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Heat Transport in (Ultra)Wide Bandgap Semiconductors and Interfaces

程 哲 研究员

时间：4月11日（星期四）15:00—16:30
地点：北京大学物理楼西563会议室

报告人简介（About speaker）：**Bio:** Zhe Cheng is an assistant professor at the School of Integrated Circuits, Peking University. He obtained his Ph.D. at Georgia Institute of Technology in 2019 with Prof. Samuel Graham (now Dean of Engineering at University of Maryland) and finished his postdoc training at University of Illinois at Urbana-Champaign with Prof. David Cahill (Member of American Academy of Arts and Sciences). He was a special research student at Nagoya University at 2019 with Prof. Hiroshi Amano (Nobel Prize laureate). He joined Peking University as an assistant professor at 2023. His research focuses on thermal management of microelectronics, advanced thermal metrology, heterogeneous integration, and thermally conductive interfaces. He has published more than 50 papers on prestigious journals such as Nature Communications, Small, ACS Applied Materials & Interfaces. He has also published three book chapters and one U.S. patent.

摘要（Abstract）：Next-generation electronics that utilize wide and ultrawide bandgap semiconductors are rapidly advancing many technologies by providing more compact and efficient devices. However, thermal management remains a significant challenge in achieving the maximum output power of the devices. Aggressive thermal management strategies are essential to overcome these thermal limitations. This talk will discuss recent progress in heat transport in wide bandgap semiconductors and interfaces: Part 1 focuses on achieving the intrinsic high thermal conductivity of semiconductors, where we specifically discuss wafer-scale high thermal conductivity materials that are capable of mass production; Part 2 discusses the high thermal boundary conductance (TBC) of technologically-important interfaces involving high thermal conductivity semiconductors that are integrated by room-temperature bonding; Part 3 discusses advanced thermal metrology for large-area mapping thermal boundary resistances of semiconductor interfaces. Thermal conductive integration of high thermal conductivity semiconductors facilitates addressing the thermal challenges and contributing to high-performance, high output power, and high reliability electronic devices.

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