

PHYSICS
COLLEGE OF ARTS AND SCIENCES

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: 02/24/2023

PROJECT TITLE: Tailoring 2D electron gases in superconducting oxidesEvgeny Mikheev
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This project is in the area of experimental condensed matter physics. It will be part of a larger effort to develop new fabrication procedures for superconducting quantum devices that operate at cryogenic temperatures.

The student will learn the basics of electrical device testing, Python-based measurement control and automation, and cryogenic measurements.

Scientifically, the project will entail testing of simple devices with 2D conducting channels patterned in single crystals of oxide perovskite SrTiO₃. We will compare different device geometries and nanofabrication procedures. The student will perform basic room temperature electrical conduction tests, measure temperature dependence of electrical conductivity, and test device tunability with side gate voltages.

The student will need basic familiarity with Python and the physics of electromagnetism on the level Phys 2002 or 2006.

This project is best-suited to physics and engineering majors.