

Graduate Student Researcher (PhD) opportunity in Condensed Matter Physics.

The field of quantum materials is a rapidly growing research area with a promise to answer fundamental questions important for future quantum technology. Condensed matter devices realized at the nanoscale may help us reveal the secrets of room-temperature superconductivity and build quantum computers with unmatched efficiency to solve certain computational problems. Here at the Department of Physics and Astronomy at University of Notre Dame, we are working on the cutting edge research at the frontiers of science to answer these fundamental questions of modern quantum physics.

The University of Notre Dame's Department of Physics and Astronomy is a home to the newly organized Stavropoulos Center for Complex Quantum Matter. The central mission of our Center is to explore and exploit both fundamental and technological aspects of novel quantum materials. With the expertise ranging from quantum devices and quantum transport to the state-of-art scanning probe techniques, the Center and the Department are aiming to be the world leader in experimental and theoretical condensed matter research. Currently the Center includes the following members:

Prof. Stepanov's laboratory is in its building stage and we expect to be fully operational by Fall 2023. Our laboratory focuses on cryogenic near-field optical studies of moiré materials with the focus on strongly correlated phenomena. Apart from standard techniques in our lab (electronic transport, 2D materials isolation and stacking, clean room experience, electron beam lithography, thermal and e-beam material deposition), our laboratory focuses on the powerful scanning-probe method, with an aim to unravel quantum properties in 2D materials and beyond.

Broadly defined, our current projects include:

- Cryogenic near-field plasmonics in magic angle twisted bilayer and trilayer graphene.
- Cryogenic near-field photovoltage studies of strongly correlated electrons.
- Moiré devices design and improvement.
- High-temperature superconductivity in twisted layered materials.

We are looking for motivated graduate students with a strong background in condensed matter physics (materials science), willing to learn and capable of finding solutions to challenging problems.

More information can be found at <https://sites.nd.edu/stepanovlab/>.

Interested candidates please send their CV or any other requests about the graduate program to Petr Stepanov: pstepano@nd.edu.

Notre Dame Physics' graduate program info: <https://physics.nd.edu/graduate/>

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