

Enhanced convective heat transfer at the micro scale — micro pin fins

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Faculty host: Jaime Juárez

Seminar on October 2, 2018 at 11:00am in 2004 Black Engr. Bldg.

Abstract

In the last two decades, a plethora of novel engineering applications have emerged with stringent cooling requirements. High power density electronic components now dissipate heat fluxes in excess of 1 kW/cm² and require low temperature operating conditions. A range of enhanced heat transfer methods in micro domains have been explored, and, to some extent, implemented.

This talk will introduce cooling demand and approaches that have been studied. It will then focus on a particular enhancement technique, namely micro scale pin fin heat sinks, and discuss research effort to better understand key fundamental heat transfer and fluid flow processes controlling the performance of these system.

Professor **Yoav Peles** is the Chair of the Department of Mechanical and Aerospace Engineering at the University of Central Florida (UCF). Prior to UCF, Professor Peles was the Director of the Mechanical Engineering Program and the Associate Department Head for Graduate Studies in the Department of Mechanical, Aerospace and Nuclear Engineering (MANE) at Rensselaer Polytechnic Institute (RPI).

He is an international leader in convective heat transfer in micro domains. Professor Peles published about 110 peer reviewed journal papers, about 55 conference papers, has several patents, written four book chapters, and is the author of a book entitled Contemporary Perspective on Flow Boiling Instabilities in Microchannels. He organized and co-organized several international conferences and workshops including the ASME International Conference on Nanochannels, Microchannels, and Minichannels 2013 (ICNMM 2013), the International Workshop on Micro and Nano Structures for Phase Change Heat transfer, and the first Gordon Research Conference (GRC) on Micro and Nanoscale Phase Change Heat Transfer (2015). He is a fellow of the American Society of Mechanical Engineering (ASME).

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This seminar counts towards the ME 600 seminar requirement for Mechanical Engineering graduate students.