Call for Papers
Special issue in the memory of Professor Avram Bar-Cohen

Professor Avram Bar-Cohen, past President of IEEE Electronics Packaging Society, and past Editor-in-Chief of the IEEE Transactions on Components and Packaging Technologies passed away on October 10, 2020. He was a giant in the field of thermal management, and made seminal research and professional contributions over a five decade period. Professor Bar-Cohen's research focused on several areas in microsystems packaging. His work on air cooling focused on optimization of natural and forced air cooling devices, and sustainability and life cycle considerations of thermal management devices. His work spanned the spectrum from fundamental research to emerging applications, including 2.5D and 3D heterogeneous integration, radio frequency, opto-electronics, and power electronics devices and systems.

Professor Bar Cohen's research on two-phase heat transfer focused on submerged condensers, pool boiling of dielectric coolants, enhanced surfaces, flow boiling in microgaps, and flow regime characterization in microchannels. With the ongoing move towards heterogeneous integration and three-dimensional packaging technologies, Professor Bar-Cohen recognized the potential of evaporative cooling for such applications. While serving as Program Manager for the Defense Advanced Projects Research Agency (DARPA), he initiated the IceCool Fundamentals program for the exploration of high exit vapor quality two-phase cooling for emerging microelectronics architectures. During 2020, he co-organized a workshop under the sponsorship of the Office of Naval Research to assess understanding of evaporative thermal management and identify research gaps and barriers to implementation of this cooling technique, with a particular focus on fundamental understanding of high vapor quality two-phase flows.

A Special Issue of the IEEE Transactions on Components, Packaging and Manufacturing Technology is planned for publication in 2021. Papers on analytical, numerical, and experimental investigations of thermal management of microsystems are solicited for this Special Issue. Topics include, but are not limited to, the following.

Computational simulations of single and two-phase cooling
Air cooling enhancements
Optimization of air cooled systems
Sustainability considerations in design of thermal packaging
Thermal management of 2.5D and 3D heterogeneous microsystems
Thermal management of emerging radio frequency, optoelectronics, and power electronics devices and systems
Fundamentals of boiling processes in micro/nanoscale devices and systems
Two-phase thermal management devices
Novel metrology techniques for two-phase flow
Materials and surface enhancements in boiling
Capillary flow driven two-phase devices
Multi-disciplinary cross-cutting topics in liquid cooling, including fluids, reliability, erosion modeling

The Special Issue is planned to be published in July 2021, in memory of Professor Bar-Cohen's 75th birthday. The publication deadlines are:

Draft manuscript submission: January 30, 2021
Author notification on manuscripts: March 15, 2021
Revised manuscripts due: April 15, 2021
Final decision on manuscripts: April 30, 2021
Final manuscripts due: May 15, 2021

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