

	<p>USHAKOVA, Elena V. Doctor of Science</p>
<p>Research interests</p>	<ul style="list-style-type: none"> <li>✓ Synthesis and functionalization of carbon nanoparticles by solvothermal and microwave methods</li> <li>✓ Hybrid materials based on carbon nanoparticles and metal, semiconductor and magnetic nanoparticles</li> <li>✓ Carbon nanoparticles emitting in the red and near infrared region of the spectrum</li> <li>✓ Chiral carbon nanoparticles for theranostics</li> <li>✓ Sensors based on carbon nanoparticles</li> </ul>
<p>Features of the PhD program</p>	<ul style="list-style-type: none"> <li>✓ Training and work on modern spectral equipment, including microscopy methods</li> <li>✓ Collaborations with foreign research groups (Australia, Hong Kong, Germany, Ireland)</li> <li>✓ Financial support for a PhD student in completing kpi.</li> </ul>
<p>List of the supervisor's research projects (participation/supervision)</p>	<ul style="list-style-type: none"> <li>✓ RSF «Chiral carbon nanoparticles with optical transitions in the red and near-infrared regions for theranostics» (2022-2024), PI</li> <li>✓ Priority 2030 «Functionalized carbon nanoparticles» (2022-2024), PI</li> </ul>
<p>List of potential thesis topics</p>	<ul style="list-style-type: none"> <li>✓ Self-assembly of (non)metallic nanoparticles at soft interfaces and their implementation for optics, catalytic and electrocatalytic applications</li> <li>✓ Self-assembly of 2D materials (graphene, graphene oxide, MXene) at soft interfaces and investigation of their properties (optical, catalytic and electrocatalytic)</li> <li>✓ Sensing elements based on in-situ generation of reagents (in particular, ELISA sensors with H<sub>2</sub>O<sub>2</sub> in-situ generation)</li> </ul>
<p>Publications in the last five years</p>	<p>51 (Scopus / Web of Science)</p>
<p>Key publications</p>	<p>1. Kosolapova, K. D., Koroleva, A. V., Arefina, I. A., Miruschenko, M. D., Cherevko, S. A., Spiridonov, I. G., Zhizhin E.V., Ushakova E.V., Rogach, A. L. (2023). Energy-level engineering of carbon dots through a post-synthetic treatment with acids and amines// <i>Nanoscale</i>. - 2023. - V. 15. - pp. 8845-8853. DOI: 10.1039/D3NR00377A IF=7.366, SJR=1.62</p> <p>2. Das A., Kundelev E. V., Vedernikova A. A., Cherevko S. A., Danilov D. V., Koroleva A. V., Zhizhin E. V., Tsytkin A. N., Litvin A. P., Baranov A. V., Fedorov A. V., Ushakova E. V., Rogach, A. L. Revealing the nature of optical activity in carbon dots produced from different chiral precursor molecules // <i>Light</i>:</p>

	<p>Science &amp; Applications. – 2022. – V. 11(92). DOI: 10.1038/s41377-022-00778-9. IF=18.491, SJR=6.1, Q1 (2013)</p> <p>3. Döring A., Ushakova E.V., Rogach A. L. Chiral carbon dots: synthesis, optical properties, and emerging applications //Light: Science &amp; Applications. – 2022. – V. 11(75). DOI: 10.1038/s41377-022-00764-1. IF=18.491, SJR=6.1, Q1 (2013)</p> <p>4. Marunchenko A. A. Baranov M. A., Ushakova E. V., Ryabov D. R., Pushkarev A. P., Gets D. S., Nasibulin A. G., Makarov S. V.. Single-Walled Carbon Nanotube Thin Film for Flexible and Highly Responsive Perovskite Photodetector //Advanced Functional Materials. – 2022. – V. 32. – No. 12. – p. 2109834. DOI: 10.1002/adfm.202109834. IF=17.093, SJR=6.069 Q1 (2002)</p> <p>5. Litvin A. P., Zhang X., Ushakova E. V., Rogach, A. L. Carbon Nanoparticles as Versatile Auxiliary Components of Perovskite-Based Optoelectronic Devices //Adv. Funct. Mater. – 2021. – P.2010768. DOI: 10.1002/adfm.202010768. IF=16.723, SJR=5.88;</p>
Key IPs	<p>Kurshanov D.A., Cherevko S.A., Baranov A.V., Dubavik A.Yu., Ushakova E.V., Bogdanov K.V., Baranov M.A. Luminescent sensor for the concentration of heavy metal ions (mainly cobalt) in water based on quantum dots of ternary composition – 2020</p>
Supervisor’s specific requirements	<ul style="list-style-type: none"> <li>✓ English</li> <li>✓ Basic knowledge in optics/organic chemistry</li> <li>✓ Learnability</li> </ul>
Code of the subject area of the PhD program	<p>1.3.6 Optics 1.3.17 Chemical Physics, Burning and Combustion, Physics of Extreme States of Matter</p>