David Saykin

PhD candidate | Research Assistant

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About me

Stanford PhD student looking for Summer internship.

Projects

MAGNETO-OPTICAL STUDIES OF METALS

Stanford University **2019 - Present**

I developed high–precision interferometer to measure Kerr angle in metals and applied it to study unconventional superconductors. My optical system is able to detect a change in Kerr or Faraday rotation as low as 50 nanoradians at temperatures ranging from room temperature down to 300 milliKelvin. Preliminary results are published in PhysRevLett.131.016901 and Phys. Rev. B 105, 024521

RF MEASUREMENTS IN QUANTUM COMPUTING PROCCESSORS

Bleximo Corp. **Summer 2022**

Summer internship at quantum computing company "Bleximo". I designed and constructed qubit measurement setup which automatically calibrates vector network analyzer data using "Thru-Reflect-Line" standards. I set up and stress-tested hardware components and developed software to automate calibration process.

ANOMALOUS ELASTICITY OF GRAPHENE

Karlshruhe Institute of technology **2018 - 2019**

I describe elastic parameters of 2D membranes (in particular, graphene) using perturbation theory in dimensionality of out–of–plane phonons. I develop a numerical Monte–Carlo simulation scheme to extract numerical values for critical exponent and elastic coefficients. Results are published in Phys. Rev. Research 2, 043099 and Annals of Physics 168108, 0003-4916.

MAGNETOCONDUCTANCE OF P-N JUNCTION IN WEYL SEMIMETAL

Moscow Institute of Physics and Technology **2016 - 2017**

I analytically study Landau levels in two–cone Weyl semimetal model and find that due to magnetic tunneling between nodes spectrum posses a gap, which can be observed in Hall resistance experiment. I predict modification of the known result of large magnetocondactance of the p–n junction realized in ballistic Weyl semimetal. Results are published in Phys. Rev. B 97, 041202(R)

Experience

RESEARCH ASSISTANT Stanford University **2019 – Present**

TEACHING ASSISTANT Stanford University **2019 – Present**

QUNATUM DESIGN INTERN Bleximo **Summer 2022**

RESEARCH ASSISTANT Landau Institute of Theoretical Physics **2015 – 2019**

TEACHING ASSISTANT Moscow Institute of Physics and Technology **2017 – 2019**

Volunteering

PRESIDENT Stanford Russian-speaking Student Association **2021 – 2022**

REFEREE Journal of Theoretical and Experimental Physics (JETP) **2019**

Education

STANFORD UNIVERSITY

PhD in Physics **2019 - Present**

SKOLKOVO INSTITUTE OF SCIENCE AND TECHNOLOGY

MSc in Theoretical Physics

2017 - 2019 | **GPA: 3.7**

MOSCOW INSTITUTE OF PHYSICS AND TECHNOLOGY

BSc in Applied Math and Physics

2013 - 2017 | **GPA: 3.9**

Skills

QUANTUM ENGINEERING

Low-noise transport measurement
Free-standing/fiber-coupled optics
Cryogenics, Low-temp thermometry
Photolithography
Chemical Vapor Deposition
Machining (lathe, mill)
Laboratory electronics
Data acquisition and analysis

PROGRAMMING LANGUAGES

Python (NumPy, Pandas, TensorFlow)
C • C++ • Assembler • HTML
Matlab • Mathematica • LaTeX 2$_\varepsilon$

COMPUTER SCIENCE

Parallel computing (Cuda, OMP, MPI)
Monte Carlo simulations
Machine Learning

TOOLS

Git • Linux shell • GPIB

LANGUAGES

English (advanced) • Russian (native)