# Potential scientific supervisors: Chemistry & Materials Science

| № | Surname | Name | University | Scientific interests | Link to portfolio |
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| 1. | Belskaya | Nataliya | Ural Federal University named after the first President of Russia B.N. Yeltsin | Design and synthesis of novel organic fluorophores for bioimaging applications<br>Synthesis of fluorescent photoprotective groups for targeted delivery of diagnostic agents and drugs. | https://urfu.ru/en/research/postgraduate-programs-in-english/admission-options/open-doors-olympiad/research-supervisors/nataliya-p-belskaya/ |
| 2. | Bulanov | Evgeny | National Research Lobachevsky State University of Nizhny Novgorod | Synthesis and research of inorganic compounds of mineral structural types for development of materials for biomedical applications | http://eng.unn.ru/images/Open_Doors/Profiles/bulanovEN.pdf |
| 3. | Buryukin | Fedor | Siberian Federal University | Enhancement of deep refining technologies, Improvement of oil refining technologies, improvement of motor fuels operating properties fuels, oilfield chemistry, chemical methods of enhanced oil recovery. | https://www.sfu-kras.ru/files/Buryukin_F.A._Struktura_nauchnogo_profilya_portfolio_PNR_2024_ENG.pdf |
| 4. | Gushchin | Artem | Novosibirsk State University | Complexes of platinum group metals and gold with redox-active N-donor ligands: synthesis, study of structure, physicochemical properties and biological activity. | https://www.nsu.ru/upload/medialibrary/2cd/v1un10b7iqyio9s66o1uvlmdd2697zg5/%D0%93%D1%83%D1%89%D0%B8%D0%BD_%D0%B0%D0%BD%D0%B3%D0%BB.pdf |
| 5. | Kerpeleva | Svetlana | Peter the Great St. Petersburg Polytechnic University | Biomechatronics, Mechatronic systems for working in extreme conditions, Materials Science, Tribology | https://opendoors.spbstu.ru/files/supervisors_portfolio/kerpeleva.pdf |
| 6. | Krivoshapkin | Pavel | ITMO University | Nanomaterials and interactions in colloids. Nanomedicine.<br>Sustainable Chemistry for Energy Technologies. Alternative energy sources. | https://int.itmo.ru/en/opendoors_phd |
| 7. | Krivoshapkina | Elena | ITMO University | Developed original methods for the synthesis of metal and metal oxide nanoparticles using solution chemistry; investigated the principles of nanoparticle | https://aspirantura.itmo.ru/?main=43 |

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| | | | | distribution in polymer and inorganic matrices; investigated membrane catalytic reactor protection and the dependence of the catalytic activity on the morphology of the separating layers; investigated the assembly of hybrid systems based on polysaccharide, carbon, scleroprotein and metal oxide nanoparticles; and synthesized and manufactured nanomaterials catalytic, imaging, and sensing applications. Created nanomaterials with improved optical and mechanical properties; used the extended DLVO theory to estimate the interaction energy of particles in aqueous and water-hazardous metal oxide systems, taking into account the structural component of surface forces; identified the key approaches to the production of natural biopolymer-based hybrid materials, which is the foundation for the development of new functional organo-inorganic materials which, due to the combination of components with different structures and properties, have synergistic effects and unique properties. The developed inorganic nanoparticle-modified biopolymer-based material solves a wide range of problems. | |
| 8. | Kurzina | Irina | National Research Tomsk State University | 1. Electrophysical foundations of ion-plasma technologies for modifying the surface properties of polymer materials<br>2. Physico-chemical bases of synthesis and phase formation of ion-modified biocompatible and bioresorbable hydroxyapatite under microwave exposure.<br>3. Physical bases of hardening of ultrafine-grained titanium under irradiation with aluminum and nickel ions.<br>4. Development of new highly efficient adsorbents and technologies for their application to increase the | http://tsuod.tilda.ws/kurzinaen |

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| | | | | volume and quality of APG processing at oil and gas processing enterprises of the Siberian region.<br>5. Scientific bases of new production technologies for obtaining high-performance composite materials and complex-profile products.<br>6. Development of the fundamental foundations for the production of new organic and polymer compounds and materials.<br>7. Search for biomarkers and therapeutic targets in the processes of chronic inflammation associated with the progression of malignant neoplasms, regenerative processes of cardiovascular diseases and implantolog. | |
| 9. | Makarov | Sergey | ITMO University | Perovskite nanophotonics:<br>1. Perovskite nanolasers and microlasers<br>2. Effects of nanophotonics in thin-film optoelectronic devices<br>3. Perovskite devices with dual functionality<br>4. Highly efficient perovskite solar cells | https://int.itmo.ru/en/opendoors_phd |
| 10. | Naumov | Anton | Peter the Great St. Petersburg Polytechnic University | Synthesis of composite materials by means of Friction Stir Processing | https://opendoors.spbstu.ru/files/supervisors_portfolio/naumov.pdf |
| 11. | Nipruk | Oksana | National Research Lobachevsky State University of Nizhny Novgorod | Synthesis and study of compounds of heavy radioactive elements | http://eng.unn.ru/images/Open_Doors/Profiles/niprukOV.pdf |
| 12. | Novikov | Alexander | ITMO University | Studying the properties of (bio)active and functional chemical systems at all levels of matter organizations (from the nano- to the macrolevel) through the use of DFT calculation methods, chemoinformatics, correlation analysis, computer modeling and the creation of descriptor systems for describing complex macromolecules. | https://aspirantura.itmo.ru/?main=43 |

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| 13. | Nyuchev | Alexander | National Research Lobachevsky State University of Nizhny Novgorod | Organic chemistry | http://eng.unn.ru/images/Open_Doors/Profiles/nyuchevAV.pdf |
| 14. | Orlova | Anna | ITMO University | Fundamental research in the field of development of colloidal systems and multilayer coatings based on colloidal quantum-sized semiconductor 0D, 1D and 2D nanocrystals; magnetic nanoparticles; metal oxides; molecular generators of reactive oxygen species (ROS); specific indicator molecules; porous dielectric matrices | https://int.itmo.ru/en/opendoors_phd |
| 15. | Permin | Dmitry | National Research Lobachevsky State University of Nizhny Novgorod | Development of methods for obtaining new ceramic materials in the visible and infrared spectral regions | http://eng.unn.ru/images/Open_Doors/Profiles/perminDA.pdf |
| 16. | Postnikov | Pavel | National Research Tomsk Polytechnic University | 1. Functional upcycling of polymer wastes towards design of smart materials<br>2. Plasmon-assisted transformations of organic compounds<br>3. Design of smart materials for environmental chemical engineering<br>4. Targeted design of non-covalent organic frameworks<br>5. Non-covalent catalysis in organic synthesis<br>6. Novel hypervalent iodine reagents<br>7. Surface chemistry in sensor design | https://tpu.ru/upload/medialibrary/139/56uwzhvvb6b97so2gggw734wl0dd034z/Postnikov-AYA.pdf |
| 17. | Potapov | Andrei | Novosibirsk State University | Novel metal-organic frameworks with high luminescence for the detection of biologically active substances and environmental pollutants; Switchable metal-organic frameworks for the development of smart optical materials. | https://www.nsu.ru/upload/medialibrary/acb/yex1noe6qneisjy9wprx036lbdbur8j2/potapov-russian.pdf |
| 18. | Rodriguez | Raul | National Research Tomsk Polytechnic University | The work of Prof. Rodriguez focuses on nanomaterials. The study of laser treatment processes on nanomaterials and their composites are the basis | https://tpu.ru/upload/medialibrary/bf1/nnbpu2cz3kmtef4pvnhy30xggeukk1tz/Rodriges-_AYA_.pdf |

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| | | | | for the fabrication of graphene-based composites for a wide range of applications from biomedicine to energy. Plasmonic nanomaterials have a special benefit of working as nano-antennas focusing light at the nanoscale and enhancing optical spectroscopy signals. It is used for nanospectroscopy applications and nanoelectronics. | |
| 19. | Romanenko | Sergey | National Research Tomsk Polytechnic University | analytical chemistry, analysis of environmental objects, energy efficiency. | https://tpu.ru/upload/medialibrary/b58/yka18s2n1v8en4vlm7d928odji7u9175/Romanenko-_AYA_.pdf |
| 20. | Sadykov | Vladislav | Novosibirsk State University | Synthesis and characterization of materials with mixed ionic-electronic conductivity for oxygen and hydrogen separation membranes; nanocomposite materials for catalysts of biofuels transformation into syngas and hydrogen | https://www.nsu.ru/upload/medialibrary/951/iirb66g4z9sig4aswro8qd94rwc4tr1b/%D0%A1%D0%B0%D0%B4%D1%8B%D0%BA%D0%BE%D0%B2_%D0%B0%D0%BD%D0%B3%D0%BB_2023.pdf |
| 21. | Savchenkov | Anton | Samara University | Synthesis, structure elucidation and relationship among composition/structure/properties of coordination compounds.<br>Implementation of stereoatomic model and Voronoi–Dirichlet tessellation for analysis of crystal structures, including noncovalent interactions, polymorphism, actinide contraction and more. | https://ssau.ru/storage/pages/5566/file_66f6b8b91ee3f8.12948670.pdf |
| 22. | Shityakov | Sergey | ITMO University | Neuroscience, precision medicine, bioinformatics, biomedical engineering, and rational drug design at the blood-brain barrier using modern computer modelling methods of chemical interactions. | https://aspirantura.itmo.ru/?main=43 |
| 23. | Skorb | Ekaterina | ITMO University | Infochemistry and self-organization for chemical systems.<br>Development of interdisciplinary approaches of chemistry with IT with study and modeling of chemical systems at interfaces for programmable, smart materials for medicine, diagnostics, energy, etc. | https://aspirantura.itmo.ru/?main=43 |

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| 24. | Smirnov | Evgeny | ITMO University | Nanotechnology, material science, nanoparticles: synthesis and properties of colloidal particles, preparation of novel materials.<br>Physical chemistry, surface chemistry: self-assembly at soft interfaces (liquid-liquid, liquid-air, etc.).<br>Electrochemistry: investigation of properties of nanoparticles and their assemblies, in particular, for photocatalytic and electrocatalytic applications.<br>Analytical chemistry: application of nanoparticles and their assemblies for surface enhanced methods, for example, SERS, as well as in ELISA-based methods. | https://aspirantura.itmo.ru/?main=43 |
| 25. | Stepanova | Elena | National Research Tomsk Polytechnic University | Carbohydrate chemistry. Total synthesis. Protective groups in carbohydrates. | https://tpu.ru/upload/medialibrary/01d/vyvrcc6s0m0dk2j52h2nv9lk1hykq5nf/Stepanova-_AYA_.pdf |
| 26. | Ulasevich | Svetlana | ITMO University | The main research interests concern biomimetic materials and the development of bioactive materials based on functional coatings based on titanium dioxide and polymer systems, as well as the study of their principles of functioning and biological response. Functional coatings and stimuli-responsive dynamic systems have been developed to create microdosing systems for the controlled release of drugs, active chemicals, as well as to regulate and control the growth of osteoblast cells. The sonochemical fabrication of functional materials and coatings. | https://aspirantura.itmo.ru/?main=43 |
| 27. | Ushakova | Elena | ITMO University | Synthesis and functionalization of carbon nanoparticles by solvothermal and microwave methods<br>Hybrid materials based on carbon nanoparticles and metal, semiconductor and magnetic nanoparticles<br>Carbon nanoparticles emitting in the red and near infrared region of the spectrum<br>Chiral carbon nanoparticles for theranostics<br>Sensors based on carbon nanoparticles | https://aspirantura.itmo.ru/?main=43 |

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| 28. | Uspenskaya | Mayya | Peter the Great St. Petersburg Polytechnic University | Polymers, ecology, waste recycling, sensor systems, environmental monitoring, eco-friendly materials. | https://opendoors.spbstu.ru/files/supervisors_portfolio/uspenskaya.pdf |
| 29. | Vasilyeva | Marina | Far Eastern Federal University | Environmental chemistry, electrochemical synthesis of film functional materials, plasma electrolytic oxidation, heterogeneous catalysis, photocatalysis, surface chemistry, electrode materials, electrochemical sensors. | https://www.dvfu.ru/en/open_doors/vasilyeva/ |
| 30. | Zelentsov | Sergey | National Research Lobachevsky State University of Nizhny Novgorod | Quantum chemistry, photochemistry, plasma chemistry, potential energy surface method, reaction mechanisms in high energy chemistry, photolithography, electron lithography, photochemistry of azides and nitro compounds, mathematical methods in chemistry. | http://eng.unn.ru/images/Open_Doors/Profiles/zelentsov.pdf |