Department of Mechanical Engineering The University of Hong Kong

SEMINAR

Title: **Microscopic Thermal-Fluids Engineering for Next-generation Electronics and Water**

Speaker: **Professor Yangying Zhu**
Associate Professor, Mechanical Engineering
UCSB
USA

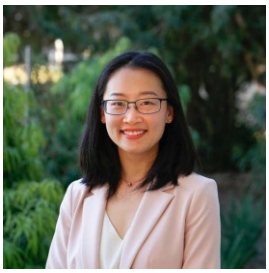
Date: **September 26, 2025 (Friday)**

Time: **9:30am**

Join Zoom Meeting
https://hku.zoom.us/j/99134339088?pwd=a3zMxHxPSdz3jOVT1HCLcKwa9lbNsr.1

Meeting ID: **991 3433 9088**
Password: **165482**

Abstract:
Effective management of thermal and fluid transport has become a critical challenge in many electronics, energy, water, and manufacturing systems due to the increasing power density and ever-shrinking materials length scale. We combine micro/nanoengineering with *in situ* measurement techniques to provide insights on phase-change liquid-vapor thermal transport. Using micro-Raman spectroscopy, we probe the temperature at the liquid-vapor-solid three-phase contact line region during evaporation to probe the spatial heterogeneity of evaporation flux. We show that both thin-film evaporation and capillarity contribute to up to 100% enhancement in the heat transfer coefficient during microchannel flow boiling by introducing microstructures with tunable geometry. In addition, the friction introduced by the surface structures effectively suppress density wave oscillation flow instability. These examples demonstrate the potential of combining fundamental thermo-fluid science and advanced micro/nano engineering approaches to address many of the pressing thermal challenges for energy and sustainability.



Bio: Yangying Zhu is an associate professor in the Mechanical Engineering department at University of California, Santa Barbara. Her work focuses on fundamental understanding of the thermofluids process for energy and water sustainability and advanced manufacturing. She obtained her PhD from MIT, advised by Prof. Evelyn Wang, where she developed microsystems for aggressive cooling of electronics. During her postdoc with Prof. Yi Cui at Stanford University, she investigated thermal effects in lithium-based batteries. She received early career awards from NSF, NASA, ONR, ARPA-E, and the ASME Pi Tau Sigma Gold Medal.

ALL INTERESTED ARE WELCOME
For further information, please contact Prof. Mingxin Huang