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2021 International Green Energy Conference

(IGEC-XIII)

July 15-18, 2021 | Tianjin, China

Name	Bingyang Cao	
Affiliation	School of Aerospace Engineering, Tsinghua University, Beijing 100084, China	
Invited Plenary Lecture		
Presentation Title	Towards green IC with near-junction thermal managements	
Abstract (Approximately 200 words)	Heat transport and thermal management are becoming a bottleneck problem in electronic systems. Approaching green IC necessitates an in-depth understanding of heat transport and efficient thermal management strategies to ensure the electronic devices' reliability, lifetime, power output and energy costs. The talk will cover the following topics. (1) Heat transport in nanostructures: At micro/nanoscale, however, the system size becomes comparable to the mean free path or the wave length of phonons in semiconductors, where heat transports in a non-diffusive way and the Fourier's law breaks down. Non-Fourier effects result in the size-, geometry-, interface- and heating condition-dependence of effective thermal conductivity of nanostructures. (2) Heat generation and thermal spreading: In the near-junction regions of electronic devices, heat generation is dominated by non-equilibrium scattering among electrons and phonons, and the heat transfer process is dominated by thermal spreading resistance. The density of material interfaces is dramatically increasing, which makes interfacial thermal transport become a dominant factor for the overall thermal performance. (3) Embedded liquid cooling: Embedded microchannel liquid cooling is demonstrated to be one of the most promising thermal management technologies. The optimization design of microchannels is a typical multi-objective issue involving in lowering the flow drag, enhancing the heat transfer coefficient, and increasing the temperature uniformity etc.	
Biographical Sketch (Approximately 200 words)	Bingyang Cao is full professor and head in the School of Aerospace Engineering, Tsinghua University, China. He was awarded MOE New Century Talented Scientists Program (2011), Excellent Youth Funding of NSFC (2013), Wu Zhonghua Outstanding Young Scholar Award from China Engineering Thermophysics Society (2014), Outstanding Young Scientists Funding of NSFC (2018), First Prize of Natural Science of MOE (2019), and IAAA Medal & Fellow of International Association of Advanced Materials (2020). He currently serves as chair of the Young Scientist Committee of the Heat and Mass Transfer Society of China, vice-chair of the Thermally Conductive Composite Committee of the Composite Society of China, executive committee member of the Asian Union of Thermal Science and Engineering, member of the Heat and Mass Transfer Society of China etc. His research mainly covers micro/nanoscale heat transfer, thermal functional materials, and advanced thermal management technologies. He has published more than 150 SCI-indexed journal papers. He is currently serving as Editor-in-Chief of ES Energy & Environment, editorial member of 6 international journals, including Journal of Physics: Condensed Matter (SCI), Scientific Reports (SCI), Materials (SCI) etc.	