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COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

FACULTY RESEARCH TALKS

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Zoom talk | Friday, April 10, 2026 | Noon to 1 p.m.

Presenter 1:
VIKTORYIA SHAUTSOVA
ASSISTANT PROFESSOR
Materials Science and Engineering

Light-Matter Interactions in 2D Material Nanophotonics and Their Applications

Two-dimensional (2D) materials offer unprecedented tunability of electronic and optical properties through control of layer number, heterostructure assembly, electrical gating and phase engineering, enabling exciting opportunities for nanophononic integration and optoelectronic applications. In this talk, Viktoryia Shautsova will discuss large-scale fabrication strategies for 2D material-based devices and their integration with nanophotonic components that can tune 2D material optical properties. She will also present laser-induced phase transitions in $PdSe_2$ enabling direct optical writing of functional device architectures.

Shautsova's research group studies the fundamental properties and functional applications of emerging nanomaterials, such as 2D materials, and nanophotonic systems to tackle critical challenges in nanoelectronics, optoelectronics and bioelectronics. By integrating theory, nanophotonics, material science and device engineering, innovative design architectures are created to harness and control light and electronic behavior at the nanoscale. Before joining UCF, Viktoryia was a Stanford Science Fellow and a postdoctoral scholar at Oxford University and received her doctorate in physics from Imperial College London.

Presenter 2:
SIHONG YAN
ASSISTANT PROFESSOR
Mechanical and Aerospace Engineering

Research at LIFT Lab: From Applied Aerodynamics to Large-Scale GPU CFD Simulation

This research develops a Lattice Boltzmann Method (LBM) framework for rapid simulation of large-scale flow fields, naturally suited for GPU acceleration and real-time prediction. The benchmark problem considers atmospheric boundary layer wind interacting with a skyscraper in a 3.2 km × 1.6 km × 1.6 km domain. Results indicate possible real-time performance on Blackwell GPU architecture. The framework is extendable to coastal wind, wind energy, urban atmospheric flow, and benchmark studies for general GPU algorithm verification.

Sihong Yan earned his doctoral and master's degrees in aerospace engineering from Pennsylvania State University through the Vertical Lift Research Center of Excellence program, and his bachelor's degree in aeronautical and astronautical engineering from Shanghai Jiao Tong University. Before joining UCF, he held postdoctoral appointments at Penn State and the Georgia Institute of Technology. His research focuses on multiphase and thermal-fluid problems in hazardous atmospheric conditions, including but not limited to icing clouds, freezing drizzle and hail. He also studies electrical advanced vertical-lift vehicles, emphasizing experimental methods for rotor aerodynamics and fluid-structure interaction. He serves on the AIAA Atmospheric and Space Environment Science Technical Committee.

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