

SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING

Website: <https://cde.nus.edu.sg/ece>

Area: Microelectronic Technologies and Devices (MTD)

Host: Prof Armin Aberle (Main Supervisor)
Asst Prof Hou Yi (Co-supervisor)

TOPIC	:	Realizing TCO-Free Interconnecting Layers via Surface Modification of Doped Polysilicon for Perovskite-on-Silicon Tandem PV Applications
SPEAKER	:	Ms Lee Ling Kai Graduate Student, ECE Dept, NUS
DATE	:	Friday, 25 April 2025
TIME	:	1:00PM to 2:00PM
VENUE	:	Block E3A, E3A-04-25/26 Level 4 Conference Room College of Design and Engineering, NUS

ABSTRACT

The integration of perovskite on silicon in tandem solar cells has already surpassed the Shockley-Queisser (SQ) limit of single-junction solar cells. Silicon provides a stable and mature foundation, while perovskites offer high flexibility in tuning bandgaps. In a two-terminal (2T) tandem configuration, the interconnecting layer serves as an electrical connection between the perovskite top cell and the silicon bottom cell, enabling current flow between the two sub-cells. We introduce a simplified interconnecting structure using NiOx/nickel silicide/n⁺ poly-Si, where the nickel silicide is formed through post-deposition processing, eliminating the need for conventional transparent conductive oxide (TCO) layers. The formation of nickel silicide at the NiOx/n⁺ poly-Si interface establishes an ohmic contact, facilitating efficient carrier transport. In this study, we successfully demonstrate that NiSi can serve as a TCO-free interconnecting layer, achieving power conversion efficiencies (PCEs) comparable to ITO-based devices.

BIOGRAPHY

Ms. Lee Ling Kai is currently pursuing her Ph.D. degree at the Department of Electrical and Computer Engineering (ECE) and the Solar Energy Research Institute of Singapore (SERIS) at NUS. In 2020, she received her Bachelor's degree from ECE at NUS. Ms. Lee's current research focuses on the development of functional layers for next-generation perovskite-based solar cell applications.

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