), Irina N. Dolganova, Arsen K. Zotov, Anna I. Alekseeva, Kirill B. Dolganov, Kirill I. Zaytsev, David G. Kochiev.

10.40-11.00 (09.40-10.00 Moscow local)

Internet Invited Lecture

Single-Wall Carbon Nanotube-Based Fresnel Zone Plate with Gate-Tunable Features for Terahertz Frequencies

Arina V. Radivon (Moscow Institute of Physics and Technology, Russia), Gleb M. Katyba, Nikita I. Raginov, Aleksey V. Chernykh, Aleksei S. Ezerskii, Elizaveta G. Tsiplakova, Ignat I. Rakov,

Maksim I. Paukov, Vladimir V. Starchenko, Aleksey V. Arsenin, Igor E. Spector, Kirill I. Zaytsev, Dmitry V. Krasnikov, Nikolay V. Petrov, Albert G. Nasibulin, Valentyn Volkov, Aram A. Mkrtychyan, Maria G. Burdanova.

11.00-11.20 (10.00-10.20 Moscow local)

Internet Invited Lecture

3D structures of hollow spherical silica particles for THz technologies

Nadezhda S. Sukhinina (Osipyan Institute of Solid State Physics of the RAS, Chernogolovka, Russia), Vladimir M. Masalov, Gleb M. Katyba, Gennadi A. Emel'chenko

11.20-11.40 (10.20-10.40 Moscow local)

Internet Invited Lecture

Optical diagnosis of tissue freezing depth in cryosurgery using the sapphire cryoprobes

Arsen K. Zotov (Prokhorov General Physics Institute of the RAS, Moscow, Russia), Zaytsev K.I., Kurlov V.N. and Dolganova I.N.

11.40-11.55 (10.40-10.55 Moscow local)

Oral Report *On-line*

Technology Development for Forming Multilayer Structures Si/SiO₂/Si₃N₄ for the Fabrication of Photonics Integrated Circuit (PIC) Components

Pestova B. Victoria (National Research University of Electronic Technology, Zelenograd, Russia), Abanin A.I., Ryazanov R.M., Kitsyuk E.P., Lazarenko P.I.

11.55-12.10 (10.55-11.10 Moscow local)

Oral Report *On-line*

Engineering of albumin/poly (vinylpyrrolidone-co-acrylic acid) ultrasound-responsive microbubbles by tuning the copolymer structure

Tatiana M. Estifeeva (Skolkovo Institute of Science and Technology, Moscow, Russia), Anna M. Nechaeva, Roman A. Barmin, Yaroslav O. Mezhev, Dmitry A. Gorin and Polina G. Rudakovskaya

12.10-12.25 (11.10-11.25 Moscow local)

Oral Report *On-line*

Compact sapphire probe for sensing tissue properties during microcirculation disorder

Alina A. Platonova (Prokhorov General Physics Institute of the Russian Academy of Science, Moscow, Russia), Polina V. Aleksandrova, Anna I. Alekseeva, Sophya P. Kudryavtseva, Arsen K. Zotov, Kirill I. Zaytsev, Kirill B. Dolganov, Vladimir N. Kurlov, Irina N. Dolganova

12.25-12.40 (11.25-11.40 Moscow local)

Oral Report *On-line*

Development of a water-stable membrane based on fluorinated polymers and quantum dots for optics and electronics

Tatiana G. Statsenko (Moscow Institute of Physics and Technology, Dolgoprudny, Russia), Dmitry S. Gets, Sofia M. Morozova

12.40-12.55 (11.40-11.55 Moscow local)

Oral Report *On-line*

Novel functional oxide and carbide ceramics for biomedical applications

Aleksei V. Kaledin (Osipyan Institute of Solid State Physics RAS, Chernogolovka, Russia), Sergey L. Shikunov, Irina N. Dolganova, Irina A. Shikunova, Gleb M. Katyba, Vladimir N. Kurlov

12.55-13.10 (11.55-12.10 Moscow local)

Oral Report *On-line*

Determination of the elasticity of protein-polymer microbubbles by nanoindentation

Polina G. Rudakovskaya, Pavel S. Kuzmin (Skolkovo Institute of Science and Technology, Moscow, Russia), Pavel S. Kuzmin, Tatyana M. Estifeeva, Roman A. Barmin, Dmitry A. Gorin

13.10-13.35 (12.10-12.35 Moscow local)
Coffee break

13.35-13.50 (12.35-12.50 Moscow local)

Oral Report *On-line*

Recrystallization in two-dimensional colloidal crystals under a rotating electric field: The relationship between grain size, deformation, and interparticle interaction forces

Daniil A. Bystrov (Bauman Moscow State Technical University, Moscow, Russia), Ivan A. Kushnir, Sofia A. Korsakova, Egor V. Yakovlev, Nikita P. Kryuchkov, Stanislav O. Yurchenko

13.50-14.05 (12.50-13.05 Moscow local)

Oral Report *On-line*

Structure features of self-assembly and diffusion in polydisperse emulsions

Ivan A. Kushnir (Bauman Moscow State Technical University, Moscow, Russia), Ivan V. Simkin, Anastasia A. Shirokova, Egor V. Yakovlev, Nikita P. Kryuchkov, Stanislav O. Yurchenko

14.05-14.20 (13.05-13.20 Moscow local)

Oral Report *On-line*

Method of studying the mechanisms of three-dimensional self-assembly of colloidal particles with the use of light-sheet microscopy and machine learning

Anton I. Shvetsov (Bauman Moscow State Technical University, Moscow, Russia), Egor V. Yakovlev, Ivan V. Simkin, Anastasia A. Shirokova, Aleksandra V. Kokhanovskaia, Aksiniia A. Bondareva, Polina A. Zabavina

14.20-14.35 (13.20-13.35 Moscow local)

Oral Report *On-line*

Tunable Colloidal Spinners: A Novel System for Chiral Active Soft Matter

Pavel A. Libet (Bauman Moscow State Technical University, Moscow, Russia), Egor V. Yakovlev, Nikita P. Kryuchkov, Ivan V. Simkin, Andrei V. Sapelkin, Stanislav O. Yurchenko.

14.35-14.50 (13.35-13.50 Moscow local)

Oral Report *On-line*

Thermally and magnetically responsive soft actuator with patterned structure

Belyaeva A. Anastasia (Bauman Moscow State Technical University, Moscow, Russia), Morozova S.M.

14.50-15.05 (13.50-14.05 Moscow local)

Oral Report *On-line*

Nanointerfaces based on carbon framework nanomaterials for nerve tissue cells stimulation

Uliana E. Kurilova^{1,2}, Denis T. Murashko², Irina A. Suetina³, Leonid I. Russu³, Marina V. Mezentsseva³, Artem V. Kuksin², Victoria V. Suchkova^{1,2}, Alexander Yu. Gerasimenko^{1,2}; ¹I.M. Sechenov First Moscow State Medical University, Moscow, Russia, ²National Research University of Electronic Technology, Moscow, Zelenograd, Russia, ³National Research Center for Epidemiology and Microbiology named after Honorary Academician N.F. Gamaleya of the Ministry of Health of the Russian Federation, Moscow, Russia

September 27, Friday

Saratov time/Moscow time

10:00-13:00/09:00-12:00

Chairs: Vladimir N. Kurlov, Osipyan Institute of Solid State Physics RAS

Yandex telemost:

<https://telemost.yandex.ru/j/07322869151659>



10.00-10.20 (9.00-9.20 Moscow local)

Invited

Rutile solid immersion lens for high-resolution THz microscopy

Vladislav A. Zhelnov (Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia), Nikita V. Chernomyrdin, Vladimir N. Kurlov, Kirill I. Zaytsev

10.20-10.40 (9.20-9.40 Moscow local)

Invited

THz-wave scattering in optically inhomogeneous biological tissues: Theoretical and experimental studies

Anna S. Kucheryavenko (Osipyan Institute of Solid State Physics RAS), Irina N. Dolganova, Nikita V. Chernomyrdin, Kirill I. Zaytsev

10.40-10.55 (9.40-9.55 Moscow local)

Calculation of losses in the double metal waveguide of a THz QCL by modified Marcattili method

Bogdan A. Zhmud (V.G. Mokerov Institute of Ultra-High Frequency Semiconductor Electronics of the RAS), Alexander S. Sobolev, Rustam A. Khabibullin

10.55-11.10 (9.55-10.10 Moscow local)

Polarization-sensitive THz solid immersion microscopy

Demyan D. Rybnikov (Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia), Darya R. Il'enkova, Vladislav A. Zhelnov, Anna I. Alekseeva, Nikita V. Chernomyrdin, Kirill I. Zaytsev

11.10-11.25 (10.10-10.25 Moscow local)

Experimental setup and protocols to characterize the in-house THz photoconductive antennas

Artem E. Zubov (Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow), Denis V. Lavrukhin, Yurii G. Goncharov, Dmitry S. Ponomarev

11.25-11.40 (10.25-10.40 Moscow local)

Optical properties of models of porous ceramics based on hydroxyapatite

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

11.40-11.55 (10.40-10.55 Moscow local)

Prediction of refractive index of ceramic material by machine learning

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

11.55-12.10 (10.55-11.10 Moscow local)

Active middle IR metamirror addressed by near IR light hologram and electric current

Vladimir E. Kaydashev (Southern Federal University), Sergey Zhukov, Islam Mutaev, Maxim Kutepov, AnastasyaChouprik

12.10-12.25 (11.10-11.25 Moscow local)

Vanadium dioxide films on ZnO-buffered LiNbO3 substrates for active gradient metasurfaces

Maxim Ochukurov (Southern Federal University), Maxim Kutepov, GevorkKarapetyan, Evgenii Kaidashev, Vladimir Kaydashev

12.25-12.40 (11.25-11.40 Moscow local)

Development of the photoconductive antenna-based THz pulsed spectrometer

Kirill B. Dolganov (Prokhorov General Physics Institute of the Russian Academy of Sciences), Irina G. Antokhina, Yuri I. Borisov, Ilya V. Zhivotovsky, Igor E. Spector

12.40-13.05 (11.40-12.05 Moscow local)
Coffee break

13.05-13.20 (12.05-12.20 Moscow local)

Switching Rotational Dynamics Types in a Microrod System Using Tunable Hodographs

Sofia A. Korsakova (Bauman Moscow State Technical University, Moscow, Russia), Nikita P. Kryuchkov, Egor V. Yakovlev, Daniil A. Bystrov, Fabian Hagemans, Ivan V. Simkin, Jerome J. Crassous, Stanislav O. Yurchenko

13.20-13.35 (12.20-12.35 Moscow local)

Interpolating the Radial Distribution Function in Two-Dimensional Fluid Across a Wide Temperature Range

Nikita P. Kryuchkov, Artur D. Nasyrov, Ilya R. Denisenko (Bauman Moscow State Technical University, Moscow, Russia), Stanislav O. Yurchenko

13.35-13.50 (12.35-12.50 Moscow local)

Switching Rotational Dynamics Types in a Microrod System Using Tunable Hodographs

Anastasiya A. Shirokova (Bauman Moscow State Technical University, Moscow, Russia), Egor V. Yakovlev, Ivan V. Simkin, Pavel A. Libet, Maxim A. Dragun, Artur D. Nasyrov, Alexandra V. Kokhanovskaia, Nikita P. Kryuchkov, Stanislav O. Yurchenko

13.50-14.05 (12.50-13.05 Moscow local)

Machine Learning-Based Potentials for Digital Twins of Soft Matter

Ivan V. Simkin (Bauman Moscow State Technical University, Moscow, Russia), Nikita.P. Kryuchkov, Egor.V. Yakovlev, Stanislav.O. Yurchenko

14.05-14.20 (13.05-13.20 Moscow local)

Influence of anomalous agents on the dynamics of an active system

Artur D. Nasyrov (Bauman Moscow State Technical University, Moscow, Russia), Nikita P. Kryuchkov, Konstantin D. Gursky, and Stanislav O. Yurchenko

14.20-14.35 (13.20-13.35 Moscow local)

Analysis of microobject interaction forces in electric fields using optical tweezers on human peripheral blood lymphocytes

Maksim A. Dragun (Bauman Moscow State Technical University, Moscow, Russia), Daniil A. Bystrov, Ivan A. Kushnir, Anna A. Kopylova, Egor V. Yakovlev, Sofia A. Korsakova, Alla A. Shabalina, Maksim N. Andreev, Alla B. Salmina, Sergey N. Illarioshkin, and Stanislav O. Yurchenko

14.35-14.50 (13.35-13.50 Moscow local)

The study of laser induced cavitation dynamics using computer simulation

Ivan N. Shishkov (Bauman Moscow State Technical University, Moscow, Russia), Egor V. Yakovlev, Nikita P. Kryuchkov

JOINT INTERNET POSTER SESSION

Terahertz Optics and Biophotonics VII

&

Advanced Materials for Optics and Biophotonics VII

Data of fully optical frequency doubling inside the volumes of glass plates

Liubov I. Vostrikova (Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia; Departments of Mathematics and Natural Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia)

Conference on Endogenous Biophotonics: Ultra-Weak Luminescence from Biological Systems III

In commemoration of
the 150th anniversary of the birth of A.G. Gurwitsch and
the 120th anniversary of the birth of G.M. Frank

Co-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 Honorable Member of the Programme Committee, **Cristiano de Mello Gallep**, University of Campinas, Campinas, Brazil

Alexander A. Krasnovsky, Federal Research Center of Biotechnology, Bach Institute of Biochemistry RAS, Moscow, Russia, **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk Akademgorodok, Russia, **Felix Scholkmann**, University of Zurich, Zurich, Switzerland, **Galia N. Surkenova**, Institute of Cell Biophysics RAS, Pushchino, Moscow Region, Russia, **Kharlampy P. Tiras**, Institute of Theoretical and Experimental Biophysics RAS, Pushchino, Moscow Region, Russia, **Alexey V. Trofimov**, Emanuel Institute of Biochemical Physics RAS, Moscow, Russia, **Raif G. Vasilov**, Kurchatov Complex of NBICS-Technologies, National Research Center «Kurchatov Institute», Moscow, Russia, **Vladimir L. Voeikov**, Lomonosov Moscow State University, Moscow, Russia, **Ilya V. Volodyaev**, Lomonosov Moscow State University, European Medical Centre, Moscow, Russia

September 25, Wednesday

**INTERNET INVITED LECTURE/ORAL
REPORT/INTERNET ORAL REPORT
SESSION
ENDOGENOUS BIOPHOTONICS I
(In English)**

Zoom link:

<https://us06web.zoom.us/j/84570942086?pwd=-nqvdIyaUyzIfvfqGhrUWTdJhpBJiXq.1>
ID: 845 7094 2086
Passcode: 907307

**(Institute of Theoretical and Experimental
Biophysics RAS, Pushchino, Moscow
Region, 3 Institutskaya Street)**

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

14.40-15.10 Saratov time (UTC+4)

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

Introduction and Oral Report

A.G. Gurwitsch and G.M. Frank, pioneers of research on ultraweak luminescence of biological systems: strokes to scientific biographies and results of work in the field of mitogenetic radiation

[Ilya V. Volodyaev](#)¹, [Elena V. Naumova](#)²;

¹Faculty of Biology, Moscow State University, Moscow, Russia; ²Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences, Novosibirsk, Russia

15.10-15.40 Saratov time (UTC+4)

14.10-14.40 Moscow time, local time of the speaker (UTC+3)

Internet Invited Lecture

Six decades of chemiluminescence studies: A brief retrospective view to the very beginning and the subsequent developments

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

15:40-16.00 Saratov time (UTC+4)

14.40-15.00 Moscow time (UTC+3),

13.40-14.00 Hungary time, local time of the speaker (UTC+2)

Internet Oral Report

Unique algorithm, data processing and physical laws for the evaluation of embryo photon emission and viability

[József Bódis](#)^{1,4,7}, [József Berke](#)^{1,2}, [Zoltán Bognár](#)^{1,3,4}, [István Gulyás](#)¹, [Dávid Berke](#)⁵, [Attila Enyedi](#)², [Veronika Kozma-Bognár](#)^{2,6}, [Péter Mauchart](#)^{1,7}, [Bernadett Nagy](#)^{1,4,7}, [Ákos Várnagy](#)^{1,4,7}, [Kálmán Kovács](#)^{1,4,7};

¹National Laboratory on Human Reproduction, University of Pécs, Pécs, Hungary; ²Dennis Gabor University, Department of Drone Technology and Image Processing, Budapest, Hungary; ³Department of Medical Biology and Central Electron Microscope Laboratory, Medical School, University of Pécs, Pécs, Hungary; ⁴HUN-REN-PTE Human

Reproduction Scientific Research Group, Pécs, Hungary; ⁵John von Neumann Computer Society, Multimedia in Education Section, Budapest, Hungary; ⁶Dennis Gabor University, Rector's cabinet, Budapest, Hungary ⁷Department of Obstetrics and Gynecology, Medical Scholl, University of Pecs, Pécs, Hungary

16.00-16.30 Saratov time (UTC+4)
15.00-15.30 Moscow time (UTC+3)
Coffee break

16.30-17.00 Saratov time (UTC+4)
15.30-16.00 Moscow time, local time of the speaker (UTC+3)
14.30-15.00 Switzerland time, local time of the speaker (UTC+2)
Internet Invited Lecture
Biological autoluminescence (ultra-weak photon emission): Involved in biological regulatory processes?
Felix Scholkmann^{1,2,3};
¹Neurophotonics and Biosignal Processing Research Group, Biomedical 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;³Neuroscience Center Zurich, University of Zurich and ETH Zurich, Zurich, Switzerland

17.00-17.30 Saratov time (UTC+4)
16.00-16.30 Moscow time (UTC+3)
15.00-15.30 Austria time, local time of the speaker (UTC+2)
Internet Invited Lecture
Ultra-weak electromagnetic hormesis as the baseline of athermal effects in biota
Pierre Madl
Dep. of Biosciences & Medical Biology,
University of Salzburg, Austria

17.30-18.00 Saratov time (UTC+4)
16.30-17.00 Moscow time (UTC+3)
6.30-7.00 San Diego time, local time of the speaker (UTC-7)
Internet Oral Report
A New Model of DNA-Water Interaction: Dynamic Chromatin Self-Organization as the Basis of Cellular Logic
Ivan V. Savelev¹, Michael M. Rempel¹,
Alexandr V. Vikhorev¹, Oksana O. Poleskaya¹, Richard Alan Miller¹, Alexandr V. Vetcher² and Max V. Myakishev-Rempel¹;
¹DNA Resonance Research Foundation, San Diego, CA, USA;²Russian Peoples Friendship University & Shishonin Integrative Health Clinic, Moscow, Russia

18.00-19.00 Saratov time (UTC+4)
17.00-18.00 Moscow time (UTC+3)
ROUND TABLE DISCUSSION
(In English)

Zoom link:
<https://us06web.zoom.us/j/84570942086?pwd=-nqvdIyaUyzlFvfqGhrUWTdJhpBJiXq.1>
ID: 845 7094 2086
Passcode: 907307

(Institute of Theoretical and Experimental Biophysics RAS, Pushchino, Moscow Region, 3 Institutskaya Street)
Moderators: **Ilya V. Volodyaev**, Moscow State University, European Medical Center, Moscow, Russia, **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

September 26, Thursday

INVITED LECTURE SESSION,
ENDOGENOUS BIOPHOTONICS II
(In Russian)

Zoom link:
<https://us06web.zoom.us/j/84570942086?pwd=-nqvdIyaUyzlFvfqGhrUWTdJhpBJiXq.1>
ID: 845 7094 2086
Passcode: 907307

(Institute of Theoretical and Experimental Biophysics RAS, Pushchino, Moscow Region, 3 Institutskaya Street)
Chairs: **Ilya V. Volodyaev**, Moscow State University, European Medical Center, Moscow, Russia, **Elena V. Naumova**, Rzhanov Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia

12.00-12.30 Saratov time (UTC+4)
11.00-11.30 Moscow time, local time of the speaker (UTC+3)
Invited Lecture
Informational effect of ultra-weak radiation of biological systems on complementary biological systems
Yuriy Gorovoy¹, Nikita V. Penkov²;
¹Yaroslavl State Technical University, Russia,
²Institute of Cell Biophysics of the Russian Academy of Sciences, Russia

12.30-13.00 Saratov time (UTC+4)
11.30-12.00 Moscow time, local time of the speaker (UTC+3)
Invited Lecture
Charge Transfer in DNA and Biophotonics
Victor D. Lakhno;
Institute of Mathematical Problems of Biology, Russian Academy of Sciences, Russia

13.00-13.30 Saratov time (UTC+4)
12.00-12.30 Moscow time, local time of the speaker (UTC+3)
InvitedLecture
Open complex collective modes and critical dynamics of cells in oncological transformation and microgravity conditions
Oleg B. Naimark;
Institute of Continuous Media Mechanics UB RAS, Perm, Russia

13.30-14.30 Saratov time (UTC+4)
12.30-13.30 Moscow time (UTC+3)
Lunch time

INVITED LECTURE/INTERNET INVITED LECTURE/INTERNET ORAL REPORT SESSION, ENDOGENOUS BIOPHOTONICS III (In Russian + Invited Interned Lecture by Prof. Gallep in English)

Zoom link:

<https://us06web.zoom.us/j/84570942086?pwd=nqvdIyaUyzlFvfqGhrUWTdJhpBJiXq.1>
ID: 845 7094 2086
Passcode: 907307

(Institute of Theoretical and Experimental Biophysics RAS, Pushchino, Moscow Region, 3 Institutskaya Street)
Chair: **Vladimir L. Voeikov**, Lomonosov Moscow State University, Faculty of Biology, Moscow

14.30-15.00 Saratov time (UTC+4)
13.30-14.00 Moscow time, local time of the speaker (UTC+3)
InvitedLecture
Energy theory of carcinogenesis. Why and how cancer and metastases occur
Victor A. Ovsyannikov;
Ioffe Physical-Technical Institute, Saint-Petersburg, Russia

15.00-15.30 Saratov time (UTC+4)
14.00-14.30 Moscow time, local time of the speaker (UTC+3)
Internet Oral Report
Optical method of localization of acupuncture points and theoretical concepts of the role of photons in neural activity
Leonid G. Navrotsky^{1,2}, Liliya I. Lisitsyna²;
¹Institute of Laser Physics SB RAS, Novosibirsk, Russia; ²Novosibirsk State Technical University, Novosibirsk Russia

15.30-16.00 Saratov time (UTC+4)
14.30-15.00 Moscow time,
14.30-15.00 Belarus time, local time of the speaker (UTC+3)

Internet Oral Report
Registration of fluorescence of endogenous porphyrins and flavins in living cells and their extracts

Vitaly Yu. Plavskii, Andrei N. Sobchuk, Aliaksandr V. Mikulich, Olga N. Dudinova, Ludmila G. Plavskaya, Antonina I. Tretyakova, Raman K. Nahorny, Tatsiana S. Ananich, Alexei D. Svechko, Sergey V. Yakimchuk, Ihar A. Leusenka;
B.I. Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus

16.00-16.30 Saratov time (UTC+4)
15.00-15.30 Moscow time, local time of the speaker (UTC+3)
15.00-15.30 Belarus time, local time of the speaker (UTC+3)

Internet InvitedLecture
Using fluorescence analysis and chemiluminescence to determine the causes of increased sensitivity of cancer cells to blue light

Vitaly Yu. Plavskii, Olga N. Dudinova, Ludmila G. Plavskaya, Antonina I. Tretyakova, Aliaksandr V. Mikulich, Raman K. Nahorny, Andrei N. Sobchuk, Tatsiana S. Ananich, Alexei D. Svechko, Sergey V. Yakimchuk, Ihar A. Leusenka;
Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus

16.30-16.50 Saratov time (UTC+4)
15.30-15.50 Moscow time, local time of the speaker (UTC+3)
9.30-9.50 Brasilia time, local time of the speaker (UTC-3)
Internet InvitedLecture
Delayed luminescence in Algae for toxicological tests
Julya Tavares, Cristiano M Gallep;
Universidade Estadual de Campinas – UNICAMP, Brazil

September 27, Wednesday

INVITED LECTURE/ORAL REPORT/INTERNET ORAL REPORT SESSION ENDOGENOUS BIOPHOTONICS IV (In Russian)

Zoom link:

<https://us06web.zoom.us/j/84570942086?pwd=nqvdIyaUyzlFvfqGhrUWTdJhpBJiXq.1>
ID: 845 7094 2086
Passcode: 907307

(Institute of Theoretical and Experimental Biophysics RAS, Pushchino, Moscow Region, 3 Institutskaya Street)

Chairs: **Andrey V. Budagovsky**^{1,2},
1Michurinsk State Agrarian University,
Michurinsk, Tambov Region, Russia;

²Michurin Federal Scientific Center,
Michurinsk, Tambov Region, Russia,
Yury A. Nikolaev; The Federal Research
Centre "Fundamentals of Biotechnology" of
the Russian Academy of Sciences, Moscow,
Russia

10.50-11.20 Saratov time (UTC+4)

**9.50-10.20 Moscow time, local time of the
speaker (UTC+3)**

Oral Report

**Mitogenetic effect: methods, critique and
anti-critique**

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

11:20-12.00 Saratov time (UTC+4)

10.20-11.00 Moscow time (UTC+3)

Invited Lecture

**Mechanical impacts on water systems in
nature is one of the main reasons for their
transfer into electronically excited state**

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

12.00-12.30 Saratov time (UTC+4)

**11.00-11.30 Moscow time, local time of the
speaker (UTC+3)**

Invited Lecture

**Peculiarities of the study of distant non-
chemical interactions in microorganisms**

Yury A. Nikolaev, Galina I. El-Registan;

The Federal Research Centre "Fundamentals
of Biotechnology" of the Russian Academy of
Sciences, Moscow, Russia

12:30-13.00 Saratov time (UTC+4)

11.30-12.00 Moscow time (UTC+3)

Invited Lecture

**Communication function of cell
bioluminescence**

Andrey V. Budagovsky^{1,2}, Olga N.
Budagovskaya^{1,2}, and Ivan A. Budagovsky³;

¹Michurinsk State Agrarian University,
Michurinsk, Tambov Region, Russia; ²Michurin
Federal Scientific Center, Michurinsk, Tambov
Region, Russia; ³Lebedev Physical Institute,
Moscow, Russia

13.00-14.00 Saratov time (UTC+4)

12.00-13.00 Moscow time (UTC+3)

Lunch time

14:00-14.20 Saratov time (UTC+4)

13.00-13.20 Moscow time (UTC+3)

Round table Report

Living cell as a source of photogeneration

Galia N. Surkenova;

Institute of Cell Biophysics of the Russian
Academy of Sciences, Pushchino, Russia

14:20-14.50 Saratov time (UTC+4)

13.20-13.50 Moscow time (UTC+3)

Invited Lecture

**On possible registration of mitogenetic
effect in A.M. Kuzin group experiments**

Sergey N. Mayburov; Lebedev institute of
physics, Moscow, Russia

14.50-17.30 Saratov time (UTC+4)

13.50-16.30 Moscow time (UTC+3)

ROUND TABLE DISCUSSION

(In Russian)

Zoom link:

<https://us06web.zoom.us/j/84570942086?pwd=ngvdIyaUyzlFvfqGhrJWtdJHhBJiXq.1>

ID: 845 7094 2086

Passcode: 907307

**(Institute of Theoretical and Experimental
Biophysics RAS, Pushchino, Moscow
Region, 3 Institutskaya Street)**

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

BIOMEDICAL ENGINEERING: MINI-SYMPOSIUM

Chairs:

Alex G. Kuchumov, Perm National Research Polytechnic University, Russia

Program Committee:

Nadya Antonova, Institute of Mechanics Bulgarian Academy of Sciences (Bulgaria); **KayvanSadeghy**, University of Tehran (Iran); **Mikhail Golub**, Kuban State University (Russia); **FulufheloNemavhola**, Durban University of Technology (South Africa); **Alex G. Kuchumov**, Perm National Research Polytechnic University (Russia); **Tri Nguyen-Quang**, Dalhousie University (Canada); **Oscar Sachenkov**, Kazan Federal University (Russia); **ThanyaniPandelani**, University of South Africa (South Africa); **Irina Yu. Yanina**, Saratov State University, Tomsk State University (Russia)

September 26, Thursday

**INVITED LECTURE/ORAL BIOMEDICAL
ENGINEERING**

<https://bigbluebutton.pstu.ru/rooms/ag-k-w9u-j22/join>



Chair: **Alex G. Kuchumov**, Perm National Research Polytechnic University, Russia

10.00-10.30

Invited

Effect of Colon Stiffness on Peristaltic Transport of Chyme: a Numerical Simulation
Mohammad Pourjafar; University of Tehran

10.30-11.00

Invited

Optimization of polymer valve leaflets for heart valve prosthesis in silico
EvgenyOvcharenko; Research Institute of Complex Issues of Cardiovascular Diseases

11.00-11.30

Invited

Biaxial Mechanical Properties of Sheep Myocardium
ThanyaniPandelani; University of South Africa

11.30-12.00
Coffee break

12.00-12.20

Oral Report

Cell-based modeling of tissue development in a scaffold affected by shear stresses

Dmitry Bratsun; Perm National Research Polytechnic University

12.20-12.40

Oral Report

Solid mechanics models in ophthalmology

Eva B. Voronkova; St. Petersburg State University

12.40-13.00

Oral Report

Development of methods and software for diagnostics of human motor functions based on video fixation

Victoria Vladimirovna Smirnova; LeonRodLLC, Kazan, Russia

Oral Report

13.00-13.20

Investigation of loaded porous structures inside a computed tomography.

Nikita Kharin; Kazan Federal University

13.30-14.00
Coffee break

14.00-14.20

Oral Report

On the mesh structures of an intramedullary rod

Pavel Bolshakov; Kazan Federal University

14.20-14.40

Oral Report

Thermally and magnetically responsive soft actuator with patterned structure

Anastasia Belyaeva; N.E. Bauman Moscow State Technical University

14.40-15.00

Oral Report

Approach to evaluate the efficacy of ex vivo root canal treatment using microtomography

Evgeniy V. Sadyrin; Don State Technical University

15.00-15.20

Oral Report

Numerical calculation of bone strength in rats exposed to impaired motor activity

Oleg Gerasimov; Volga Region State University of Physical Culture, Sport and Tourism

15.20-15.40

Oral Report

CT-Based reconstruction of elastic properties of inhomogeneous material using FEM

Oleg Gerasimov; Kazan Federal University

15.40-16.00
Coffee break

16.00-16.20

Oral Report

Identification of material properties of multi-layered structures using laser Doppler vibrometry for the purposes of mechanical and biomedical engineering

Mikhail Golub; Kuban State University

16.20-16.40

Oral Report

The effect of fluid pressure in porous composites: a mathematical model applied to the optic nerve

Denis Kucherenko; Virginia Polytechnic Institute and State University

INTERNET POSTER

1BE. Effect of permeability and wall properties on peristaltic transport of chyme in the colon Saveliy Peshin; Perm National Research Polytechnic University

2BE. Biocorrosion characterisation and mathematical modelling of dental implants Winnie Mtetwa; UNISA Biomedical and bioresources Engineering

3BE. Advanced material modelling and fatigue characterization of bio-inspired 3D printed dental implants Emmanuel Munenge; UNISA-Biomedical & Bioresources Engineering

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XXIV

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

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

International Program Committee:

Nikita M. Ryskin, Kotel'nikov Institute of Radio-Engineering of RAS (Russia); **Igor S. Nefedov**, Aalto University, Espoo (Finland); **Georgi N. Georgiev**, "Sts. Cyril and Methodius" University, VelikoTirnovo, (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**, Kotel'nikov Institute of Radio-Engineering of RAS (Russia)

September 26, Thursday

GoogleMeet Oral Report 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

Итерационный метод решения задачи дифракции на нелинейной диэлектрической решетке в сильных электромагнитных полях

Lerer A.M., Ivanova I.N. Kravchenko V.I., Southern Federal University, Rostov-on-Don, Russia

14.15–14.30

Полосно-пропускающие фильтры, выполненные по SIW- и ESIW-технологиям

Bukin S.P., Krutiev S.V., Southern Federal University, Rostov-on-Don, Russia

14.30–14.45

Многослойный полосно-пропускающий СВЧ-фильтр, выполненный по SIW-технологии

Сабурова В.С., Крутиев С.В., Southern Federal University, Rostov-on-Don, Russia

14.45–15.00

Development of a time-of-flight lidar photo detector module

Cherepanov V.V.^{1,2}, Bukin S.P.^{1,2}, Kleschenkov A.B.^{1,2}, Krutiev S.V.^{1,2}, Moshichenko S.D.^{1,2}, Gorbachev N.V.¹, ¹Southern Federal University, Rostov-on-Don, Russia; ²LLC "NPO SMARTSENS", Rostov-on-Don, Russia

15.00-15.15

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

Localized plasmons in nanoparticles: calculation methods

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

15.50–16.10

Resonant tunneling structures of the terahertz range

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

16.10–16.30

Diffraction of a wave packet on a dielectric layer with dispersion: a spectral approach

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

16.10–16.30

Extremely high-frequency band diagnostic complex DKM-01 as a noninvasive method of the human tissue estimation

Riasik I.O., Moscow Research Institute of Cybernetic Medicine, Moscow, Russia

16.30–16.50

Result correction of concentration ratio inlet measurement for quantitative mass-spectrometry

Kolesov H.N., Dubinov A.E. Russian Federal Nuclear Center – All-Russia Scientific and Research Institute of Experimental Physics (RFNC–VNIIEF), Mira av. 37, Sarov, 607188, Russia

16.50–17.10

3-D Particle-In-Cell Simulation of Microwave Frequency Comb Generation in Cyclotron Resonance Interaction of an Electromagnetic Wave with a Counterpropagating Rectilinear Electron Beam

Rostuntsova A.A.^{1,2,3}, Ryskin N.M.^{1,3},¹Saratov Branch, Kotelnikov Institute of Radioengineering and Electronics RAS, Saratov, Russia, ²A.V. Gaponov-Grekhov Institute of Applied Physics RAS, Nizhny Novgorod, Russia, ³Saratov State University, Saratov, Russia

17.10–17.30

Investigation of the possibility of increasing the resistance to self-excitation of a traveling wave lamp with a retarding system such as a chain of coupled resonators

Nefedov S.A., Igangaliev A.N., Polyakov I.V., Rzhevin N.V., SC NPP Almaz, Saratov, 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 26, Wednesday

ON-LINE JOINT INVITED

LECTURE/ORAL SESSION

MACHINE LEARNING I

(On-line)

Microsoft Teams link:

Chair: **Yuri Kistenev**

Moderator: **Sergey Zaytsev**

15.00-15.15

Deep-learning aided bacteria diagnostics using multimodal optical spectroscopy

Oleg O. Pavlov, Boris P. Yakimov, Daniil D. Lysukhin, Evgeny A. Shirshin; Faculty of Physics, M.V. Lomonosov Moscow State University, Russia

15.15-15.30

Evaluating of metabolic activity of fibroblasts incubated on porous ceramics using fluorescence lifetime imaging and phasor approach

Tatiana B. Lepekhina¹, Viktor V. Nikolaev¹, Maxim E. Darwin², HalaZuhayri¹, Mikhail S. Snegerev¹, Aleksandr S. Lozhkomoev³, Elena I. Senkina^{1,3}; ¹Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, Tomsk, Russia ²Independent Researcher, Berlin, Germany, ³Institute of Strength Physics and Materials Science of the Siberian Branch of the Russian Academy of Sciences (ISPMS SB RAS), Tomsk, Russia

15.30-15.45

THZ high resolution spectrometer construction and experimental verification for multicomponent gas mixtures analysis

Tretyakov A.K.¹, Kistenev Yu.V.¹, Nikolaev V.V.¹, Raspopin G.K.¹; ¹Tomsk State University, Tomsk, 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. Priezzhev**, Moscow State University

September 26, Thursday

PUBLIC LECTURE SESSION MODERN OPTICS
(Building 3, Big Physical Hall)

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

14.00-14.45

BIOPHOTONICS – A NEW SCIENCE IN THE SERVICE OF HUMANITY
Valery V. Tuchin, Saratov State Univ., Russia

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

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;

September 25, Wednesday

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

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

14.00-14.30

Observable and Unobservable Interference of Light

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

14.30-15.00

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

Valery M. Anikin, Saratov State University, Saratov, Russia

15.00-15.20

Meanders of rivers, A. Einstein and clarification of Baer's law

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

15.20-15.40

Axiomatic construction of classical physics

Alexander A. Skaptsov, Saratov State University, Saratov, Russia

15.40-16.00

To v^2 or not to v^2 ?" Cannon-ball flight, Newton and school physics

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

16.00-16.20
Coffee break

16.20-16.35

On Quantum Quest education approach

Ekaterina A. Lozhkina, Dmitry V. Churochkin, Svetlana V. Churochkina, Saratov State University, Saratov, Russia

16.35-16.50

Implementation of mathematical models of pattern recognition for the diagnosis of breast cancer

Anastasiya K. Klokova, Julia A. Brodskaya, Yuri Gagarin State Technical University of Saratov

16.50-17.05

Pattern recognition models for diagnostic tasks in the class of non-Hodgkin's lymphomas

Matvey V. Sedykh, Julia A. Brodskaya, Yuri Gagarin State Technical University of Saratov; Saratov; Russia

17.05-17.20

Implementation of methods of the mathematical theory of pattern recognition in the diagnosis of Parkinson's disease, taking into account models of genealogy

Maxim L. Murmantsev, Julia A. Brodskaya, Yuri Gagarin State Technical University of Saratov; Saratov; Russia

17.20-17.40

Number systems for the programmer

Boris L. Faifel, Yuri Gagarin State Technical University of Saratov; Saratov; Russia

17.40-18.00

Quantum operations using the Black Opal educational platform

Olga A. Cherkasova, Svetlana V. Churochkina, Dmitry V. Churochkin, Saratov State University, Saratov, Russia

September 26, 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

A View of the World by Erwin Schrödinger

Boris A. Medvedev, Saratov State University, Saratov, Russia

14.20-14.40

Gustav Kirchhoff and Physics. Two centuries together

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

14.40-15.00

True randomness, nonlocal whole, Bell's theorem

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

15.00-15.20

About solving the attribution problem of works by Victorian modern artists through models of pattern recognition theory

Julia A. Brodskaya, Saratov State University, Saratov, Russia

15.20-15.40

Complicating the theoretical apparatus of fundamental science: Progress or a deadline for development?

Yuliya M. Duplinskaya, Yuri Gagarin State Technical University of Saratov, Saratov, Russia

15.40-16.00

The place of philosophy in the reality of technoscience

Natal'ya V. Dovgalenko, Yuri Gagarin State Technical University of Saratov, Saratov, Russia

16.00-16.20
Coffee break

16.20-16.40

Chemistry and music. Patterns of historical development

Vitaliy V. Sorokin¹, Vladimir V. Orlov²; ¹Saratov State University, Saratov, Russia, ²Saratov State Conservatory, Saratov, Russia

16.40-17.00

Theatre of new music in the context of art synthesis

Vladimir V. Orlov, Alina A. Shafigullina, Yana S. Otekina, Saratov State Conservatory, Saratov, Russia

17.00-17.20

The echo of solar storms in the life of the founder of heliobiology A. L. Chizhevsky

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

17.20-17.30

The experiment of the great theorist and its continuation

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

17.30-17.40

Quantum information networks and prospects for their development in the Russian Federation

Alexander V. Gorokhov, Samara University, Samara, Russia

17.40-17.50

The criterion of scientific knowledge

Victor V. Rozen, Saratov State University, Saratov, Russia

17.50-18.00

Language as an instrument of knowledge and co-creation with Nature

Oleg V. Schimelfenig, Saratov State University, Saratov, Russia

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

Chair: A. Markin, Saratov State University, Saratov, Russia

1H. The influence of potassium guamate on the optical characteristics of peas

Elena V. Timchenko¹, Alisa P. Timchenko², Olga V. Nikulkina²; ¹Samara University, Samara, Russia; ²Lyceum "Technical", Samara, Russia

2H. Application of optical methods to assess the composition of dried and fresh apples

Elena V. Timchenko¹, Lidiia P. Timchenko², Irina V. Kurbatova²; ¹Samara University, Samara, Russia; ²Lyceum "Technical", Samara, Russia

3H. The neutrino oscillations in the external electromagnetic field: prospects of practical application in astronomy

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

²Saratov State University, Saratov, Russia

³Saratov State Medical University, Saratov, Russia

4H. Role of fluorescence in courtship display of jumping spiders *Synageles* sp.

Matvey I. Nikelshparg^{1,2}, Evelina I. Nikelshparg², Sergei Zonstein³, Vasily V. Anikin¹;

¹Saratov State University, Saratov, Russia;

²Ben-Gurion University, Beer-Sheva, Israel;

³Tel-Aviv University, Tel-Aviv, Israel

Workshop English as a Communicative Tool in the Scientific Community XXIII

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 26, Thursday

ROUND TABLE DISCUSSION *(Building 18, Room 110)*

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

12:00-14:00

20 years of experience in translating scientific papers from Russian into English

Vladimir L. Derbov, Saratov State
University, Saratov, Russia

How to teach ESP to beginners

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

ESP: Grammar patterns

Svetlana V. Eremina, Saratov State
University, Saratov, Russia

ROUND TABLE OF HIGH TECHNOLOGIES COMMERCIALIZATION AND REGIONAL INNOVATION SYSTEMS XVIII

Co-chairs: Julia S. Skibina, LLC SPE “Nanostructured Glass Technology”, **Andrey Shuvalov**, LLC SPE “NanostructuredGlassTechnology”, **Sergey N. Sokolov**, RME “INJECT” LLC, Saratov, Russia, **Daniil N. Bratashov**, Saratov State University, **Andrey P. Rytik**, Saratov State University

Secretary: Anastasiya A. Zanishevskaya, LLC SPE “Nanostructured Glass Technology”

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

September 25, Wednesday

INVITED LECTURE/ORAL SESSION ROUND TABLE OF HIGH TECHNOLOGIES COMMERCIALIZATION AND REGIONAL INNOVATION SYSTEMS XVIII (Building 6, Hall 204)

Link to connect online:

<https://telemost.yandex.ru/j/91529721227800>



Co-chairs: Julia S. Skibina, LLC SPE “Nanostructured Glass Technology”, Russia
Andrey Shuvalov, LLC SPE “Nanostructured Glass Technology”, Russia; **Sergey N. Sokolov**, RME “INJECT” LLC, Saratov, Russia; **Daniil N. Bratashov**, Saratov State University, Russia; **Andrey P. Rytik**, Saratov State University, Russia

Saratov time/Moscow time

11:00-11:25/10:00-10:25

Invited

The importance of functional dyes in advancing nanobiochemical pharmacology and toxicology

Neng Yan¹, Alessandro Parodi², ¹School of Environmental Studies, China University of Geosciences, Wuhan, China, ²Scientific Center for Translation Medicine, Sirius University of Science and Technology, Sochi, Russia

11:25-11:40/10:25-10:40

Oral Report

Automated chemical reactor - an assistant in the company's operation

Sergei V. German^{1,2}, Alexey M. Yaschenok^{1,2}, Damir U. Rakhmanov², Vasiliy S. Chernyshev^{2,3}, Dmitry A. Gorin^{1,2}; ¹Skolkovo Institute of Science and Technology, Moscow, Russia; ²TetraQuant LLC, Moscow Russia; ³National Medical Research Center for Obstetrics, Gynecology and Perinatology named after Academician V.I. Kulakov, Moscow, Russia

11:40-11:55/10:40-10:55

Oral Report

System engineering models for the development of medical devices

Daniil N. Bratashov, Science medical center, Saratov state university, Saratov, Russia

11:55-12:10/10:55-11:10

Oral Report

Hyperspectral imaging systems for biomedical applications

Sergei A. Perkov¹, Viktor A. Vorobev^{1,2}, Sergei V. German¹, Sergey Y. Gorodkov³, Dmitry A. Gorin¹, ¹Skolkovo Institute of Science and Technology, Moscow, Russia, ²Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland, ³Saratov State Medical University, Saratov, Russia

12:10-12:25/11:10-11:25

Oral Report

Methodology for creating products or startups

Andrey P. Rytik¹, ¹Saratov State University, Saratov, Russia

12:25-12:40/11:25-11:40

Round Table

HIGH TECHNOLOGIES COMMERCIALIZATION

International School for Students and Young Scientists on Fluorescent Dyes, Proteins, and Instrumentation in Life Sciences

Chair: Alexey A. Pakhomov, Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry of the Russian Academy of Sciences.

Program Committee: Alexey A. Pakhomov, Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry (Russia), **Andrei V. Zvyagin**, Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry (Russia), **Alexander A. Lanin**, Lomonosov Moscow State University (Russia), **Evgeny A. Shirshin**, Lomonosov Moscow State University (Russia), **Dmitry A. Gorin**, SkolTech, Saratov State University (Russia), **Maria V. Lomova**, Saratov State University (Russia), **Afshan Shirkavand**, Medical Laser Research Center, ACECR, Tehran, (Iran).

September 26, Thursday

INVITED LECTURE/ON-LINE SESSION

(Building 8, Hall 420)

Link to connect in Tolka:

<https://onlinessu.ktalk.ru/v4p1rves4d6o>



Chair: Alexey A. Pakhomov, Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia,

Moderator: Maria V. Lomova, Saratov State University, Russia

Saratov time/Moscow time

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

Invited On-line

Fluorescence Lifetime Imaging (FLIM): Principles and Applications

Andrei V Zvyagin; Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia

12:30-13:00/11:30-12:00

Invited On-line

Multiplexed Fluorescence Lifetime Microscopy of Live Cells Using Fluorogen-Activating Proteins

Alexey M. Bogdanov¹; Yulia A. Bogdanova², Ilya D. Solovyev³, Nadezhda S. Baleeva^{2,4}, Ivan N. Myasnyanko^{2,4}, Anastasia A. Gorshkova², Dmitriy A. Gorbachev², Aidar R. Gilvanov², Sergey A. Goncharuk², Marina V. Goncharuk², Konstantin S. Mineev², Alexander S. Arseniev², Alexander P. Savitsky³, Mikhail S. Baranov^{2,4,5}; ¹Department of Photonics, Izmir Institute of Technology, Izmir, Turkey; ²Institute of Bioorganic Chemistry, Russian

Academy of Sciences, Moscow, Russia; ³A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia; ⁴Pirogov Russian National Research Medical University, Moscow, Russia; ⁵Department of Biology, Lomonosov Moscow State University, Moscow, Russia

13:00-13:30/12:00-12:30

Invited

Phosphorescence metal complexes for sensing physiological parameters in biological objects

Kristina S. Kisel¹, Julia R. Shakirova¹, Ilya S. Kritchenkov¹, Vadim A. Baigildin¹, Anastasia I. Solomatina¹, Nina A. Zharskaia¹, Sergey A. Silonov^{1,2}, Sergey P. Tunik¹; ¹Saint Petersburg State University, Saint Petersburg, Russia, ²Institute of Cytology, Russian Academy of Sciences, Saint Petersburg, Russia

13.30-14.00
Coffee break

14:00-14:30/13:00-13:30

Invited On-line

Contemporary fluorescent dyes for molecular and cell biology

Alexey V. Ustinov^{1,2}; ¹Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia; ²Lumiprobe RUS Ltd., Moscow, Russia

14:30-15:00/13:30-14:00

Invited On-line

Fluorescent styryl dyes in nucleic acid and cell research

Olga A. Fedorova¹, Ekaterina Y. Chernikova¹, Maria A. Ustimova¹, Vladimir B. Tsvetkov², Nelly S. Chmelyuk³, Maxim A. Abakumov³, and Yuri V. Fedorov¹; ¹A.N. Nesmeyanov Institute of Organoelement Compounds of the Russian Academy of Sciences, Russia; ²I.M. Sechenov First Moscow State Medical University; ³Pirogov Russian National Research Medical University, Russia

15:00-15:30/14:00-14:30

Invited

Derivatives of BODIPY dye for bioimaging and therapy

Alexey A. Pakhomov; Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia

15:30-16:00/14:30-15:00

Invited *On-line*

Multifunctional biocompatible nanostructures for targeted phototherapy

Viktoria O. Shipunova; Moscow Institute of Physics and Technology, Moscow Region, Russia

16.00-16.30
Coffee break

16:30-17:00/15:30-16:00

Invited *On-line*

Diffuse optical spectroscopy for investigation of biological tissues

Ilya V. Turchin; Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

17:00-17:30/16:00-16:30

Invited

Modern nonlinear microscopy: deep, functional and label-free

Aleksandr A. Lanin, M.V. Lomonosov Moscow State University, Life Improvement by Future Technologies (LIFT) center, Skolkovo, Moscow, Russia

17:30-18:00/17:30-18:00

Invited

Magnetic CaCO₃-protein-cyanine dyes multicomposite for visualization by fluorescent and non-labeling methods

Maria V. Lomova; Saratov State University, Russia
Russia

Invited *Record*

Light/Laser Application in Drug Delivery in Photodynamic therapy

Afshan Shirkavand¹, Leila Ataie Fashtami^{1,2}; ¹Department of Photodynamic, Medical Laser Research Center (MLRC), Yara Institute, ACECR, Tehran, Iran, ²Department of Regenerative Medicine, Royan Institute for Stem Cell Biology & Technology, ACECR, Tehran, Iran