

Title of Seminar: THINK BIG! EMERGING LARGE-AREA ELECTRONICS FOR LARGE-SCALE SYSTEM INTEGRATION



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Abstract

Emerging applications, such as AI computing, RF systems, and human-machine interfaces, require microelectronic systems with unprecedented scales and energy efficiency. Meeting these demands necessitates a fundamental shift in how microelectronics are integrated today. In this talk, I will present an emerging technology based on low-temperature large-area electronics, to enable a heterogeneous integration platform for future large-scale microelectronic systems. Traditionally, large-area electronics have been constrained by low-frequency operation, typically in the kilo-Hertz to mega-Hertz range. To address this, I will introduce co-design strategies across the entire stack—from fundamental materials and devices to circuits and system integration—that leverage the unique technology advantages while overcoming its inherent challenges. These advancements pushed the technology to the giga-Hertz regime, with pathways to further extend to millimeter-wave frequencies. I will use RF systems as an application example to demonstrate these co-design techniques through two systems built, including a phased array and a reconfigurable antenna. Then I will briefly discuss the transformative opportunities opened by this emerging technology in 2.5D heterogeneous integration, 3D monolithic integration, and human-machine interfaces.

Bio

Can Wu is currently a postdoctoral researcher at Stanford University. He received his Ph.D. in Electrical and Computer Engineering from Princeton University in 2021 and his B.S. degree from the Institute of Microelectronics at Tsinghua University in 2013. He developed large-area thin-film devices, circuits, and systems for wireless sensing and human-machine interfaces. His work has been recognized with the Best Student Poster Award at 2015 Flex Conference, Best Student Paper Award at 2019 Device Research Conference, and Top-Ranked Student Paper at 2023 IEDM. He is also the recipient of the Princeton University Gordon Wu Fellowship.

Host

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