ETH zürich

Institute of Fluid Dynamics
Institute of Energy and Process Engineering

Colloquium Thermo- and Fluid Dynamics

Nature-Inspired Phase-Change Heat Transfer

Prof. Jonathan Boreyko
Department of Mechanical Engineering
Virginia Polytechnic Institute and State University

As nature attests, surprises abound when considering phase-change systems that span multiple lengths scales or involve all three phases simultaneously. First, we demonstrate that the transpiration cycle of plants can get reproduced with ultra-tall synthetic trees. Second, we develop scaling laws to capture the arrested hydrodynamics of water droplets impacting icy substrates. Finally, by placing ice cubes on a superheated surface, we reveal that the boiling curve gets dramatically stretched for enhanced heat transfer.

Jonathan Boreyko is an Associate Professor and John R. Jones III Fellow at Virginia Tech in the Department of Mechanical Engineering. His research lies at the intersection of fluid mechanics, phase-change heat transfer, and materials science and has been covered by The New York Times, The Washington Post, CNN, and NPR. He has over 60 publications which have been cited over 4,500 times. Recent awards received by Dr. Boreyko include the NSF CAREER Award, the Air Force YIP Award, the ASEE Outstanding New Mechanics Educator Award, and the ASME ICNMM Outstanding Early Career Award. His children enjoy measuring how long it takes for ice to melt and water to evaporate.

Date: Wednesday, 21 September 2022
Time: 16:15 - 17:15h
Place: ETH Zurich, ML F 36
Host: Prof. Filippo Coletti, IFD

Further information: https://ifd.ethz.ch/events/ktf.html

D MAVT