

Tackling the centuries-old Leidenfrost effect

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Venue: Faculty of Engineering Bldg. 2, Room 31A

Abstract: From water droplets rolling around on a hot pan without quickly evaporating to splitting molten iron with bare hands, behind these unrelated phenomena lies the Leidenfrost effect discovered in 1756: liquids evaporate from high-temperature surfaces to form a continuous air film blocks the contact between solid and liquid. Although this effect shows broad application prospects in fields such as drag reduction and liquid mixing, it is also a century-old problem that has plagued the field of high-temperature heat dissipation. How to break this century-old physical effect is a major challenge for thermal-related applications.

This seminar will focus on leverage on the integration of materials, thermal-fluids, manufacturing, energy, and other fields to develop thermally heterogeneous materials that fundamentally suppress the century-old Leidenfrost effect for efficient liquid cooling. I will also demonstrate how the heterogeneous design concept can be extended for efficient water harvesting, energy harvesting, and other applications.



Biography:

Zuankai Wang is the Associate Vice President (Research and Innovation), Chair Professor in the Department of Mechanical Engineering, and Director of Research Center for Nature-Inspired Science and Engineering at The Hong Kong Polytechnic University (PolyU). He received his BSc from Jilin University, his MSc from the Shanghai Institute of Microsystem and Information Technology, and his PhD from the Rensselaer Polytechnic Institute. Before joining PolyU, Prof. Wang was a Chair Professor at the Department of Mechanical Engineering and was the Associate Dean in the College of Engineering at the City University of Hong Kong. He is the Executive Editor-in-Chief of *Droplet* (Wiley) and an advisory board member for more than 10 journals.

Prof. Wang is a Fellow of the Hong Kong Academy of Engineering Sciences, the Royal Society of Chemistry, and the International Society of Bionic Engineering. He has won numerous awards, including the Croucher Senior Research Fellowship, RGC Senior Research Fellowship, BOCHK Science and Technology Innovation Prize, Green Tech Award, Xplorer Prize, and the 35th World Cultural Council Special Recognition Award. He was named as "Highly Cited Researcher" by Clarivate Analytics (2022, 2023).

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