Curriculum Vitae

Dr. Yuriy Yerin

The Physics Division of the School of Science and Technology,
the University of Camerino

Education

Graduated with cum laude from the Department of Theoretical Physics, Physics faculty, V.N. Karazin Kharkov National University,
MSc Thesis: *Non-stationary Ginzburg-Landau equations for a two-band superconductor.*

PhD at the B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine in 2013,
PhD thesis: *Coherent current states in two-band superconductors*, Advisor: Prof. Dr. A.N. Omelyanchouk.

Research expertise

Solid state and condensed matter physics, nano- and mesoscale phenomena in superconductors, BCS-BEC crossover. Professional skills in *Matlab, C++, Maple* and *Comsol Multiphysics.*
Scientific popularization (in Russian) of the last achievements in physics elementy.ru/news?theme=3150219

Teaching expertise

- The theory of superconductivity for master's degree and postgraduate students in 2005-2007, V. N. Karazin Kharkiv National University
- Teacher of physics and astronomy in the middle and high schools in 2005-2009, Kharkiv, Ukraine

Awards

President Prize for outstanding young students, 2003, 2004.
Scholarship award of the National Academy of Sciences of Ukraine for 2014-2015

Languages

English: fluent
Ukrainian: native
Russian: native
Italian: basic

Conferences

1. "Condensed Matter: Theory & Applications", Kharkov, Ukraine, 2006.
2. "Physical Phenomena in Solids", Kharkov, Ukraine, 2007.
3. "Physical properties of nanosystems", NATO workshop, Yalta, Ukraine, 2009.
4. "International Conference on Superconductivity and Magnetism", Antalya, Turkey, 25-30 April 2010.
5. Review report "*Type 1.5 superconductivity*" on II International Conference for Young Scientists "Low Temperature Physics" (ICYS–LTP–2011), Kharkov, Ukraine, 6 - 10 June 2011.
6. "International Conference on Superconductivity and Magnetism", Istanbul, Turkey, 29 April - 4 May 2012.
7. III International Conference for Young Scientists "Low Temperature Physics" (ICYS–LTP–2012), Kharkov, Ukraine, 14 - 18 May 2012.
8. Trilateral (Russia-Ukraine-Germany) workshop on Hot Topics in HTSC: Fe-Based Superconductors, Zvenigorod, Ukraine, September 29 – October 2 2013
9. "International Conference on Superconductivity and Magnetism", Antalya, Turkey, 27 April - 2 May 2014.
10. XX Symposium "Nanophysics & Nanoelectronics", Nizhniy Novgorod, Russia, March 14-18, 2016.
11. "International Conference on Superconductivity and Magnetism", Dalaman, Turkey, 24 April - 30 April 2016.
12. XXI Symposium "Nanophysics & Nanoelectronics", Nizhniy Novgorod, Russia, March 13-17, 2017.
13. DPG Frühjahrstagung (Spring Meeting) of the Condensed Matter Section, Dresden, Germany, 19 - 24 March 2017.
14. The Workshop "Synthesis, theoretical examination and experimental investigation of emergent materials", Moscow, Russia, 14-16 June, 2017.
15. The international conference SuperFluctuations 2017 "Fluctuations and Highly Non Linear Phenomena in Superfluids and Superconductors", San Benedetto del Tronto, Italy, September 6–8, 2017.
16. International Conference on Multi-Condensate Superconductivity and Superfluidity in Solids and Ultra-cold Gases, ICTP Trieste, Italy, 14-18 May, 2018
17. International conference SuperFluctuations 2018 "Fluctuations and Highly Non Linear Phenomena in Superfluids and Superconductors", San Benedetto del Tronto, Italy, September 5–7, 2018.
18. International conference SuperFluctuations 2019 "Fluctuations and Highly Non Linear Phenomena in Superfluids and Superconductors", Padova, Italy, September 2–4, 2019.

Visiting scientist and collaboration

The Leibniz Institute of Photonic Technology (*Prof. E. Ill'ichev*)

The Leibniz Institute for Solid State and Materials Research in Dresden (*Prof. Dr. Jeroen van den Brink, Dr. S.-L. Drechsler and Dr. D. Efremov*)

Technische Universität Dresden (*Prof. Dr. Hans-Henning Klauß, Prof. Dr. D. Inosov*)

Universität Bayreuth (*Prof. Dr. Vollrath Martin Axt and Dr. Alexei Vagov*)

Grants and projects

Joint research project of RFBR-NAS of Ukraine "Quantum dynamic phenomena in superconducting qubits" for 2009-2010.

Research project for young scientists of the National Academy of Sciences Ukraine "Theoretical and experimental investigation of the superconducting properties of oxypnictides and iron chalcogenides and structures based on them" for 2011-2012.

Joint Ukrainian-German project of Humboldt Foundation "Synthesis and study of new iron-based high-temperature superconductors" for 2012-2015.

Joint Ukrainian-German research project "Quantum effects in a qubit systems based on single-band and multiband superconductors" for 2013-2015.

Research project of Russian Science Foundation "Transport and electrodynamic properties of hybrid structures for superconducting cryoelectronics and spintronics" for 2015-2017.

DFG German Research Foundation individual project "Disorder effect on the structure of a single-vortex state and the morphology of vortex lattice in non-centrosymmetric superconductors" for 2017-2018.

List of publications

1. Y. S. Yerin and A. N. Omelyanchouk, *Coherent current states in a two-band superconductor*, Low Temp. Phys. 33, 401 (2007).
2. Y. S. Yerin, S. V. Kuplevakhskii, and A. N. Omelyanchuk, *Little–Parks effect for two-band superconductors*, Low Temp. Phys. 34, 891 (2008).
3. A.N. Omelyanchouk, Y. S. Yerin, *Josephson effect in point contacts between two-band superconductors*, arXiv:0910.1429, proceedings of NATO advanced research workshop "Physical properties of nanosystems (PPN-2009)".
4. Y. S. Yerin, A. N. Omelyanchouk, *Josephson currents in point contacts between dirty two-band superconductors*, Low Temp. Phys. 36, 969 (2010).
5. Y.S. Yerin, S. V. Kuplevakhskiy, and A. N. Omelyanchouk, *Soliton states in mesoscopic two-band-superconducting cylinders*, Low Temp. Phys. 37, 667 (2011).
6. V. N. Fenchenko, Y. S. Yerin, *Phase slip centers in a two-band superconducting filament: application to MgB_2*, Physica C: Superconductivity, 480, 129 (2012).
7. Y.S. Yerin, V.N. Fenchenko and E.V. Il'ichev, *Phase diagram of the resistive state of a narrow superconducting channel in the voltage-driven regime*, Low Temp. Phys. 39, 125 (2013).
8. Y. Yerin, S.-L. Drechsler, G. Fuchs, *Ginzburg-Landau analysis of the critical temperature and the upper critical field for three-band superconductors*, J. of Low Temp. Phys. 173, 247 (2013).
9. Y. S. Yerin, V. N. Fenchenko, *Dynamics of the resistive state of a narrow superconducting channel in the ac voltage driven regime*, Low Temp. Phys. 39, 1023 (2013).
10. Y.S. Yerin and A. N. Omelyanchouk, *Frustration phenomena in Josephson point contacts between single-band and three-band superconductors*, Low Temp. Phys. 40, 943 (2014).

11. Y. S. Yerin, A.N. Omelyanchouk, E. Il'ichev, *Dc SQUID based on a three-band superconductor with broken time-reversal symmetry*, Supercond. Sci. Technol. 28, 095006 (2015).
12. Y.S. Yerin, A.S. Kiyko, A.N. Omelyanchouk and E. Il'ichev, *Josephson systems based on ballistic point contacts between single-band and multi-band superconductors*, Low Temp. Phys. 41, 885 (2015).
13. Y. Yerin, A. Omelyanchouk, S.-L. Drechsler, D.V. Efremov and Jeroen van den Brink, *Anomalous diamagnetic response in multi-band superconductors with time-reversal broken symmetry*, Phys. Rev. B 96, 144513 (2017).
14. Y. Yerin, A.N. Omelyanchouk, *Proximity and Josephson effects in microstructures based on multiband superconductors*, Low Temp. Phys. 43, 1263 (2017).
15. S. V. Mironov, D. Yu. Vodolazov, Y. Yerin, A. V. Samokhvalov, A. S. Mel'nikov, and A. Buzdin, "*Temperature Controlled Fulde-Ferrell-Larkin-Ovchinnikov Instability in Superconductor-Ferromagnet Hybrids*", Phys. Rev. Lett. 121, 077002 (2018).
16. E. E. Pestov, Y. N. Nozdrin, A. I. El'kina, Y. S. Yerin, M. Lyu, A. I. Boltalin, I. V. Morozov, *Specific features of the nonlinear microwave response of the* $(Na_{0.3}K_{0.7})_xFe_{2-y}Se_2$ *sodium–potassium ferroselenide-based multiband superconductors*, Physics of the Solid State 60, 2157 (2018).
17. A. S. Cameron, Y. S. Yerin, Y. V. Tymoshenko, P. Y. Portnichenko, A. S. Sukhanov, M. Ciomaga Hatnean, D. McK. Paul, G. Balakrishnan, R. Cubitt, D. S. Inosov, *Rotation of the magnetic vortex lattice in* Ru_7B_3 *driven by the effects of broken time-reversal and inversion symmetry*, arXiv:1810.03876 (accepted for the publication in PRB).
18. S. V. Mironov, D. Yu. Vodolazov, Y. Yerin, A. V. Samokhvalov, A. S. Mel'nikov, A. Buzdin, *Reply to "Comment on Yerin et al., Phys. Rev. Lett. 121, 077002 (2018), and Mironov et al., Phys. Rev. Lett. 109, 237002 (2012)" by A. F. Volkov, F. S. Bergeret, and K. B. Efetov*, arXiv:1812.02973.
19. Hiroyuki Tajima, Yuriy Yerin, Andrea Perali, Pierbiagio Pieri, *Enhanced critical temperature, pairing fluctuation effects, and BCS-BEC crossover in a two-band Fermi gas*, Phys. Rev. B 99, 180503(R) (2019).
20. Yuriy Yerin, Hiroyuki Tajima, Pierbiagio Pieri, and Andrea Perali, *Coexistence of giant Cooper pairs and bosonic condensate in the BCS-BEC crossover in a two-band superfluid Fermi gas*, Phys. Rev. B 100, 104528 (2019).
21. Yuriy Yerin, Stefan-Ludwig Drechsler, Dmitri V. Efremov, and Jeroen van den Brink, *Phase solitons in a weakly coupled three-component superconductor*, preprint (2019).