

## Seminar On

**High-Performance Silicon-Based Solutions for Terahertz Applications****Professor Liang Gao****School of Information Science and Engineering****Southeast University****Date : 7 August 2025 (Thursday)****Time : 11:00 am – 12:00 nn****Venue : Room 15-202, 15/F, State Key Laboratory of Terahertz and Millimeter Waves,  
Lau Ming Wai Academic Building, City University of Hong Kong****Abstract**

The terahertz (THz) spectrum, spanning from 0.1 to 10 THz, is crucial for advancing future high-speed 6G communications, non-invasive imaging, and spectroscopy. Among the various technologies, silicon-based integrated circuits offer significant advantages due to their commercial viability, high yield, and potential for creating compact, cost-effective THz systems. However, the inherent speed limitations of silicon devices pose considerable challenges in developing high-performance THz circuits.

In this seminar, I will present the research efforts undertaken at Southeast University to overcome these challenges. Our work has focused on innovative array architectures and design methodologies, enabling us to progressively push the performance limits of CMOS-based THz radiator arrays in terms of array scale, operating frequency, and output power.

A notable achievement we will highlight is the development of the world's largest THz radiator array in CMOS technology. This array has a record peak radiated power of ~13 dBm at 671 GHz, representing the highest output power reported to date for any silicon-based THz source.

Furthermore, we have developed essential THz circuit blocks, including wideband power amplifiers, high-speed On-Off Keying (OOK) transmitters, and scalable Intermediate Frequency (IF) beamforming receiver arrays. These advancements provide robust solutions for a wide range of THz sensing and communication systems. Our research underscores the significant potential of silicon technology in realizing practical THz applications.

**Biography**

**Dr. Liang Gao** received his B.Eng. in electronic information science and technology from Sun Yat-sen University in June 2018, and his Ph.D. in electrical engineering from City University of Hong Kong in July 2022. Following his doctoral studies, Dr. Liang Gao served as a postdoctoral fellow at the State Key Laboratory of Terahertz and Millimeter Waves at City University of Hong Kong from August 2022 to February 2023. He then joined the CoSMIC Lab. at Columbia University as a postdoctoral research scientist in March 2023. Currently, Dr. Liang Gao is a Professor at the School of Information Science and Engineering, Southeast University. His research focuses on developments in integrated circuits and systems for high-frequency applications. His contributions are well-recognized, with over 10 journal and conference papers, including highly prestigious publications such as the IEEE Journal of Solid-State Circuits (JSSC) and the International Solid-State Circuits Conference (ISSCC).

**\*\*\* ALL ARE WELCOME \*\*\*****Enquiries:**

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