



Professor Avram Bar-Cohen

(1946 - 2020)

On October 10, 2020, we learned sadly, of Prof. Avram Bar-Cohen's passing. It is no understatement to call Prof. Bar-Cohen, better known to so many of us simply as *Avi*, a legend in our field of micro-electronics packaging, especially in the area of thermal management. His immense body of work, the success of his students, and the positive imprint of his personality and influence is writ large on our community. His passing leaves behind a very large void in the lives of so many he came in touch with.

Avi began his university career at the Ben Gurion University (Beer Sheva, Israel), in 1972 after receiving his Ph.D., from the Massachusetts Institute of Technology in 1971 under the guidance of Prof. Art Bergles. He then moved to the University of Minnesota, followed by a stint as the Chair of the Mechanical Engineering Department, in the A. James Clark School of Engineering, University of Maryland during 2001 to 2010. Since 2010, he had been on a leave of absence for six years as a Program Manager at DARPA and then as a Principal Engineering Fellow at Raytheon Technologies in the Space and Airborne Systems. Interspersed with his university career were many years in the industry as he started and ended his professional life at Raytheon; and he spent 5 consequential years at Control Data Corporation during the second half of 1980s.

He was exceptional in his academic, industrial and program manager roles and in each of them he mentored and encouraged a broad spectrum of researchers. During the span of his academic career he successfully advised a number of students who have gone on to make their own mark on industry and academia. The body of work Avi produced has been truly impressive in scope, influence and depth. The books he co-authored, for instance with Prof. Allan Kraus, have become essential reading for graduate students and researchers in the field. His seminal work on single- and two-phase cooling is referred widely. It has both fundamental scientific depth and pragmatic applicability in the cooling of microelectronics. His experiences in industry helped him focus on driving implementable technology innovations and as DARPA Program manager he was able to continue and enhance the scope of his influence driving major changes in microelectronics cooling technologies.

Just as impressive as his body of work are his contributions to the nurture and growth of the thermal management and packaging communities in IEEE and ASME. He collaborated with other leaders, to start, shape and grow major conferences in packaging and microelectronics, adding to their prestige and

attracting the attention of some of the best technical minds around the globe to solve important problems in thermal management of electronic devices and systems.

The arc of Avi's influence encompassed IEEE in numerous successful ways. He served on its Board of Governors and was the President of the IEEE Electronics Packaging Society (EPS, formerly CPMT). He represented EPS as a Distinguished Lecturer and was a past Editor-in-Chief of the IEEE CPMT Transactions (1995-2005). He showed great vision in starting the ITherm Conference series in 1988 as a companion conference to the broader EPS ECTC conference. A grateful IEEE EPS community (then CPMT) honored him with its highest award, the prestigious CPMT Field Award in 2014. Prior to this he had been awarded the CPMT Society's Outstanding Sustained Technical Contributions Award (2002), the ITherm Achievement Award (1998), and the THERMI Award (1997).

Avi was an equally active member of the thermal management and heat transfer communities in the American Society of Mechanical Engineers (ASME). He is one of the founders of the highly successful ASME Conference, InterPACK. He was the General Chair of InterPACK 1995. In his role as an influential statesman in ASME, he broadened the scope of InterPACK, attracting industrial sponsorship to encourage student participation and collaborating with JSME to enhance international engagement. As a result of this, newer generations of engineers were attracted to this field and went on to have successful academic and industrial careers. Through the years, he actively guided the InterPACK and ITherm conferences through their ups and downs to make them the most sought-after conferences that they have become now. Their success reflects his vision and prescience for long-term benefits of such conferences and his dogged persistence to make them complementary world class conferences. He received the InterPACK Achievement Award in 2005. He also received the Luikov Medal from the International Center for Heat and Mass Transfer in Turkey (2008) and ASME's Heat Transfer Memorial Award (1999), Edwin F. Church Medal (1994), and Worcester Reed Warner Medal (1990). He became a member of the European Union Academy of Sciences in 2020. Additionally, he had been made a Life Fellow of IEEE and ASME.

Avi is survived by his wife Anat, his children Barak, Talia and Raanan and his grandchildren Gabriel, Gefen, Luna, Maya, Nina, Caleb and Isaac, all of whom he cherished. We, the editorial team, on behalf of the entire community would like to thank him for his contributions and offer our condolences and support to his family and loved ones in this time of grief.

We as a community owe him a tremendous debt of gratitude for mentoring a number of us, and for his technical and organizational contributions that will live on for many lifetimes. Just as importantly, we owe him a debt of gratitude for helping us grow to our current state of maturity and making us a vibrant, deeply rounded and well-knit technical community that can effectively and collaboratively respond to important upcoming challenges in heterogeneous integration. He has given us the confidence, training and self-belief to do so. That is the true mark of a visionary and a great leader. He was a true mentor and a friend. Avi, with his quick smile, infectious optimism, generosity and ability to inspire will be missed but he will also be remembered in a thousand different ways through the imprints of his influence in all of us. Avi personally believed that the best and most meaningful contributions are ahead of us and that as engineers we are all, with his spirit encouraging us, capable of so much more. In that sense he will truly continue to still stay with us.