

Dedicated to the 75th Anniversary of the Physics Department of Saratov State University

Saratov Fall Meeting

SFM'20

8th International Symposium “Optics and Biophotonics”

**24th International School for Junior Scientists and Students on Optics,
Laser Physics & Biophotonics**

Towards Optical and Multimodality Translational Imaging TOMTI-20

**Chinese-Russian Workshop on Biophotonics and Biomedical Optics
ChRW-2020**

Schedule of SFM-20/TOMTI-20/ChRW-20

September 28, Monday (China time UTC+8; Saratov time UTC+4)

8.40-8.50 (China time: 12.40-12.50)	Introduction to ChRW Program Valery V. Tuchin, Saratov State University, Russia; Dan Zhu, Huazhong University of Science and Technology, China				Zoom
8.50-12.30 (12.50-16.30)	ON-LINE ChRW INVITED LECTURE SESSION I Chairs: Dan Zhu, Huazhong Univ. of Science and Technology, China Valery V. Tuchin, Saratov State Univ., Russia				Zoom
12.30-12.50 (16.30-16.50)	Coffeebreakfor own				
12.50-15.50 (16.50-19.50)	ON-LINE ChRW INVITED LECTURE SESSION II Chairs: Hui Ma, Tsinghua Univ., China Mikhail Yu. Kirillin, Inst. of Applied Physics RAS, Russia	Zoom Building 10, Hall 511	14.00-15.00	OSA SHORT COURSE Fluorescence Imaging with Endogenous Contrast for Biomedical Diagnostics Evgeny A. Shirshin, Faculty of Physics, M.V. Lomonosov Moscow State University, Russia	Zoom Building 10, Main Conference Hall
15.50-16.10 (19.50-20.10)	Coffeebreakfor own		15.00-15.30	Coffee break	Building 10
16.10-17.50 (20.10-21.50)	ON-LINE ChRW INVITED/ORAL LECTURE SESSION III Chairs: Gang Liu, Xiamen Univ., China Oxana V. Semyachkina-Glushkovskaya, Saratov State Univ., Russia	Zoom Building 10, Hall 511	15.30-16.30	OSA SHORT COURSE Fluorescence Imaging with Endogenous Contrast for Biomedical Diagnostics Evgeny A. Shirshin, Faculty of Physics, M.V. Lomonosov Moscow State University, Russia	Zoom Building 10, Main Conference Hall

September 29, Tuesday (Saratov time UTC+4)

8.50-12.30 (13.50-16.30)	ON-LINE ChRW INVITED/ORAL LECTURE SESSION IV Chairs: Buhong Li , Fujian Normal Univ., Fuzhou, China Dmitry E. Postnov , Saratov State Univ., Russia	<i>Zoom Building 10, Hall 511</i>	10.00-11.00	SPIE SHORT COURSE Combination of Photonics Tools with Nanostructured Particles for Biomedical Applications Dmitry A. Gorin , Center for Photonics and Quantum Materials, Skolkovo Institute of Science and Technology, Moscow, Russia	<i>Zoom Building 10, Main Conference Hall</i>
12.30-12.50 (16.30-16.50)	Coffeebreak for own		11.00-11.30	Coffeebreak	<i>Building 10</i>
12.50-13.30 (16.50-17.30)	ON-LINE ChRW INVITED/ORAL LECTURE SESSION V Chairs: Junle Qu , Shenzhen Univ., China Valery V. Tuchin , Saratov State Univ., Russia	<i>Zoom Building 10, Hall 511</i>	11.30-12.30	SPIE SHORT COURSE Combination of Photonics Tools with Nanostructured Particles for Biomedical Applications Dmitry A. Gorin , Center for Photonics and Quantum Materials, Skolkovo Institute of Science and Technology, Moscow, Russia	<i>Zoom Building 10, Main Conference Hall</i>
13.30-13.40 (17.30-17.40)	Closing of the ChRW Dan Zhu , Huazhong Univ. of Science and Technology, China Valery V Tuchin , Saratov State Univ., Russia				<i>Zoom Building 10, Hall 511</i>
13.55-14.00	Introduction to SFM/TOMTI/ChRW Program Valery V. Tuchin , Saratov State University, Russia				<i>Zoom Building 10, Hall 511</i>
ON-LINE SFM/TOMTI/ChRW PLENARY SESSION I Chairs: Valery V. Tuchin , Saratov State University, Russia Alexei A. Bogdanov Jr. , University of Massachusetts Medical School, Worcester MA, USA					
14.00-14.40 (Local time: 12.00-12.40)	Mechanisms of Recovery Functions of Sleep: The Role of the Meningeal Lymphatic System Thomas Penzel , Interdisciplinary Center of Sleep Medicine in Charité – Universitätsmedizin Berlin, Germany				
14.40-15.20 (12.40-13.20)	Nonlinear Analysis of Electrical Activity of Sleep Brain: Photostimulation of the Meningeal Lymphatic System Juergen Kurths , Physics Department, Humboldt University, Berlin; Potsdam Institute for Climate Impact Research, Potsdam, Germany				
15.20-16.00 (15.20-16.00)	Multimodal Optical Diagnostics of Cancer Valery P. Zakharov , Samara National Research University, Samara, Russia				

16.00-16.40 (14.00-14.40)	Adapting to a Pandemic & An International Clinical Trial with Diffuse Optics Marco Pagliuzzi, Lorenzo Cortese, Umut Karadeniz, ICFO; Jaume Mesquida, Hospital de Sabadell, Institut Universitari Parc Taulí; Turgut Durduran, ICFO-The Institute of Photonic Sciences, Barcelona, Spain, Inst. Catalana de Recerca i Estudis Avançats (ICREA)		
16.40-17.20 (14.40-15.20)	Clinical Biophotonics - From Bench to Bedside Juergen Popp, Leibniz Institute of Photonic Technology, Jena, Germany		
14.00-17.20 (13.00-16.20)	ON-LINE INVITED/ORAL TERAHERTZ OPTICS AND BIOPHOTONICS Chair: Nikita V. Chernomyrdin, GPI RAS, Russia	<i>Zoom</i>	ON-LINE INVITED/ORAL ADVANCED MATERIALS FOR OPTICS AND BIOPHOTONICS Chair: Gleb M. Katyba, ISSP RAS, Russia <i>Zoom</i>
17.20-17.30	Coffee break for own		
ON-LINE SFM/TOMTI/ChRW PLENARY SESSION II Chairs: Valery V. Tuchin, Saratov State University, Russia Valery P. Zakharov, Samara National Research University, Samara, Russia			
17.30-18.00 (09.30-10.00)	Magnetic Resonance Imaging and Optical Clearing Alexei A. Bogdanov Jr., University of Massachusetts Medical School, Worcester MA, USA; A.N. Bakh Institute of Biochemistry, Federal Research Center "Fundamentals of Biotechnology" of the Russian Academy of Sciences and Moscow State University, Moscow, Russia		
18.00-18.20 (17.00-17.20)	Aspect Imaging Compact Preclinical Permanent Magnets: Technology and Applications Kobi Katsobashvili, Aspect Imaging Ltd., Shoam, Israel		<i>Zoom</i>
18.20-19.00 (10.20-11.00)	Modeling of Speckle Contrast and Dynamics in the Single and Few Scattering Region David Boas, Boston University, Boston, USA		<i>Building 10 Hall 511</i>
19.00-19.15 (17.00-17.15)	FLIM and FCS Microscopy in Biophysics and Biochemistry PicoQuant Mathias Bayer, PicoQuant GmbH, Berlin, Germany		
19.15-19.55 (11.15-11.55)	Ubiquitous Terahertz Photonics Maksim Skorobogatiy, Department of Engineering Physics, Polytechnique Montreal, Canada		
19.55-20.35 (10.55-11-35)	Optoacoustics: Emerging Imaging and Theranostic Modality Rinat O. Esenaliev, University of Texas Medical Branch, Galveston, Texas, USA		

September 30, Wednesday (Saratov time UTC+4)

ON-LINE SFM/TOMTI/ChRW PLENARY SESSION III

Chairs: **Valery V. Tuchin**, Saratov State University, Russia
Peter S. Timashev, Institute for Regenerative Medicine, Sechenov University

9.00-9.40 (22.00-22.40)	Development of Sub-Millimeter Multifunction Optical Endoscopes Jennifer Barton , University of Arizona, Tucson, Arizona, USA	Zoom Building 10, Hall 511
9.40-10.20 (14.40-15.20)	Whole-Body/Organ Imaging with Single-Cell Resolution by CUBIC Hiroki R. Ueda , The University of Tokyo/RIKEN BDR, Tokyo, Japan	
10.20-11.00 (9.20-10.00)	Design of Tunable Colloidal Interactions in External Rotating Electric and Magnetic Fields Stanislav O. Yurchenko , Bauman Moscow State Technical University, Moscow, Russia	
11.00-11.40 (11.00-11.40)	Nucleic Acid & Au Nanoparticles-Based Advanced Functional Biomaterials Timofey E. Pylaev , Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia	
11.40-12.00	Coffee break for own	

ON-LINE SFM/TOMTI/ChRW PLENARY SESSION IV

Chairs: **Valery V. Tuchin**, Saratov State University, Russia
Timofey E. Pylaev, Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia

12.00-12.40 (11.00-11.40)	Quantum Computing with High-Dimensional Systems Alexei K. Fedorov , Russian Quantum Center, Skolkovo, Moscow Institute of Physics and Technology, Russia	Zoom Building 10, Hall 511
12.40-13.20 (11.40-12.20)	Decellularized Materials in Regenerative Medicine Through the Prism of Biophotonics Peter S. Timashev , Institute for Regenerative Medicine, Sechenov University, Department of Polymers and Composites, N.N. Semenov Institute of Chemical Physics of RAS, Institute of Photonic Technologies, Research Center "Crystallography and Photonics" of RAS, Russia	
13.20-13.50 (11.20-11.50)	Fiber Photonics for Life: News & Dreams Viacheslav Artyushenko , art photonics GmbH, Berlin, Germany	

SFM Registration and coffee breaks take place at sessions of each conference separately

10.20-12.30	ON-LINE ORAL LOW-DIMENSIONAL STRUCTURES Chair: Olga Glukhova , Saratov State Univ., Russia	<i>Google Meet</i>	13.30-15.50	ORAL SESSION BIOCOMPUTING I Chairs: Dmitry E. Postnov , Saratov State Univ., Russia	<i>Building 5, Hall 72</i>	
13.50-15.00	Lunch for own					
15-00-19.30	JOINT INVITED LECTURE/ORAL SESSION BIOPHYSICS I / NANOBIPHOTONICS I Chair: Yury Kistenev , Tomsk State Univ., Russia	<i>Building 10, Main Conference Hall</i>	ON-LINE INVITED LECTURE/ORAL SESSION NANOBIPHOTONICS II Chair: Nikolai G. Khlebtsov , IBPPM RAS, Saratov State Univ., Russia	<i>Zoom</i>	ORAL SESSION SPECTROSCOPY I Chair: Lev M. Babkov , Saratov State Univ., Russia	<i>Building 3, Room 34</i>
	ON-LINE JOINT INVITED LECTURE/ORAL SESSION BIOPHYSICS II & BIOMEDICAL SPECTROSCOPY I Chair: Ekaterina Borisova , Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria Moderator: Isabella Serebryakova , Saratov State Univ., Russia	<i>Zoom</i>	ON-LINE ORAL SESSION LASER PHYSICS&PHOTONICS Chair: Vladimir L. Derbov , Saratov State Univ., Russia	<i>Zoom</i>	LECTURE/ORAL SESSION EDUCATION I Chairs: Boris A. Medvedev , Saratov State Univ., Russia	<i>Building 3, Hall 51</i>
14-45-15.00 (13.45-14.00)	TOMTI OPENING Alexander G. Gabibov , IBCh RAS, Moscow, Russia				<i>Zoom</i>	
15-00-18.00 (14.00-17.00)	TOMTI ON-LINE INVITED LECTURE SESSION I Chairs: Alexei A. Bogdanov Jr. , University of Massachusetts Medical School, Worcester MA, USA Victoria Zherdeva , Federal State Institution «Federal Research Centre «Fundamentals of Biotechnology» of the Russian Academy of Sciences», Moscow, Russia				<i>Zoom</i>	

October 1, Thursday (Saratov time UTC+4)

10.00-13.00	<p>JOINT INVITED/ORAL SESSION BIOPHYSICS III, MICROSCOPY & BIOMEDICAL SPECTROSCOPY</p> <p>Chair: Vladimir Y. Zaitsev, Inst. of Applied Physics of the RAS, Russia</p>	<i>Building 10, Main Conference Hall</i>
10.00-10.30 (9.00-9.30)	<p>TOMTI ON-LINE INVITED LECTURE SESSION II</p> <p>Chairs: Alexei A. Bogdanov Jr., University of Massachusetts Medical School, Worcester MA, USA Victoria Zherdeva, Federal State Institution «Federal Research Centre «Fundamentals of Biotechnology» of the Russian Academy of Sciences», Moscow, Russia</p>	<i>Zoom</i>
10.30-13.10 9.30-12.10)	<p>TOMTI ON-LINE INTERNET REPORT/POSTER SESSIONS</p> <p>Chairs: Alexei A. Bogdanov Jr., University of Massachusetts Medical School, Worcester MA, USA Victoria Zherdeva, Federal State Institution «Federal Research Centre «Fundamentals of Biotechnology» of the Russian Academy of Sciences», Moscow, Russia</p>	<i>Zoom</i>
14.00-14.40	<p>PUBLIC LECTURE SESSION MODERN OPTICS</p> <p>Chair: Irina Yu. Yanina, Saratov State University</p> <p>A journey into the microcosmos: where does optics meet acoustics? Dmitry A. Gorin, Center for Photonics and Quantum Materials, Skolkovo Institute of Science and Technology, Moscow, Russia</p> <p>Photonics in Medicine in 2020: What's New? Evgeny A. Shirshin, Faculty of Physics, M.V. Lomonosov Moscow State University, Russia</p>	<i>Zoom</i>
<p>ON-LINE SFM/TOMTI/ChRW PLENARY SESSION V</p> <p>Chairs: Alexei A. Bogdanov Jr., University of Massachusetts Medical School, Worcester MA, USA Valery V. Tuchin, Saratov State University, Russia</p>		
15.00-15.25 (14.00-14.25)	<p>Visualization of Histone Epigenetics: A New Way to Track Single-Cell Physiology Konstantin A. Lukyanov, Center of Life Sciences, Skolkovo Institute of Science and Technology, Moscow, Russia</p>	<i>Zoom</i>
15.25- 15.40(14.25- 14.40)	<p>Super-resolution with very low laser power, ideal for long term imaging Peter Drent, Confocal.nl, Amsterdam, The Netherlands</p>	
15.40-16.20 (6.40-7.20)	<p>Live Biophotonic Analysis of Early Mammalian Embryonic Processes Irina V. Larina, Baylor College of Medicine, Houston, USA</p>	

16.20-17.00 (8.20-9.00)	Image-Guided Precision Nanomedicine for Cancer Therapy Anna Moore , Departments of Radiology and Physiology, Precision Health Program, College of Human Medicine, Michigan State University, East Lansing, USA			
17.00-17.40 (9.00-9.40)	Molecular Imaging Using Time Domain Fluorescence Anand T.N. Kumar , Harvard Medical School, Optical Molecular Imaging Laboratory, Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, USA			
17.40-18.00 (15.40-16.00)	Preclinical & Multimodality Imaging MR SOLUTIONS Fabrice Chaumard , MR Solutions Ltd, Ares, France			
15.30-17.45	LECTURE/ORAL SESSION II Chair: Boris A. Medvedev , Saratov State Univ., Russia			<i>Building 3, Hall 51</i>
18.00-20.00	JOINT POSTER/INTERNET SESSION Chairs: Ivan V. Fedosov , Oleg Grishin , Saratov State Univ., Russia Moderators: Ivan V. Fedosov , Michael M. Slepchenkov , Vasily B. Ageev , Alexander I. Dubrovsky , Saratov State Univ., Russia			<i>Building 3</i>
October 2, Friday (Saratov time UTC+4)				
10.00-18.00	ORAL SESSION BIOCOMPUTING II Chair: Dmitry E. Postnov , Saratov State Univ., Russia	<i>Building 5, Hall 72</i>	ROUND-TABLE DISCUSSION EDUCATION Chair: Boris A. Medvedev , Saratov State Univ., Russia	<i>Building 3, Hall 51</i>
	ORAL SESSION NONLINEAR DYNAMICS Chair: Vadim S. Anishchenko , Saratov State Univ., Russia			<i>Building 3, Room 38; Zoom</i>

8th International Symposium on Optics and Biophotonics

Conference on Optical Technologies in Biophysics & Medicine XXII

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

Secretary: **Polina A. Dyachenko(Timoshina)**, Saratov State University, National Research Tomsk State University

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

September 30, Wednesday

JOINT INVITED LECTURE/ORAL SESSION BIOPHYSICS I&NANOBIOPHOTONICS I (Building 10, Main Conference Hall)

Chair: **Yury Kistenev**, Tomsk State University, Russia

15.00-15.20

Invited

Laser-Ablated Silicon Nanoparticles for Optical Bioimaging

Stanislav V. Zobotnov¹, Leonid A. Golovan¹, Daria A. Kurakina², Aleksandr V. Khilov², Fedor V. Kashaev¹, Olga I. Sokolovskaya¹, Pavel K. Kashkarov¹, Ekaterina A. Sergeeva^{1,2}, Mikhail Yu. Kirillin²; ¹M.V. Lomonosov Moscow State University, Faculty of Physics, Moscow; ²Institute of Applied Physics RAS, Nizhny Novgorod, Russia

15.20-15.40

Invited

Relaxation and Osmotic-Induced Slow Strain Mapping in Biological Tissues by Optical Coherence Elastography

Yulia A. Alexandrovskaya¹, O.I. Baum¹, A.A. Sovetskiy², A.L. Matveyev², L.A. Matveev², V.Yu. Zaitsev²; ¹Institute of Photon Technologies, Federal Scientific Research Center "Crystallography and Photonics", RAS, Troitsk, Moscow; ²Institute of Applied Physics RAS, Nizhny Novgorod, Russia

15.40-16.00

Invited

Combined Usage of OCT-Elastography and OCT-Angiography for Quantitative In Vivo Assessment of Functional and Morphological Alterations in Model Tumors Treated by PDT and Chemotherapy

Marina A. Sirotkina¹, E.V. Gubarkova¹, A.A. Plekhanov¹, A.A. Sovetskiy², V.V. Elagin¹, A.L. Matveyev¹, L.A. Matveev¹, S.S. Kuznetsov³, E.V. Zagaynova¹, N.D. Gladkova¹, Vladimir Y. Zaitsev²; ¹Privolzhsky Research Medical University; ²Institute of Applied Physics RAS; ³N.A. Semashko Nizhny Novgorod Regional Clinical Hospital, Nizhny Novgorod, Russia

**ON-LINE JOINT INVITED
LECTURE/ORAL SESSION
BIOPHYSICS II & BIOMEDICAL
SPECTROSCOPY I**

**(Building 10, Hall 511,
Zoom link:**

<https://osachapter.zoom.us/j/98300886300>

Chair: **Ekaterina Borisova**, Institute of
Electronics, Bulgarian Academy of Sciences,
Sofia, Bulgaria

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

17.00-17.20 (Local time: 16.00-16.20)

Invited

**Optical Bioimaging of Connective Tissue in
Norm and Lichen Sclerosus**

Marina A. Sirotkina, A.L. Potapov, V.V.
Dudenkova, A.A. Moiseev, M.M. Karabut, I.A.
Kuznetsova, N.D.Gladkova; Privolzhsky Research
Medical University, Nizhny Novgorod, Russia

17.20-17.40 (15.20-15.40)

Invited

**Interstitial PDT of Glioblastoma – Status and
Perspectives**

Adrian Rühm and Ronald Sroka, Laser-
Forschungslabor, LIFE Center, Department of
Urology, University Hospital, LMU Munich, Munich,
Germany

17.40-18.00 (15.40-16.00)

Invited

**Skin Reflectance: How Long the Photons
Travel until Remission**

Janis Spigulis, Vanesa Lukinsone, Anna
Maslobojeva, UldisRubins, Maris Kuzminskis
Biophotonics Laboratory, Institute of Atomic
Physics and Spectroscopy, University of Latvia,
Riga

18.00-18.20 (10.00-10.20)

Invited

**Dynamic Imaging of the Lymphatic Drainage
from the Eye in Mice by Multispectral
Photoacoustic Tomography**

Vladislav Toronov^{1,2}, Balal Mian¹, Yeni Yucel^{1,2,3},
Xun Zhou^{3,1}, Ryerson University,²The Institute for
Biomedical Engineering, Science & Technology
(iBEST) St. Michael's Hospital,³Keenan Research
Centre for Biomedical Science of St. Michael's
Hospital, Toronto, Canada

18.20-18.40 (9.20-9.40)

Invited

**Optical Coherence Tomography of
Preimplantation Embryonic Development In
Vivo**

Irina V. Larina Baylor College of Medicine.
Houston, USA

18.40-19.00 (17.40-18.00)

Invited

**Fluorescence diagnostics of soft tissues
neoplasia**

Ekaterina Borisova¹, Tsanislava Genova¹,
Petranka Troyanova², Elmira Pavlova³, Borislav
Vladimirov²; ¹Institute of Electronics, Bulgarian
Academy of Sciences; ²University Hospital
"Tzaritza Yoanna – ISUL"; ³"St. Panteleimon"
General Hospita, Sofia, Bulgaria

19.00-19.15 (18.00-18.15)

**Influence of Active Er-laser Delivery on the
Optical Properties of Drug**

A.V. Belikov, S.N. Smirnov, Anastasia D.
Tavalinskaya, ITMO University, S.-Peterburg,
Russia

October 1, Thursday

**JOINT INVITED/ORAL SESSION
BIOPHYSICS III, MICROSCOPY, &
BIOMEDICAL SPECTROSCOPY II
(Building 10, Main Conference Hall)**

Chair: **Vladimir Y. Zaitsev**, Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia

10.00-10.20

Assessment of Changes in the Viscosity Properties of Tumor Cell Membranes under the Influence of Chemotherapeutic Agents

Liubov Shimolina^{1,2}, Marina Shirmanova¹, Marina Kuimova³, Maria. Lukina¹, Irina Druzhkova¹, Elena Zagaynova¹; ¹Privolzhsky Research Medical University, Nizhny Novgorod; ²Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia; ³Imperial College London, South Kensington, London, United Kingdom

10.20-10.40

In-vivo Holographic Laser Speckle Contrast Imaging of Brain Tissues with Pathological Vascular Conditions

Arkady Abdurashitov¹, Natalia Shushunova², Olga Sindeeva^{1,2}, Oxana Semyachkina-Glushkovskaya², Valery Tuchin^{2,3,4,1}Skolkovo Institute of Science and Technology, Skolkovo Innovation Center;²Saratov State University; ³Tomsk State University; ⁴Institute of Precision Mechanics and Control, RAS, Saratov, Russia

10.40-11.00

Invited

In Vivo Multimodal Optical Imaging of Equivocal Melanocytic Skin Lesions

Vadim Elagin¹, E. Gubarkova¹, O. Garanina¹, D. Davydova¹, N. Orlinskaya¹, L. Matveev², I. Klemenova¹, I. Shlivko¹, E. Zagaynova^{1,1}Privolzhsky Research Medical University;²Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia

11.00-11.20

Optical properties of functionally relevant human brain areas

Ksenia Achkasova¹, Alexander Moiseev², Konstantin Yashin¹, Elena Kiseleva¹, Eugenia Bederina¹, Anna Epishkina¹, Natalia Gladkova¹; ¹Privolzhsky Research Medical University; ²Institute of Applied Physics Russian Academy of Science, Nizhny Novgorod, Russia

**POSTER SESSION BIOPHYSICS
(Building 3, 3rd floor Hall)**

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

18.00-20.00

1B. One-Step Synthesis of Biotinylated Gold Nanoparticles for Application in Immunoassay Alina A. Kokorina, Irina Yu. Goryacheva, Saratov State University, Saratov, Russia

2B. Quantitative Benign and Malignant Human Breast Tumors Assessment Using Cross-Polarization Optical Coherence Tomography Ekaterina V. Gubarkova¹, Alexander A. Moiseev², Elena B. Kiseleva¹, Dmitry A. Vorontsov, Sergey S. Kuznetsov¹, Alexey Y. Vorontsov, Grigory V. Gelikonov², Elena V. Zagaynova¹, Marina A. Sirotkina¹, Natalia D. Gladkova¹; ¹Privolzhsky Research Medical University; ²Institute of Applied Physics RAS, Nizhny Novgorod, Russia

3B. Possibilities of Optical Coherence Elastography for Determining of Changes in Tumor Tissue Stiffness Value Post Neoadjuvant Chemotherapy Anton A. Plekhanov¹, Marina A. Sirotkina¹, Sergey S. Kuznetsov¹, Alexander A. Sovetsky², Ekaterina V. Gubarkova¹, Vladimir Y. Zaitsev², Natalia D. Gladkova¹; ¹Privolzhsky Research Medical University; ²Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia

4B. Metabolism of Stem Cell Grown on Heterogeneous Tissue-Engineered Scaffolds Vadim Elagin¹, S. Rodimova^{1,2}, N.V. Minaev³, A.I. Shpichka⁴, E.V. Zagaynova^{1,2}, P.S. Timashev^{3,4}, D.S. Kuznetsova^{1,1}Privolzhsky Research Medical University;²Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod;³Shubnikov Institute of Crystallography, Federal Scientific Research Centre "Crystallography and Photonics" RAS, Moscow;⁴Institute for Regenerative Medicine, Sechenov First Moscow State Medical University, Moscow, Russia

5B. The Influence of Various Anatomical and Physiological Parameters of the Small Intestine on Its Trans-Serosal Multimodal OCT Imaging Elena B. Kiseleva^{1,2}, Maxim G. Ryabkov¹, Evgenia L. Bederina¹, Mikhail A. Sizov³, Alexander N. Vorobyov³, Alexander A. Moiseev⁴, Natalia D. Gladkova^{1,2,1}Privolzhsky Research Medical University;²Institute of Experimental Oncology and Biomedical Technologies;³Nizhny Novgorod State Budgetary Healthcare Institution "City Clinical Hospital No.

- 30";⁴Institute of Applied Physics of the RAS, Nizhniy Novgorod, Russia
- 6B. **Determination of the Binary Diffusion Coefficient of an Iodine-Glycerol Preparation (Lugol) in the Dentin of a Human Tooth** Alexey A. Selifonov^{1,2}, V.V. Tuchin^{1,3,4,5}; ¹Saratov State University; ²Saratov State Medical University; ³National Research Tomsk State University; ⁴Institute of Precision Mechanics and Control of the RAS, Saratov; ⁵A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the RASncs, Moscow Russia
- 7B. **Tissue Optical Clearing in the Ultraviolet for Clinical Use in Dentistry to Optimize the Treatment of Chronic Recurrent Aphthous Stomatitis** Alexey A. Selifonov^{1,2}, V.V. Tuchin^{1,3,4,5}; ¹Saratov State University; ²Saratov State Medical University; ³National Research Tomsk State University; ⁴Institute of Precision Mechanics and Control of the RAS, Saratov; ⁵A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the RASncs, Moscow, Russia
- 8B. **Recent advances in the laser radiation transport through the head tissues of humans and animals (review)** Alaa Sabeeh Shanshool¹, Valery Tuchin^{1,2,3}; ¹Saratov State University; ²National Research Tomsk State University; ³Institute of Precision Mechanics and Control of the RAS, Saratov, Russia
- 9B. **Urethral Pain Syndrome: Role of Cross-Polarization OCT in the Study of the Disease Pathogenesis** Olga S. Streltsova¹, Anton S. Kuyarov¹, Alexander A. Moiseev², Muhammad A. Molvi¹, Elena B. Kiseleva^{1,3}; ¹Privolzhsky Research Medical University, Department of urology named after E.V. Shakhov; ²Institute of Applied Physics RAS; ³Institute of Experimental Oncology and Biomedical Technologies, Nizhniy Novgorod, Russia
- 10B. **Determination of Male Reproductive Function Using Microstructural Waveguides** Pavel A. Lepilin^{1,2,3}; Gennady T. Sukhikh⁴, Julia S. Skibina^{2,3}, Anastasia A. Zanishevskaya^{2,3}, Andrey A. Shuvalov^{2,3}, Natalia O. Yanchuk³, Aleksey Yu. Gryaznov^{2,3}, Anastasia Sysoeva⁴, Nataliya P. Makarova⁴, Elena A. Kalinina⁴; ¹Saratov State University; ²LLC SPE "Nanostructured Glass Technology"; ³International Research and Education Center "Structural Nanobiophotonics", Saratov; ⁴Research Center for Obstetrics, Gynecology and Perinatology, Moscow, Russia
- 11B. **Hormone Sensor Based On Microstructural Waveguides** Daria Shumarina¹, J.S. Skibina², A.A. Zanishevskaya², A.U. Gryaznov²; ¹Saratov State University; ²SPE LLC Nanostructural Glass Technology, Saratov Russia
- 12B. **Use of a Tilted Diffractive Lens with an Increased Depth of Field in Decision-Making Systems Based on Computer Vision** Alexey Dzyuba¹, Pavel Serafimovich², Svetlana Khonina^{2,3}, Sergei Popov^{2,3}; ¹ITMO University, S.-Petersburg; ²Image Processing Systems Institute; ³Samara National Research University, Russia
- 13B. **Diagnostics of Coupling between Autonomous Regulation of Heart Rate Variability and Respiration In Different Phases of Sleep, Taking into Account the Age of the Subjects** Alexey N. Hramkov¹, E.I. Borovkova^{1,2,3}, A.S. Karavaev^{1,2,3}; ¹Saratov State University; ²Saratov State Medical University named after V. I. Razumovsky; ³Saratov branch of the IRE named after V. A. Kotelnikov RAS, Saratov, Russia
- 14B. **Effect of Low-Intensity Electromagnetic Field on Dehydration Self-Assembly of Core Histones H3.2 and H4** Anna V. Egorova¹, Grigory E. Brill², Olga V. Ushakova³; ¹Russian National Research Medical University n.a. N.I. Pirogova, Moscow; ²Saratov State Medical University n.a. V.I. Razumovsky; ³Yuri Gagarin State Technical University of Saratov, Saratov, Russia
- 15B. **Comparative OCT Study of Optical Clearing of Human Skin In Vivo with Phototypes II and VI** Isabella A. Serebryakova¹, Yury I. Surkov¹, Elina A. Genina^{1,2}, Alexey N. Bashkatov^{1,2}, Valery V. Tuchin^{1,2,3}, Vladimir Zharov⁴; ¹Saratov State University; ²Tomsk State University; ³Institute of Precision Mechanics and Control of the RAS, Saratov, Russia; ⁴Arkansas Nanomedicine Center, University of Arkansas for Medical Sciences, Little Rock, AR USA
- 16B. **Effect of Ex Vivo Skin Drying on Collimated Transmittance Spectra Kinetics** Sergey Zaytsev^{1,2}, Alexey N. Bashkatov^{1,3}, Walter Blondel², Marine Amouroux², Valery V. Tuchin^{1,3,4}, Elina A. Genina^{1,3}; ¹Saratov State University, Russia; ²Université de Lorraine, Nancy, France; ³Tomsk State University; ⁴Institute of Precision Mechanics and Control, RAS, Saratov, Russia
- 17B. **OCT Analysis of In Vivo Human Skin Optical Clearing Combined with Physical and Chemical Permeation Enhancers** Sergey Zaytsev^{1,2}, Victoria Charykova¹, Munira Uysupova¹, Alexey N. Bashkatov^{1,3}, Valery V. Tuchin^{1,3,4}, Elina A. Genina^{1,3}; ¹Saratov State University, Russia; ²Université de Lorraine, Nancy, France; ³Tomsk State University; ⁴Institute of Precision Mechanics and Control, RAS, Saratov, Russia

- 18B. **Detection of Melanoma Tumor Cells In Vivo and In Vitro** O.Avramets¹, Ekaterina Dmitrienko², E. Kurochkina², E. Osintsev², O. Inozemtseva³, A. Fedonnikov², D. Bratashov³, G.A. Afanasieva^{2,1} Smolensk State Medical University; ²Saratov State Medical University. V.I. Razumovsky; ³Saratov State University, Russia
- 19B. **On the Possibility of Intensifying the Photochemical Stage of Scleral Collagen Riboflavin/UV Crosslinking by Tissue Optical Clearing** Marina E. Shvachkina¹, Alexander B. Pravdin¹, Yury V. Kistenev², Dmitry A. Yakovlev¹; ¹Saratov State University, Saratov; ²Tomsk State University, Tomsk, Russia
- 20B. **Effect of Silicon Nanoparticles on Microrheologic Parameters of Red Blood Cells** Arseniy Kapkov¹, Petr Ermolinskiy¹, Alexey Popov³, Andrei Lugovtsov^{1,2}, Alexander Priezhev^{1,2}; ¹Physics Department, Lomonosov Moscow State University; ²International Laser Centre, Lomonosov Moscow State University, Russia; ³Opto-Electronics and Measurement Techniques, University of Oulu, Oulu, Finland
- 21B. **The Process of Erythrocytes Grouping by Ultrasound Standing Wave** Valery A. Doubrovski¹, Sergey V. Markov^{1,2}, S. O. Torbin¹; ¹Saratov State Medical University; ²Saratov State University, Saratov, Russia
- 22B. **A Photoacoustic Monitoring of Circulating Tumor Cells in Mice with Melanoma** Oleg Grishin¹, Arkadii Abdurashitov², Nataliya Shushunova¹, Roman Verkhovskii¹, Evgenii Shashkov³, Daniil Bratashov¹, Vladimir P. Zharov⁴, Olga Inozemtseva¹; ¹Saratov State University, Saratov; ²Skolkovo Institute of Science and Technology, Skolkovo Innovation Center, Moscow; ³Prokhorov General Physics Institute of RAS, Moscow, Russia; ⁴University of Arkansas for Medical Sciences, Little Rock, AR, USA

Workshop on Laser Physics and Photonics XXII

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

Secretary: **Anna V. Novoselova**, Saratov State University (Russia)

International Program Committee **Vladimir L. Derbov** (Chair), Saratov State University (Russia), **Alexander V. Gorokhov**, Samara State 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**, Saratov State Technical University (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)

September 30, Wednesday

ORAL SESSION PHOTONICS

(Zoom link:

<https://us02web.zoom.us/j/89528697709>

Conference ID: 895 2869 7709

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

15.00-15.20

Study of local optical nonlinear response using time-resolved inline digital holography
Belashov A.V., ITMO University, Ioffe Institute, St. Petersburg, Russia; Shevkunov I.A., ITMO University, St. Petersburg, Russia, Tampere University, Tampere, Finland; Nalegaev S.S., Putilin S.E., Petrov N.V., ITMO University, St. Petersburg, Russia; Cheng C.J., National Taiwan Normal University, Taipei, Taiwan

15.20-15.40

Airy beams for laser manipulation of airborne light-absorbing particles.

Alexey Porfirev, Image Processing Systems Institute of RAS—Branch of the FSRC “Crystallography and Photonics” RAS

15.40-16.00

Influence of temperature on the shape of Ramsey resonances detected in an optically dense medium.

Voloshin G.V., Barantsev K.A., Litvinov A.N. Peter the Great St. Petersburg Polytechnic University

16.00-16.20

Tunneling of wave packets through photonic band-gap structures

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

16.20-16.40

Coffee Break

14.40-17.00

Investigation of entangled States of two interacting qubits in the fields of the laser and thermostat by integrating along paths.
Shleenkov Mark, Biryukov Alexander, Samara National Research University, Samara, Russia

17.00-17.20

Electromagnetically induced transparency of powerful probe pulses.
Parshkov Oleg M, Makoveichuk Alexander A. Yuri Gagarin State Technical University of Saratov

17.20-17.40

Laser Monitor Application for Study of Aluminum Nanopowder Ignition and Combustion

Fedor A. Gubarev, Iuliia D. Liushnevskaya, National Research Tomsk Polytechnic University, Tomsk, Russia; Lin Li, Liaoning Technical University, Huludao, China; Andrei V. Mostovshchikov, National Research Tomsk Polytechnic University, Tomsk, Russia; Alexander P. Ilyin, National Research Tomsk Polytechnic University, Tomsk, Russia, Tomsk State University of Control Systems and Radioelectronics, Tomsk, Russia

17.40-18.00

Optical multi-band detection of unmanned aerial vehicles with YOLO v4 convolutional neural network

Anfimov D.R., Golyak Ig.S., Morozov A.N., Nazolin A.L., Scherbakova A.V. and Fufurin I.L. Bauman Moscow State Technical University, Moscow, Russia

October 1, Thursday

INTERNET SESSION

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

INTERNET REPORTS

1. **Calculations of output power of the graphene-based terahertz laser.** Kozina O.N., Kotel'nikov Institute of Radio-Engineering and Electronics of Russian Academy of Science, Saratov Branch, Saratov, Russia, Melnikov L.A., Yuri Gagarin State Technical University of Saratov, Saratov, Russia, Nefedov I.S., Peoples' Friendship University of Russia (RUDN University), Moscow, Russia
2. **Reflection matrices for plane waves composing a beam.** Moiseeva N.M. Volgograd State University, Volgograd, Russia
3. **Methods of production of carbon nanoparticles by laser reduction of graphene oxide.** Sergey Svyakhovskiy, Lomonosov Moscow State University, Russia Lev G. Kuznetsov, Lomonosov Moscow State University, Russia Nikolay I. Pyshkov, Lomonosov Moscow State University, Russia
4. **Photoreflectance spectroscopy of the mesoporous silicon structures.** Lev P. Avakyants, Lomonosov Moscow State University, Russia Sergey E. Svyakhovskiy, Lomonosov Moscow State University, Russia Artem E. Aslanyan, Lomonosov Moscow State University, Russia Anatoliy V. Chervyakov, Lomonosov Moscow State University, Russia
5. **Coherent states and molecular rotation control.** Alexander V. Gorokhov, Samara National Research University named after academician S.P. Korolev, Samara, Russian Federation

INTERNET POSTERS

- 1P. **Change in the polarization of laser radiation upon reflection from an anisotropic plate.** Yatsyshen Valeriy, Volgograd State University, Volgograd, Russia
- 2P. **Excitation of polaritons near resonance by a nanocomposite plate.** Yatsyshen Valeriy, Potapova Irina, Verevkina Kseniya, Volgograd State University, Volgograd, Russia
- 3P. **Single-mode waveguide propagation of light in a smoothly irregular integrated-optical waveguide.** Divakov D.V., RUDN University, Lovetskiy K.P., RUDN University, Sevastianov L.A., RUDN University & BLTP JINR, Russia
- 4P. **Volumetric anisotropic microlattices in compound materials.** Liubov I. Vostrikova, Vitaly A. Smirnov, Rzhanov Institute of Semiconductor Physics SB RAS, Departments of Mathematics and Natural Sciences and Informational Technologies of NSUEM, Novosibirsk, Russia
- 5P. **Extension of the geometrized Maxwell theory using torsion.** Kulyabov D. S., RUDN University &

LIT JINR, Russia, Korolkova A. V., RUDN University, Gevorkyan M. N., RUDN University, Demidova A. V., RUDN University, Apreutesey A. M. Yu., RUDN University

- 6P. **Extension of geometrized Maxwell theory based on nonmetricity.** Kulyabov D. S., RUDN University & LIT JINR, Russia, Korolkova A. V., RUDN University, Sevastianov L. A., RUDN University & BLTP JINR, Russia, Velieva T. R., Plekhanov Russian University of Economics & RUDN University, Fedorov A. V., RUDN University
- 7P. **Entanglement in Tavis-Cummings model with Kerr nonlinearity induced by a thermal noise.** Eugene K. Bashkirov, Samara National Research University, Samara, Russia
- 8P. **Chalcogenide fiber based microresonators as sensing elements of spectroscopic sensors.** Irina Belonozhkina, Daniil Zhivotkov, Elena Romanova, Saratov State University, Saratov, Russia
- 9P. **Dynamics of entanglement of two qubits interacting with two resonators.** Mikhail M. Evseev, Eugene K. Bashkirov, Samara National Research University, Samara, Russia
- 10P. **Suppression of modulation instability in broad-area semiconductor lasers by injection of external optical radiation.** E.A. Yarunova, A. A. Krents, N. E. Molevich, Samara National Research University, Samara, Russia; Lebedev Physical Institute, Samara, Russia
- 11P. **Entanglement in two-atom two-photon Tavis-Cummings model induced by a thermal field.** Rodion K. Zakharov, Marya O. Guslyannikova, Eugene K. Bashkirov, Samara National Research University, Samara, Russia
- 12P. **Propagation and focusing of optical vortex beams generated by generalized spiral phase plates.** Mikhail Kirilenko, Samara National Research University; Svetlana Khonina, Image Processing Systems Institute of RAS—Branch of the FSRC "Crystallography and Photonics" RAS; Andrey Ustinov, Image Processing Systems Institute of RAS—Branch of the FSRC "Crystallography and Photonics" RAS; Pavel Khorin, Samara National Research University; Alexey Porfirev, Image Processing Systems Institute of RAS—Branch of the FSRC "Crystallography and Photonics" RAS
- 13P. **Modeling diffraction of a polarized light by three-dimensional nonlinear spiral phase in the near zone.** Alexey Porfirev Samara National Research University, IPSI RAS - branch of the

FSRC «Crystallography and Photonics» RAS

- 14P. **Dynamical symmetry of two qubits in external fields with dipole – dipole interaction.** Alexander V. Gorokhov, Samara National Research University, Samara, Russia, George I. Eremenko, Samara National Research University, Samara, Russia
- 15P. **Fabrication and study of a coplanar waveguide transmission structure made by magnetron sputtering and laser ablation for microwave flexible electronics.** Starodubov A.V., Kozhevnikov I.S., Serdobintsev A. A., Saratov State University, Saratov, Russia.
- 16P. **Polarization dynamics of vertical cavity semiconductor laser with external light injection.** E.V. Ushakova, S.S. Volchkov Yuri Gagarin Technical University of Saratov, Russia.
- 17P. **Numerical investigation of spatio-temporal dynamics of semiconductor disk laser.** L.A. Kochkurov, Yuri Gagarin Technical University of Saratov, Saratov, Russia
- 18P. **Optical rectification of polarization modulated signal based on injection-locking single-mode VCSEL.** Leonid Kochkurov, Yuri Gagarin State Technical University of Saratov, Saratov, Russia
- 19P. **Impact of rare-earth doping upon micro-periodical anisotropy.** V.A. Smirnov, L.I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS, Departments of Mathematics and Natural Sciences and Informational Technologies of NSUEM, Russia
- 20P. **Study the ablation regimes of thin copper films on dielectric substrates by nanoseconds laser pulses.** Rasulov I.I., Kozhevnikov I.O., Serdobintsev A.A., Starodubov A.V., Saratov State University, Saratov, Russia.
- 21P. **Research of the influence of the longitudinal displacement of the laser beam focusing on the laser perforation process.** Atamanyuk Ramez G., Khramov Vladimir N., Ril' Ivan A., Volgograd State University, Volgograd, Russia.
- 22P. **Development of the creating diffractive optical elements with a large depth of plasma-chemical etching method for the infrared wavelength range.** S.A. Fomchenkov Image Processing Systems Institute – branch of the Federal Scientific Research Centre “Crystallography and Photonics” of Russian Academy of Sciences, Samara, Russia
- 23P. **Melting and welding of glass capillaries by picosecond laser radiation (1064 nm).** D.A. Bessonov, T.N. Sokolova, E.L. Surmenko, Yuri Gagarin State Technical University of Saratov, Saratov, Russia
- 24P. **Theoretical and experimental study of signal identification in wireless data transmission with using light beams with fractional orbital angular momentum.** Alexey A. Kovalev, Image Processing Systems Institute of the RAS – Branch of FSRC “Crystallography & Photonics” of the RAS, Alexey P. Porfirev Samara University
- 25P. **Computer models of laser speckle-interferometer of lateral micro displacement of scattering object.** Ludmila A. Maksimova, Natalia Yu. Mysina, Institute of Precision Mechanics and Control Russian Academy of Sciences, Russia; Bogdan A. Grizbil, Saratov State University, Russia; Vladimir P. Ryabukho, Saratov State University, Institute of Precision Mechanics and Control Russian Academy of Sciences, Russia
- 26P. **Control of rogue waves in laser with opto-electronic feedback.** A. A. Krents, N. E. Molevich, Yaronova E. A. department of Physics, Samara National Research University, Samara; department of Theoretical Physics, Lebedev Physical Institute, Samara, Russia
- 27P. **Calculations of metastable and scattering states of beryllium dimer.** Vladimir L. Derbov, Saratov State University, Saratov, Russia; Galmandakh Chuluunbaatar, Joint Institute for Nuclear Research, Dubna, Russia, RUDN University, Moscow, Russia; Alexander A. Gusev, Joint Institute for Nuclear Research, Dubna, Russia; Ochbadrakh Chuluunbaatar, Joint Institute for Nuclear Research, Dubna, Russia, Institute of Mathematics, National University of Mongolia, Ulaanbaatar, Mongolia; Sergue I. Vinitzky, Joint Institute for Nuclear Research, Dubna, Russia, RUDN University, Moscow, Russia; Alexander V. Mitin, Moscow Institute of Physics and Technology, Dolgoprudny, Moscow Region, Russia, Chemistry Department, Lomonosov Moscow State University, Moscow, Russia, Joint Institute for High Temperatures of RAS, Moscow, Russia

Conference on Spectroscopy and Molecular Modeling XXI

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

Secretary: Inna I. Plastun, Saratov State Technical University (Russia)

International Program Committee: Lev M. Babkov, Saratov State University (Russia), Lev A. Gribov, Institute named by V. I. Vernadskyi RAS (Moscow, Russia), Dmitry S. Umreiko, Belarus State University (Minsk, Belorussia), Nadezda A. Davydova, Institute of Physics, NAS of Ukraine, Tatiana G. Bourova, Saratov State Pedagogical Institute (Russia), 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 30, Wednesday

**ORAL SESSION
SPECTROSCOPY
(Building 3, Room 34)**

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

**15.35-15.50
OPTICAL CLEARING OF HUMAN SKIN USING
SOME DISACCHARIDES**

K.V. Berezin¹, K.N. Dvoretzkiy², A.M. Likhter³,
I.T. Shagautdinova³

¹Saratov State University, Saratov, Russia;

² Saratov State Medical University, Saratov,
Russia;

³Astrahan State University, Astrahan, Russia

**15.50- 16.05
MOLECULAR DYNAMICS SIMULATION OF
DIFFUSION COEFFICIENTS AND STRUCTURAL
PROPERTIES OF MONO- AND
POLYETHYLENE GLYCOLS**

K.N. Dvoretzkiy¹, K.V. Berezin², A.M. Likhter³,
I.T. Shagautdinova³

¹Saratov State Medical University,

²Saratov State University, Saratov, Russia;

³Astrahan State University, Astrahan, Russia

**16.05–16.20
COMPARISON OF SIGNAL CALIBRATION
METHOD IN PROBLEM OF RAMAN
SPECTROSCOPY *internet***

N. Trifonov^{1,2}, A. Efitorov¹, S. Burikov^{1,2}, T.
Dolenko^{1,2}, K. Laptinsky¹ and S. Dolenko¹.

¹D.V. Skobeltsyn Institute of Nuclear Physics, M.V.
Lomonosov Moscow State University, Moscow,
Russia;

²Physical Department, M.V. Lomonosov Moscow
State University, Moscow, Russia

**16.20–16.35
MECHANISM OF THE INTERACTION OF
CARBON DOTS WITH ENVIRONMENTAL
MOLECULES IN AQUEOUS SUSPENSIONS
*internet***

G. Chugreeva¹, K.A. Laptinsky^{1,2}, S.A. Burikov^{1,2},
A.E. Tomskaya³, T.A. Dolenko^{1,2}

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

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

³North-Eastern Federal University, Yakutsk,
Russia

**16.35– 16.50
MOLECULAR MECHANISMS OF METAL
NANOPARTICLES FORMATION BY
BACTERIAL SYNTHESIS**

I.L. Plastun, A. A. Zakharov, A. A. Naumov
Saratov State Technical University, Saratov,
Russia

**16.50– 17.05
MOLECULAR MODELING OF METAL
SALTS AND FLAGELLIN INTERACTION
DURING THE FORMATION OF SILVER
SULPHIDE NANOPARTICLES**

A. Zakharov, I. Plastun, A. Naumov A. Bokarev
Saratov State Technical University, Saratov,
Russia

**17.05– 17.20
STUDY OF RESILIENCE OF
NEURAL NETWORK SOLUTION OF
INVERSE PROBLEM BASED ON
INTEGRATION OF OPTICAL
SPECTROSCOPIC METHODS TO NOISE IN
DATA *internet***

I. Isaev¹, O. Sarmanova^{1,2}, S. Burikov^{1,2},
T. Dolenko^{1,2}, K. Laptinsky¹, N. Trifonov^{1,2},
S. Dolenko¹

¹D.V. Skobeltsyn Institute of Nuclear Physics,
M.V. Lomonosov Moscow State University,
Russia;

²Faculty of Physics, Moscow State University,
Russia

**17.20–17.35
MICROENVIRONMENTAL EFFECT ON
NADH POLARIZED FLUORESCENCE
STUDIED BY ULTRAFAST
SPECTROSCOPY *internet***

I.A. Gorbunova¹, M.E. Sasin¹, J. Rubayo-
Soneirad², O. S. Vasyutinskii¹

¹Ioffe Institute, Saint-Petersburg, Russia;

²InSTEC, University of Havana, Havana, Cuba

**17.35– 17.50
CALCULATION OF THE INTERNAL
CONVERSION RATE OF PORPHINE
ELECTRONIC EXCITATION IN THE FIRST
ELECTRON- EXCITED STATE**

V.V. Nechaev¹, K.N. Dvoretzkiy², K.V. Berezin³

¹Saratov State Technical University, Saratov,
Russia;

² Saratov State Medical University, Saratov,
Russia;

³Saratov State University, Saratov, Russia

**17.50 – 18.05
DETERMINATION OF CONFORMATIONAL
COMPOSITION OF PHENYLALANINE IN THE
GAS PHASE**

G. N. Ten¹, N.E. Scherbakova²

¹Saratov State University, Saratov, Russia;

²Russian Research Anti-Plague Institute "Microbe",
Saratov, Russia

**18.05 – 18.20
MODELING OF IR SPECTRA OF
POLYETHYLENETEREPHTALATE**

G.N. Ten¹, A.Yu. Gerasimenko², M.S. Savelyev²,
N.E. Scherbakova³

¹Saratov State University, Saratov, Russia;

²Institute of Biomedical Systems, National
Research University of Electronic Technology;
Institute of Bionic Technologies and Engineering,
I.M. Sechenov First Moscow State Medical
University, Moscow, Russia;

³ Russian Research Anti-Plague Institute
"Microbe", Saratov, Russia

**18.20 -18.35
INTERPRETATION OF IR SPECTRA OF
TRIPHENYLPHOSPHITE BASED IN
MOLECULAR MODELING**

I. Ivlieva-Peretokina¹, L.Babkov¹, N. Davydova²,

¹Saratov State University, Russia;

²Institute of Physics NAS of Ukraine, Kyiv, Ukraine

**18.35 -18.50
IR SPECTRA AND STRUCTURE OF
SUPRAMOLECULAR COMPLEXES OF
DIAMOND-LIKE NANOPARTICLES WITH
DRUGS AND BIOMOLECULES**

A. Bokarev, I. Plastun

Saratov State Technical University, Saratov,
Russia

October 1, Thursday

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

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

**Internet presentations opened from
30.09.2020, 11:00**

18.00-20.00

**1S. DETERMINATION OF CRITICAL
CONCENTRATIONS OF SELF-
ORGANIZATION OF SODIUM
OCTANOATE IN AQUEOUS SOLUTIONS
USING RAMAN SPECTROSCOPY**

I.V. Plastinin, S.A. Burikov, T.A.
Dolenko Moscow State University,
Moscow, Russia

**2S. MOLECULAR MODELING OF PROTEIN
STRUCTURES AND METAL SALTS
INTERACTION**

A. Naumov, I.Plastun, A. Bokarev, A.
Zakharov

Saratov State Technical University, Saratov,
Russia

**3S. DETERMINATION OF MALE
REPRODUCTIVE FUNCTION USING
MICROSTRUCTURAL WAVEGUIDES**

P.A. Lepilin¹, G.T. Sukhih², J.S. Skibina¹,
A.A. Zanishevskaya¹, A.A. Shuvalov¹,
N.O. Yanchuk¹, A.Yu. Gryaznov¹, A.
Sysoeva³, N.P. Makarova³, E.A. Kalinina³

¹International Research and Education Center
"Structural Nanobiophotonics", Saratov,
Russia;

² Research Center for Obstetrics, Gynecology
and Perinatology, Moscow, Russia;

³ART Department, Research Center for
Obstetrics, Gynecology and Perinatology,
Ministry of Health of the Russian
Federation, Moscow, Russia

**4S. RAMAN SPECTRA OF SOME
FLUOROQUINOLONES: A
THEORETICAL**

STUDI

A.V. Markin

Saratov State University, Saratov, Russia

**5S. LUMINESCENCE QUENCHING OF
UO₂(II) ION BY ON 2,2'-
BIPYRIDIL DICARBOXYLIC AMIDE**

A. Kupaeva, A. Kharcheva, N. Borisova,
A. Ivanov, S. Patsaeva

Lomonosov Moscow State University, Moscow,
Russia

**6S. LUMINESCENT PROPERTIES OF
EUROPIUM AND TERBIUM
COMPLEXES: THE INFLUENCE OF
SOLVENTS AND pH**

Z.A. Charyshnikova, A.V. Kharcheva, A.V. Ivanov,
O.K. Farat, N.E. Borisova, S.V. Patsaeva
Lomonosov Moscow State University, Moscow,
Russia

7S. THE EFFECT OF TEMPERATURE ON LUMINESCENT PROPERTIES OF EUROPIUM COMPLEXES WITH N-HETEROCYCLIC LIGANDS

D.A. Kharitonov, A.V. Kharcheva, N.E. Borisova, O.K. Farat, S.V. Patsaeva
Lomonosov Moscow State University, Moscow,
Russia

8S. ELECTROSPECTRAL SYSTEMS BASED ON SURFACE-ENHANCED RAMAN SPECTROSCOPY FOR BIOANALYSIS: A LITERATURE OVERVIEW

A.I. Danchuk, A. V. Markin
Saratov State University, Saratov, Russia

9S. NMR SPECTROSCOPY IN STRUCTURE DETERMINATION OF A NUMBER OF POLYSUBSTITUTED PYRIDINES AND THIAZOLOPYRIMIDINES

A.A. Meshcheryakova, N.O. Vasilkova,
E.S. Vasil'yeva, V.V. Sorokin, A.P. Kriven'ko
Saratov State University, Saratov, Russia

10S. VISUALISATION OF DETONATION NANODIAMONDS USING COHERENT ANTI-STOKES LIGHT SCATTERING SPECTROSCOPY

K.A. Laptinsky^{1,2}, S.A. Burikov^{1,2},
O.A. Shenderova³, T.A. Dolenko^{1,2}

¹Skobeltsyn Institute of Nuclear Physics,
Lomonosov Moscow State University, Russia;

²Faculty of Physics, Lomonosov Moscow State
University, Russia;

³Adamas Nanotechnologies, Inc, Raleigh, NC,
USA

11S. DISSOLVED HUMIC SUBSTANCES AND FUNGAL METABOLITES CAN EXHIBIT SIMILAR FLUORESCENCE PROPERTIES

E. Fedoseeva, S. Patsaeva,
D. Khundzhua, E. Prudnikova, V. Terekhova
Pirogov Medical University, Moscow, Russia

12S. MODELING OF STRUCTURE AND IR SPECTRA OF DIHYDROXYBENZOIC ACID ISOMERS

D.S. Finashkin, L.M. Babkov
Saratov State University, Saratov, Russia

13S. TWO-DIMENSIONAL SPECTROSCOPY IN THE ANALYSIS OF THE REACTION PRODUCTS OF 1,3-DIPOLAR CYCLOADDITION OF SOME ZOMETHINE YLIDES AND 3-PHENYL-1-(PYRROL-2-YL)PROPEN-2-ONE

S.V. Borisova, E.U. Kiseleva, V.V. Sorokin,
I.N. Klochkova

Saratov State University, Saratov, Russia

14S. STRUCTURE AND VIBRATIONAL SPECTRUM OF URIDINE

V.V. Nechaev¹, K.N. Dvoretzkiy²,
K.V. Berezin³

¹Saratov State Technical University, Saratov,
Russia;

²Saratov State Medical University,
Saratov, Russia;

³Saratov State University, Saratov, Russia

15S. INTERMOLECULAR INTERACTION AND IR SPECTRA OF BEHENIC ACID

S.N. Firsunin¹, L.M. Babkov¹, T.V. Bezrodna², T.A. Gavrilko², J. Baran³

¹Saratov State University, Saratov, Russia,

²Institute of Physics, NAS of Ukraine,
Kyiv, Ukraine

³Institute of Low Temperatures and Structure
Research, PAN, Wroclaw, Poland

16S. THE INFLUENCE OF THE STRUCTURE OF N-HETEROCYCLIC REAGENTS ON THE STABILITY CONSTANT OF F-ELEMENTS COMPLEXES

T. Sumyanova, N.E. Borisova, A. Ivanjv,
G. Zakirova
Faculty of Chemistry, Lomonosov Moscow
State University, Moscow, Russia

INTERNET SESSION

1S1. APPLICATION FTIR SPECTROSCOPY FOR IDENTIFYING SYNTHETIC AZODYES

N.B. Shestopalova, Yu.A. Fomina
Saratov State Medical University, Saratov,
Russia

2S1. STUDY OF COMPLEXATION REACTIONS BETWEEN SUBSTITUTED 1,10-PHENANTHROLINE-2,9-DICARBOXAMIDE AND LANTHANIDE NITRATES

D. Volkova, Ts. Sumyanova, N. Borisova
Faculty of Chemistry, M.V. Lomonosov
Moscow State University, Moscow, Russia

Conference on Nanobiophotonics XVI

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

Secretary: **Timofey E. Pylaev**, Institute of Biochemistry and Physiology of Plants and Microorganisms of the RAS, Saratov State Medical University, Agricultural Research Institute of South-East Region

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

September 30, Wednesday

NANOBIOPHOTONICS JOINT INVITED/PLENARY SESSION

11.00 – 11.40 (plenary)

Nucleic acid & Au nanoparticle-based advanced functional biomaterials

Timofey E. Pylaev IBPPM RAS, Saratov State Medical University, Agricultural Research Institute of South-East Region

September 30, Wednesday

ORAL/INVITED SESSION NANOBIOPHOTONICS

(Zoom link:

<https://us02web.zoom.us/j/5920866414?pwd=cZFTc2Q4Mkh0VkrPTnl0ZXZpZDQvdz09>

Conference ID: 592 086 6414)

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

15.00 – 15.20 (Invited)

Plasmonic particles for integration in functional materials and devices

Fulvio Ratto¹, Sonia Centi¹, Lucia Cavigli¹, Boris Khlebtsov², Claudio Sangregorio³, Nikolai Khlebtsov², Roberto Pini¹, ¹Istituto di Fisica Applicata Nello Carrara, Consiglio Nazionale delle Ricerche, Fiorentino, Italy, ²IBPPM RAS, Saratov, Russia ³Istituto di Chimica dei Composti Organico Metallici, Consiglio Nazionale delle Ricerche, Fiorentino, Italy

15.20 – 15.35

Petal-like Gap-enhanced Raman Tags with a Controllable Structure

Boris Khlebtsov, IBPPM RAS Andrey Burov, IBPPM RAS Daniil Bratashov, Saratov State University Roman Tumskiy, IBPPM RAS Nikolai Khlebtsov, IBPPM RAS, Saratov State University

15.35 – 15.50

Influence of interactions of lanthanide-based nanocomplexes with surrounding molecules on the luminescent properties of nanoparticles in suspensions

Fedyanina¹, S. Burikov¹, O. Sarmanova¹, S.V. Kuznetsov², T. Dolenko¹, ¹Moscow State University, Department of Physics, Moscow, Russia (2) - Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

15.50 – 16.05

Preparation Cd-free quantum dots and their optical properties

Tatiana S. Ponomaryova, Anastasiya S. Novikova, Irina Yu. Goryacheva, Saratov State University, Saratov, Russia

16.05 – 16.20

Excitation of localized graphene plasmons by aperiodic self-assembled arrays of metallic antennas

V. Kaydashev¹, B. Khlebtsov², A. Miakonkikh³, E. Zhukova¹, S. Zhukov¹, D. Mylnikov¹, I. Domaratskiy¹ and D. Svintsov¹. ¹Center for Photonics and 2D Materials, Moscow Institute of Physics and Technology (MIPT), Russia, ²IBPPM RAS, Saratov, Russia, ³Valiev Institute of Physics and Technology RAS, Moscow, Russia

16.20 – 16.35

Fluorescent Nanosensor for pH and Temperature Measurements Based on Carbon Dots

M.Yu. Khmeleva¹, O.E. Sarmanova^{1,2}, K.A. Laptinskiy^{1,2}, S.A. Burikov^{1,2}, S.A. Dolenko², A.E. Tomskaya³, T.A. Dolenko^{1,2} ¹ Faculty of Physics, Lomonosov Moscow State University, Russia ² Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Russia ³ North-Eastern Federal University, Yakutsk, Russia

16.35 – 16.50

Ultrasensitive cardiac Troponin-T Sensing by a single molecules counting method

Pavel N. Melentiev,†,‡; Lina V. Son,⊥, #; Denis S. Kudryavtsev,⊥; Igor E. Kasheverov,⊥; Victor I. Tsetlin,⊥; Rinat O. Esenaliev,§; Victor I. Balykin†,‡; †Institute of Spectroscopy RAS, Moscow Russia ‡National Research University, Higher School of Economics, Moscow, Russia ⊥Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry of the RAS, Moscow, Russia # Moscow Institute of Physics and Technology, Dolgoprudny, Russia §The University of Texas Medical Branch, USA

16.50 – 17.05

Diatoms: where photoacoustics meets fluorescence

Julijana Cvjetinovic¹, Dmitry Gorin¹, Alexey Salimon¹, Alexander Korsunsky², Marina Novoselova¹, Philipp Sapozhnikov³, Olga Kalinina⁴, Evgeny Shirshin^{1,4}, Alexey Yashchenok¹, ¹Skolkovo Institute of Science and Technology, Moscow, Russia, ²Department of Engineering Science, University of Oxford, Oxford, United Kingdom, ³Shirshov Institute of Oceanology of Russian Academy of Sciences, Moscow, Russia, ⁴Lomonosov Moscow State University, Moscow, Russia

17.05 – 17.20

Functionalized Microstructured Optical Fibers in Biophotonics

Timur Ermatov, Skoltech Julia S. Skibina, SPE LLC Nanostructured Glass Technology Roman E. Noskov, Tel Aviv University Valery V. Tuchin, Saratov State University, Tomsk State University, Institute of Precision Mechanics and Control of the Russian Academy of Sciences Dmitry A. Gorin, Skoltech

17.20 – 17.35

Bimodal fluorescence and optoacoustic contrast agent based on the self-quenching of indocyanine green

Maksim D. Mokrousov, Skolkovo Institute of Science and Technology Marina V. Novoselova, Skolkovo Institute of Science and Technology Jackie Nolan, University of Arkansas for Medical Sciences Walter Harrington, University of Arkansas for Medical Sciences Polina Rudakovskaya, Skolkovo Institute of Science and Technology Daniil N. Bratashov, Saratov State University Ekaterina I. Galanzha, University of Arkansas for Medical Sciences, Saratov State University Juan Pablo Fuenzalida-Werner, Institute of Biological and Medical Imaging (IBMI) Boris P. Yakimov, Lomonosov Moscow State University Gleb Nazarikov, Skolkovo Institute of Science and Technology Vladimir P. Drachev, Skolkovo Institute of Science and Technology, University of North Texas Evgeny A. Shirshin, Lomonosov Moscow State University, Institute of Spectroscopy of the Russian Academy of Sciences Vasilis Ntziachristos, Institute of Biological and Medical

Imaging (IBMI), Chair of Biological Imaging and Center for Translational Cancer Research (TranslaTUM) Andre C. Stiel, Institute of Biological and Medical Imaging (IBMI) Vladimir P. Zharov, University of Arkansas for Medical Sciences, Saratov State University Dmitry A. Gorin, Skolkovo Institute of Science and Technology

17.35 – 17.50

Getting things back from the bloodflow: flow cytometer and magnetic sorter foe detection and extraction of objects from undiluted blood.

D.N. Bratashov¹, R.A. Verkhovskii¹, O.A. Sindeeva^{1,2}, A.A. Kozlova¹, I.O. Kozhevnikov¹, E.S. Prikhozhenko¹, O.A. Mayorova¹, O.V. Grishin¹, M.A. Makarkin¹, A.V. Ermakov¹, A.S. Abdurashitov², ¹Saratov State University, Saratov, Russia, ²Skolkovo Institute of Science and Technology, Moscow, Russia

17.50 – 18.05

In vitro study of exosome secretion rate by nanoparticle tracking analysis

A.Merdalimova, V.Chernyshev, R. Chuprov-Netochin, D.Gorin, Skolkovo Institute of Science and Technology, Moscow, Russia

18.05 – 18.20

Effectivity and safety studying of microcapsules intra-arterial delivery in the kidney by the optical monitoring of hemodynamic

Olga A. Sindeeva†,‡, Arkady S. Abdurashitov†, Ekaterina S. Prikhozhenko†, Oksana A. Mayorova†, Olga I. Gusliakova†, Natalia A. Shushunova†, Valentina O. Plastun†, Valery V. Tuchin† and Gleb B. Sukhorukov‡, # ‡Skolkovo Institute of Science and Technology, Russia. †Saratov State University, Russia. #School of Engineering and Materials Science, Queen Mary University of London, United Kingdom.

18.20 – 18.35

Visualization of mechanisms of kidney cancer A498 cell death under the influence of combined therapy of *Gratiola officinalis* extract and cyclophosphamide using the effect of fluorescence of ultrastructural cell components

A.M. Mylnikov, N.A. Navoloki, D.A. Mudrak, N.V. Polukonova, G.N. Maslyakova, Saratov State Medical University n.a. V.I. Razumovsky

September 26, Thursday

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

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

18.00 – 20.00

1. Synthesis of luminescent gold nanoclusters Regina O. Rashchevskaya, Alina A. Kokorina and Irina Yu. Goryacheva

2. Enhanced photo- and thermo stability of Au nanorods conjugated with small thiols Sonia Centi, Istituto di Fisica Applicata 'Nello Carrara', Italy Lucia Cavigli, Istituto di Fisica Applicata 'Nello Carrara', Italy Claudia Borri, Istituto di Fisica Applicata 'Nello Carrara', Italy Alessio Milanese, Istituto di Fisica Applicata 'Nello Carrara', Italy Martina Banchelli, Istituto di Fisica Applicata 'Nello Carrara', Italy Sofia Chioccioli, Università degli Studi di Firenze, Italy Boris Khlebtsov, IBPPM RAS Nikolai G. Khlebtsov, IBPPM RAS, Saratov State University Paolo Matteini, Istituto di Fisica Applicata 'Nello Carrara', Italy Patrizia Bogani, Istituto di Fisica Applicata 'Nello Carrara', Italy Fulvio Ratto, Istituto di Fisica Applicata 'Nello Carrara', Italy Roberto Pini, Istituto di Fisica Applicata 'Nello Carrara', Italy

3. Synthesis of fluorescent nanostructures based on L-aspartic acid with various additives Vera V. Olomskaya, Saratov State University (Russia); Ekaterina A. Mordovina, Saratov State University (Russia); Irina Yu. Goryacheva, Saratov State University (Russia)

4. Glauconite-based antibacterial composites with copper nanoparticles Selifonova E.I., Chernova R.K., Rusanova T.Yu., Serzhantov V.G., Naumova G.N., Cherdakova E.N., Venig S.B. Saratov State University, Russia

5. The potential of gold nanoparticles for coronavirus diagnosis, treatment and prophylaxis L.A. Dykman, S.A. Staroverov, A.S. Fomin, K.P. Gabalov, IBPPM RAS, Saratov, Russia

6. Core type as a factor of gap-enhanced Raman tags SERS response Andrey M. Burov, Boris N. Khlebtsov, Nikolai G. Khlebtsov, IBPPM RAS, Saratov, Russia

7. Is it possible to reuse CTAB growth solution of gold nanorods? Yuliya D. Gudova,

Alexander A. Skaptsov Saratov State University, Saratov, Russia

8. Antioxidant albumin-based nanocomposites containing sulforaphane drug and superoxide dismutase plasmid Vitaly Khanadeev, IBPPM RAS, Saratov, Russia, Saba Naqvi, National Institute of Pharmaceutical Education and Research, Raebareli, U.P India; Indian Institute of Technology Roorkee, Roorkee, India; Boris N. Khlebtsov, IBPPM RAS, Saratov, Russia Nikolai G. Khlebtsov, IBPPM RAS, Saratov, Russia; Gopinath Packirisamy, National Institute of Pharmaceutical Education and Research, Raebareli, U.P India; Indian Institute of Technology Roorkee, Roorkee, India

9. Photothermal properties of strongly coupled Au nanopillars P. Timoshenko¹, V. Kaydashev² ¹Southern Federal University, Rostov-on-Don, Russia ²Moscow Institute of Physics and Technology (MIPT), Dolgoprudny, Russia

10. Prospective strategies for enhanced intra- and transdermal delivery of antifungal drugs Ekaterina V. Lengert, Saratov State University, Saratov Russia Ekaterina E. Talnikova, Saratov State Medical University, Saratov Russia, Roman A. Verkhovskii, Saratov State University, Saratov Russia Mariia S. Saveleva, Saratov State University, Saratov, Russia Valery V. Tuchin, Saratov State University, Saratov, Russia; Tomsk State University, Tomsk, Russia; Institute of Precision Mechanics and Control of the Russian Academy of Sciences, Saratov, Russia Yulia I. Svenskaya Saratov State University, Saratov, Russia

11. Mesoporous CaCO₃ vaterite microparticles with polyelectrolyte coatings for transdermal drug delivery Mariia Saveleva, Ekaterina Lengert, Roman Verkhovskii, Anton Pavlov, and Yulia Svenskaya Saratov State University, Saratov, Russia

12. A novel technology for conductive scaffolds Ekaterina V. Lengert, Ilya O. Kozhevnikov, Alexey A. Serdobintcsev, Anton M. Pavlov Saratov State University, Saratov, Russia

13. In vivo MRI imaging of submicron polyelectrolyte capsules loaded with magnetite nanoparticles under magnetic navigation Yulia Svenskaya, Saratov State University, Russia Anastasiia Kozlova, Saratov State University, Russia Francesca Garello, University of Turin, Italy Ekaterina Lengert, Saratov State University, Russia Enzo Terreno, University of Turin, Italy Dmitry Gorin, Skolkovo Institute of Science and Technology, Russia

14. Particulate System for Efficient Non-Invasive Transdermal Drug Delivery Yulia Svenskaya¹, Ekaterina Lengert¹, Ekaterina Talnikova², Mariia Saveleva¹, Roman Verkhovskii¹, Georgy Terentyuk¹, Elina Genina¹, Valery Tuchin¹, ¹Saratov State University, Russia, ²Saratov State Medical University, Russia

15. Some steps in the development of an immunochromatographic test to quantify cortisol in human salivary fluid. Elizaveta V. Panfilova, IBPPM RAS, Saratov, Russia

16. Freezing-induced loading of inorganic nanoparticles into porous mineral matrices P.A. Demina Saratov State University, Saratov, Russia, T.V. Bukreeva Shubnikov Institute of Crystallography of Federal Scientific Research Centre "Crystallography and Photonics" RAS, Moscow, Russia National Research Center "Kurchatov Institute", Moscow, Russia M.V. Lomova Saratov State University, Saratov Russia

17. Preferential accumulation of carriers in the target organ after delivery via the renal artery Ekaterina S. Prikhozhdenko (Saratov State University, 83 Astrakhanskaya str., Saratov 410012, Russia) Olga I. Gusliakova (Saratov State University, 83 Astrakhanskaya str., Saratov 410012, Russia) Oksana A. Mayorova (Saratov State University, 83 Astrakhanskaya str., Saratov 410012, Russia) Natalia A. Shushunova (Saratov State University, 83 Astrakhanskaya str., Saratov 410012, Russia) Arkady S. Abdurashitov (Skolkovo Institute of Science and Technology, Skolkovo Innovation Center, Building 3, Moscow, 143026, Russia) Dmitry A. Gorin (Skolkovo Institute of Science and Technology, Skolkovo Innovation Center, Building 3, Moscow, 143026, Russia) Gleb B. Sukhorukov (Skolkovo Institute of Science and Technology, Skolkovo Innovation Center, Building 3, Moscow, 143026, Russia; School of Engineering and Materials Science, Queen Mary University of London, Mile End, Eng, 215, London E1 4NS, United Kingdom) Olga A. Sindeeva (Skolkovo Institute of Science and Technology, Skolkovo Innovation Center, Building 3, Moscow, 143026, Russia; Saratov

State University, 83 Astrakhanskaya str., Saratov 410012, Russia)

18. Synthesis of molecularly imprinted polymers for enzymes Presnyakov K. U. (Saratov State University, Institute of Chemistry) Pidenko P.S. (Saratov State University, Institute of Chemistry) Burmistrova N.A. (Saratov State University, Institute of Chemistry)

19. MRI contrast control of submicron carriers loaded with magnetite nanoparticles Anastasiia A. Kozlova 1, Sergey V. German 2,3, Vsevolod S. Atkin 1, Victor V. Zhev 4, Maxwell Astle 5, Daniil N. Bratashov 1, Yulia I. Svenskaya 1 and Dmitry A. Gorin 3 1 Saratov State University, Saratov, Russia 2 Institute of Spectroscopy of the Russian Academy of Sciences (ISAN), Troitsk, Russia 3 Skolkovo Institute of Science and Technology, Skolkovo Innovation Center, Moscow, Russia 4 Saratov State Medical University, Saratov, Russia 5 School of Chemistry, University of Nottingham, University Park, NG7 2RD, UK

20. Impact of new formulation on mechanical functions of the lungs and their interaction with cells of the immune system after intrapulmonary administration Olga I. Gusliakova†, Elena N. Atochina-Vasserman‡, Elena Abramova#, Andrew J. Gow# †Saratov State University, Saratov, Russia. ‡ University of Pennsylvania, Philadelphia, United States of America. # Rutgers University, Piscataway, New Jersey, United States of America.

21. Theoretical model of magnetic nanoparticles under the influence of the magnetic field Samia Salem^{1, 2}, Valery Tuchin^{1, 3, 4, 5} 1Department of Optics and Biophotonics, Saratov State University, Saratov 410012, Russia 2Department of Physics, Faculty of Science, Benha University, Egypt 3Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk 634050, Russia 4Laboratory of Molecular Imaging, Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow 119071, Russia 5Institute of Precision Mechanics and Control of the Russian Academy of Sciences, Saratov 410028, Russia

Workshop on Microscopy and Low-Coherence Methods XIII

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

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

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

October 1, Thursday

JOINT POSTER/INTERNET SESSION

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

18.30-20.00

1M. Towards open platform for laser scanning confocal microscopy

Vasily B. Ageev, Ivan V. Fedosov Department of optics and biophotonics, Saratov State University, Saratov, Russia

2M. Instantaneous interference images and the manifestation of the spatial coherence of light with wide frequency and angular spectra in an interference experiment

Ludmila A. Maksimova, Natalia Yu. Mysina, Vladimir P. Ryabukho State University, Institute of Precision Mechanics and Control Russian Academy of Sciences, Russia

3M. Influence of ultrasound parameters of the therapeutic frequency range on the optical and thermophysical properties of human skin and on the efficiency of immersion optical clearing in vivo

Yuriy I. Surkov, Isabella A. Serebryakova, Aleksey N. Bashkatov, Valery V. Tuchin, Vladimir Zharov and Elina A. Genina Saratov National Research State University, Saratov, Russia, National Research Tomsk State University, Tomsk, Russia, Institute of Precision Mechanics and Control of the Russian Academy of Sciences, Saratov, Russia, Arkansas Nanomedicine Center, University of Arkansas for Medical Sciences, Little Rock, AR USA

4M. Longitudinal coherence in interference microscopy

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

5M. Information capacity and energetic efficiency of high-speed time-domain full-field optical coherence tomography system

Igor P. Gurov, Maxim A. Volynsky, Nikita B. Margaryants, Aleksei Pimenov ITMO University, Saint Petersburg, Russia

6M. Microstructure of titanium films formed by induction PVD on alumina ceramics

Marina A Fomina, Alexander Aman, Andrey M. Zakharevich, Vladimir A. Koshuro Yuri Gagarin State Technical University of Saratov, Russia, Otto Vollmann GmbH & Co. KG, Germany, Saratov State University, Russia,

7M. Researching of the structural and morphological characteristics of coatings based on metal-containing calcium phosphates

Olga A. Markelova, Vladimir M. Taran, Sergey Ya. Pichkhidze Yuri Gagarin State Technical University of Saratov, Department of Materials Science and Biomedical Engineering

8M. Evaluation of low-coherence interference fringe parameters by the adaptive wiener filtering method

Igor P. Gurov, Vlada O. Kapranova, Pavel S. Skakov, ITMO University, Saint Petersburg, Russia

INTERNET REPORTS

1. Mechanical changes in cataract lenses assessed with optical coherence elastography

Honggiu Zhang, Chen Wu, Manmohan Singh, Salavat R. Aglyamov, Kirill V. Larin University of Houston, USA

2. Heartbeat Optical Coherence Elastography: Utilizing Heartbeat to Measure Corneal Biomechanical Properties

Achuth Nair, Manmohan Singh, Salavat R. Aglyamov, and Kirill V. Larin University of Houston, USA

3. Optical coherence angiography to evaluate concurrent changes in the fetal brain and maternal extremities due to maternal ethanol exposure

Raksha Raghunathan, Chih-Hao Liu, Manmohan Singh, Rajesh C. Miranda, Kirill V. Larin University of Houston, USA

4. Optical Coherence Elastography with Needle-based Piezoelectric-driven Probe

Harshdeep Singh Chawla, Justin Rippy, Fernando Zvietcovich, Salavat R. Aglyamov and Kirill V. Larin Department of Biomedical Engineering, University of Houston, USA

5. Ocular tissue biomechanics using Brillouin microscopy and optical coherence elastography

Yogeshwari S Ambekar, Manmohan Singh, Jitao Zhang, Achuth Nair Salavat Aglyamov, Giuliano Scarcelli, Kirill V Larin, Fischell Department of Biomedical Engineering, University of Houston, USA, Department of Bioengineering, University of Maryland, College park, MD, USA

6. Response of malignant tumor cells to photodynamic treatment assessed by means of digital holographic microscopy

Anna A. Zhikhoreva, Andrey V. Belashov, Natalya A. Avdonkina, Irina A. Baldueva, Anna B. Danilova, Mark L. Gelfond, Tatyana L. Nekhaeva, Irina V. Semenova and Oleg S. Vasyutinskii Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia, N.N. Petrov National Medical Research Center, Ministry of Health of Russia, St. Petersburg, Russia

7.

Invited

Numerical simulation in optical coherence tomography as a tool for development of emerging oct-mods

Lev A. Matveev, Alexander L. Matveyev, Alexander A. Moiseev, Alexander A. Sovetsky, Alexey A. Zykov Institute of Applied Physics of the Russian Academy of Sciences, Russia

8. Aberration determination in OCT imaging using phase gradient autofocus technique

Vasily Matkivsky, Alexander Moiseev, Pavel Shilyagin, Alexander Rodionov, Grigory Gelikonov Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

9. Low-coherence interferometry system and its application for contactless profilometry and optical coherence tomography

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

10. Non-invasive assessment of fluid retention in tissues by direct measurements of capillary parameters using optical microscopy

Denis A. Davydov, Boris P. Yakimov, Gleb S. Budylin, Victor V. Fadeev, Yury I. Gurfinkel, Evgeniy A. Shirshin Department of Physics of M.V. Lomonosov Moscow State University, Institute of spectroscopy of the Russian Academy of Science, Moscow, Russia

INVITED INTERNET LECTURE

Optical coherence elastography and Brillouin spectroscopy for biomechanical mapping of tissues

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

Conference on Internet Biophotonics XIII

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

Secretary: **Daria K. Tuchina**, Saratov State University, Saratov, Russia; National Research Tomsk State University, Tomsk, Russia

International Program Committee: **Wei Chen**, University of Central Oklahoma (USA); **Cornelia Denz**, University of Münster (Germany); **Kishan Dholakia**, University of St. Andrews (UK); **Paul M.W. French**, Imperial College of Science, Technology and Medicine (UK); **Elina A. Genina**, Saratov State University (Russia); **Kirill V. Larin**, University of Houston (USA), Saratov State University (Russia); **Martin Leahy**, National University of Ireland, Galway; **Qingming Luo**, Hainan University (China); **Roberto Pini**, Inst. di Fisica Applicata, Sesto Fiorentino (Italy); **Juergen Popp**, Inst. of Photonic Technology, Jena (Germany); **Alexander V. Priezzhev**, Moscow State University (Russia); **Lihong Wang**, Caltech, Pasadena (USA); **Ruikang K. Wang**, University of Washington (USA); **Mikhail Yu. Kirillin**, Institute of Applied Physics RAS, Nizhny Novgorod (Russia), **Valery P. Zakharov**, Samara State University (Russia), **Edik Rafailov**, Aston University (UK).

October 1, Thursday

INTERNET SESSION

Chairs: **Ivan V. Fedosov**, **Alexey N. Bashkatov**, **Valery V. Tuchin**, Saratov State University, Russia
Moderators: **Michael M. Slepchenkov**, **Vasily B. Ageev**, **Alexander I. Dubrovsky**, Saratov State University, Russia

18.00 – 20.00

INVITED INTERNET LECTURES

1. Determination of the water profile in the stratum corneum of the oil-treated skin using in vivo confocal Raman microscopy Maxim E. Darwin¹, Chunsik Choe², Sehyok Choe², Johannes Schleusener¹, Jürgen Lademann¹, ¹Department of Dermatology, Venerology and Allergology, Center of Experimental and Applied Cutaneous Physiology, Charité Universitätsmedizin Berlin, Berlin, Germany; ²Biomedical Materials Division, Faculty of Material Science, Kim Il Sung University, Pyongyang, DPR Korea

2. Biophotonic analysis of embryonic cardiodynamics Andrew L. Lopez¹, Shang Wang², Irina Larina¹, ¹Baylor College of Medicine, Houston, USA; ²Institute of Technology, Hoboken, NJ, USA

3. The efficiency of the refractive index matching mechanism in various biological tissues – a comparative study between the ultraviolet and the visible-NIR regions Nelma M. Gomes¹, Luís M. Oliveira¹, Valery V. Tuchin²⁻⁵, ¹Polytechnic of Porto – School of Engineering, Porto, Portugal; ²Saratov State University, Saratov, Russia; ³Tomsk State University, Tomsk, Russia; ⁴Institute of Precision Mechanics and Control of the

Russian Academy of Sciences, Saratov, Russia; ⁵A.N. Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia

4. Ultrasonic modes to improve the optical clearing of the skin ex vivo Daria K. Tuchina^{1,2}, Alexey N. Bashkatov^{1,2}, Nikita A. Navolokin³, Valery V. Tuchin^{1,2,4}, ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia; ³Saratov State Medical University, Saratov, Russia; ⁴Institute of Precision Mechanics and Control RAS, Saratov, Russia

5. The assessment of tumor vascularization degree for predicting the effectiveness of plasmon photothermal and photodynamic therapy Alla Bucharskaya¹, Galina Maslyakova¹, Marina Chekhonatskaya¹, Pakhomy Svetlana¹, Mudrak Dmitry¹, Nikita Navolokin¹, Georgy Terentyuk^{1,2}, Ekaterina Borisova³, Boris Khlebtsov⁴, Nikolai Khlebtsov⁴, Vadim Genin², Alexey Bashkatov², Elina Genina², Valery Tuchin², ¹Saratov State Medical University, Russia; ²Saratov State University; ²Institute of Electronics, Bulgarian Academy of Sciences, Bulgaria; ⁴Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, Russia

6. Time-domain near-infrared optical tomography of neonatal brain Alexander Kalyanov, Jingjing Jiang, Aldo Di Costanzo Mata, Martin Wolf, University of Zurich, Zurich, Switzerland

7. 5-ALA/PpIX fluorescence signal of glioblastoma cells in correlation with early and late photodynamic-induced apoptosis Ekaterina Borisova¹, Dobroslav Kyurkchiev², Kalina Tumangelova-Yuseir², Ekaterina Ivanova-Todorova², Ivan Angelov¹, Lidia Zaharieva¹,

Peter Karazapryanov², Krassimir Mlnkin²,
¹Institute of Electronics, Bulgarian Academy of
Sciences, Bulgaria; ²University Hospital "St.
Ivan Rilski", Medical University, Sofia, Bulgaria

8. A unified Monte Carlo platform for light transport simulation D. Kurakina¹, A. Getmanskaya^{1,2}, A. Gorshkov^{1,3}, A. Khilov¹, V. Perekatova¹, E. Sergeeva¹, M. Kirillin¹,
¹Institute of Applied Physics RAS, Nizhny Novgorod, Russia; ²N.I. Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia; ³Intel Corp., Nizhny Novgorod office, Russia

9. Comparison of two image reconstruction algorithms for early-photon fluorescence molecular tomography Alexander B. Konovalov^{1,2}, Vitaly V. Vlasov^{1,2}, Alexander S. Uglov¹,
¹Federal State Unitary Enterprise "Russian Federal Nuclear Center – Zababakhin All-Russia Research Institute of Technical Physics," Snezhinsk, Russia; ²Bach Institute of Biochemistry, Research Center of Biotechnology of the Russian Academy of Sciences, Moscow, Russia

10. Use of imaging photoplethysmography for assessing intracranial blood flow in response to trigemino-vascular activation in a rat migraine model Anastasija V. Osipchuk¹, Maxim A. Volynsky², Alexey Y. Sokolov^{1,3}, Alexei A. Kamshilin²,
¹Valdman Institute of Pharmacology, Pavlov First Saint Petersburg State Medical University, Saint Petersburg, Russia; ²ITMO University, Saint Petersburg, Russia; ³Pavlov Institute of Physiology of the Russian Academy of Sciences, Saint Petersburg, Russia

11. Development of patient-derived ortopic glioblastoma model in nude mice D.V. Yuzhakova¹, E.B. Kiseleva¹, M.M. Lukina¹, V.V. Dudenkova¹, G.M. Yusubalieva², A.I. Gavrina¹, V.P. Baklaushev², M.V. Shirmanova¹,
¹Privolzhsky Research Medical University, Nizhny Novgorod, Russia; ²Federal Research and Clinical Center, Federal Medical and Biological Agency, Moscow, Russia

12. Application of LIBS technology for the biotissue diagnosis A.V. Belikov, S.N. Smirnov, A.D. Tavalinskaya, ITMO University, Russian Federation

13. Nanodiamond phantom mimicking human tissue Małgorzata Szczerska, Gdańsk University of Technology, Poland

14. Developing novel photodynamic therapy protocols with assistance of optical monitoring M. Kirillin¹, D. Kurakina¹, A. Khilov¹, M. Shakhova^{1,2}, A. Orlova¹, E. Sergeeva¹, A. Meller^{1,2}, Yu. Ivanova³, K. Pavlova³, and N. Orlinskaya^{1,2},
¹Institute of Applied Physics RAS, 603950, Ulyanov St., 46, Nizhny Novgorod, Russia, ²Privolzhsky Research Medical University, Nizhny

Novgorod, Russia, ³N.I. Lobachevsky State University of Nizhny Novgorod, Russia

INTERNET REPORTS

1. Evaluation of the Shear modulus for the blood vessel wall using intravascular optical coherence tomography raw data A.Yu. Potlov, S.V. Frolov, T.A. Frolova, S.G. Proskurin, Tambov State Technical University, Russia

2. Evaluation of geometric characteristics and internal structure of atherosclerotic plaques on the walls of the blood vessels and their phantoms using intravascular optical coherence tomography A.Yu. Potlov, S.V. Frolov, S.G. Proskurin Tambov State Technical University, Russia

3. Spectral assessment of the state of dental tissues with periodontal disease E.V. Timchenko¹, P.E. Timchenko¹, M.A. Zybin², L.T. Volova³, O.O. Frolov¹, Yu.D. Ityakov¹,
¹Samara National Research University named after academician S.P. Korolev; ²Dental clinic "Diamant"; ³Samara State Medical University, Samara)

4. Ultra-weak photon emission of biological objects in UV-range: early researches of physical properties and up-to-date possibilities of their verification Elena V. Naumova, Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Science, Novosibirsk, Russia

5. Ultra-weak UV-chemiluminescence of blood and its quenching in cancer diseases (an overview of experimental and clinical data and prospects of verification) E.V. Naumova Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Science, Novosibirsk, Russia

6. Raman spectroscopy method for bone analysis during osteoresorption E.V. Timchenko, P.E. Timchenko, E.V. Pisareva, M.Y. Vlasov, L. T. Volova, O.O. Frolov, Ya.V. Fedorova, G.P. Tikhomirova, D.A. Romanova, Samara National Research University named after academician S.P. Koroleva

7. Dose-dependent dynamics of tumor growth under the influence of Chlamydia psittaci AMK-16 specific ornithosis antigen Anna Lyapina¹, Maxim Lavrukhin¹, Larisa Padilo¹, Maria Khizhnyakova¹, Nadeжда Filonova¹, Onega Ulianova², Galina Maslyakova³, Alla Bucharaskaya³, Nikita Navolokin³, Sergey Dobdin², Anatoly Skripal², Vitaly Evstifeev⁴, Sergey Ulyanov^{1,2}, Valentina Feodorova¹,
¹Federal Research Center for Virology and Microbiology, Branch in Saratov, Russia; ²Saratov State University, Russia; ³Saratov State Medical University n.a. V.I. Razumovsky, Russia; ⁴Federal Center for Toxicological, Radiation and Biological Safety, Kazan, Russia

8. Differentiation of Highly Pathogenic Avian Influenza Virus (HPAIV) A strains using of GB-speckles, coding the nucleotide sequences of the neuraminidase gene Maria Khizhnyakova¹, Sergey Zaitsev¹, Yuriy Saltykov¹, Onega Ulianova², Sergey Ulyanov^{1,2}, Alexander Ulyanov³, Nadezhda Filonova¹, Valentina Feodorova¹, ¹Federal Research Center for Virology and Microbiology, Branch in Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Rocolabs, New York, USA

9. The GB-speckles generated for the gene *pgp4* as the promising model towards to differentiation some *Chlamydia* spp Maria Khizhnyakova¹, Sergey Zaitsev¹, Yuriy Saltykov¹, Onega Ulianova², Sergey Ulyanov^{1,2}, Alexander Ulyanov³, Nadezhda Filonova¹, Valentina Feodorova¹, ¹Federal Research Center for Virology and Microbiology, Branch in Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Rocolabs, New York, USA

10. Comparison of structural and statistical characteristics of interfering GB speckles, coding nucleotide sequences of the gene GPCR of Lumpy Skin Disease Virus and Sheeppox Virus Yuriy Saltykov¹, Onega Ulianova², Sergey Ulyanov^{1,2}, Sergey Zaitsev¹, Alexander Ulyanov³, Valentina Feodorova¹, ¹Federal Research Center for Virology and Microbiology Branch in Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Rocolabs, New York, USA

11. Study of statistical properties of GB-speckles, generated on nucleotide sequences of the SARS-CoV-2 gene «S» Sergey Zaitsev¹, Maria Khizhnyakova¹, Yuriy Saltykov¹, Onega Ulianova², Sergey Ulyanov^{1,2}, Alexander Ulyanov³, Nadezhda Filonova¹, Valentina Feodorova¹, ¹Federal Research Center for Virology and Microbiology, Branch in Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Rocolabs, New York, USA

12. Optical properties of liver tumor tissues in the spectral range of 350-2000 nm in laser photothermolysis treatment Vadim D. Genin^{1,2}, Alla B. Bucharskaya³, Elina A. Genina^{1,2}, Georgy S. Terentyuk⁴, Nikolay G. Khlebtsov^{1,5}, Valery V. Tuchin^{1,2,6}, Alexey N. Bashkatov^{1,2}, ¹Saratov State University, Saratov, Russia; ²Tomsk State University, Tomsk, Russia; ³Saratov State Medical University, Saratov, Russia; ⁴Saratov First Veterinary Clinic, Saratov, Russia; ⁵Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov, Russia; ⁶Institute of Precision Mechanics and Control RAS, Saratov, Russia

13. Multivariate analysis of the Raman and NIR fluorescence spectra for optical biopsy

of skin cancer Yulia A. Khristoforova¹, Ivan A. Bratchenko¹, Dmitry N. Artemyev¹, Oleg O. Myakinin¹, Alexander A. Moryatov², Sergey V. Kozlov², Valery P. Zakharov¹, ¹Samara University, Russia; ²Samara State Medical University, Russia

14. Determination of changes in skin tissue during the development of malignant neoplasms by Monte Carlo simulation and Multivariate Curve Resolution – Alternating Least Squares Irina Matveeva, Oleg Myakinin, Yulia Khristoforova, Samara University, Russia

15. Water migration in skin after optical clearing Anton Yu. Sdobnov¹, Johannes Schleusener², Jürgen Lademann², Valery V. Tuchin^{3,6}, Maxim E. Darwin^{2,1} University of Oulu, Oulu, Finland; ²Center of Experimental and Applied Cutaneous Physiology, Department of Dermatology, Venerology and Allergology, Charité – Universitätsmedizin Berlin, Corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, Berlin Institute of Health, Berlin, Germany; ³Saratov State University, Saratov, Russian Federation; ⁴Institute of Precision Mechanics and Control of the RAS, Saratov, Russian Federation; ⁵Bach Institute of Biochemistry, Research Center of Biotechnology of the RAS, Moscow, Russian Federation; ⁶Tomsk State University, Tomsk, Russian Federation

16. Development of remote optical methods for diagnostics and monitoring of the state of the visual organ V.V. Bakutkin, I.V. Bakutkin, V.A. Zelenov International Academy of consulting, audit and education, Saratov, Russia

17. Biophysical approaches to tooth restoration selection: new direction formation in restorative dentistry Nadezda Bessudnova, Sergey B. Venig, Vladimir Senkin, SSU, Saratov, Russia

18. Laser-ablated silicon nanoparticles in tumor treatment via hyperthermia: numerical calculations O. I. Sokolovskaya¹, S.V. Zabolotnov¹, L.A. Golovan¹, D.A. Kurakina², E.A. Sergeeva^{1,2}, M.Yu. Kirillin², ¹Lomonosov Moscow State University, Moscow, Russia; ²Institute of Applied Physics RAS, Nizhny Novgorod, Russia

19. Blood flow visualization by means of laser speckle-contrast measurements under the conditions of nonergodicity A. Yu. Sdobnov¹, V. V. Kalchenko², A. V. Bykov¹, A. P. Popov³, G. Molodij², I. V. Meglinski^{1, 4-6}, ¹University of Oulu, Oulu, Finland; ²Weizmann Institute of Science, Rehovot, Israel; ³VTT Technical Research Centre of Finland, Oulu, Finland; ⁴Tomsk State University, Tomsk, Russia; ⁵Institute of Engineering Physics for Biomedicine (PhysBio), National Research Nuclear University (MEPhI), Moscow, Russia; ⁶College of Engineering and Physical Sciences, Aston University, Birmingham, UK

20. Machine Learning Applications for Spectral Analysis of Human Exhaled Air for Early Diagnosis of Diseases Igor S. Golyak, D.R. Anfimov, E.R. Kareva, P.P. Demkin, A.N. Morozov, I.L. Fufurin, A.V. Scherbakova; Bauman Moscow State Technical University, Moscow, Russia

21. Advances in Physicochemical Methods for Early Diagnosis of Diseases Based on the Analysis of Human Exhaled Breath A.N. Morozov¹, I.L. Fufurin¹, Olga A. Nebritova¹; ¹Bauman Moscow State Technical University, Moscow, Russia

22. Experimental Setup and Method for Human Breath Analysis for the Primary Diagnosis of Diseases Anastasia V. Scherbakova, D.R. Anfimov, I.S. Golyak, E.R. Kareva, A.N. Morozov, P.P. Demkin, I.L. Fufurin; Bauman Moscow State Technical University, Moscow, Russia

23. Red Blood Cell in the Field of the Laser Beam of Optical Tweezers Petr Ermolinskiy¹, Andrei Lugovtsov^{1,2}, Pavel Kokhanchik³, Alexander Priezzhev^{1,2,1} Physics Department, Lomonosov Moscow State University,²International Laser Center, Lomonosov Moscow State University,³Skolkovo Institute of Science and Technology, Russia

INTERNET POSTERS

1. Long-term spectroscopic observations on water samples with phototrophic microorganisms from the supralittoral zone of the Alaid Volcano, the Kuril Islands A.A. Zhiltsova¹, L.P. Anikin², V.A. Rashidov^{2,3}, S.V. Patsaeva¹, ¹Lomonosov Moscow State University, Moscow, Russia; ²Institute of Volcanology and Seismology of Far Eastern Branch of the Russian Academy of Sciences, Petropavlovsk-Kamchatsky, Russia; ³Far Eastern Geological Institute of Far Eastern Branch of RAS, Petropavlovsk-Kamchatsky, Vladivostok, Russia

2. Fluorescence and absorbance indices for chromophoric dissolved organic matter (CDOM) occurring in the stratified lakes at the coast of the White Sea A.A. Zhiltsova¹, D.A. Voronov^{2,3}, E.D. Krasnova¹, S.V. Patsaeva¹, ¹Moscow State University, Moscow, Russia; ²Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences; ³Belozersky Institute of Physico-Chemical Biology, Moscow State University, Moscow, Russia

3. Fluorescence of chlorosomal extracts bacteriochlorophylls (Bchl d and Bchl e) green sulfur bacteria V.V. Rymar, A.A. Zhiltsova, E.D. Krasnova², D.A. Voronov³, S.V. Patsaeva, Moscow State University, Moscow, Russia

4. Analysis of the interaction of antibiotics and organic matter in natural water: spectral studies A. Paramonova^{1,2}, V. Terekhova^{1,2}, S. Patsaeva¹, ¹M.V. Lomonosov Moscow State University, Moscow, Russia; ²A.N. Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences, Moscow, Russia

5. Luminescence indicators of bean leaves at different times of treatment with sodium fluoride O.A. Kalmatskaya, V.A. Karavaev, Lomonosov Moscow State University, Moscow, Russia

6. Study of dental tissues at apical periodontitis by Raman spectroscopy E.V. Timchenko¹, P.E. Timchenko¹, M.A. Zybin², K.B. Chernyy-Tkach¹, O.O. Frolov¹, ¹Samara National Research University; ²Dental Clinic "Diamant"

7. Cerebrovascular reactivity assessment with systemic use of carbonic anhydrase inhibitor for rats: capabilities of imaging photoplethysmography Oleg V. Mamontov^{1,2}, Alexey Y. Sokolov^{1,3}, Maxim A. Volynsky⁴, Anastasija V. Osipchuk¹, Alexei A. Kamshilin⁴, ¹Pavlov First Saint Petersburg State Medical University, Saint Petersburg, Russia; ²Almazov National Medical Research Centre, Saint Petersburg, Russia; ³Pavlov Institute of Physiology, RAS, Saint Petersburg, Russia; ⁴ITMO University, Saint Petersburg, Russia

8. Detection of masked hypertension based on laser Doppler flowmeter measurements Yulia I. Loktionova¹, Maria A. Mikhailova^{1,2}, Andrey I. Korolev², Valida A. Dadaeva², Alexandr Yu. Gorshkov², Elena V. Zharkikh¹, Andrey V. Dunaev¹, Andrey A. Fedorovich², Evgeny A. Zherebtsov^{1, 3}, ¹Orel State University named after I.S. Turgenev, Orel, Russia; ²National Medical Research Center for Therapy and Preventive Medicine of the Ministry of Healthcare of the Russian Federation; ³University of Oulu, Oulu, Finland

9. Characterising hepatocellular carcinoma inoculated in mice by fluorescence lifetime measurements Ksenia Kandurova¹, Valery Shupletsov¹, Elena Potapova¹, Evgeny Zherebtsov^{1,2}, ¹Orel State University, Russia; ²University of Oulu, Finland.

10. Polyacrylamide-based fluorescence phantom for calibration measurements of the FAD content in human skin V.V. Shupletsov¹, E.A. Zherebtsov^{1,2}, V.V. Dremin^{1,3}, A.P. Popov⁴, A.V. Bykov¹, E.V. Potapova¹, A.V. Dunaev¹, I.V. Meglinski^{2,3}, ¹Orel State University named after I.S. Turgenev, Orel, Russia; ²University of Oulu, Oulu, Finland; ³School of Engineering and Applied Science, Aston University, Birmingham, UK; ⁴VTT Technical Research Centre of Finland, Oulu, Finland

11. Urethral pain syndrome: role of cross-polarization OCT in the study of the disease pathogenesis Olga S. Streltsova¹, Anton

S.Kuyarov¹, Alexander A.Moiseev²,
Muhammat A.Molvi¹, Elena B. Kiseleva¹,
¹Privolzhsky Research Medical University,
Nizhny Novgorod, Russia; ²Institute of Applied
Physics Russian Academy of Sciences,
Nizhny Novgorod, Russia

12. Changes in the functional activity of platelets in experimental light desynchronization Vyacheslav F. Kirichuk, Olga V. Zlobina, Alexey N. Ivanov, Olga N. Antipova, Svetlana S. Pakhomy, Alena Yu. Karetnikova, Elena S. Terekhina, Nikita V. Shlyapnikov, Irina O. Bugaeva, Saratov State Medical University n.a. V.I. Razumovsky, Saratov, Russia

13. Light effect on the microvasculature of the skin according to the data of laser Doppler flowmetry in the experiment Olga V. Zlobina, Alexey N. Ivanov, Olga N. Antipova, Svetlana S. Pakhomy, Artyom A. Dolgov, Taisiya V. Milashevskaya, Ekaterina V. Smolina, Irina O. Bugaeva, Saratov State Medical University n.a. V.I. Razumovsky, Saratov, Russia

14. THz spectroscopy of emanation from the skin of patients with different diseases Zasedatel Viacheslav Tomsk State University, Tomsk, Russia

15. Effect of titanium dioxide nanoparticles on human red blood cells microrheologic properties: in vitro studies by laser techniques A.I. Neznanov¹, I.M. Kadanova¹, A.E. Lugovtsov¹, A.V. Priezzhev¹, A.P. Popov²,
¹Lomonosov Moscow State University, Russia;
²VTT Technical Research Centre of Finland, Oulu, Finland

16. The investigation of the dependence of the registered patterns of scattering light on changes in the optical power of probing radiation in digital diaphanoscopy E.O. Bryanskaya¹, I.N. Makovik¹, V.V. Dremin^{1,2}, O.A. Bibikova³, B.M. Shuraev⁴, A.V. Dunaev¹, V.G. Artyushenko³,
¹Orel State University named after I.S. Turgenev, Orel, Russia;
²Aston Institute of Photonic Technologies, School of Engineering & Applied Science, Aston University, Birmingham, UK;
³Art photonics GmbH, Berlin, Germany;
⁴Diagnostic Medical Center "MediScan", Orel, Russia

17. Cathodoluminescence as a powerful tool for visual diagnostics of hard tooth tissues - polymer material adhesive interfaces Sergey B. Venig, SSU Nadezda O. Bessudnova, SSU

18. Cyclic tissue clearing Nataliya Kozintseva¹, Arkady S. Abdurashitov^{2,3}, Valery V. Tuchin^{2,5},
¹MEPHI, Moscow, Russia;
²Saratov State University, Saratov, Russia;
³Tomsk State University, Tomsk, Russia;
⁴Institute of Precision Mechanics and Control

RAS, Saratov, Russia; ⁵ITMO University, St. Petersburg, Russia

19. Optimization of 980nm laser radiation parameters for fractional therapy of oral mucosa Yulia V. Semyashkina, Andrey V. Belikov, ITMO University

20. Optics and thermodynamics of titanium-containing optothermal fiber converter and vein wall during endovascular laser coagulation Do Thanh Tung, Yulia V. Semyashkina, Andrey V. Belikov, ITMO University, Russia

21. 980nm fractional laser treatment of McCall festoon and Stillman's cleft Elena S. Sergeeva¹, Luidmila A. Ermolaeva¹, Denis Y. Fedotov¹, Yulia V. Semyashkina², Andrey V. Belikov²,
¹St. Petersburg State University, Russia;
²ITMO University, Russia

22. PDT with a genetically-encoded photosensitizer miniSOG by continuous wave or pulsed laser irradiation on tumor spheroid model D.V. Yuzhakova¹; M.V. Shirmanova¹; M.M. Lukina¹; A.I. Gavrina¹; A.I. Izosimova^{1,2}; V.A. Kamensky³,
¹Privolzhsky Research Medical University, Nizhny Novgorod, Russia;
²Lobachevsky State University of Nizhny Novgorod;
³Institute of Applied Physics RAS, Nizhny Novgorod, Russia

23. Chemometric analysis of Raman spectra for evaluating hard palate implants E.V. Timchenko¹, P.E. Timchenko¹, Volova L.T.², O.O. Frolov¹, E.F. Yagofarova¹,
¹Samara National Research University;
²Samara State Medical University, Samara, Russia

24. Confocal Raman microspectroscopy of porcine skin ex vivo using laser excitation at 633 nm and optical clearing with glycerol/water/DMSO solution Ali J. Sadeq^{1,2,3}, Malik H. Mahmood^{1,2,4}, R. Holomb¹, L. Himics¹, V. V. Tuchin^{5,6,7}, M. Veres¹¹,
¹Institute for Solid State Physics and Optics, Wigner Research Center for Physics, Budapest, Hungary;
²Institute of Physics, University of Szeged, Szeged, Hungary;
³Ministry of Higher Education and Scientific Research, Baghdad, Iraq;
⁴College of Medicine, University of Misan, Al-Amarah, Misan, Iraq;
⁵Saratov State University, Saratov, Russia;
⁶Precision Mechanics and Control Institute of the Russian Academy of Sciences, Saratov, Russia;
⁷National Research Tomsk State University, Tomsk, Russia

25. Effect of ex vivo skin drying on collimated transmittance spectra kinetics Sergey Zaytsev^{1,2}, Alexey N. Bashkatov^{1,3}, Walter Blondel², Marine Amouroux², Valery V. Tuchin^{1,3,4}, Elina A. Genina^{1,3},
¹Saratov State University, Russia;
²Université de Lorraine, Nancy, France;
³Tomsk State University;
⁴Institute of Precision Mechanics and Control, RAS, Saratov, Russia

26. OCT analysis of in vivo human skin optical clearing combined with physical and

chemical permeation enhancers Sergey Zaytsev^{1,2}, Victoria Charykova¹, Munira Uysupova¹, Alexey N. Bashkatov^{1,3}, Valery V. Tuchin^{1,3,4}, Elina A. Genina^{1,3}; ¹Saratov State University, Russia; ²Université de Lorraine, Nancy, France; ³Tomsk State University; ⁴Institute of Precision Mechanics and Control, RAS, Saratov, Russia

27. Study of the interaction between collagen and collagenase molecules by Dynamic Light Scattering in the presence of various modifiers A.V. Petrova, I.A. Sergeeva, G.P. Petrova, Lomonosov Moscow State University, Moscow, Russia

28. Study of wound healing on healthy and lymphedema tissues using Multiphoton Microscopy HalaZuhayri¹, A.I.Knyazkova^{1,2}, V.V.Nikolaev^{1,2}, A.V.Borisov^{1,3}, Yu.V.Kistenev^{1,3}, P.A.Dyachenko^{1,4}, V.V.Tuchin^{1,4}, ¹Tomsk State University; ²Institute of Strength Physics and Materials Science SB RAS; ³Siberian State Medical University, Tomsk, Russia; ⁴Saratov State University, Saratov, Russia

29. Application of Digital Speckle Patterns Correlation for Blood Clotting Time Evaluation Iuliia D. Liushnevskaya, Fedor A. Gubarev, National Research Tomsk Polytechnic University, Russia

Conference on Low-Dimensional Structures X

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 30, Wednesday

ORAL SESSION

(*Google Meet link:*

<https://meet.google.com/ehh-dsoh-mzh>)

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

10.00-10.15

Anisotropy and regularity of quantum electron transport and electrical conductivity of graphene nanomesh with circular holes

P.V. Barkov, O.E. Glukhova, Saratov State University, Saratov, Russia

10.15-10.30

Formation of porphyrin derivatives monolayers using Langmuir-Blodgett technique

N.N. Begletsova¹, V.N. Mironyuk¹, A.I. Smirnova², N.V. Usoltseva², E.G. Glukhovskoy¹, ¹Saratov State University, Saratov, Russia, ²Ivanovo State University, Ivanovo, Russia

10.30-10.45

Ab initio study of non-common graphene polymorphs

K.P. Katin^{1,2}, K.S. Grishakov^{1,2}, V.S. Prudkovskiy^{2,3}, M.M. Maslov^{1,2}, ¹National Research Nuclear University MEPhI, Moscow, Russia, ²Research Institute for the Development of Scientific and Educational Potential of Youth, Moscow, Russia, ³Georgia Institute of Technology, Atlanta, United States

10.45-11.00

Magnon-phonon interaction in antiferromagnetic two-dimensional MXenes

Ke Wang^{1,2}, Hai Wang¹, Gang Zhang², ¹Xidian University, No. 2 Taibai Road, Xi'an, Shaanxi Province, China, ²A*STAR, Singapore

11.00-11.15

Framework of phenomenological models: quasiparticle properties

M. F. Lin, C. Y. Lin, NCKU, Taiwan

11.15-11.30

A Direct Z-Scheme PtS₂/Arsenene van der Waals Heterostructure with High Photocatalytic Water Splitting Efficiency

Kai Ren¹, Wencheng Tang¹, Minglei Sun¹, Yongqing Cai², Yuan Cheng³, Gang Zhang³, ¹Southeast University, Nanjing, Jiangsu, China, ²University of Macau, Taipa, Macau, China, ³A*STAR, Singapore

11.30-11.45

Dehydrogenation process of crumpled graphene using the Airebo and ReakhFF potentials: molecular dynamics

K.A. Krylova, J.A. Baimova, Institute for Metals Superplasticity Problems of the Russian Academy of Sciences, Ufa, Russia, Bashkir State University, Ufa, Russia

11.45-12.00

Hole-matrixed carbonylated graphene: synthesis, properties, and highly-selective ammonia gas sensing

M.K. Rabchinskii¹, A.S. Varezchnikov², V.V. Sysoev², M.A. Solomatin², D.A. Kirilenko¹, V.V. Shnitov¹, S.A. Ryzhkov³, D.Yu. Stolyarova⁴, P.N. Brunkov¹, ¹Ioffe Institute, ²Yuri Gagarin State Technical University of Saratov, ³ITMO University, ⁴NRC "Kurchatov Institute"

12.15-12.30

Shock waves in graphene and boron nitride

I.A. Shepelev¹, S.V. Dmitriev², E.A. Korznikova², ¹Saratov State University, Saratov, Russia, ²Ufa Federal Research Centre of Russian Academy of Sciences, Ufa, Russia

October 1, Thursday

INTERNET REPORTS

- 1L. **Biopolymer structures with a single-walled carbon nanotubes framework for the restoration of heart tissue**

A.Yu. Gerasimenko^{1,2}, U.E. Kurilova¹, 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

- 2L. **Formation of electrically conductive nanocomposites with three-dimensional networks of carbon nanotubes for bioelectronics**

N.A. Demidenko¹, A.Yu. Gerasimenko^{1,2},¹National Research University of Electronic Technology, Zelenograd, Moscow, Russia,²I.M. Sechenov First Moscow State Medical University, Moscow, Russia

- 3L. **Relationship between the capacitive characteristics of a flat capacitor and the amount of surfactant in a Langmuir monolayer formed between its plates**

V.N. Mironyuk, V.F. Kabanov, A.I. Mikhailov, N.N. Begletsova, E.G. Glukhovskoy, Saratov State University, Saratov, Russia

- 4L. **Electrophysical and morphological characteristics of vertically aligned carbon nanotubes array after laser and barium nitrate structuring**

E.P. Kitsyuk^{1,2,3}, Yu.P. Shaman², A.Yu. Gerasimenko^{1,4},¹National Research University of Electronic Technology (MIET), Zelenograd, Moscow, Russia,²Scientific-manufacturing company "Technological Centre",³Institute of Nanotechnology of Microelectronics of the RAS,⁴I.M. Sechenov First Moscow State Medical University, Moscow, Russia

- 5L. **Formation and research of Langmuir monolayers based on an asymmetrically substituted porphyrin derivatives and arachidic acid**

V.N. Mironyuk¹, N.N. Begletsova¹, A.J. Al-Alwani¹, A.I. Smirnova², N.V. Usoltseva², E.G. Glukhovskoy¹,¹Saratov State University, Saratov, Russia,²Ivanovo State University, Ivanovo, Russia

- 6L. **Numerical calculation of laser welds nanocomposite formation parameters using solders based on proteins and carbon nanotubes**

D.I. Ryabkin^{1,2}, N.A. Taricyna¹, E.A. Morozova², A.Yu. Gerasimenko^{1,2},¹National Research University of Electronic Technology, Zelenograd, Moscow, Russia,²I.M. Sechenov First Moscow State Medical University, Moscow, Russia

- 7L. **Studying of graphene-nickel composite by molecular dynamics method**

L.R. Safina¹, J.A. Baimova^{2,3},¹Ufa State Petroleum Technological University, Ufa, Russia,²Institute for Metals Superplasticity Problems of the Russian Academy of Sciences, Ufa, Russia,³Bashkir State University, Ufa, Russia

- 8L. **Casimir-Lifshitz force between two graphene sheets: classical electromagnetic Green's functions approach**

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

- 9L. **Quasi-2D-nanoflakes of Co3O4: synthesis and chemoresistive response to vapors of compound studies**

M.A. Solomatin¹, F.S. Fedorov¹, A.S. Varezchnikov¹, D.A. Kolosov³, O.E. Glukhova³, A.G. Nasibulin², V.V. Sysoev^{2,1}, Yury Gagarin State Technical University of Saratov, Saratov, Russia,²Skolkovo Institute of Science and Technology, Moscow, Russia,³Saratov State University, Saratov, Russia

POSTER SESSION

(Building 3, 3d floor Hall)

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

18.30-19.30

1. **Sensory properties of layered phospholipid-graphene films**

M.M. Slepchenkov, O.E. Glukhova, Saratov State University, Saratov, Russia

2. **Synthesis Photovoltaic properties of graphene-nanotube composite films**

V.V. Mitrofanov, O.E. Glukhova, M.M. Slepchenkov, Saratov State University, Saratov, Russia

3. **Electronic and optical properties of vertical heterostructures based on monolayers of 2D materials**

O.E. Glukhova, M.M. Slepchenkov, D.A. Kolosov, K.R. Asanov, Saratov State University, Saratov, Russia

4. **Multilayer formation of nematic liquid crystal on the surface of a subphase with copper nanoparticles**
N.N. Begletsova, E.G. Glukhovskoy, Saratov State University, Saratov, Russia
 5. **Quantum capacity of CNT decorated with iron particles**
V.V. Shunaev, A.V. Ushakov, O.E. Glukhova, Saratov State University, Saratov, Russia
 6. **Doping of graphene with pyrolytic nitrogen. Energy and electronic properties**
S.A. Toom, V.V. Shunaev, Saratov State University, Saratov, Russia
 7. **Administration of Reactive Oxygen Species via Polymeric Microcontainers for Selective Photodynamic Therapy**
A.V. Ermakov, Saratov State University, Saratov, Russia
 8. **Studying of formation process and optoelectrical properties of langmuir monolayers and langmuir-blodgett films of iron phthalocyanine**
I.A. Gorbachev, A.V. Smirnov, V.V. Kashin, V.V. Kolesov, I.E. Kuznetsova, Kotelnikov institute of Radio Engineering and Electronics of RAS, Moscow, Russia
 9. **Solution of j-type dimeric magnesium phthalocyanine complex for switches of optoelectronic medical systems and vision protection**
M.S. Savelyev^{1,2}, A.Yu. Gerasimenko^{1,2}, P.N. Vasilevsky¹, A.Yu. Tolbin³,¹National Research University of Electronic Technology, MIET, Zelenograd, Moscow, Russia,²I.M. Sechenov First Moscow State Medical University, Moscow, Russia,³Institute of Physiologically Active Compounds, Russian Academy of Sciences, IPAC RAS
 10. **Study of the stability of monolayers based on porphyrin derivatives**
A.J. Al-Alwani, N.N. Begletsova, V.F. Kabanov, V.N. Mironyuk, A.I. Mikhailov, E.G. Glukhovskoy, Saratov State University, Saratov, Russia
 11. **Effect of temperature on hydrogen sorption of crumpled graphene with structural elements different sizes**
N.G. Apkadirova¹, K.A. Krylova^{1,2},¹Bashkir State University, Ufa, Russia,²Institute for Metals Superplasticity Problems of the Russian Academy of Sciences, Ufa, Russia
 12. **Study of Modified Layered Graphene Composites from the Position of Application as Electrodes lithium ion batteries**
D.A. Kolosov, O.E. Glukhova, Saratov State University, Saratov, Russia
- INTERNET POSTERS**
13. **Modified Nanostructured layers of zirconium and tantalum formed on titanium by induction PVD**
M.E. Fedoseev¹, A.M. Zakharevich², A.A. Fomin¹,¹Yuri Gagarin State Technical University of Saratov, Saratov, Russia,²Saratov State University, Saratov, Russia
 14. **Layered Formation of a strain sensor prototype under the action of laser radiation in layers of biocomposite nanomaterial**
L. Ichkitidze^{1,2}, A. Gerasimenko^{1,2}, D. Telyshev^{1,2}, A. Kuksin¹, V. Petukhov¹, S. Selishchev¹,¹National Research University of Electronic Technology "MIET", Moscow, Russia,²I.M. Sechenov First Moscow State Medical University, Moscow, Russia
 15. **Graphene Optical Density Changes of Aqueous Dispersion for Biological Materials and Carbon Nanotubes with Action Gradient Magnetic Field**
L. Ichkitidze^{1,2}, A. Markov¹, A. Gerasimenko^{1,2}, D. Telyshev^{1,2}, S. Selishchev¹,¹National Research University of Electronic Technology "MIET", Moscow, Russia, ²I.M. Sechenov First Moscow State Medical University, Moscow, Russia
 16. **Composites Field emission from indium antimonide quantum dots**
M.V. Gavrikov, V.F. Kabanov, Saratov State University, Saratov, Russia
 17. **The mechanical characteristics of solid and flexible structures based on single-walled carbon nanotubes and biopolymers**
D.T. Murashko¹, 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
 18. **Halloysite nanotubes as natural containers for freezing-induced loading**
Dr. D. Voronin^{1,2}, Dr. K. Cherednichenko¹, P. Demina², Dr. A. Abramova², Prof. V.

Vinokurov¹,¹National University of Oil and Gas «Gubkin University», Moscow, Russia,²Saratov State University, Saratov, Russia

19. **Photo-conductance of thin nanostructured WO₃ films in the vicinity of the edge of fundamental absorption band**

L.A. Kochkurov¹, E.V. Ushakova¹, D.A. Zimnyakov^{1,2}, Yury Gagarin State Technical University of Saratov, Saratov, Russia,²Institute for Problems of Precision Mechanics and Control RAS, Saratov, Russia

Conference on Biomedical Spectroscopy VII

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

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

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

September 30, Wednesday

ON-LINE JOINT INVITED LECTURE/ORAL SESSION

BIOPHYSICS II & BIOMEDICAL SPECTROSCOPY I

(Building 10, Hall 511,

Zoom link:

<https://osachapter.zoom.us/j/98300886300>

Chair: **Ekaterina Borisova**, Institute of Electronics,
Bulgarian Academy of Sciences, Sofia, Bulgaria

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

17.00-17.20 (Local time: 16.00-16.20)

Invited

Optical Bioimaging of Connective Tissue in Norm and Lichen Sclerosus

Marina A. Sirotkina, A.L. Potapov, V.V. Dudenkova, A.A. Moiseev, M.M. Karabut, I.A. Kuznetsova, N.D. Gladkova; Privolzhsky Research Medical University, Nizhny Novgorod, Russia

17.20-17.40 (15.20-15.40)

Invited

Interstitial PDT of Glioblastoma – Status and Perspectives

Adrian Rühm and Ronald Sroka, Laser-Forschungslabor, LIFE Center, Department of Urology, University Hospital, LMU Munich, Munich, Germany

17.40-18.00 (15.40-16.00)

Invited

Skin Reflectance: How Long the Photons Travel until Remission

Janis Spigulis, Vanesa Lukinsone, Anna Maslobojeva, Uldis Rubins, Maris Kuzminskis; Biophotonics Laboratory, Institute of Atomic Physics and Spectroscopy, University of Latvia, Riga

18.00-18.20 (10.00-10.20)

Invited

Dynamic Imaging of the Lymphatic Drainage from the Eye in Mice by Multispectral Photoacoustic Tomography

Vladislav Toronov^{1,2}, Balal Mian¹, Yeni Yucel^{1,2,3}, Xun Zhou^{3,1}; Ryerson University,²The Institute for Biomedical Engineering, Science & Technology (iBEST) St. Michael's Hospital,³Keenan Research Centre for Biomedical Science of St. Michael's Hospital, Toronto, Canada

18.20-18.40 (9.20-9.40)

Invited

Optical Coherence Tomography of Preimplantation Embryonic Development In Vivo

Irina V. Larina; Baylor College of Medicine, Houston, USA

18.40-19.00 (17.40-18.00)

Invited

Fluorescence diagnostics of soft tissues neoplasia

Ekaterina Borisova¹, Tsanislava Genova¹, Petranka Troyanova², Elmira Pavlova³, Borislav Vladimirov²; ¹Institute of Electronics, Bulgarian Academy of Sciences; ²University Hospital "Tzaritza Yoanna – ISUL"; ³"St. Panteleimon" General Hospital, Sofia, Bulgaria

19.00-19.15 (18.00-18.15)

Influence of Active Er-laser Delivery on the Optical Properties of Drug

A.V. Belikov, S.N. Smirnov, Anastasia D. Tavalinskaya, ITMO University, S.-Peterburg, Russia

October 1, Thursday

INVITED INTERNET REPORTS

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

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

18.00 – 20.00

1BS Study of ovalbumin coagulation dynamics by using upconversion luminescence of NaYF₄:Yb,Er nanoparticles Ustalkov S.O., Saratov State University, Mohammed A.H.M., Saratov State University, Zakharevich A.M., Saratov State University, Kozyrev, A.A., National Research Nuclear University "MEPhI", Sagaidachnaya E.A., Saratov State University, Kochubey V.I., Saratov State University, Tomsk State University, Skaptsov A.A. Saratov State University

2BS Spectral studies of the interaction of luminescent probes with glycosylated proteins Melnikov A.G., Saratov State Technical University named after Yu.A.Gagarin, Melnikov G.V., Saratov State Technical University named after Yu.A.Gagarin, Kochubey V.I., Saratov State University, Tomsk State University, Pravdin A.B., Saratov State University, Kukushkina A.A., Saratov State University

3BS SERS signal of human blood plasma Natalia E. Markina., Saratov State University, Alexey V. Markin, Saratov State University

4BS Laser pump power density as a factor controlling up-conversion luminescence quantum yield of lanthanide nanocomplexes O.E. Sarmanova, Moscow State University, Department of Physics, Moscow, Russia, S.A. Burikov, Moscow State University, Department of Physics, Moscow, Russia, T.A. Dolenko, Moscow State University, Department of Physics, Moscow, Russia

5BS Spectral analysis of biological tissue with embedded nanoparticles Kozlova Ekaterina., Saratov State University, Kochubei Vyacheslav, Saratov State University, Tomsk State University

- 1. Application of Raman spectroscopy and machine learning for studying of blood serum of rats with liver cancer** O. P. Cherkasova, Institute of Laser Physics SB RAS, Russia, Institute on Laser and Information Technologies - Branch of the Federal Scientific Research Centre "Crystallography and Photonics" of RAS, Russia, A. A. Mankova, Lomonosov Moscow State University, Russia, E. N. Lazareva, Tomsk State University, Russia, Saratov State University, Russia, Y.V. Kistenev, Institute of Strength Physics and Materials Science of Siberian Branch of the RAS, Russia, D. A. Vrazhnov, Tomsk State University, Russia, Institute of Strength Physics and Materials Science of Siberian Branch of the RAS, Russia, V.V. Tuchin Tomsk State University, Russia, Saratov State University, Russia, A.P. Shkurinov, Institute on Laser and Information Technologies - Branch of the Federal Scientific Research Centre "Crystallography and Photonics" of RAS, Russia, Lomonosov Moscow State University, Russia
- 2. Fiber optic solutions for biomedicine** O. Bibikova, art photonics GmbH, Berlin, Germany, V. Belikova, Samara State University, Samara, Russia, I. Usenov, art photonics GmbH, Berlin, Germany, T. Sakharova, art photonics GmbH, Berlin, Germany, V. Artyushenko, art photonics GmbH, Berlin, Germany
- 3. Unraveling molecular profiles in skin in vivo using Raman microspectroscopy and non-negative matrix factorization** B.P. Yakimov M.V. Lomonosov Moscow State University, Moscow, Russia, A.V. Venets M.V. Lomonosov Moscow State University, Moscow, Russia J. Schleusener, Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Department of Dermatology, Venerology and Allergology, Center of Experimental and Applied Cutaneous Physiology, Germany, V.V. Fadeev, M.V. Lomonosov Moscow State University, Moscow, Russia, M.E. Darwin, Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Department of Dermatology, Venerology and Allergology, Center of Experimental and Applied Cutaneous Physiology, Germany, E.A. Shirshin M.V. Lomonosov Moscow State University, Moscow, Russia, Institute of

Spectroscopy of the Russian Academy of Sciences, Troitsk, Moscow, Russia

INTERNET REPORTS

1. **The dispersive element based on porous silicon photonic crystal for ultra-compact optical spectrometers** Sergey E. Svyakhovskiy, Lomonosov Moscow State University, Russia
2. **Surface Photoluminescence of Nanodiamonds: Dependence on pH** A. V. Lachko, A. M. Vervalde, K. A. Kozhushnyi, T. A. Dolenko, Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia

INTERNET POSTERS

1. **Ph-dependent photoluminescence of nanodiamonds and carbon dots: similarities and differences** Vervalde A. M., Faculty of Physics, M. V. Lomonosov Moscow State University, Moscow, Russia, Salekhov A. D., Faculty of Physics, M. V. Lomonosov Moscow State University, Moscow, Russia Shenderova O. A., Adamas Nanotechnologies, Inc., 8100 Brownleigh Dr, Suit 120, Raleigh, NC 27617, USA, Dolenko T. A., Faculty of Physics, M. V. Lomonosov Moscow State University, Moscow, Russia
2. **The Determination of Polarized Fluorescence Parameters of FAD in Water-Methanol Solutions**, M.K. Krasnopevtceva, Ioffe Institute, St.

Petersburg, Russia, V.P. Belik, Ioffe Institute, St. Petersburg, Russia, I.V. Semenova, Ioffe Institute, St. Petersburg, Russia, A.G. Smolin, Ioffe Institute, St. Petersburg, Russia, O.S. Vasyutinskii, Ioffe Institute, St. Petersburg, Russia

3. **Quality control of tablets "Papazol" by spectrophotometry using chemometrics**, Shestopalova N.B. Saratov State Medical University named after V. I. Razumovsky, Fomina Yu.A. Saratov State Medical University named after V. I. Razumovsky, Rusanova T.Yu. Saratov State University, Burmistrova N.A. Saratov State University
4. **Advanced spectral analysis of dental materials for dentistry during their manufacture**, Frolov O.O., Samara National Research University, Samara, Russia, Timchenko P.E., Samara National Research University, Samara, Russia, Timchenko E.V., Samara National Research University, Samara, Russia, Volova L.T., Samara State Medical University, Institute of Experimental Medicine and Biotechnology, Samara, Russia, Zybin M.A., Samara State Medical University, Institute of Experimental Medicine and Biotechnology, Samara, Russia

Conference on Computation Biophysics and Analysis of Biomedical Data VII

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

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

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

September 30, Wednesday

ORAL SESSION I (Building 5, Hall 72)

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

13:30-13:50

Absence epileptiform activity simulation using a nonautonomous network of neural-like radioengineering circuits

Nikita N. Egorov, V.I. Ponomarenko, I.V. Sysoev, M.V. Sysoeva, Saratov Branch of Kotelnikov IRE of RAS; Saratov State University, Russia

13:50-14:10

Internet

A topological classification of population bursts in spiking neural network

Sergey A. Lobov^{1,2}, A.I. Zharinov¹, O. Semenova¹, V.B. Kazantsev^{1,2}, ¹Lobachevsky State University; ²Innopolis University, Russia

14:10-14:30

Internet

Local and collective IP₃-mediated calcium dynamics in astrocyte network

Darya V. Verveiko¹, A.Yu. Verisokin¹, A.R. Brazhe², D.E. Postnov³, ¹Kursk State University, ²Moscow State University; ³Saratov State University, Russia

14:30-14:50

Internet

Computational realization of non-linear diffusion generalizing Barenblatt-Pattle's approach on the case of flows' simulations in elastic microvessels

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

14:50-15:10

Internet

Formation, dynamics and properties of stable moving patterns in a simple model of neural tissue

Andrey Yu. Verisokin¹, D.V. Verveiko¹, D.E. Postnov², ¹Kursk State University; ²Saratov State University, Russia

15:10-15:30

Extended detrended fluctuation analysis of EEG signals during sleep and the opening of the blood-brain barrier

Alexey N. Pavlov¹, A.I. Dubrovsky¹, A.A. Koronovskii Jr.¹, O.N. Pavlova¹, O.V. Semyachkina-Glushkovskaya¹, J. Kurths², ¹Saratov State University, Russia; ²Potsdam Institute for Climate Impact Research, Germany

15:30-15:50

Mathematical modeling of the phenomenon Spontaneous Internal Desynchrony (SID)

Ksenia O. Merkulova, D.E. Postnov, Saratov State University, Russia

October 1, Thursday

**JOINT INTERNET POSTER SESSION
AND INTERNET DISCUSSION**

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

Opened from 10-00 30.10.2020

- 1BC. **Spectral analysis of signals of the regulatory system of blood circulation in patients with Covid-19** Viktoria V. Skazkina¹, N.S. Krasikova², A.S. Karavaev^{1,3}, E.I. Borovkova^{1,2}, A.V. Kuligin², Y.M. Ishbulatov^{1,3}, R.S. Prokhorov², A.G. Kudryavzev⁴, A.R. Kiselev^{1,2}, ¹Saratov State University; ²Saratov State Medical University; ³Saratov Branch of Kotelnikov IRE of RAS; ⁴Saratov City Clinical Hospital No. 10, Russia
- 2BC. **Modeling spike-wave discharge initiation in the brain thalamocortical system by small networks of neurooscillators** Anton A. Kapustnikov, M.V. Sysoeva, I.V. Sysoev, Saratov Branch of Kotelnikov IRE of RAS, Russia
- 3BC. **fNIRS-based classification of hand-related motor activity and motor imagery** A.E. Hramov, Vadim V. Grubov, A. Badarin, Innopolis University, Russia
- 4BC. **Artificial neural network predicts inter-areal functional connectivity** Elena Pitsik, N.S. Frolov, Innopolis University, Russia
- 5BC. **Age-related Changes In The Brain Functional Connectivity During Motor Initiation** Nikita S. Frolov, E. Pitsik, A.E. Hramov, Innopolis University, Russia
- 6BC. **Influence of the sensory information complexity on the features of low-frequency rhythms of human EEG** Alexander Kuc, Yuri Gagarin State Technical University of Saratov, Russia
- 7BC. **Study of the phase synchronization of low-frequency oscillations of the processes of autonomous regulation of blood circulation** Anton D. Martynov¹, E.I. Borovkova^{1,3}, ¹Saratov State University; ²Saratov State Medical University named after V. I. Razumovsky; ³Saratov Branch of Kotelnikov IRE of RAS, Russia
- 8BC. **Approach to collaborative BCI for enhancing human-to-human interaction in shared visual task** Vadim V. Grubov, V. Maksimenko, Innopolis University, Russia
- 9BC. **Peculiarities of brain sources reconstructed by MEG signals during imaginary movements** Semen A. Kurkin¹, P. Chholak², A. Pisarchik², A.E. Hramov¹, ¹Innopolis University, Russia; ²Technical University of Madrid, Spain
- 10BC. **A Model for particle transport in a branched blood vessel under the influence of magnetic field** Samia F. Salem^{1,2}, V.V. Tuchin^{1,3-5}, ¹Saratov State University, Russia; ²Benha University, Egypt; ³Tomsk State University; ⁴Research Center of Biotechnology of the RAS; ⁵Institute of Precision Mechanics and Control of the RAS, Russia
- 11BC. **Extended detrended fluctuation analysis and its applications** Alexander A. Koronovskii Jr., A.N. Pavlov, Saratov State University, Russia
- 12BC. **Method of assessing the complexity in the brain spatial electrical activity** Evgeniy N. Egorov¹, K.S. Samatova², O.M. Posnenkova², A.S. Kiselev^{1,2}, ¹Saratov State University; ²Saratov State Medical University, Russia
- 13BC. **The pilot study of weak changes in the spatial EEG activity of healthy test subjects in a passive wakefulness with odors impacts** Kamila Samatova¹, A. Titova¹, A. Runnova^{1,2}, A. Varegnikov³, ¹Saratov State Medical University; ²Saratov State University; ³Yuri Gagarin State Technical University of Saratov, Russia
- 14BC. **A study of synchronization between rats ECoG channels under the anesthesia** Maksim Zhuravlev^{1,2}, S. Kustodov¹, E. Egorov¹, A. Dubrovskii¹, O. Semyachkina-Glushkovskaya¹, ¹Saratov State University; ²Saratov State Medical University, Russia
- 15BC. **Method for the automatic diagnosis of states of wakefulness, sleep, and epileptic activity by rats invasive ECoG signals** Ekaterina Kryakvina¹, R.V. Ukolov², A.R. Kiselev¹, E.Yu. Sitnikova³, ¹Saratov State Medical University; ²Saratov State University; ³Institute of Higher Nervous Activity and Neurophysiology of RAS, Russia
- 16BC. **The study of the generation of alpha rhythm in patients with chronic headaches** Michail Novikov¹, R. Parsamyan¹, V. Romanenko¹, A. Runnova^{1,2}, ¹Saratov State Medical University; ²Saratov State University, Russia
- 17BC. **Synchronization in the brain EEG-activity in modified Multiple Sleep Latency Test** Elena Martirosyan¹, O. Posnenkova¹, R. Parsamyan¹, M. Zhuravlev^{2,1}, ¹Saratov State Medical University; ²Saratov State University, Russia
- 18BC. **The study of changes in EEG activity in spatial tasks in disabilities children in primary school** Margarita A. Popova^{1,2},

- R.V. Ukolov¹, E.S. Grinina¹, R.M. Shamionov¹, ¹Saratov State University; ²Saratov State Medical University, Russia
- 19BC. **Spectral characteristics of photoplethysmographic indicators of human peripheral vascular tone** Igor B. Isupov, R.Sh. Zatrudina, V.Yu. Gribkov, VolSU, Russia
- 20BC. **Detection of special points in a photoplethysmogram** V.Yu. Gribkov, I.B. Isupov, R.Sh. Zatrudina, VolSU, Russia
- 21BC. **Synchronization in the inhibitory coupled Hodgkin-Huxley neural networks** Andrey V. Andreev, V.A. Maksimenko, Innopolis University, Russia
- 22BC. **External stimulus classification by Hodgkin-Huxley neural network** Andrey V. Andreev, A.N. Pisarchik, A.E. Hramov, Innopolis University, Russia
- 23BC. **Biomarkers of brain activity in the process of solving cognitive tasks** Artem A. Badarin, S.A. Kurkin, V.V. Grubov, Innopolis University, Russia
- 24BC. **Analysis of the hemodynamic response of various movements type** Artem A. Badarin, S.A. Kurkin, V.V. Grubov, E.N. Pitsik, Innopolis University, Russia
- 25BC. **Analysis of the muscle activation pattern during equilibrium seeking activity** Vladimir S. Khorev, V.V. Grubov, A.A. Badarin, V.A. Maksimenko, S.A. Kurkin, Innopolis University, Russia
- 26BC. **Mathematical model of Covid-19 pandemic based on retarded differential equation** F.M. Pen'kov¹, S.I. Vinitsky^{2,3}, Vladimir L. Derbov⁴, A.A. Gusev², P.M. Krassovitskiy^{2,5}, Joint Institute for Nuclear Research, Dubna, Russia; ¹Al-Farabi Kazakh National University, Kazakhstan; ²Joint Institute for Nuclear Research; ³Peoples' Friendship University of Russia; ⁴Saratov State University, Russia; ⁵Institute of Nuclear Physics, Kazakhstan
- 27BC. **Spectral analysis of signals of the regulatory system of blood circulation in patients with Covid-19** Viktoria V. Skazkina¹, N.S. Krasikova², A.S. Karavaev^{1,3}, E.I. Borovkova^{1,2}, A.V. Kuligin², Y.M. Ishbulatov^{1,3}, R.S. Prokhorov², A.G. Kudryavzev⁴, A.R. Kiselev^{1,2}, ¹Saratov State University; ²Saratov State Medical University;
- ³Saratov Branch of Kotelnikov IRE of RAS; ⁴Saratov City Clinical Hospital No. 10, Russia
- 28BC. **Component analysis and informative feature selection for Raman spectral data** Y.V. Kistenev¹, Denis A. Vrazhnov^{1,2}, O. P. Cherkasova^{3,4}, A. A. Mankova⁵, A.V. Karmenyan⁶, E.V. Perevedentseva^{6,7}, A.S. Krivokharchenko⁸, M.N. Sarmiento⁶, E.L. Barus⁶, C.-L. Cheng⁶, ¹Tomsk State University; ²Institute of Strength Physics and Materials Science of Siberian Branch of the RAS; ³Institute of Laser Physics SB RAS; ⁴Institute on Laser and Information Technologies - Branch of the Federal Scientific Research Centre "Crystallography and Photonics" of RAS; ⁵Lomonosov Moscow State University, Russia; ⁶National Dong Hwa University, Hualien, Taiwan; ⁷P.N. Lebedev Physics Institute of RAS; ⁸N. N. Semenov Institute of the Chemical Physics, RAS, Russia
- 29BC. **Automated system for diagnosing fungal diseases** Ali V. Mukshaev¹, O.V. Ushakova¹, O.V. Nechaeva¹, A.V. Egorova², N.V. Bespalova¹, D.A. Schnaider³, S.V. Nechaev⁴, ¹Yury Gagarin State Technical University of Saratov; ²Russian National Research Medical University n.a. N.I. Pirogova; ³Saratov Regional Dermatovenerological Dispensary; ⁴ITMO University, Russia
- 30BC. **Improving low-resolution gas-mixture absorption spectra using neural networks** Viktor E. Skiba¹, D.A. Vrazhnov^{1,2}, V.V. Prischepa¹, M.B. Miroshnichenko², ¹National Research Tomsk State University; ²Institute of Strength Physics and Materials Science of SB RAS, Russia
- 31BC. **Impact of the integrity of surrounding teeth on tooth restoration selection: numerical simulation and clinucal observation** Vladimir S. Senkin¹, N.O. Bessudnova¹, N.O. Bessudnova¹, S.B. Venig¹, D.Yu. Serov², ¹Saratov State University; ²Yury Gagarin State Technical University of Saratov, Russia
- 32BC. **Mathematical modeling of impact endothelial mechanism in the regulating vascular tone** Elena S. Litvinenko, D.E. Postnov, Saratov State University, Russia

October 2, Friday

ORAL SESSION II

(Building 5, Hall 72)

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

10:00-10:10

Opening remarks

Dmitry E. Postnov, Saratov State University, Russia

10:10-10:30

Label-free vascular network imaging using adaptive Niblack analysis and PIV

Maxim A. Kurochkin^{1,2}, I.V. Fedosov², D.E. Postnov², ¹Skolkovo institute of science and technology; ²Saratov State University, Russia

10:30-10:50

Variability of retrograde and antegrade waves after occlusion recorded by ultrasound dopplerography

Anatoly V. Skripal, A. S. Bakhmetyev, S. Yu. Dobdin, A. A. Sagaidachny, R. T. Baatyrov, A.D. Usanov, V. A. Klochkov, A. S. Tikhonova, Saratov State University, Russia

10:50-11:10

Internet

Using adaptive window wavelet neural network to solve a spectroscopy inverse problem

Alexander Efitorov^{1,2}, V. Shiroky^{1,2}, S. Dolenko^{1,2}, ¹D.V.Skobel'tsyn Institute of Nuclear Physics; ²M.V.Lomonosov Moscow State University, Russia

10:50-11:10

Detection of oscillational patterns with changes in frequency and amplitude characteristics in complex non-stationary signals

Rodion Ukolov¹, A. Krutyakov², M. Simonyan², M. Zhuravlev^{1,2}, ¹Saratov State University; ²Saratov State Medical University, Russia

11:10-11:30

Internet

Mathematical and computational modeling of host-pathogen interaction in the lung lesion development due to Mycobacterium tuberculosis in humans

Anastasia I. Lavrova^{1,2}, ¹Saint-Petersburg State University; E.B. Postnikov³, D. Esmedlyaeva², ²Saint-Petersburg State Research Institute of Phthisiopulmonology; ³Kursk State University, Russia

11:30-11:50

Internet

Identification and analysis of key parameters for the ossification of cells on composites gellan gum hydrogels functionalized by Ca/Mg carbonates

Anatolii A. Abalymov^{1,2}, L. Van der Meeren², A.G. Skirtach², B.V. Parakhonskiy¹, ¹Saratov State University, Russia; ²Ghent University, Belgium

11:50-12:10

Neuro-fuzzy stabilization of the rotating platform

R.S. Biryukov, Stepan M. Shulpin, Lobachevsky State University of Nizhny Novgorod, Russia

Workshop on Nonlinear Dynamics XI

Workshop Chair: **Vadim S. Anishchenko**, Saratov State University (Russia)
Secretary: **Andrei V. Slepnev**, Saratov State University (Russia)

October 2, Friday

ORAL SESSION

(Building 3, Room 38; Zoom link:

<https://us02web.zoom.us/j/84239757588>)

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

12.30-12.50

Oscillations and synchronization in SIRS models of epidemic propagations

Alexey Shabunin, Saratov State University, Saratov, Russia

12.50-13.00

Synchronization of complex dynamics in systems with nonlinear inertial coupling of the memristive type

Ivan Korneev, Saratov State University, Russia; Andrei Slepnev, Saratov State University, Russia; Vladimir Semenov, FEMTO-ST Institut, CNRS & Université Bourgogne Franche-Comté, France; Tatyana Vadivasova, Saratov State University, Russia

13.00-13.15

Quasiperiodicity and chaos in course of grinding: analysis of a model based on nonlinearly coupled Van der Pol-like oscillators

Pavel Kuptsov, Mechanical Engineering Research Institute of the Russian Academy of Sciences (IMASH RAN), Moscow, Russia

13.15-13.30

Modeling nonlinear dynamics using an artificial neural network

Pavel V. Kuptsov, Laboratory of topological methods in dynamics, National Research University Higher School of Economics, Nizhny Novgorod, Russia; Anna V. Kuptsova, Institute of Electronic Engineering and Instrumentation, Yuri Gagarin State Technical University of Saratov, Russia

13.30-13.40

Delocalized modes in 2D cuprate-like lattices

Alexander Chetverikov, Saratov State University, Russia

13.40-13.50

Modeling non-Gaussian diffusion processes

Valery M. Anikin, Saratov State University, Russia

13.50-14.00

Effects of synchronization in heterogeneous multiplex networks with sparse coupling between layers

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

14.00-14.10

Breather-like excitations in chains of oscillators and active particles with nonlinear coupling

K.S. Sergeev, Saratov State University, Russia; A.V. Slepnev, Saratov State University, Russia; E.M. Elizarov, Saratov State University, Russia; A.P. Chetverikov, Saratov State University, Russia

14.10-14.20

Bistable labyrinth-like structures and chimera states in a 2D lattice of van der Pol oscillators

I.A. Shepelev, Saratov State University, Russia; V.S. Anishchenko, Saratov State University, Russia

14.20-14.30

Dynamics of a 2D lattice of van der Pol oscillators with nonlinear repulsive coupling

I.A. Shepelev, Saratov State University, Russia; T.E. Vadivasova, Saratov State University, Russia

14.30-14.40

The dynamics of an ensemble of FitzHugh-Nagumo oscillators with memristive couplings

Ivan Korneev, Saratov State University, Russia; Andrei Slepnev, Saratov State University, Russia; Vladimir Semenov, FEMTO-ST Institut, CNRS & Université Bourgogne Franche-Comté, France; Tatyana Vadivasova, Saratov State University, Russia

14.40-14.50

Synchronization of 2D van der Pol lattices with different inter-layer coupling between them.

I.A. Shepelev, Saratov State University, Russia; A.V. Bukh, Saratov State University, Russia; T.E. Vadivasova, Saratov State University, Russia; V.S. Anishchenko, Saratov State University, Russia

14.50-15.00

Delocalized nonlinear vibrational modes of triangular lattices

E.A. Korznikova, Institute of Molecule and Crystal Physics, Ufa Federal Research Centre of Russian Academy of Sciences, Ufa, Russia; I.A. Shepelev, Saratov State University, Russia; D.S. Ryabov, Southern Federal University, Institute of Physics,

Rostov-on-Don, Russia; S.V. Dmitriev, Institute of Molecule and Crystal Physics, Ufa Federal Research Centre of Russian Academy of Sciences, Ufa, Russia

15.00-15.10

Supersonic voidions in 2D Morse lattice

E.A. Korznikova, Institute of Molecule and Crystal Physics, Ufa Federal Research Centre of Russian Academy of Sciences, Ufa, Russia; I.A. Shepelev, Saratov State University, Russia; D.S. Ryabov, Southern Federal University, Institute of Physics, Rostov-on-Don, Russia; S.V. Dmitriev, Institute of Molecule and Crystal Physics, Ufa Federal Research Centre of Russian Academy of Sciences, Ufa, Russia

JOINT POSTER/INTERNET SESSION (Online)

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

1ND. The Impact of Interlayer Coupling Defects on Synchronisation in a Two-layer Network of Nonlocally Coupled Logistic Maps

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

2ND. Investigation of the relationship between the energy of wavelet transformation in the range of the alpha-rhythm of EEG data with the performance of tasks for concentration

Anton Selskij, Maksim Zhuravlev, Saratov State University, Saratov, Russia; Anastasiya Runnova, Saratov State Medical University, Saratov, Russia

3ND. Calculation of evoked potential from EEG data using time delays

Anton Selskij, Maksim Zhuravlev, Saratov State University, Saratov, Russia; Anastasiya Runnova, Saratov State Medical University, Saratov, Russia

4ND. Inference of the cross-frequency coupling in a multiplex Kuramoto model via recurrence quantification analysis approach

Nikita Frolov, Neuroscience and Cognitive Technology Laboratory, Center for Technologies in Robotics and Mechatronics Components, Innopolis University, Russia; Vladimir Maksimenko, Neuroscience and Cognitive Technology Laboratory, Center for Technologies in Robotics and Mechatronics Components, Innopolis University, Russia; Dibakar Ghosh, Physics and Applied Mathematics Unit, Indian Statistical Institute, India

5ND. The application of the base simplest implementation of data processing technique in time-resolved inline digital holography measurements for study of noncollinear degenerate phase modulation

S.S. Nalegaev, I.A. Shevkunov, S.E. Putilin, C.J. Cheng and N.V. Petrov

6ND. Application of recurrent analysis to the determination of connections between EEG data channels

Elizaveta Emelyanova, Anton Selskij, Maksim Zhuravlev, Saratov State University, Saratov, Russia; Anastasiya Runnova, Saratov State Medical University, Saratov, Russia

7ND. Research of the dynamics of the ensemble average velocity in the "corrugated waveguide" system with an oscillating boundary

A. Savin, Saratov State University, Russia; D. Lyubchenko, Saratov State University, Russia

8ND. Relay synchronization in multiplex networks with different dynamics of layers

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

9ND. Two scenarios of adaptation during monotonous cognitive activity

S. Kustodov, Saratov State Medical University, Russia; P. Protasov, Saratov State University, Russia; M. Popova, Saratov State Medical University, Saratov State University, Russia; A. Runnova, Saratov State Medical University, Saratov State University, Russia; M. Zhuravlev, Saratov State University, Saratov State Medical University, Russia; R. Shamionov, Saratov State Medical University, Russia

10ND. Collective dynamics of a 2D network of nonlocally coupled van der Pol oscillators.

A.V. Bukh, Saratov State University, Russia; V.S. Anishchenko, Saratov State University, Russia

11ND. Dynamics of two coupled van der Pol-Mathieu oscillators

I.R. Ramazanov, A.V. Slepnev, Saratov State University, Russia

12ND. Studying a Single FitzHugh-Nagumo (FHN) Model Using "The Virtual Heart" Software

D.Y. Klyushina, G.I. Strelkova, Saratov State University, Russia

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

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

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

International Program Committee:

Robert R. Alfano, CCNY, USA; **Stefan Andersson-Engels**, Tyndall National Institute, Cork, Ireland; **Oleg V. Angelsky**, Chernivtsi National University, Ukraine; **Victor N. Bagratashvili**, Inst. of Laser and Information Technologies RAS, Russia); **Claude Boccara**, ESPCI, France; **Alexander V. Bykov**, Univ. of Oulu, Finland; **Alexander V. Doronin**, Yale University, New Haven, CT, USA; **Steven L. Jacques**, Oregon Health Sciences Univ., USA ; **Alexey P. Popov**, Univ. of Oulu, Finland; **Alexander P. Sviridov**, Inst. of Laser and Information Technologies RAS, Russia; **Valery V. Tuchin**, Saratov National Research State University, Institute of Precision Mechanics and Control RAS, National Research Tomsk State University, Russia; **Olga V. Ushakova** Yuri Gagarin Saratov State Technical University of Saratov, Russia; **Alexander G. Ushenko** Chernivtsi National University, Ukraine; **Lihong Wang**, California Institute of Technology, CA, USA

JOINT POSTER/INTERNET SESSION

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

Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia, Ekaterina V. Ushakova, Yuri Gagarin State Technical University of Saratov, Russia

October 1, Thursday

18.00-20.00

1. Competition of electron transfer processes and the heavy atom effect in the dye-potassium polytitana

Andrei G. Melnikov, Viktoriya Efremova, Yuri Gagarin State Technical University of Saratov, Russia, Gorokhovskiy A.V., Krugova E.A., Bykov D.A., Vikulova M.A., Yuri D.S, Melnikov G.V, Yuri Gagarin State Technical University of Saratov, Russia

2. Simulation of radiation transfer in dispersive multiphase systems

Elena Isaeva, Saratov State Technical University, Russia, Anna Isaeva, Saratov State Technical University, Russia, Dmitry Zimnyakov, Saratov State Technical University, Russia

3. The speckle spectroscopy of the randomly inhomogeneous medium-saturated by dyes under the noise conditions

Anna Isaeva, Saratov State Technical University, Russia, Elena Isaeva, Saratov State Technical University, Russia, Dmitry Zimnyakov, Saratov State Technical University, Russia

4. Videoreflectometry of nucleation process in plasticized polylactide

Marina V. Alonova, Yuri Gagarin State Technical University of Saratov, Russia, Dmitry A.

5. Optical simulation and analysis of a circularly polarization imaging system

V. Dremin, Research & Development Center of Biomedical Photonics, Orel State University, Orel, Russia, E. Zharkikh, Research & Development Center of Biomedical Photonics, Orel State University, Orel, Russia, A. Bykov, Optoelectronics and Measurement Techniques Unit, University of Oulu, Oulu, Finland

6. Features of optical diffusion diagnostics in structure characterization of the foamed polymers

Olga V. Ushakova, Yuri Gagarin State Technical University of Saratov, Russia, Dmitry A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia

7. Non-coherent video-reflectometry of growing pores in plasticized polymers during supercritical fluid

E.V. Ushakova, Yuri Gagarin State Technical University of Saratov, Saratov, Russia, Marina V. Alonova, Yuri Gagarin State Technical University of Saratov, Russia, Dmitry A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Saratov, Russia

8. Photo-conductance of MoSi₂ nanoparticle layers in the near ultraviolet and visible spectral range

S.V. Dybrovsky, Saratov State Technical University, Russia, D.V. Tsypin, Yuri Gagarin State Technical University of Saratov, Saratov,

Russia, S.S. Volchkov, Yury Gagarin State Technical University of Saratov, Saratov, Russia, D.A. Zimnyakov, Yury Gagarin State Technical University of Saratov, Saratov, Russia

9. Non-linear optical properties of nanostructured titanium nitride under high-power laser pumping in the fundamental absorption band

A.Sh. Gubanov, Yury Gagarin State Technical University of Saratov, Saratov, Russia, S. S. Volchkov, Yury Gagarin State Technical University of Saratov, Saratov, Russia, L.A. Kochkurov, Yury Gagarin State Technical University of Saratov, Saratov, Russia, D.A. Zimnyakov, Yury Gagarin State Technical University of Saratov, Saratov, Russia

10. A Visible and near-IR tunnel photosensor with a nanoscale metal and DLC film emitter in Strong electrostatic field

Georgy G. Akchurin, Saratov State University, Saratov, Russia, Garif G. Akchurina, Saratov State University, Saratov, Russia, Nikolay P. Aban'shin, Volga-Svet Co. Ltd, Saratov, Russia, Alexander P. Loginov, Volga-Svet Co. Ltd, Saratov, Russia, Yuri A. Avetisyan, Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia, Sergey S. Volchkov, Yuri Gagarin State Technical University of Saratov, Saratov, Russia, Dmitry A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Saratov, Russia, Sergey V. Zarkov, Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia, Alexander N. Yakunin, Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia

11. Experimental investigation of localization of field in blade structure based on nano-sized DLC film

A.N. Yakunin, Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia, N.P. Aban'shin, Volga-Svet Co. Ltd, Saratov, Russia, D.V.Ponomarev, Saratov State University, Saratov, Russia, Yu.A. Avetisyan, Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia, Ga.G. Akchurin, Saratov State University, Saratov, Russia

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XX

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

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

International Program Committee:

Alexander I. Nosich, Kharkov Institute of Radio-Engineering and Electronics, NAS Ukraine (Ukraine); Nikita M. Ryskin, Saratov State University (Russia); Igor S. Nefedov, Aalto University, Espoo (Finland); Georgi N. Georgiev, "Sts. Cyril and Methodius" University, Veliko Tirnovo, (Bulgaria); Andrei D. Grigoriev, St. Petersburg Electrotechnical University LETI (Russia); Josef Modelsky, Warsaw University of Technology (Poland); Dmitry I. Trubetskov, Saratov State University (Russia); Alexander M. Lerer, South Federal University, Rostov-Don (Russia)

October 1, Thursday

pseudospark-sourced electron gun
Anton Pavlov, Andrey Starodubov, Roman Torgashov, Nikita Ryskin, Saratov State University, Saratov, Russia.

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

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

INTERNET REPORT

18.00-20.00

1EM FRACTAL RECTENNA FOR RADIO FREQUENCY ENERGY COLLECTION IN WI-FI RANGE A.V. Smirnov, I.A. Gorbachev, A.V. Gorbunova, V.V. Kolesov, I.E. Kuznetsova, Kotelnikov Institute of Radio Engineering and Electronics of RAS, Moscow, Russia

2EMA flexible CPW-fed antenna for ISM and cellular bands fabricated by laser ablation Starodubov A.V., Ozhogin I.S., Kozhevnikov I.O., Serdobintsev A.A., Saratov State University.

3EM The effect of the external magnetic field on the higher harmonics formation in the output power spectrum of low-voltage vircator with nonlaminar electron beams Andrei Starodubov, Nikolay Kuznetsov, Viktor Galushka, Anton Pavlov, Yurii Kalinin, Saratov State University.

4EM The effect of the external magnetic field on the higher harmonics formation in the output power spectrum of low-voltage vircator with nonlaminar electron beams Andrei Starodubov, Nikolay Kuznetsov, Viktor Galushka, Anton Pavlov, Yurii Kalinin, Saratov State University.

5EM Peculiarities of microfabrication the slow-wave structure for millimeter-band backward-wave oscillator based on the

Reconfigurable Broadband Terahertz Perfect Absorbers and Generators Based on Multilayer Graphene Ribbon Plasmonic Structures Lerer A.M., Southern Federal University, Makeeva G.S, Penza State University, Cherepanov V.V., Ivanova I.N., Southern Federal University.

INTERNET POSTER SESSION

Analysis of the effect of heating a container for chemical-thermal treatment of titanium in a carbon-containing environment, depending on the geometry and current strength of the inductor Voyko A.V., Yuri Gagarin State Technical University, Saratov, Russia.

Numerical simulation of induction PVD of titanium on steel plates Fomin A. A., Yuri Gagarin State Technical University, Saratov, Russia.

Influence of induction chemical-thermal treatment on the mechanical properties of high-speed steel grade HSS Kabanov D.S., Voyko A.V., Yuri Gagarin State Technical University, Saratov, Russia.

Carburizing the surface of tantalum in a sealed container using an induction machine Voyko A.V., Kabanov D.S., Yuri Gagarin State Technical University, Saratov, Russia.

Influence of induction treatment on the steel-titanium layered structure for the formation of

a highly hard working titanium-oxide surface Fomin A.A., Shelkunov A.Yu., Yuri Gagarin State Technical University, Saratov, Russia.

Investigation of changes in the electrical parameters of induction heating of commercial titanium in the high-temperature range Shchelkunov A.Yu., Egorov I.S., Fomin A. A., Yuri Gagarin State Technical University, Saratov, Russia.

Conference on Terahertz Optics and Biophotonics III

Chairs: **Igor V. Reshetov**, Sechenov University (Russia); **Vladimir N. Kurlov**, ISSP RAS (Russia); **Petr S. Timashev**, Sechenov University (Russia); **Irina N. Dolganova**, ISSP RAS; **Kirill I. Zaytsev**, Prokhorov GPI RAS

Secretary: **Nikita V. Chernomyrdin**, GPI RAS (Russia)

International Program Committee: Igor V. Reshetov, Sechenov University (Russia); Alexei Ivlev, Max-Planck-Institut für Extraterrestrische Physik (Germany); Maksim Skorobogatiy, Polytechnique Montréal (Canada); Dmitry S. Ponomarev, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russian); Rustam A. Khabibullin, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russia); Olga P. Cherkasova, Institute of Laser Physics of SB RAS (Russia); Gennady A. Komandin, Prokhorov General Physics Institute of RAS (Russia); Igor E. Spector, Prokhorov General Physics Institute of RAS (Russia)

September 29, Tuesday

ON-LINE INVITED/ORAL SESSION

(Zoom Link:

<https://us02web.zoom.us/j/81951423348?pwd=QVplQmJlczdFVDZ2aVlDUzNYVGFEZ09>

ID: 819 5142 3348; Passcode: 089)

Chair: **Nikita V. Chernomyrdin**, GPI RAS (Russia)

14.00-14.20 (13.00-13.20 Moscow local)

Invited

Reconfigurable broadband terahertz perfect absorbers and generators based on multilayer graphene ribbon plasmonic structures

A.M. Lerer (Southern Federal University, Russia),
G.S. Makeeva, V.V. Cherepanov, I.N. Ivanova

14.20-14.40 (13.20-13.40 Moscow local)

Invited

Photoconductive THz detector featuring an artificially strained InGaAs/InAlAs superlattice

D.V. Lavrukhin, A.E. Yachmenev, R.A. Khabibullin,
Yu.G. Goncharov, I.E. Spector, K.I. Zaytsev,
D.S. Ponomarev (Institute of Ultra High Frequency Semiconductor Electronics of RAS, Russian)

14.40-15.00 (13.40-14.00 Moscow local)

Invited

Diagnosis of glioma molecular markers by terahertz spectroscopy

O.P. Cherkasova (Institute of Laser Physics, Siberian Branch of the RAS, Russia)

15.00-15.20 (14.00-14.20 Moscow local)

Sapphire fiber metalens for THz photoconductive devices

N.V. Zenchenko (Institute of Ultra High Frequency Semiconductor Electronics of RAS, Russia),
I.A. Glinskiy, D.V. Lavrukhin, G.M. Katyba,
E.V. Yakovlev, K.I. Zaytsev, D.S. Ponomarev

15.20-16.00 (14.20-15.00 Moscow local) – break

16.00-16.20 (15.00-15.20 Moscow local)

Dielectric properties of blood serum with liver cancer in THz frequency range

Invited

M.R. Konnikova, M.M. Nazarov,
O.P. Cherkasova (Institute of Laser Physics, Siberian Branch of the RAS, Russia),
E.N. Lazareva, P.A. Dyachenko, V.V. Tuchin,
A.P. Shkurinov

16.20-16.40 (15.20-15.40 Moscow local)

THz spectroscopy as a diagnostic method for thyroid cancer

M.R. Konnikova (Institute of Laser and Information Technologies – Branch of the Federal Scientific Research Centre «Crystallography and Photonics» of the RAS, Russia),
O.P. Cherkasova, M.M. Nazarov,
Y.V. Kistenev, D.A. Vrazhnov, A.P. Shkurinov

16.40-17.00 (15.40-16.00 Moscow local)

Development of pellets for studying the diabetic blood plasma in the THz frequency range

A.A. Lykina (ITMO University, Russia),
M.M. Nazarov, M.R. Konnikova, V.N. Trukhin,
P.G. Gavrilova, V.L. Vaks, V.A. Anfertyev,
E.G. Domracheva, M.B. Chernyaeva,
Yu.V. Kistenev, D.A. Vrazhnov,
V.V. Prischepa, Yu.A. Kononova,
D.V. Korolev, Ya.G. Toropova,
O.P. Cherkasova, A.P. Shkurinov,
O.A. Smolyanskaya

17.00-17.20 (16.00-16.20 Moscow local)

Fast assessment of the optical properties of diabetic blood plasma using the terahertz holographic imaging method

E.L. Odlyanitskiy (ITMO University, Russia),
M.S. Kulya, Q. Cassar, I.A. Mustafin,
V.N. Trukhin, D.V. Korolev, Y.V. Kononova,
P. Mounaix, J.P. Guillet, N.V. Petrov,
O.A. Smolyanskaya

Conference on Advanced Materials for Optics and Biophotonics III

Conference Chair: **Vladimir N. Kurlov**, ISSP RAS (Russia); **Igor V. Reshetov**, Sechenov University (Russia); **Petr S. Timashev**, Sechenov University (Russia); **Irina N. Dolganova**, ISSP RAS (Russia); **Kirill I. Zaytsev**, Prokhorov GPI RAS

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

International Program Committee: Maksim Skorobogatiy, Polytechnique Montréal (Canada); Marina A. Schcedrina, Sechenov University (Russia); Dmitry S. Ponomarev, Institute of Ultra High Frequency Semiconductor Electronics of RAS (Russian); Valery E. Karasik, Bauman Moscow State Technical University (Russia); Irina A. Shikunova, Institute of Solid State Physics of RAS (Russia); Gennady A. Komandin, Prokhorov General Physics Institute of RAS (Russia); Igor E. Spector, Prokhorov General Physics Institute of RAS (Russia); Alexei K. Fedorov, Russian Quantum Center (Russia); Vladimir A. Lazarev, Bauman Moscow State technical University (Russia); Anastasia I. Shpichka, Sechenov University (Russia)

September 29, Tuesday

**ON-LINE INVITED/ORAL SESSION and
(Zoom Link:**

<https://us02web.zoom.us/j/85970853230?pwd=TENCTFd0MU5VVG1TWTJGV1FSK05FQT09>
ID: 859 7085 3230; Passcode: 711203)
Chair: **Gleb M. Katyba**, ISSP RAS (Russia)

**14.00-14.20 (13.00-13.20 Moscow local)
Invited**

Whey protein isolate hydrogel-based biomaterials

Timothy Douglas, Engineering Dept., Lancaster University (UK)

**14.20-14.40 (13.20-13.40 Moscow local)
Invited**

Exploring Next generation Few Mode Assisting Elliptical Ring Core Cladding Optical Fiber

D. Vigneswaran (Department of Physics, University College of Engineering, Anna University, Ramanathapuram, India), J.S. Skibina, M.S. Manirajan

**14.40-15.00 (13.40-14.00 Moscow local)
Invited**

High-power mid-infrared quantum-cascade lasers

G.S. Sokolovskii, Ioffe Institute (Russia)

**15.00-15.20 (14.00-14.20 Moscow local)
Invited**

HgCdTe-based quantum cascade lasers bridging the gap between THz and far-IR ranges

R.A. Khabibullin, IUHFSE RAS (Russia); D.V. Ushakov, A.A. Afonenko, D.S. Ponomarev, S.V. Morozov, A.A. Dubinov

**15.20-16.00 (14.20-15.00 Moscow local)
– break**

**16.00-16.20 (15.00-15.20 Moscow local)
Metaelements formation via volumemicrostructuring of silicate glass using femtosecond laser radiation**

M.S. Kovalev (BMSTU, Russia), N.G. Stsepuro, G.K. Krasin, S.I. Kudryashov

**16.20-16.40 (15.20-15.40 Moscow local)
Screening and diagnosis of skin melanoma using multiple imaging systems**

K.G. Kudrin (Academy of postgraduate education under FSBU FSCC of FMBA of Russia, Russia), E.N. Rimskaya, I.A. Apollonova, A.P. Nikolaev, N.V. Chernomyrdin, D.S. Sviatoslavov, D.V. Davydov, I.V. Reshetov

**16.40-17.00 (15.40-16.00 Moscow local)
Solid-state Cr²⁺:ZnSe laser for OCT imaging in the fourth near-infrared optical window**

M.K. Tarabrin (BMSTU, Russia), D.A. Nazarov, V.A. Lazarev

JOINT INTERNET POSTER SESSION

Terahertz Optics and Biophotonics III

Recent advances in terahertz solidimmersion microscopy of soft biological tissues

N.V. Chernomyrdin (GPI RAS, Russia),
A.S. Kucheryavenko, V.A. Zhelnov,
I.N. Dolganova, G.A. Katyba, I.V. Reshetov,
V.V. Tuchin, K.I. Zaytsev

Study of interstellar and circumstellar ice analogs using terahertz pulsed spectroscopy and Fourier-transform infrared spectroscopy

A.A. Gavdush (GPI RAS, Russia),
B.M. Giuliano, B. Müller, G.A. Komandin,
K.I. Zaytsev, A.V. Ivlev, and P. Caselli

Metasurfaces based on Au and VO₂ for THz applications

V. Kaydashev (MIPT, Russia), S. Zhukov,
M. Kutepov, I. Domaratskiy, A. Slavich

THz and IR molecular imaging of paraffin-embedded cancerous tissues

A.I. Knyazkova (Tomsk State University, Institute of Strength Physics and Materials Science SB RAS), A.A. Samarinova,
A.V. Borisov, V.E. Skiba, Yu.V. Kistenev

Optimal agents for immersion optical clearing of tissues at terahertz frequencies

G.R. Musina (GPI RAS, Russia),
A.A. Gavdush, N.V. Chernomyrdin,
I.N. Dolganova, V.E. Ulitko, N.A. Naumova,
G.A. Komandin, V.V. Tuchin, K.I. Zaytsev

Advanced Materials for Optics and Biophotonics III

Nanoporous SiO₂ based on annealed artificial opals as a favorable material platform for terahertz optics

V.E. Ulitko (ISSP RAS, Russia), A.K. Zotov,
A.A. Gavdush, G.M. Katyba, G.A. Komandin,
I.E. Spector, I.M. Shmytko, G.A. Emelchenko,
I.N. Dolganova, M. Skorobogatiy, V.N. Kurlov,
V.M. Masalov, K.I. Zaytsev

Step-index sapphire fiber and its application in a terahertz near-field microscopy

G.M. Katyba (ISSP RAS, Russia),
I.N. Dolganova, I.A. Shikunova, D.O. Strukov,
N.V. Chernomyrdin, K.I. Zaytsev, and
V.N. Kurlov

Optically-controlled cryodestruction of biological tissues using sapphire applicators

A.K. Zotov (ISSP RAS, Russia),
I.N. Dolganova, K.I. Zaytsev, I.A. Shikunova,
N.A. Naumova, L.P. Safonova,
P.V. Aleksandrova, and V.N. Kurlov

A potential of optical coherence tomography for the differentiation of intact brain tissue, human brain gliomas of different WHO grades and glioma model 101.8

P.V. Aleksandrova (GPI RAS, Russia),
I.N. Dolganova, P.V. Nikitin, A.I. Alekseeva,
N.V. Chernomyrdin, N.A. Naumova,
S.-I.T. Beshplav, I.V. Reshetov, A.A. Potapov,
V.N. Kurlov, V.V. Tuchin, and K.I. Zaytsev

Features of the development of a standard for testing the system of automated morphometry of clinical images of pigmented skin neoplasms

E.N. Rimskaya (BMSTU, Russia), K.G. Kudrin,
I.A. Apollonova, A. P. Nikolaev,
N.V. Chernomyrdin, D.V. Davydov and
I.V. Reshetov

Calculation of thermal conductivity and attenuation of pulsed laser radiation in the eye tissue

N.A. Zelenina (ITMO University, Russia),
V.V. Zalipae, A.S. Izmailov,
O.A. Smolyanskaya

Workshop on Brain Physics

Workshop Co-chairs: **Oxana V. Semyachkina-Glushkovskaya**, Saratov State University (Russia); **Jurgen Kurths**, Physics Department, Humboldt University and Potsdam Institute for Climate Impact Research (Germany); **Thomas Penzel**, Interdisciplinary Center of Sleep Medicine in Charité – Universitätsmedizin (Germany); **Valery V. Tuchin**, Saratov State University, Tomsk State University, Institute of Precision Mechanics and Control of the RAS (Russia)
Secretary: **Ekaterina Borisova**, Institute of Electronics, Bulgarian Academy of Sciences, Bulgaria; Saratov State University, Russia; **Andrei V. Slepnev**, Saratov State University (Russia)

September 30, Wednesday

ORAL SESSION
(Building 5, Room 72;
Zoom link:

<https://us02web.zoom.us/j/89959585323>)

Chair: **Oxana V. Semyachkina-Glushkovskaya**,
Saratov State University, Russia

16.15-16.30

Breakthrough strategies of stimulation of the cerebral lymphatics during sleep

Nikita Navolokin, Saratov State University, Russia; Alexander Shirokov, Saratov State University, Russia; Ivan Fedosov, Saratov State University, Russia; Maria Klimova, Saratov State University, Russia; Andrey Terskov, Saratov State University, Russia; AyselMamedova, Saratov State University, Russia; Inna Blokhina, Saratov State University, Russia; Nikita Lezhnev, Saratov State University, Russia; Ilana Agranovich, Saratov State University, Russia; Oxana Semyachkina-Glushkovskaya, Saratov State University, Russia

16.30-16.45

Compact device with smartphone control for estimation of cardiovascular autonomic control using only photoplethysmogram recorded from earlobe

Danil D. Kulminskiy, Saratov Branch of the Institute of RadioEngineering and Electronics of Russian Academy of Sciences, Saratov State University, Russia; Alexander V. Kurbako, Saratov State University, Russia; Anatoly S. Karavaev, Saratov State University, Saratov Branch of the Institute of RadioEngineering and Electronics of Russian Academy of Sciences, Saratov State Medical University, Russia; Dmitry M. Ezhov, Saratov State University, Russia; Mikhail D. Prokhorov, Saratov Branch of the Institute of RadioEngineering and Electronics of Russian Academy of Sciences, Russia; Vladimir I. Ponomarenko, Saratov Branch of the Institute of RadioEngineering and Electronics of Russian Academy of Sciences, Saratov State University, Russia; Boris B. Bezruchko, Saratov State University, Saratov Branch of the Institute of RadioEngineering and Electronics of Russian Academy of Sciences, Russia

16.45-17.00

Diagnostics of synchronization between the systems of autonomic regulation of cardiovascular function using synchrogram analysis

E.I. Borovkova, Saratov State Medical University, Saratov State University, Russia; A.S. Karavaev, Saratov State Medical University, Saratov State University, Saratov Branch of the Institute of RadioEngineering and Electronics of Russian Academy of Sciences, Russia; A.R. Kiselev, Saratov State Medical University, Saratov State University, Russia; V.I. Gridnev, Saratov State Medical University, Saratov State University, Russia; A.N. Khramkov, Saratov State University, Russia; E.P. Chernets, Saratov State University, Russia; E.V. Navrotskaya, Saratov State University, Russia; M.D. Prokhorov, Saratov State University, Saratov Branch of the Institute of RadioEngineering and Electronics of Russian Academy of Sciences, Russia; Bezruchko B.P., Saratov State University, Russia

JOINT POSTER/INTERNET SESSION **(Online)**

Chair (BP): **Oxana V. Semyachkina-Glushkovskaya**, Saratov State University, Russia

1BP. NADH growth rate evaluation in different rat brain regions by fluorescence spectroscopy

Alexander Palalov, Orel State University, Russian; Pavel Gorlin, Orel State University, Russia; Evgeniya Seryogina, Orel State University, Russia; Alexander Alekseev, Orel State University, Russia; EvgenyZherebtsov, Orel State University, Russia, University of Oulu, Finland; Andrey Abramov, Orel State University, Russia, UCL Queen Square Institute of Neurology, London

2BP. A comparative analysis of bioenergetic parameters of brain cells in acute slices and cell culture using fluorescence microscopy

Angelina Dolgikh, Orel State University, Russia; Olga Stelmashchuk, Orel State University, Russia; Andrey Vinokurov, Orel State University, Russia; EvgenyZherebtsov, Orel State University, Russia, University of Oulu, Finland; Andrey Dunaev, Orel State University, Russia; Andrey Abramov, Orel State University, Russia, Queen Square Institute of Neurology, UK

3BP. Photostimulation of permeability of blood-brain barrier for beta-amyloid

Maria Klimova, Saratov State University, Russia; AyselMamedova, Saratov State University, Russia; Ilana Agranovich, Saratov State University, Russia; Inna Blokhina, Saratov State University, Russia; Tatiana Antonova, Saratov State University, Russia; Andrey Terskov, Saratov State University, Russia; Alexander Shirokov, Saratov State University, Russia; Nikita Navolkin, Saratov State University, Russia; Oxana Semyachkina-Glushkovskaya, Saratov State University, Russia

4BP. Optimisation of photodynamic opening of blood-brain barrier

Maria Klimova, Alexander Dubrovsky, Alexander Shirokov, Alexander Fomin, Andrey Terskov, Ilana Agranovich, AyselMamedova, Aleksandr Khorovodov, Valeria Vinnik, Inna Blokhina, Nikita Lezhnev, Ali Esmat Sharif, Anna Kuzmina, Sergey Sokolovski, Valery Tuchin, EdikRafailov

5BP. Direct measurements of rat intracranial pressure

V.B. Ageev, Saratov State University, Russia; I.A. Blokhina, Saratov State University, Russia; I.V. Fedosov, Saratov State University, Russia; O.V.

Semyachkina-Glushkovskaya, Saratov State University, Russia

6BP. Machine learning approach in EEG-based determination of BBB state for rats

K.S. Sergeev, Saratov State University, Russia; N.I. Semenova, FEMTO-ST Institut, Université Bourgogne Franche-Comté 15B avenue des MontbouconsBesançon Cedex, 25030, France; A.V. Slepnev, Saratov State University, Russia

7BP. Optimal dose for photosensitizers-free PDT of glioma

Aleksandr Khorovodov, Saratov State University, Russia; Inna Blokhina, Saratov State University, Russia; Nikita Lezhnev, Saratov State University, Russia; Nikita Navolokin, Saratov State Medical University, Russia; Alexander Shirokov, Institute of Bioorganic Chemistry, Russian Academy of Sciences, Russia; Andrey Terskov, Saratov State University, Russia; AyselMamedova, Saratov State University, Russia; ArynaEvsukova, Saratov State University, Russia; Maria Klimova, Saratov State University, Russia; Ilana Agranovich, Saratov State University, Russia; Oxana Semyachkina-Glushkovskaya, Saratov State University, Russia

Workshop on Quantum Science and Technologies

Co-Chairs: **Aleksey K. Fedorov**, and **Evgeniy O. Kiktenko**, Russian Quantum Center (Russia)

Secretary: **Alena S. Mastiukova**, Russian Quantum Center (Russia); Moscow Institute of Physics and Technologies (Russia)

International Program Committee:

Yury V. Kurochkin, NTI Center for Quantum Communications at MISiS University (Russia); Vadim Makarov, NTI Center for Quantum Communications at MISiS University (Russia); Georgy Shlyapnikov, LPTMS, University of Paris-Sud (France), University of Amsterdam (The Netherlands), Russian Quantum Center (Russia)

September 29, Tuesday

ORAL SESSION

Campus of the Skolkovo Institute of Science and Technology

Chair: Aleksey Fedorov, Russian Quantum Center (Russia)

11:30 - 11:35

Aleksey Fedorov, Opening Ceremony

11:40 - 12:05

Stanislav Straupe, Quantum computing with single neutral atoms: prospects and challenges

12:10 - 12:35

Ilya Semerikov, Ion quantum computer: technical challenges (LRC Project)

12:40 - 13:05

Evgeniy Kiktenko, Quantum information processing with high-dimensional quantum systems (LRC Project)

13:10 - 13:35

Boris Bantysh, Quantum tomography of noisy qudits (LRC Project)

15:10 - 15:35

Alexander Ulanov, uCIM: fully optical analogue quantum simulator

15:40 - 16:05

Ilya Besedin, G-flux qubits for superconducting quantum processors

16:10 - 16:20

Alexander Chernov, Single photon sources based on 1D and 2D materials

16:30 - 16:55

Grant Avosopiants, The action of the photon annihilation operator on multimode thermal states of light: theory and experiment

16:55 - 18:00

Online posters, Poster Session, Free Discussions

13:40 - 15:00

Lunch

POSTERS

Yurii Kuznetsov (FTIAN),
Alena Mastiukova (RQC),
Maxim Gavreev (RQC),
Alexandr Martyshkin (Saratov State University),
Grachev Andrey (Saratov State University),
Sergey Odintsov (Saratov State University)

24^d International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

SHORT COURSES

September 28, Monday

OSA SHORT COURSE

Building 10, Main Conference Hall

Zoom link:

<https://osachapter.zoom.us/j/94441799931>)

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

14.00-15.00

Fluorescence Imaging with Endogenous Contrast for Biomedical Diagnostics

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

15.00-15.30

Coffee break

15.30-16.30

Fluorescence Imaging with Endogenous Contrast for Biomedical Diagnostics

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

September 29, Tuesday

SPIE SHORT COURSE

Building 10, Main Conference Hall

Zoom link:

<https://osachapter.zoom.us/j/94441799931>)

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

10.00-11.00

Combination of Photonics Tools with Nanostructured Particles for Biomedical Applications

Dmitry A. Gorin, Center for Photonics and Quantum Materials, Skolkovo Institute of Science and Technology, Moscow, Russia

11.00-11.30

Coffee break

11.30-12.30

Combination of Photonics Tools with Nanostructured Particles for Biomedical Applications

Dmitry A. Gorin, Center for Photonics and Quantum Materials, Skolkovo Institute of Science and Technology, Moscow, Russia

Workshop on Modern Optics XIX

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

Chair: Irina Yu. Yanina, Saratov State University

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

Moderator: Isabella Serebryakova, Saratov State University

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

October 1, Thursday

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

Zoom link: <https://osachapter.zoom.us/j/92367493556>)

Chair: Irina Yu. Yanina, Saratov State University

14.00-14.20

A journey into the microcosmos: where does optics meet acoustics?

Dmitry A. Gorin, Center for Photonics and Quantum Materials, Skolkovo Institute of Science and Technology, Moscow, Russia

14.20-14.40

Photonics in Medicine in 2020: What's New?

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

Workshop English as a Communicative Tool in the Scientific Community XIX

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

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

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

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

October 1, Thursday

INTERNET SESSION

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

- 1. On-line English Language Resources: Use and Abuse** Svetlana V. Eremina, Alexander B. Pravdin, Saratov State University, Saratov, Russia
- 2. Teaching Students How to Write an Effective CV** Dina Alexeeva, Saratov State University, Saratov, Russia
- 3. Typical errors in students' scientific paper translating** Arina O. Shelyugina, Saratov State University, Saratov, Russia
- 4. Translation theory for science students: Let's not reinvent the wheel** Darya N. Tselovalnikova, Saratov State University, Saratov, Russia
- 5. Motivation in Distance Learning** Anna Smirnova, Saratov State University, Saratov, Russia
- 6. Issues in Russian terminology relating to components of Chinese characters**, Konstantin A. Grebenyuk, Saratov State University, Russia

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

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

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

September 30, Wednesday

LECTURE/ORAL SESSION I (Building 3, Hall 51)

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

15.30-15.45

The Great Physical Auditorium as a scientific information center

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

15.45-16.00

Nonclassical light

D. Klychkova, Saratov State University, Saratov, Russia

16.00-16.15

Study of the distribution and composition of molecules in gall-forming insects at different stages of development by means of raman spectroscopy

M. Nikelshparg¹, E. Nikelshparg², D.N. Bratashov³, V.V. Anikin³

¹Gimnasium №3 of Saratov, Saratov, Russia

²Lomonosov Moscow State University, Moscow, Russia

³Saratov State University, Saratov, Russia

16.15-16.30

On 2D diffusion of seismic waves

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

16.30-16.45

Alexander Stoletov: a scientific feat or a myth?

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

16.45-17.00

Plasmonic photothermal or/and photodynamic therapy of tumors: designing therapies

A. Bucharskaya¹, N. Navolokin¹, G. Maslyakova¹, E. Borisova², B. Khlebtsov³, N. Khlebtsov³, A. Bashkatov⁴, E. Genina⁴, V. Tuchin⁴

¹Saratov State Medical University, Saratov, Russia

²Institute of Electronics, Bulgarian Academy of Sciences, Bulgaria

³Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, Saratov, Russia

⁴Saratov State University, Saratov, Russia

17.00-17.15

Exciton series in film spectra based on PbS with different grain size

N.B. Trofimova, M.I. Shishkin, A.A. Serdobintsev, D.Yu. Postnov, A.G. Rokakh, Saratov State University, Saratov, Russia

17.15-17.30

Hydrophilization of CdZnSeS/ZnS alloyed quantum dots using mercaptoethanol

P. Strokin, D. Drozd, I. Goryacheva, Saratov State University, Saratov, Russia

17.30-17.45

An eco-friendly molecularly fluorescence composite structures based of carbon biomass based and their applications in chemical analysis

M.S. Stepukhovich, A.A. Bakal, A.M. Abramova, Saratov State University, Saratov, Russia

17.45-18.00

Synthesis and properties of silica nanoparticles modified with luminescent carbon nanostructures

Y.A. Podkolodnaya, A.A. Kokorina, I.Y. Goryacheva, Saratov State University, Saratov, Russia

October 1, Thursday

LECTURE/ORAL SESSION I (Building 3, Hall 51)

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

15.30-15.45

To the 95th anniversary of the discovery of the electron spin. Historical and philosophical aspect

B. Medvedev, Saratov State University, Saratov, Russia

15.45-16.00

Are You opposed to the «terrible remote learning»?! Sorry, You are thousands years late...

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

16.00-16.15

Optical laboratory in the remote mode

Starshov, Saratov State University, Saratov, Russia

16.15-16.30

Experimenting with light at chemistry lessons with secondary school students

A.V. Markin, Saratov State University, Saratov, Russia

16.30-16.45

How to explain the essence of digital signal processing to students of physics

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

16.45-17.00

Comparison of facial recognition algorithms

M. Repeyev, Saratov State University, Saratov, Russia

17.00-17.15

Application of ternary number system and ternary logic for microprocessor systems

A.S. Dronkin, Saratov State University, Saratov, Russia

17.15-17.30

The price of naturalness or how to beat quick sort

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

17.30-17.45

Methods for controlling errors in computer simulation of small magnetic fields

V. Malyarchuk, Saratov State University, Saratov, Russia

17.45-18.00

Nonlinear model YIG resonator in the calculations of the magnetically sensitive devices

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

18.00-18.15

Noise suppression effect in a heteromagnetic active oscillator

A. Ignatiev, M. Inkin, Saratov State University, Saratov, Russia

October 2, Friday

ROUND TABLE

**Man and light in natural and art treatment of the Universe
(Building 3, Hall 51)**

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

Panel members:

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

^aSaratov State University, Saratov, Russia

^bSamara University, Samara, Russia

^cYuri Gagarin State Technical University of Saratov, Russia

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

14.00-14.20

Coherence in Classical and Quantum Physics

A.V. Gorokhov, Samara National Research University named after academician S.P. Korolev, Samara, Russia

14.20-14.35

Gravity: the force or the curvature of space

V. Rozen, Saratov State University, Russia

14.35-14.50

Macroscopic quantum phenomena - a bridge between two worlds

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

14.50-15.05

Principle of uncertainty in the knowledge of nature

B. Medvedev, Saratov State University, Saratov, Russia

15.05-15.20

Abnormal shielding of the electric field as a widely used but little known phenomenon

A. Rokakh, Saratov State University, Saratov, Russia

15.20-15.35

Optics, chemistry, philosophy (Background and history of photography from Aristotle to the present day)

V. Sorokin, Saratov State University, Saratov, Russia

15.35-15.50

Pattern recognition methods in pulmonology and phthiisology using the differential diagnosis of bronchopulmonary diseases as an example

J. Brodskaya, Saratov State University, Saratov, Russia

16.05-16.20

The wave process of distribution of invasive insect species in the Volga region in the XXI century

Vasily Anikin, Saratov State University, Saratov, Russia

16.20-16.35

On the features of teaching optics for students of geological areas of training and specialties

L.A. Romanchenko, Sergo Ordzhonikidze Russian State University for Geological Prospecting, Russia

16.35-16.50

Physics for the university's natural science: first-year teaching problems

S.V. Ovchinnikov, Saratov State University, Saratov, Russia

16.50-17.05

Stratification of physical reality in various systems of coding of information

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

17.05-17.20

The phenomenon of techno-science and its cultural environment

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

17.20-17.35

The darkness of the unconscious as the driving force of life

O. Shimelfenig, Saratov State University, Saratov, Russia

17.35-17.50

«Saint Isaac» Prophet. Apostle. Demiurge (A hundred years of Isaac Asimov)

M. Stolnitz, Saratov State University, Russia

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(On-line)

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

1. Optical parameters of plants grown under artificial lighting

E.V. Timchenko¹, A.P. Timchenko², T. Melnikova², T.V. Melnikova²

¹Samara University, Samara, Russia

²Technical Lyceum named after S.P. Korolev, Samara, Russia

2. Statistical characteristic of chaotic sequences generator based on counters

V. Chesakov, L. Sotov, Saratov State University, Saratov, Russia

3. PWM controller as pulse oscillator

V.G. Andrianov, H.N. Kolesov, K.A. Vasin, Saratov State University, Saratov, Russia

4. Computer simulation of powerful microwave amplifiers based on domestic bipolar transistors.

A. Kalinin, A. Khvalin, Saratov State University, Saratov, Russia

5. Influence of transistor parameters on fluctuations in a heteromagnetic active oscillator

M. Inkin, A. Ignatiev, Saratov State University, Saratov, Russia

6. Measurement of phase noise level and threshold sensitivity of magnetic field sensor with YIG resonator

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

INTERNET REPORTS (Building 3, 3d floor Hall)

1. Riemann hypothesis from the physicist's point of view

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