



Program of Chinese-Russian Workshop on Biophotonics and Biomedical Optics-2020

Chairs:

Dan Zhu, Ph.D, Professor, SPIE Fellow, Deputy Director of Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China

Valery V. Tuchin, Corr.-member of the RAS, Doc. of Sci., Professor, SPIE/OSA Fellow, Head of Optics and Biophotonics Department, Saratov State University; Head of Laboratory of Laser Diagnostics of Technical and Living Systems, Institute of Precision Mechanics and Control of the RAS, Saratov, Russia; Supervisor of Lab. of Biophotonics, National Research Tomsk State University, Tomsk, Russia

Secretaries:

Tingting Yu, Ph.D, Associate Professor, Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, China

Polina A. Dyachenko, Ph.D, Associate Professor, Optics and Biophotonics Department, Saratov State University, Saratov, Russia

September 28, Monday

ON-LINE INVITED LECTURES

Conference Hall 511, Building 10 and Conference Hall 43, Building 3

ZOOM platform <https://us02web.zoom.us/j/88531543932>

SESSION I

Chairs: **Valery V. Tuchin**, Saratov State University, Russia

Yueqing Gu, China Pharmaceutical University, China

Saratov time/China time

8:40-8:50/12:40-12:50

**Welcome speech from the chairs of the
Chinese-Russian Workshop on
Biophotonics and Biomedical Optics-2020**

Dan Zhu, Huazhong University of Science
and Technology, Wuhan, China

Valery V. Tuchin, Saratov State University,
Russia

8:50-9:10/12:50-13:10

Tissue optical clearing imaging: from *in vitro* to *in vivo*

Dan Zhu, Huazhong University of Science
and Technology, Wuhan, China

9:10-9:30/13:10-13:30

A liquid as a source of terahertz radiation
Alexander P. Shkurinov, Department of
Physics, Moscow State University, Moscow,
Russia

9:30-9:50/13:30-13:50

**Multi-parameter optical diagnostics of
microcirculatory-tissue systems: methods
and technical means**

Andrey V. Dunaev, Orel State University,
Orel, Russia

9:50-10:10/13:50-14:10

**Dispersion-mediated conjugate
suppression for high speed optical
computing OCT imaging**

Ping Xue, Tsinghua University, Beijing,
China

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

**Silicon nanomaterials for Biosensing and
Bioimaging**

Yao He, Soochow University, Suzhou,
China

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

**A superstable homogeneous lipiodol-ICG
formulation for locoregional
hepatocellular carcinoma treatment**

Gang Liu, Xiamen University, Xiamen,
China

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

**The Role of Individual Cysteine
Substitutions in the Fast Photoswitching
and Photoconversion of the
Biphotochromic Fluorescent Protein
SAASoti**

Alexander P. Savitsky, Bach Institute of
Biochemistry, Research Center of
Biotechnology of the RAS, Moscow, Russia

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

**Structural and Functional Optical
Coherence Tomography, Technology and
Applications**

Zhihua Ding, Zhejiang University,
Hangzhou, China

11:30-11:50/15:30-15:50

**Bimodal optoacoustic & fluorescent
probes for theranostics**

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

11:50-12:10/15:50-16:10

**High affinity ligands for precise tumor
diagnosis**

Yueqing Gu, China Pharmaceutical
University, Nanjing, China

12:10-12:30/16:10-16:30

**Optimization of spectral and spatial light
beam distribution of optical systems for
photodynamic therapy**

Andrey V. Belikov, ITMO University,
Saint-Petersburg, Russia

12:30-12:50/16:30-16:50

COFFEE BREAK

SESSION II

Chairs: **Hui Ma**, Tsinghua University, China

Mikhail Yu. Kirillin, Institute of Applied Physics RAS, Russia

12:50-13:10/16:50-17:10

**Study on the Relationship between
Reduced Scattering Coefficient and
Young's Modulus in Microwave Ablation**

Zhiyu Qian, Nanjing University of
Aeronautics and Astronautics, Nanjing,
China

13:10-13:30/17:10-17:30

**Mining polarization features from a
Mueller matrix**

Hui Ma, Tsinghua University, Beijing,
China

13:30-13:50/17:30-17:50

**Imaging Processing of Laser Speckle
Contrast Imaging of Blood Flow**

Pengcheng Li, Huazhong University of
Science and Technology;
Wuhan, China/Hainan University, Haikou,
China

13:50-14:10/17:50-18:10
Tumor microenvironment-responsive drug delivery systems
Yi Ma, China Pharmaceutical University, Nanjing, China

14:10-14:30/18:10-18:30
Laser-induced local vascular responses
Dmitry E. Postnov, Saratov State University, Saratov, Russia

14:30-14:50/18:30-18:50
Optical techniques for blood microrheology assessing: red blood cells deformability, aggregation and their interrelation
Andrei E. Lugovtsov, M.V. Lomonosov Moscow State University, Moscow, Russia

14:50-15:10/18:50-19:10
Photodynamic therapy with BPD-based nanoconstructs under complementary

fluorescence and optoacoustic imaging monitoring
Ilya V. Turchin, Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia

15:10-15:30/19:10-19:30
Monte Carlo simulation of COVID-19 spread in early and peak stages in different regions of Russian Federation using an agent-based modelling
Mikhail Yu. Kirillin, Institute of Applied Physics RAS, Nizhny Novgorod, Russia

15:30-15:50/19:30-19:50
MOUSE: Advanced Approaches to Skin In Vivo Optical Clearing
Elina A. Genina, Saratov State University, Saratov, Russia

15:50-16:10/19:50-20:10
COFFEE BREAK

SESSION III

Chairs: **Gang Liu**, Xiamen University, China
Oxana V. Semyachkina-Glushkovskaya, Saratov State University, Russia

16:10-16:30/20:10-20:30
Breakthrough strategies of stimulation of the cerebral lymphatics during sleep
Oxana V. Semyachkina-Glushkovskaya, Saratov State University, Saratov, Russia

16:30-16:50/20:30-20:50
In Vivo Raman Spectroscopy for Chronic Diseases Detection
Ivan A. Bratchenko, Samara National Research University, Samara, Russia

16:50-17:10/20:50-21:10
Nanomedicine in cancer immunotherapy

Xiaolong Liu, Mengchao Hepatobiliary Hospital of Fujian Medical University, Fuzhou, China

17:10-17:30/21:10-21:30
Sapphire fiber bundles for terahertz imaging with spatial resolution beyond the Abbe limit
Kirill I. Zaytsev, Prokhorov General Physics Institute of the Russian Academy of Sciences, Bauman Moscow State Technical University, Moscow, Institute for Regenerative Medicine, Sechenov University, Moscow, Russia

September 29, Tuesday

**CHINESE REPORTS
SESSION IV**

Voov ID: 945 737 579. Accessing code: 123456

Chairs: Junle Qu, Peking University, Beijing, China
ShaoqunZeng, Huazhong University of Science and Technology, China

Saratov time/China time

5:30-5:50/9:30-9:50

Multimodal optical imaging for small animal research

Xiaoquan Yang, Huazhong University of Science and Technology, Wuhan, China

5:50-6:10/9:50-10:10

Artificial intelligence assisted screening for cervical cancer

Xiuli Liu, Huazhong University of Science and Technology, Wuhan, China

6:10-6:30/10:10-10:30

NIR skull optical clearing window for in vivo cortical vasculature imaging and targeted manipulation

Dongyu Li

Huazhong University of Science and Technology, Wuhan, China

6:30-6:50/10:30-10:50

MACS: Rapid aqueous clearing system for three-dimensional mapping of intact organs

Jingtang Zhu, Huazhong University of Science and Technology, Wuhan, China

6:50-7.10/10:50-11:10

MACS: Rapid aqueous clearing system for three-dimensional mapping of intact organs

Jingtang Zhu, Huazhong University of Science and Technology, Wuhan, China

ON-LINE INVITED LECTURES

Conference Hall 511, Building 10 and Conference Hall 43, Building 3

SESSION V

ZOOM platform <https://us02web.zoom.us/j/88531543932>

Chairs: Buhong Li, Fujian Normal University, Fuzhou, China
Dmitry E. Postnov, Saratov State University, Saratov, Russia

Saratov time/China time

8:50-9:10/12:50-13:10

Multimodal tissue imaging at optical clearing

Valery V. Tuchin, Saratov State University, Institute of Precision Mechanics and Control of the RAS, Saratov; National Research Tomsk State University, Tomsk, Russia

9:10-9:30/13:10-13:30

Early diagnosis of diseases by label-free, high-resolution, multiparametric imaging
ZhiyiLiu, Zhejiang University, Zhejiang, China

9:30-9:50/13:30-13:50

Progress on Stimulated Emission Depletion Microscopy

Junle Qu, Shenzhen University, Shenzhen, China

9:50-10:10/13:50-14:10

Recent advances in optical imaging for photodynamic therapy

Buhong Li, Fujian Normal University, Fuzhou, China

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

Multiscale photoacoustic microscopy

Lei Xi, Southern University of Science and Technology, Shenzhen, China

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

Gap-enhanced (resonance) Raman tags for bioimaging

Jian Ye, Shanghai Jiao Tong University, Shanghai, China

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

Characterization of tissue elasticity with Optical Coherence Elastography: going beyond the linear paradigm

Vladimir Yu. Zaitsev, Institute of Applied physics RAS & Privolzhsky Research Medical University, Nizhny Novgorod, Russia

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

Optical Microendoscopy and its applications

Ling Fu, Huazhong University of Science and Technology, Wuhan, China

11:30-11:50/15:30-15:50

Biomedical applications of nonlinear optical microimaging techniques

Liwei Liu, Shenzhen University, Shenzhen, China

11:50-12:10/15:50-16:10

Medical applications of IR and THz imaging and machine learning

Yury V. Kistenev, Tomsk State University, Tomsk, Russia

12:10-12:30/16:10-16:30

Angiogenesis and glial responses after near-infrared light attenuates A β burden and alleviates cognitive impairments in APP/PS1 mice

Xunbin Wei, Peking University, Beijing, China

SFM PLENARY LECTURE

September 29, Tuesday, 15:20-

16:00/19:20-20:00

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

Multimodal optical diagnostics of cancer

Valery P. Zakharov, Samara National Research University, Samara, Russia

SFM PLENARY LECTURE

September 30, Wednesday, 12:40-

13:20/16:40-17:20

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

Decellularized materials in regenerative medicine through the prism of biophotonics

Peter S. Timashev, Institute for Regenerative Medicine, Sechenov University, Department of Polymers and Composites, N.N. Semenov Institute of Chemical Physics of RAS, Institute of Photonic Technologies, Research Center "Crystallography and Photonics" of RAS, Russia

12:30-12:40/16:30-16:40

Closing Speech

Junle Qu, Shenzhen University, China

Valery V. Tuchin, Saratov State University, Russia

INTERNET REPORTS

- 1. Evaluation of dynamic viscosity of turbid fluids using optical coherence tomography** A.Yu. Potlov, S.V. Frolov and S.G. Proskurin Tambov State Technical University, Russia
- 2. A method for evaluation of absolute and relative blood flow velocities in soft biological tissues using optical**

- coherence tomography** A.Yu. Potlov, S.V. Frolov and S.G. Proskurin Tambov State Technical University, Russia
- 3. Mitogenetic effect (stimulation of mitoses with ultra-weak UV-radiation) and its applications to cancer research and diagnostics** I. V. Volodyaev, M.V. Lomonosov Moscow State University,

- Moscow, Russia; E.V. Naumova, Rzhanov Institute of Semiconductor Physics, Russian Academy of Science, Siberian Branch, Novosibirsk, Russia
4. **Express Diagnostics of Erythrocytes Size Distribution on the basis of Hyperspectral Holography and Laser Diffractometry Techniques** Andrei Lugovtsov^{1,2}, Vladislav Ustinov³, Georgy Kalenkov⁴, Sergey Kalenkov⁵ And Alexander Priezzhev^{1,21} physics Department, Lomonosov Moscow State University, Russia ²International Laser Center, Lomonosov Moscow State University, Russia ³Moscow Center Of Fundamental And Applied Mathematics, Lomonosov Moscow State University, Russia ⁴Institute Of Geosphere Dynamics (Idg Ras), Russia ⁵Moscow Polytechnic University, Russia
 5. **Refractive Properties of Blood Serum of Rats with Experimental Liver Cancer** Ekaterina N. Lazareva^{1,2}, Polina A. Dyachenko^{1,2}, Maxim M. Nazarov³, Alla B. Bucharskaya⁴, Valery V. Tuchin^{1,2,5,6}, Alexander P. Shkurinov^{7,81} Saratov State University, Saratov, Russia ²Tomsk State University, Tomsk, Russia ³National Research Center "Kurchatov Institute", Moscow, Russia ⁴Saratov State Medical University, Saratov, Russia ⁵Itmo University, St. Petersburg, Russia ⁶Institute Of Precision Mechanics And Control, Russian Academy Of Sciences, Saratov, Russia ⁷Department Of Physics And International Laser Center, M.V. Lomonosov Moscow State University, Russia ⁸Crystallography And Photonics Federal Research Center, Russian Academy Of Sciences, Moscow, Russia
 6. **Study of skin dehydration in the course of grafted tumor development using spectral refractometry, NIR and THz spectroscopy** Polina Dyachenko (Timoshina)^{1,2}, Ekaterina Lazareva^{1,2}, Maxim Nazarov³, Alla Bucharskaya⁴, Valery Tuchin^{1,2,5}, Alexander Shkurinov⁶¹ Saratov State University, Russia ²Tomsk State University, Russia ³NRC «Kurchatov Institute», Russia ⁴Saratov State Medical University, Russia ⁵Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia ⁶Lomonosov Moscow State University, Russia
 7. **Influence of quantum-dimensional effects on field localization in a planar DLC structure with embedded plasmon nanoparticles** Sergey V. Zarkov¹, Yuri A. Avetisyan¹, Garif G. Akchurin^{1,2}, Valery V. Tuchin^{1,2,3}, Alexander N. Yakunin¹¹ Russian Academy of Sciences, Institute of Precision Mechanics and Control, Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Tomsk State University, Tomsk, Russia
 8. **Localization of heat sources during laser light irradiation of a planar DLC structure with embedded plasmon nanoparticles** Sergey V. Zarkov¹, Yuri A. Avetisyan¹, Garif G. Akchurin^{1,2}, Valery V. Tuchin^{1,2,3}, Alexander N. Yakunin¹¹ Russian Academy of Sciences, Institute of Precision Mechanics and Control, Saratov, Russia; ²Saratov State University, Saratov, Russia; ³Tomsk State University, Tomsk, Russia