

Anton A. Anikin

Kaliningrad, Russia
anikinanton93@gmail.com
References available on request

PROFILE

A postdoc with a background in experimental Condensed Matter Physics. Select areas of research include the field of strongly correlated materials, such as Unconventional Superconductors, Charge Density Wave and Excitonic Insulator materials. Experience includes teaching and research: crystal growth, characterization, main experimental study, theoretical modeling, and analysis. Characterization and research of plasmonic and magnetic nanoparticles for biomedical applications

SKILLS

- **Single Crystal Growth techniques:**

Chemical Vapor Transport (CVT);
Chemical Vapor Deposition (CVD)

- **Experimental techniques:**

SEM, EDS, powder XRD, transport and magnetometry with QD PPMS, Raman Spectroscopy, STM, Ultrafast Spectroscopy, Optical Spectroscopy, Phototherapy and Magnetomechanics

- **Teaching:**

General physics and nanomaterials science lectures/recitations, materials science courses and projects for minors

- **Software:**

OriginPro, NI LabVIEW, Arduino IDE, WSxM, Wolfram Mathematica, Glotaran and Surface Xplorer

- **Languages:**

English, Russian (native)

EDUCATION

PhD in Physics

*Drexel University
Philadelphia, US
2021*

- Fundamental study of Charge Density Wave materials with exotic properties. Experimental and theoretical probing of mechanisms of controversial correlated phases.
- Study of the promising Excitonic Insulator material TiSe_2 with complex Charge Density Wave domain structure in order to be used in new data storage devices.
- PhD Thesis: "Charge Density Waves in 2D Transition Metal Dichalcogenides".

BSc and MSc in Physics

*Moscow State University
Moscow, Russia
2017*

- Studied the disputed High-Temperature Superconductivity mechanisms in newly discovered materials with complex anisotropic electronic structure.
- Research work on a new family of layered iron-based superconductors conducted with the "break-junction" technique at cryogenic temperatures to probe superconducting order parameters in Multiple Andreev Reflections Spectroscopy mode.
- Simulation and experimental data fitting using theoretical model extension of the Bardeen-Cooper-Schrieffer theory as applied to interacting multiple anisotropic superconducting energy gaps using Wolfram Mathematica.
- MSc Thesis: "Two-gap Superconductivity in BaFe_2As_2 ".
- BSc Thesis: "Temperature Dependencies of Order Parameters in Superconducting $\text{Sm}_{0.85}\text{Th}_{0.15}\text{OFeAs}$ ".

EXPERIENCE

Postdoc Researcher

*Immanuel Kant Baltic
Federal University
Kaliningrad, Russia
2022 – present*

- Photothermal and magnetomechanical studies of composite nanoparticles intended for biomedical applications. Evaluation of the nanoparticles performance, application of the physical fields in *in vitro* studies
- Development of sensors based on 2D materials
- Undergraduate and graduate lectures. Minors project activities mentorship

Research and Teaching Assistant

*Drexel University
Philadelphia, US
2017 – 2021*

- Single crystal growth, sample preparation and characterization, devices fabrication, experimental study, theoretical modeling and analysis.
- Relaxation dynamics study using Ultrafast Broadband Spectroscopy conducted in the Argonne National Laboratory at the Advanced Photon Source.
- Samples grown were stoichiometric and intercalated 2D Transition Metal Dichalcogenides, including NbSe₂, TiSe₂, TaS₂, WSe₂, and 1D Ta₂NiSe₅.
- Recitation sections in Physics

Research Intern

*Institute for
Theoretical and
Experimental Physics
Moscow, Russia
2016 – 2017*

- A collaboration with FAIR (Facility for Antiproton and Ion Research, Darmstadt, Germany) in order to develop an approach on how High Temperature Superconducting (HTS) materials could be applied in particle accelerators and detectors systems.
- Report: “Review of superconducting properties study of iron-based HTS to be used in rapidly circulating magnetic fields”.

CONFERENCES

- 2023** V International Baltic Conference on Magnetism (IBCM), Svetlogorsk, Russia
- Oral report: “Photothermal properties of magnetic nanoparticles”.
- 2023** 1st International Conference APRICOT 2023 “Magnetic nanomaterials in biomedicine: synthesis and functionalization”, Yerevan, Armenia
- Oral report: “Photothermal conversion efficiency of composites of gold and CFO-nanoparticles”.
- 2020** Drexel Emerging Graduate Scholars Conference, Philadelphia, USA
- Poster: “Temperature Hysteresis of Resistivity in 1T-TiSe₂ in Charge Density Wave State”.
- 2016** 14th Kurchatov Youth Scientific School, Kurchatov Institute, Moscow, Russia
- Oral report: “Evolution of superconducting gaps in doped Sm(Th)OFeAs”.

PUBLICATIONS

- A. Anikin, R. D. Schaller, G. P. Wiederrecht et al., “Ultrafast dynamics in the high-symmetry and in the charge density wave phase of 2H-NbSe₂”, Phys. Rev. B 102, 205139 (2020); [10.1103/PhysRevB.102.205139](https://doi.org/10.1103/PhysRevB.102.205139)
- A. A. Anikin, V. Salnikov, S. Pshenichnikov et al., “Magnetic, optical and photothermal properties of Fe₃O₄ and CoFe₂O₄ nanoparticles coated with organic materials”, J. Magn. Magn. Mater., 171507 (2023); [10.1016/j.jmmm.2023.171507](https://doi.org/10.1016/j.jmmm.2023.171507)
- S. Chatterjee, A. Anikin, D. Ghoshal et al., “Nanoporous metals from thermal decomposition of transition metal dichalcogenides”, Acta Materialia 184, 79 (2020); [10.1016/j.actamat.2019.11.018](https://doi.org/10.1016/j.actamat.2019.11.018)
- L. V. Panina, V. K. Belyaev, A. Anikin et al., “Nanocomposites with Magnetic Core–Gold Shell Structure for Photothermia”, Phys. Metals Metallogr., 123, 1185–1192 (2022); [10.1134/S0031918X22601597](https://doi.org/10.1134/S0031918X22601597)
- A. Wegner, J. Zhao, J. Li, J. Yang, A. Anikin et al., “Evidence for pseudo–Jahn–Teller distortions in the charge density wave phase of 1T–TiSe₂”, Phys. Rev. B 101, 195145 (2020); [10.1103/PhysRevB.101.195145](https://doi.org/10.1103/PhysRevB.101.195145)