

Nikolai Khokhlov, PhD

Postdoctoral Researcher
in Ultrafast Magnetism & Magneto-Optics

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SUMMARY

Ph.D. in Physics with over 10 years of experience in academia and government labs, specializing in Experimental Optics, Photonics and Femtomagnetism. Proven track record of translating high-level research challenges into robust automated setups and executing projects within a €150K+ budget. Cross-functional researcher focused on optimizing experimental workflows and delivering high-impactful results, experienced in team-leading and collaboration with international groups.

Optical lab experience: free-space optics | ultrafast laser-based setups | optical spectroscopy microscopy and imaging

Software: Python, MATLAB, LabView, OOMMF, Boris Spintronics, C#

Professional competencies: Project management & workflow optimization | Team leadership & mentorship | Grant writing & budgeting | Design of educational courses & training

RESEARCH EXPERIENCE

Postdoctoral Fellow | *Radboud University, Nijmegen, Netherlands* | **12.2022 – Present**

Group of Prof. Alexey Kimel (Ultrafast Spectroscopy of Correlated Materials)

- Conducting experimental research in femtomagnetism and all-optical magnetization switching (AOS) in antiferromagnets and magnetoelectric materials.
- Designed and constructed optical dual-pump-probe setup combining sub-picosecond temporal and sub-micron spatial resolutions at cryogenic temperatures.
- Spearheaded the migration of lab instrumentation and data-analysis pipelines from LabVIEW to Python, accelerating data workflows by up to 75%.
- Co-authored 5 high-impact publications (including Nature Physics, Physical Review Letters) and delivered over 10 conference presentations.
- Providing daily supervision and technical mentorship to 2 Ph.D. candidates.

Senior Research Fellow | *Ioffe Institute, St. Petersburg, Russia* | **04.2017 – 11.2022**

Group of Dr. Alexandra Kalashnikova (Ferroics Physics Lab)

- Led a dedicated research line focused on optically excited spin waves and ultrafast magnetoacoustics.
- Successfully secured and managed €150,000+ in research funding as a Principal Investigator (RSF, RFBR, BASIS grants).
- Planned and supervised the full-lifecycle construction of two experimental laboratories

dedicated to femtosecond optical spectroscopy and microscopy.

- Supervised and successfully guided 2 Ph.D. and 5 M.Sc. students through to their project defenses.

Research Fellow | Russian Quantum Center / Moscow State University, Russia | 2013 – 2017

Group of Prof. Vladimir Belotelov

- Investigated magneto-plasmonic and magneto-photonic heterostructures for enhanced magneto-optical activity.
- Built a static magneto-optical spectroscopy setup and a time-resolved pump-probe setup from scratch (procurement, alignment, testing).
- Programmed specialized instrumentation control architectures using MATLAB and LabVIEW.

TEACHING & MENTORING EXPERIENCE

- **Invited Associate Professor | ITMO University, Russia | 2018 – 2022**
Developed and delivered two graduate-level courses for M.Sc. students: "Micromagnetics" and "Linear and Nonlinear Magnetophotonics".
- **Student Supervision:** Directly mentored 4 Ph.D. students (2 successfully defended) and 5 M.Sc. students through to successful defenses and publication of results.
- **Science Outreach:** Winner of the City Science Slam (St. Petersburg, 2018); former Natural Sciences Teacher at Gymnasium 1518 (supervised high-school research projects).

SELECTED PUBLICATIONS

30+ publications in peer reviewed journals: [Scopus](#) || [Google Scholar](#)

1. I. A. Filatov, ..., **N. E. Khokhlov**, A. M. Kalashnikova. "Magnon-Cherenkov effect from a picosecond strain pulse." *Nature Physics*, 1-7 (2026). DOI: [10.1038/s41567-025-03137-8](https://doi.org/10.1038/s41567-025-03137-8)
2. T. T. Gareev, **N. E. Khokhlov**, L. Körber, A. P. Pyatakov, A. V. Kimel. "Electrically-gated laser-induced spin dynamics in magnetoelectric iron garnet at room temperature." *Physical Review Letters*, vol. 136, p. 126702 (2026). DOI: [10.1103/wx41-2bsr](https://doi.org/10.1103/wx41-2bsr)
3. T. T. Gareev, **N. E. Khokhlov**, L. Körber, A. V. Kimel. "Strongly inhomogeneous spin dynamics induced by ultrashort laser pulses with a gradient intensity profile." *Physical Review Letters*, vol. 135, p. 156701 (2025). DOI: [10.1103/gspf-b9n2](https://doi.org/10.1103/gspf-b9n2)
4. **N. E. Khokhlov**, A. E. Dolgikh, B. A. Ivanov, A. V. Kimel. "Double pulse all-optical coherent control of ultrafast spin-reorientation in antiferromagnetic rare-earth orthoferrite." *APL Materials*, vol. 12, p. 051119 (2024). DOI: [10.1063/5.0197976](https://doi.org/10.1063/5.0197976).
5. **N. E. Khokhlov**, P. Gerevenkov, ..., A. M. Kalashnikova. "Optical excitation of propagating magnetostatic waves in an epitaxial galferol film by ultrafast magnetic anisotropy change." *Physical Review Applied*, vol. 12, p. 044044 (2019). DOI: [10.1103/PhysRevApplied.12.044044](https://doi.org/10.1103/PhysRevApplied.12.044044)

GRANTS & FUNDING RECORD

- **European Projects:** Participant of EU COST Action CA17123 "Magnetofon" and collaborator within the ERC Advanced Grant "SPARTACUS".
- **Russian Science Foundation (RSF):** Grant Team Leader (project 22-22-00326, €60,000); Key Performer in 4 others RSF grants.
- **Russian Foundation for Basic Research (RFBR):** Principal Investigator (3 projects, €30,000 total); Performer in 20+ RFBR grants.
- **Private Foundations:** Personal Grant 19-1-3-42-1 from the "BASIS" Foundation for Theoretical Physics (€20,000).
- **Federal Programs:** Research performer in "Megagrant" project .

EDUCATION

Ph.D. in Physics | Moscow State University (MSU), Faculty of Physics, Russia | **2011 – 2015**

Thesis: "Resonant optical effects at optical, magnetic and acoustic impacts on plasmon-polaritons in multilayered structures."

Supervisor: Prof. Vladimir I. Belotelov

M.Sc. Equivalent (Specialist) in Physics | Moscow State University, Russia | **2005 – 2011**

Thesis: "Electromagnetic field localization in plasmonic crystals containing magnetic and semiconductor layers."

HONORS, AWARDS & FELLOWSHIPS

- **2022:** Best Young Scientist Research Award, Ioffe Institute.
- **2017, 2019, 2022:** St. Petersburg Government Award for Outstanding Young Ph.D. Researchers.
- **2020:** State Certificate of Intellectual Property / Authorship for ultrafast optical pump-probe spectroscopy automation software.
- **2012: DAAD Fellowship** (German Academic Exchange Service) for short-term doctoral research at the Technical University of Dortmund, Germany.

REFERENCES

Prof. Alexey Kimel (Postdoc Advisor) | Radboud University, Netherlands

Dr. Alexandra Kalashnikova (Former Laboratory Head) | Ioffe Institute, Russia