

**Program of the 6th International Symposium  
«Physics Engineering and Technologies for Biomedicine»  
and Schools for Young Scientists**

**November 20-24 of 2021**

**Moscow, Russia**

***(on-line format)***

**SCHEDULE:**

**November 20, 2021**

***School 1*** «Physics, Engineering and Technologies for Biomedicine»

**November 21, 2021**

***School 2*** «Nanotechnology Approaches for Highly Efficient Production, Detection  
and Delivery of Bioactive Compounds»

**November 22-24, 2021**

***Symposium and poster sessions*** «Physics, Engineering and Technologies for Biomedicine»

<b>Saturday, November 20</b>	<b>School 1 "Physics Engineering and Technologies for Biomedicine"</b>
09.30	<b>Opening of the School</b>
10.00	Andrei Kabashin CNRS (France), MEPHI (Russia) <b>Laser nanofabrication for diverse applications</b>
11.00	Anton Fojtik Czech Technical University in Prague (Czech Republic), MEPHI (Russia) <b>Nanotechnology approach for sensors, storage energy and genetic information</b>
11.30	Vladimir Mironov MEPHI (Russia) <b>In-vivo bioprinting</b>
12.00	Victor Timoshenko MSU, MEPHI (Russia) <b>Silicon based nanoparticles for cancer theranostics applications</b>
12.30	Ahmed Al-Kattan Aix Marseille University (France) <b>Novel nanoparticles-enhanced biomimetic platforms for medical and tissue engineering applications</b>
13.00-14.00	<b>Lunch</b>
14.00	Natalia Epstein MEPHI (Russia), Obninsk Institute for Nuclear Power Engineering (Russia) <b>The life cycle of medicines and GxP practices</b>
14.30	Victor Loschenov MEPHI (Russia), Prokhorov General Physics Institute (Russia) <b>Fluorescence diagnostics and photodynamic therapy in the experiment and in the clinic</b>
15.00	Vladimir Oleynikov MEPHI (Russia), Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, RAS (Russia) <b>Correlative microscopy: state of art and perspectives</b>
15.30	Vladimir Morozov Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, RAS (Russia) <b>New approaches to the detection of ionizing radiation for biology and medicine</b>
16.00	Alexey Lipengolz MEPHI (Russia), National Medical Research Center of Oncology N.N. Blokhin (Russia) <b>Neutron capture therapy of malignant tumors</b>
16.30	Victoria Shipunova MEPHI (Russia), Moscow Institute of Physics and Technology (Russia) <b>Nanostructures for oncotheranostics</b>
17.00	Alexander. Kharin MEPHI (Russia) <b>Convolutional neural networks for SEM images analysis</b>
17.30	Igor Meglinski Aston University (UK), MEPHI (Russia) <b>Visual perception of polarized light by humans</b>
18.00	Tatiana Savelieva Prokhorov General Physics Institute (Russia), MEPHI (Russia) <b>Optical biopsy in neurosurgery</b>
18.30	Anton Popov MEPHI (Russia) <b>Laser synthesis of colloidal solutions for biomedical applications</b>
19.00	<b>Debriefing, discussions, closing of the School</b>

Sunday, November 21	<i>School 2</i> <b>"Nanotechnological Approaches to Highly Efficient Production, Detection and Delivery of Biologically Active Compounds"</b>
09.30	<b><i>Opening of the School</i></b>
10.00	Yuri Gunko Trinity College, Dublin (Ireland) <b><i>Chiral nanomaterials</i></b>
10.30	Galina Nifontova MEPhI (Russia) <b><i>Stimulus-sensitive delivery systems based on polyelectrolyte microcapsules</i></b>
11.00	Pavel Samokhvalov MEPhI (Russia) <b><i>Colloidal synthesis of nanomaterials for biomedicine, optoelectronics and photocatalysis</i></b>
11.30	Dayana Gulevich MEPhI (Russia) <b><i>Colloidal synthesis code: optimization of reaction conditions by machine learning methods</i></b>
12.00	Victor Krivenkov MEPhI (Russia) <b><i>Two-photon processes in hybrid nanoscale structures for medical diagnostics and optoelectronics</i></b>
12.30	Igor Nabiev University of Reims Champagne-Ardenne (France) <b><i>Control of the functions of biological molecules under conditions of strong light-matter coupling</i></b>
13.00-14.00	<b>Lunch</b>
14.00	Andrey Sarychev Institute of Theoretical and Applied Electrodynamics, RAS (Russia) <b><i>The theory of giant raman amplification and new biosensors</i></b>
14.30	Andrey Ivanov MEPhI (Russia), Institute of Theoretical and Applied Electrodynamics, RAS (Russia) <b><i>Amplification of electromagnetic fields by optical metamaterials</i></b>
15.00	Anton Yefimov NMIC of Transplantology and Artificial Organs named after V.I. Shumakov (Russia) <b><i>Scanning probe nanotomography for three-dimensional analysis of nanostructured and hybrid biomaterials</i></b>
15.30	Maria Baryshnikova FGBNU «RONC named after N.N. Blochin» (Russia) <b><i>Nanotechnological approaches to the creation of personalized non-antigenic antitumor vaccines</i></b>
16.00	Maria Sumarokova MEPhI (Russia) <b><i>Mechanical and physico-chemical properties of biomaterials using atomic force microscopy</i></b>
16.30	Konstantin Mochalov Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, RAS (Russia) <b><i>Tunable microresonators for controlling the properties of molecules in the mode of strong light-matter coupling</i></b>
17.00	<b><i>Debriefing, discussions, closing of the School</i></b>

Monday, November 22	<b>Symposium</b> <b>"Physics Engineering and Technologies for Biomedicine"</b>
10.00	<i>Sergey Klimentov, Alexander Garmash</i> <i>MEPhI (Russia)</i> <b>Greetings from organizers</b>
10.10	<i>Andrei Kabashin</i> <i>CNRS (France), MEPhI (Russia)</i> <b>Research Agenda in PhysBio MEPhI</b>
10.50	<b>KEYNOTE SPEAKER</b> <i>Anton Fojtik</i> <i>Czech Technical University in Prague (Czech Republic), MEPhI (Russia)</i> <b>Nanostructures for Biomedical Sensors</b>
11.30	<i>Amitava Patra</i> <i>Institute of nano science and technology (India)</i> <b>New Possibilities of Metal Clusters for Bio-Applications</b>
12.00	<i>Vladimir Fomin</i> <i>Institute for Integrative Nanosciences, IFW Dresden (Germany), MEPhI (Russia)</i> <b>Spin-Dependent Phenomena in Semiconductor Micro-and Nanoparticles for Biomedical Applications</b>
12.30	<i>Indrajit Roy</i> <i>University of Delhi (India)</i> <b>Enzyme-mimetic nanomaterials for light-activated anticancer and antibacterial applications</b>
13.00-14.00	<b>Lunch</b>
14.00	<i>Viktor Timoshenko</i> <i>MSU (Russia), MEPhI (Russia)</i> <b>Nanoparticles for Photohyperthermia Applications</b>
14.30	<b>KEYNOTE SPEAKER</b> <i>Irina Zavestovskaya</i> <i>MEPhI (Russia), Lebedev Physics Inst. (Russia)</i> <b>Advanced binary nanotechnologies of hadron therapy</b>
15.10	<i>Victoria Shipunova</i> <i>Inst. of Bioorganic Chemistry of RAS (Russia), Moscow Inst. of Physics and Technology (Russia)</i> <b>Polymer nanocapsules are effective tools for the personified metastatic tumors treatment</b>
15.40	<i>Gleb Tselikov</i> <i>Moscow Inst. of Physics and Technology (Russia)</i> <b>Transition metal dichalcogenide nanospheres for biomedical theranostics</b>
16.00	<i>Victor Krivenkov</i> <i>MEPhI (Russia)</i> <b>Bright and stable plasmon-exciton quantum emitters based on semiconductor quantum dots</b>
16.20	<i>Ivan Zelepukin</i> <i>MEPhI (Russia), Inst. of Bioorganic Chemistry of RAS (Russia)</i> <b>Pharmacokinetics of magnetic nanoparticles in the organism</b>
16.40-17.10	<b>Coffee break</b>
17.10	<i>Petr Nikitin</i> <i>Prokhorov General Physics Institute (Russia)</i> <b>New opportunities for nanobiotechnology, medical diagnostics and food safety control</b>
17.40	<b>HONORARY KEYNOTE SPEAKER</b> <i>Paras Prasad</i> <i>University at Buffalo (USA), MEPhI (Russia)</i> <b>Neurophotonics and Nanobiotechnology for Brain diseases and disfunction</b>

18.25	Anderson Gomes Federal University of Pernambuco (Brazil), MEPHI (Russia) <b>Photoacoustic microscopy and tomography with plasmonic nanoparticles</b>
18.55	Igor Meglinski Aston University (UK), MEPHI (Russia) <b>Mutual interaction of red blood cells influenced by nanoparticles studied by a combined use of optical tweezers and scanning electron microscopy</b>

<b>Tuesday, November 23</b>	<b>Symposium "Physics Engineering and Technologies for Biomedicine"</b>
10.00	<b>PLENARY LECTURER</b> Sergey Deev Inst. of Bioorganic Chemistry of RAS (Russia) <b>Hybrid nanostructures for theranostics. Progress, problems, perspectives</b>
10.45	Deepika Sharma Institute of Nano Science and Technology (India) <b>Inhibition of heat shock proteins sensitizes glioma cells to magnetic hyperthermia and enhances anti-tumor immune response in xenograft model by abscopal effect</b>
11.15	Rudolf Steiner ILM at Ulm University (Germany) <b>Tissue diagnostics helps to make medical laser application more save</b>
11.45	Patricia Alloncle Aix Marseille University (France) <b>Laser-induced cells printing: a versatile tool for applications in biology</b>
12.15	Victor Tsetlin Inst. of Bioorganic Chemistry of RAS (Russia), MEPHI (Russia) <b>Immunotherapy: autoimmune diseases, envenomation, inflammation and cancer</b>
12.45	Victoriya Tishchenko A.F. Tsyb Medical Radiological Research Centre (Russia) <b>PSMA-targeted radiopharmaceuticals for imaging and therapy of prostate cancer</b>
13.05-14.05	<b>Lunch</b>
14.05	Roman Zubarev Karolinska Institutet (Sweden) <b>Orbitrap Fourier Transform Mass Spectrometry redefines chemical mass of hydrogen</b>
14.35	<b>KEYNOTE SPEAKER</b> Alexander Makarov Thermo Fischer Scientific (Germany) <b>Expanding applications of mass spectrometry in modern medicine</b>
15.15	Igor Nabiev Université de Reims Champagne-Ardenne (France), MEPHI (Russia) <b>Label-free detection of SARS-CoV-2 variants of vi-ral protein antigens with sers spectroscopy</b>
15.45-16.15	<b>Coffee break</b>
16.15	<b>Poster session</b>

Wednesday, November 24	<i>Symposium</i> <b>"Physics Engineering and Technologies for Biomedicine"</b>
10.00	<i>KEYNOTE SPEAKER</i> Marco Durante GSI Helmholtzzentrum für Schwerionenforschung (Germany) <b>The future of heavy ion therapy</b>
10.40	Sergey Polozov MEPhI (Russia) <b>Radiation therapy: new challenges and tasks for Russian accelerator community</b>
11.10	Alexey Lipengolts, Vsevolod Skribitsky MEPhI (Russia), N.N. Blokhin National Medical Research Center of Oncology (Russia) <b>Radiologic in vivo studies of laser ablated gold nanoparticles in laboratory animals</b>
11.30	Mikhail Belikhin Lebedev Physics Inst. (Russia) <b>Dosimetric estimation of intrafractional target motion influence on dose distribution in proton therapy using dynamic phantom</b>
11.50	Vyacheslav Saburov A.F. Tsyb Medical Radiological Research Centre (Russia) <b>The status of the neutron therapy complex based on the NG-24M compact neutron generator</b>
12.10	Alexander Pryanichnikov Lebedev Phycs Inst.(Russia), MSU (Russia) <b>Possibilities of proton imaging implementation at protom synchrotron: development of irradiation modes with low intensity beams</b>
12.30	Maxim Kuznetsov Lebedev Phycs Inst.(Russia) <b>Optimization of spatial distribution of irradiation during fractionated proton therapy</b>
12.50-13.50	<b>Lunch</b>
13.50	Geogry Ermolaev Moscow Institute of Physics and Technology (Russia) <b>Ultimate Phase Engineering with Atomically Thin Transition Metal Dichalcogenides</b>
14.10	Alexander Kharin MEPhI (Russia) <b>Laser ablation of porous silicon targets: a molecular dynamics study</b>
14.30	Dmitry Ivanov University of Kassel (Germany), MEPhI (Russia) <b>Theoretical Investigation of Metallic Nanoparticles Generation Processes During Pulsed Laser Ablation in Liquids</b>
14.50	Martin Garcia The University of Kassel (Germany) <b>The SARS-CoV-2 spike protein is vulnerable to moderate electric fields</b>
15.20-15.50	<b>Coffee break</b>
15.50	<b>Poster session</b>
20.00	<b>Discussions and Closing ceremony</b>