

MSc STO | INDUSTRY GUEST LECTURE SERIES

Heterogeneous Integration and Advanced Packaging in Silicon Photonics

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Dr Xiaoguang Tu

Distinguished Engineer, Si-Photonics Team Lead

Marvell, Singapore



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Heterogeneous Integration and Advanced Packaging in Silicon Photonics

ABOUT THE TALK

This lecture explores the integration of photonics and electronics through heterogeneous platforms, including silicon (Si), indium phosphide (InP) and gallium arsenide (GaAs), and how these technologies are enabling increasingly integrated and high-performance silicon photonics systems. The session examines key advanced packaging approaches, including co-packaged optics, 2.5D/3D IC integration, flip-chip and wafer-level packaging, and their role in bringing photonic and electronic components together. It will also address electro-optical coupling and alignment methods, as well as the testing, yield and reliability challenges associated with heterogeneous systems.

Through these topics, the lecture provides insights into how advances in heterogeneous integration and packaging are reshaping silicon photonics, from device and material interfaces through to system-level integration, testing and yield optimisation.

KEY TOPICS

Heterogeneous Integration · Silicon Photonics · Co-Packaged Optics · 2.5D/3D IC · Flip-Chip
Wafer-Level Packaging · Testing & Yield

Connecting classroom learning with semiconductor industry practice

Dr Xiaoguang Tu

Distinguished Engineer, Si-Photonics Team Lead – Marvell, Singapore

ABOUT THE SPEAKER

Dr Xiaoguang Tu received his PhD in Microelectronics and Solid-State Electronics from the Institute of Semiconductors, Chinese Academy of Sciences, in 2008, specialising in silicon photonics. He was previously a Research Fellow at Nanyang Technological University and a Research Scientist at A*STAR Institute of Microelectronics. He joined Inphi Corporation in 2016, which was subsequently acquired by Marvell Technology in 2021. At Marvell, he leads the Si-Photonics team in Singapore. His current research interests span Si-based optoelectronic devices, circuits and products, heterogeneous integration, and advanced packaging technologies for high-speed, AI-driven data-centre interconnects.

HIGHLIGHTS

- 18+ YEARS – Silicon Photonics Experience
- 10+ YEARS – Inphi / Marvell
- SI-PHOTONICS TEAM LEAD – Marvell Singapore

Learn from the people shaping the semiconductor industry