	GORLACH, Maxim A. Candidate of Science
Research interests	✓ Theoretical nanophotonics, metamaterials, axion electrodynamics ✓ Topological photonics, superconducting qubits ✓ Quantum technologies
Features of the PhD program	✓ Collaboration with Nobel Prize winner Prof. Frank Wilczek ✓ Research agenda is supported by Priority 2030 strategic development program of ITMO as one of the most promising ✓ Publications in the most prestigious international journals: Nature Photonics, Nature Communications, Laser & Photonics Reviews, Physical Review Letters
List of the supervisor's research projects (participation/supervision)	✓ Axion electrodynamics, axion topological insulators (supervision) ✓ Topological states in arrays of superconducting qubits (supervision) ✓ Topological photonics (supervision)
List of potential thesis topics	✓ Axion metamaterials ✓ Topological protection of quantum computations ✓ Topological photonics: from microwaves to the visible
Publications in the last five years	53 (Scopus / Web of Science)
Key publications	1. A.A. Stepanenko, M.D. Lyubarov, M.A. Gorlach. "Higher-Order Topological Phase of Interacting Photon Pairs", Physical Review Letters 128, 213903 (2022). 2. L. Shaposhnikov, M. Mazanov, D.A. Bobylev, F. Wilczek, M.A. Gorlach. "Emergent axion response in multilayered metamaterials", Physical Review B 108, 115101 (2023). 3. D.A. Bobylev, D.A. Smirnova, M.A. Gorlach. "Photonic Topological States Mediated by Staggered Bianisotropy", Laser & Photonics Reviews 15, 1900392 (2021). 4. N.A. Olekhno, E.I. Kretov, A.A. Stepanenko, P.A. Ivanova, V.V. Yaroshenko, E.M. Puhtina, D.S. Filonov, B. Cappello, L. Matekovits, M.A. Gorlach. "Topological edge states of interacting photon pairs emulated in a topolectrical circuit", Nature Communications 11, 1436 (2020). 5. M. Li, D. Zhirihin, M. Gorlach, X. Ni, D. Filonov, A. Slobozhanyuk, A. Alu, A.B. Khanikaev. "Higher-order topological states in photonic kagome crystals with long-range interactions", Nature Photonics 14, 89-94 (2020).

Supervisor's specific requirements	✓ At least one publication in a peer-reviewed international journal (not conference proceeding) ✓ Solid background in classical electrodynamics and quantum mechanics ✓ Previous research experience in the related area of physics: photonics, condensed matter or theoretical physics ✓ See further details of PhD vacancy at the website https://physics.itmo.ru/en/vacancy/75
Code of the subject area of the PhD program	1.3.3 Theoretical physics 1.3.6 Optics