# PROGRAM TOMTI

## SARATOV TIME UTC+4

### Plenary Lecture Session II September 29

**Saratov 18.00-18.20 (Shoham 17.00-17.20)**

1. Aspect Imaging Compact Preclinical Permanent Magnets: Technology and Applications
   Kobi Katsobashvili, Aspect Imaging Ltd., Shoham, Israel

**Saratov 19.00-19.15 (Berlin 17.00-17.15)**

2. FLIM and FCS Microscopy in Biophysics and Biochemistry PicoQuant
   Mathias Bayer, PicoQuant GmbH, Berlin, Germany

### September 30, Wednesday

**14.45 - 15.00 (Moscow 13.45 - 14-00)**

**OPENING OF TOMTI**

**Alexander G. Gabibov**
IBCh RAS, Moscow, Russia

### Invited Lecture Session

**15.00 - 18.00 (Moscow 14.00 - 17.00)**

1. Insights into Metabolic Aspects of Tumor Growth with Fluorescence and Phosphorescence Time-resolved Techniques
   Marina SHIRMANOVA[1], Maria LUKINA[1], Liubov SHIMOLINA[1], Vladislav SHCHESLAVSKIY[1], Varvara DUDENKOVA[1], Vladimir ZAGAINOV[2], Anna ORLOVA[3], Ilya KRITCHENKOV[4], and Elena ZAGAYNOVA[1] 1Institute of Experimental Oncology and Biomedical Technologies, Privolzhskiy Research Medical University, Russia 2Volga District Medical Center, Russia 3Institute of Applied Physics RAS, Russia 4Chemistry Department, Saint Petersburg State University, Russia

2. Solid and Liquid Tissue Pathology Analysis by Multimodal Microscopy
   Francesco S. Pavone, European Laboratory for non Linear Spectroscopy, R. Cicchi, E. Baria, S. Anand, INO-CNR, S. Morselli, M.Gacci, S. Serni, Urology Unit, University Hospital Florence, G. Nesi, D. Massi, Anatomopathology Unit, University Hospital Florence, S. Centi, F. Ratto, F. Rossi, R. Pini, IFAC CNR, Florence, Italy; O. Bibikova, Imperial College London, V. Artyushenko, Art Photonics, Berlin

3. Quantitative Fluorescence Polarization Imaging for Cancer Detection
   Anna Yaroslavskaya, University of Massachusetts at Lowell, USA

4. Genetically Encoded Autonomous Bioluminescence in Eukaryotes
   Ilia Yampolsky, Department of Biomolecular Chemistry, Institute of Bioorganic Chemistry, Moscow, Russia

5. Towards the Creation of a Magic Bullet: Supramolecular Nanostructures for Oncotheranostics
   Victoria Shipunova, Polina Kotelnikova, Elena Komedchikova, Anna Sogomonyan, Maria Belova, Olga Kolesnikova, Vladislav Soloviev, Maxim Nikitin, Sergey Deyev, IBCh RAS, Russia

6. Monitoring of Optical Clearing Effects by Fluorescence and Magnetic Resonance Imaging *in vivo*
   Alexei A. Bogdanov Jr.[1,2] , Natalia I. Kazachkina [2], Victoria V. Zherdeva[2], Irina G. Meerovich [2], Ilya D. Solovyev [2], Daria K. Tuchina [2,3,4], Alexander P. Savitsky [2], Valery V. Tuchin [2,3,4,5]
   1- University of Massachusetts Medical School, Radiology, Worcester, Massachusetts, United States of America; 2 -A.N. Bach Institute of Biochemistry, FRC of Biotechnonogy of the RAS, Moscow, Russian Federation; 3- Saratov State University, Saratov, Russian Federation; 4 -Tomsk State University, Tomsk, Russian Federation; 5 -Institute of Precision Mechanics and Control of the Russian Academy of Sciences, Saratov, Russian Federation

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**Invited lecture, October 1, Thursday**

**Saratov 10.00 – 10.30 (Sydney 16.00 – 16.30|9.00-10.30 Moscow)**

1. Big Data and Hyperspectral Imaging Uncover Hidden Regularities of Native Colours and Patterns in Cells and Tissues
   Ewa M. Goldys, Martin E. Gosnell, Abbas Habibalahi, Saabah Mahbub, Jared Campbell, Ayad G. Anwer, Jesse Michael, University of New South Wales, Sydney, Australia

**Internet Report Session, October 1, Thursday**

**Saratov 10.30-11.50 (Moscow 9.30 – 10.30)**

1. Assessment of Melanin Distribution from the Basal Membrane to the Stratum Corneum *in vivo* by Fluorescence and Raman Microspectroscopy
   B.P. Yakimov [1], E.A. Shirshin [1,2] , J. Schleusener [3], V.V. Fadeev [1], M.E. Darvin [3]
   1- M.V. Lomonosov Moscow State University, Faculty of physics, 1-2 Leninskie Gory, Moscow, 119991, Russia; 2- Institute of Spectroscopy of the Russian Academy of Sciences, Fizicheskaya Str., 5, 108840, Troitsk, Moscow, Russia; 3-Charité – Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Department of Dermatology, Venerology and Allergology, Center of Experimental and Applied Cutaneous Physiology, Charitéplatz 1, Berlin, 10117, Germany

2. Tissue-like Phantoms Mimicking Blood Vessel for Intravascular Optical Coherence Tomography
   A.Yu. Potlov, S.V. Frolov and S.G. Proskurin Tambov State Technical University, Russia

3. Comparison of Optical Coherence Elastography and Ultrasound Shear Wave Elastography in Gelatin Tissue-Mimicking Phantoms
   Justin R. Rippy [1,3], Manmohan Singh [1,3], Salavat Aglyamov [2], and Kirill V. Larin [1,3,*]
   1- Department of Biomedical Engineering, University of Houston; 2 - Department of Mechanical Engineering, University of Houston; 3 - Department of Molecular Physiology and Biophysics, Baylor College of Medicine *Contact author: University of Houston, 2026 SERC, Houston, TX 77204. Email: klarin@uh.edu Ph:No: 832-842-8834

4. FLIM Assessment of Cells Heterogeneity: Machine Learning-based Approach
Alexey Gayer [1], Elena Nikonova [1], Boris Yakimov [1], Gleb Budylin [2], Maria Lukina [3], Varvara Dudenkova [3], Vladislav Shcheslavskiy [3], Marina Shirmanova [3], Evgeny Shirshin [1,2]
1 -Department of Physics, M.V. Lomonosov Moscow State University, 1/2 Leninskie gory, Moscow 119991, Russia; 2 - Institute of spectroscopy of the Russian Academy of Sciences, 5 Fizicheskaya str., Moscow 108840, Russia; 3 - Institute of Experimental Oncology and Biomedical Technologies, Privolzhskiy Research Medical University, Minin and Pozharsky Sq., 10/1, 603005 Nizhny Novgorod, Russia

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**Internet Poster Session, October 1, Thursday**

**Saratov 11.50 – 13.10 (Moscow 10.50 – 12.10)**

1. Optical Clearing of Mouse Skin Samples using MR and X-ray Agents
Nikita S. Chikalkin [1], Daria K. Tuchina [1,2], Olga A. Sindeeva [1], Alexander P. Savitsky [3], Alexei A. Bogdanov Jr. [3,4] , Valery V. Tuchin [1,2,5]
1-Saratov State University, Saratov, Russia; 2-National Research Tomsk State University, Tomsk, Russia; 3-Federal Research Center of Biotechnology, Russian Academy of Sciences, Moscow, Russia; 4-University of Massachusetts Medical School, Worcester, MA, USA; 5-Institute of Precision Mechanics and Control, Russian Academy of Sciences, Saratov, Russia

2. Dual-Wavelength Subtraction Optical Imaging for Delineating Cutaneous Tumors
Peter R. Jermain (University of Massachusetts Lowell Advanced Biophotonics Laboratory) Xin Feng (University of Massachusetts Lowell Advanced Biophotonics Laboratory) Sherry H. Yu (Massachusetts General Hospital Department of Dermatology) Victor A. Neel (Massachusetts General Hospital Department of Dermatology) Anna N. Yaroslavsky (University of Massachusetts Lowell Advanced Biophotonics Laboratory, Massachusetts General Hospital Department of Dermatology)

3. Chest Shield for Blue Light Phototherapy
Androniki Mitrou, Advanced Biophotonics Lab, University of Massachusetts Lowell, Lowell, MA 01854; Tyler Iorizzo, Advanced Biophotonics Lab, University of Massachusetts Lowell, Lowell, MA 01854; Javed Mannan, Neonatal-Perinatal Medicine, University of Massachusetts Medical School, Worcester, MA 01605; Anna Yaroslavsky, Advanced Biophotonics Lab, University of Massachusetts Lowell, Lowell, MA 01854

4. Characterizing Optical Properties of Kidney Stone Phantoms
Tyler Iorizzo (Advanced Biophotonics Laboratory, University of Massachusetts Lowell, USA) Ilya Yaroslavsky (IPG Medical, MA, USA) Anna Yaroslavsky (Advanced Biophotonics Laboratory, University of Massachusetts Lowell, USA)

5. *In vitro* Testing of New Ir(III) Complexes as Phosphorescent Sensors of Molecular Oxygen for Cancer Studies
Anastasia KOMAROVA (Privolzhskiy Research Medical University; Lobachevsky State University of Nizhny Novgorod); Maria LUKINA (Privolzhskiy Research Medical University); Varvara DUDENKOVA (Privolzhskiy Research Medical University); Leonid BOCHKAREV (G.A. Razuvaev Institute of Organometallic Chemistry of the Russian Academy of Sciences); Ilya KRITCHENKOV (Saint Petersburg State University); Sergey TUNIK (Saint Petersburg State University); Marina SHIRMANOVA (Privolzhskiy Research Medical University)

6. Investigation of Apoptosis in Tumor Cells Using Genetically Encoded Sensors of Caspases Activity.
   Alena GAVRINA [1], Marina SHIRMANOVA [1,] Varvara DUDENKOVA [1,2], Tatiana KOVALEVA [1], Konstantin LUKYANOV [1,3], and Elena ZAGAYNOVA [1,2]
   1 -Privolzhskiy Research Medical University, Nizhny Novgorod, Russia; 2- Nizhny Novgorod State University, Nizhny Novgorod, Russia; 3- Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Moscow, Russia

7. Lentiviral Tet-On System for Inducible Expression of Fluorescent Chimeras of dCas9 Orthologs and it's Application
   Gerel Abushinova (FRC of Biotechnology of the RAS, Laboratory of Molecular Imaging, Russia; Vavilov Institute of General Genetics RAS, Laboratory of functional genomics, Russia); Lilia Maloshenok (Vavilov Institute of General Genetics RAS, Laboratory of functional genomics, Russia; FRC of Biotechnology of the RAS, Laboratory of Molecular Imaging, Russia); Victoria Zherdeva (FRC of Biotechnology of the RAS, Laboratory of Molecular Imaging, Russia); Sergey Bruskin (Vavilov Institute of General Genetics RAS, Laboratory of functional genomics, Russia); Alexander Savitsky (FRC of Biotechnology of the RAS, Laboratory of Physical Chemical Biology, Russia); Alexey Bogdanov (FRC of Biotechnology of the RAS, Laboratory of Molecular Imaging, Russia)
8. Planar Imaging for Preliminary Assesement of Optical Clearing Effect in Tumor Bearing Mice
   Aysiay Saydasheva, FRC of Biotechnology of the RAS ;Kazachkina Natalia. I. FRC of Biotechnology of the RAS; Zherdeva Victoria.V FRC of Biotechnology of the RAS; Bogdanov Alexei Jr. FRC of Biotechnology of the RAS; Savitsky Alexander P. FRC of Biotechnology of the RAS

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**Plenary Lecture Session V October 1, Thursday**

**Saratov 15.00 - 18.00 (Moscow 14.00 - 17.00)**

1. Visualization of Histone Epigenetics: a New Way to Track Single-cell Physiology
   Konstantin A. Lukyanov Center of Life Sciences, Skolkovo Institute of Science and Technology, Moscow, Russia

2. Super-resolution with very low laser power, ideal for long term imaging
   Peter Drent, Confocal.nl, Amsterdam, The Netherlands

3. Live Biophonic Analysis of Early Mammalian Embryonic Process
   Irina V. Larina Baylor College of Medicine, Department of Molecular Physiology and Biophysics, Houston, Texas, USA

4. Image-guided Precision Nanomedicine for Cancer Therapy
   Anna Moore, Ph.D. Michigan State University

5. Molecular imaging using time resolved fluorescence
   Anand T. N. Kumar, Massachusetts General Hospital, Harvard Medical School

6. Preclinical & Multimodality Imaging MR SOLUTIONS
   Fabrice Chaumard, MR Solutions Ltd.