PHYSICS
ARTS & SCIENCES

RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: February 8, 2026

PROJECT TITLE: Design and measurement of ionic liquid gated devices based on strontium titanate

Physical Requirement :
No special requirements

Project's Technical Skills Requirement :
Proficiency with Python coding, familiarity with DC measurement instrumentation and cryogenics, previous completion of the OASiS rapid certification on cleanroom fabrication.

Project's Available Positions : Research co-op fellowship (1)

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Project Description

Making low disorder nanoscale patterns using 2D electron gas systems in superconducting substrates is extremely relevant with many popular applications in quantum information technology. In this project, ionic liquid gated devices with submicron scale features will be fabricated on strontium titanate substrates with ionic liquid gated designs in mind. The characterization will involve experiments with DC and low-frequency AC instruments from room temperature to low milliKelvin temperatures. The student will work on testing different nanoscale geometries for fabrication and forming them into measurable junctions for measurement. For this, the student will work on the use of CAD software for device design, Python-based measurement instrument control, and cryogenic measurements in the Mikheev Lab. Fabrication will involve work in the SEM facilities in the Advanced Material Characterization Center, and the ERC cleanroom facilities at UC.