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SFM'17

Dedicated to 100 Anniversary of Physical and Mathematical Education in SSU

International Symposium
Optics and Biophotonics-V

21st International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Organized by

Saratov State University (National Research University of Russia) (SSU)

Research-Educational Institute of Optics and Biophotonics, SSU

International Research-Educational Center of Optical Technologies for Industry and Medicine "Photonics", SSU

Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS

Institute of Precision Mechanics and Control, RAS (IPMC RAS)

Saratov State Medical University n.a. V.I. Razumovsky

Volga Region Center of New Information Technologies, SSU

Tomsk State University (National Research University of Russia) (TSU), Russia

Biomedical Photonics Committee of Chinese Optical Society, China

SPIE Student Chapter, SSU

SPIE Student Chapter of Bauman Moscow State Technical University

OSA Student Chapter, SSU

Saratov/Penza IEEE Chapter

In cooperation with

Academy of Natural Sciences, Saratov Regional Division

Russian Society for Photobiology

Saratov Science Center, RAS

Biophotonics4Life Worldwide Consortium (https://www.biophotonics.world/)

EPIC – European Photonics Industry Consortium

Co-sponsored by

RFBR – Russian Foundation for Basic Research

RAS – Russian Academy of Sciences

SPIE – The International Society of Photo-Optical Instrumentation Engineers

OSA –Optical Society of America

IEEE - Institute of Electrical and Electronics Engineers

LLC SPE Nanostructed Glass Technology, Saratov

Russian Technology Platform "The Medicine of the Future"

Russian Technology Platform "Photonics"

European Technology Platform "Photonics21"

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

RME INJECT LLC, Saratov, Russia

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Igor V. Meglinski, University of Oulu, Finland; Saratov State University

Risto Myllyla, University of Oulu, Finland

Juergen Popp, Institute of Photonic Technology, Jena, Germany

Dmitry E. Postnov, Saratov State University

Alexander B. Pravdin, Saratov State University

Alexander Priezzhev, International Laser Center, Moscow State University

Vladimir P. Ryabukho, Saratov State University, Institute of Precision Mechanics and Control RAS

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Sergey R. Utz, Clinics of Skin and Veneral Diseases, SSMU, Russia

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Schedule of SFM-17
International Symposium "Optics and Biophotonics-V"
21st International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

September 25, Monday				
12.00-14.00	**Registration**			*Building10, Foyer*
14.00-14.10	**Opening of 21st International School on Optics, Laser Physics & Biophotonics** **Valery V. Tuchin,** Saratov State University, Russia			*Building 10, Hall 503*
14.10-15.10	**SPIE SHORT COURSE** **Fluorescence Microscopy for Biomedical Applications** **Herbert Schneckenburger**, Aalen University, Germany			*Building 10 Hall 503*
15.10-15.40	**Coffee break**			
15.40-16.40	**SPIE SHORT COURSE** **Fluorescence Microscopy for Biomedical Applications** **Herbert Schneckenburger**, Aalen University, Germany			*Building 10 Hall 503*
16.40-19.00	**ORAL SESSION** **ENGLISH** Co-chairs: **Alexander B. Pravdin** and **Svetlana V. Eremina**, Saratov State University, Russia	*Building 10 Hall 503*	**LECTURE/ORAL SESSION** **EDUCATION I** Co-chairs: **Boris A. Medvedev** and **Vladimir P. Ryabukho,** Saratov State University, Russia	*Building 3, Room 34*

September 26, Tuesday										
9.00-14.00	**Registration**									*Building 3, Foyer*
9.30-11.30	**OSA SHORT COURSE** **Speckle and Related Phenomena: Techniques and Applications in Biomedicine** **Sean J. Kirkpatrick**, Michigan Technological University, USA									*Building 10, Hall 503*
11.30-12.00	**Coffee break**									
12.00-13.00	**OSA SHORT COURSE** **Speckle and Related Phenomena: Techniques and Applications in Biomedicine** **Sean J. Kirkpatrick**, Michigan Technological University, USA									*Building 10, Hall 503*
13.00-14.00	**Lunch**									
14.00-14.10	**Opening of International Symposium "Optics and Biophotonics-V"** **Valery V. Tuchin**, Saratov State University, Russia									*Building 10 Main Conference Hall*
14.10-15.30	**PLENARY SESSION I** Chair: **Valery V. Tuchin,** Saratov State University, Russia **Polarization Optical Imaging as an Intraoperative Tool for Skin Cancer Delineation, Anna Yaroslavsky**, University of Massachusetts, USA **Advanced Methods of 3D Live Cell Microscopy**, **Herbert Schneckenburger**, Aalen University, Germany									*Building 10 Main Conference Hall*
15.30-16.00	**Coffee break**									
16.00-17.00	**ORAL SESSION BIOCOMPUTING I** Chair: **Dmitry E. Postnov**, Saratov State University, Russia	*Building 10, Hall 503*	**INVITED/ORAL SESSION BIOPHYSICS I** Chair: **Herbert Schneckenburger**, Aalen University, Germany	*Building 10 Main Conference Hall*	**PLENARY SESSION BIOMEDICAL SPECTROSCOPY I** Chair: **Alexander B. Pravdin**, Saratov State University, Russia	*Building 3, Room 34*	**LECTURE/ORAL SESSION EDUCATION II** Co-chairs: **B. Medvedev** and **V. Ryabukho,** SSU, Russia	*Scientific Library Conf. Hall*	**ORAL SESSION PHOTONICS I** Chair: **Vladimir L. Derbov**, Saratov State University, Russia	*Building 3, Big Physical Hall*
17.00-18.30					**ORAL SESSION SPECTROSCOPY I** Chair: **Lev M. Babkov,** Saratov State University, Russia					
19.00-21.00	**Welcome Party**									*Univ.camp.*

September 27, Wednesday		
9.00-10.00	**SPIE SHORT COURSE** **(Bauman Moscow State Technical Univ. SPIE Student Chapter)** **Multimodal Imaging for the Biomedical Applications** **Anna Yaroslavsky**, University of Massachusetts, Lowel, USA	*Building 10, Hall 503*
10.00-10.30	**Coffee break**	
10.30-11.30	**SPIE SHORT COURSE** **(Bauman Moscow State Technical Univ. SPIE Student Chapter)** **Multimodal Imaging for the Biomedical Applications** **Anna Yaroslavsky**, University of Massachusetts, Lowel, USA	*Building 10, Hall 503*
11.30-12.00	**Coffee break**	
12.00-13.20	**PLENARY SESSION II** Chair: **Alexander V. Priezzhev**, Moscow State University, Russia **Laser Speckle Modeling and Simulation for Biophysical Dynamics,** Kosar Khaksari, Tufts University, **Sean J. Kirkpatrick**, Michigan Technological University, USA **Advances in Label-Free Optical Endomicroscopy Technologies Towards Histological Imaging of Biological Tissues *in Vivo*, Xingde Li**, Johns Hopkins University, USA	*Building 10 Main Conference Hall*
13.20-14.20	**Lunch**	
15.30-17.30	**Social program (Volga boat tour)**	

September 28, Thursday		
9.00-10.00	**OSA FELLOW SHORT COURSE** **Optical Coherence Tomography and Endoscopy** **Xingde Li**, Johns Hopkins University, USA	*Building 10, Hall 503*
10.00-10.30	**Coffee break**	
10.30-11.30	**OSA FELLOW SHORT COURSE** **Optical Coherence Tomography and Endoscopy** **Xingde Li**, Johns Hopkins University, USA	*Building 10, Hall 503*
11.30-12.00	**Coffee break**	
12.00-13.20	**PLENARY SESSION III** Chair: **Sean J. Kirkpatrick**, Michigan Technological University, USA **Multiparametric Analysis of Tumor Development and Response for Chemotherapy Using Time-Resolved Imaging, Elena Zagaynova**[1], Marina Shirmanova[1], Marina Kuimova[2], Konstantin Lukyanov[3], Maria Lukina[1], Lubov Shimolina[1], Varvara Dudenkova[1], Tatyana Sergeeva[1], Natalia Klementieva[1], Vladislav Scheslavsky[4], Irina Druzhkova[1], [1]Nizhny Novgorod State Medical Academy, Russia; [2]Imperial College, London, UK; [3]Institute of Bioorganic chemistry, Russia; [4]Becker & Hickl GmbH, Berlin, Germany **Laser Trapping and Manipulation of Red Blood Cells: An Efficient Tool for Hemorheologic Research, Alexander V. Priezzhev**, Moscow State University, Russia	*Building 10, Main Conference Hall*
13.20-14.20	**Lunch**	
14.20-15.10	**PUBLIC LECTURE SESSION** **MODERN OPTICS** Co-chairs: **Georgy V. Simonenko, Alexander B. Pravdin**, Saratov State University, Russia **Recent Developments of Translational Optical Micro Imaging Technologies**, **Xingde Li**, Johns Hopkins University, USA **Shining Light on Cells and Tissue, Herbert Schneckenburger**, Aalen University, Germany **Show "Exciting Light", Ivan V. Fedosov**, Saratov State University, Russia	*Building 3, Big Physical Hall*
15.10-16.00	**INVITED LECTURE/ORAL SESSION** **BIOPHYSICS II** Chair: **Ivan V. Fedosov**, Saratov State University, Russia	*Building 3, Big Physical Hall*

14.20-16.00	**JOINT ORAL SESSION POLARIZATION I/ MICROSCOPY AND LOW-COHERENCE METHODS** Co-Chairs: **Dmitry A. Zimnyakov**, Saratov State Technical University, Russia, **Kirill Larin**, Houston University, USA	*Building 10 Main Conference Hall*	**ORAL SESSION PHOTONICS II** Chair: **Vladimir L. Derbov**, Saratov State University, Russia	*Building 10, Hall 503*	**ORAL SESSION NONLINEAR DYNAMICS I** Chair: **Vadim S. Anishchenko**, SSU Russia	*Building 3, Room 38*	**ROUND-TABLE DISCUSSION EDUCATION II** Co-chairs: **Boris A. Medvedev** and **Vladimir P. Ryabukho,** Saratov State University, Russia	*Scientific Library Conference Hall*
			LOW-DIMENSIONAL STRUCTURES Chair: **Olga Glukhova,** SSU, Russia	*Building 3, Room 34*	**ORAL SESSION NANOBIOPHOTONICS I** Chair: **Nikolai G. Khlebtsov**, IBPPM RAS, SSU, Russia	*Building 9, Conference Hall*		
16.00-16.30	**Coffee break**							
16.30-18.30	**PLENARY SESSION IV INTERNET BIOPHOTONICS** Chair: **Valery V. Tuchin**, Saratov State University, Russia **Speckle Fluctuations to Probe Dynamics on the Macroscopic to Microscopic Scales, David Boas,** Boston University, USA **Acousto-Optics - Review of Recent Developments in Biomedicine, Stefan Andersson-Engels,** Michael Raju and Jacqueline Gunter, Tyndall National Institute and Department of Physics, University College Cork, Cork, Ireland **Optical Tools in Radiation Therapy, Brian Pogue**, Dartmouth College, USA **In vivo skin optical clearing window for cutaneousvascular and cell imaging Dan Zhu**, Britton Chance Center for Biomedical Photonics, Huazhong University of Science and Technology, Wuhan, China							*Building 3, Big Physical Hall*
16.30-19.30	**JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION. COMPETITION FOR THE BEST STUDENT POSTER AWARD** Moderators: **Dmitry Agafonov**, **Ivan V. Fedosov,** Saratov State University, Russia **Special event: Fair of Innovative Biophotonics Technologies https://nano-glass.ru/fair/index.html**							*Building 3, 3rd floor Hall* *Room 34*

<table>
<tr><th colspan="9">September 29, Friday</th></tr>
<tr><td>9.00-10.20</td><td colspan="7">PLENARY SESSION V
Chair: Herbert Schneckenburger, Aalen University, Germany
New Generation of Compact Laser Sources for Imaging, Diagnostics and Treatment In Biomedicine, Edik Rafailov, Aston University, UK
Sapphire Shaped Crystals for Biomedical Applications, Vladimir N. Kurlov[1], Irina A. Shikunova[1], Gleb M. Katyba[1], Sergey N. Rossolenko[1], Nikita V. Chernomyrdin[2], Andrei A. Kuznetsov[2], Igor V. Reshetov[3], Kirill I.Zaytsev[2,4], [1]Institute of Solid State Physics of RAS; [2]Bauman Moscow State Technical University; [3]Sechenov First Moscow State Medical University; [4]Prokhorov General Physics Institute of RAS, Russia</td><td rowspan="2">Building 10 Main Conference Hall</td></tr>
<tr><td>10.20-10.30</td><td colspan="7">Special Event: OSA Presentation, Xingde Li, Johns Hopkins University, USA</td></tr>
<tr><td>10.30-11.00</td><td colspan="8">Coffee break</td></tr>
<tr><td rowspan="3">11.00-13.00</td><td>INVITED/ORAL SESSION BIOPHYSICS III
Chair: Oxana Semyachkina-Glushkovskaya, Saratov State University, Russia</td><td>Building 10 Main Conference Hall</td><td>ORAL SESSION BIOCOMPUTING II
Chair: Eugeny B. Postnikov, Kursk State University, Russia</td><td>Building 10, Hall 503</td><td>ORAL SESSION SPECTROSCOPY II
Chair: Kirill V. Berezin, Saratov State University, Russia</td><td>Building 3, Room 34</td><td>ORAL SESSION BIOMEDICAL SPECTROSCOPY II
Chair:Vyacheslav I. Kochubey Saratov State University, Russia</td><td>Scientific Library Conference Hall</td></tr>
<tr><td>ORAL SESSION POLARIZATION II
Chair: Dmitry A. Zimnyakov, Saratov State Technical University, Russia</td><td>Building 1, Room 459, SSTU, 77 Politechnicheskaya Str.</td><td>ORAL SESSION ELECTROMAGNETICS
Chair: Michael V. Davidovich, Saratov State University, Russia</td><td>Building 8, Room 82</td><td>ORAL SESSION NONLINEAR DYNAMICS II
Chair: Vadim S. Anishchenko, Saratov State University, Russia</td><td>Building 3, Room 38</td><td>ORAL SESSION NANOBIOPHOTONICS II
Chair: Nikolai G. Khlebtsov, IBPPM RAS, SSU, Russia</td><td>Building 9, Conference Hall</td></tr>
<tr><td colspan="7">ORAL SESSION TELEMEDICINE
Co-chairs: Valery V. Bakutkin, Saratov Research Institute of Rural Hygiene and Sergey R. Utz, Clinics of Skin and Veneral Diseases, SSMU, Russia</td><td>Clinics of Skin and Venereal Diseases, SSMU, 22 Proviantskaya Str.</td></tr>
<tr><td>14.00-17.00</td><td colspan="7">Round-table discussions and closing of the School. The Best Student Poster Award Ceremony.</td><td>Open Air Museum</td></tr>
</table>

September 30, Saturday		
10.00-11.00	**INVITED SESSION** **PHYSIOLOGY I** Chair: **Edik Rafailov**, Aston University, UK	*Building 10, Hall 503*
11.00-11.30	**Coffee break**	
11.30-13.00	**ORAL SESSION** **PHYSIOLOGY II** Chair: **Alla Salmina**, Krasnoyarsk State Medical University, Russia	*Building 10, Hall 503*
13.00-14.30	**Lunch**	
14.30-17.00	**ORAL SESSION and ROUND-TABLE DISCUSSION** **PHYSIOLOGY III** Co-chairs: **Ekaterina Borisova**, Institute of Electronics, Bulgarian Academy of Sciences, Bulgaria and **Oxana Semyachkina-Glushkovskaya**, Saratov State University, Russia	*Building 10, Hall 503*

PLENARY LECTURES

September 26, Tuesday

PLENARY SESSION I
(*Building 3, Big Physical Hall*)
Chair: **Valery V. Tuchin,** Saratov State University, Russia

14.10-14.50
Polarization Optical Imaging as an Intraoperative Tool for Skin Cancer Delineation
Anna Yaroslavsky, University of Massachusetts, Lowel, USA

14.50-15.30
Advanced Methods of 3D Live Cell Microscopy
Herbert Schneckenburger, Aalen University, Germany

September 27, Wednesday

PLENARY SESSION II
(*Building 10, Main Conference Hall*)
Chair: **Alexander V. Priezzhev**, Moscow State University, Russia

12.00-12.40
Laser Speckle Modeling and Simulation for Biophysical Dynamics
Kosar Khaksari[1], **Sean J. Kirkpatrick**[2], [1]Tufts University; [2]Michigan Technological University, USA

12.40-13.20
Advances in Label-Free Optical Endomicroscopy Technologies Towards Histological Imaging of Biological Tissues *in Vivo*
Xingde Li, Johns Hopkins University, USA

September 28, Thursday

PLENARY SESSION III
(*Building 10, Main Conference Hall*)
Chair: **Sean J. Kirkpatrick**, Michigan Technological University, USA

12.00-12.40
Multiparametric Analysis of Tumor Development and Response for Chemotherapy Using Time-Resolved Imaging
Elena Zagaynova[1], Marina Shirmanova[1], Marina Kuimova[2], Konstantin Lukyanov[3], Maria Lukina[1], Lubov Shimolina[1], Varvara Dudenkova[1], Tatyana Sergeeva[1], Natalia Klementieva[1], Vladislav Scheslavsky[4], Irina Druzhkova[1], [1]Nizhny Novgorod State Medical Academy, Russia; [2]Imperial College, London, UK; [3]Institute of Bioorganic chemistry, Russia; [4]Becker & Hickl GmbH, Berlin, Germany

12.40-13.20
Laser Trapping and Manipulation of Red Blood Cells: An Efficient Tool for Hemorheologic Research
Alexander V. Priezzhev, Moscow State University, Russia

PLENARY SESSION IV
INTERNET BIOPHOTONICS
(*Building 3, Big Physical Hall*)
Chair: **Valery V. Tuchin**, Saratov State University, Russia

16.00-17.30
Speckle Fluctuations to Probe Dynamics on the Macroscopic to Microscopic Scales
David Boas, Boston University, USA

Acousto-Optics - Review of Recent Developments in Biomedicine
Stefan Andersson-Engels, Michael Raju and Jacqueline Gunter, Tyndall National Institute and Department of Physics, University College Cork, Cork, Ireland

Optical Tools in Radiation Therapy
Brian Pogue, Dartmouth College, USA

***In vivo* skin optical clearing window for cutaneousvascular and cell imaging**
Dan Zhu, Britton Chance Center for Biomedical Photonics, Huazhong University of Science and Technology, Wuhan, China

September 29, Friday

PLENARY SESSION V
(*Building 10, Main Conference Hall*)
Chair: **Herbert Schneckenburger**, Aalen University, Germany

9.00-9.40
New Generation of Compact Laser Sources for Imaging, Diagnostics and Treatment In Biomedicine
Edik Rafailov, Aston University, UK

9.40-10.20
Sapphire Shaped Crystals for Biomedical Applications
Vladimir N. Kurlov[1], Irina A. Shikunova[1], Gleb M. Katyba[1], Sergey N. Rossolenko[1], Nikita V. Chernomyrdin[2], Andrei A. Kuznetsov[2], Igor V. Reshetov[3], Kirill I.Zaytsev[2,4], [1]Institute of Solid State Physics of RAS; [2]Bauman Moscow State Technical University; [3]Sechenov First Moscow State Medical University; [4]Prokhorov General Physics Institute of RAS, Russia

SPIE FOCUS EVENTS
THE BEST STUDENT POSTER AWARD

September 28, Thursday

SPECIAL EVENT I
(Building 3, 3rd floor Hall)

16.30-19.30
Competition for the Best Student Poster Award
Jury of experts appointed by the Organizing Committee

September 29, Friday

SPECIAL EVENT II
In frames of Round-table discussions and closing of the School and the Symposium

15.00-15.30
Competition for the Best Student Poster Award. Winners award
Valery V. Tuchin, Natalia A. Talaikova, Saratov State University, Russia,

International Symposium Optics and Biophotonics - V

Conference on Optical Technologies in Biophysics & Medicine XIX

Co-chairs: **Elina A. Genina,** Saratov State University; Tomsk State University (Russia**), Valery V. Tuchin, S**aratov State University; Institute of Precision Mechanics and Control RAS; Tomsk State University (Russia)
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September 26, Tuesday

INVITED LECTURE/ORAL SESSION
BIOPHYSICS I
(Building 10, Main Conference Hall)
Chair: **Herbert Schneckenburger**, Aalen University, Germany

16.00-16.20
Invited
Detection performance as a design tool in Mueller imaging for cervical cancer
Meredith Kupinski, University of Arizona, USA; LPICM, CNRS, Ecole polytechnique, University Paris-Saclay, Palaiseau, France

16.20-16.40
Invited
The application of nano-layers in fiber-optic sensors
Małgorzata Jedrzejewska-Szczerska, Gdańsk University of Technology, Poland

16.40-17.00
Invited
Biofluid analysis with SERS-active nanoparticles and substrates
Maciej Wróbel[1], Soumik Siddhanta[2], Zufang Huang[2], Ishan Barman[2], [1]Gdańsk University of Technology, Poland; [2]Johns Hopkins University, USA

17.00-17.20
Invited
Sapphire terahertz photonic crystal waveguides for medical diagnosis purposes
Gleb Katyba[1,2], Kirill Zaytsev[1,3], Nikita Chernomyrdin[1], Stanislav Yurchenko[1], Igor Reshetov[4], Irina Shikunova[2], Vladimir Kurlov[2], [1]Bauman Moscow State Technical University (Moscow, Russia); [2]Institute of Solid State Physics RAS, Russia; [3]Prokhorov General Physics Institute of RAS (Moscow, Russia); [4]Sechenov First Moscow State Medical University (Moscow, Russia)

17.20-17.40
Invited
Terahertz dielectric spectroscopy of skin malignancies in vivo
Kirill Zaytsev[1,2], Nikita Chernomyrdin[1], Konstantin Kudrin[3], Gleb Katyba[4], Vladimir Kurlov[4], Igor Spector[2], Sergey Lebedev[2], Gannady Komandin[2], Stanislav Yurchenko[1], and Igor Reshetov[3], [1]Bauman Moscow State Technical University (Moscow, Russia); [2]Prokhorov General Physics Institute of RAS (Moscow, Russia); [3]Sechenov First Moscow State Medical University (Moscow, Russia); [4]Institute of Solid State Physics of RAS (Chernogolovka, Russia)

17.40-18.00

Invited

Computationally effective method for chromatic dispersion calculation and correction in thespectral-domain OCT

Pavel Shilyagin, Vasiliy Matkivskiy, Alexander Moiseev, Grigory Gelikonov, Valentine Gelikonov, Institute of Applied Physics RAS, Russia

18.00-18.20

Invited

Stability of data processing algorithms in the laser ektacytometry of red blood cells

Sergey Nikitin, V. D. Ustinov. M. V. Lomonosov Moscow State University, Russia

18.20-18.30

Visual assessment of microstructural co- and cross-polarized optical coherence tomography images in malignant gliomas

Konstantin Yashin, Privolzhsky Federal Medical Center in Nizhny Novgorod, Faculty of Neurosurgery, Russia

September 28, Thursday

INVITED LECTURE/ORAL SESSION BIOPHYSICS II

(Building 10, Main Conference Hall)

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

15.10-15.30

Invited

Image enhancement in acoustic resolution photoacoustic microscopy

Pavel Subochev, Institute of Applied Physics RAS, Russia

15.30-15.40

Histological examination of the oral mucosa after fractional diode laser irradiation with different power level and pulse duration

Andrey V Belikov[1], Luidmila A Ermolaeva[2], Dmitriy E Korzhevsky[2], Elena S Sergeeva[1], Yulia V Semyashkina[1], Maria M Antropova[1], Denis Y Fedotov[2], Maria A Zaitseva[3] Tatiana V Kashina[3]; [1]ITMO University, Russia, [2]St. Petersburg State University, Russia, [3]Institute of Toxicology of the Federal Medical and Biological Agency, Russia

15.40-15.50

New method of laser lithotripsy based on indirect laser surgery

Nikolai Mitin[1], Olga Streltsova[2], Dmitriy Pochtin[2], Vladimir Bredikhin[1], Alexander Pikulin[1], Vladislav Kamensky[1], [1]Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia, [2]Nizhny Novgorod State Medical Academy, Nizhny Novgorod, Russia

15.50-16.00

Optical methods for numerical estimation of collagen state after gamma-irradiation

Marina Kochueva[1], S.S. Kuznetsov[1], V.V. Dudenkova[1], A.V. Varlamova[2], A.V. Maslennikova[1,2], [1]Nizhny Novgorod State Medical Academy, Nizhny Novgorod, Russia, [2]Lobachevsky State University, Nizhny Novgorod, Russia

16.00-16.10

Visual assessment of microstructural co- and cross-polarized optical coherence tomography images in malignant gliomas

Konstantin Yashin, Privolzhsky Federal Medical Center in Nizhny Novgorod, Faculty of Neurosurgery, Russia

16.00-16.30

Coffee break

POSTER SESSION BIOPHYSICS

(Building 3, 3rd floor Hall)

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

16.30-19.30

1B. **Glycerol and water in biotissues. quick reference** Mikhail Stolnitz, Saratov State University, Russia

2B. **Investigation of mixed saliva by optoelectronic methods** E.A. Savchenko, E.K.Nepomnyashchaya, E.N. Velichko, M.A. Baranov, E.T. Aksenov Saint-Petersburg Polytechnic University of Peter the Great, Russia

3B. **Influence of low intensity red laser on the growth of staphyloccocus aureus strains and sensitizing effect of photoditazin** Anna V. Egorova[1], G.E. Brill[1], I.O. Bugaeva[1], G.V. Ponomaryov[2], O.V. Ushakova[3], [1]Saratov State Medical University n.a. V.I. Razumovsky, Russia, [2]Scientific Research Institute of Biomedical Chemistry n.a. V.N. Orechovich RAMN, Russia, [3]Yuri Gagarin State Technical University of Saratov, Russia

4B. **Monitoring of diabetes mellitus in children with the non-invasive measurement of advanced glycation end products** Diana Skomorokha, N.G. Kiseleva, O.L. Lopatina, V.V. Salmin, T.E. Taranushenko, A.B. Salmina, KrasGMU, Russia

5B. **In vivo optical focusing of circulating red blood cells** Oleg Grishin, Ivan Fedosov, Saratov State University, Russia

6B. **Modeling of the multispectral radiation source for skin inspection of redox potential** Elvira Timofeeva, Elena Gorbunova, Aleksandr Chertov, University ITMO, Russia

7B. **Assessment of red blood cell aggregation influenced by nanoparticles** Tatiana Avsievich, Alexey Popov, Alexander Bykov, Igor Meglinski, University of Oulu, Finland

8B. **The control of the optical and physiological properties of the human skin in vivo using the external mechanical compression** Olga Zyuryukina, Yury Sinichkin, Saratov State University, Tomsk State University, Russia

9B. **Study of interaction between ferromagnetic fluids and blood plasma proteins by dynamic light scattering** Elina Nepomnyashchaya, Savchenko Ekaterina, Velichko Elena, Aksenov Evgenij, Pleshakov

Ivan, Peter the Great Saint-Petersburg Polytechnic University, Russia

10B. **Optical clearing potential and diffusion properties of albumin solutions in muscle tissue** Ekaterina Lazareva[1,2,3], Alexey Bashkatov[1,3], Ilya Samusev[2], Valery Tuchin[1,3,4] [1]Research Educational Institute of Optics & Biophotonics, Saratov State University, Saratov, Russia, [2]Center for Functionalized Magnetic Materials (FunMagMa), Immanuel Kant Baltic Federal University, Kaliningrad, Russia, [3]Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk, Russia, [4]Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of Precision Mechanics and Control RAS, Saratov, Russia

11B. **Antibacterial properties of nano-dimensional composites on the basis of a natural sorbent** Ekaterina Selifonova[1], Scherbakova Nataly[1], Shapoval Olga[2], Nechayeva Olga[2], Naumova Galina[1], Splyukhin Vladimir[1], Sergeants Victor[1], Chernova Rimma[1], Venig Sergey[1]; [1]Saratov state university, Russia, [2]Saratov State Medical University, Russia

12B. **The modified z-scan technique with simultaneous measurements of the rayleigh scattering** Sergey Volchkov, Sergey Yuvchenko, Dmitry Zimnyakov, Saratov State Technical University, Russia

13B. **Optical digital recording of sedimentation of erythrocytes and its modeling in the form of a collective process** Valery A. Doubrovski, K.N. Dvoretski, M.F. Medvedeva, S.V. Markov, Saratov State Medical University n. a. V. I. Razumovsky, Russia

14B. **Sub-wavelength-resolution spectroscopy and imaging at terahertz frequencies** Nikita Chernomyrdin[1], Aleksander Schadko[1], Sergey Lebedev[2], Igor Spektor[2], Gennady Komandin[2], Vladimir Kurlov[3], Igor Reshetov[4], Stanislav Yurchenko[1], and Kirill Zaytsev[1,2]; [1]Bauman Moscow State Technical University, Russia; [2]Prokhorov General Physics Institute of RAS, Russia [3]Institute of Solid State Physics of RAS, Russia, [4]Sechenov First Moscow State Medical University, Russia

15B. **Study the interaction of fulleroid type nanoparticles with red blood cell membranes by atomic force microscopy** Anna Doronkina, Tkachenko Natalie, Pravdin Alexander, Kochubei Vyacheslav, Saratov State University, Russia

16B. **Laser-assisted cryodestruction of biological tissue** Irina Shikunova[1], Kirill Zaytsev[2,3], Igor V.Reshetov[4], Vladimir Kurlov[1]; [1]Institute of Solid State Physics of RAS, [2]Bauman Moscow State Technical University, [3]Prokhorov General Physics Institute of RAS, [4]Sechenov First Moscow State Medical University Moscow, Russia

17B. **Development of a method for increasing the depth of detection of nanoparticles in the skin with OCT – visualization** Sergey Zaytsev[1], A.N. Bashkatov[1,2], E.A. Genina[1,2]; [1]Saratov State University, Russia, [2]Tomsk State University, Russia

18B. **Comparative study of the of fractional laser microablation of the epidermis and ultrasound impact effect on the skin optical clearing** Nataly S. Ksenofontova[1], A.N. Bashkatov[1,2], A.B. Bucharskaya[3], G.S. Terentyuk[3], V.V. Tuchin[1,2], E.A. Genina[1,2] [1]Saratov state university, Russia, [2]Tomsk state university, Russia, [3]Saratov state medical university, Russia

19B. **Studies of the age-related changes in the surface of hyaline cartilage using raman spectroscopy** Pavel Timchenko[1], Dmitriy Dolgushkin[2], Larisa Volova[2], V. Lazarev[2], Anna Tyumchenkova[1], Mariya Markova[1], [1]Samara National Research University, [2]Samara State Medical University, Russia

20B. **Investigation of kinetics of skin geometrical parameters ex vivo at the skin optical clearing by glycerol solutions with different concentrations** Vadim Genin, Alexey Bashkatov, Elina Genina, Valery V. Tuchin, Saratov State University, Russia

21B. **Cellular and intracellular localization of the i class histone deacetylases in mouse brain cortex in long periods after photothrombotic infarct** Svetlana Demyanenko, Maria Neginskaya, Valentina Dzreyan, SFedU, Russia

22B. **laser forming of 3-D nanocomposite structures for the restoration of bone-cartilage defects** Natalia Zhurbina, Ulyana Kurilova, Alexander Gerasimenko, Alexandr Polokhin, National Research University of Electroncs Techology, Russia

23B. **Study of glycerol diffusion in biological tissues during developing of alloxan induced diabetes** Daria Tuchina[1,2], Alexey Bashkatov[1,2] Alla Bucharskaya[3], Valery Tuchin[1,2,4], [1]Research-Educational Institute of Optics and Biophotonics, Saratov National Research State University, Saratov, Russia, [2]Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk, Russia, [3]Saratov State Medical University, Saratov, Russia [4]Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of

Precision Mechanics and Control RAS, Saratov, Russia

24B. **Laser structuring of 3D nanocomposites based on scaffolds of carbon nanotubes in protein matrix** Aleksandr Polokhin, Alexander Gerasimenko, Natalia Zhurbina, National Research University of Electronic Technology, Zelenograd, Russia

25B. **Changes in the spectral characteristics of blood flow under thermal tests in diabetic patients** Elena Zharkikh[1], Irina Mizeva[2], Victor Dremin[1], Mariya Filina[1], Evgeny Zherebtsov[3], Elena Potapova[1], Andrey Dunaev[1], [1]Orel State University named after I.S. Turgenev, Orel, Russia, [2]Institute of Continuous Media Mechanics, Perm, Russia, [3]Aston Institute of Photonic Technologies, Aston University, Birmingham, UK

26B. **Combined use of laser Doppler flowmetry and videocapillaroscopic methods for simultaneous assessment of rhythmic oscillations in blood microcirculation** Igor O. Kozlov[1], M.V. Volkov[2], I.P. Gurov[2], N.B. Margaryants[2], A.V. Potemkin[2], E.A. Zherebtsov[3], V.V. Dremin[1], A.V. Dunaev[1], [1]Orel State University named after I.S. Turgenev, Orel, Russia, [2]ITMO University, Russia, [3]Aston Institute of Photonic Technologies, Aston University, Birmingham, UK

27B. **Comparative research of the biochemical analysis results and the raman and autofluorescence analysis of human body fluids from the patients with malignant tumors** Lyudmila Shamina, Ivan Bratchenko, Dmitry Artemyev, Oleg Myakinin, Samara University, Russia, Alexander Moryatov, Sergey Kozlov, Samara State Medical University, Russia Valery Zakharov, Samara University, Russia

28B. **Noninvasive control of distribution of rhodamine-loaded capsules in vivo** Olga Stelmashchuk[1], Evgenia Seryogina[1], Yana Tarakanchikova[2,3], Gennadii Piavchenko[1], Evgeny Zherebtsov[4], Andrey Dunaev[1], Alexey Popov[3], Igor Meglinski[1,3], [1]Orel State University named after I.S. Turgenev, Orel, Russia, [2]Saratov State University, Saratov, Russia, [3]University of Oulu, Oulu, Finland, [4]Aston Institute of Photonic Technologies, Aston University, Birmingham, UK

29B. **Investigation of optical and hydrodynamic processes initiated in biological tissues and liquids under the action of high-power pulses of 1.54 um laser radiation** A.V. Belikov, Ya.Yu. Fomicheva[1], S.V. Gagarsky[1], A.N. Sergeev[1], Sergey N. Smirnov[1], A.M. Zagorulko[2]. [1]ITMO University, Russia, [2]St. Petersburg Branch of the S. Fyodorov Eye Microsurgery Federal State Institution, Russia

30B. **Photonic crystal fiber as optical sensor for lead(II) detection** Victor Borzov, Pavel Pidenko, Sergei Bondarenko, Abbas Sulayman, Nataliya Burmistrova, Tatiana Rusanova, Saratov State University, Russia

31B. **ER:YLF-laser microperforation of the nail plate for drug delivery** A.V. Belikov, A.N. Sergeev, S.N. Smirnov, Anastasia D. Tavalinskaya, ITMO University, Russia

32B. **In vitro study of the soft tissue cutting efficiency with carbon, erbium and titanium fiber opto-thermal converters of laser radiation** Andrey Belikov, Alexei Skrypnik, ITMO University, Russia

33B. **Study of the effect of optical clearing agents on microhemodynamics by speckle-contrast imaging** Polina Timoshina[1,2], Denis Alexandrov[3], Valery Tuchin[1,2,4], [1]Research-Education Institute of Optics and Biophotonics, Saratov State University, Russia; [2]Interdisciplinary Laboratory on Biophotonics, Tomsk State University, Russia; [3] Saratov State Medical University, Russia; [4]Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia

34B. **Polarization image contrast between tumor and healthy tissues – *ex vivo* investigations** Thomas Sang Hyuk Yoo[1], Tsanislava Genova[2], Hee Ryung Lee[1], Ekaterina Borisova[2], Ivan Terziev[3], Enric Garcia-Caurel[1], Razvigor Ossikovski[1], Tatiana Novikova[1], [1]LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, France, [2]Institute of Electronics, Bulgarian Academy of Sciences, Bulgaria, [3]University hospital "Tzaritza Ioanna-ISUL", Sofia, Bulgaria

35B. **Optical coherence tomography for noninvasive diagnosis of the middle ear diseases** Valery Gelikonova, Pavel Shilyagin[2], Dmitry Trepelov[2], Vasily A. Matkivsky[2], Alexey Novozhilov[3], Timur Abubakirov[3], Grigory Gelikonov[2], Andrey Shakhov[3], Valentin Gelikonov[2], [1]Lobachevsky state university of Nizhny Novgorod, [2]Institute of Applied Physics of Russian Academy of Science, [3]Volga District Medical Centre

36B. **Multimodal sensing techniques for studies on glymphatic system** Aleksandra Zienkiewicz[1], Vesa Korhonen[1,2]; Vesa Kiviniemi[1,2], Igor Meglinski[1], Teemu Myllylä[1], [1]University of Oulu, Finland, [2]Medical Research Center (MRC), Oulu University Hospital, Finland

37B. **Macro and micro spectroscopy parameters of cancerous and healthy gastrointestinal tissues** Tsanislava Genova[1], Ekaterina Borisova[1], Oksana Semyachkina-Glushkovskaya[2], Dmitry Gorin[2], Daniil Bratashov[2], , Ivan Terziev[3], [1]Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria, [2]Saratov State University, Russia, [3]University Hospital "Tsaritsa Yoanna"-ISUL, Sofia, Bulgaria

38B. **Analysis of albumin Raman scattering in visible and near-infrared ranges** Anastasya Lykina, Dmitry Artemyev, Samara National Research University, Russia

39B. **Features of the temperature response on double cuff-occlusion of the upper limb: remote ischemic preconditioning aspect** Alexander Sagaidachnyi, A.V. Fomin, D.A. Usanov, A.V. Skripal, Saratov State University, Russia

40B. **Transport of methylene blue in water-ethanol solution through skin *ex vivo*** Elizaveta Basko[1], Maria Klementeva[1], Alexey Bashkatov[1,2], Valery Tuchin[1,2,3], Elina Genina[1,2];[1]Research-Educational Institute of Optics and Biophotonics, Saratov State University, Saratov, Russia [2]Interdisciplinary Laboratory of Biophotonics, Tomsk State University, Tomsk, Russia, [3]Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of Precise Mechanics and Control RAS, Saratov, Russia

41B. **Software guided hardware system for dermoscopy analysis of skin cancer** Semyon Konovalov, Oleg Myakinin, Pavel Bakhtinov, Ivan Bratchenko, Valery P. Zakharov, Samara National Research University, Russian Federation

42B. **Research of the fiber system characteristics and geometry for raman scattering registration** Yuliya E. Litvinova, D.N. Artemyev, I.A. Bratchenko, Samara National Research University named after academician S.P. Korolev, Russia

43B. **Raman scattering research of liquid analytes using lab-on-chip systems** Taiysiya V. Slivkova, D.N. Artemyev, I.A. Bratchenko, Samara National Research University named after academician S.P. Korolev, Russia

44B. **The study of the reflecting layer shape and thickness of the lab-on-chip system chamber for effective optical signal registration** Irina B. Mambetova, D.N. Artemyev, I.A. Bratchenko, Samara National Research University, Russia

45B. **Antibacterial properties of nano-dimensional composites on the basis of a natural sorbent** Ekaterina Selifonova[1], Natalya Scherbakova[1], Olga Shapoval[2], Nechayeva Olga[2], Galina Naumova[1], Vladimir Splyukhin[1], Victor Sergeants[1], Rimma Chernova[1], Sergey Venig[1], [1]Saratov state university, Russia, [2]Saratov State Medical University, Russia

46B. **The estimation of hemodynamic signals measured by fnirs response to cold pressor** Mohammadali Ansari, Iran Elham Fazliazar, Laser and Plasma research institute, Shahid Beheshti University, Iran

47B. **Assessing erythrocyte size distribution by means of laser diffractometry and hyperspectral holography** Andrei Lugovtsov[1], Georgy Kavenkov[2], Alexander Shtanko[3], Sergey Kalenkov[4], Sergey Nikitin[5], Alexey Semenov[1,5], Alexander Priezzhev[1,5], [1]International Laser Center, M.V. Lomonosov Moscow State University, [2]Microholo Ltd, Raushskaya nab., [3]Moscow State University of Technology "Stankin", [4]Moscow Polytechnic University, [5]Department of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia

48B. **In vivo study of skin cancers with dermoscopy, hyperspectral imaging and raman spectroscopy** Ivan Bratchenko[1], Yulia Khristoforova[1], Dmitry Artemyev[1], Oleg Myakinin[1], Semyon Konovalov[1], Violetta Sherendak[1], Alexander Moryatov[2], Oleg Kaganov[2], Sergey Kozlov[2], Alexander Orlov[3], Valery Zakharov[1], [1]Samara University, [2]Samara State Medical University, [3]Samara Regional Clinical Oncology Dispensary, Russia

49B. **Assessing results of laser-induced thermo-mechanical treatment of avascular collagenous tissues by optical coherence elastography** Vladimir Zaitsev, Alexander Matveyev, Lev Matveev, Grigory Gelikonov, Dmitry Shabanov, Aleksander Sovetsky, Alexander Omelchenko, Olga Baum, Alexei Yuzhakov, Emil Sobol Institute of Applied Physics RAS, Nizhny Novgorod, Russia

50B. **Optical analysis of implants from the dura mater** Nikita Kiyko, Samara University, Russia

51B. **Transmission polarization mapping of sclera** Dmitry A. Tikhonov[1], Tatyana G. Kamenskikh[1], Marina E. Shvachkina[2], Alexander B. Pravdin[2], Dmitriy D. Yakovlev[2], Dmitriy A. Yakovlev[2]; [1]Saratov State Medical University; [2]Saratov National Research State University, Saratov, Russia

September 29, Friday

JOINT INVITED LECTURE/ORAL SESSION BIOPHYSICS III/
(Building 10, Main Conference Hall)
Chair: **Oksana Semyachkina-Glushkovskaya,**
Saratov State University, Russia

11.00-11.20
Invited
Selection of fiber spectroscopy methods to detect malignant tissues
Viacheslav Artyushenko[1], Olga Bibikova[1,2,3], Urszula Zabarylo[5], Iskander Usenov[1], Tatiana Sakharova[1], Georgy Danielyan[1], Andrey Bogomolov[7,8], Olaf Minet[5,6], [1]Art photonics GmbH, Berlin, Germany, [2]Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Oulu, Finland; [3]Institute of Analytical and Bioanalytical Chemistry, Ulm University, Ulm, Germany; [4]Research-Educational Institute of Optics and Biophotonics, Saratov State University, Saratov, Russia, [5]Center for Radiology C6, Medical Physics and Optical Diagnostics, CBF, Charité-Universitätsmedizin, Berlin, Germany, [6]Technical University of Berlin, Institute for Optics & Atomic Physics (IOAP), Berlin, Germany, [7]Samara State Technical University, Samara, Russia; [8]Global modelling, Aalen, Germany

11.20-11.40
Invited
Optical methods for assessing the rheological parameters of blood and interaction forces of red blood cells in patients with arterial hypertension
Andrei Lugovtsov[1], Alexey Semenov[1,2], Petr Ermolinskiy[2], Anastasiya Maslyanitsina[2], Larisa Dyachuk[3], Elena Pavlikova[3], Yuri Gurfinkel[3], Alexander Priezzhev[1,2] [1]International Laser Center, M.V. Lomonosov Moscow State University, Moscow, Russian Federation, [2]Department of Physics, M.V. Lomonosov Moscow State University, [3]Medical Research and Education Center, M.V. Lomonosov Moscow State University, Moscow, Russian Federation

11.40-12.00
Invited
The application of OCT in small animal dentistry
Michał Wąsowicz[1], Katarzyna Karpieńko[3], Marcin strąkowski[3], Jerzy Pluciński[3], Paulina Strąkowska[3], Maciej Cićkiewicz[4], [1]Department of Morphological Sciences, Faculty of Veterinary Medicine, Warsaw University of Life Sciences, Warsaw, Poland; [2]Praktyka Weterynaryjna. Michał Wąsowicz, Warszawa, Poland, [3]Department of Metrology and Optoelectronics, Faculty of Electronics, Telecommunications and Informatics, Gdańsk University of Technology, Gdańsk, Poland, [4]DentalMovies. Maciej Cićkiewicz, Warszawa, Poland

12.00-12.20
Invited
Early photon fluorescence molecular tomography with Lyubimov reconstruction model: sensitivity functions and resolution estimates
Alexander Konovalov, Vitaly Vlasov, Russian Federal Nuclear Center - Zababakhin Institute of Apllied Physics, Russia

12.20-12.40
Powerful LED device for photodynamic therapy of onychomycosis and other applications
Andrey Belikov, Yulia Semyashkina, Michael Modin, David Zhubrev, ITMO University, Russia

12.40-12.50
Optimization of spectral characteristics of the optical scheme of the diagnostic fluorimeter for an assessment of the concentration of glycation products in the skin.
Victor Kulikov, Samara National Research University, Russia

12.50-13.00
Study of the process of blood clotting by speckle-correlation of image
Iuliia Sytnik[1], Alyona Bloshkina[1], Fedor Gubarev[1], V.E. Zuev[2] Lin Li[1], [1]National Research Tomsk Polytechnic University; [2]Institute of Atmospheric Optics, Russian Academy of Sciences, Siberian Branch

Workshop on
Laser Physics and Photonics XIX

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

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

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

September 26, Tuesday

ORAL SESSION PHOTONICS I
(Building 10, Hall 503)

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

15.50-16.00 (Invited)
Radiative pulling forces nearby a hyperbolic metamaterial slab
Igor Nefedov, Alexander Shalin, ITMO University, Russia

16.00-16.10
Generalized Tavis-Cummings models and quantum networks
Alexander V. Gorokhov, Samara National Research University, Russia

16.10-16.20
The measurement of argon and krypton metastable atoms in the barrier discharge plasma
Anna S. Ghildina, P.A. Mikheyev, N. N. Lunev, A. K. Chernyshov, N.I. Ufimtsev, G. N. Popkov, V. N. Azyazov, Samara branch of the P.N. Lebedev Physical Institute; Samara National Research University, Russia

16.20-16.30
Spontaneous radiation in the hyperbolic materials
Leonid A. Melnikov, M.V. Ryabinina, Yuri Gagarin State Technical University of Saratov, Russia

16.30-16.40
Electromagnetically induced transparency by elliptic polarization of interacting fields
Oleg M. Parshkov, Yuri Gagarin State Technical Univesity of Saratov, Russia

16.40-16.50
Stripes and hexagons in two-level broad-area lasers with the periodic pump modulation
Anton A. Krents, Samara State Univesity, Russia

16.50-17.00
Fractals dimensions investigation of regular and stochastic structure using optics technique
Maxime D. Matasov, PNPI, Russia

ORAL SESSION PHOTONICS I
(Building 3, Big Physical Hall)

17.10-17.20
Modelling of the nonlinear soliton dynamics in the ring fiber cavity
Vadim Razukov, Saratov State Technical University, Russia

17.20-17.30
Enchanced terahertz rectification by hybrid plasmon modes in periodic graphene
Mashinsky V. Konstantin, Saratov State University, Russia

17.30-17.40
Ajusting of bangap zone in low-contrast solid-core photonic bandgap fibre
Alexander Plastun, A. Konyukhov, Sararov State University, Russia

17.40-17.50
The choice of the optimal approximation in the kinetic description of the vacuum production of an e^- e^+ plasma in strong laser fields
Konstantin Kravtsov, V.V. Dmitriev, S.S. Levenez, A.D. Panferov, S.A. Smolyansky, Saratov State University

17.50-18.00
Amplification of terahertz plasmons in active graphene at pumping graphene by optical plasmons
Ilia M. Moiseenko, Saratov State University, Russia

18.00-18.10
Synchronization and control of external-cavity laser diodes
Leonid A. Kochkurov, Synchronization and control of external-cavity laser diodes

September 28, Thursday

ORAL SESSION PHOTONICS II
(Building 10, Hall 503)

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

14.20-14.30
Atom-atom entanglement in the double Jaynes-Cummings model
Eugene K. Bashkirov, Samara National Research University, Russia

14.30-14.40
Three-body scattering model: parametric basis surface functions
Sergue I. Vinitsky[1], A.A. Gusev[1], O. Chuluunbaatar[1], V.L. Derbov[2], L.L. Hai[1], [1]Joint Institute for Nuclear Research, Dubna, Russia,[2]Saratov State University, Saratov, Russia.

14.40-14.50
A method for efficiently ar-coating of mid-ir laser crystals by creating a microrelief
Vladimir Lazarev, Bauman Moscow State Technical University, Russian Federation

14.50-15.00
The description of thermal electromagnetic field influence on entangled state of interacting qubits by the path integral approach
Mark A. Shleenkov, Samara National Research University, Russia

15.00-15.10
Calculation of normal modes of the closed waveguides in general vector case
Mikhail D. Malykh, L.A. Sevastianov, Anastasiia A. Tyutyunnik, RUDN University, Moscow, Russia

15.10-15.20
O2(A1∆) vibrational kinetics in oxygen-iodine laser
Aleksei P. Torbin, A.A. Pershin, M.C. Heaven, V.N. Azyazov, Samara National Research University,Samara, Russia; Chemistry Department of Emory University, Atlanta, USA

15.20-15.30
Modification of inner surface of photonic crystal fibers by (3glycidyloxypropyl)trimethoxysilane for ELISA
Pavel Pidenko, Saratov State University, Russia

15.30-15.40
Cooperative spontaneous decay of an excited atom in a dense ensemble of impurity atoms in a dielectric near the conductive surface
Alexei S. Kuraptsev, I. M. Sokolov, Peter the Great St. Petersburg Polytechnic University

15.40-15.50
The description of two-photon Rabi oscillation in the path integral approach
Yana V. Degtyareva, Alexander A. Biryukov, Samara National Research University, Russia.

15.50-16.00
Direct and reverse plasmons in symmetrical structures
Michael V. Davidovich, Saratov State University, Saratov, Russia

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

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

17.30-19.30

1P. **Dependence of the ellipsometric parameters of reflected light on the orientation of the optical axis relative to the plane of incidence** Natalya M. Moiseeva, Anton V. Moiseev, Volgograd State University, Russia
2P. **Simulation of light propagation in the thin-film waveguide microlens** M.D. Malykh, D.V. Divakov, L.A. Sevastianov, RUDN University, Moscow, Russia
3P. **Modeling and manufacture of an interference filter with a defective layer for narrow spectral selection** Sergey A. Fomchenkov, Alexey Porfirev, Samara National Research University, Russia
4P. **Effects of decorrelation in digital holographic interferometry of a scattering object** Bogdan A. Grizbil, Institute of Problems of Precise Mechanics and Control of RAS, Saratov, Russia
5P. **Synchronization of oscillations in coupled multimode optoelectronic oscillators: Bifurcation analysis** Maksim I. Balakin, Yuri Gagarin State Technical University of Saratov, Russia
6P. **Sharp focusing of laser light by multilayer cylinders with circular cross section** Elena S. Kozlova, Image

Processing Systems Institute of RAS, Samara, Russia

7P. **Generation of regular optical pulses in asymmetrically modulated VCSEL with external small optical injection** Anton A. Krents, Samara State University, Russia

8P. **The use of the Finsler metric in the geometrization of the Maxwell equations** Dmitry S. Kulyabov, A.V. Korolkova, E.G. Eferina, T.R. Velieva, Peoples' Friendship University of Russia (RUDN University) & Laboratory of Information Technologies, Moscow, Russia

9P. **The algorithm for lenses calculation in geometrized Maxwell's theory** Dmitry S. Kulyabov, Anna V. Korolkova, Leonid A. Sevastianov, Migran N. Gevorkyan, Anastasiya V. Demidova, Peoples' Friendship University of Russia (RUDN University) & Laboratory of Information Technologies, Moscow, Russia

10P. **Experimental investigation of complex circular Airy beam characteristics** Alexey P. Porfirev, S. Fomchenkov, S. Khonina, Samara National Research University, Russia

11P. **Laser trapping of light-absorbing particles in air with asymmetric Gaussian optical vortices** Sergey A. Fomchenkov, A.P. Porfirev, Samara National Research University, Russia

12P. **Investigation of focusing features of a spiral binary axicon** Alexey P. Porfirev, S. Degtyarev, S. Khonina, Samara National Research University, Russia

13P. **Silicon on silicon dioxide slot waveguide evanescent CH_4 gas sensor at mid-IR 3.39 μm wavelength** Muhammad Ali Butt[1], Svetlana Khonina[2], [1]Samara National Research University, Russia, [2]Image Processing Systems Institute, Samara, Russia

14P. **Elliptic Gaussian beam with an elliptic phase singularity and its orbital angular momentum** Alexey A. Kovalev, IPSI RAS - Branch of the FSRC "Crystallography and Photonics" RAS, Russia

15P. **Orbital angular momentum of an arbitrary elliptic laser beam** Alexey A. Kovalev, IPSI RAS - Branch of the FSRC "Crystallography and Photonics" RAS, Russia

16P. **Transformation of the shape of an optical pulse in a phototropic medium** Vladislav Yu. Gribkov, Rimma S. Zatrudina, Volgograd State University, Russia

17P. **Numerical modeling of the dynamics of a bidirectional long ring Raman fiber laser** Sergei V. Sukhanov, Yuri Gagarin State Technical University of Saratov, Russia

18P. **Resonant absorption of terahertz radiation in a plasmon membrane structure based on graphene with a periodic metal grating** Veronica S. Melnikova, Saratov State University, Russia

19P. **Monitoring of Intralipid thawing and heating by the laser speckle contrast Imaging** Anton Sdobnov, Saratov State University, Rissia, University of Oulu, Finland

20P. **Research on the optical properties of colloidal solutions luminescent nanocrystals (CdSe / ZnS) in photonic-crystal fibre with hollow core (HCPCF).** Pavel Pidenko, Saratov State University, Russia

21P. **Tight focusing of a nonhomogeneously polarized optical vortex** Sergey S. Stafeev, Image Processing Systems Institute of RAS – Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia

22P. **Dynamics of the optical field in the ring cavity with nonlinear metamaterial and time-delayed feedback** Elizaveta A. Yarunova, Samara State University, Russia

23P. **Investigation of the spectral characteristics of a tunnel photodiode based on DLC nanofilms** Garif G. Akchurin, N. P. Aban'shin, Yu. A. Avetisyan, G. G. Akchurin Jr., V.I. Kochubey, A. N. Yakunin, Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia

24P. **Modeling of electrostatic field localization in nanostructures based on DLC film using tunneling microscopy methods** Alexander N. Yakunin, N. P. Aban'shin, Yu. A. Avetisyan, G. G. Akchurin Jr., G. G. Akchurin, Institute of Precision Mechanics and Control of RAS, Saratov, Russia

25P. **The mechanism of stabilization of the tunneling current of photo- and autoemitters based on nanostructures with DLC film** Yury A. Avetisyan, N.P. Aban'shin, G.G. Akchurin Jr., G.G. Akchurin, A.N. Yakunin, Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia

26P. **Frequency comb generation due to modulation instability in optical fibers with variable dispersion.** A. Konyukhov, Alexander I. Rap, Saratov State University, Russia

27P. **Phase analysis of spatial spectra of speckle patterns in digital speckle photography** Ludmila A. Maksimova[1], Petr V. Ryabukho[2], Natalya Yu. Mysina[1], Dmitry V. Lyakin[1], Vladimir P. Ryabukho[1,2], [1]Institute of Precision Mechanics and Control Russian Academy of Sciences, Russia; [2]Saratov State University, Russia

28P. **Geometric quantum discord of double Jaynes-Cummings model** Mikhail Evseev, Eugene Bashkirov, Samara National Research University, Russia

29P. **Inelastic collisions of Schroedinger solitons in dispersion oscillation fibers** A. Konyukhov, P. Mavrin, Saratov State University, Russia

30P. **Dynamics of atom-filed entanglement for Tavis-Cummings models** Eugene Bashkirov, Samara National Research University, Russia

31P. **Dispersive wave generation in fibers with variable dispersion** A. Konyukhov, E. Schurkin, Saratov State University, Russia

32P. **Bounded Airy pulses in optical fibers with variable dispersion.** A. Konyukhov, V. Baranovsky, Saratov State University, Russia

33P. **Optimization of silicon waveguides for gas detection application at mid-ir wavelengths** Muhammad Ali Butt, S. Khonina, E. Kozlova, Samara National Research University, Russia; Image Processing Systems Institute, Samara, Russia, Russian Academy of Sciences.

34P. **Light with orbital angular momentum and encryption algorithms** Sergey A. Burlov, A. V. Gorokhov, Samara National Research University, Russia

35P. **Entanglement and chaos in the dynamics of two- and three-level atoms, interacting with photons in nonideal cavities** Sergey N. Agapov, A. V. Gorokhov, Samara National Research University, Russia

36P. **Modification of the laser triangulation method for measuring the thickness of optical layers** Anton Adamov, V. Khramov, Volgograd State University, Russia

37P. **WKB solution 4×4 for electromagnetic waves in a plane anisotropic inhomogeneous medium** Natalya Moiseeva, A. Moiseev, VolSU, Russia

38P. **Influence of temperature on the spectral characteristics of semiconductor lasers in the visible range** Anton Adamov, M. Baranov, V. Khramov, Volgograd State University, Russia

39P. **O2(B) relaxation in active medium of oxygen-iodine laser** Georgy I. Tolstov Zagidullin M.V., Khvatov N.A., Medvedkov I.A., Azyazov V.N., Samara University, Russia.

40P. **Method of measurement of the temperature of biological fabric in the field of exposure to laser radiation with small size of beam profile at laser welding** Dmitry Ryabkin, National Research University "MIET", Russia

41P. **Autodyne signal of a semiconductor laser included in scanning microwave microscope to control nanodisplacement of the probe** Dmitry Usanov, Anatoly Skripal, Elisey Astakhov, Sergey Dobdin, Saratov State University, Russia

42P. **Eigenvalue based analysis of soliton fission in optical supercontinuum generation** Andrey Konyukhov, SSU, Russia

43P. **Analysis of multimode supercontinuum generation in microstructured optical fibers** Andrey Konyukhov, SSU, Russia

44P. **Surface plasmons-polaritons at interface between dielectric and heterogeneous medium with metal nanoparticles** Vasily F. Nazvanov, SSU, Russia

45P. **Long-range surface exciton polaritons in thin films of vanadium dioxide** Vasiliy F. Nazvanov, Saratov State University, Russia

46P. **Direct micr-trapping of biological micro-objects** Sofija V. Ganchevskaya, A. V. Mikheev, Samara University

47P. **Ramsey scheme for coherent population resonance detection in the optically dense medium** Konstantin Barantsev, G. Voloshin, A. Litvinov, E. Popov, Peter the Great St.Petersburg Polytechnic University

48P. **Response curve of epr-magnetometer with optical pumping** Evgenij Popov, Konstantin Barantsev, Andrew Litvinov, Peter the Great Saint-Petersburg polytechnic university, Russia

49P. **Experimental investigation of speckle-field aperture decorrelation effect in digital holographic interferometry of scattering object** Bogdan Grizbil, P. Ryabukho, L. Maximova, V.P. Ryabukho, Saratov State University; Institute of Precision Mechanics and Control, Russian Academy of Sciences

50P. **Laser interferometry of thermal displacements of the cathode of an electron gan** Grizbil B. A., Bogachev R.Yu., Zhuravlev S.D., Sakhadzhi G.V., Ryabukho V.P., Saratov State University; Institute of Precision Mechanics and Control, Russian Academy of Sciences, JSC "R&D enterprise "Almaz";

51P. **Experimental study of adaptive method for doe synthesis using a spatial light modulator** Vladislav Skobnikov, Tatyana Vovk, Nikolay Petrov, ITMO University, Russia

52P. **To the theory of hybrid modes in a discrete spectrum in finite structures with nanocrystalline films** Igor Rudenok, Volgograd State Technical University, Russia

53P. **Investigation of the spectral characteristics of a tunnel photodiode based on DLC nanofilms** Garif G. Akchurin, Nickolay P. Abanshin, Yu A. Avetisyan, Ge. G. Akchurin, Vyacheslav I. Kochubey, Aleksander N. Yakunin, Saratov State University; Institute of Precision Mechanics and Control of the RAS, Russia

54P. **Modeling of electrostatic field localization in nanostructures based on DLC film using tunneling microscopy methods** Aleksander N.Yakunin, N. P. Abanshin, Yu. A. Avetisyan,Georgy G. Akchurin, Garif G. Akchurin, Saratov State University; Institute of Precision Mechanics and Control of the RAS, Russia

55P. **Arrays of photonic vortex lattices generated by close-packed monolayers of dielectric microparticles** Nikolai N. Mitin, Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia

56P. **Thermal regimes in the irradiation of an optical glass by high-intensity femtosecond laser pulses** Semyon Evseyko, T. Ramazanov, E. A. Romanova, Saratov State University, Russia

INTERNET REPORTS

1. **Principal characteristics of the electromagnetic waves propagation in the asymmetrical hyperbolic medium**
   Olga N. Kozina, Kotel'nikov Institute of Radio-Engineering and Electronics of RAS, Saratov, Russia
2. **Comparison of light harmonic generation in al and ge consisted silicate materials**
   V.A. Smirnov, L.I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Russia
3. **Multi-peaks scattering of light in glasses**
   Liubov Vostrikova, Vitaly Smirnov, Rzhanov Institute of Semiconductor Physics SB RAS, Russia
4. **Influence of pb concentration on light harmonic generation in different glass mediums**
   V.A. Smirnov, L.I. Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Russia
5. **Influence of dipole-dipole interaction and detuning on entanglement dynamics in two-atom jaynes-cummings model**
   Eugene Bashkirov, Anatoly Vorobiev, Samara University, Russia
6. **WKB solution 4 × 4 for electromagnetic waves in a plane magnetically anisotropic inhomogeneous layer**
   Natalya Moiseeva, Anton Moiseev, VolSU, Russia

Conference on Spectroscopy and Molecular Modeling XVIII

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

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

International Program Committee **Lev M. Babkov**, *Saratov State University (Russia),* **Michael D. Elkin**, *Saratov State Technical University Saratov (Russia),* **Lev A. Gribov**, *Institute named by V. I. Vernadskyi RAS (Moscow, Russia),* **Dmitry S. Umreiko**, *Belarus State University (Minsk, Belorussia),* **Nadezda A. Davydova**, *Institute of Physics, NAS of Ukraine,* **Tatiana G. Bourova**, *Saratov State Pedagogical Institute (Russia),* **Nikolai V. Burenin**, *Institute of Applied Physics RAS (Moscow, Russia),* **Victor L. Furer**, *Kazan Civil Engineer Academy (Russia),* **Alexander V. Gorohov**, *Samara State University (Russia)*

September 26, Tuesday

ORAL SESSION SPECTROSCOPY I

(Building 3, Room 34)

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

17.00–17.10

New date about logarithmic in the mass ratio contributions to the fine shift of the S energy levels in hydrogen-like atoms

Svetlana Churochkina, Anastasiya Udalova, Saratov State University, Russia

17.10 – 17.20

A new mechanism of change separation in the primary stage of photosynthesis

Vladimir Nechaev[1], Kirill Berezin[2], [1]Yuri Gagarin State Technical University of Saratov, Russia, [2]Saratov State University, Russia

17.20–17.30

Preservation stability of monolayer from arachic acid by the action of charged ions

Anna Kolesnikova[1], Oksana Shinkarenko[1], M.V. Gavrikov[1], O.Yu Tsvetkova[1], A.S. Chumakov[1], E.G.Glukhovskoy[1], A.J.K. Al-Alwani[2], [1]Saratov State University, Russia, [2]Babylon University, Babylon, Iraq

17.30–17.40

Young's modulus and poisson's ratio of carbon nanocomposites of complex shape

M. Mazepa, A. Kolesnikova, Sararov State University, Russia

17.40 – 17.50

Simulation of interaction processes of low molecular weight tissue cleansing agents with collagen protein by molecular dynamics, molecular docking and quantum chemistry methods

Kirill Berezin[1], Konstantin Dvoretski[2], Maria Chernavina[1], [1]Saratov State University, Russia, [2]Saratov Medical State University, Russia

17.50 – 18.00

Interpretation of IR and Raman spectra of D-Ribose in polycrystalline state of the basis of the local symmetry concept

Anna Novoselova[1], Vladimir Nechaev[2], Kirill Berezin[1], [1]Saratov State University, Russia, [2]Yuri Gagarin State Technical University of Saratov, Russia

September 28, Thurday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

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

16.30-19.30

1S. **Quantum chemical investigation of several molecular rectifiers** Alexey Markin, Saratov State University, Russia

2S. **Vaterite as template for construction BSA-particles** Albina Alebastrova, Saratov State University, Russia

3S. **Copper nanoparticles for SERS detection of small analytes** Natalia Markina, Ilya Gorbachev, Andrey Zakharevich, Alexey Markin, Saratov State University, Russia

4S. **The interaction of quantum dots of ZNS with gold atoms** Kolesnikova Anna[1], Evgeny Glukhovskoy[1], Begletsova Nadezhda[1], Embekov Sergey[1], Shinkarenko Oksana[1], Al-Alwani Ammar[2], Chumakov Alexey[1], [1]Saratov State University, Russia, [2]Babylon University, Babylon, Iraq

5S. **The effect of position of methoxy group on the spectral properties of isoflavones** Tatyana Egorenkova[1], Konstantin Dvoretski[2], Anatolij Likhter[1], Kirill Berezin[3], [1]Astrakhan State University, Russia, [2]Saratov Medical State University, Russia, [3]Saratov State University, Russia

6S. **Molecular model and spectral properties of some anthocyanins** Ekaterina Stepanovich[1], Anatolij Likhter[1], Konstantin Dvoretski[2], Kirill Berezin[3], [1]Astrakhan State University, Russia, [2]Saratov Medical State University, Russia, [3]Saratov State University, Russia

7S. **Molecular model and spectral properties of several carotenoids** Elena Djalmuhambetova[1], Anatolij Likhter[1], Kirill Berezin[2], [1]Astrakhan State University, Russia, [2]Saratov State University, Russia

8S. **Molecular model and spectral properties of dihydroxyanthraquinones** Ekaterina Antonova[1], Anatolij Likhter[1], Kirill Berezin[2], [1]Astrakhan State University, Russia, [2]Saratov State University, Russia

9S. **Electronic spectra of the molecular switch based on pseudorotaxanes** Sayapin K.A., Ten G.N., Saratov State University, Russia

10S. **The energy of covalent bonds and geometric parameters of the oxygen-functionalized nanotubes** Krivda I.S., Ten G.N., Saratov State University, Russia

11S. **Influence of polarity of solvents on IR and Raman spectra of ascorbic acid** Kutsenko Svetlana Anatolievna, Maksimova Svetlana Valeryevna, Danyaeva Yuliya Sergeevna, Volgograd State University, Russia

12S. **The changes in the electronic spectra of ascorbic acid induced by laser radiation** Danyaeva Yuliya Sergeevna, Kutsenko Svetlana Anatolievna, Volgograd State University, Russia

13S. **Electronic-vibrational processes dynamics upon xanthene dyes molecules two-photon laser excitation in polyvinyl alcohol matrix with silver nanoparticles** Borkunov R.Yu.[1], Tsarkov M.V.[1], Konstantinova E.I.[2], Samusev I.G.[1], Bryukhanov V.V.[1], [1]Immanuel Kant Baltic Federal University, Russia, Kaliningrad, [2]Kaliningrad State Technical University, Russia, Kaliningrad

14S. **Determination of the structure of N-, O-, S-containing heterocyclic compounds by spectral methods** Ivonin M.A., Vasilkova N.O., Safarova N., Sorokin V.V., Krivenko A.P., Saratov State University, Russia

15S. **Vibrational spectroscopy of albumin and collagen upon the interaction with the laser radiation** Julia Fedorova, National Research University MIET, Russia

16S. **Influence of curvature of monoatomic copper chains with 10 and 20 atoms on their optical properties: quantum chemical calculations** Alexey Markin, Saratov State University, Russia

17S. **Modeling of hydrogen bonds formation in diamond-like nanoparticles and doxorubicine molecular complex for targeted drug delivery** Inna Plastun, Andrey Bokarev, Alexandr Zakharov, Nikita Eryomin, Saratov State Technical University, Russia

18S. **Modeling of skin cancer dermoscopy images** Malica B. Iralieva, Oleg O. Myakinin, Ivan A. Bratchenko, Valery P. Zakharov, Samara National Research University, Russia

19S. **Analysis of the joint fluid with Raman spectroscopy for identifying joint pathology** P.E.Timchenko[1], E.V. Timchenko[1], M.D.Markova[1], E. F. Yagofarova[1], L.T. Volova[2], D.A. Dolgyshkin[2], [1]Samara national research University, Samara, Russia, [2]Samara State Medical University, Samara, Russia

20S. **Modeling of vibrational spectra of phenylalanine in gas phase** G.N. Ten[1], M.K. Berezin[1], V.I. Baranov[2], [1]Saratov State University, Russia, [2]Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

INTERNET REPORTS

1IS. **Interpretation of the vibrational spectra of proline in gas phase**
G.N. Ten[1], N.E. Scherbakova[2], V.I. Baranov[3], [1]Saratov State University, Russia, [2]Russian Scientific Research Institute for Plague Control "Microbe", Saratov, Russia, [3]Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

2IS. **Influence of flavonoid-containing extracts on peroxidation processes intensity**
Nikita Navolokin, D.A. Mudrak, I.L. Plastun, A.B. Bucharskaya, K.E. Andreeva, G.A.

Afanasyeva, N.V. Polukonova, G.N. Maslyakova, Saratov State Medical University, Russia
3IS. **Spectroscopic analysis of the powdery chitosan-iodine complex**Belyakova O.A.[1], Lugovitskaya T.N.[1], Shipovskya A.B.[2], [1]Institute of nanostructures and Biosystems of SSU, Russia, [2]Department of polymers on the basis of "AKRIPOL" Saratov State University, Russia

September 29, Friday

ORAL SESSION
SPECTROSCOPY II
(Building 3, Room 34)
Co-chairs: **Kirill V. Berezin, Lev M. Babkov,**
Saratov State University, Russia

11.00 – 11.10
Nondispersive infrared ray methane gas sensor using dual-source single-wavelength structure
Andrey Konyukhov, Alexander Plastun, Saratov State University, Russia

11.10 – 11.20
Septic human albumin conformation study by vibration spectroscopy methods
Andrey Zyubin[1], Elizaveta Konstantinova[2], Vasily Slezhkin[2], Ilya Samusev[1], Valery Bryukhanov[1], [1]Immanuel Kant Baltic Federal University, Russia, [2]Kaliningrad state technical university. Russia

11.20 -11.30
Mechanical and electronic properties of doped porous carbon nanostructures
Anna Kolesnikova, Saratov State University, Russia

11.30 – 11.40
Determination of conformational composition of alanine in the gas phase
G.N. Ten[1], N.E. Scherbakova[2], V.I. Baranov[3], [1]Saratov State University, Russia, [2]Russian Scientific Research Institute for Plague Control "Microbe", Saratov, Russia, [3]Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

11.40 – 11.50
Interpretation of electronic absorption spectra and fluorescence of bovine serum albumin
G.N. Ten[1], N.E. Scherbakova[2], V.I. Baranov[3], [1]Saratov State University, Russia, [2]Russian Scientific Research Institute for Plague Control "Microbe", Saratov, Russia, [3]Institute of Geochemistry and Analytical Chemistry, RAS, Moscow, Russia

11.50 – 12.00
Molecular modeling of immersion optical clearing of biological tissues
Maria Chernavina[1], Konstantin Dvoretski[2], Kirill Berezin[1], Anatolij Likhter[3], Ilmira Shagautdinova[3], Ekaterina Antonova[3], Ekaterina Stepanovich[3], Elena Djalmuhambetova[3], Valerij Tuchin[1], [1]Saratov State University, Russia, [2]Saratov Medical State University, Russia, [3]Astrakhan State University, Russia

12.00 – 12.10
Molecular modeling of the process of reversible dissolution of the collagen protein under the action of tissue-clearing agents
Konstantin Dvoretski[1], Maria Chernavina[2], Kirill Berezin[2], Valerij Tuchin[2], [1]Saratov Medical State University, Russia, [2]Saratov State University, Russia

12.10 – 12.20
Vibronically induced transitions of O4 complex
Andrey Pershin[1], Valeriy Azyazov[1], Alexander Mebel[2], [1]Samara University, Russia, [2]Florida International University, USA

12.20 – 12.30
The interaction of the krizin and apigenin with of transition metals
Oleg Kozlov[1], Kirill Berezin[1], Konstantin Dvoretskiy[2], Anatolij Likhter[3], Ekaterina Stepanovich[3], [1]Saratov State University, Russia, [2]Saratov Medical State University, Russia, [3]Astrakhan State University, Russia

12.30 – 12.40
Molecular models of sugars and spectral properties of honey
Anatolij Likhter[1], Kirill Berezin[2], Konstantin Dvoretski[3], Ilmira Shagautdinova[1], Ekaterina Antonova[1], [1]Astrakhan State University, Russia, [2]Saratov State University, Russia, [3]Saratov Medical State University, Russia

12.40 – 12.50
The Raman spectra of various vegetable oils and the molecular model of the triglycerides
Maria Chernavina[1], Kirill Berezin[1], Konstantin Dvoretski[2], Anatolij Likhter[3], Ilmira Shagautdinova[3], [1]Saratov State University, Russia, [2]Saratov Medical State University, Russia, [3]Astrakhan State University, Russia

12.50 – 13.00
FT-IR spectrum and molecular model of quercetin
Ilmira Shagautdinova[1], Kirill Berezin[2], Konstantin Dvoretski[3], Anatolij Likhter[1], Ekaterina Antonova[1], [1]Astrakhan State University, Russia, [2]Saratov State University,

Russia, [3]Saratov Medical State University, Russia

Galiya Galimova[1], Alexander Mebel[2], Valeriy Azyazov[1], [1]Samara National Research University, Russia, [2]Florida International University, USA

13.00 – 13.10
Quantum chemical study of the mechanism of oxidation of pyrene by hydroxyl radical

Conference on Nanobiophotonics XIII

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

Secretary: **Timofey Pylaev,** Institute of Biochemistry and Physiology of Plants and Microorganisms of RAS, Russia;

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

September 28, Thursday

ORAL SESSION NANOBIOPHOTONICS I

(Building 9, Conference Hall)
Chair: **Nikolai G. Khlebtsov,** IBPPM RAS, Saratov State University, Russia

14.20 – 14.35
Characterisation of hemoglobin microparticles by simultaneous measurement of collimated and diffuse transmission spectra Kathrin Smuda, Physikalisch-Technische Bundesanstalt Berlin, Germany

14.35 – 14.50
Quantitative dot-immunoassay using SERS tags with embedded reporters Boris Khlebtsov, IBPPM RAS, Saratov, Russia

14.50 – 15.05
Immobilized gold nanostars for high-efficient laser transfection of animal cells and its application for gene delivery Ekaterina Vanzha, IBPPM RAS, Saratov, Russia

15.05 – 15.20
Porous biodegradable submicron particles for non-invasive transdermal drug delivery Yulia Svenskaya, Sararov State University, Saratov, Russia

15.35 – 15.50
Lateral grain statistics Daniil Bratashov**,** Saratov State University, Saratov, Russia

15.20 – 15.35
Photosensitizer-loaded nonwoven materials for biomedical applications Alexandra Severyukhina, Sararov State University, Saratov, Russia

15.35 – 15.50
Influence of plasmon particles-analyte distance on SERS enhancement Ekaterina Prikhozhdenko, Sararov State University, Saratov, Russia

September 29, Friday

ORAL SESSION NANOBIOPHOTONICS II

(Building 9, Conference Hall)
Chair: **Nikolai G. Khlebtsov,** IBPPM RAS, Saratov State University, Russia

11.00 – 11.15
Nanoscale luminescent labels of organic and inorganic nature Irina Goryacheva, Sararov State University, Saratov, Russia

11.15-11.30
Opportunity analysis of gold nanosensors application for ocular melanoma diagnosis Diana Gracheva, Samara National Research University, Samara, Russia

11.30 – 11.45
Enhancement of hemeprotein Raman spectra *in vitro* and *in situ* with different plasmonic nanostructures Evelina Nikelshparg, Lomonosov Moscow State University, Moscow, Russia

11.45 – 12.00
Photoinduced toxicity, cell internalization and thermal resistance of PR3+:LAF3 nanoparticles Maxim Pudovkin, Kazan Federal University, Kazan, Russia

12.00 – 12.15
Cytotoxicity evaluation of gold nanoparticles on the microalga *Dunaliella salina* in microplate test-system Daniil Chumakov**,** IBPPM RAS, Saratov, Russia

12.15 – 12.30
Carbon nanoparticles: synthesis, fractionation and characterization Alina Kokorina, Saratov State University, Saratov, Russia

12.30 – 12.45
Synthesis and optical properties of in-based luminescent semiconductor nanoparticles Anastasyia Novikova, Saratov State University, Saratov, Russia

September 28, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

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

16.30 – 19.30

1N. **Interaction between quantum dots CdSeZnS/ZnS adsorbed on silver roughness surface with human serum albumin** Elizaveta Konstantinova, Kaliningrad State Technical University, Immanuel Kant Baltic Federal University, Center for Functionalized Magnetic Materials (FunMagMa), Kaliningrad, Russia Andrey Zyubin, Institute of Physics and Technology, Immanuel Kant Baltic Federal University, Center for Functionalized Magnetic Materials (FunMagMa), Kaliningrad, Russia Vasily Slezhkin, Kaliningrad State Technical University, Russia Valeriy Bryukhanov, Institute of Physics and Technology, Immanuel Kant Baltic Federal University, Kaliningrad, Russia Ilya Samusev, Institute of Physics and Technology, Immanuel Kant Baltic Federal University, Kaliningrad, Russia

2N. **SERS induced by plasmon coupled nanoparticle arrays** V.E. Kaydashev, N.V Lyanguzov, A.S Anokhin, A Chernishov and E.M. Kaidashev, Southern Federal University, Russia

3N. **Gauss' band fitting of scattering and absorption spectra of metallic nanoparticles in 400-1200 nm region** Kirill N. Borisenko, Alexander A. Skaptsov, Saratov State University, Saratov, Russia

4N. **Plasmonic photothermal therapy: approaches to evaluate the effectiveness** Alla Bucharskaya, Saratov State Medical University , Russia Galina Maslyakova, Saratov State Medical University , Russia Marina Chekhonatskaya, Saratov State Medical University , Russia Georgy Terentyuk, Research National Saratov State University, Saratov State Medical University , Russia Nikita Navolokin, Saratov State Medical University , Russia Boris Khlebtsov, Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, Russia Nikolai Khlebtsov, Institute of Biochemistry and Physiology of Plants and Microorganisms, RAS, Russia Alexey Bashkatov, Research National Saratov State University , Russia Elina Genina, Research National Saratov State University , Russia Valery Tuchin, Research National Saratov State University , Russia

5N. **Physical and chemical characteristics of polyamide solution and nonwoven material with antibacterial additive "biopag"** Elmira Valiulina, Saratov State University, Russia German Lyubun, Saratov State University, Russia Svetlana Klimova, Saratov State University, Russia

6N. **A study of the lymphocytes structural features in rats with induced diabetes mellitus using atomic force microscopy** Olga V. Stolbovskaya, Radik M. Khairullin, Boris B. Kostishko. Rinat I.*Bakhtiyarov,* Ulyanovsk State University

7N. **Polyelectrolyte spacers for surface-enhanced Raman scattering on gold nanostars inside hollow core photonic crystal fibers** Bondarenko S.D., Saratov State University Bratashov D.N, Saratov State University Burmistrova N.A., Saratov State University Shuvalov A.A., SPC Nanostructured Glass Technology Ltd Chibrova A.A., SPC Nanostructured Glass Technology Ltd Khlebtsov B.N., Institute of Biochemistry and Physiology of Plants and Microorganisms Russian Academy of Sciences Skibina Y.S., SPC Nanostructured Glass Technology Ltd Goryacheva I.Y., Saratov State University

8N. **Investigation of the silica-coated quantum dots colloidal stability depending on the type and amount of functional groups on their surface** Daniil Drozd, Saratov State University, Russia Daria Tsupka, Saratov State University, Russia Hasmik Chepnyan, Saratov State University, Russia Olga Goryacheva, Saratov State University, Russia Irina Goryacheva, Saratov State University, Russia

9N. **Theoretical and experimental research of properties and efficiency of application of gold nanostars for local laser hyperthermia of cells and biotissues** Akchurin Georgy[1,2,5], Avetisyan Yriy[2,5], Yakunin Aleksander[2,5], Akchurin Garif[1,2,5], Bibikova Olga[3,5], Zarkov Sergey[2], Khanadeev Vitaly[4], Bogatyrev Vladimir[4], Khlebtsov Nickolai[1,4], Tuchin Valery[1,2,5,6], [1]Saratov National Research State University, [2]Institute of Precision Mechanics and Control RAS, Saratov, Russia; [3]Art photonics GmbH, Berlin, Germany; [4]Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov, Russia; [5]Research-Educational Institute of Optics and Biophotonics, Saratov National Research State University, Saratov, Russia; [6]Tomsk State University, Tomsk, Russia

10N. **Estimation of microcapsules controlled delivery efficiency in systemic blood flow using magnetic field *in vivo*** Olga A. Sindeeva, Saratov state university, Russia Denis V. Voronin, Saratov state university, Russia Maxim A. Kurochkin, Saratov state university, Russia Oksana Mayorova, Saratov state university, Russia Ivan V. Fedosov, Saratov state university, Russia Dmitry A. Gorin, Saratov state university,

Russia Valery V. Tuchin, Saratov state university, Russia Gleb B. Sukhorukov, Queen Mary University of London

11N. **Polyethyleneimine-entrapped gold nanoparticles as a potential delivery system for DNA vaccines against African swine fever virus** Timofey Pylaev, Alexander Fomin, Ekaterina Vanzha, Sergey Staroverov, Nikolai Khlebtsov, IBPPM RAS, Saratov, Russia

12N. **Novel SERS tags with embedded Raman molecules** Vitaly Khanadeev, IBPPM RAS, Saratov, Russia; Boris Khlebtsov, IBPPM RAS, Saratov, Russia; Xiulong Jin, School of Biomedical Engineering & Med-X Research Institute, Shanghai Jiao Tong University, Shanghai, China; Jian Ye, School of Biomedical Engineering & Med-X Research Institute, Shanghai Jiao Tong University, Shanghai, China; Shanghai Key Laboratory of Gynecologic Oncology, Ren Ji Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai, China; Nikolai Khlebtsov, IBPPM RAS, Saratov, Russia; Saratov National Research State University, Saratov, Russia

13N.

INTERNET REPORTS

1. **Specifics of action of heating on induced optical microstructures** Liubov Vostrikova, Vitaly Smirnov, Rzhanov Institute of Semiconductor Physics SB RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Russia.

2. **The effects of antenatal exposure of gold nanoparticles on the internal organs of rat offspring** Svetlana Pakhomy, Alla Bucharskaya, Galina N. Maslyakova Olga V. Zlobina Irina O.Bugaeva Nikita A. Navolokin Dmitry A. Mudrak Boris N. Khlebtsov Vladimir A.Bogatyrev Nikolai G. Khlebtsov, Saratov State Medical University, Saratov, Russia, IBPPM RAS, Saratov, Russia

3. **Nonlinear structures for micro-optics induced in amorphous materials** Liubov Vostrikova, Vitaly Smirnov, Rzhanov Institute of Semiconductor Physics SB RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Russia.

4. **Low frequency nonlinear transformation of light in micro polarizability** Vitaly Smirnov, Liubov Vostrikova, Rzhanov Institute of Semiconductor Physics SB RAS and Faculties of Mathematics and Nature Sciences and Informational Technologies of NSUEM, Russia.

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

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

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

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

September 28, Thursday

ORAL SESSION MICROSCOPY AND LOW-COHERENCE METHODS

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

14.20-14.35
Axial scale factor in laser confocal microscopy as a function of a numerical aperture
Lyakin Dmitriy, Institute of Precise Mechanics and Control RAS, Russia

14.35-14.45
Numerical anperture effect in the interferometer with autocorrelation of low-coherence
Lyakin Dmitriy, Institute of Precise Mechanics and Control RAS, Russia

14.45-14.55
Multimodal biomedical visualization of skin cancer
Myakinin Oleg, Samara State University, Russia.

14.55-15.05
Atomic force microscopy as method for studying the interaction of carbon nanoparticles with erythrocyte membranes
Natalie Tkachenko, Saratov State University, Russia

15.05-15.20
Simultaneous measurement of refractive index and thickness of liquid samples
Katarzyna Karpienko, Marcin Marzejon, Mateusz Ficek, Małgorzata Jędrzejewska-Szczerska, Faculty of Electronics, Telecommunications and Informatics Gdańsk University of Technology, Poland

15.20-15.30
Analysis of 3D OCT-images for diagnosis of skin cancer
Dmitry S. Raupov, Oleg O. Myakinin,Ivan A. Bratchenko, Valery P. Zakharov, Alexander G. Khramov, Samara National Research University, Russia

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

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

17.30-19.30

1M. **Effects of spatial decoherence of light field in interference microscopy with broad-band and extended light source: experimental investigation** Natalya Mysina, Petr Ryabukho, Dmitry Lyakin, Ludmila Maksimova, Vladimir Ryabukho, Saratov State University; Institute of Precision Mechanics and Control RAS, Russia

2M. **Cellular cycle of normal and tumor cells under the influence of diode red light in vitro** Olga Stolbovskaya, Radik Khairullin, Yuriy Saenko Ulyanovsk State University, Russia

3M. **Comparative analysis of structural features of lymphocytes of cats with retroviral infection and without it, using atomic force microscopy** Artemev Dmitry, Krasnikova Ekaterina, Belyakova Anastasiya Saratov State Agricultural University, Russia; Olga Stolbovskaya, Kostishko Boris Ulyanovsk State University, Russia

4M. **The distribution of spatial coherence in the diffraction far field by a diffraction grating of partially coherent light beam** Natalia Talaikova, Vladimir Ryabukho, Saratov State University; Institute of Precision Mechanics and Control of RAS, Russia

5M. **Effect of angular and frequency spectrum of incident illumination on the structure of polychromatic interference images of thin stratified objects and its manifestation in interference experiments** Anton Dyachenko, Vladimir Ryabukho, Saratov State University; Institute of Precision Mechanics and Control of RAS, Russia

6M. **Fluorescent angiography in the mouse brain lymphatic** Anton Namykin, Ivan Fedosov Saratov State University, Russia

7M. **Spatial spectrum of defocused coherence signal in digital holographic microscopy with quasimonochromatic partially spatially coherent illumination in transmission: experimental investigation** Daria Klychkova, Anton Grebenyuk, Vladimir Ryabukho, Saratov State University; Institute of Precision Mechanics and Control, RAS, Russia

INTERNET REPORTS

Invited

1. **Low-cost and high-performance 3-D light-sheet fluorescence imaging on pre-owned conventional microscopes**
Peng Fei,Tingting Zhu, Xinlin Xie, Yao Yao, Dan Zhu, Huazhong University of Science and Technology, China

2. **Square Fresnel zone plate with chiral side lobes for particle manipulations**
Igor V. Minin, Oleg V. Minin, SGUGiT, Russia
A. Vijayakumar, B. Vinoth, Joseph Rosen, Chau-Jern Cheng

Conference on Internet Biophotonics X

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

Secretary: **Daria K. Tuchina,** Saratov State University (National Research University of Russia), Saratov, Russia; Tomsk State University (National Research University of Russia), 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); **Kirill V. Larin**, University of Houston (USA), Saratov State University (National Research University of Russia), (Russia); **Martin Leahy**, National University of Ireland, Galway; **Qingming Luo**, Huazhong University of Science and Technology (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), **Igor Minin**, Siberian State University of Geosystem and Technologies, Novosibirsk, Russia

September 28, Thursday

PLENARY SESSION
(Building 3, Big Physical Hall)
Chair: **Valery V. Tuchin**, Saratov State University (National Research University of Russia), Saratov, Russia; Tomsk State University (National Research University of Russia), Tomsk, Russia; Institute of Precision Mechanics and Control RAS, Russia

16.30-18.30

1. **Speckle fluctuations to probe dynamics on the macroscopic to microscopic scales** David Boas, Boston University, USA
2. **Optical tools in radiation therapy** Brian Pogue, Dartmouth College, USA
3. **Acousto-optics - review of recent developments in biomedicine** Stefan Andersson-Engels, Michael Raju and Jacqueline Gunter, Tyndall National Institute and Department of Physics, University College Cork, Cork, Ireland
4. ***In vivo* skin optical clearing window for cutaneous vascular and cell imaging** Dan Zhu, Britton Chance Center for Biomedical Photonics, Wuhan National Laboratory for Optoelectronics; MOE Key Laboratory for Biomedical Photonics, Collaborative Innovation Center for Biomedical Engineering, School of Engineering Sciences, Huazhong University of Science and Technology, Wuhan, China

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

Moderators: **Dmitry Agafonov**, **Ivan V. Fedosov,** Saratov State University (National Research University of Russia)

16.30-19.30

INVITED INTERNET LECTURES

1. **Water content in colon tissues by dispersion evaluation** I. Carneiro[1], S. Carvalho[1], R. Henrique[1], L. Oliveira[2], V.V. Tuchin[3], [1]Portuguese Oncology Institute of Porto, Portugal; [2]Instituto Superior de Engenharia do Porto, Portugal; [3]Saratov State University, Saratov, Russia
2. **Monitoring of the cerebral status during cardiac arrest** V. Toronov[1], T. Nguyen[1], R. Nosrati[1], S. Lin[2], P. Dorian[2], [1]Department of Physics, Ryerson University, Canada; [2]Keenan Research Centre, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Canada
3. **Quantitative model for temporal laser speckle contrast imaging including the influence of sampling number** P. Li, Y. Wang, J. Lu, Britton Chance Center for Biomedical Photonics, Wuhan National Laboratory for Optoelectronics, Huazong University of Science and Technology, China
4. **Multi-spectral-line imaging: applications in biophotonics and forensics** J. Spigulis, I. Oshina, University of Latvia, Latvia

5. **Spaser cluster nanobubbles for cancer theranostics** E.I. Galanzha[1], M. Stockman[2], V.P. Zharov[1], [1]University of Arkansas for Medical Sciences, USA; [2]Center for Nano-Optics and Department of Physics and Astronomy, Georgia State University, Atlanta, Georgia, USA

6. **Evaluation of photodynamic treatment efficiency on glioblastoma cells *ex vivo*** E. Borisova[1], Ya. Andreeva[1], K. Ivanova-Todorova[2], E. Naydenov[3], D. Kyurkchiev[2], K. Minkin[3], [1]Institute of Electronics, BAS, Sofia [2]Laboratory of Clinical immunology, University Hospital "St. Ivan Rilski", Sofia [3]University Hospital "St. Ivan Rilski", Sofia, Bulgaria

7. **Mueller polarimetric imaging for early detection of uterine cervix cancer: from proof of principle experiments to *in vivo* measurements** A. Pierangelo[1], J. Vizet[1], J. Rehbinder[1], S. Deby[1], S. Roussel[1], T. Novikova[1], R. Soufan[2], C. Haie-Meder[3], H. Fernandez[4], A. Nazac[5], F. Moreau[1], [1]Laboratoire de Physique des Interfaces et des Couches Minces (Ecole Polytechnique), France; [2]Institut Gustave Roussy, France Catherine Genestie, Institut Gustave Roussy, France; [3]Institut Gustave Roussy, France; [4]CHU de Bicêtre AP-HP, France; [5]University Hospital Brugmann, Université Libre de Bruxelles, Belgium

8. ***In-vivo* two-photon imaging of cerebral microvascular flow and metabolism in pre-clinical research** D. Bragin, University of New Mexico, USA

9. **Optical coherence tomography for enhanced diagnostics and treatment monitoring** M. Kirillin[1], M. Shakhova[1], A. Meller[1], D. Sapunov[2], E. Sergeeva[2], P. Agrba[2], A. Khilov[2], D. Loginova[1], E. Kiseleva[1], A. Shakhov[1], [1]Institute of Applied Physics RAS, Russia; [2]Nizhny Novgorod State Medical Academy, Russia

10. **Automated and multimodal digital holographic microscopy for *in vitro* cytotoxicity testing of nanomaterials** S. Mues, S. Ketelhut, B. Kemper, J. Schnekenburger, Biomedical Technology Center, University of Muenster, Muenster, Germany

11. **Confocal Raman microscopy for *in vivo* measurement of hydrogen bound water molecule types in the human *stratum corneum*** M. Darvin[1], J. Schleusener[1], C.-S. Choe[1,2], J. Lademann[1], [1]Charité - Universitätsmedizin Berlin, Department of Dermatology, Venerology and Allergology, Center of Experimental and Applied Cutaneous Physiology, Berlin, Germany; [2]Kim Il Sung University, Ryongnam-Dong, Taesong District, Pyongyang, DPR Korea

12. **Estimation of tumor invasion depth prior to PDT procedure with chlorine series photosensitizer from two-wavelength probing** A. Khilov, M. Kirillin, D. Loginova, I. Turchin, IAP RAS, Russia

13. **Circulating tumor cells are nonuniformly distributed monitored by *in vivo* flow cytometry** X. Zhu, Y. Suo, N. Ding, H. He, X. Wei, S. Jiao Tong University, China

14. **Fluorescence detection of rare circulating cells *in vivo*: technology, applications and future prospects** M. Niedre, Northeastern University, Boston, USA

15. **Human skin optical properties modifications upon optical clearing agents estimated from spatially-resolved tissue optical spectroscopy** P. Rakotomanga[1], G. Khairallah[2], C. Soussen[3], M. Amouroux[3], F. Marchal[4], A. Delconte[3], W. Feng[5], D. Zhu[5], W. Blondel[3], [1]Université de Lorraine, CNRS, CRAN, France; [2]Université de Lorraine, CNRS, Metz-Thionville Regional Hospital, France; [3]Université de Lorraine, CNRS, France; [4]Université de Lorraine, CNRS, Institut de Cancérologie de Lorraine; [5]Huazhong University of Science and Technology, Wuhan, China; Huazhong University of Science and Technology, Wuhan, China

16. **Differentiating tissue clearing process using distinct optical clearing agents by Mueller matrix microscope** Q. Xie[1], N. Zeng[1], D. Chen[1], V.V. Tuchin[2,3], H. Ma[4], [1]Tsinghua university, China; [2]Saratov State University, [3]Tomsk State University, Russia; [4]Tsinghua university, China

17. **Faster Raman imaging through compressed sensing and high-throughput Raman spectroscopy through multimodal microscopy** N. Pavillon, N.I. Smith, Biophotonics Laboratory, Immunology Frontier Research Center (IFReC), Osaka University, Suita, Osaka, Japan

18. **A comparative study of *ex vivo* skin optical clearing using two-photon and Raman microscopy** A. Sdobnov[1], M.E. Darvin[2], J. Lademann[2], V.V. Tuchin[3], [1]Optoelectronics and Measurement Techniques Laboratory, University of Oulu, Finland; [2]Center of Experimental and Applied Cutaneous Physiology, Department of Dermatology, Venerology and Allergology, Charité – Universitätsmedizin Berlin, Germany; [3]Research-Education Institute of Optics and Biophotonics, Saratov National Research State University Russian Federation

19. **Photo-activated plasmonic nanostructures for advanced detection of neurodegenerative disorders** R. Pini[1], P. Matteini[1], M. de Angelis[1], M. Banchelli[1], M. Cottat[1], C. D'Andrea[1], E. Ruggiero[1], N. Khlebtsov[2,3], E Panfilova[2], [1]Institute of Applied Physics "Nello Carrara", National

Research Council of Italy (IFAC CNR), Sesto Fiorentino, Italy; [2] Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov, Russia; [3]Saratov National Research State University, Saratov, Russia

20. **Biological computer: using gold nanoparticles conjugated to fluorophores as biological logic gates** E. Barnoy, R. Popovtzer, D. Fixler, Faculty of Engineering and the Institute of Nanotechnology and Advanced Materials, Bar Ilan University, Ramat Gan, Israel

21. **Improve the resolution of acoustic microscopy** I.V. Minin, O.V. Minin, SGEGiT, Russia

22. **Laser immunotherapy for cancer treatment** W. Chen, University of Central Oklahoma, USA

23. **Protease activity by FRET sensors: from computer simulation, *in vitro* study to *in vivo* monitoring** A.P. Savitsky, Federal Research Centre "Fundamentals of Biotechnology" of the RAS, Moscow, Russia

24. **Characterization of relationship between OCT angiography signal and capillary blood flow** W.J. Choi, R.K. Wang, University of Washington, Department of Bioengineering, WA, USA

25. **Multispectral photoacoustic elastic tomography of cancer *in vivo*** Z. Yuan, Faculty of Health Sciences, University of Macau, Macau SAR, China

INTERNET REPORTS

1. **Study of the influence of optical clearing agents on the efficiency of adipose tissue heating *in vitro*** I.Yu. Yanina[1,2], E.K. Volkova[1,2], D.K. Tuchina[1,2], E.A. Genina[1,2], A.N. Bashkatov[1,2], V.V. Tuchin[1,2,3], [1]Saratov State University, [2]Tomsk State University, [3]Institute of Precision Mechanics and Control RAS, Russian Federation

2. **Comparison of different registration methods of optical clearing of muscle tissue** M. Kozintseva, A.N. Bashkatov, V.I. Kochubey, V.V. Tuchin, Saratov State University, Russia

3. **An algorithm for localization of optical structure disturbances in biological tissue using time-resolved diffuse optical tomography** A.Yu. Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University, Russian Federation

4. **An algorithm for improving the quality of structural images of biological tissue in endoscopic optical coherence tomography** A.Yu. Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University, Russian Federation

5. **The demineralization impact on morphology and composition of tooth hard tissues** A.A. Selifonov,[1,2] Yu.S. Skibina,[1,3] D.K. Tuchina,[1,4] A.M. Zakharevich,[1] V.V. Tuchin1,[4,5], [1]Saratov State University, Saratov, Russia; [2]Saratov State Medical University, Russia; [3]LLC SPE "Nanostructed Glass Technology", Saratov, Russia; [4]Tomsk State University, Tomsk, Russia [5]Precision Mechanics and Control Institute of the Russian Academy of Sciences, Saratov, Russia

6. **Combined ultrasound and sensitizers action on formation of reactive oxygen species and cell survival** M. Kolosov, R. Aref'ev, V. Lapukhina, V. Yatsenko, Southern Federal University, Rostov on Don, Russia

7. **Probing depth problem in optical diffuse reflectometry** D.A. Loginova, I.I. Fiks, E.A. Sergeeva, M.Yu. Kirillin, Institute of Applied Physics RAS, Nizhny Novgorod, Russia

8. **Russian state standard of electrical polarizability of biological particles** G.V. Shuvalov[1], K.V. Generalov[2], G.A. Buryak[2], V.M. Generalov[2], M.V. Kruchinina[3], O.V. Minin[4], I.V. Minin[1, 4], [1]Federal State Unitary Enterprise Siberian Scientific Research Institute of Metrology, Novosibirsk, Russia; [2]Federal Budgetary Institution of Science State Scientific Center of Virology and Biotechnology "Vector", Rospotrebnadzor, Novosibirsk Region, Koltsovo, Russia; [3]Federal State Budget Scientific Institution "Scientific Research Institute of Therapy and Preventive Medicine", Novosibirsk, Russia; [4]SGUGiT, Russia

9. **Detection of the presence of *chlamydia trachomatis bacteria* inside the epithelial cells using diffusing wave spectroscopy** S. Ulyanov[1,2,4], N. Filonova[2,3], I. Subbotina[2,3], Yu. Moiseeva[5], S. Zaitsev[2], Yu. Saltykov[2], T. Polyanina[2], A. Lyapina[2], O. Ulianova[2], O. Larionova[1,3], S. Utz[5], V. Feodorova[1,2,3], [1]Federal Research Center for Virology and Microbiology, Pokrov, Russia, [2]Federal Research Center for Virology and Microbiology, [3]Saratov State Agrarian University, [4]Saratov State University, [5]Saratov State Medical University, Saratov, Russia

10. **Application of LASCA imaging for detection of disorders of blood microcirculation in chicken embryo, infected by *chlamydia trachomatis*** O. Ulianova[2], I. Subbotina[2,3], N. Filonova[2,3], S. Zaitsev[2], Yu. Saltykov[2], T. Polyanina[2], A. Lyapina[2], S. Ulyanov[1,2,4], O. Larionova[1,3], V. Feodorova[1,2,3], [1]Federal Research Center for Virology and Microbiology, Pokrov, Russia; [2]Federal Research Center for Virology and Microbiology, Branch in Saratov, [3]Saratov State Agrarian University, [4]Saratov State University, [5]Department of Dermatology and Venerology, Saratov State Medical University, Saratov, Russia

11. **Development of principles of two-cascaded laser speckle-microscopy with implication to high-precision express diagnostics of chlamydial infection** N. Filonova[2,3], I. Subbotina[2,3], Yu. Moiseeva[5], S. Zaitsev[2], Yu. Saltykov[2], T. Polyanina[2], A. Lyapina[2], O. Ulianova[2], S. Ulyanov[1,2,4], O. Larionova[1,3], S. Utz[5], V. Feodorova[1,2,3] [1]Federal Research Center for Virology and Microbiology, Pokrov, Russia [2]Federal Research Center for Virology and Microbiology, Saratov, Russia [3]Department for Microbiology, Biotechnology and Chemistry, Saratov State Agrarian University, [4]Saratov State University, [5]Saratov State Medical University, Saratov, Russia

12. **Optimization of algorithm of coding of genetic information of bacteria of *chlamydia rachomatis* using laser speckles** V.A. Feodorova[1,2,3], S.S. Ulyanov[1,2,4], S.S. Zaytsev[2], Yu.V. Saltykov[2], O.V. Ulianova[2] [1]Federal Research Center for Virology and Microbiology, Pokrov, Russia [2]Federal Research Center for Virology and Microbiology, [3]Saratov State Agrarian University, [4]Saratov State University, [5]Saratov State Medical University, Saratov, Russia

13. **Application of virtual electronic speckle pattern interferometry for detection of polymorphism in the of chlamydia trachomatis omp1 gene** Yu.V. Saltykov[2], S.S. Ulyanov[1,2,4], S.S. Zaytsev[2], O.V. Ulianova[2], V.A. Feodorova[1,2,3] [1]Federal Research Center for Virology and Microbiology, Pokrov, Russia [2]Federal Research Center for Virology and Microbiology, Branch in Saratov, [3]Saratov State Agrarian University, [4]Saratov State University, Saratov, Russia

14. **Application of laser scanning speckle-microscopy for high-resolution express diagnostics of chlamydial infection** I. Subbotina[2,3], N. Filonova[2,3], S. Zaitsev[2], Yu. Saltykov[2], T. Polyanina[2], A. Lyapina[2], Yu. Moiseeva[5], O. Ulianova[2], S. Ulyanov[1,2,4], O. Larionova[1,3], S. Utz[5], V. Feodorova [1,2,3] [1]Federal Research Center for Virology and Microbiology, Pokrov, Russia [2]Federal Research Center for Virology and Microbiology, Branch in Saratov, [3]Saratov State Agrarian University, [4]Saratov State University, [5]Saratov State Medical University, Saratov, Russia

15. **Reversible photobleaching of photoswitchable fluorescent protein SAASOti** I.D. Solovyev[1,2], A.V. Gavshina[2], A.P. Savitsky[1,2], [1]Chemistry Department, Lomonosov Moscow State University, Moscow, Russia; [2]Federal Research Centre "Fundamentals of Biotechnology" of the Russian Academy of Sciences, Moscow

16. **Analysis of tumor heating kinetics during laser-induced plasmon-resonant photothermal treatment of transplanted tumors in rats** V.D. Genin[1], E.A. Genina[1,2], A.B. Bucharskaya[3], D.K. Tuchina[1,2], G.S. Terentyuk[3], N.G. Khlebtsov[4], V.V. Tuchin[1,2], A.N. Bashkatov[1,2] [1]Saratov State University, Saratov, Russia; [2]Tomsk State University, Russia; [3]Saratov State Medical University; [4]Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov, Russia

17. **Investigation of change of tumor optical properties after laser-induced plasmon-resonant photothermal treatment of transplanted tumors in rats** V.D. Genin[1], E.A. Genina[1,2], A.B. Bucharskaya[3], V.V. Tuchin[1,2], N.G. Khlebtsov[4], A.N. Bashkatov[1,2] [1]Saratov State University, Russia; [2]Tomsk State University, Russia [3]Saratov State Medical University; 4 - Institute of Biochemistry and Physiology of Plants and Microorganisms RAS, Saratov, Russia

18. **Color mapping of one specific velocity of a flow with complex geometry using optical coherence tomography** A.Yu. Potlov, S.V. Frolov, S.G. Proskurin, Tambov State Technical University, Russian Federation

19. **Study of tissue oxygenation using meso-tetrabenzoporphyrin palladium** N.I. Kazachkina[1], Ju. G. Lymar[1], V.I. Scheslavsky[2], E.A. Lukyanetz[3], A.P. Savitsky[1], [1]Federal Research Centre "Fundamentals of Biotechnology", A.N. Bach Institute of Biochemistry, RAS, Russia; [2]Becker&Hickel Ltd., Germany; [3]State Research Center of Organic Products and Dyes, Russia

20. **Opto electronic tweezers based smart sweeper for cells/micro-particles sorting** Ravi Verma, Nitin Kumar, RRCAT, India

21. **Participation of water in free radical reactions in an organism** K.N. Novikov, V.L. Voeikov Faculty of Biology, Lomonosov Moscow State University, Russia

Conference on Low-Dimensional Structures VII

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

Secretaries: **Vladislav V. Shunaev,** Saratov State University (Russia), **Michael M. Slepchenkov,** Saratov State University (Russia)

International Program Committee: **Ming-Fa Lin,** National Cheng Kung University, Tainan (Taiwan), **Irina V. Zaporotskova**, Volgograd State University, Volgograd (Russia), **Galina N. Maslyakova**, Saratov State Medical University named after V.I. Razumovsky, Saratov (Russia), **Igor S. Nefedov**, Aalto University, Espoo (Finland), **Nikolay I. Sinitsyn**, Institute of Radioengineering and Electronics (IRE) of RAS, Saratov (Russia), **Gennadiy V. Torgashov,** Institute of Radioengineering and Electronics (IRE) of RAS, Saratov (Russia)

September 28, Thursday

ORAL SESSION
(Building 3, Room 34)
Chair: **Olga E. Glukhova**, SaratovStateUniversity Russia

14.20-14.30
Investigation on optical and morphology properties of cdse quantum dots monolayer by ligands exchange
A.J. Al-Alwani, Babylon University, Iraq, A.S. Chumakov, A.A Podlubnii, O.A. Shinkarenko, N.N. Begletsova, I.A. Gorbachev, D.N. Bratashov, S.B. Venig, E.G. Glukhovskoy, Saratov State University, Russia

14.30-14.40
Electrical conductance calculation of extended non periodic nanostructures by using nonequilibrium Green's function method
G. Savostyanov, O.E. Glukhova, Saratov State University, Russia

14.40-14.50
Spin relaxation in an electron waveguide in the presence of an external electromagnetic field
Y. Turkin, P. Kuptsov, Yuri Gagarin State Technical University of Saratov, Russia

14.50-15.00
Tunable self-assembly in two-dimensional colloidal suspensions in external rotating electric fields
S.O. Yurchenko, E.V. Yakovlev, K.A. Komarov, K.I. Zaytsev, Bauman Moscow State Technical University, Russia

15.00-15.10
InAs-QD/GaAs(001) quantum dot nanostructures grown by ion-beam sputtering
S. Chebotarev, V. Irkha, L. Goncharova, Platov South-Russian State Polytechnical University, Russia

15.10-15.20
Physical and chemical properties of the filtering nonwoven material for the medical individual protection of respiratory bodies
Nikita Stenkin, A. Abramov, Y. Salkovsky, S. Klimova, Saratov State University, Russia

15.20-15.30
Influence of technological parameters on the dynamics of the flow of unstable polymer jets in the process of capillar electrospinning
S. Ovchinnikova, Oleg Lomovtsev, Y. Salkovsky, S. Klimova, Saratov State University, Russia

15.30-15.40
Polyamide and fluoroplastic membranous materials
A. Usachev, A. Savonin, V. Atkin, A. Zakharevich, A. Golyadkina, S. Klimova, Saratov State University, Russia

15.40-15.50
Patterned Arrays of Microchambers Made of Polyelectrolyte - Graphene Oxide Multilayers Demonstrate Improved Mechanical and Optical Properties
A. Ermakov, Saratov State University, Russia, Institute of Materials Research and Engineering, A*STAR, Singapore, L. Su Hui, M. Kiryukhin Institute of Materials Research and Engineering, A*STAR, Singapore, A. Pereira Kauling, A.H.C. Neto, National University of Singapore, Singapore, E. Glukhovskoy, D. Gorin, Saratov State University, Russia, G. Sukhorukov, Queen Mary University of London, UK

15.50-16.00
Modification of polyelectrolyte microcapsules for drug delivery system
O.A. Goryacheva, D.D. Drozd, H.A. Chepnyan, I.Yu. Goryacheva, Saratov State University, Russia, H. Gao, G.B. Sukhorukov, Queen Mary University of London, UK

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3d floor Hall)

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

17.30-19.30

1L. **Obtaining monolayer's quantum dots of a2b6 composition and their investigation by afm stm methods** O. Hassoon, Saratov State University, Russia. Ministry Of Electricity, Iraq, M.V. Gavrikov, O.Yu. Tsvetkova, A.S. Kolesnikova, A.J.K. Al-Alwani, E.G. Glukhovskoy, Saratov State University, Russia

2L. **New 2d-hybrid films of carbon nanotubes / graphene as an element base of optical nanodevices** M.M. Slepchenkov, O.E. Glukhova, Saratov State University, Russia, I.S. Nefedov, Aalto University, Finland

3L. **Electrophysical properties of carbon composites based on graphene and carbon nanotubes** V.V. Mitrofanov, Olga E. Glukhova, Michail M. Slepchenkov, Saratov State University, Russia

4L. **Investigation of the dynamics of the behavior of low-density lipoprotein when penetrating the endothelial intercellular gap** A.A. Zyktin, O.E. Glukhova, Saratov State University, Russia, G.N. Maslyakova, Saratov State Medical University, Russia,

5L. **Electronic properties of graphene nanostructures in the presence of DNA nucleotides** D.S. Shmygin, Olga E. Glukhova, Sararov State University, Russia

6L. **New layer graphen-graphane nanostructures as material for nanoelectronic devices** V.V. Shunaev, M.M. Slepchenkov, O.E. Glukhova, N.A. Panova, Saratov State University, Russia

7L. **Study of copper nanoparticles in sds solution** N. Begletsova, E. Selifonova, A. Zakharevich, A. Chumakov, O. Shinkarenko, A. Al-Alwani, R. Chernova, E. Glukhovskoy, Saratov State University, Russia

8L. **Investigation of electric conductivity of bios-composite materials from CNT and albumin by the Non-equilibrium Green function method** D.M. Kardov, G.V. Savostyanov, O.E. Glukhova, Saratov State University, Saratov, Russia

9L. **The formation and studying of langmuir monolayler of quantum dots and surfactant mixtures** I. Gorbachev, E. Gluhovskoy, Saratov State University, Russia

10L. **Formation and investigation of hybrid structures on the basis of quantum points** N.O. Kuznetsov, N.N. Begletsova, O.A. Shinkarenko, A.S. Chumakov, O.Yu. Tsvetkova, A.Z.K. Al-Alvani, A.H. Hassoun Odei, E.G. Glukhovskoy, Saratov National Research University named after NG Chernyshevsky, Russia

11L. **Influence of formation conditions on the properties of monolayers of copper nanoparticles in the organic ctab matrix** O. Tsvetkova, N.N. Begletsova, O.A. Shinkarenko, A.S. Chumakov, A.S. Kolesnikova, A.J.K. Al-Alwani, E.G. Glukhovskoy, Saratov State University, Russia, N.O. Kuznetsov, JSC "SPC" Almaz-Fazotron"

12L. **Theoretical prediction of the electronic properties of graphene nanoblisters** P. Barkov, O.E. Glukhova, Saratov State University, Russia

13L. **Approbation of the method for obtaining a monolayer of graphene from polycyclic aromatic hydrocarbons** O. Shinkarenko, Olga Tsvetkova, Ammar Al-Alwani, Mikhail Pozharov, Nikolay Kuznetsov, Oday Hassoon, Anna Kolesnikova, Evgeny Glukhovskoy, Saratov State University, Russia

14L. **Thermodynamics of two-dimensional colloidal systems in solvents and at media interfaces** N. Kryuchkov, Bauman Moscow State Technical University, Russia

15L. **Colloid suspension in rotating electric fields: pilot experimental study, prospective applications in physics and chemistry, material science and biomedicine** E.V. Yakovlev, N.P. Kryuchkov, P.V. Ovcharov, A.K. Zotov, S.O. Yurchenko, Bauman Moscow State Technical University, Russia, K.I. Zaytsev, Prokhorov General Physics Institute of RAS, Bauman Moscow State Technical University, Russia

16L. **Gallium nitride thin films with co-adsorbed alkali metals for biological sensors for diagnosis of metabolism in cells of living organisms** V. Irkha, S. Chebotarev, Platov South-Russian State Polytechnical University, Russia

17L. **Conductive optical coatings based on nanosized gold films on a porous anodized aluminum oxide membrane** N. Ushakov, F. Fedorov, M. Vasilkov, V.A. Kotel'nikov Institute for RadioEngineering & Electronics of RAS, Saratov Branch, Russia

18L. **Influence of additional reagents in the process of gold nanorods synthesis** O. Savenko, A.A. Skaptsov, Saratov State University, Russia

19L. **Application of carbon nanoclusters in electronics** T.Krachkovskaya, Yuri Gagarin State Technical University of

Saratov, Russia, G. Sakhadzhi, A. Emelyanov, M.Silayeva, JSC "NPP Almaz", Russia

20L. **Morphology and microhardness of tic coatings on titanium treated with high-frequency currents** A. Voyko, M. Fomina, V. Koshuro, A. Fomin, I. Rodionov, V. Atkin, V. Galushka, A. Zakharevich, A. Skaptsov Saratov State University, Russia

21L. **Microstructure and hardness of carbon and tool steel quenched with high-frequency currents** A. Fomin, M. Fedoseev A. Voyko, M.Fomina, V. Koshuro, Yuri Gagarin State Technical University of Saratov, Russia, Russia Andrey Zakharevich, Saratov State University, Russia

22L. **Modification of the surface of metal products with carbide coatings by electrospark alloying** V. Koshuro, M. Fomina, A. Fomin, Yuri Gagarin State Technical University of Saratov, Russia

23L. **Submicrometric structure of superhard oxide coatings on the surface of refractory metals treated with high-frequency currents** A. Fomin, I. Egorov, A. Shelkunov, Yuri Gagarin State Technical University of Saratov, Russia

24L. **The structure of ti-ta welded joint and microhardness distribution over the cross section** A. Fomin, V. Koshuro, I. Egorov, A. Shelkunov, I. Rodionov, Yuri Gagarin State Technical University of Saratov, Russia, A. Zakharevich, Saratov State University, Russia

25L. **Formation of self-organizing periodic structures on the surface of glass-carbon from impulse laser radiation 1064 nm** I. Popov, T.N. Sokolova, E.L. Surmenko, D.A. Bessonov, Gagarin Saratov State Technical University, RPF "Pribor-T", Russia

Conference on Biomedical Spectroscopy IV

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

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

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

September 26, Tuesday

PLENARY SESSION AND INVITED LECTURE/ORAL SESSION
(Building 3,Room 34)
Chair: **Alexander B. Pravdin**, Saratov State University, Russia

15.50-16.30
Plenary lecture
Raman spectroscopy of meteorite-catalyzed synthesized prebiotic compounds from formamide after proton irradiation. Ekaterina Borisova, Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria

16.30-16.45
Enhancement of hemeprotein Raman spectra in vitro and in situ with different plasmonic nanostructures. Evelina Nikelshparg[1], A. A. Bayzhumanov[1], E. A.Goodilin[1], A.A. Semenova[1], L. I. Deev[1], A. S. Sarycheva[1], O. Sosnovtseva[2], G. V. Maksimov[1], N. A. Brazhe[1] [1]Lomonosov Moscow State University, Russia, [2]Copenhagen University, Denmark

16.45-17.00
Synthesis and characterization of $NaYF_4$@SiO_2 upconversion particles for biological applications Elena Sagaidachnaya[1], Vyacheslav Kochubey[1,2], [1]Saratov National Research State University, Russian Federation, [2]National Research Tomsk State University, Russian

September 28, Thursday

POSTER/INTERNET SESSION AND INTERNET DISCUSSION. COMPETITION FOR THE BEST STUDENT POSTER AWARD
(Building 3, 3rd floor Hall)
Chair (BS): **Elena K. Volkova**, Saratov State University Russia

17.30-19.30

1BS. **Colour perception of human tooth dentine fluorescence** Natalia Kazadaeva, Matvei Vodolagin, Alexander B. Pravdin, Leonid E. Dolotov Saratov State University, Russia

2BS. **Comparative analysis of spectrometers** Veronika A. Blank, IPSI RAS, Samara, Russia

3BS. **Fluorescent upconversion $NaYF_4:Yb^{3+}$, Er^{3+} particles for thermometry of biological tissue** Elena Volkova.[1,2], Irina Yanina.[1,2], Elena Sagaidachnaia.[1], Julia Konyukhova [1], Vyacheslav Kochubey [1,2], Valery Tuchin.[1,2,3], [1]Saratov National Research State University,Saratov, Russia, Саратов, Россия, [2] Interdisciplinary Laboratory of Biophotonics, Tomsk National Research State University, Tomsk, Russia, [3]

Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of Precise Mechanics and Control of the Russian Academy of Sciences, Saratov, Russia

4BS. **Luminescent blood analysis at pathological states** Ekaterina Kozlova[1], Vyacheslav Kochubey[1,2], Almas Myrzagaliyev[3], Sergey Gorodkov[3], [1]Saratov State University, Russia, Interdisciplinary, [2]Laboratory of Biophotonics, Tomsk National Research State University, Tomsk, [3]Saratov State Medical University, Russia

5BS. **Effect of surface plasmon resonance of silver nanoparticles on the fluorimetric properties of doxycycline and its complex with europium.** Elena Zhelobitskaya, Tatyana D. Smirnova, , Tatyana G. Danilina, Saratov State University, Russia

6BS. **Fluorimetric determination of doxycycline in the presence of silver nanoparticles in pharmaceutical preparations.** Elena Zhelobitskaya, Saratov State University, Russia

7BS. **Fiber-optic light dose sensors for monitoring in photodynamic therapy.** I.A. Osmakov [1], T.A. Savel'eva[1,2], E.V. Filonenko[3], V.B. Loshchenov [1,2], [1]Nuclear Research Nuclear University "MIFI", Moscow, Russia, 2 Prokhorov General Physics Institute, Russian Academy of Sciences, Moscow, Russia, 3 P. Herzen Scientific Research Institute of Oncology , Moscow, Russia

8BS. **Different response to tissue oxygen tension change of delayed fluorescence and phosphorescence: a kinetic study.** Azamat Ishemgulov, Sergey Letuta, Orenburg State University, Russian Federation

9BS. **Studies of the age-related changes in the surface of hyaline cartilage using Raman spectroscopy.** Anna S. Tyumchenkov[1], Elena V. Timchenko[1], Pavel E. Timchenko[1], Dmitriy A. Dolgushkin[2], Larisa T. Volova[2], V.A. Lazarev[2], Mariya D. [1]Markova, [1]Samara National Research University, [2]Samara State Medical University

10BS. **Macroscopic monolayer of plasmon coupled gold nanoparticles on mirror for fluorescence enhancement** Vladimir E. Kaydashev, A. Zolotukhin, A. Belanova, A S. Anokhin, E. M. Kaidashev, Southern Federal University, Rostov-on-Don, Russia

11BS. **Molecular modeling of diamond-like nanoparticles interaction with drugs and biomolecules in context of targeted drug delivery systems formation.** Inna Plastun, Andrey Bokarev, Alexandr Zakharov, Nikita Eryomin, Saratov State Technical University, Russia

12BS. **Near – Infrared Spectrometry in cancer investigation.** Lukasz Surazynski[1], Miika T. Nieminen[2], Markus Mäkinen[3], Tapio Seppänen[4], Teemu Myllylä[1], [1]Optoelectronics and Measurement Techniques Lab., University of Oulu, Finland, [2]Research Unit of Medical Imaging, Physics and Technology, University of Oulu, Finland, [3]Research unit of Cancer and Translational Medicine, Department of Pathology, University of Oulu, Oulu, Finland, [4]Center for Machine Vision and Signal Analysis, University of Oulu, Finland

13BS. **Quenching by heavy metal ions of a fluorescence system of probes associated with proteins.** Andrei Melnikov, O.A. Plotnikova, A.V. Kovalenko, Saratov State Technical University, Russia

14BS. **One step synthesis of carbon materials based on lemon acid and 1,2 ethylendiamine.** A.A. Bakal, E.A. Mordovina, A. V. Vostrikova, Saratov State University, Russia

15BS. **A spectral method for studying the growth kinetics of silica particles.**. Anastasia S. Eliseeva, Saratov State University, Saratov, Russia

16BS. **Research of effectiveness of the staphylococcal infections treatment in the tonsils using optical methods** Yuri D. Ityaksov, E. V. Timchenko, P. E. Timchenko, A.A. Asadova, Samara National Research University, Samara, Russia

17BS. **Influence of excitation power density on temperature dependencies of $NaYF_4$: Yb, Er nanoparticles luminescence spectra** Sergey O. Ustalkov, Saratov State University, Russia,

18BS. **Investigation of the interaction of fulleroid-type nanoparticles with erythrocyte membranes by atomic force microscopy.** Anna A. Doronkina, Saratov State University, Saratov, Russia

19BS. **Possibilities of diffuse reflection spectroscopy method for assessing the state of peripheral haemodynamics.** Elena V. Potapova, Orel State University named after I.S. Turgenev, Orel, Russia

20BS. **Vibrational spectroscopy of albumin and collagen in interaction with laser radiation**. Yuliya O. Fedorova, National Research University of Electronic Technology, Moscow, Zelenograd, Russia

21BS. **Analysis of the joint fluid with raman spectroscopy for identifying joint pathology**.Maria D. Markova[1], P. E. Timchenko[1], E. V. Timchenko[1], E. F. Yagofarova[1], L. T. Volova[2], D.A., Dolgyshkin [2], [1]Markova, [1]Samara National Research University, [2]Samara State Medical University, Russia

INTERNET REPORT

Experimental modeling of local laser hyperthermia using thermosensitive nanoparticles absorbing in NIR. I.D. Romanishkin[1], P.V. Grachev[1], D.V.

Pominova[1], I.A. Burmistrov[2], K. Kaldvee [3], I. Sildos [3], A.S. Vanetsev[1], E.O. Orlovskaya[1], Yu.V. Orlovskii[1], V.B. Loschenov[1], A.V. Ryabova[1], [1]Prokhorov General Physics Institute, Russian Academy of Sciences, Russia, [2]M.V.Lomonosov Moscow State University, Russia, [3]Institute of Physics, University of Tartu, Estonia

September 30, Friday

INVITED LECTURE/ORAL SESSION
(Scientific Library Conference Hall)
Chair:**Vyacheslav I. Kochubey** Saratov State University, Russia

11.00-11.15
The ambiguity of modeling the absorption spectra of multilayer media. Vyacheslav Kochubey, Saratov State University, Russia

11.15-11.30
Analysis of the joint fluid with raman spectroscopy for identifying joint pathology E. F. Yagofarova[1], Elena V. Timchenko[1], Pavel E. Timchenko[1], Dmitriy A. Dolgushkin[2], Larisa T. Volova[2], V.A. Lazarev[2], Mariya D. [1]Markova, [1]Samara National Research University, [2]Samara State Medical University, Russia

11.30-11.45
Septic human albumin conformation study by vibration spectroscopy methods Andrey Zyubin[1], Elizaveta Konstantinova[2], Vasily Slezhkin[2], Ilya Samusev[1], Valery Bryukhanov[1], [1]Immanuel Kant Baltic Federal University, Russia, [2]Kaliningrad state technical university,Russia

11.45-12.00
$CuInS_2$ nanoparticles began to be used as nanothermometers. In the present work, a luminescence method has been developed to study the mechanism of $CuInS_2$ quantum dots growth in real time. Ammar Mohammed, Saratov State University, Saratov, Russia, Iraq

12.00-12.15
Application of fluorescent proteins as sensors of fibril formation. A.A. Rubekina[1], T.N. Tikhonova[2], V.L. Drutsa[3], Shirshin E. A.[1], M.V. [1]Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia, [2]M.V. Lomonosov Moscow State University International Laser Center, Moscow, Russia, [3]A. N. Belozersky Institute of Physico-Chemical Biology, Lomonosov Moscow State University, Moscow, Russia

13.10-13.25
The application of upconversion nanoparticles for laser thermolysis problems Alexander Skaptsov, Saratov State University, Russia

13.25-13.40
Comparative spectrum surface analysis of aortic valves of sheep heart before and during the process of their decellularization Denis S. Trapeznikov[1], E. V. Timchenko[1], P. E. Timchenko[1], P.Yu. Shalkovskaya[1], D.S. Trapeznikov[1], D. A. Dolgushkin[2], L. T. Volova[2], [1]Samara National Research University, [2]Samara State Medical University, Russia

12.15-12.30
Application of fluorescence spectroscopy for discrimination phytoplankton microalgae in situ. Alexander Yu. Popik[1], Sergey S. Voznesenskiy[1], Evgeny L. Gamayunov [1], Zhanna.V. Markina[2], Tatyana Yu. Orlova[2], [1]Institute of Automation and Control Processes FEB RAS, [2]National Scientific Center of Marine Biology FEB RAS

12.30-12.45
Multifunctional upconversion nanoparticles based on NaYGdF4 for laser induced heating, non-contact temperature sensing and controlled hyperthermia with use of pulsed periodic laser excitation. Daria Pominova[1], A.V. Ryabova[1], I.D. Romanishkin[1], P.V. Grachev[1], I.A. Burmistrov[2], S.V. Kuznetsov[1], [1]A.M. Prokhorov General Physics Institute of the Russian Academy of Sciences, Russia, [2]Lomonosov Moscow State University, Russia

12.45-13.00
Transfer of electron excitation energy between luminescent probes associated with proteins in the system SACH - immunoglobulin. Andrei Melnikov[1], V.I. Kochubey [2], A.B. Pravdin[2], A.V. Kovalenko [1], G.V. Melnikov[1], [1]Saratov State Technical University, Russia, [2]Saratov State University, Russia

Conference on Computational Biophysics and Analysis of Biomedical Data IV

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

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

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

September 26, Tuesday

ORAL SESSION I

(Building 10, Hall 503)

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

16:00-16:15

Speckle image processing as a problem of spatiotemporal filtering Eugene B. Postnikov[1], M.O. Tsoy[2], D.E. Postnov[2], [1]Kursk State University; [2]Saratov State University, Russia

16:15-16:30

Modelling of calcium waves in astrocytic network Darya V. Verveyko[1], D.E. Postnov[2], A.Yu. Verisokin[1], A.R. Brazhe[3], [1]Kursk State University; [2]Saratov State University; [3]Lomonosov Moscow State University, Russia

16:30-16:45

Analysis of cerebral blood flow dynamics during the latent stage of stroke formation Alexey N. Pavlov[1,2], A.S. Abdurashitov[2], O.N. Pavlova[2], O.V. Semyachkina-Glushkovskaya[2], [1]Saratov State Technical University; [2]Saratov State University, Russia

16:45-17:00

Quantitative study of blood platelet shape change during activation Alexander E. Moskalensky, Novosibirsk State University, Russia

17:00-17:15

Mechanisms for the formation of autonomous pacemakers in bistable active media Andrey Yu. Verisokin[1], D.V. Verveyko[1], D.E. Postnov[2], [1]Kursk State University; [2]Saratov State University, Russia

17:15-17:30

Mathematical modelling of adaptive network with competition V. Makarov, V. Nedaivozov, Daniil Kirsanov, M. Goremyko, Saratov State Technical University, Russia

17:30-17:45

Mathematical simulation of coherence resonance in a model neural network Andrej Andreev, A.E. Runnova, A. Pisarchik, A.E. Hramov, Saratov State Technical University, Russia

17:45-18:00

Conference chair opinion: Interactive pre-review of poster session on computational biophysics Dmitry E. Postnov

September 28, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3rd floor Hall)

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

16.30-19.30

1BD. **Hierarchical model for absences discharges** Tatiana M. Medvedeva[1], M.V. Sysoeva[2], G. van Luijtelaar[3], I.V. Sysoev[1], [1]Saratov State University; [2]Saratov State Technical University, Russia; [3]Donders Centre for Cognition, Radboud University, Nijmegen, the Netherlands

2BD. **An approach to fetal intracardiac hemodynamic monitoring** Nikolay Minaev[1,2], A. Kazantsev[2], J. Ponomareva[3], E. Chatskis[4], D. Medvedeva[1,2], A. Senin[2], P.A. Kazantsev[5], L.M. Subbotina[1,2],

[1]Pushchino State Institute of Nature Science; [2]Institute for Biological Instrumentation of RAS; [3]Moscow State University of Medicine and Dentistry, Russia; [4]Road Clinical Hospital at the Chita-2 Station of Russian Railways; [5]Pawlin Technoogies Ltd, Russia

3BD. **Personalized computer modeling in cardiac surgery** Anastasiya Golyadkina, K. Skripachenko, Saratov State University, Russia

4BD. **Personalized biomechanical justification of the choice of osteotomy of the first metatarsal bone of the foot** Anastasiya Golyadkina[1], A. Polienko[1], S. Kireev[2], [1]Saratov State University; [2]Saratov State Medical University, Russia

5BD. **Features of modern preoperative planning systems in the field of traumatology** Hai A. Vu, A.D. Luneva, M.M. Mazepa, A.S. Kolesnikova, I.V. Kirillova, L.Yu. Kossovich, Sararov State University, Russia

6BD. **Personalized approach to orthodontic treatment** Aleksandr Dol', Sararov State University, Russia

7BD. **Detection of different states of the sleep in the rodents by means of artificial neuronal networks** Viacheslav Yu. Musatov[1], V. Dykin[1], S. Pchelintseva[1], A. Pisarchik[2], [1]Saratov State Technical University, Russia; [2]Universidad Politécnica de Madrid, Spain

8BD. **Optimal EEG spatiotemporal representation for classification of brain states associated with distinct interpretations of bistable images** A.E. Hramov, Vyacheslav Yu. Musatov, A.E. Runnova, A.N. Pisarchik, Saratov State Technical University, Russia

9BD. **Brain states recognition during visual perception by means of artificial neuronal network in the different EEG frequency ranges** A.E. Hramov, Vyacheslav Yu. Musatov, M.O. Zhuravlev, Saratov State Technical University, Russia

10BD. **Detection and classification of imaginary movement using EEG signals** Vyacheslav Yu. Musatov[1], A.E. Runnova[1], S.V. Pchelintseva[1], V.V. Grubov[1], T.Yu. Efremova[1], M.V. Khramova[2], M.O. Zhuravlev[1], [1]Saratov State Technical University; [2]Saratov State University, Russia

11BD. **Characteristics of laser induced vascular responses** Elena S. Stiukhina, M.A. Kurochkin, I.V. Fedosov, D.E. Postnov, Saratov State University, Russia

12BD. **Investigation of the diagnostic efficiency of laser speckle-flowmetry in relation to the blood flow of a chicken embryo in vivo** Yuri N. Avtomonov, M.O. Tsoy, D.E. Postnov, Saratov State University, Russia

13BD. **Analysis of psycho-physiological features of a subject in simple tests with the registration of electroencephalograms** Maksim Zhuravlev[1], P. Protasov[2], A. Koronovskii[1], A. Runnova[2], [1]Saratov State University; [2]Saratov State Technical University, Russia

14BD. **Brain-computer interface on the basis of EEG system 'ENTSEPHALAN'** Vladimir O. Nedajvozov, D.V. Kirsanov, Saratov State Technical University, Russia

15BD. **Time delay estimation between low-frequency oscillations of regulatory subsystems of cardiovascular system via nonlinear methods with surrogate data testing** Vladimir S. Khorev[1], V.I. Ponomarenko[2], A.R. Kiselev[3], A.S. Karavaev[1], [1]Sararov State University; [2]Saratov Branch of the Institute of Radio Engineering and Electronics of RAS; [3]Saratov State Medical University, Russia

16BD. **Multifractal analysis of real and imaginary movements: EEG study** Vladimir Maksimenko, A. Pavlov, A. Runnova, S. Pchelintseva, T. Efremova, A. Pisarchik, Saratov State Technical University, Russia

17BD. **Reconstructions of parameters of radiophysical chaotic generator with delayed feedback from short time series** Yurii M. Ishbulatov[1], A. Karavaev[2], A. Kiselev[3], [1]Saratov State University; [2]Saratov Branch of the Institute of Radio Engineering and Electronics of RAS; [3]Bakulev Scientific Center for Cardiovascular Surgery, Russia

18BD. **Numerical modeling of dynamics of heart rate and arterial pressure during passive orthostatic test** Yurii M. Ishbulatov, A. Kiselev, A. Karavaev, Saratov Branch of the Institute of Radio Engineering and Electronics of RAS, Russia

19BD. **Automatic adjustment of the Kalman filtering based algorithms for interferometric signals processing** Maxim A. Volynsky, P.A. Ermolaev, ITMO University, Russia

20BD. **Low-frequency dynamics of autonomic regulation of circulatory system in healthy subjects** Viktoriia Skazkina[1], E.I. Borovkova[1], A.R. Kiselev[2], A.S. Karavaev[1], [1]Saratov State University; [2]Saratov State Medical University, Russia

21BD. **Classification of brain states during cognitive task solving by means of processing multi-channel MEG data** Svetlana V. Pchelintseva[1], A.A. Koronovskii[2], A.E. Runnova[1], A.E. Hramov[1], [1]Saratov State Technical University; [2]Saratov State University, Russia

22BD. **Models of neural activity given extracellular environment** Ekaterina A. Kurishova, D.E. Postnov, Saratov State University, Russia

23BD. **Correlation characteristics of the process of autoregulation vascular tone** Kristina V. Rogatina, M.O. Tsoy, D.E. Postnov, Saratov State University, Russia

24BD. **Development of an automated system for complex screening and early diagnostics of pigmented skin lesions** Elena N. Rimskaya[1,2], K. Kudrin[3], I. Reshetov[2], A. Nikolaev[1], I. Apollonova[1], [1]Bauman Moscow State Technical University; [2]Sechenov Moscow State Medical University; [3]IAS FMBA, Russia

25BD. **Seeking for the better speckle data processing: flying dumpling** Maria O. Tsoy[1], E.B. Postnikov[2], D.E. Postnov, [1]Saratov State University; [2]Kursk State University, Russia

26BD. **Blood flow velocity measurements in chicken embryo vascular network** Maksim A. Kurochkin, E.S. Stiukhina, I.V. Fedosov, V.V. Tuchin, Saratov State University, Russia

27BD. **Mathematical model of bone drilling for virtual surgery system** Innokentiy K. Alaytsev[1], T.V. Danilova[1], A.O. Manturov[1], G.O. Mareew[2], O.V. Mareew[2], [1]Saratov State Technical University; [2]Saratov State Medical University, Russia

28BD. **Visualization of 3d CT-based anatomical models** Innokentiy K. Alaytsev[1], T.V. Danilova[1], A.O. Manturov[1], G.O. Mareew[2], O.V. Mareew[2], [1]Saratov State Technical University; [2]Saratov State Medical University, Russia

29BD. **Creation of anatomical models from CT data** Innokentiy K. Alaytsev[1], T.V. Danilova[1], A.O. Manturov[1], G.O. Mareew[2], O.V. Mareew[2], [1]Saratov State Technical University; [2]Saratov State Medical University, Russia

30BD. **The software of the control unit for visualization of the data of the ventricular assist device** Ilya N. Rodionov, National Research University of Electronic Technology - MIET, Russia

31BD. **Automated analysis of plethysmograms for functional studies of hemodynamics** Rimma Sh. Zatrudina, I. Isupov, V. Gribkov, Volgograd State University, Russia

32BD. **X-ray microtomography studies of the structure of bulk composites internal structure made from a dispersion of carbon nanotubes and bovine serum albumin** Dmitry Ignatov, MIET, Russia

33BD. **Quantification of blood velocity using laser Doppler anemometer** Maria A. Borozdova, I.V. Fedosov, V.V. Tuchin, Saratov State University, Russia

September 29, Friday

ORAL SESSION II

(Building 10, Main Conference Hall)

Chair: **Eugeny B. Postnikov**, Kursk State University, Russia.

11:00-11:15

Characterization of the dynamics of neural systems from noisy sequences of interspike intervals Olga N. Pavlova[1], A.N. Pavlov[2,1], [1]Saratov State University; [2]Saratov State Technical University, Russia

11:15-11:30

Effects of deep controlled breathing on the phase synchronization of oscillations in cardiovascular and respiratory systems in human Arina V. Tankanag[1], A.A. Grinevich[1], I.V. Tikhonova[1], G.V. Krasnikov[2], N.K. Chemeris[1], [1]Institute of Cell Biophysics RAS; [2]Tula State Lev Tolstoy Pedagogical University, Russia

11:30-11:45

Nanoparticle-enabled experimentally trained denoising technique for optical coherence tomography Irina Dolganova[1], N.V. Chernomyrdin[1], K. Kudrin[2], V. Masalov[3], S.O. Yurchenko[1], K.I. Zaytsev[1], A.M. Prokhorov[4], [1]BMSTU; [2]I.M. Sechenov First MSMU; [3]ISSP RAS; [4]GPI RAS, Russia

11:45-12:00

Proepileptic patterns in EEG of WAG/Rij rats Vadim Grubov[1], E. Sitnikova[2], V. Nedaivozov[1], [1]Saratov State Technical University; [2]Institute of higher nervous activity and neurophysiology RAS, Russia

12:00-12:15

Mathematical methods and models of pattern recognition in the visual arts Julia Brodskaya, Saratov State University, Russia

12:15-12:30

Analysis of the features of real and imaginary movements based on the multichannel EEG Vladimir Maksimenko, A. Runnova, S. Pchelintseva, T. Efremova, M. Zhuravlev, A. Pisarchik, Saratov State Technical University, Russia

12:30-12:45

Numerical criteria for evaluating the effect of pharmaceutical preparations on the manifestation of epileptic activity Maksim V. Kornilov, I.V. Sysoev, Saratov State University, Russia

12:45-13:00

Chimera in the network of networks V. Makarov, N. Frolov, V. Maximenko, Daniil Kirsanov, M. Goremyko, A. Hramov, Saratov State Technical University, Russia

Workshop on Nonlinear Dynamics VIII

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

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

September 28, Thursday

ORAL SESSION
(Building 3, Room 38)
Chair: **Vadim S. Anishchenko**, Saratov State University, Russia

14.20-14.40
Indirect control of synchronization of nonidentical van der Pol oscillators in starlike networks
Pavel Kuptsov, Yuri Gagarin State Technical University of Saratov, Russia; Anna Kuptsova, Yuri Gagarin State Technical University of Saratov, Russia

14.40-15.00
The role of the tanscritical bifurcation in emergence of self-sustained oscillations in a unidirectional ring of Toda oscillators
Anton Dvorak, Saratov State Technical University, Russia; Sergey Astakhov, Saratov State Technical University, Russia; Vladimir Astakhov, Saratov State Technical University, Russia

15.00-15.20
Synchronization on a multi-loop torus in a system with time delay
ArtemGulai, Yuri Gagarin State Technical University of Saratov, Russia; Sergey Astakhov, Yuri Gagarin State Technical University of Saratov, Russia; Vladimir Astakhov, Yuri Gagarin State Technical University of Saratov, Russia

15.20-15.40
Structure formation in chain of nonlocal coupled active elements
Konstantin Sergeev, Saratov State University, Russia; Alexander Chetverikov, Saratov State University, Russia

15.40-16.00
Bifurcations of spatiotemporal structures in a medium of FitzHugh–Nagumo neurons with diffusive coupling
Igor A. Shepelev, Saratov State University, Russia; Tatiana E. Vadivasova, Saratov State University, Russia

POSTER SESSION
(Building 3, 3rd floor Hall)
Chair (ND): **Andrei V. Slepnev**, Saratov State University, Russia

16.30-19.30

1ND. **Statistical characteristics of noised-induced intermittency in erbium-doped fiber laser** Maksim Zhuravlev, Saratov State University, Russian Federation; Alexander Hramov, Saratov State Technical University, Russian Federation; Alexey Koronovskii, Saratov State University, Russian Federation; Olga Moskalenko, Saratov State University, Russian Federation; Alexander Pisarchik, Center for Biomedical Technology, Spain

2ND. **Multifrequency tori in the broad-area laser model** Anton Krents, Samara University, Russia; Anton Shakirov, Samara University, Russia; Roman Chertovskih, Samara University, Russia;NonnaMolevich, Samara University, Russia

3ND. **Dynamics of a network consisting of two rings of Henon maps and Lozi maps with nonlocally coupling** Elena Rybalova, National Research Saratov State University, Russia;WadimAnischenko, National Research Saratov State University, Russia

4ND. **Analysis of interactions between 0.1 Hz oscillations in cardiovascular system in perioperative period** Elena Sidak, Saratov State University, Russia

September 29, Friday

ORAL SESSION
(Building 3, Room 38)
Chair: **Vadim S. Anishchenko**, Saratov State University, Russia

11.00-11.17
Noise-induced transitions and coherence resonance in a double-well oscillator with nonlinear dissipation
Vladimir Semenov, Saratov State University, Russia

11.17-11.34
Noise-induced transitions in an ensemble of non-locally coupled maps with period-doubling bifurcations
Andrei Bukh, Andrei Slepnev, Tatiana Vadivasova, Saratov National Research State University, Russia

11.34-11.51
Time-delayed feedback control of coherence resonance chimeras
Nadezhda Semenova, Department of Physics, Saratov State University, Saratov, Russia; Anna Zakharova, InstitutfürTheoretischePhysik,

TechnischeUniversität Berlin, Berlin, Germany; Vadim Anishchenko, Department of Physics, Saratov State University, Saratov, Russia; Eckehard Schöll, InstitutfürTheoretischePhysik, TechnischeUniversität Berlin, Berlin, Germany

11.51-12.08
Application of local index of stability for analysis of ensembles of coupling elements
Igor A. Shepelev, Andrei V. Bukh, Tatiana E. Vadivasova, Saratov State University, Russia

12.08-12.25
Soliton resonances in models of nonlinear Schrodinger equation with variable coefficients
Andrey Konyuhov, Evgeny Schurkin, Saratov State University, Russia

12.25-12.42
Spatial structures formation in two-dimensional ensemble of active particles
Konstantin Sergeev, Alexander Chetverikov, Saratov State University, Russia

12.42-13.00
Trajectory-probabilistic dualism in chaotic dynamics
Valery M. Anikin, Saratov State University, Russia

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

Chair: **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

Thursday September 28

INVITED LECTURE/ORAL SESSION

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

15.30-15.45
Invited
Simulation of light fields in porous and granular media A.P. Sviridov, Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, 119333, Russia

15.45-16.00
Evolution of foam structure and related optical phenomena D.A. Zimnyakov**,** S.A. Yuvchenko, A.A. Isaeva, E.A. Isaeva, Yuri Gagarin State Technical University of Saratov

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

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

16.30-19.30

1PC. **Diffuse reflectance simulation in tissue phantom for Speckle dynamics** A.V. Pantyukov, Yuri Gagarin State Technical University of Saratov, E.A. Isaeva, Yuri Gagarin State Technical University of Saratov, Russia, A. A. Isaeva, Yuri Gagarin State Technical University of Saratov, Russia,

2PC. **The influence of red laser radiation on the structure-forming properties and the lethal effect of bacterial lipopolysaccharide** A.V. Egorova, Saratov State Medical University n.a. V.I. Razumovsky, Russia, G.E. Brill, Saratov State Medical University n.a. V.I. Razumovsky, Russia, K.V. Agadjanova, Saratov State Medical University n.a. V.I. Razumovsky, Russia, I.O. Bugaeva, Saratov State Medical University n.a. V.I. Razumovsky, Russia, O.V. Ushakova, Yuri Gagarin State Technical University of Saratov, Russia

3PC. **Polarization analysis of scattering gel-like layers** A.A. Isaeva, Sararov State Technical University, Russia, E.A. Isaeva, Sararov State Technical University, Russia, Y. V. Agapova, Yuri Gagarin State Technical University of Saratov, Russia, M. A. Macheev, Yuri Gagarin State Technical University of Saratov, Russia

4PC. **Experimental study of the skin in vivo using the scattering ellipsometry** A. B. Bulykina, ITMO University, Russia, V. A. Ryzhova, ITMO University, Russia, V. V. Korotaev, ITMO University, Russia

5PC. **Dynamics of structure changes in SCF/subcritically foamed polylactides** S.A. Yuvchenko, D.V. Tzyipin, D.A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia

6PC. **Peculiarities of the light transport in aged wet foams** I. Slavnetskov, A. Kalacheva, S.A. Yuvchenko, D.A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia

7PC. **Statistical properties of the band-limited fluorescent radiation in dye-doped laser-pumped random media** K. Ushakova, S.A. Yuvchenko, D.A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia

8PC. **The modified z-scan technique with simultaneous measurements of the**

Rayleigh scattering S.S. Volchkov, S.A. Yuvchenko, D.A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia

9PC. **Application of the one-oscillator Lorentz model for reconstructing the complex dielectric function of dispersive nanosystems** S.S. Volchkov, S.A. Yuvchenko, D.A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia

10PC. **The dependence of the transport characteristics foam materials from their structures** Yuvchenko S.A., Tsypin D.V., Yuri Gagarin State Technical University of Saratov, Russia

11PC. **Anisotropy of fluorescence of coumarin 6 in determination of binding with potassium polytytanate** D.S. Kovaleva, M.A. Vikulova, A.G.Melnikov, A.V. Gorohovsky, V.V. Efremova Saratov State Technical University, Russia

Friday September 29

ORAL SESSION

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

11.00-11.15

Determination of light scattering parameters of porous media A.P. Sviridov, Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, Russia, V.S. Zhigarkov, Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, Russia, A.G. Shubnyy, Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, Russia, V.I Yusupov, Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, Russia

11.15-11.30

Bleaching of pigmented skin phantoms by pulsed laser radiation A.P. Sviridov, Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, 119333, Russia, A.G. Shubnyy, Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, 119333, Russia, V.S. Zhigarkov,Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, 119333, Russia, A.O. Mariyants, Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, 119333, Russia, V.I. Yusupov,Federal Research Centre "Crystalography and Photonics" of Russian Academy of Sciences, Moscow, 119333, Russia

11.30-11.45

Non-linear properties of semiconductor nanoparticles: the Cole-Cole interpretation D.A. Zimnyakov, S.A. Yuvchenko, S.S. Volchkov, Yuri Gagarin State Technical University of Saratov

11.45-12.00

Change of polarization-optical properties of collagenous tissue during dehydration and optical immersion clearing process M. E. Shvachkina, D. D. Yakovlev, A. B. Pravdin, D. A. Yakovlev, Saratov State University, Russia

12.00-12.15

Optical chirality of collagenous tissues D.A. Yakovlev, M. E. Shvachkina , D. D. Yakovlev, A. B. Pravdin, Saratov State University, Russia

12.15-12.30

Common optical properties of birefringent gratings and random mosaic birefringent layers D. D. Yakovlev, Saratov National Research State University, Russia

12.30-12.45

Speckle correlometry and diffuse transmittance spectroscopy of aging foamed structures E.A. Isaeva, A. A. Isaeva, S. A. Yuvchenko, D.A. Zimnyakov**,** Yuri Gagarin State Technical University of Saratov, Russia

12.45-13.00

Evolution of polarization state of multiply scattered light various scenarios M. V. Alonova, D. A. Zimnyakov, Yuri Gagarin State Technical University of Saratov, Russia

Workshop on Electromagnetics of Microwaves, Submillimeter and Optical Waves XVII

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

Secretaries: **Alexander N. Savin**, Saratov State University (Russia), **Dmitry A. Kolosov**, Saratov State University (Russia), **Alexander A. Zakharov,** 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)

Thursday September 28

JOINT POSTER/INTERNET SESSION
(Building 3, 3rd floor Hall)
Chair (EM): **Michael V. Davidovich**, Saratov State University, Russia

16.-30-19.-30

1EM. **Multilevel Model of a Non-Uniform Emitter and Anomalous Shot Noise** Maksim Inkin, Saratov State University, Russia

2EM. **Fiels Localization Produces by Artificial Dielectric Periodical Structures on Substrate in the Photonic Metamaterial Regime** Igor V. Minin, SGUGiT, Russia Oleg V. Minin, SGUGIT, Russia

3EM. **Microwave Reflection, Transmission, and Absorption by Human Brain Tissue** Mohammad Ali Ansari, Mehrdad Zarei, Najmeh Akhlaghipour, Ali Reza Niknam, Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran

INTERNET REPORTS

1. **Plasmon-Polaritons in Plan-Multilayered Structures: the Methods of Simulation and Properties** Michael V. Davidovich, Saratov State University, Saratov, Russia

Friday September 28

ORAL SESSION
ELECTROMAGNETICS
(Building 8, Room 82, SSU)
Chair: **Michael V. Davidovich**, Saratov State University, Russia

11.00-11.15
Fabrication and Characterization of Optical Microresonators with high Q-Factor Made of Glasses Ttansparent in Mid-IR
Daniil Zhivotkov, Saratov State University, Russia

11.15-11.30
Plasmons in Hyperbolic Metamaterials: the Properties and Applications
Michael V. Davidovich, Saratov State University, Russia

11.30-11.45
The Diffraction of Flat Wave on Plane-Layered Structure and the Surface Wave
Michael V. Davidovich, Saratov State University, Russia

11.45-12.00
Design of Evanescent Wave Fiber Sensors for Mid-Infrared Spectroscopy
Svetlana Korsakova, Elena Romanova, Andrei Rozhnev, Saratov State University, Saratov, Russia Alexander Velmuzhov, Tatiana Kotereva, Maxim Sukhanov, Vladimir Shiryaev, Institute of Chemistry of High Purity Substances of the RAS, Nizhny Novgorod, Russia

12.00-12.15
Simulation and Development of Novel Slow-Wave Structures for Miniaturized THZ-Band Vacuum-Tube Devices
Andrey I Benedik, Tatiana A Karetnikova, Roman A Torgashov, Saratov State University, Russia, Andrey G Rozhnev, Gennadiy V Torgashov, Saratov Branch, Institute of Radio Engineering & Electronics RAS, Nikita M Ryskin, Saratov State University, Russia

12.15-12.30

Using Phase Loching for Improving Frequency Stability and Tunability of THZ-band Gyrotrons

Asel B. Adilova, Svetlana A. Gerasimova, Maria M. Melnikova, Alexandra V. Tyshkun, Saratov State University, Russia Andrey G. Rozhnev, Saratov Branch, Institute of Raio Engineering & Electronics RAS, Nikita M Ryskin, Saratov State University, Russia

13.00-13.15

Amplification of Terahertz Plasnons in Active Graphene at Pumping Graphene by Optical Plasmons

I. M. Moiseenko, National Research Chernyshevsky Saratov State University, M. Yu. Morozov, V. V. Popov, Kotelnikov Institute of Radio Engineering and Electronics of RAS (Saratov Branch)

13.00-13.15

Enchanced Terahertz Rectification by Hybride Plasmon Modes in Periodic Graphene

K.V. Mashinskii, Kotelnikov Institute of Radio Engineering and Electronics of RAS (Saratov Branch), Saratov State University, D.V. Fateev V. V. Popov, Kotelnikov Institute of Radio Engineering and Electronics of RAS (Saratov Branch)

13.15-13.30

THZ Metamaterials and Systems Based on Precise Rolled-up Metall-Semiconductors Resonators

Elena V. Naumova, Victor Ya. Prinz, Sergey V. Golod, Vladimir A. Seleznev, Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences, Russia, Vitaliy V. Kubarev, Budker Institute of Nuclear Physics, Siberian Branch of Russian Academy of Sciences, Russia, Alexander G. Milekhin, Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences, Russia Igor V. Semchenko, Sergei A. Khakhomov, Francisk Skorina Gomel State University, Gomel, Belarus, Viktar S. Asadchy, Francisk Skorina Gomel State University, Gomel, Belarus and Aalto University, Aalto, Finland, Andrei M. Goncharenko, George V. Sinitsyn, Andrey V. Lyakhnovich, Vitalij L. Malevich, Stepanov Institute of Physics, National Academy of Sciences of Belarus, Minsk, Belarus

Workshop on Laser and Optical Technologies for Brain Physiology and Pathology

Co-chairs: **Oxana Semyachkina-Glushkovskaya**, **Valery V. Tuchin,** Saratov State University, Russia

Secretary: **Ekaterina Zinchenko**, Saratov State University, Russia

International Program Committee
Viacheslav Artyushenko, art photonics, Germany; **Ekaterina Borisova**, Institute of Electronics, BAS, Bulgaria; **Denis Bragin**, University of New Mexico School of Medicine, Department of Neurosurgery, Albuquerque, USA; **Vyacheslav Kalchenko,** Weizmann Institute of Science, Israel; **Juergen Kurths**, Humboldt University, Physics Department Potsdam Institute for Climate Impact Research, Germany; **Qingming Luo**, Huazhong Univ. of Sci. and Technol., China; **Teemu Myllylä**, University of Oulu, Oulu, Finland; **Alexey Pavlov**, Saratov State Technical University, Russia; **Edik Rafailov**, Aston Institute of Photonic Technologies, UK; **Alla Salmina**, Krasnoyarsk State Medical University, Krasnoyarsk, Russia; **Sergey Sokolovsky**, Aston Institute of Photonic Technologies, UK; **Vladislav Yu. Toronov**, Ryerson University, Canada; **Tatyana Yakusheva**, Washington University, USA; **Dan Zhu**, Huazhong Univ. of Sci. and Technol., China

30 September 2017

INVITED LECTURE SESSION
(Building10, 503 room)

Chair: **Edik Rafailov**, Aston University, United Kingdom

10.00-10.30
Invited
A new approach to assessing tissue changes using laser technologies for example of patients with type 2 diabetes mellitus
Viktor Sidorov, General Director of LAZMA Research and Production Enterprise, Saratov, Russia

10.30-11.00
Invited
Application of BBB models for studying postnatal angiogenesis and barriergenesis
Alla Salmina, Krasnoyarsk State Medical University named after Prof. V.F. Voino-Yasenetsky, Ministry of Public Health, Russia

11.00-11.30
Coffee break

ORAL SESSION
(Building10, 503 room)

Chair: **Alla Salmina**, Krasnoyarsk State Medical University, Russia

11.30-11.50
Tissue optical clearing
Elina Genina, Saratov State University, Tomsk State University, Russia

11.50-12.10
Lasers application for the treatment of central nervous system diseases
Oxana Semyachkina-Glushkovskaya, Saratov State University, Saratov, Russia

12.10-12.30
Experimental modeling of gradient microenvironment on scaffolds and in mictofluidic systems for studying cerebral angiogenesis
Vladimir Salmin, Krasnoyarsk State Medical University named after Prof. V.F. Voino-Yasenetsky, Ministry of Public Health, Russia

12.30-12.50
Evaluation of photodynamic treatment efficiency on glioblastoma cells *ex vivo*
Ekaterina Borisova, Institute of Electronics, Bulgarian Academy of Sciences, Sophia, Bulgaria

13.00-14.30
Lunch

ORAL SESSION and ROUND-TABLE DISCUSSION

(Building10, 503 room)

Co-chairs: **Ekaterina Borisova**, Institute of Electronics, Bulgarian Academy of Sciences, Bulgaria and **Oxana Semyachkina-Glushkovskaya**, Saratov State University, Russia

14.30-14.50

Mathematical modeling of the relationship between neural activity and cerebral blood flow: approaches and perspectives

Dmitry Postnov, Saratov State University, Saratov, Russia

14.50-15.10

Methods of multifractal analysis in the diagnosis of functional disorders of cerebral vascular dynamics

Alexey Pavlov, Yuri Gagarin State Technical University of Saratov, Russia

15.10-15.30

Optical visualization of lymphatic and glymphatic in the brain

Oxana Semyachkina-Glushkovskaya, Saratov State University, Saratov, Russia

15.30-15.40

Opening of the blood-brain barrier by sound: optical visualization of permeability of cerebral vessels

Maria Ulanova, Saratov National Research State University, Saratov, Russia

15.40-15.50

Intravital imaging of lymphatic vessels and nodes in animals using optical coherence tomography

Akady Abduashitov, Saratov State University, Saratov, Russia

15.50-16.00

Optical method of intravital evaluation of blood-brain barrier permeability

Anton Namykin, Saratov National Research State University, Saratov, Russia

21th International School for Junior Scientists and Students on Optics, Laser Physics & Biophotonics

Workshop on Modern Optics XV

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

Workshop Chair: **Georgy V. Simonenko**, Saratov State University (Russia)

Secretary: **Irina Yu. Yanina**, Saratov State University, Tomsk State University (Russia)

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

September 28, Thursday

LECTURE SESSION:
(Building 3, Big Physical Hall)

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

14.00-14.20

Public lecture: Recent Developments of Translational Optical Micro Imaging Technologies
Prof. Xingde Li
Johns Hopkins University, USA

14.20-14.40

Public lecture: Shining Light on Cells and Tissues
Prof. Herbert Schneckenburger
Aalen University, Germany

14.40-14.50
Show "Exciting Light"
Assoc. Prof. Ivan V. Fedosov
Department of Optics and Biophotonics, Saratov State University

Workshop English as a Communicative Tool in the Scientific Community XVI

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

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

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

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

September 25, Monday

ORAL SESSION I
(Building 10, Hall 503)
Chair: **Alexander B. Pravdin,** Saratov State University, Russia

16.40-16.55
On the meaning of the term
Svetlana V. Eremina, Alexander B. Pravdin, Saratov State University, Russia

16.55-17.10
The complete list of strokes of Chinese characters for learning purposes
Konstantin Grebenyuk, Saratov State University, Russia

17.10-17.25
Frequent metaphoric models
Dina Alexeeva, Saratov State University, Russia

17.25-17.40
Guidelines for preparing ESL students for oral presentations: The linguistic aspect
Darya Tselovalnikova, Saratov State University, Russia

17.40-17.55
Terminology in computer science
Arina Shelyugina, Saratov State University, Russia

17.55-18.10
Writing a science paper: Profitable and effective
Anna Smirnova, Anna Sosnovskaya, Saratov State University, Russia

18.10-18.25
What Confuses Native Speakers Attending Non-Native Speakers Presentations
Trena Ellen Tackitt, Wyoming University, USA

18.25-18.40
Scientific text: Contextual integrity
Alexander B. Pravdin, Svetlana V. Eremina, Saratov State University, Russia

September 28, Thursday

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION
(Building 3, 3rd floor Hall)
Chair (E): **Natalia I. Kazadaeva,** Saratov State University Russia

16.30-19.30

1E. **Basic Chinese vocabulary for students of physics**
Marina Egorova, Konstantin Grebenyuk, Saratov State University, Russia

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

Chairs: **Boris A. Medvedev**, **Vladimir P. Ryabukho,** Saratov State University, Russia

Secretary: **A. A. Skaptsov**, Saratov State University, Russia

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

September 25, Monday

LECTURE/ORAL SESSION I
(Building 3, Room 34)
Co-chairs: **Boris A. Medvedev, Vladimir P. Ryabukho**,
Saratov State University, Russia

16.40-16.50
Ten years of the workshop on "History, methodology and philosophy of the optical education"
B. Medvedev, V. Ryabukho, A. Skaptsov, Saratov State University, Russia

16.50-17.05
Invited
Structured light, properties and some applications I
A. Gorokhov, Samara National Research University, Russia

17.05-17.15
Invited
Stages of development of laser technologies in electronics
T. Sokolova, E. Surmenko, I. Popov, D. Bessonov, Saratov State Technical University, Russia

17.15-17.22
Features of laboratory classes on laser technologies with students of unrelated specialties
T. Sokolova, E. Surmenko, I. Popov, D. Bessonov, Saratov State Technical University, Russia

17.22-17.29
Magnetic nanoparticles in living organisms
S. Zhusubalieva, A. Dronkin, B. Medvedev, Saratov State University, Russia

17.29-17.36
Magnetosomes in the brain: questions, answers, hypotheses
A. Dronkin, B. Medvedev, Saratov State University, Russia

17.36-17.43
Physical research in the brain
A. Namykin, Ivan V. Fedosov, Saratov State University, Russia

17.43-17.50
Nonspherical gold nanoparticles: application and development prospects in the 21st century
Olga Savenko, Saratov State University, Russia

17.50-17.57
«Recombination characteristics of luminescence and photoconductivity in CdS-PbS films»
M. Shishkin, A. Rokakh, Saratov State University, Russia

17.57-18.04
"Mott transition, plasma resonance and the photoelectric effect in films based on cadmium sulfide"
M. Shishkin, A. Rokakh, Saratov State University, Russia

18.04-18.11
"Secondary-ion photoeffect of film structure "silicon on silicon"
D.Mitin, D. Utkin, Ya. Utkina, A. Serdobintsev, A. Rokakh, Saratov State University, Russia

18.11-18.18
Spectral characteristics of "silicon on silicon" film structures photosensitivity"
D. Utkin, Ya. Utkina, M. Shishkin, D. Mitin, A. Serdobintsev, A. Rokakh, Saratov State University, Russia

18.18-18.25
Proton size anomaly
S. Churochkina, A. Udalova, Saratov State University, Russia

18.25-18.32
Einstein–Hopf drag, doppler shift of thermal radiation and blackbody drag
S. Churochkina, I. Demin, Saratov State University, Russia

18.32-18.39
Ш-Function and its use for signals description
K. Grebenyuk, Saratov State University, Russia

18.39-18.46
Features of application of the combined method of modeling of magnetic fields

V. Malyarchuk, Saratov State University, Russia

18.46-18.54
Heteromagnetic oscillator frequency instability investigation
A. Maslow, A. Ignatiev, Saratov State University, Russia

18.54-19.00
Magnetoelectronic amplifier with ferromagnetic resonator
A. Vasiliev, A. Ignatiev, Saratov State University, Russia

September 26, Tuesday

LECTURE/ORAL SESSION II
(Scientific Library, Conference Hall)
Co-chairs: **Boris A. Medvedev, Vladimir P. Ryabukho**,
Saratov State University, Russia

15.50-16.00
Evolution of optical instruments and methods for recording and analyzing optical images
I. Fedosov, Saratov State University, Russia

16.00-16.10
New lecture course for masters: the history of physics in the context of philosophical questions of natural science
B. Medvedev, Saratov State University, Russia

16.10-16.20
The official opponent in the system of purposeful scientific activity
V. M. Anikin[1], B. Poizner[2],
[1]Saratov State University, Russia
[2]Tomsk State University, Russia

16.20-16.27
The description of atom hyperfine structure in the quasipotential approach
N. Boikova[1], Olga Boikova[2],
[1]Saratov State University,
[2]Saratov Medical University "Reaviz", Russia

16.27-16.35
Energy spectra of exotic atoms
N. Boikova[1], Olga Boikova[2],
[1]Saratov State University,
[2]Saratov Medical University "Reaviz", Russia

16.35-16.45
Applied and scientific importance of fundamental constants desirable form of participation
N. Boikova[1], Olga Boikova[2],
[1]Saratov State University,
[2]Saratov Medical University "Reaviz", Russia

16.45-16.55
A study of the impact of external influences on information signal fiber-optic gyroscope
S. Ovchinnikov, S. Serdobintzev, Saratov State University, Russia

16.55-17.05
Dark-field microscopy of metal nanoparticles: demonstration experiment for secondary school
A. Markin, Saratov State University, Russia

17.05-17.12
History of laser thermolysis development
E. Kozlova, A. Skaptsov, Saratov State University, Russia

17.12-17.19
Different results of one experiment in the history of optics
M. Starshov, Y. Leshko, Saratov State University, Russia

17.19-17.26
Paradox of transparency
M. Starshov, O. Sultanova, Saratov State University, Russia

17.26-17.34
Return ancient problem
M. Starshov, M. Grigorieva, Saratov State University, Russia

17.34-17.41
Use of light pressure for researches of blood circulation
O. Grishin, I. Fedosov, Saratov State University, Russia

17.41-17.48
Research of blood microcirculation by a laser occlusion
A. Evstigneeva, O. Nebritova, O. Grishin, I.Fedosov, Saratov State University, Russia

17.48-17.54
Characteristics of the carbon nanoparticles produced by hydrothermal synthesis on the basis of dextran sodium sulfate
A. Nikolaeva[1], A. Vostrikova[1], I. Goryacheva[1], G.Sukhorukov[2],
[1]Saratov State University, Russia
[2]Queen Mary University of London, UK

17.54-18.00
Lanthanide-doped upconversion carbon nanoparticles
D. Shpuntova[1], A. Vostrikova[1], S. Vavilina[1], I.Goryacheva[1], G. Sukhorukov[2],
[1]Saratov State University, Russia
[2]Queen Mary University of London, UK

September 28, Thursday

ROUND TABLE
Man and light in natural and art treatment of the Universe
(Scientific Library, Conference Hall)

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

Panel members:

Valery V. Tuchin[a], Vladimir P. Ryabukho[a], Vladimir L. Derbov[a], Victor V. Rozen[a], Oleg V. Shimelfenig[a], 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],

[a]Saratov State University, Saratov, Russia
[b]Samara University, Samara, Russia
[c]State Technical University of Saratov, Saratov, Russia
[d]M.V. Lomonosov Moscow State University, Moscow, Russia

14.20-14.27
Structured light, properties and some applications II
Prof. A. Gorokhov, Samara National Research University, Russia

14.27-14.34
Is the expanding Universe finite or infinite?
Prof. V. Rozen, Saratov State University, Russia

14.34-14.41
The Universe: the greatest masterpiece
St. A. Kochetkova, Saratov State Technical University, Russia

14.41-14.47
"Occasional" inventions and discoveries"
Prof. A. Rokakh, Saratov State University, Russia

14.47-14.54
The manifestation of the photosynthetic activity of the plant parasite dodder (Cuscuta Campestris) in case of her damaging by galloformed weevil (Smicronyx Smreczynskii)
Prof. V.V. Anikin[1], M. Nikelshparg[2],
[1]Saratov State University, Russia,
[2]Gimnasium N3 of Saratov, Russia.

14.54-15.01
Schrödinger Cat, nonlocal reality and physics philosophy
Prof. O. Parshkov, Saratov State Technical University, Russia

15.01-15.07
Prophet of «order-out-of-chaos»
Magister M. Stolnitz, Saratov State University, Russia

15.07-15.14
The development of physical representations from antiquity to the renaissance
Associate Prof. B. Medvedev, Saratov State University, Russia

15.14-15.21
Mathematical methods and models of pattern recognition in the visual arts
Associate Prof. J. Brodskaya, Saratov State University, Russia

15.21-15.27
Russian space art in "Amaravella" creativity
Dr. L. Solodovnichenko, Associate Prof. O. Shimelfenig, Saratov State University, Russia

15.27-15.34
"The probable cause of the dialectic disappearance out of the philosophical space of Russia»
Prof. A. Rokakh, Saratov State University, Russia

14.34-15.41
«Transgression» through the prism of non-classical science
Associate Prof. N. Dovgalenko, Saratov State Technical University, Russia

15.41-15.48
Scientific knowledge as retrospective reconstruction of reality
Prof. Yu. Duplinskaya, Saratov State Technical University, Russia

15.48-16.55
The revolution of color: chemical background
Prof. V. Sorokin, Saratov State University, Russia

15.55-16.00
Color factor in modern telecommunications
Associate Prof. O. Shimelfenig, Dr. L. Ya. Solodovnichenko Saratov State University, Russia

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3d floor Hall)
Chair (H): **A. Skaptsov**, Saratov State University, Russia

16.30-19.30

1H. **Calibrations of the magneto-inertial module** A. Ignatiev, D. Spiridonov, Saratov State University, Russia
2H. **Magnetic images of moving objects** A. Ignatiev, D. Spiridonov, Saratov State University, Russia
3H. **Results of polygon tests of the magneto-inertial module** A. Ignatiev[1], D. Spiridonov[1], A. Vasiliev[1], H. Proskuryakov[2], M. Pozdnyakov[2],[1]Saratov State University, Russia, [2]Institute of Critical Technologies, Russia
4H. **Parametric synthesis of the main characteristics of a microstrip filter** N. Erofeeva, A. Khvalin, Saratov State University, Russia
5H. **Fast routing algorithm in optical multistage interconnection networks using Lehmer codes** L. Sotov, V. Chesakov, Saratov State University, Russia
6H. **Measurement parameters of ultra-wideband 60 GHz to 1.5 THz solid-state pulse generators on the basis of multilayer heterostructures GaAs/AlGaAs** A. Vasiliev[1], A. Maslov[1], A. Ignatiev[1], V. Gergel'[2], V. Pavlovsky[2], [1]Saratov State University, Russia [2]Institute of Radioengineering and Electronics V.A. Kotelnikov of RAS.,Russia
7H. **Research ways to increase the sensitivity of the magnetic sensor on the basis of heteromagnetic structures** A. Vasiliev, A. Ignatiev, Saratov State University, Russia
8H. **"Weitch charts for simplifying truth functions: instructive cases of practical application"** A. Dvoineva, K. Grebenyuk, Saratov State University, Russia
9H. **OPTILAB – initiative student laboratory for optical-electronic instrumentation and engineering** E. Timofeeva[1], A. Nogin[1], E. Sagaidachnaya[2] [1]University ITMO, Russia, [2]Saratov State University, Russia
10H. **Stem training: from students to students** E. Timofeeva, A. Nogin, T. Korolev, E. Benenson, E. Tsypushtanova, University ITMO, Russia

INTERNET REPORTS

(Building 3, 3d floor Hall)

1. **The geometric interpretation of some mathematical expressions containing the riemann ζ-function**
   Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia
2. **The second postulate of euclid and the hyperbolic geometry**
   Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia
3. **Calculation of the riemann ζ-function on a relativistic computer**
   Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia
4. **Presentation of the book "New Electrodynamics"**
   Y. Zayko, Stolypin Volga Region Management Institute, Russian Presidential Academy of National Economy and Public Administration, Russia

Workshop on Telemedicine: Opportunities, Applications, Prospects X

Chairs: **Valery V. Bakutkin**, Saratov Research Inctitute of Hygiene, Russia, and ***Sergey R. Utz,*** Clinic of Skin and Venereal Diseases of Saratov Medical State University, Russia

International Program Committee: **Frank Lievens**, ISfTeH (Belgium); **Malina Jordanova**, MD, PhD. Solar-Terrestrial Influences Laboratory. Bulgarian Academy of Sciences (Bulgaria); **Anton V. Vladzimirsky**, Prezident of AfUTeHD (Ukrania); **Oleg V. Kasimov**, Saratov Railway Clinic (Russia), **Walter BLONDEL**, Université de Lorraine - CNRS, CRAN, France; **Valery V. Tuchin** Saratov National Research State University (Russia)

September 29, Friday

PLENARY SESSION V

(*Building 10, Main Conference Hall*)

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

9.00-9.40

Benchmarking of Devices Currently Used for Teledermatology Consultations: Optical Specifications and Limits

Marine Amouroux, Université de Lorraine – CRAN, France

ORAL SESSION TELEMEDICINE

(*Clinic of Skin and Venereal Diseases, SSMU*)

Co-chairs: **V. Bakutkin**, Saratov Research Institute of Rural Hygiene, Russia

11.00-11.10

Research of pupillary reactions of the person at influence by monochromatic radiation of a light range

Valery Bakutkin, Saratov research institute of hygiene,. Zelenov Vladimir "Makao". Russia

11.10-11.20

Development of a prototype hardware-software complex for individual monitoring the dose of external light radiation

Kuznetsova Marya, Melnikov Leonid Saratov state technical university. Russia.

11.20-11.30

Theoretical and experimental studies of the optical characteristics of the skin with various forms of its hydration

Oleg Chichev, **Saratov state technical university, Valery Bakutkin,** Saratov research institute of hygiene, Russia

11.30-11.40

Possibilities of stimulating the fusional ability of the human visual analyzer.

Perehodtseva Elena. Saratov state technical University. Russia.

11.50-12.00

Hardware-software complex for telemedicine binocular pupillometry.

Zelenov Vladimir."Makao" Russia

12.00-12.10

Device for measuring skin color index based smartphone with android operating system for a telemedicine

Kuznetsova Marya, Melnikov Leonid Saratov State Technical University. Russia

12.10-12.20

Development of software and hardware for skin analysis in case of allergic and inflamation reaction.

Kurenkov Anton, Aristov Dmitry, Kachanov Oleg, Bakutkin Valery. " Technoavtomat". Russia.

JOINT POSTER/INTERNET SESSION AND INTERNET DISCUSSION

(Building 3, 3d floor Hall)

Chair (T): ***Sergey R. Utz***, Clinic of Skin and Venereal Diseases of Saratov Medical State University

16.30-19.30

1T. **Simulation of laser eye surgery** Danilova Tatyana V., Saratov State Technical University

2T. **Virtual reality simulation system for surgeries. Manturov**, Yuri Gagarin State Technical University of Saratov, Russia Gleb Mareew, Saratov State Medical University, Russia Oleg Mareew, Saratov State Medical University, Russi

Internet Report

1. **Finding out the needed information in a video Oscar Chabrera Villarreal,** ViLynx Co-Founder & EU Manager Elisenda Bou Balust, ViLynx Co-Founder & CTO, IEEE member, Universitat Politècnica de Catalunya (UPC, Barcelon