UNDERGRADUATE RESEARCH CO-OP FELLOWSHIP (URCF)

PHYSICS ARTS & SCIENCES

RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: April 27, 2025

PROJECT TITLE: <u>Design and measurement of ionic liquid gated devices based on</u> <u>strontium titanate</u>

Physical Requirement : No special requirements Project's Technical Skills Requirement : Proficiency with Python coding, familiarity with electronic transport 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 relevant to applications in quantum information technology. In this project, ionic liquid gated devices with submicron scale features will be fabricated on strontium titanate substrates. The characterization will involve experiments with DC and low-frequency AC instruments from room temperature to low milliKelvin temperatures. The student will work on designing and fabricating a device, experiments and analysis. 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.