I²CNER Webinar

International Institute for Carbon-Neutral Energy Research (WPI-I²CNER)
Kyushu University

Title **Heat Transfer Enhancement Mechanisms in Oscillating Heat Pipes**

Speaker Prof. Hongbin Ma
Department of Mechanical & Aerospace Engineering,
University of Missouri, Columbia, USA

Time& Date 9:00 AM(JST), Wednesday, December 14th, 2022

Abstract

Heat transfer process in an oscillating heat pipe (OHP) involves liquid-vapor interfacial phenomenon, surface forces, thermally excited mechanical vibration, evaporation and condensation heat transfer, and oscillated forced convection. An OHP can effectively integrate thin film evaporation, oscillating flow, thermally-excited mechanical vibration, high heat transfer coefficient of entrance region, vortices induced by the oscillating flow of liquid plugs and vapor bubbles, and near-wall velocity overshoot (Richardson's annular effect), resulting in an extra high heat transport capability. In addition, the oscillating/pulsating motions in the OHP depends on the surface conditions, dimensions, working fluid, operating temperature, heat flux and total heat load, orientation, number of meandering turns, and, most importantly, the filling ratio.

About the Speaker

Dr. Hongbin Ma is Chair, Curators' Distinguished Professor, & Glen A. Barton Professor, in the Department of Mechanical & Aerospace Engineering, and the director of the Multiphysics Energy Research Center (MERC) in the College of Engineering at the University of Missouri (MU). He received his Ph.D. in 1995 from Texas A&M University. Since he joined MU in 1999, he has conducted active research in the fields of phase-change heat transfer, heat pipes, ejector refrigeration, and thermal management. His research has been supported by NSF, ONR, NIH, Intel, Dell, Foxconn, DARPA, Northrop Grumman, and many other federal agencies and private companies. His research work has resulted in more than 310 publications including 1 book, 8 book chapters, and over 170 refereed journal papers as well as 21 patentable technologies. The contributions he made are not only in scientific fundamental research but also in engineering applications. His research efforts led to the establishments of both companies of ThermAvant Technologies (TAT), where he is cofounder and president, and ThermAvant International (TAI), where he is cofounder and CEO, to further develop and commercialize his research results. He is a Fellow of American Society of Mechanical Engineering (ASME) and a Fellow of National Academy of Inventor (NAI).

Registration https://zoom.us/webinar/register/WN_a91Lxq6BTy6oJ6j9Xkgv0Q

Host Prof. Bidyut Baran Saha

Contact I²CNER・Q-PIT Office of Research Support Services,
Research Support and Public Relations
TEL: +81 92 802-6935
Email: iq-kenkyu@jimu.kyushu-u.ac.jp