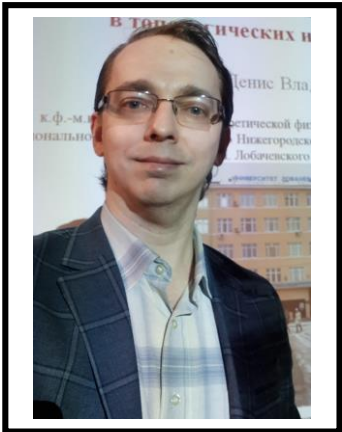


DENIS V. KHOMITSKY

University	National Research Lobachevsky State University of Nizhny Novgorod
Level of English proficiency	Advanced
Educational program and field of the educational program for which the applicant will be accepted	1.3. Physical sciences 1.3.8. Condensed Matter Physics
List of research projects of the potential supervisor (participation/leadership)	<p>1. State assignment of the Ministry of Science and Higher Education of the Russian Federation "Nanostructured semiconductors, Dirac materials and crystals of biologically active substances for photonics, spintronics, quantum computing and biomedicine", project No. 0729-2020-0058 (2020-2022)</p> <p>2. State assignment of the Ministry of Science and Higher Education of the Russian Federation "Quantum structures for quantum technologies", project No. FSWR-2023-0035 (2023-2025)</p>
List of the topics offered for the prospective scientific research	<p>1) Landau-Zener-Stuckelberg-Majorana interferometry of driven quantum dots;</p> <p>2) Modeling of coupled quantum dots in topological insulators formed by magnetic barriers;</p> <p>3) Exchange interaction modeling for holes in quantum wells with neighboring delta layer of magnetic atoms.</p>
 <p>Research supervisor:</p> <p>Denis V. Khomitsky,</p> <p>Candidate of Science/PhD (Lobachevsky State University of Nizhny Novgorod)</p>	Physical and technical sciences
	<p>Supervisor's research interests</p> <p>Theory of nanostructures, spintronics; Optical and transport properties of nanostructures; Spin dynamics in quantum dots and topological insulators; Regular and irregular dynamics of spin in nonstationary fields</p>
	<p>Research highlights</p> <p>Quantum states, spin textures, optical and transport properties of semiconductor nanostructures such as quantum wells, nanowires and quantum dots with spin-orbit coupling. Combined effects of tunneling and driving on spin evolution. Quantum dot formation in topological insulators by magnetic barriers. Regular and irregular dynamics of tunneling and spin in nonstationary fields applied to nanostructures.</p>
	<p>Supervisor's specific requirements</p> <p>Well-developed skills in basic methods of quantum mechanics; Well-developed skills in solid state physics; Good skills in programming of problems in quantum mechanics, mathematical physics and linear algebra.</p>
	<p>Supervisor's main publications</p> <p><i>10 papers in WoS, Scopus and RSCI during 2019-2023, including:</i></p> <p>[1] Khomitsky, D.V. Electric dipole spin resonance at shallow donors in quantum wires / D.V. Khomitsky, E.A. Lavrakhina, and E.Ya. Sherman // <i>Physical Review B</i>. – 2019. – V.99. – P.014308.</p> <p>[2] Khomitsky, D.V. Spin Rotation by Resonant Electric Field in Few-Level Quantum Dots: Floquet Dynamics and Tunneling /</p>

	<p><i>D.V. Khomitsky, E.A. Lavrukhina, and E.Ya. Sherman // Physical Review Applied. – 2020. – V.14. – P.014090.</i></p> <p>[3] <i>Dorokhin, M.V. Role of resident electrons in the manifestation of a spin polarization memory effect in Mn delta-doped GaAs heterostructures / M.V. Dorokhin, M.V. Ved, P.B. Demina, D.V. Khomitsky, K.S. Kabaev, M.A.G. Balanta, F. Ikawa, B.N. Zvonkov, and N.V. Dikareva // Physical Review B. – 2021. – V.104. – P.125309.</i></p> <p>[4] <i>Khomitsky, D.V. Formation of bound states from the edge states of 2D topological insulator by macroscopic magnetic barriers / D.V. Khomitsky, A.A. Konakov and E.A. Lavrukhina // Journal of Physics: Condensed Matter. – 2022. – V.34. – P.405302.</i></p> <p>[5] <i>Khomitsky, D.V. Single-spin Landau-Zener-Stückelberg-Majorana interferometry of Zeeman-split states with strong spin-orbit interaction in a double quantum dot / D.V. Khomitsky and S.A. Studenikin // Physical Review B. – 2022. – V.106. – P.195414.</i></p>
	<p>Results of intellectual activity</p> <p>-</p>