

Dr. Natalia Kopteva

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EMPLOYMENT

Sep. 2014 – Dec. 2019 **Junior researcher**
Spin Optics Laboratory, St.Petersburg State University, Russia

Feb. 2019 – Present **Researcher**
Spin Optics Laboratory, St.Petersburg State University, Russia

EDUCATION

Sept. 2009 – Aug. 2013 **Bachelor of Science in Physics**
Physical Faculty of the St.Petersburg State University, Russia
Thesis: “Photo-induced Faraday rotation in microcavities”
Adviser: Dr. R.V. Cherbunin

Sep. 2013 – Aug. 2015 **Master of Science in Physics** (diploma with honour)
Physical Faculty of the St.Petersburg State University, Russia
Thesis: “Observation of Rabi oscillations in microcavities by the Kerr rotation signal”
Adviser: Dr. R.V. Cherbunin

Sep. 2015 – Aug. 2019 **Ph.D. in Physics**, Physical Faculty of the St.Petersburg State University, Russia
Thesis: «Electron-nuclear spin dynamics in semiconductor nanostructures»
Adviser: Prof., Dr. Irina Yugova

My work in the field of optical properties of semiconductor nanostructures has involved:

2013-2015 Experimental study of polariton dynamics in semiconductor microcavities by pump-probe method:

- Development of ability to reach significant photoinduced Kerr rotation angle;
- An experimental study of Rabi oscillation effect in semiconductor microcavities.

2015-2019 Experimental and theoretical investigations of the electron-nuclear spin interactions in ZnSe based structures and InAs/GaAs quantum dots:

- An experimental study of the electron-nuclear spin dynamics of donor-localized electrons in the ZnSe structure;
- Theoretical modeling of electron-nuclear spin dynamics of Kerr rotation signal in a regime of the dynamical nuclear polarization;
- Generalization of the theoretical model of signal formation in pump-probe experiments to the case of nonresonant optical pumping of carriers localized in quantum dots by laser pulse trains.

SCIENTIFIC INTERESTS

- Ultrafast optical spectroscopy of semiconductor nanostructures.
- Spin dynamics in semiconductor nanostructures.
- Electron-nuclear spin interactions in semiconductor nanostructures.

AWARDS

2013 - 2015 Personal scholarship of the Saint Petersburg State University

2017-2018 Rector's scholarship for PhD students in the Saint Petersburg State University

SCIENTIFIC VISITS

2016-2019

Group of Prof. Dr. Manfred Bayer

Experimentelle Physik II, Fachbereich Physik, TU Dortmund

Several research stays of one-three months duration in TU Dortmund supported by the Deutsche Forschungsgemeinschaft.

PUBLICATIONS

- N.E. Kopteva, E. Kirstein, E. A. Zhukov, M. Hussain, A. S. Bhatti, A. Pawlis, D. R. Yakovlev, M. Bayer, A. Greilich. Spin dephasing of electrons and holes in isotopically purified ZnSe/(Zn,Mg)Se quantum wells, PRB 100, 205415 (2019).
- Kopteva N. E., Yugova I. A, Zhukov E. A., Kirstein E., Evers E., Belykh V. V., Korenev V. L., Yakovlev D. R, Bayer M. and Greilich A. Theoretical modeling of the nuclear-field Induced tuning of the electron spin precession for localized spins, Physica Status Solidi B, 256, 1800534 (2019).
- E.A. Zhukov, E. Kirstein, N.E. Kopteva, F. Heisterkamp, I.A. Yugova, V.L. Korenev, D.R. Yakovlev, A. Pawlis, M. Bayer and A. Greilich, « Discretization of the total magnetic field by the nuclear spin bath in fluorine-doped ZnSe», Nature Communication, 9, 1941 (2018)
- E. Evers, V. V. Belykh, N. E. Kopteva, I. A. Yugova, A. Greilich, D. R. Yakovlev, D. Reuter, A. D. Wieck, and M. Bayer, « Decay and revival of electron spin polarization in an ensemble of (In,Ga)As quantum dots», PRB 98, 075309 (2018).
- A. Akimov, M. Salewski, I. V. Kalitukha, S. V. Poltavtsev, J. Debus, D. Kudlacik, V. F. Sapega, N. E. Kopteva, E. Kirstein, E. A. Zhukov, D. R. Yakovlev, G. Karczewski, M. Wiater, T. Wojtowicz, V. L. Korenev, Yu. G. Kusrayev, and M. Bayer, “Direct measurement of the long-range p–d exchange coupling in a ferromagnet-semiconductor Co/CdMgTe/CdTe quantum well hybrid structure”, PRB 96, 184412 (2017).
- A. V. Trifonov, N. E. Kopteva, M. V. Durnev, I. Ya. Gerlovin, R. V. Cherbunin, A. Tzimis, S. I. Tsintzos, Z. Hatzopoulos, P. G. Savvidis, and A. V. Kavokin, “Inverse-phase Rabi oscillations in semiconductor microcavities”, PRB 95, 155304 (2017).
- R. V. Cherbunin, M. Vladimirova, K. V. Kavokin, A. V. Mikhailov, N. E. Kopteva, P. G. Lagoudakis, and A. V. Kavokin, „Significant photoinduced Kerr rotation achieved in semiconductor microcavities“, PRB 91, 205308 (2015).
- S. V. Poltavtsev, I. I. Ryzhov, R. V. Cherbunin, A. V. Mikhailov, N. E. Kopteva, G. G. Kozlov, K. V. Kavokin, V. S. Zapasskii, P. V. Lagoudakis, and A. V. Kavokin, “Optics of spin-noise-induced gyrotropy of an asymmetric microcavity”, PRB 89, 205308 (2014).