

MECHANICAL AND MATERIALS ENGINEERING
ENGINEERING AND APPLIED SCIENCE

RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

APPLICATION DEADLINE: April 29, 2024

PROJECT TITLE: MEME: Multiscale Evaporation Modeling in Engineering

Physical Requirement : Ability to sit at a desk for extended periods

Project's Technical Skills Requirement : Preferred skills include: • Experience with MATLAB • Familiarity with computational fluid dynamics (CFD) • Proficiency in engineering thermodynamics

Project's Available Positions : Undergraduate Research Assistant

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Project Description

Liquid-vapor interfaces are ubiquitous in both natural and engineered devices. We often don't notice it but they are all around us! The cup of coffee on your desk, the tree outdoor, the AC unit indoor, they all have liquid-vapor interfaces and are undergoing "evaporation" in some form. Curved interfaces (such as droplets and bubbles) are particularly interesting because they exhibit unique properties due to surface tension thereby significantly altering evaporation dynamics. In turn, the evaporation deforms and moves the interface. The goal of this project is to develop simulation tools to predict both the evaporation and the subsequent motion of liquid-vapor interfaces using multiscale modeling tools. This research project will be completed in the UC Lab for Interfacial Dynamics (UCLID). See kishanbellur.github.io for more information. The student will work as part of a multidisciplinary team to develop liquid-vapor phase change and thin film evaporation models to embed within CFD software. The student will also have the opportunity to help in outreach activities and contribute to research publications.